

Legend of science

External constructions by the extended ›family‹ – the biography of Paul Ehrlich

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Among Paul Ehrlich's personal heritage at the *Rockefeller Archive Center* we find a copy of an undated letter by Otto Meyer, from the years 1916/1917, to »Dear Lady!«. This letter was addressed to Hedwig Ehrlich.

In the quiet atmosphere of a hospital train which now is taking me to Russia I find the opportunity to meet your request and to write down what I remember from the good days of my time as a [re-search] assistant. I hope that this will find you well; I will post the letter when still being in Germany. In about eight days I will be back in Hamburg again, and then I will be happy to further discuss one or the other point, as far as my memory will not betray me. Should I have the opportunity to go to Frankfurt, I will accept your friendly invitation. I think there will be much to talk about our common memory of this great and honourable man.¹

No autobiography exists of Paul Ehrlich, winner of the Nobel Prize in Medicine in 1908 and ›discoverer‹ of Salvarsan, and only a few autobiographical statements and sketch-like pieces of information on his life have been passed on.² This may be astonishing, given the fact that his

1 Otto Meyer to Hedwig Ehrlich, 1916/1917, copy, Rockefeller Archive Center 650 Eh 89 Paul Ehrlich Collection (RAC PEC) Box 51 Folder 5 (hereafter abbreviated as 51/5).

2 For example an address (›Ehrlich-Kommers‹), given in Frankfurt in January 1909 on the occasion of being granted the Nobel Prize, in RAC

less famous colleagues and contemporaries considered it desirable to tell posterity about their lives, like Friedrich von Müller (1953), Bernhard Naunyn (1925), Carl Ludwig Schleich (1920), Ehrlich's ›tutor‹ Wilhelm von Waldeyer-Hartz (1921), who again referred to his ›tutor‹ Adolf Kußmaul as an example, who had published his personal memories (Waldeyer-Hartz 1921: V; Kußmaul 1902). In the 19th and 20th centuries it was rather common for famous life scientists and physicians to write memoirs at the end of their lives. These autobiographies were written as a retrospective memory to make later generations remember one's own pride in achievements. Furthermore, these memoirs allowed their authors to present their own contributions to ›progress‹ as well as to the process of modernization.

Even in periods of crisis (and lack of confirmation) countless autobiographies were written, e. g. after the First and Second World War. These texts served as justification, self-assurance and keeping control of the interpretation of one's own life. If a scholar or a politician did not write memoirs himself or herself, others did: disciples, successors, relatives, contemporaries. This group of people can be understood as an extended academic family, possibly including a sworn-in team of colleagues as well as the scientific community.³ From Albert Schweizer to Ferdinand Sauerbruch the German history of medicine has maintained the illusion of great men as physicians with an intense passion for their profession. This hagiographic approach to the history of an academic discipline has no match (Gradmann 1998; 2003: 245). It was the autobiographers' or their disciples' goal to classify the main achievements and to locate themselves in a tradition of great scientists. Furthermore there is a great demand for biographies of life scientists, also providing the reader – mainly physicians – with orientation for their work, while at the same time a certain ethos of a passionate and charitable physician is

PEC Box 3 Folder 8; or a sketch he sent to Christian A. Herter, 10.7. 1909, RAC PEC 1/17.

3 See e.g. Legout 1999, who describes the Institute Pasteur as a ›lieu de memoire‹ and the close community of scientists as a family.

idealized and facilitated to the medical profession – the biography in some way serves as living evidence of this ideal.⁴ The construction of icons of science worked most of all as a commemorative practice, and the collective memories of Paul Ehrlich, Robert Koch or Louis Pasteur as »saints« of medicine helped creating the identity of an extended »family«, of the discipline and of the nation (Söderqvist 1997; Abir-Am 1999).

Earlier biographies of Paul Ehrlich (Lazarus 1922; Marquardt 1924 & 1951; Venzmer 1948; Loewe 1950; Greiling 1954; Satter 1963; Bäumlér 1979) describe him as a hero, as the founding-father of chemotherapy, as a saint of science and a benefactor of mankind. Another metaphor characterizes Ehrlich as somebody who was oblivious of everything around him, a childish professor who, far from any earthly interest, made countless experiments in his laboratory to find out about scientific truth. Both narrations are rather fiction than reflections of Paul Ehrlich's »real life and every day activities, which consisted essentially of organizing knowledge and literature as well as of administering a scientific cooperation organized according to the division of labour.

As a Nobel Prize winner and the »inventor of chemotherapy«, contemporaries as well as later generations doubtlessly considered Paul Ehrlich »worthy of a biography« and his achievements worth to be remembered.⁵ Still, his family, his former staff and colleagues had a specific interest in a biography on Paul Ehrlich. In this paper I will give a short account of his life. I will then present the »history of the biography«, how books on Ehrlich were (or were not) realized and for which purposes the relevant pieces of information were collected. These biographical memories of friends and colleagues laid the groundwork for later biographies as well as for the movie on Paul Ehrlich. These bits and pieces of collective

4 The great number of biographies on physicians and life scientists bases probably on the need not only of the biographers (or the autobiographers) to locate themselves in the tradition of great men, but also on the demand of a wide readership – mainly physicians themselves – for guidance and orientation for their own work, cf. Frank Stahnisch, cited in Klein 2006: 9.

5 To refer to the keyword by Schweiger 2009.

memory can be found among Paul Ehrlich's personal papers at the Rockefeller Archive Center. Ehrlich's papers have a changeful history of their own. The archival records do not only consist of his personal papers but also of documents by others, growing with every article written on Ehrlich and his legacy. Finally, by some examples I will illustrate the construction of biographic legends. Among others, this will be about Ehrlich's alleged early talent for chemistry.

Paul Ehrlich – stages of a biography

In 1854 Paul Ehrlich was born at Strehlen near Breslau, where he grew up. After having attended grammar school in Breslau, Ehrlich studied medicine there, in Strassburg and Freiburg. Already during his studies Ehrlich had distinguished himself by dye-technological studies on the histology and morphology of cells, and immediately after the completion of his doctorate in Leipzig the leading German internist, Theodor Frerichs, made him his assistant at the *Charité* in Berlin. At the *Charité* Ehrlich enjoyed much freedom. During his years there he worked on the histological colouring of cells, particularly blood cells, he worked on blood diseases and started first chemotherapeutical research projects. These studies resulted in being appointed university professor in July 1882, at a comparatively young age. In the following year Paul Ehrlich married Hedwig Pinkus, daughter of the Silesian textile industrialist Joseph Pinkus. In 1885 he published what later became his habilitation thesis on the *Requirement of the organism for oxygen*.⁶

Until the mid-1880s his future prospects looked splendid, but in 1885 his mentor Theodor Frerichs committed suicide. Ehrlich's relations to his new superior, Carl Gerhardt, were difficult. After a professional crisis, suffering from tuberculosis and a health stay in Egypt in 1888/1889, Ehrlich worked first at a private laboratory and from 1891 on at the newly founded *Institute for Infectious Diseases*, which was headed by Robert Koch. It was there where, together with Emil Behring, he developed the

⁶ Cf. Ehrlich 1956-1960; and for this and the following paragraphs Huentelmann 2011.

anti-diphtheria serum, which was celebrated as a new kind of therapy and as a milestone in medicine. The anti-diphtheria serum did not only mean a scientific but also an economic success. With the serum being marketed, the medical administration started discussing state regulation for it, and a state control station for anti-diphtheria serum was established. After it had become independent in 1896 as the *Institut für Serumforschung und Serumprüfung* (*Institute for Serum Research and Serum Testing*), Paul Ehrlich was appointed its director. In the following years, Ehrlich and his staff worked on questions of determining the value of sera, of standardizing evaluations as well as of the development and constitution of antitoxins (and toxins) or antibodies as well as on the course of immunological processes which Ehrlich explained by his sidechain theory.

In 1899 the institute was transferred to Frankfurt and renamed *Institut für experimentelle Therapie* (*Institute of experimental Therapy*), thus symbolizing the shift of its research focus. After the turn of the century, Ehrlich increasingly turned towards dye therapy and extended it to what was to become chemotherapy. Ehrlich reduced the operative principle of the antitoxins produced by the body as a reaction to toxins to their molecular or chemical composition, in the course of which antitoxins and toxins neutralized each other. Following this model, Ehrlich searched for chemical substances which had a direct effect on the pathogenic germ causing a certain illness or on its toxic substances but were neutral towards the organism. In the context of searching such ideal »magic bullets« that ideally target the pathogen, chemical substances were supposed to be experimentally and systematically examined for their therapeutic effects. In this context, Ehrlich also concentrated on illnesses caused by exotic parasites, such as malaria, later sleeping sickness and syphilis. Furthermore, he focused on certain chemical substances, most of all the basic dyes of the azogroup, with which he was familiar (aniline dyes) and later on arsenic.

Furthermore, in 1901 Ehrlich had received private donations to drive on experimental cancer research. With the countless animal experiments, research in the field of experimental therapy proved to be extraordinarily expensive, and the Institute's chronic lack of funding was the reason for repeated overspending. Only by Franziska Speyer's foundation and

the establishment of the *Georg-Speyer-House* in 1906 the funding of experimental research was provided with a solid basis, so that the experiments could be extended at a large scale. After Paul Ehrlich had been granted the Nobel Prize for Medicine for his works in the field of immunology in 1908, he achieved the breakthrough in the field of chemotherapy two years later. This discovery made his fame last. By Salvarsan, Ehrlich and his staff had developed a remedy against syphilis which was very effective and easy to apply, and thus they had also practically realized the ideal of the »magic bullets« propagated by Ehrlich, on whose clinical testing and improvement he worked in the following years. After a first serious illness in the winter of 1914/1915, Paul Ehrlich died in August, 1915 – mourned by posterity as a benefactor of mankind.

How to construct a biography

As mentioned, Paul Ehrlich did not write an autobiography. He did not like writing »artistic letters«, as he called official letters, expert's reports or longer manuscripts. An alternative was a biography based on interviews, something which Ehrlich and his family planned after his 60th birthday (Schiff 1916; Bäumlér 1979). This project was never realized, so that Paul Ehrlich's death put an end to all plans for an autobiography. In October 1915, soon after his death, Hedwig Ehrlich decided to appoint a biographer in order to keep the memory of her husband alive. She gave the task of collecting material and writing the biography to a former assistant and staff member of Ehrlich, Leonor Michaelis, and to her nephew Felix Pinkus.⁷ Though much material as well as many contemporary witnesses (Hedwig Ehrlich among them) could help to describe the last years of his career, only little information had survived on the first thirty years of his life. Ehrlich himself had only made sporadic remarks on his childhood and education, and most of his fellows had already died.⁸

7 NN (Leonor Michaelis) to Felix Pinkus, 5.6.1916, RAC PEC 60/11.

8 There was only little Hedwig Ehrlich knew about his youth. »What a pity that Neisser is not alive anymore, just as Mr. Max Cohn who would still know some things. These two gentlemen would also have known much about his time as a university student, about which unfortunately I can-

Thus, Michaelis and Hedwig Ehrlich wrote to old friends, schoolmates and relatives to collect information on Paul Ehrlich.⁹ Michaelis asked a former schoolmate, Max Grube, »to shortly and freely summarize the memories of this schoolmate and of school in general. Any memory from this time would be of great value for my purpose, as unfortunately sources from this time are very scarce«.¹⁰

The results varied: Alfred Neumann pinned down memories of Paul Ehrlich from his own childhood and his years of studying,¹¹ while Otto Meyer wrote some pages on his time as Ehrlich's assistant at the *Charité*.¹² Among the documents of the Faculty Department of Medicine of Leipzig University, Leonor Michaelis researched Ehrlich's lost dissertation thesis on the *Theory and Practice of Histological Staining*.¹³ In the course of time, these bits and pieces of memory were supplemented by the recollections of family members, colleagues and staff members such as Franz Oppenheimer, a former doctoral student of Ehrlich, who pub-

not tell anything myself. It is such a pity that death has been such a grim reaper among my husband's colleagues from those days. On Strasburg Salomonsen, Kopenhagen and Waldeyer may be supposed to be best informed, after all. I do not know anybody from the time in Freiburg. Also, I have never seen any »Collegienhefte« [college exercise books], study books or the like. Unfortunately, there does not even exist any letter by Carl Weigert from those days.« Hedwig Ehrlich to NN (Leonor Michaelis), 25.2.1917, RAC PEC 60/11.

9 Cf. correspondence in RAC PEC Box 51; 59/1; 60/11.

10 NN (Leonor Michaelis) to Max Grube, 28.2.1917, RAC PEC 60/11.

11 See NN (Alfred Neumann) to NN (Hedwig Ehrlich), 25.3.1916, RAC PEC 51/7.

12 See Otto Meyer to Hedwig Ehrlich, undated ca. 1916/1917, RAC PEC 51/5.

13 See University Library Leipzig University, 20.3.1917, RAC PEC 60/11; the dissertation thesis, including remarks on its origin – as assumed by the member of the library staff, was found among the files of the Faculty of Medicine. The thesis is reprinted in Ehrlich 1956 I.

lished a newspaper article on his experiences as Ehrlich's assistant,¹⁴ Wilhelm Waldeyer-Hartz wrote his memoirs during the war including some passages on Ehrlich,¹⁵ Anna Knoche, Paul Ehrlich's sister, remembered her brother's childhood, youth and years as a schoolboy and student.¹⁶ The history of his ancestors and parents was reconstructed from family documents,¹⁷ and a nephew of Paul Ehrlich started to reconstruct the broader family history (Knoche 1936). All these different memories were complemented by Hedwig Ehrlich, who recalled her life with her husband, looked through her diaries and letters¹⁸ and wrote a report of their journey to Egypt.¹⁹ Moreover, the construction of Ehrlich's biography by collecting material profited from stories that had been published on the occasion of Ehrlich's 60th birthday, e.g. by his teacher Rudolf Tardy or his fellow student Carl Julius Salomonsen.²⁰

These various biographical fragments came from different kinds of sources (oral narrations, excerpts from diaries, newspaper articles, excerpts from a biography, written reports) and therefore differed from each other. Furthermore, their content depended profoundly on the respective narrator as the source of the information. Heinrich Rosin, for

14 See reminiscence by Franz Oppenheimer, *Vossische Zeitung*, 4.7.1930, excerpt in RAC PEC 51/8.

15 Cf. Waldeyer-Hartz 1921. Waldeyer-Hartz had sent the manuscript to Paul Ehrlich.

16 »Material for a biography on Paul Ehrlich – I. ancestors and parents – II. school years – III. studenthood – memories of his sister«, RAC PEC 51/4.

17 *Memories of Abraham Weigert*, 1867, RAC PEC 51/16.

18 »Some time later I will also give you the travel reports on Egypt.« They were still with Hedwig Ehrlich's mother, Auguste Pinkus, and Hedwig would soon look for them, Hedwig Ehrlich to NN (Michalis), 24.9.1916, RAC PEC 60/11.

19 Cf. the report: »Journey to Egypt 1888-1889«, RAC PEC 51/12. The fragments of the diary on the journey to Egypt are found in RAC PEC Pack 1.

20 Cf. Tardy 1914; Salomonsen in Bäumler 1979: 41-45.

example, was almost of the same age, had basically grown up with Ehrlich at his stepfather's boarding house and had attended school with him.²¹ Still, his reaction to Hedwig Ehrlich's request was cautious: »Even I cannot tell much; it has been such a long time, and memories cannot be ordered to come. But I will prepare a paper where I will write down what might come back to my mind now and then; and this I will send to you then.«²² In contrast to these painstaking remarks, *Hofrat* Max Grube, who had had only little contact with Ehrlich, boasted to have »a lively memory of [Ehrlich] as a young boy. He is still in my mind: small, with a comparatively big head showing reddish, slightly curly and always centreperted hair, and sitting in the first row.«²³ What is crucial is not that Grube remembered Ehrlich as a silent and keen student »who read for himself the most difficult Greek and Roman authors«, but that his recollections related to a time almost fifty years ago. It is therefore questionable to which degree these memories were more subjective than »objective« and how much of them was due to Grube's imagination.

Ehrlich's early talent for chemistry

Apart from his activity as a physician, Ehrlich also worked at the interface of biology, pharmacology and chemistry – which started to become institutionalized also as biochemistry and what Ehrlich called experimental therapy. Adolf Lazarus in his biography dedicated a chapter to »Ehrlich as a chemist«. Starting out from Ehrlich's early dye-analytical histological studies and his studies on chemotherapy, the contemporaries raised the question about the preconditions for his success. They assumed that Ehrlich must have had a particular talent for chemistry which belonged to his personality and qualified him for his special studies on chemistry and chemotherapy. Ehrlich supported this assumption by tel-

21 During his time at the Magdalenen-Gymnasium (ca. 1864-1872), Ehrlich lived as a boarder at the family Munck. The owner, »Professor« Munck, was Heinrich Rosin's stepfather, the two were almost brought up together.

22 Heinrich Rosin to Hedwig Ehrlich, 15.12.1915, RAC PEC 51/10.

23 Max Grube to NN (Leonor Michaelis), 10.3.1917, RAC PEC 60/11.

ling anecdotes, saying that he was able to see chemical compounds with his inner eye. Another one of Ehrlich's anecdotes, which was also spread by his friend, Arthur von Weingart, is the biographical sketch introducing a commemorative publication dedicated to Ehrlich, telling that for his final grammar school exam on the subject »Life – a dream?« he had written an essay discussing »that life was based on ordinary oxidation, that even the activity of the brain was such a process, and that dreaming was a kind of oxidation, a kind of ›brain phosphorescence«. This essay by Ehrlich had been marked »insufficient«, so that he had had to pass an additional oral exam (Weinberg 1914: 3-4). In the construction process of biographies on Ehrlich, this particular talent for chemistry was supposed to be emphasized, as Hedwig Ehrlich explicitly asked about information on early chemical experiments in Ehrlich's childhood days or his time at school.

This »talent for the natural sciences« was said to have been inherited from his father's father, »a man who had much talent for natural sciences and who even at the age of ninety ex proprio studied the natural sciences in my small hometown and gave popular-scientific lectures.«²⁴ This grandfather had owned a huge library where Ehrlich stated to have read books on natural sciences at an early age. Hedwig Ehrlich and Leonor Michaelis in their letters to schoolmates asked for details then to be used as evidence for the alleged talent for chemistry.

Heinrich Rosin remembered »chemical experiments, the production of oxygen and the like«, as well as »all kinds of mixtures we produced in nutshells and donated to the gods as ›sacrifices«.«²⁵ *Sanitätsrat* Seidelmann, however, who during *Oberprima* (final school year in Germany) often had been sitting next to Ehrlich, stated that he did not know about chemical studies during Ehrlich's years in school. He reported that they had been talking about other things on their way home from school.²⁶

24 Paul Ehrlich to Christian Herter, 10.7.1909, RAC PEC 1/17.

25 Rosin to Hedwig Ehrlich, 4.12.1915, RAC PEC 51/10.

26 Sanitätsrat Seidelmann to Rudolf Tardy, 12.12.1916, RAC PEC 60/11.

Also G. Neisser, brother of Albert Neisser, a close schoolfriend who died only one year after Ehrlich, was not able to provide the desired information. His brother obviously had not reported on early influences which might have directed Ehrlich towards the natural sciences, particularly to chemistry.²⁷ Major Noack proved to be a failure, too: »In my memory, P. E. was a somewhat delicate, modest, very keen and gifted man, whom I liked very much personally. I was never close to him, as he lived a very secluded life. We did know that he was interested in a variety of matters, but I do not remember that chemistry was one of them.«²⁸

By presenting instances of early chemical experiments during Ehrlich's years as a schoolboy, Hedwig Ehrlich and her supporters were interested in providing evidence for Ehrlich's early talent for and preference of the natural sciences. However, to prevent this from being disqualified as children's games and to make it appear a serious and thought-out matter, they had people search for the ominous exam essay. They were able to win over Rudolf Tardy for the investigation,²⁹ Ehrlich's former teacher. Besides, Tardy asked Noack and Neisser about the essay, but only received negative answers: »Also, I do not know anything about Ehrlich in his examination essay having interpreted life as a chemical process in the brain. Thus I am sorry for not being able to contribute anything in this respect to the intended biography on E.«³⁰ Although Neisser was not able to make any statements on the examination essay, too, he did further research.³¹ Even Adolf Lazarus, one of Ehrlich's former staff members, was not able to provide the desired information: »He himself has found such anecdotes only in newspaper articles.« However, Neisser was successful with *Kommerzienrat* Ernst Schwerin: »On the other hand, Ehr-

27 G. Neisser to Rudolf Tardy, 8.1.1917, RAC PEC 60/11.

28 Major Noack to Rudolf Tardy, 11.1.1917, RAC PEC 60/11.

29 Rudolf Tardy had been asked to do the research work, Leonor Michaelis to Hedwig Ehrlich 1.1.1917, RAC PEC 60/11.

30 Major Noack to Rudolf Tardy, 11.1.1917, RAC PEC 60/11.

31 G. Neisser to Rudolf Tardy, 8.1.1917, RAC PEC 60/11.

lich's son-in-law, [...] confirms that often his father-in-law had told with a laugh that for his examination essay he had interpreted dreams as brain phosphorescence. Ehrlich had been interested in chemistry as early as in his time at Strehlen, and in those days he had been mixing all kinds of styling gel.«³² Finally, Tardy went back to the original place, to the Magdalenen-Gymnasium in Breslau, and asked a former teacher whether he could look for Ehrlich's examination essay – without success, since the result was »= 0«, as Michaelis had once summarized the research results.³³ The essay could not be found, but indeed they could find evidence that the written exam – whatever it was written about – had been marked »insufficient«, so that Ehrlich had had to pass an oral examination.³⁴ Arthur Weinberg, director of the chemical company Leopold Cassella & Co. in Frankfurt and a close friend of Paul Ehrlich, during the war serving as a major at the *Kriegsamt* (War Office), who had been contacted because he had told this anecdote in his biographical sketch, knew about it only from Ehrlich's own narrations. He »even quoted some sentences he still remembered, and because his memory is very good, as you know, I do not doubt that these sentences were literal/really historic.« Weinberg presumed that the headmaster had made the essay disappear to not compromise Ehrlich.³⁵ All this correspondence and efforts had – in the midst of the troubles of the First World War – produced only marginal results.

Paul Ehrlich *post mortem* – the (hi)stories of biography(ies) on Paul Ehrlich

The biography by Leonor Michaelis and Felix Pinkus was never written. Nevertheless, above quoted Adolf Lazarus wrote a small volume for the *Meister der Heilkunde* (Masters of Medicine)-series, which was published in

32 G. Neisser to Rudolf Tardy, 15.1.1917, RAC PEC 60/11.

33 As a final account: Leonor Michaelis to Hedwig Ehrlich, 1.1.1917, RAC PEC 60/11.

34 Krause to Rudolf Tardy, 8.2.1917, RAC PEC 60/11.

35 Arthur von Weinberg, 4.3.1917, RAC PEC 60/11.

1922 and was dedicated to Hedwig Ehrlich. Obviously, Lazarus had previously been talking to Hedwig Ehrlich and had included some personal anecdotes in his book (Lazarus 1922). More than any other, the biography by Martha Marquardt, Ehrlich's secretary, caused great sensation. In 1924 she had published a biography on the occasion of Ehrlich's 70th birthday, relating her boss's personal characteristics and his way of working (Marquardt 1924). After Ehrlich's death it had been Marquardt who had sorted his papers at the institute.³⁶ Her book was met with approval by Hedwig Ehrlich, who supported its publication. Georg Venzmer, too, when writing a biography of Paul Ehrlich in the 1930s, was allowed to see the biographical material collected by Hedwig Ehrlich, to whom he expressed his special thanks in the foreword (Venzmer 1948).³⁷

The year 1933 marked the beginning of troublesome times for the Jewish Ehrlich family. Increasingly, Jews were discriminated and public life was cleared from the memories of Jewish scientists. The »Paul-Ehrlich-Strasse« in Frankfurt was renamed. With the Ehrlich family emigrating, the odyssey of his papers and the biographical material began: from Geneva to South America and finally to the United States. During the difficult times of exile, Paul Ehrlich's family again wished a biography that would meet their demands. Even more so as his widow and his children believed Ehrlich's heritage and reputation for his achievements in immunology and chemotherapy to be wiped out. Accordingly, his grandsons Günther and Hans-Wolfgang Schwerin, who were living in exile, planned a biography which, however, became rather a compilation of legends. A preliminary collection of notes included chapters such as: »Ehrlich's favorite quotations«, »Ehrlich as a martyr«, the »secret of bacteriologic war«, »Ehrlich and the Emperor«, »coach driver«, »absent-mindedness«, the »magician and on the magic of colours«, and many other keywords.³⁸

36 Cf. the Martha Marquardt Collection in the RAC.

37 A manuscript of the biography in RAC PEC 51/14. An evaluation of Venzmer's biography by Ehrlich's grandson, who found the biography »naive« in RAC PEC 59/1.

38 Cf. »Notes on a Biography of Paul Ehrlich«, RAC PEC 59/1.

One of the grandsons also noted: »the secret of the ingenious act of creation. Inspiration by music. I was able to see how he was »moved« and carried away towards creative thought. Rythm. He always needed associative stimulation. Strongly associative, i. e. ingenious thinking.«³⁹

A biography from a similarly emotional perspective was written by a nephew of Paul Ehrlich, the physician Felix Pinkus, who had known Ehrlich also from their personal cooperation.⁴⁰ The troubles of the war and the post-war period as well as Felix Pinkus's death brought these plans to nought – neither Hans-Wolfgang and Günther Schwerin nor Felix Pinkus ever published their intended books. After all, another biography had perhaps become obsolete, since Martha Marquardt published a biography on Paul Ehrlich in 1949. She still owned a number of Ehrlich's letters, excerpts and copybooks.⁴¹ In the years after the Second World War, two other biographies were published: one by Hans Loewe (1950) as part of a series called *Große Naturforscher* (Great Natural Scientists), the other one by Walter Greiling (1954), entitled: *Im Banne der Medicine* (Under the Spell of Medicine). The latter was published on the occasion of Ehrlich's 100th birthday in 1954. These early biographies as well as the US-American movie »Dr. Ehrlich's magic bullets«⁴² presented a

39 Fragments and copies of the biographical sketch are found in a number of boxes in RAC PEC.

40 Cf. Ehrlich, Lazarus & Pinkus 1901.

41 Marquardt 1949. The biography was funded, and Marquardt, who was then living in London, financed by Almroth Wright, a former British friend of Ehrlich; see also her personal papers, Martha Marquardt Collection in the RAC.

42 The film was produced at Warner Brothers Studios and premiered in the US in 1940. The cast was of the finest quality, e.g. Edward G. Robinson in the role of Paul Ehrlich, and it was one of the most successful films of that year. The script was nominated for the Oscar. In 1945/1946, the film was shown at first at Austrian and then at German cinemas, under the title »Paul Ehrlich – Ein Leben für die Forschung«, cf. Lexikon 1995: 3008.

number of anecdotes from the family's collection. One of these legends will shortly be recalled in the following paragraphs.

The construction of Ehrlich's talent for chemistry

During university vacations, Paul Ehrlich usually visited his family at Strehlen. Presumably he spent his summers with additional physiological and histological studies. Instead of guinea pigs, difficult to get and expensive to buy in the city, other rodents were found in abundance in the rural area of Silesia, even more so as Ehrlich had help. In retrospect, Alfred Neumann remembered that after the student's arrival a bunch of boys met in front of his parents' home to collect frogs, mice or other animals for him.⁴³ Ehrlich dissected the creatures or used them for physiological experiments in a vacant kitchen room that had been converted into a provisional »laboratory«. Later his sister Anna Knoche reported on one such experiment: Ehrlich had stolen some pigeons from the family's pigeon loft and had injected dye into their brains, as a result of which their heads were said to have turned blue. In this kitchen laboratory, so the legend goes, Ehrlich did not only consolidate and trained the practical aspects of his medical studies but also produced different kinds of hair gel, creams and cough drops.⁴⁴

There is a number of anecdotes on chemical experiments during Paul Ehrlich's childhood, youth and years as a student. Georg Venzmer made the vacant kitchen an »alchemist's laboratory« (Venzmer 1948: 17), Martha Marquardt described it as a »washhouse« where Ehrlich »brewed all kinds of little mixtures« (Marquardt 1951: 5). In Walter Greiling these anecdotes became even more colourful: Ehrlich classified stones but also beetles, butterflies and water animals according to his grandfather's books, and later, inspired by the narrations of his cousin Carl Weigert who was studying medicine, he had more animals collected.

43 See the report by Alfred Neumann, RAC PEC 51/7.

44 Memories of Anna Knoche, sister of Paul Ehrlich, RAC PEC 51/4.

He kept the animals in his mother's washhouse, in the vessels and washtubs he found there, and fed them daily, until one morning, when it was washing day, the maids were frightened by the swarming mass and started to cry, so that his mother had to intervene. From then on, an empty kitchen room on the first floor, which had not been used for years, was left to Paul Ehrlich. It was there where he established his laboratory. From the liqueur factory [the family held a licence for producing alcohol] he took what he needed, at the pharmacy he watched for hours how the receipts were made, how substances were crushed and mixed, how the many glass vessels contributed their powders and liquids. He asked to be given some vessels and their contents, and with them he filled the shelves of his laboratory which envying comrades called a ›devil's workshop‹ (Greiling 1954: 53-54).

Ernst Bäumler, who tried to write a rather documentary book, rejects these stories as ›nice legends‹ ›meant to give evidence to his early ingenuity‹. Nevertheless, he mentioned anecdotes on how ›little Paul‹ had established a laboratory in a former kitchen where he had experimented as much as he liked and had produced cough drops. Then, however, he connected these ›legends‹ to Ehrlich's dye-therapeutical experiments during his medical studies (Bäumler 1979: 30-32).

Looking at the construction process of the biographies on Ehrlich, it becomes clear that these experiments were transferred from his years as a university student to his years as a schoolboy. Over the decades the legend was transformed to a story of young Paul continuing the chemical experiments he had started during his vacations when attending grammar school. But according to the retrospective reports by Alfred Neumann and Anna Knoche, these only sketchily mentioned ›experiments‹ can be dated to his years as a university student, not to his earlier education.⁴⁵ This chronological shift does not so much mark the correction of a detail of Paul Ehrlich's biography, but rather the backdating of his experi-

45 Cf. the report by Alfred Neumann, RAC PEC 51/7 and the memories of Anna Knoche PEC 51/4.

ments to his schooldays illustrates exemplarily how specific characteristics were attributed to him. For Venzmer and Marquardt his early research represents Ehrlich's (ingenious) talent for the natural sciences which later only had to be further developed. Knowledge of chemistry or of the natural sciences achieved in the course of his life were projected on Paul Ehrlich as a young man. As a result, his career towards a Nobel Prize winner was explained as an unavoidable consequence of his early talent.

These legends and biographical fragments of young Paul's interests in the natural sciences and in his grandfather's library, his use of the kitchen as a laboratory, the vital colouring of pigeons, the production of mixtures as well as the misunderstood examination essay appear in all biographies. More or less colourfully depicted, the biographical legends produce an idea of Ehrlich who already as a child had shown an impressive talent for chemistry.⁴⁶

46 A similar (re)construction of Ehrlich as a young man can be sketched by the example of his leadership role as described by Marquardt. In the chapter on his time at grammar school in Breslau she describes that during holidays »the whole male youth of Strehlen« between seven and 16 years of age had been rallying around Ehrlich and that he had been roving around with the »whole bunch of boys«. They had made »all kinds of fun«, had collected mice and frogs, and Ehrlich had always been their leader. When they had been playing »highwaymen« there had sometimes been quarrels, in the context of which Ehrlich had »once been severely beaten«. »This may be supposed to have been some kind of little revenge of the physically stronger subjects on their spiritually superior leader [...], for his spiritual superiority which, however, did not change at all the love and adoration of all his followers [...]. After all, all his life meant fighting. He did not put up with anything, could not stand injustice. He was always ready to defend himself and, if necessary, to attack.« With this »militant attitude« Ehrlich had been a child of his time – and of the historical space. Without a break, Marquardt changes from the »militant Ehrlich« – who, other than Emil Behring, had never served with the army or, as Robert Koch had done, had fought in the war – to the bad fate of his Silesian home region (Marquardt 1951: 6 f.). Probably as a result of the freedom of the author, Georg Venzmer mixed the various anecdotes beyond recognition and colours them with a grain of imagination. Young

**Legend of science –
external constructions by the nuclear and the academic family**

The construction of biographical legends raise a number of general questions. The first question aims at the biographies, at their authors and their sponsors. What was the constituents' interest, what the biographers' benefits? Hedwig Ehrlich as well as her grandchildren were interested in keeping the memory of Paul Ehrlich alive. Besides, all biographies on her husband refer to Hedwig Ehrlich herself: She would be less significant as Paul Ehrlich's widow if her husband and his good deeds were forgotten and, as a consequence, his significance declined. For this

Paul had not only been a »little natural researcher«, who already »when attending 4th form had the pharmacist make cough drops of his own design, he is also a real boy who knows well how to play and frolic around and who, notwithstanding all his modesty, is the leader of his little friends« (Venzmer 1848: 18).

Alfred Neumann's retrospect provides a more accentuated image of Ehrlich. Neumann's memory, who was seven years old then, starts when Ehrlich was 18 and already a university student. On vacation at Strehlen Ehrlich, »together with a teacher from the local school«, had initiated open-air games at regular intervals. Having initiated them, Ehrlich had been the leader when they were playing »knights« or »highwaymen«. »Otherwise, Paul led rather a secluded life during holidays. He was seldomly seen, on the other hand quite a number of thrilling stories was told about him [...].« Neumann tells about the same games and fights as Marquardt and Venzmer do, for whom Neumann's memories must have served as a source. In Marquardt and Venzmer respectively the memories are given in different contexts, wrongly so the games and fights are placed in his childhood years, and Ehrlich is stylized as a young leader. However, the original source makes obvious that probably Ehrlich played the »leading role« because he was older than the others, being in his period of adolescence between youth and adult, because of his somewhat remote status as a university student as well as his contact to a teacher from the local *Bürgerschule*, and not at last because of his upper class status which made him somewhat different from the Strehlen »village youth. Otherwise, in accordance with a number of other memories, Ehrlich is described as calm, reserved and leading a secluded life, cf. the report by Alfred Neumann, RAC PEC 51/7; and 60/11.

reason she was personally involved in shaping the public memory of Paul Ehrlich. In my opinion, this motivation becomes particularly obvious in periods when the memory of Paul Ehrlich was threatened, e.g. after his death in 1915 and during the Nazi era. For Hedwig Ehrlich, the plans for a biography and its publication shortly after her husband's death may also have been some kind of mourning. This loss meant a personal, severe cut in her life, because as *Frau Geheimrätin* she had to re-define her role and to find new tasks – such as organizing a biography, and twenty years later, when the commemoration of Ehrlich was threatened to be erased, his family and colleagues attempted to raise his fame by means of a biography.

For me, it is particularly remarkable that the biographical material looks back to an odyssey of its own. Among the few things Hedwig Ehrlich was allowed to take with her when emigrating to Switzerland and later the US were letters (all the letters she had received as a bride as well as the here presented correspondence), official documents, newspaper articles and other memorabilia. On the one hand, remembering was a bitter emotion when in exile she was recalling past times by way of letters and excerpts from newspapers, on the other hand these documents meant comfort, and the memories of her former significance helped with compensating for the loss of status.⁴⁷

It is also interesting to ask about the motivation of Leonor Michaelis, Adolf Lazarus, Martha Marquardt and the other biographers. These early biographers, who had had a personal relationship to Ehrlich, may have had reasons similar to those of Hedwig Ehrlich: by reminding to Ehrlich's achievements and describing his career they would also increase their own significance.

In his studies on different forms of capital, Bourdieu states that cultural capital is more or less connected to a certain person who has accumulated the scientific or cultural capital during his/her life, and that delegating this cultural capital is impossible (Bourdieu 1992: 55). Using the

47 On this, see the correspondence with Felix Pinkus in the Pinkus Family Collection (RAC).

example of biographers who write a biography of their teachers, scientific colleagues, companions or family members, it could be asked to what extent cultural capital could be transferred onto the biographer if the biographer has or had been in closer contact to the biographed person and thus by biographing the once (or still) known person this connection stays alive, and, in some way, the fame of the biographed person rubs off on the biographer himself and if in so far, under these circumstances, the cultural capital of one person could be delegated or transferred to another. Nevertheless, even if one might doubt the delegation of cultural capital, without doubt the early biographers of Paul Ehrlich, who had had a personal relationship to him and the Ehrlich family as their supporter or initiator, had accumulated cultural capital by writing biographies⁴⁸ and keeping his memory alive.

Secondly, there are questions about the sources. It is remarkable how insistently biographical information was searched for during the difficult years of the war in 1916/1917. But how is this information to be judged? The requests for information about chemical experiments make us expect a certain answer and certain information. As a result, other memories might have been concealed and remained untold. Beyond this, all biographies are in some way a retrospective review of one's life. Contemporaries had a specific idea of Paul Ehrlich, the Nobel Prize winner. These images were retrospectively matched with appropriate childhood memories (e.g. of the hard-working student). In any case, the childhood memories were related to the later Paul Ehrlich, they were checked for their validity and, if necessary, rejected.

What can be remembered of an incident that happened fifty years ago, and in how far does this reflect a weak past, in how far is it actually historical, as Arthur von Weinberg has it? As we have seen, the value of a statement depends on who provides the information and from the de-

48 In some way all written biographies accumulate capital: beside the mentioned connexion of accumulating cultural capital, scientific capital is accumulated if the biography is written in a certain academic context, and economic capital if the biography is written for the purpose of sale.

gree to which he/she reflects on his/her own memories: Heinrich Rosin, who for many years had been living with Ehrlich day after day and who, while expressing doubts, tried to remember, will be judged differently from Max Grube, who was not close to Ehrlich but at once produced an image of Ehrlich in front of his inner eye.

The various reports were collected and served as a foundation for many biographies on Paul Ehrlich. In the course of this process the reports developed a life of their own. Each biographer staged the information differently and added details. For example, in the case of Walter Greiling's narration finally the reader cannot differentiate between the original report, the modifications resulting from Greiling's own imagination and his image of Ehrlich, and Greiling's personal experience that only later was projected on Ehrlich.

Precisely because of their lack of clarity the reports were more and more transformed to legends, because they recall events that had happened forty or fifty years ago. Their narrators recalled particular incidents which, after having been internalized, are told as having happened daily. The unique colouring of pigeons is changed into Ehrlich having coloured animals already as a young man. By way of individual legends it then became possible to construct a certain image. The longer ago, the more probable was it that the incident would become legendary. For Ehrlich's grandchildren, who had often heard these anecdotes and who had deeply internalized the legends into the family's (collective) memory, the series of legends fixed on record cards served as a basis for their intended biography. Single, supposedly typical incidents which the biographer may have experienced personally, such as Ehrlich's dye experiments, are meant to typically reflect a certain characteristic. Furthermore, every biographer looked at the sources from a different angle and enjoyed the freedom of the author. Most of Ehrlich's biographers used this freedom extensively. Often the reports, embellished to become legends, served for bridging gaps in the narration or to stage typical characteristics as legends. By way of the legend of his early talent for chemistry the image of the student and assistant physician is constructed, who via

dye-technological and chemotherapeutical experiments finally made a career as the creator of chemotherapy.

In some way, the writing of a biography is rather the construction of new life than the re-construction of somebody's life – no matter if it is an autobiography or a biography. By constructing and narrating the life of the biographed person, (former) hagiographic biographies highlighting the topos of a founding father, similar to the discourses of inventor or the narrative of a creator of a certain discipline, institute, therapeutic or research field, becomes a double meaning: the biographer becomes a creator of a new person himself: In the same way as Ehrlich is described as a creator, e.g. by his grandson or by Hans Loewe as a creator of chemotherapy, the biographer creates (invents or becomes the founding father/mother) a new, individual person who in some passages has only few things in common with the life of the biographed person.

My article is not meant to doubt Ehrlich's outstanding importance for the life sciences or his talent for chemistry, about the latter I could only speculate. The history of (published and unpublished) biographies shows how Ehrlich's talent and the narration of his career as a scientist was constructed from the various, purposefully researched reports. This particular talent for chemistry was more and more shifted to his childhood and therefore seemed to be ›inherited‹. While these legends cover gaps in the biographies, they were also used for making Ehrlich more human and at the same time – by way of making him more human – for super-elevating him as a scientist. These legends were complemented by a number of others: his love for animals, his modest origins, his childish-quirky behaviour and others more, on the whole resulting in an overall image of Ehrlich. The history of science as well as the popular biographies of scientists are for a good deal made of legends. Legends do not only serve as means of commemoration of the ›saints of science‹ but also as an illustration for complicated processes of scientific discovery.

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