

**The Case of Heinrich Wilhelm Poll (1877-1939):
A German-Jewish Geneticist, Eugenicist, Twin Researcher, and Victim of the Nazis**

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Abstract: This paper uses a reconstruction of the life and career of Heinrich Poll as a window into developments and professional relationships in the biological sciences in Germany in the period from the beginning of the twentieth century to the Nazi seizure of power in 1933. Poll's intellectual work involved an early transition from morphometric physical anthropology to comparative evolutionary studies, and also found expression in twin research – a field in which he was an acknowledged early pioneer. His advocacy of eugenics led to participation in state-sponsored committees convened to advise on social policy, one of which debated sterilisation and made recommendations that led eventually to the establishment of the notorious Kaiser Wilhelm Institute for Anthropology, Human Heredity and Eugenics. However, his status as a prominent geneticist and, in particular, as a eugenicist had an ironic and ultimately tragic dimension. Heinrich Poll was of Jewish birth, and this resulted in his career being destroyed by an application of the population policies he had helped put in place.

In 1902 a young, recently qualified Berlin doctor by the name of Heinrich Poll published a major (134-page) craniological study of the Moriori, the indigenous inhabitants of the Chatham Islands some 700 kilometres to the east of New Zealand.¹ The skulls on which Poll based his paper had been collected five years earlier by a visiting German museum director, Hugo Schauinsland,² and his examination of them can be described as methodologically typical of the physical anthropology of the period. It was, however, the only anthropometric study that he would ever publish. A close reading of Poll's monograph suggests that he was already having difficulty in accepting earlier anthropometric studies of the Moriori, that he may have had doubts about the validity of anthropometric method as a means of determining racial types, and that he also doubted the veracity of such types. Such misgivings reflected the belief, then topical in the wider anthropological community, that anthropometry, as the dominant mode of enquiry into racial differences, had led into "an epistemological, methodological, and conceptual blind alley".³ Like others, Poll seems to have felt that "statistics by themselves could only point to a biological problem, which could only be solved by a biological methodology".⁴ This is evidenced by the direction that Poll's professional career would eventually take in the biological sciences. Our work has revealed that at the time he produced his 1902 monograph on the Moriori, Poll had recently received his doctorate, had strong interests in anthropology and endocrinology, and was about to embark on a career as an anatomist and geneticist. In this last-mentioned capacity, he was to become an important early contributor to twin research and, in particular, to achieve prominence as a eugenicist in interwar Germany.⁵ Poll's career thus coincided with a shift in German physical anthropology from a preoccupation with morphological studies and the attribution of specimens to pre-defined types to a crucially important struggle over whether new concepts from developmental biology, genetics and statistical methods were to be welcomed or rejected in the re-formulation of German science. History records that that struggle was lost temporarily

as a notorious association was forged with National Socialism. Ironically, Poll would eventually fall victim to official population policies that were an application of those he had helped to put in place.

Heinrich Wilhelm Poll was born in Berlin on 5 August 1877, the only surviving child of Moritz Poll, an engineer, and his wife Julie. Poll's parents were Jewish, but he converted to Protestantism at a young age.⁶ He spent his childhood, education and two thirds of his professional career in Berlin. Strongly influenced by Berlin's pre-war ambience, Poll developed interests in the natural sciences and biology – with a strong technical and mathematical emphasis – from his schooldays. His enthusiasm for science and technical matters is reflected in the course of his studies and in his development, at the age of twenty-one, of an apparatus for measuring cranial capacity which was described in his first published paper, and later noted by the renowned physical anthropologist W. L. H. Duckworth in his *Morphology and Anthropology* (1904).⁷ After achieving his *Reifeprüfung*, or school-leaving examination, in September 1895, Poll studied medicine from 1895 to 1900, passing first the *Physikum*, a preliminary examination in medicine in July 1897, and then the *Staatsexamen*, the university qualification required for teaching. He gained his doctorate with the dissertation *Veränderungen der Nebenniere bei Transplantation* (“Changes to the Adrenal Gland in Transplantation”) in July 1900, and his *Habilitation*, or postdoctoral lecturing qualification, in June 1904, with a public lecture entitled *Über die Bewertung anthropologischer Reihen* (“On the Evaluation of Anthropological Series”).

In a Curriculum Vitae written in 1931, Poll identified three formative influences on his student years. These were the anatomist Wilhelm von Waldeyer, the cellular biologist Oscar Hertwig, and the anatomist and anthropologist Wilhelm Krause. Of these, Waldeyer was a part-time anthropologist and a convert to Darwinism who is credited with introducing the term “chromosome”;⁸ Hertwig discovered that cellular union is the basis for sexual

reproduction;⁹ and Krause was one of the few professors to teach physical anthropology at German universities at the end of the nineteenth century.¹⁰ During his student days and the period that followed, Poll was drawn to “a comparative and evolutionary view of biology” which led to a life-long focus on the theoretical content and practical implications of heredity. Strongly influenced by the rediscovery of Mendel’s laws of heredity at the turn of the century, these interests found expression in eugenic ideas inspired by the writings of Wilhelm Schallmayer,¹¹ Ludwig Woltmann¹² and Christian von Ehrenfels,¹³ which, in the early years of the new century, were being promulgated through Woltmann’s journal, the *Politisch-Anthropologische Revue* (“Political-Anthropological Review”). Those ideas formed a framework within which Poll approached the development of applied population policy. In his thinking, eugenic ideas combined with von Ehrenfels’s Gestalt theory to form a general theoretical orientation which guided his scientific work over thirty years. After the brief period in which he worked on formalistic studies, Poll extended von Ehrenfels’s theory to physiological and biological processes. His scientific interests were based on “questions about the application of population policy and genetics on the one hand, and the translating of zoological and botanical discoveries to the area of human heredity on the other”.¹⁴ He researched the histology, cytology and evolutionary history of adrenal glands in disparate taxa until able, by 1909, to report on the biology of adrenal systems.¹⁵ As Editor of the noted contemporary scientific journal, the *Zentralblatt für allgemeine und experimentelle Biologie* (“Journal for General and Experimental Biology”; first volume 1910-1911), Poll was in a position to guide his fellow biologists through the rapidly expanding literature and specialised fields of biological study – and above all cell biology – that were then gaining ground in Wilhelmine Germany.¹⁶ In addition to such editorial work, he continued to study the physiology of sexual reproduction in hybrids, especially amongst birds, and in 1913 published his only book, *Die Entwicklung des Menschen* (“The Development of the Human Being”) – a

text which, if its bibliography is anything to judge by, was particularly indebted to the work of Hertwig.¹⁷ His research interests in hybridisation, fertility and adrenal mechanisms would continue through mid-career, during which he also advocated the use of twin studies as a means of investigating genetic variation.

In contrast to the normal German practice of attending two or more institutions in the course of obtaining one's degree, Poll completed his doctorate at one institution – the medical faculty of the University of Berlin. Similarly, most of his professional career was spent in Berlin as an assistant to Oscar Hertwig.¹⁸ After serving as a *Volontär*, or unpaid assistant, during his second semester, Poll commenced paid employment at Hertwig's *Anatomisch-Biologisches Institut* (Anatomical-Biological Institute) in April 1899, and remained there, except for a period of war service, until December 1922. The working conditions that Poll and other *Assistenten* experienced there left something to be desired. They had to contend with heavy teaching loads, and their long-term career prospects were not good insofar as none of them would gain a Chair elsewhere for a considerable period of time. Moreover, the Institute often had to make do with levels of funding, accommodation and material resources that were less generous than some professors would have preferred. However, there were certain compensations. Hertwig encouraged a comparatively high level of individual academic initiative amongst his staff, and collaborative research was undertaken only rarely. Hertwig also encouraged his *Assistenten* to work on research fields otherwise regarded as of only marginal importance but which he felt deserved investigation. One of those was Poll's work on the heredity of bird hybrids. Hertwig's *Assistenten* therefore enjoyed a degree of independence as researchers so long as their teaching burdens were not too onerous, and Hertwig sought to relieve that pressure too by securing additional assistants. Some consolation may also have been found in the fact that the Institute quickly acquired an international reputation and attracted distinguished foreign visitors. Hertwig was active in

cultivating academic links abroad and his sense of internationalism may well have influenced Poll.

Poll enjoyed the support of senior colleagues in Hertwig's Institute and the larger medical faculty. He was granted the right to call himself "Professor" in 1907, thus becoming a "Titular Professor", and Hertwig tried, albeit unsuccessfully, to have him appointed as a divisional director in the *Kaiser-Wilhelm-Institut für Biologie* (Kaiser Wilhelm Institute for Biology) when it was established in 1912.¹⁹ However, the Berlin medical faculty continued to support him for a teaching post in heredity, and in 1918, after nineteen years at the Institute, Poll eventually received such a position.²⁰ In December 1922, he was then appointed *ausserordentlicher Professor für Vererbungslehre* (extraordinary professor of heredity; i.e. professor without a Chair). Poll would reach the height of his career two years later, in September 1924, when he was appointed *ordentlicher Professor für Anatomie* (ordinary professor of anatomy; i.e. professor with Chair) at the University of Hamburg.

These changes in Poll's academic life occurred in a period of great political and social upheaval which developed in Germany after World War I. Capitulation was followed by dire political and economic uncertainty, which led to social and financial crises. A sense of strident nationalism developed, and the reconstruction of Germany became the central priority for groups at all points on the political spectrum. Poll contributed to national reconstruction in two ways: he worked on both the formulation of population policy and the rebuilding of German scientific research capabilities.

At a time when concerns about perceived social ills were exacerbated by the loss of some two million German men in combat, population policy was increasingly identified with the idea of eugenics, a subject that had long interested Poll. "Eugenics" was and remains an extremely controversial subject, largely because of its application within a specifically German context.²¹ As a consequence of this, the phrase "German eugenics" often conjures up

images of Nazi death camps and the “Final Solution”. This obscures both the complex nature of eugenics movements and the fact that eugenics was by no means an exclusively German (or even Nazi) phenomenon. At various times, a large number of groups and governments of differing political complexions have promoted the creation of healthier, more productive and more powerful nations by the putatively “rational” management (and control) of the reproductive capacities of individuals, groups and classes. From at least the last quarter of the nineteenth century, eugenics movements existed in the United States, the United Kingdom, France, Russia and Brazil. Some persisted until much later: involuntary sterilisation of those deemed medically “unfit”, for instance, was practised in Sweden until the mid-1970s.²² While eugenics might be seen as an essentially medically-driven phenomenon originating out of public health concerns, the facts are that sentiments which led to the most radical eugenicist programmes were politically motivated and that eugenics operated as a form of social selectivity, justified on pseudo-scientific racial grounds but often entirely bereft of any scientific legitimacy. Very extreme forms of selectivity were implemented whereby groups in power went beyond seeking to contain unwanted or inheritable character traits and illnesses, and sought instead to contain (or even eliminate) complete groups of the supposedly undesirable.

In Germany’s case, one is tempted to wonder whether this fateful transition from a medically-grounded programme to a more specifically racial one was prefigured in the very name that many German eugenicists applied to eugenics right from the start. This was *Rassenhygiene*, literally “race [or racial] hygiene”. While there had been much debate within German eugenics groups about the semantics of this term, the Germanised form of the English “eugenics”, *Eugenik*, never really caught on. Deliberately employed by more moderate eugenicists in preference to *Rassenhygiene* (which was favoured by some of their more “Aryan”-minded colleagues), and also felt to convey a more scientific image in general,

the term *Eugenik* would later be regarded with suspicion in some quarters during the Nazi period because it was often associated with the left-wing tendencies of some members of the eugenics movement in the Weimar period.²³ In our assessment, a critical debate in eugenicist circles of that time was whether eugenics was to operate through intervention in the reproductive behaviour of individuals or at the collective level of “race”, whereby eugenicist ideas could be crudely used in political rhetoric to justify brutal attacks on all members of target groups.

Seen from a modern perspective, and in particular one informed by the not uncommon association of “German eugenics” with the Holocaust, the fact that a person of Jewish birth such as Poll became involved in the German race hygiene movement in the first place seems extraordinary to say the least. But astonishing – or disturbing – as it might appear nowadays, Poll was by no means unique in this respect. There were, in fact, a considerable number of Jewish scientists among the many who took up and developed eugenic ideas in Germany during the first part of the twentieth century, and they embraced these ideas with enthusiasm.²⁴ They represented a wide range of professional and political interests and beliefs, and included such diverse figures as the conservative biologist Richard Goldschmidt and the radical sexual reformer Magnus Hirschfeld.²⁵ Goldschmidt in particular was openly in favour of sterilisation legislation,²⁶ and in later years was also quite open about his membership of a government-appointed advisory panel convened to formulate eugenic legislation in the Weimar period.²⁷

In terms of his professional background, Heinrich Poll’s interest in eugenics is not surprising. After all, he had trained as a doctor and had also witnessed the re-discovery of Mendel’s laws and the birth of modern genetics which together had provided a critical impetus to the expansion of the eugenics movement. Human genetics had played a conspicuous part in his academic career, and his appointment as professor for human heredity

at Berlin in 1922 – the first such position of its kind in Germany – two years prior to his gaining the Chair in Anatomy at Hamburg, recognised two decades of his work in this field.²⁸

Poll made a number of public statements of an unmistakably eugenic nature. In a 1914 article on heredity in humans, to our knowledge his earliest statement on such issues, Poll positioned himself precisely by openly encouraging social or state intervention in the reproductive behaviour of individuals. He wrote that:

Just as the organism ruthlessly sacrifices degenerate cells, just as the surgeon ruthlessly removes a diseased organ, both, in order to save the whole: so higher organic entities such as the kinship group or the state should not shy away in excessive anxiety from intervening in personal liberty to prevent the bearers of diseased hereditary traits from continuing to spread harmful genes throughout the generations. The path of analysis stands open to us, and now we should start out on the path of synthesis or at least of protection from decay. A new branch of hygiene – racial hygiene – has begun to work out the principles of such a course of action, true to the old principle of medicine that prevention is better than cure.²⁹

Poll continued to contribute articles on eugenics and related matters of public health to both academic and popular journals after World War I³⁰ and, as his academic reputation grew, was appointed to a number of official committees convened during the Weimar period to advise on social issues.

One such panel was the *Beirat für Rassenhygiene* (Committee for Racial Hygiene), set up in May 1920. Poll was one of its original members, along with Erwin Baur, Carl Correns, Richard Goldschmidt, Hans Virchow, and Felix von Luschan.³¹ This was exalted company.

Erwin Baur was a pre-eminent botanist and Director of the *Kaiser-Wilhelm-Institut für Züchtungsforschung* (Kaiser Wilhelm Institute for Plant Breeding Research) from its founding in 1928 until his death in 1933.³² Carl Correns was one of the re-discoverers of Mendel's laws, and a director of the Kaiser Wilhelm Institute for Biology at Berlin-Dahlem from 1914 until his death, also in 1933.³³ Richard Goldschmidt joined the Kaiser Wilhelm Institute for Biology in 1914, became a director there in 1919, but was forced to leave in 1936 because of his Jewish birth; he then joined the University of California at Berkeley where he gained further distinction as a geneticist.³⁴ Hans Virchow was the son of the great Rudolf Virchow and a professor of anatomy at Berlin.³⁵ Felix von Luschan, born in Austria in 1854, was the leader of the liberal tradition in German anthropology after the death of Rudolf Virchow in 1902.³⁶ during his eclectic career he was a professor of anthropology at Berlin and department head responsible for Africa and Oceania at the *Museum für Völkerkunde* (Museum for Ethnology) in Berlin, but in later life he also became increasingly interested in genetics.³⁷

The Committee for Racial Hygiene was responsible for considering a number of matters as part of the government programme of social reconstruction, one of which was to evaluate scientifically the racial hygienic legacy of the war.³⁸ Incorporated in 1921 into the Prussian *Landesgesundheitsrat* (Health Council) as its *Ausschuss für Rassenhygiene und Bevölkerungswesen* (Committee for Racial Hygiene and Population Affairs), the Committee discussed and advised on policy and legislation on issues such as abortion, taxation as a factor in marriage age, inner colonisation (i.e. rural settlement), and the racial biology of the family.³⁹ In August 1922, the Committee produced a brief and forceful report arguing for the necessity of a *Reichsanstalt* (central laboratory) to study human heredity and demography. It advocated the collection of reliable material on the perceived processes of physical and mental degeneration caused partly by factors such as alcohol and venereal disease, and partly by selective processes linked to the decline of the birth-rate and to hereditary defects. The

report also advocated the accumulation of reliable information on hereditary patterns. It was forwarded to the government authorities, who were sympathetic to the report's general recommendations in principle but felt that such an institute could not be set up for the moment; they did, however, continue to fund positions in human heredity.⁴⁰ Five months later, in January 1923, a meeting was held in the Prussian Ministry of the Interior in which two "hereditary" scientists took part, in addition to representatives of the administration. Heinrich Poll was one of those two. The other was Ernst Rüdin, who later became Director of the *Kaiser-Wilhelm-Institut für Psychiatrie* (Kaiser Wilhelm Institute for Psychiatry) in Munich and a strident supporter of "Nazi science", including its sterilisation policy.⁴¹ The initial outcome of that meeting was a plan to use the proposed *Reichsanstalt* to co-ordinate research on population matters and model the new institute on the *Kaiser-Wilhelm-Institut für Physik* (Kaiser Wilhelm Institute for Physics). Two years later, and probably in extension of this plan, the president and secretary of the *Kaiser-Wilhelm-Gesellschaft* (Kaiser Wilhelm Society), Germany's central co-ordinating body for scientific research, submitted a plan to the senate of the Society which was in effect a blueprint for the future *Kaiser-Wilhelm-Institut für Anthropologie, menschliche Erblehre und Eugenik* (Kaiser Wilhelm Institute for Anthropology, Human Heredity and Eugenics), the institution which would subsequently achieve notoriety through its close association with Nazi racial hygiene research⁴² and be headed by the anthropologist Eugen Fischer and, later, the geneticist Otmar von Verschuer. These men led development of the pseudo-scientific bases of Nazi racial policy (Fischer) and racialisation of the Jewish people (von Verschuer).⁴³

It would be unreasonable to attribute responsibility for the Nazi-era excesses of the Kaiser Wilhelm Institute for Anthropology, Human Heredity and Eugenics to the Committee for Racial Hygiene and Population Affairs, of which Poll had been a founding member. Indeed, as Niels Lösck has argued, the real behind-the-scenes lobbyist on the committee for

the creation of the future Kaiser Wilhelm Institute was actually Erwin Baur, and Poll, like other members on the panel at that time who were in charge of institutes of their own, was probably more concerned with securing research funding for himself than he was with the establishment of a centralised national research facility.⁴⁴ Be that as it may, the Committee for Racial Hygiene and Population Affairs did foreshadow at least one aspect of Nazi population policy. At another meeting in 1923, the committee discussed eugenic sterilisation, primarily on medical and psychiatric grounds, and it debated whether this should be extended to criminals and the “asocial”. Opinion was sharply divided on this issue inside and outside the committee.⁴⁵ We have found no record of where Poll stood on these issues at this particular time, but by mid-1932 the groundswell in favour of sterilisation within the German medical fraternity was such that the Prussian Health Council drafted a law permitting the *voluntary* sterilisation of certain classes of hereditarily defective individuals. The draft legislation never became law under the Weimar Republic, but it served as the basis of the Nazi *mandatory* sterilisation law, the notorious *Gesetz zur Verhütung erbkranken Nachwuchses* (Law for the Prevention of Genetically Diseased Offspring), which was enacted in July 1933.⁴⁶

Poll was also actively involved in two of the main groups that sought to promote the eugenics message in Germany throughout the 1920s. These were the *Deutsche Gesellschaft für Rassenhygiene* (German Society for Racial Hygiene) and the *Deutscher Bund für Volksaufartung und Erbkunde* (German League for National Regeneration and Heredity). The former, which had experienced periodic internal reorganisation since its founding in 1905,⁴⁷ had drawn its membership mainly from the educated middle-class and in particular from the ranks of medical professionals. Its members included Protestants, Catholics and Jews, and they came from all political parties.⁴⁸ During the Weimar period, however, a division occurred between the Munich and Berlin branches of the Society. The smaller Munich chapter tended to be more right-wing and reactionary in its outlook and more open to racist views,

while members of the larger Berlin branch were more sympathetic to the Weimar political order, generally maintained a centrist/social democratic orientation, and rejected as unscientific and politically dangerous any idea of “Nordic” or “Aryan” eugenics.⁴⁹ Poll himself was well aware of the obsession that some members of the Munich branch of the Society had with the “Nordic” racial ideal: in his 1922 review of the second volume of Baur, Fischer and Lenz’s standard text on racial hygiene, the *Grundriss der menschlichen Erblichkeitslehre und Rassenhygiene* (“Principles of Human Heredity and Racial Hygiene”), he noted, perhaps with some relief, that only a small and relatively non-descript section of the text had been devoted to what he described as “the specifically ‘Munich’ direction” (i.e. the preference for the Nordic racial element), which, he felt, weighed so heavily on the whole issue of racial hygiene.⁵⁰

By contrast, the German League for National Regeneration and Heredity tended to be more left-of-centre, and most of its members would have rejected a brand of racial hygiene that promoted Aryan or Nordic racial supremacy. Founded in 1925, the League reflected the more optimistic sense of social reconstruction that began to gain ground in Germany during the mid-1920s. Whereas the brand of eugenics promoted by the Society for Racial Hygiene had tended to reflect entrenched (middle-)class interests in particular,⁵¹ the League was dedicated more to spreading eugenic ideas to *all* Germans, including the working class, and in doing so was more closely involved with the state welfare apparatus. Partly financed by the Prussian Welfare Ministry and the Ministry of the Interior, and often holding its meetings at the Prussian Welfare Ministry, the League’s primary aim was to promote health in future generations, which it sought to do by distributing *Familienstammbücher* (i.e. booklets that contained eugenic advice for the family and stressed the need to breed a strong race), and by holding conferences and public lectures on eugenic themes. While the League concerned itself mainly with education and positive eugenics, it also contemplated negative eugenic methods

such as sterilisation and preventative detention. Extreme though such views were, the League was by no means anti-Semitic – its finances were held with the Goldschmidt-Rothschild Bank.⁵²

In contrast to his involvement with the Society for Racial Hygiene, which remains somewhat unclear,⁵³ Poll's involvement with the League for National Regeneration and Heredity was conspicuous, and dated back to its very beginnings; indeed, it was at his suggestion that the League bore the word *Erbkunde* (heredity) in its title from the outset – a decision regarded at the time as unfortunate by an unimpressed Fritz Lenz, who felt that the German *Erbkunde* sounded all too similar to *Erdkunde* (i.e. geography).⁵⁴ Poll was one of three prominent guest speakers at a special public meeting held to promote the newly founded League in September 1925,⁵⁵ and he was also one of a number of experts who had pledged their services to the fledgling association's official organ, the *Zeitschrift für Volksaufartung und Erbkunde* ("Journal for National Regeneration and Heredity").⁵⁶ He does not appear to have been an elected officer on the League's committee at the time of its founding, though he did become its secretary some time afterwards – a position he held until 1930.⁵⁷ All in all, Poll's on-going and evidently high-profile five-year work for the League suggests that he identified rather more closely with its more moderate line on eugenicist issues of the day than he did with views held by the Society for Racial Hygiene and, in particular, the latter's Munich chapter. The fact that he ceased to be the League's secretary just prior to its merger with the more right-wing Society may also be significant.

Poll's other notable contribution to the reconstruction of post-war Germany lay in the wider attempt to rebuild the country's shattered scientific capabilities. This process was assisted by the Rockefeller Foundation, with which Poll worked very closely throughout the 1920s. The Foundation's involvement with assisting German scientists in the post-war period had come about largely at the instigation of the renowned educationalist and university

reformer Abraham Flexner, who was a close personal friend of Poll's.⁵⁸ Flexner had got to know him during a visit to Berlin in 1910, which was part of a larger European tour he undertook to study medical education and which is reported in his influential 1912 Carnegie Foundation Bulletin. Poll, as Flexner would later remember, was extraordinarily helpful to him in the course of his visit, and the American came to rely on him for introductions in Berlin and other medical centres. A close friendship developed and lasted for nearly thirty years, with Flexner becoming an almost regular Sunday diner, whenever he was in Berlin, at the apartment that Poll shared with his ageing mother.⁵⁹

On returning to Germany in 1922, Flexner was appalled by the conditions he encountered in Berlin. He found the plight of the sciences there to be deplorable, and noted that the best scientists were living from hand to mouth. Acting on his own initiative, he prepared a plan to help the medical sciences in Germany, deluging his superiors at the Rockefeller Foundation with long and detailed descriptions of the conditions that existed and with suggestions about what should be done to rectify the situation. Flexner's reports were so alarming that Richard Pearce, head of Rockefeller's Division of Medical Education, felt obliged to go to Germany to view the situation there for himself.⁶⁰ In November 1922, Pearce held discussions with Poll and the chemist Fritz Haber which resulted in the formation of a special Rockefeller Foundation committee to assist struggling German medical scientists. From the outset the committee and the emergency grant programme it oversaw was intentionally kept independent of the *Notgemeinschaft der deutschen Wissenschaft* (Emergency Fund for German Science), which had been set up in 1920 as the primary German body charged with co-ordinating the reconstruction of German science. The new committee consisted of scientists who were younger, research-oriented and international in their outlook.⁶¹ It was called the *Ausschuss zur Förderung des wissenschaftlichen medizinischen Nachwuchses (Hilfsausschuss der Rockefeller-Stiftung)* (Committee for the

Promotion of Emerging Medical Scientists (Relief Committee of the Rockefeller Foundation)) and Poll was its key figure. He served as its secretary, and in this capacity became the Rockefeller Foundation's leading advisor in Germany in the Weimar period.⁶² There were five members on the committee, one of whom was Richard Willstätter, the professor of organic chemistry at Munich who had been awarded the Nobel Prize for Chemistry in 1915 for his work on chlorophyll.⁶³ Fritz Haber, also a Nobel chemistry laureate (in 1918), initially represented the Emergency Fund for German Science, but resigned in March 1923, when it was made clear that the Rockefeller committee was to be independent of the Fund.⁶⁴

The programme of emergency grants over which the Rockefeller committee and Poll presided was targeted at supporting young male medical scientists. Established university professors were deemed ineligible for assistance, as were women, except in very special cases. What was particularly novel about these grants was that they could be held by the German recipients in Germany. Recently qualified doctors received grants of \$50-150 annually and, at the upper end of the scale, there were five grants of \$1,000 annually to researchers of exceptional merit.⁶⁵ In his role as secretary of the committee, Poll was often subject to jealous criticism, which the Rockefeller Foundation initially took as a good sign that he was standing up to established professorial interests. However, he was unable to handle the administrative work involved with granting monthly cheques in a highly volatile currency to grantees and eventually a financial secretary was drafted in from the Foundation's Paris office to assist.⁶⁶ Poll also came in for criticism for using the committee's patronage to expand university posts in human genetics⁶⁷ – a field obviously close to his heart. As the economic situation in Germany improved, the Rockefeller Foundation decided to pass the administration of the emergency fellowships programme overseen by Poll's committee to the Emergency Fund for German Science, before eventually closing down the programme in

December 1926. The Foundation continued to grant other fellowships to German scientists until 1939.⁶⁸

Poll's involvement with the Rockefeller Foundation was only one part of his international work. Throughout the late 1920s and early 1930s, he gave invited lectures and attended conferences in Spain, Sweden and Holland, and, in the spring of 1932, he embarked on a six-week lecture and study trip to Greece and Turkey. His most important overseas visit occurred in the autumn of 1928 with his appointment as the inaugural recipient of the Abraham Flexner Lectureship, which had been created in honour of his friend Abraham Flexner. Although based primarily at Vanderbilt University in Nashville, Tennessee, Poll also gave lectures in New York, Chicago, Baltimore and Philadelphia.⁶⁹ He returned to Germany impressed with the American university system and did not refrain from expounding on the obvious contrasts he could see with the German system. He noted that American institutions were far better equipped than German ones and that there was also a much greater emphasis placed on research. In particular, Poll felt that American scientific endeavour was characterised by an extremely high level of specialisation, in sharp contrast to the more broad-based approach found in Europe, and that this helped individual American scientists to make extraordinary advances in their respective fields.⁷⁰

One notable focus of Poll's own scientific work in the 1920s lay in the area of twin research, a field of enquiry that had interested him since before World War I.⁷¹ Poll's first published paper on the subject, originally presented as a lecture to a session of the *Berliner Anthropologische Gesellschaft* (Berlin Anthropological Society), appeared in 1914.⁷² It has since been acknowledged by more than one critic as a pioneering attempt to utilise twin-studies in genetic research⁷³ and has even been described as "the first systematic study of the degrees of resemblance and difference present within identical twin pairs".⁷⁴ Focusing primarily on fingerprints and their degree of variation from one generation to the next, the

article reveals that Poll, like others at the time, believed very much in the potential usefulness of fingerprints as genetic markers (e.g. for conditions such as mental illness) and that they could even be used to assist with determining paternity; these were ideas he continued to consider in years to come.⁷⁵ What is especially significant about his 1914 paper, however, was that he proposed the use of identical twins as a kind of control group for comparative purposes. As is reflected in the title of the paper, Poll was clearly convinced that twin research was thus “an aid in the study of human heredity”, and indeed continued to stress this for many years afterwards.⁷⁶

Even by this time, though, Poll’s interest in twins had begun to extend far beyond the analysis of their fingerprints alone. As he mentions in his 1914 paper, he had commenced work on a large-scale study of same-sex twins in schools and the wider community in the greater Berlin area. This was a project that proceeded with the support of local school and municipal authorities, and involved the collection of a wide range of biometric and other data (including the measurement of more than thirty different physical characteristics) from the child and adult subjects of the study. Poll for his part felt confident that the project would eventually identify some 500 pairs of monozygotic twins.⁷⁷

The outbreak of war in mid-1914, however, appears to have brought Poll’s Berlin study to an abrupt halt, and it remains unclear precisely how far this research project ever advanced or indeed what became of the material accumulated. After his arrival in Hamburg in the mid-1920s, though, Poll began a second major study whose subjects this time were twins of varying ages in the greater Hamburg area. The resulting database, apparently known as the *Hamburgisches Zwillingsarchiv* (Hamburg Twin Archive), again relied on the systematic collection of biometric and other personal information from a substantial number of subjects, the majority of whom Poll and his staff had been able to locate and examine with both the approval and the support of local authorities, much in the same way as had been the case with

his pre-war twin study in Berlin; by 1930, he was able to report that he knew of 121 sets of twins out of some 20,342 children in Hamburg schools, of which 88 were same-sex twins and 33 opposite-sex.⁷⁸ The archive itself was overseen by Poll and housed in the University of Hamburg's Anatomical Institute (of which he was Director) for the sake of centralisation and thus to facilitate specialised studies by interested researchers.⁷⁹ As far as can be ascertained, the largest single work to be based on the holdings of the archive was a dissertation by Heinrich Lottig, a student of Poll's. This was completed in July 1930 and published the following year under the title of *Hamburger Zwillingsstudien: Anthropologische und charakterologische Untersuchungen an ein- und zweieiigen Zwillingen* ("Hamburg Twin Studies: Anthropological and Characterological Investigations of Mono- and Dizygotic Twins").⁸⁰ Poll himself published at least two minor articles discussing twins that we know of during the 1920s,⁸¹ and went on to produce one further extended publication on the subject, a 48-page paper entitled *Zwillinge in Dichtung und Wirklichkeit* ("Twins in Literature and Reality"), which appeared in 1930.⁸² This contained an exhaustive enumeration of occurrences of twins in literature and folklore, and illustrates, at the very least, a background in the humanities that might not otherwise be apparent from Poll's more scientific works.

The overall picture that emerges from Poll's work on twins is that he was a researcher who amassed a considerable amount of raw data but who, for reasons that remain unknown, never published widely using this material. This was certainly the opinion formed of him in the early 1920s by his fellow (and now more widely known) twin researcher Hermann Werner Siemens, who, interestingly, also characterised him as taking a more anthropological approach (as opposed to a race- or family-based one) to twin studies and their potential application in the wider area of human heredity.⁸³ But while Poll may never have published extensively on twins, either by himself or in conjunction with other authors, it would appear that he made his material freely available to other researchers (among them his junior

colleagues or students), and in this indirect sense at least, it could of course be argued that his work did eventually find its way into print. The extent of Poll's generosity with his material (and his ideas) to other researchers is yet to be fully ascertained, but two important early examples should be noted at this point. One can be seen in his encouragement of Fritz Schiff (in 1914) to undertake the first known serological examination of a pair of twins,⁸⁴ and the other in Walter Jablonski's 1922 study on the contribution of heredity to refraction in human eyes: deeply indebted to Poll's work, this latter study clearly pre-dates Siemens's pioneering monograph *Die Zwillingspathologie* ("Twin Pathology") which appeared two years later, and as such it has recently been described as the first reported "classical" twin study.⁸⁵

Poll's publications in the area of twin research were not numerous, but they were certainly known to other leading researchers in this field as it expanded spectacularly in the 1920s. Poll himself clearly followed new developments in the discipline closely. The select bibliography of specialist literature in Poll's 1930 paper on twins and, in an indirect sense, the literature cited by his student Heinrich Lottig⁸⁶ suggest he kept very much up-to-date with current research. Similarly, Poll's 1914 paper is often cited by other prominent researchers working in the area of twin studies from the mid-1920s onwards, one of whom, incidentally, was Otmar von Verschuer, based from 1927 at the Kaiser Wilhelm Institute for Anthropology, Human Heredity and Eugenics.⁸⁷ Precisely what kind of personal contact Poll might have had with other twin researchers is yet to be determined. There is no surviving correspondence between Poll and von Verschuer, for instance, in the latter's papers now held in the Archive for the History of the Max Planck Institute in Berlin-Dahlem, although the archive does have offprints of Poll's 1914 and 1930 articles on twins among the papers of Ernst Rüdin.⁸⁸ The absence of any such correspondence does not, of course, obscure the fact that Poll's contribution to twin research was clearly highly regarded by his peers, and perhaps the most telling indication of this was his nomination, together with Siemens, for the 1932

Nobel Prize in Physiology or Medicine in recognition of their (independent) work on twins. Their nominator, Reiner Müller, professor of hygiene and bacteriology at the University of Cologne, held the view that the potential to differentiate between hereditary and acquired causes of disease which had been afforded by twin research – and by the examination of monozygotic twins in particular – was “of fundamental significance for general hygiene, for eugenics and consequently for the future of humanity”, and duly nominated Poll and Siemens as joint award-winners: it was they, he claimed, who had “created the foundations of twin research” generally.⁸⁹ The evaluator appointed by the Nobel Committee to assess Müller’s recommendation, Hilding Bergstrand, professor of pathology at Stockholm’s Karolinska Institute, was rather less sanguine in his report on Poll, however: while he did concede that the latter was “one of the very first to understand the significance of twin research”, he personally felt that neither of Poll’s two main publications on twins contained any description of any discovery that was worthy of being awarded the Nobel Prize.⁹⁰

Twin research, or more precisely twin theory, formed part of a five-day workshop on hereditary biology and eugenics organised by Poll and held at the University of Hamburg in mid-July 1933.⁹¹ Aimed at teachers and academics at all levels, it involved practical exercises and theoretical investigation, and covered a range of concepts that included advanced Mendelism, eugenics (both elementary and advanced), and its application in population policy. The workshop concluded with discussions on the study of heredity in science, eugenics in applied science, and, apparently with the aim of bringing the idea of heredity to a wider audience, ways of conducting small-scale practical experiments in schools. If the topics and discussion items listed in its programme are anything to judge by, Poll’s workshop was both balanced and up-to-date in its coverage of the theories that were then under development within the international scientific community. It does not contain anything that could be construed as supportive of the racial hygiene policies which had been horribly prefigured in

Hitler's *Mein Kampf* (1925) and were about to be enacted by the Nazi government. To be specific on one crucial point, insofar as we can tell (with the assistance of colleagues) the term "race" was used in that workshop as a synonym of the term "variant" as currently used in biological sciences, i.e. as a concept free of negative racist connotations.

The workshop proceeded without any apparent objection from university or other authorities. However, it was to be the swansong of Poll's academic career. The Nazis had come to power in January 1933, and were already beginning to enact repressive legislation aimed at ridding Germany of those they regarded as politically, intellectually, racially or socially undesirable. Partly to this end, Hitler appointed Bernhard Rust, a formerly unemployed provincial school master and a man of questionable mental stability, *Reichsminister für Wissenschaft, Erziehung und Volksbildung* (Reich Minister for Science, Education and Popular Culture).⁹² Much more ominously, however, harassment of those the Nazis despised was intensified on both official and private levels. Against such a backdrop, German intellectuals and academics who opposed Hitler faced unenviable choices. Some emigrated, but for reasons that are not clear Poll chose to stay. It was a fateful decision, for almost at once he too was officially deemed to be undesirable. The reason for this was simple: Heinrich Poll, long-time and ardent eugenicist and racial hygienist, was of Jewish birth. As the following reconstruction of his life in the years after the Nazi seizure of power will show, his story provides us with a disturbing, tragic, and at times chilling case study of a fate which was experienced by numerous other German scientists, scholars and artists who suddenly found themselves *personae non gratae* in the eyes of the new regime – and often with nowhere else they could go.

Throughout the spring of 1933, the University of Hamburg's medical faculty had witnessed on-going political agitation on the part of National Socialist students directed primarily at Jewish and allegedly Marxist professors and students. Poll in particular had been

the target of added student animus due to his reputation as a tough examiner.⁹³ Despite this, though, there was strong disagreement within the *Nationalsozialistischer Deutscher Studentenbund* (National Socialist German Students Federation) about just how many staff members should be dismissed, as the leader of the local students association feared too great a depletion in teacher numbers in light of the severe economic conditions that then prevailed in Hamburg.⁹⁴

Poll would have had some inkling of the fate that was to befall him. In early April 1933 the National Socialist government had enacted the *Gesetz zur Wiederherstellung des Berufsbeamtentums* (Law for the Restoration of the Career Civil Service), the primary aim of which was the dismissal of non-Aryans and socialists or other politically undesirable civil servants, including academics. In mid-July, pursuant to the new legislation, Poll was required to submit information relating to his employment history, together with a questionnaire seeking personal details. He admitted being “of non-Aryan descent”. The law provided exemption from dismissal for Jews who had been employed since 1914 and/or who had served on the front in World War I. Poll, who fell into both categories, may have felt that this afforded him some protection. On 8 September 1933, however, Dr Heinz Lohmann of the local branch of the *Deutsche Dozentenschaft* (German Lecturers’ Union) wrote to Dr Achim Gercke, the official in charge of racial research with the Reich Ministry of the Interior, denouncing Poll.

Lohmann attacked Poll’s character on three main fronts: by alleging he lacked even basic dissection experience (and thus could not call himself an anatomist); by accusing him of having been deliberately misleading in his claim to have seen frontline service in the war; and by pointing out the fact that he was a Jew – a status, Lohmann claimed, which meant that he was both intolerable to the University of Hamburg and unacceptable to its Nazi student body. He added: “If we wish to avoid student protest demonstrations and with them any unpleasant

fuss that this would cause with regard to people overseas, then it is absolutely essential to relieve Professor Poll of his office”. Lohmann concluded his letter with a very damning accusation, which is unsubstantiated to the best of our knowledge: “Professor Poll” he claimed, “along with other members of his race, has been conspiring against National Socialist lecturers and in doing so has done our fellow party members considerable harm”.⁹⁵

The authorities acted swiftly. Before the month was out, Poll was forced to take early retirement, and in doing so acquired the dubious distinction of being the first “non-Aryan” member of the academic staff in Hamburg’s medical faculty to be dismissed under the new regime.⁹⁶ While his “retirement” did not officially come into effect until 31 December, Poll applied to take immediate leave, and this was granted effective as of 1 October. He was permitted to draw the superannuation owed to him by the university and continued to receive it for the rest of his life, although he was stripped of the annual bonus of 1220 *Reichsmarks* to which he had been eligible on retirement – an amount equivalent to roughly one-tenth of his regular pre-tax income.

By 28 October, Johannes Brodersen, who succeeded Poll in the interim as head of the Anatomical Institute, forwarded to the university authority a declaration signed by both him and Poll to the effect that the latter had completed the removal of his personal property and other material from the Institute. Strictly speaking, as we shall explain shortly, this does not appear to have been correct, and may well have reflected the pressure that had been brought to bear on Poll at this time to resign. For all intents and purposes, though, his removal was complete. His dismissal, like that of Jewish colleagues in other faculties of the University of Hamburg, took place without any visible signs of protest or solidarity from other members of staff.⁹⁷

Details of Poll’s activities after “retiring” are sketchy, but his day-to-day life as a dismissed Jewish university professor in Nazi Germany would have been very difficult. Poll

and his wife Clara⁹⁸ remained in Hamburg for six months, before moving back to Berlin in mid-March 1934. They lived there for five years. Their financial circumstances must have been precarious, and one can only speculate as to how they managed to support themselves. Poll's career prospects were minimal, and as far as can be ascertained, he and Clara lived off the pension of around 700 *Reichsmarks* (after tax) that he received each month from the university authority in Hamburg, though this would have been supplemented somewhat from 1935 to 1937 when Clara tried to resume her career as a gynaecologist. The only other income we know of that Poll received after being dismissed was the paltry sum of 274 *Reichsmarks*, noted on income declarations he submitted for the 1935 and 1936 calendar years.

Poll continued his research, however, publishing extensively in foreign journals after his dismissal. He focussed on dermatoglyphics in this period. He had published periodically on this subject since 1914, producing some six papers on this topic from 1921 to 1928, and a similar number after his dismissal.⁹⁹ He also presented a paper on dermatoglyphics at the first International Congress of Anthropological and Ethnological Sciences, held in London in the summer of 1934.¹⁰⁰ The paper was of interest to the British Criminal Investigation Department, which sent one of its superintendents along to hear the paper.¹⁰¹ Poll, it should be noted here, is also one of five pioneers in the field of dermatoglyphics who are singled out for special mention by Cummins and Midlo in their classic work *Finger Prints, Palms and Soles*, first published in 1943.¹⁰²

In a letter dated 20 March 1936 to Johannes Brodersen, his successor at the Anatomical Institute, we gain some insight into how Heinrich Poll managed to obtain the material with which to sustain his life of private research, difficult as this undoubtedly had become. In the letter, Poll claimed that on leaving his position he had left the Institute "all the results and studies belonging to my personal academic work" and therefore asked if Brodersen could either return this material himself or, if necessary, support his application to

the university authority in Hamburg for its return. The material Poll was requesting consisted essentially of “tables, diagrams and slides, partly photographs, partly drawings relating to twin studies, dactylography, internal secretion, etc”.¹⁰³ Brodersen, to his credit, took up Poll’s request and promptly forwarded an inventory of the material that Poll sought to the relevant authority. All in all, this amounted to a total of 442 slides on subjects that included fingerprints, plant hybrids and varieties, heredity (chromosome theory, drosophila, family trees, twin research, etc) and – somewhat ironically, given his the circumstances of his dismissal – racial hygiene and population policy. In a classic case of adding insult to professional injury, the request was approved, but subject to Poll paying a charge of 25 *Pfennig* per slide for his own material – or in other words, the not insubstantial sum for a dismissed academic of just over 110 *Reichsmarks*.

Poll’s research work ultimately afforded him and his wife little consolation – and even less protection – from the harsh reality of day-to-day life as the member of a persecuted minority in Hitler’s Germany. One may safely assume that they became increasingly desperate as time wore on. Like many others in his situation, Poll appealed to overseas contacts in the hope of finding a way out of Germany. Alas, he discovered that even his lengthy involvement with the Rockefeller Foundation did not guarantee emergency support, as the Foundation took the view that even longstanding contacts could not be supported if their field of work did not fit into the wider American academic context. Despite Poll’s offer to accept a job even just washing glassware, no-one could be found in America who was willing to take him on, and thus the Foundation declined to offer funds on his behalf. Alan Gregg, the director of Rockefeller’s Medical Sciences Division, would later describe Poll’s case as one of the most depressing he ever had to deal with.¹⁰⁴

By early 1939 Poll seems to have reached the point where he felt he could no longer tolerate life in Germany, and thus made the decision to emigrate. Friends in Sweden were

mobilised, and over the period from February to April of that year, he went through the drawn-out and harrowing process of applying for official permission to leave. Having notified the authorities that he was applying to move to Sweden, with the intention of devoting himself thereafter to the private study of anatomy and biology and perhaps philosophy as well, Poll was granted permission to emigrate on 4 May, but with the express requirement that he was not to engage in any teaching for a period of two years and that he was not to migrate to a third country. In addition, he was required to provide quarterly reports of his activities to an accredited German representative overseas, as well as to submit an annual declaration that he was still a citizen of the Reich. From the Swedish end,¹⁰⁵ Poll's application to enter the country was supported by an impressive collection of four eminent local scientists, all of whom shared his interest in genetics and eugenics: the famous plant breeder Herman Nilsson-Ehle, the geneticist Arne Müntzing, the newly appointed head of Sweden's Institute for Racial Biology, Gunnar Dahlberg, and the noted anatomist Ivar Broman.¹⁰⁶ Due to what may have been an unfortunate bureaucratic misunderstanding, however, Heinrich Poll and his wife were unable to enter Sweden together. Leaving Clara behind until the correct paperwork came through, Poll travelled alone, arriving in Lund on 4 June. His taste of freedom, though, was to be tragically short-lived. He died suddenly on 12 June, the victim of a heart attack. Clara travelled to Sweden to attend her husband's funeral, but returned to Germany shortly afterwards. At the beginning of August, she made her way to Lund again, where, late in the evening of the 5th – Heinrich's birthday – she took her own life.

News of Poll's death reached the authorities in Germany within a few days and by 28 July his death had been reported in *Science*.¹⁰⁷ While it is unclear whether Poll's death was ever reported publicly in Germany, he did receive acknowledgement from one prominent German scientist in the year of his death. In December 1939 the Royal Society of London published in their *Proceedings* a lecture that had been presented to it earlier that year by

Otmar von Verschuer, entitled “Twin Research from the Time of Francis Galton to the Present Day”.¹⁰⁸ With the benefit of hindsight, an awareness of von Verschuer’s role as the academic mentor of Josef Mengele, and knowledge of their now notorious mutual interest in twin research,¹⁰⁹ the lecture in question has to be seen as being rich in tragic irony. Von Verschuer’s opening reference to the long tradition of English-German scientific ties is but one irony, given that war was to break out between the two countries just a few months later. Another awful irony lies in the fact that von Verschuer, who was by now the director of the *Universitätsinstitut für Erbbiologie und Rassenhygiene* (Institute of Hereditary Biology and Racial Hygiene) in Frankfurt, acknowledges the Jewish Heinrich Poll as being the first researcher in Germany to follow up Galton’s ideas on twins. Perhaps the most awful irony of all, however, can be seen in the date on which von Verschuer delivered his lecture on twins to the Royal Society. It was 8 June 1939. By this time, Heinrich Poll – erstwhile physical anthropologist, anatomist, eugenicist and twin researcher – had completed half of his short-lived Swedish exile and had just four days left to live.

In looking back on Poll’s life, then, one is struck by two features in particular. The first is that his career path took a very different and ultimately very tragic turn from any he might have envisaged for himself as a young academic at the outset of his career at the beginning of the twentieth century. Secondly, and more specifically, there is the fact that his youthful interest in the form of bones gave way at an early stage to a much greater and much longer lived professional preoccupation with the workings – and perceived failings – of the cell. Poll remained interested in, if not committed to, the idea of inheritability throughout his professional life: this is apparent in his active participation in the German eugenics movement. Indeed, evidence presented above suggests that he laboured to advance a particular, relatively “benign” form of eugenics, but that his intentions were overtaken as German politics became increasingly radicalised and lurched to the right in the late 1920s and

early 1930s. As political power was concentrated in the hands of extremists, the purely medical application of the eugenics that Poll had clearly advocated was instead subsumed by a malignant brand of politically-driven eugenics obsessed with concepts of race that were narrowed, divested of scientific method, and perverted. “Race”, like hereditary traits and illness, thus became a criterion upon which the worth of an individual or a group was judged. While Poll’s enthusiastic contribution to the post-World War I reconstruction of German society and academic life would certainly characterise him as a German nationalist, his activities from the mid-1920s onwards also suggest that he pursued a line of “quiet resistance”, as it were, to more extreme notions of race and racial hygiene as these became increasingly fashionable and were eventually codified as Nazi doctrine. This can be seen in four particular elements of his work. Firstly, in his work on population policy, Poll focussed on the inherited traits of the individual (e.g. his 1914 paper on heredity in humans cited above) rather than the putatively inherited physical and behavioural characteristics of a race. This is indicated in his public statements, publications and committee work, and also in his senior role in the German League for National Regeneration and Heredity: this movement was founded in the year that *Mein Kampf* was first published (1925) and seems to have advanced a very different view of racial matters from Hitler’s book and from some of Poll’s former colleagues and contemporaries whose works are known to have influenced it (most notably Baur, Fischer and Lenz’s standard text on racial hygiene).¹¹⁰ Secondly, in his later work, Poll seems to have used the term “race” as one might now use the term “variety” or “variant”, i.e. as a category applicable to species across the natural world and innocent of negative connotations (see e.g. the programme of his 1933 workshop). Thirdly, Poll included current discoveries about inheritance, mutation and plasticity in his work and in the last of his teaching for which we have evidence, namely his workshop on hereditary biology and eugenics in July 1933. Fourthly, he continued to conduct basic scientific studies of

inheritability from the time of his dismissal in 1933 until his death in 1939, when all around him racist publications and slogans were inciting the population to mayhem. The above four features of Heinrich Poll's work show that his view of the value of genetic studies differed significantly from what developed in Nazi Germany.

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BIBLIOGRAPHY

*Archival Sources**Nobel Archives, Stockholm:*

Bergstrand, H. [1932]. Statement relating to H. Poll.

Müller, R. [1932]. Nomination of F. d'Hérelle, H. Poll and H. Siemens to Nobel Committee, no. 13-0.

Staatsarchiv Hamburg (StA HH):

Hochschulwesen – Dozenten- und Personalakten, I 324, Bd. 1.

Hochschulwesen – Personalakten, I 324, Bd. 2.

Hochschulwesen – Personalakten, I 324, Bd. 3.

Hochschulwesen – Personalakten, I 324, Bd. 4.

Staatsverwaltung, B V 106.

*Literature Cited*Abbott, A. and Q. Schiermeier (2000). "Deep roots of Nazi science revealed." Nature 407(6806): 823-824.Adams, M. B. (ed.) (1990). The Wellborn Science: Eugenics in Germany, France, Brazil, and Russia. New York, Oxford University Press.Anon. (1926). "Was will der Deutsche Bund für Volksaufartung und Erbkunde?" Zeitschrift für Volksaufartung und Erbkunde. 1: 1-3.

- Anon. (1927). "Jahresversammlung des Bundes für Volksaufartung und Erbkunde am 7. Mai." Zeitschrift für Volksaufartung und Erbkunde. 2: 57-59.
- Anon. (1928). "Scientific Notes and News." Science 68(1774): 640-643.
- Anon. (1939). "Recent Deaths and Memorials." Science 90(2326): 76.
- Bonner, T. N. (2002). Iconoclast: Abraham Flexner and a Life in Learning. Baltimore, John Hopkins University Press.
- Broberg, G. and M. Tydén (1996). Eugenics in Sweden: Efficient Care. Eugenics and the Welfare State: Sterilization Policy in Denmark, Sweden, Norway, and Finland. G. Broberg and N. Roll-Hansen (ed). East Lansing, Michigan State University Press: 77-149.
- Bussche, H. v. d. (1989a). Die 'Machtergreifung'. Medizinische Wissenschaft im "Dritten Reich": Kontinuität, Anpassung und Opposition an der Hamburger Medizinischen Fakultät. H. v. d. Bussche (ed). Berlin, Dietrich Reimer Verlag: 32-62.
- Bussche, H. v. d. (1989b). Akademische Karrieren im 'Dritten Reich.' Medizinische Wissenschaft im "Dritten Reich": Kontinuität, Anpassung und Opposition an der Hamburger Medizinischen Fakultät. H. v. d. Bussche (ed). Berlin, Dietrich Reimer Verlag: 63-117.
- Cornwell, J. (2003). Hitler's Scientists: Science, War, and the Devil's Pact. London & New York, Viking.
- Cummins, H. (1934). Untitled note, in: Congrès International des Sciences Anthropologiques et Ethnologiques: Compte-rendu de la première Session, Londres 1934. London, Royal Institute of Anthropology, 113.
- Cummins, H. (1939). "Obituary: Heinrich William Poll." Science 90(2330): 172-173.
- Cummins, H. and C. Midlo (1961). Finger Prints, Palms and Soles: An Introduction to Dermatoglyphics. New York, Dover Publications.

- Duckworth, W. L. H. (1904). Morphology and Anthropology. Cambridge, Cambridge University Press.
- Dunn, L. C. (1956). "G. Dahlberg, Human Geneticist." Science 124(3233): 1195-1196.
- Flexner, A. (1940 [actually 1943: = 2nd rev. ed.]). I Remember: The Autobiography of Abraham Flexner. New York, Simon and Schuster.
- Goldschmidt, R. (1956). Portraits from Memory: Recollections of a Zoologist. Seattle, University of Washington Press.
- Goldschmidt, R. (1960). In and Out of the Ivory Tower: The Autobiography of Richard B. Goldschmidt. Seattle, University of Washington Press.
- Grimm, H. (1972). "Humangenetische Ansätze bei Felix v. Luschan nach Wiederauffindung der Mendelschen Regeln (ab 1900/1901)." Mitteilungen der Sektion Anthropologie der biologischen Gesellschaft in der DDR 28: 19-28.
- Hagberg, A. (1991). Nilsson-Ehle, Nils Herman. Svenskt Biografiskt Lexikon: Band 27. Stockholm, Albert Bonnier, 41-47.
- Hägqvist, G. (1926). Broman, Ivar. Svenskt Biografiskt Lexikon: Sjätte Bandet. Stockholm, Albert Bonnier, 354-358.
- Harrington, A. (1996). Reenchanted Science: Holism in German Culture from Wilhelm II to Hitler, Princeton [N.J.], Princeton University Press.
- Harwood, J. (1993). Styles of Scientific Thought: The German Genetics Community 1900-1933. Chicago & London, University of Chicago Press.
- Jablonski, W. (1922). "Ein Beitrag zur Vererbung der Refraktion menschlicher Augen." Archiv für Augenheilkunde 91: 308-328.
- Jacobs, N. X. (1989). "From Unit to Unity: Protozoology, Cell Theory, and the New Concept of Life." Journal of the History of Biology 22: 215-242.
- King, M. (2000 [= rev. ed.]). Moriori: A People Rediscovered. Auckland, Viking.

- Lenz, F. (1925). "Ein 'Deutscher Bund für Volksaufartung und Erbkunde'". Archiv für Rassen- und Gesellschaftsbiologie, 17: 349-350.
- Lenz, F. (1931). "Die Stellung des Nationalsozialismus zur Rassenhygiene." Archiv für Rassen- und Gesellschaftsbiologie 25: 300-308.
- Liew, S. H. M. et al. (2005). "The First 'Classical' Twin Study? Analysis of Refractive Error Using Monozygotic and Dizygotic Twins Published in 1922." Twin Research and Human Genetics 8(3): 198-200.
- Lösch, N. C. (1997). Rasse als Konstrukt: Leben und Werk Eugen Fischers. Frankfurt a.M./New York, Lang.
- Lottig, H. (1931). "Hamburger Zwillingsstudien: Anthropologische und charakterologische Untersuchungen an ein- und zweieiigen Zwillingen." Beihefte zur Zeitschrift für angewandte Psychologie 61: 1-122.
- MacCurdy, G. G. (1899). "Extent of Instruction in Anthropology in Europe and the United States." Science 10(260): 910-917.
- Mai, C. and H. v. d. Bussche (1989). Die Forschung. Medizinische Wissenschaft im "Dritten Reich": Kontinuität, Anpassung und Opposition an der Hamburger Medizinischen Fakultät. H. v. d. Bussche (ed). Berlin, Dietrich Reimer Verlag: 165-266.
- Massin, B. (1996). From Virchow to Fischer: Physical Anthropology and 'Modern Race Theories' in Wilhelmine Germany. Volksgeist as Method and Ethic: Essays on Boasian Ethnography and the German Anthropological Tradition. George W. Stocking (ed). Madison, University of Wisconsin Press: 79-154.
- Massin, B. (2004). Mengele, die Zwillingsforschung und die 'Auschwitz-Dahlem Connection'. Die Verbindung nach Auschwitz. Biowissenschaften und Menschenversuche an Kaiser-Wilhelm-Instituten: Dokumentation eines Symposiums. Carola Sachse (ed). Göttingen, Wallstein-Verlag: 201-254.

- Mavalwala, J. (1977). Dermatoglyphics: An International Bibliography. The Hague, Mouton Publishers.
- Meister, R. (1959). Ehrenfels, Maria Christian Julius Leopold Karl, Frhr. v. Neue Deutsche Biographie: Band 4. Berlin, Duncker & Humblot: 352-353.
- Newman, H. H., F. N. Freeman and K. J. Holzinger (1937). Twins: A Study of Heredity and Environment. Chicago, University of Chicago Press.
- Paul, D. B. (1995). Controlling Human Heredity: 1865 to the Present. Atlantic Highlands [N. J.], Humanities Press.
- Poll, H. (1896). "Ein neuer Apparat zur Bestimmung der Schädel-Capazität." Zeitschrift für Ethnologie 28: 615-619.
- Poll, H. (1902). "Ueber Schädel und Skelete der Bewohner der Chatham-Inseln." Zeitschrift für Morphologie und Anthropologie 5(1): 1-134.
- Poll, H. (1909a). "Die Biologie der Nebennierensysteme. Zusammenfassung der Berichte. I. Morphologie." Berliner Klinische Wochenschrift 46(14): 648-650.
- Poll, H. (1909b). "Die Biologie der Nebennierensysteme. Zusammenfassender Bericht. II. Histologie und Cytologie." Berliner Klinische Wochenschrift 46(42): 1886-1890.
- Poll, H. (1909c). "Die Biologie der Nebennierensysteme. Zusammenfassender Bericht. III. Histiophysiologie und allgemeine Physiologie." Berliner Klinische Wochenschrift 46(44): 1973-1979.
- Poll, H. (1913). Die Entwicklung des Menschen. Leipzig, Theodor Thomas.
- Poll, H. (1914a). "Über Vererbung beim Menschen." Die Grenzboten 73(19-20): 247-259 & 296-311.
- Poll, H. (1914b). "Über Zwillingsforschung als Hilfsmittel menschlicher Erbkunde." Zeitschrift für Ethnologie 46: 87-105.
- Poll, H. (1921). "Über Zeugegebote." Zeitschrift für soziale Hygiene, Fürsorge- und

- Krankenhauswesen 5: 129-136.
- Poll, H. (1922). "Grundriss der menschlichen Erblichkeitslehre und Rassenhygiene, Bd. 2: F. Lenz: Menschliche Auslese und Rassenhygiene. Von E. Baur, E. Fischer, u. F. Lenz. J. F. Lehmann, München, 1921." Klinische Wochenschrift 1(9): 436.
- Poll, H. (1924). "Körperliche Erziehung und Vererbung." Monatsschrift für Turnen, Spiel und Sport 4 (1924): 205-214.
- Poll, H. (1930). "Zwillinge in Dichtung und Wirklichkeit." Zeitschrift für die gesamte Neurologie und Psychiatrie 128: 423-471.
- Poll, H. (1934). Rasse, Krankheit, und Daktylogramm. Congrès International des Sciences Anthropologiques et Ethnologiques: Compte-rendu de la première Session, Londres 1934. London, Royal Institute of Anthropology.
- Poll, H. (1992). On Skulls and Skeletons of the Inhabitants of the Chatham Islands. Results of a Journey to the Pacific, Schauinsland, 1896-1897. Transl. K. J. Dennison. Dunedin, University of Otago Medical School.
- Poll, H., and W. Laubmann (1928). "Demonstration von Varietäten bei eineiigen Zwillingen." Ergänzungshefte zum Anatomischer Anzeiger 66: 295-298.
- Poll, H., and A. Lauer (1929). "Der Vaterschaftsnachweis mit Hilfe der Papillarmuster der Fingerbeeren." Kriminalistische Monatshefte 3(10): 217-221.
- Richards, R. (1972). "A Tentative Population Distribution Map of the Morioris of Chatham Island, circa 1790." Journal of the Polynesian Society 81(3): 350-374.
- Schauinsland, H. H. (1999). Unterwegs in Übersee. Aus Reisetagebüchern und Dokumenten des früheren Direktors des Bremer Übersee-Museums. A. E. Dünzelmann et al. Bremen, Verlag H. M. Hauschild GmbH.
- Schiemann, E. (1934). "Erwin Baur." Berichte der Deutschen Botanischen Gesellschaft 52: 51-114.

- Schiff, F. (1914). "Über das serologische Verhalten eines Paares eineiiger Zwillinge."
Berliner Klinische Wochenschrift 30: 1405-1407.
- Schiff, F., and O. v. Verschuer (1931). "Serologische Untersuchungen an Zwillingen."
Klinische Wochenschrift 10(16): 723-726.
- Schott, L. (1961). "Zur Geschichte der Anthropologie an der Berliner Universität."
Wissenschaftliche Zeitschrift der Humboldt-Universität zu Berlin: Mathematisch-Naturwissenschaftliche Reihe 10: 57-65.
- Siemens, H. W. (1924). Die Zwillingspathologie: Ihre Bedeutung, ihre Methodik, ihre bisherigen Ergebnisse. Berlin, Verlag Julius Springer.
- Skinner, H. D. (1923). The Morioris of Chatham Islands. Memoirs of the Bernice P. Bishop Museum. Honolulu, The Museum. IX, no.1.
- Söderqvist, T. (1989). Müntzing, Arne. Svenskt Biografiskt Lexikon: Band 26. Stockholm, Albert Bonnier, 133-136.
- Sutton, D. G. (1985). "The Whence of the Moriori." New Zealand Journal of History 19(1): 3-13.
- Szöllösi-Janze, M. (1998). Fritz Haber 1868-1934: Eine Biographie. Munich, C. H. Beck.
- Verschuer, O. v. (1928). "Die Ähnlichkeitsdiagnose der Eineiigkeit von Zwillingen."
Anthropologischer Anzeiger 5: 244-248.
- Verschuer, O. v. (1931). "Ergebnisse der Zwillingsforschung." Verhandlungen der Gesellschaft für Physische Anthropologie 6: 1-65.
- Verschuer, O. v. (1939). "Twin Research from the Time of Francis Galton to the Present Day." Proceedings of the Royal Society of London. Series B: Biological Sciences 128(850): 62-81.
- Verschuer, O. v. (1964). "Das ehemalige Kaiser-Wilhelm-Institut für Anthropologie, menschliche Erblehre und Eugenik: Bericht über die wissenschaftliche Forschung

- 1927-1945." Zeitschrift für Morphologie und Anthropologie 55(2): 127-174.
- Weber, M. M. (1993). Ernst Rüdin: Eine kritische Biographie. Berlin/New York, Springer Verlag.
- Weindling, P. (1985). "Weimar Eugenics: The Kaiser Wilhelm Institute for Anthropology, Human Heredity and Eugenics in Social Context." Annals of Science 42(3): 303-318.
- Weindling, P. (1988). The Rockefeller Foundation and German Biomedical Sciences, 1920-40: from Educational Philanthropy to International Science Policy. Science, Politics and the Public Good: Essays in Honour of Margaret Gowing. N. A. Rupke (ed). Basingstoke [Hampshire], Macmillan Press: 119-140.
- Weindling, P. (1989). Health, race and German politics between national unification and Nazism 1870-1945. Cambridge, Cambridge University Press.
- Weindling, P. J. (1991). Darwinism and Social Darwinism in Imperial Germany: The Contribution of the Cell Biologist Oscar Hertwig (1849-1922). Stuttgart, Gustav Fischer Verlag.
- Weindling, P. (2000). "An Overloaded Ark? The Rockefeller Foundation and Refugee Medical Scientists, 1933-45." Studies in History and Philosophy of Sciences Part C: Studies in History and Philosophy of Biological and Biomedical Sciences 31(3): 477-489.
- Weingart, P. (1989). "German Eugenics between Science and Politics." Osiris 5: 260-282.
- Weiss, S. F. (1987). Race Hygiene and National Efficiency: The Eugenics of Wilhelm Schallmayer. Berkeley, University of California Press.
- Weiss, S. F. (1987). "The Race Hygiene Movement in Germany." Osiris 3: 193-236.
- Wettstein, F. v. (1938). "Carl Erich Correns." Berichte der Deutschen Botanischen Gesellschaft 56: 140-160.
- Willstätter, R. (1958). Aus meinem Leben: Von Arbeit, Musse und Freunden. Ed. with an

afterword by Arthur Stoll. Weinheim, Verlag Chemie [2nd ed.].

Wolff, C. (1986). Magnus Hirschfeld: A Portrait of a Pioneer in Sexology. London, Quartett Books.

NOTES

¹ Heinrich Poll, “Ueber Schädel und Skelete der Bewohner der Chatham-Inseln”, *Zeitschrift für Morphologie und Anthropologie*, 5:1 (1902), pp.1-134; English translation: Heinrich Poll, *On Skulls and Skeletons of the Inhabitants of the Chatham Islands. Results of a journey to the Pacific, Schauinsland, 1896-1897*. Translated from the German by K. J. Dennison, University of Otago Medical School, Dunedin, 1992. On the Moriori, see e.g. H. D. Skinner, *The Morioris of Chatham Islands* (= Memoirs of the Bernice P. Bishop Museum, vol. IX, no. 1), Honolulu, The Museum, 1923; Rhys Richards, “A Tentative Population Distribution Map of the Morioris of Chatham Island, circa 1790”, *Journal of the Polynesian Society*, 81(3) (1972), pp.350-374; Douglas G. Sutton, “The Whence of the Moriori”, *New Zealand Journal of History*, 19(1) (1985), pp.3-13; and Michael King, *Moriori: A People Rediscovered*, Auckland, Viking, 2000 [= rev. ed.].

² On Schauinsland’s collecting activities on the Chathams, see Hugo H. Schauinsland, *Unterwegs in Übersee. Aus Reisetagebüchern und Dokumenten des früheren Direktors des Bremer Übersee-Museums*, ed. by Anne E. Dünzelmann et al., Bremen, Verlag H. M. Hauschild GmbH, 1999, pp.86-102.

³ Benoit Massin, “From Virchow to Fischer: Physical Anthropology and ‘Modern Race Theories’ in Wilhelmine Germany”, in: George W. Stocking, Jr. (ed.), *Volksgeist as Method*

and Ethic: Essays on Boasian Ethnography and the German Anthropological Tradition, Madison, University of Wisconsin Press, 1996, pp.124-125.

³ Massin 1996, p.106.

⁴ Massin 1996, p.122.

⁵ Unless stated otherwise, all biographical details pertaining to Heinrich Poll as mentioned in this paper have been taken from personal files on him held by the Staatsarchiv Hamburg (StA HH).

⁶ Information kindly supplied by Professor Bengt Olle Bengtsson (University of Lund, Sweden).

⁷ Heinrich Poll, "Ein neuer Apparat zur Bestimmung der Schädel-Capacität", *Zeitschrift für Ethnologie*, 28 (1896), pp.615-619; cf. W. L. H. Duckworth, *Morphology and Anthropology*, Cambridge, Cambridge University Press, 1904, p.249.

⁸ Massin 1996, pp.84 & 118; Paul Julian Weindling, *Darwinism and Social Darwinism in Imperial Germany: The Contribution of the Cell Biologist Oscar Hertwig (1849-1922)*, Stuttgart, Gustav Fischer Verlag, 1991, p.143.

⁹ Weindling 1991, *passim*.

¹⁰ Massin 1996, pp.84-85; cf. Grant George MacCurdy, "Extent of Instruction in Anthropology in Europe and the United States", *Science*, vol. 10, no. 260 (Dec. 22, 1899), p.912.

¹¹ See Sheila Faith Weiss, *Race Hygiene and National Efficiency: The Eugenics of Wilhelm Schallmayer*, Berkeley, University of California Press, 1987.

¹² On Woltmann, see Weiss, *Race Hygiene and National Efficiency*, pp.96-98.

¹³ On Ehrenfels, see Richard Meister, "Ehrenfels, Maria Christian Julius Leopold Karl, Frhr. v.", *Neue Deutsche Biographie. Band 4*, Berlin, Duncker & Humblot, 1959, pp.352-353; and

Anne Harrington, *Reenchanted Science: Holism in German Culture from Wilhelm II to Hitler*, Princeton [N.J.], Princeton University Press, 1996, pp.108-111.

¹⁴ Poll, 1931 CV (StA HH, Hochschulwesen – Personalakten, I 324, Bd. 4).

¹⁵ A list of publications appended to Poll's 1931 CV includes the following articles: "Die Biologie der Nebennierensysteme. Zusammenfassung der Berichte. I. Morphologie", *Berliner Klinische Wochenschrift*, 46(14) (1909), pp.648-650; "Die Biologie der Nebennierensysteme. Zusammenfassender Bericht. II. Histologie und Cytologie", *Berliner Klinische Wochenschrift*, 46(42) (1909), pp.1886-1890; "Die Biologie der Nebennierensysteme. Zusammenfassender Bericht. III. Histiophysiologie und allgemeine Physiologie", *Berliner Klinische Wochenschrift*, 46(44) (1909), pp.1973-1979.

¹⁶ Natasha X. Jacobs, "From Unit to Unity: Protozoology, Cell Theory, and the New Concept of Life", *Journal of the History of Biology*, 22 (1989), pp.235-6.

¹⁷ Heinrich Poll, *Die Entwicklung des Menschen*, Leipzig, Theodor Thomas, 1913, 92pp.

¹⁸ The following discussion of Poll's early professional career under Hertwig is based on details taken from Weindling 1991, pp.218-224 & 243.

¹⁹ Weindling 1991, pp.219, 249 & 342.

²⁰ Paul Weindling, *Health, race and German politics between national unification and Nazism 1870-1945*, Cambridge, Cambridge University Press, 1989, p.335; Weindling 1991, p.219.

²¹ For a discussions of eugenics in general, see e.g. Mark B. Adams (ed.), *The Wellborn Science: Eugenics in Germany, France, Brazil, and Russia*, New York, Oxford University Press, 1990; and Diane B. Paul, *Controlling Human Heredity: 1865 to the Present*, Atlantic Highlands [N. J.], Humanities Press, 1995. Our discussion of German eugenics as given below is indebted primarily to Sheila Faith Weiss, "The Race Hygiene Movement in Germany", *Osiris*, 3 (1987), pp.193-236.

²² See Gunnar Broberg and Mattias Tydén, “Eugenics in Sweden: Efficient Care”, in: Gunnar Broberg and Nils Roll-Hansen (eds), *Eugenics and the Welfare State: Sterilization Policy in Denmark, Sweden, Norway, and Finland*, East Lansing, Michigan State University Press, 1996, pp.77-149.

²³ See Weiss, “The Race Hygiene Movement in Germany”, pp.202, 218 & 221; Weiss, *Race Hygiene and National Efficiency*, pp.103 & 156; Paul Weindling, “Weimar Eugenics: The Kaiser Wilhelm Institute for Anthropology, Human Heredity and Eugenics in Social Context”, *Annals of Science*, 42(3) (1985), p.313.

²⁴ See e.g. Weindling 1989, pp.482-483.

²⁵ Weindling, 1989, *ibid.* On Hirschfeld, see Charlotte Wolff, *Magnus Hirschfeld: A Portrait of a Pioneer in Sexology*, London, Quartett Books, 1986.

²⁶ See e.g. Weindling 1989, pp.445 & 483.

²⁷ Richard Goldschmidt, *In and Out of the Ivory Tower: The Autobiography of Richard B. Goldschmidt*, Seattle, University of Washington Press, 1960, pp.230-231. Goldschmidt does not name the panel concerned, but it was apparently the *Beirat für Rassenhygiene* (Committee for Racial Hygiene), which was set up in May 1920 (cf. Weindling 1989, p.341); see below for further details.

²⁸ Christoph Mai and Hendrik van den Bussche, “Die Forschung”, in: Hendrik van den Bussche (ed.), *Medizinische Wissenschaft im “Dritten Reich” : Kontinuität, Anpassung und Opposition an der Hamburger Medizinischen Fakultät*, Berlin, Dietrich Reimer Verlag, 1989, p.209.

²⁹ Heinrich Poll, “Über Vererbung beim Menschen”, *Die Grenzboten*, 73 (19-20) (1914), p.308; cf. Mai and van den Bussche 1989, p.209.

³⁰ See e.g. Poll “Über Zeugegebote”, *Zeitschrift für soziale Hygiene, Fürsorge- und Krankenhauswesen*, 5 (November, 1921), pp.129-136, and “Körperliche Erziehung und Vererbung”, *Monatsschrift für Turnen, Spiel und Sport*, 4 (1924), pp.205-214.

³¹ Weindling 1985, p.304; Weindling 1989, p.340; Peter Weingart, “German Eugenics between Science and Politics”, *Osiris*, 5 (1989), p.262.

³² On Baur, see e.g. Elisabeth Schiemann, “Erwin Baur”, *Berichte der Deutschen Botanischen Gesellschaft*, 52 (1934), pp.51-114; and Jonathan Harwood, *Styles of Scientific Thought: The German Genetics Community 1900-1933*, Chicago & London, University of Chicago Press, 1993, *passim*.

³³ On Correns, see e.g. Fritz von Wettstein, “Carl Erich Correns”, *Berichte der Deutschen Botanischen Gesellschaft*, 56 (1938), pp.140-160; and Harwood 1993, *passim*.

³⁴ On Goldschmidt, see e.g. Goldschmidt 1960, as well as his *Portraits from Memory: Recollections of a Zoologist*, Seattle, University of Washington Press, 1956; see also Harwood 1993, *passim*.

³⁵ Massin 1996, p.86.

³⁶ Massin 1996, p.90.

³⁷ For details of von Luschan’s career, see e.g. Massin 1996, pp.84-86, but in particular Lothar Schott, “Zur Geschichte der Anthropologie an der Berliner Universität”, *Wissenschaftliche Zeitschrift der Humboldt-Universität zu Berlin: Mathematisch-Naturwissenschaftliche Reihe*, 10 (1961), pp.61-63; for details of von Luschan’s interest in genetics, see Hans Grimm, “Humangenetische Ansätze bei Felix v. Luschan nach Wiederauffindung der Mendelschen Regeln (ab 1900/1901)”, *Mitteilungen der Sektion Anthropologie der biologischen Gesellschaft in der DDR*, 28 (1972), pp.19-28.

³⁸ Weindling 1985, p.304.

³⁹ Weindling 1985, *ibid.*; Weindling 1989, pp.340-341.

⁴⁰ Weindling 1985, p.308; Weindling 1989, p.338; Weingart 1989, p.262.

⁴¹ For an overview of Rüdin's career, see Matthias M. Weber, *Ernst Rüdin: Eine kritische Biographie*, Berlin/New York, Springer Verlag, 1993.

⁴² Weingart 1989, pp.262-263.

⁴³ See e.g. Alison Abbott and Quirin Schiermeier, *Nature*, vol. 407, issue 6806, 19 October 2000, pp.823-824.

⁴⁴ See Niels C. Lösch, *Rasse als Konstrukt: Leben und Werk Eugen Fischers*, Frankfurt a.M./New York, Lang, 1997, pp.168-170.

⁴⁵ Weindling 1989, pp.391-392.

⁴⁶ Weiss, "The Race Hygiene Movement in Germany", pp.225 & 229.

⁴⁷ Weindling 1989, *passim*.

⁴⁸ Weiss, "The Race Hygiene Movement in Germany", p.209.

⁴⁹ Weiss, "The Race Hygiene Movement in Germany", p.219.

⁵⁰ Heinrich Poll, "Grundriss der menschlichen Erblichkeitslehre und Rassenhygiene, Bd. 2: F. Lenz: Menschliche Auslese und Rassenhygiene. Von E. Baur, E. Fischer, u. F. Lenz. J. F. Lehmann, München, 1921.", *Klinische Wochenschrift*, 1(9) (1922), p.436.

⁵¹ Weiss, "The Race Hygiene Movement in Germany", pp.208-209.

⁵² Weindling 1989, pp.406-407; Weiss, "The Race Hygiene Movement in Germany", pp.219-220.

⁵³ See e.g. Mai and van den Bussche 1989, p.209, who say merely that Poll was a "longstanding member of the German Society for Racial Hygiene".

⁵⁴ Fritz Lenz, "Ein 'Deutscher Bund für Volksaufartung und Erbkunde'", *Archiv für Rassen- und Gesellschaftsbiologie*, 17 (1925), p.350.

⁵⁵ Anon., “Jahresversammlung des Bundes für Volksaufartung und Erbkunde am 7. Mai”, *Zeitschrift für Volksaufartung und Erbkunde*, 2 (1927), p.57. The other two speakers were Erwin Baur and the Swedish eugenicist Herman Lundborg.

⁵⁶ Anon., “Was will der Deutsche Bund für Volksaufartung und Erbkunde?”, *Zeitschrift für Volksaufartung und Erbkunde*, 1 (1926), p.2.

⁵⁷ Weindling 1991, p.342.

⁵⁸ On Flexner, see Thomas Neville Bonner, *Iconoclast: Abraham Flexner and a Life in Learning*, Baltimore, John Hopkins University Press, 2002.

⁵⁹ Abraham Flexner, *I Remember: The Autobiography of Abraham Flexner*, New York, Simon and Schuster, 1940 [actually 1943: = 2nd rev. ed.], p.159.

⁶⁰ Bonner 2002, 182.

⁶¹ Paul Weindling, “The Rockefeller Foundation and German Biomedical Sciences, 1920-40: from Educational Philanthropy to International Science Policy”, in: Nicolaas A. Rupke (ed.), *Science, Politics and the Public Good: Essays in Honour of Margaret Gowing*, Basingstoke [Hampshire], Macmillan Press, 1988, pp.124-125.

⁶² Weindling 1988, p.125; Weindling 1985, p.315.

⁶³ Weindling 1988, p.125. On Willstätter, see e.g. his posthumous memoir *Aus meinem Leben: Von Arbeit, Musse und Freunden*, ed. with an afterword by Arthur Stoll (2nd ed.), Weinheim, Verlag Chemie, 1958.

⁶⁴ Weindling 1988, pp.125-126. A recent biographer of Haber, however, claims that his reasons for resigning from the committee were “purely personal”, and in particular because he felt that Poll was “completely unsuited to distributing fifty thousand American dollars in a manner that was either good or to anyone’s benefit”; see Margit Szöllösi-Janze, *Fritz Haber 1868-1934: Eine Biographie*, Munich, C. H. Beck, 1998, p.583.

⁶⁵ Weindling 1988, p.126.

⁶⁶ Weindling 1988, *ibid.*; cf. Szöllösi-Janze 1998, p.583.

⁶⁷ Weindling 1988, pp.126-127.

⁶⁸ Weindling 1988, pp.127-128.

⁶⁹ Itinerary reconstructed from various newspaper cuttings held in Poll files in Staatsarchiv Hamburg (StA HH, Hochschulwesen – Personalakten, I 324, Bd. 3); cf. Anon., “Scientific Notes and News”, *Science*, vol. 68, no. 1774 (Dec. 28, 1928), pp.641-642.

⁷⁰ Newspaper cutting held in Poll files in Staatsarchiv Hamburg (StA HH, Hochschulwesen – Personalakten, I 324, Bd. 3).

⁷¹ And possibly for a very personal reason, too: according to Poll’s 1931 Curriculum Vitae (StA HH, Hochschulwesen – Personalakten, I 324, Bd. 4), his only other siblings had been two twin sisters, both of whom had died in early childhood.

⁷² Heinrich Poll, “Über Zwillingsforschung als Hilfsmittel menschlicher Erbkunde”, *Zeitschrift für Ethnologie*, 46 (1914), pp.87-105.

⁷³ See e.g. Harold Cummins, “Obituary: Heinrich William Poll”, *Science*, vol. 90, no. 2330 (Aug. 25, 1939), p.173; and Benoit Massin, “Mengele, die Zwillingsforschung und die ‘Auschwitz-Dahlem Connection’”, in: Carola Sachse (ed.), *Die Verbindung nach Auschwitz. Biowissenschaften und Menschenversuche an Kaiser-Wilhelm-Instituten: Dokumentation eines Symposiums*, Göttingen, Wallstein-Verlag, 2004, p.202.

⁷⁴ Horatio H. Newman, Frank N. Freeman and Karl J. Holzinger, *Twins: A Study of Heredity and Environment*, Chicago, University of Chicago Press, 1937, p.19.

⁷⁵ Examples can be seen the list of publications appended to Poll’s 1931 CV (StA HH, Hochschulwesen – Personalakten, I 324, Bd. 4).

⁷⁶ See e.g. Poll 1930, p.426.

⁷⁷ Poll 1914b, pp.102-104.

⁷⁸ Poll 1930, p.427; cf. Heinrich Lottig, “Hamburger Zwillingsstudien: Anthropologische und charakterologische Untersuchungen an ein- und zweieiigen Zwillingen”, *Beihefte zur Zeitschrift für angewandte Psychologie*, 61 (1931), p.12.

⁷⁹ Lottig 1931, p.12

⁸⁰ Lottig 1931. On Lottig’s indebtedness to the Hamburg archive, see esp. pp.iii & 11-12 of his study.

⁸¹ Both co-written: the first with W. Laubmann, “Demonstration von Varietäten bei eineiigen Zwillingen”, *Ergänzungshefte zum Anatomischer Anzeiger*, 66 (1928), pp.295-298; the second with A. Lauer, “Der Vaterschaftsnachweis mit Hilfe der Papillarmuster der Fingerbeeren”, *Kriminalistische Monatshefte*, 3(10) (1929), pp.217-221.

⁸² Poll 1930.

⁸³ Hermann Werner Siemens, *Die Zwillingspathologie: Ihre Bedeutung, ihre Methodik, ihre bisherigen Ergebnisse*, Berlin, Verlag Julius Springer, 1924, p.35; cf also *ibid.*, p.2.

⁸⁴ Fritz Schiff, “Über das serologische Verhalten eines Paares eineiiger Zwillinge”, *Berliner Klinische Wochenschrift*, 30 (27 July 1914), p. 1405; cf. Fritz Schiff and Otmar von Verschuer, “Serologische Untersuchungen an Zwillingen”, *Klinische Wochenschrift*, 10(16) (18 April 1931), p.723.

⁸⁵ Walter Jablonski, “Ein Beitrag zur Vererbung der Refraktion menschlicher Augen”, *Archiv für Augenheilkunde*, 91 (1922), pp.308-328; cf. Shiao Hui M. Liew et al., “The First ‘Classical’ Twin Study? Analysis of Refractive Error Using Monozygotic and Dizygotic Twins Published in 1922”, *Twin Research and Human Genetics*, 8(3) (2005), pp.198-200.

⁸⁶ Poll 1930, p.474, Lottig 1931, pp.94-97.

⁸⁷ See e.g. von Verschuer’s “Die Ähnlichkeitsdiagnose der Eineiigkeit von Zwillingen”, *Anthropologischer Anzeiger*, 5 (1928), p.247; as well as his “Ergebnisse der

Zwillingsforschung”, *Verhandlungen der Gesellschaft für Physische Anthropologie*, 6 (1931), pp.2, 3, 13 & 63.

⁸⁸ Information kindly supplied by Dr Marion Kazemi (Archiv zur Geschichte der Max-Planck-Gesellschaft, Berlin).

⁸⁹ Reiner Müller, Nomination of F. d’Hérelle, H. Poll and H. Siemens to Nobel Committee [1932], no. 13-0 (Nobel Archives, Stockholm). (Note: Müller’s nomination of Poll and Siemens also contained a recommendation of Félix d’Hérelle for the Nobel Prize for the latter’s work on bacteriophages). Material from the Nobel Archives was kindly provided by the Nobel Committee for Physiology or Medicine.

⁹⁰ Hilding Bergstrand, Statement relating to H. Poll [1932] (Nobel Archives, Stockholm). Material from the Nobel Archives was kindly provided by the Nobel Committee for Physiology or Medicine.

⁹¹ Copy of workshop programme contained in Poll files held in Staatsarchiv Hamburg (StA HH, Hochschulwesen – Dozenten- und Personalakten, I 324, Bd. 1).

⁹² See John Cornwell, *Hitler’s Scientists: Science, War, and the Devil’s Pact*, London & New York, Viking, 2003, p.129.

⁹³ Hendrik van den Bussche, “Die ‘Machtergreifung’”, in: Hendrik van den Bussche (ed.), *Medizinische Wissenschaft im “Dritten Reich”: Kontinuität, Anpassung und Opposition an der Hamburger Medizinischen Fakultät*, Berlin, Dietrich Reimer Verlag, 1989, p.34.

⁹⁴ Van den Bussche 1989a, p.35.

⁹⁵ StA HH, Hochschulwesen – Dozenten- und Personalakten, I 324, Bd. 1: Lohmann to Gercke, 8 September 1933.

⁹⁶ Hendrik van den Bussche, “Akademische Karrieren im ‘Dritten Reich’”, in: Hendrik van den Bussche (ed.), *Medizinische Wissenschaft im “Dritten Reich”: Kontinuität, Anpassung*

und *Opposition an der Hamburger Medizinischen Fakultät*, Berlin, Dietrich Reimer Verlag, 1989, p.75.

⁹⁷ Van den Bussche 1989a, p.35.

⁹⁸ Information on Clara Poll-Cords can be found in the on-line database *Dokumentation: Ärztinnen im Kaiserreich* maintained by the Institut für Geschichte der Medizin, Freie Universität Berlin (<http://userpage.fu-berlin.de/~elehmus/index.html>).

⁹⁹ For a list of Poll's publications in the field of dermatoglyphics, see Jamshed Mavalwala, *Dermatoglyphics: An International Bibliography*, The Hague, Mouton Publishers, 1977, pp.185-186.

¹⁰⁰ Heinrich Poll, "Rasse, Krankheit, und Daktylogramm", in: *Congrès International des Sciences Anthropologiques et Ethnologiques: Compte-rendu de la première Session, Londres 1934*, [London, Royal Institute of Anthropology], 1934, p.113.

¹⁰¹ Harold Cummins, untitled note in: *Congrès International des Sciences Anthropologiques et Ethnologiques: Compte-rendu de la première Session, Londres 1934*, [London, Royal Institute of Anthropology], 1934, p.113.

¹⁰² Harold Cummins and Charles Midlo, *Finger Prints, Palms and Soles: An Introduction to Dermatoglyphics*, New York, Dover Publications, 1961 [= 2nd ed.], p.21.

¹⁰³ StA HH, Hochschulwesen – Dozenten- und Personalakten, I 324, Bd. 1: Poll to Brodersen, 20 March 1936.

¹⁰⁴ Paul Weindling, "An Overloaded Ark? The Rockefeller Foundation and Refugee Medical Scientists, 1933-45", *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences*, 31(3) (September 2000), p.483.

¹⁰⁵ The following section describing Poll's emigration to and arrival in Sweden owes a particular debt to information kindly supplied by Professor Bengt Olle Bengtsson (University of Lund).

¹⁰⁶ The involvement of Dahlberg, Müntzing and Nilsson-Ehle in the Swedish genetics and eugenics movements is mentioned in Broberg and Tydén 1996, *passim*; for further biographical details, see respectively: L. C. Dunn, “G. Dahlberg, Human Geneticist”, *Science*, vol. 124, no. 3233 (Dec. 14, 1956), pp.1195-1196; Thomas Söderqvist, “Müntzing, Arne”, *Svenskt Biografiskt Lexikon: Band 26*, Stockholm, Albert Bonnier, 1989, pp.133-136; and Arne Hagberg, “Nilsson-Ehle, Nils Herman”, *Svenskt Biografiskt Lexikon: Band 27*, Stockholm, Albert Bonnier, 1991, pp.41-47. On Broman, see G. Häggqvist, “Broman, Ivar”, *Svenskt Biografiskt Lexikon: Sjätte Bandet*, Stockholm, Albert Bonnier, 1926, pp.354-358.

¹⁰⁷ Anon. 1939, “Recent Deaths and Memorials”, *Science*, vol. 90, no. 2326 (Jul. 28, 1939), p.76.

¹⁰⁸ Otmar Freiherr von Verschuer, “Twin Research from the Time of Francis Galton to the Present Day”, *Proceedings of the Royal Society of London. Series B: Biological Sciences*, vol. 128, no. 850 (Dec. 15, 1939), pp.62-81.

¹⁰⁹ For a list of some of von Verschuer’s publications on twins, see e.g. Otmar Freiherr von Verschuer, “Das ehemalige Kaiser-Wilhelm-Institut für Anthropologie, menschliche Erblehre und Eugenik: Bericht über die wissenschaftliche Forschung 1927-1945”, *Zeitschrift für Morphologie und Anthropologie*, 55(2) (1964), pp.166 & 170-171; on Mengele’s work on twins in Auschwitz, see Massin 2004.

¹¹⁰ See e.g. Fritz Lenz, “Die Stellung des Nationalsozialismus zur Rassenhygiene”, *Archiv für Rassen- und Gesellschaftsbiologie*, 25 (1931), p.302.