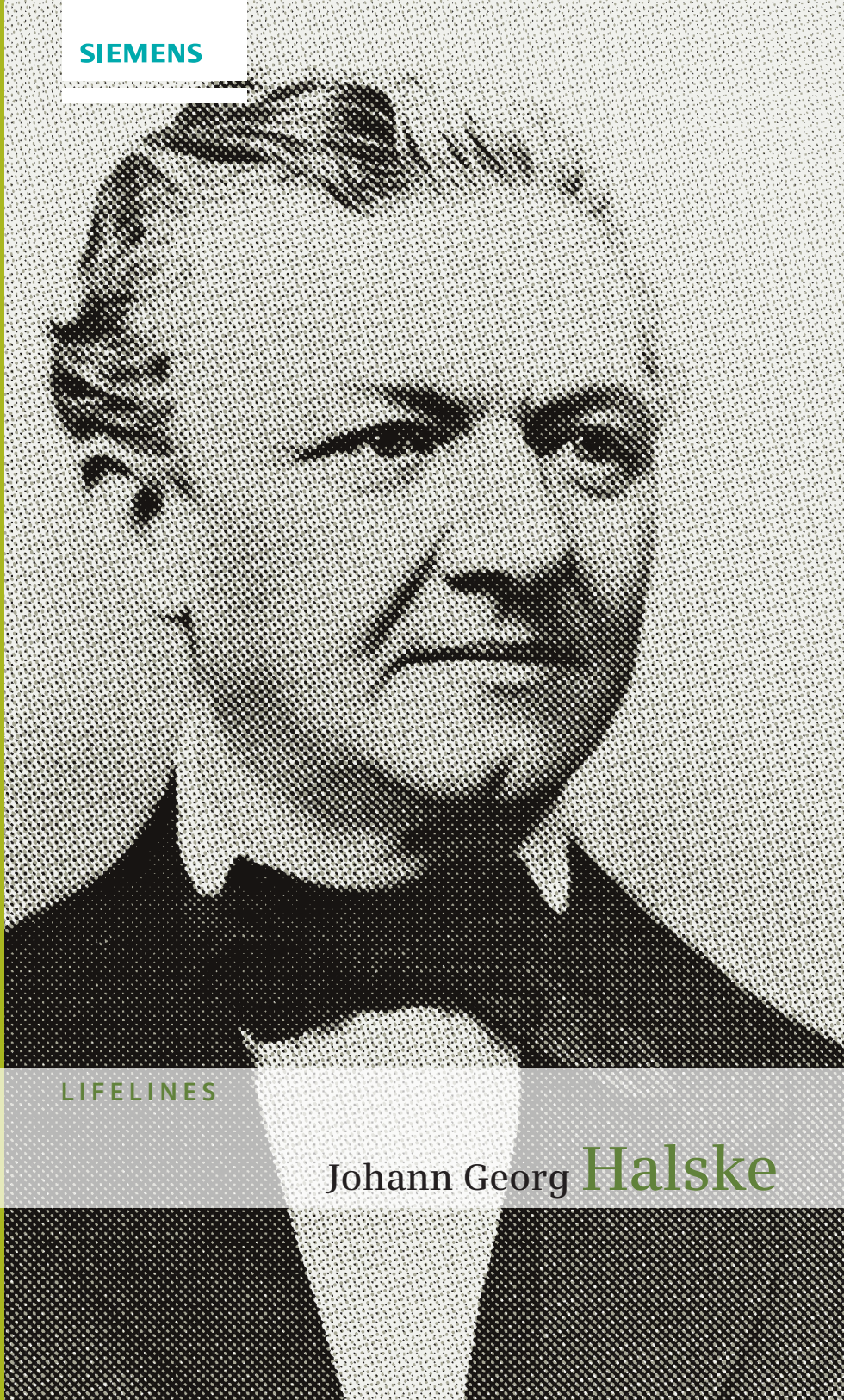
SIEMENS



LIFELINES

Johann Georg Halske

July 30, 2014 marks the 200th birthday of **Johann Georg Halske**. To celebrate the occasion, the Siemens Historical Institute has published a biographical portrait of this precision mechanic who later became Werner von Siemens' business partner.

The brochure is the first volume in the new series **LIFELINES**, which is dedicated to introducing the men and women who have done the most to shape the history and development of Siemens. This group includes businessmen who led the company, members of the Managing Board, engineers, inventors and creative thinkers. A conscious effort has been made to include the lives and contributions of those individuals who are not always counted among the company's most prominent figures.

Johann Georg Halske

Johann Georg

Halske

30. 7. 1814 – 18. 3. 1890

LIFELINES

Johann Georg Halske, 1855

Introduction

Precision, meticulous attention to detail, and a sharp eye for the finer points combined with a penchant for creating artistic forms — all these were outstanding facets of Johann Georg Halske's character and made him one of the most famous precision mechanics in nineteenth-century Berlin. As a youth, he had already developed a passion for the "art of mechanics" that would stay with him for a lifetime and ultimately become his profession. Halske began building precision instruments in his own workshop beginning in 1844. He earned a profitable living and an excellent reputation, not only among his colleagues but also his customers, who came to him from the environs of the Berlin University. If there had been no more to his life than that, Halske would have had no cause for complaint.

But fate had more in store for him. More or less by chance, on December 31, 1846, Halske encountered a man who would shift his life into entirely different channels. Werner von Siemens needed the right partner to help him build a pointer telegraph that he had developed. With enthusiasm and his own brand of passion for tinkering with technical mechanisms, Halske joined the young artillery lieutenant as they threw themselves into the adventure of telegraphy. Less than twelve months after their first meeting, the precision mechanic Halske became one of the three founders of the new Telegraphen-Bauanstalt von Siemens & Halske — the Telegraph Construction Company of Siemens & Halske. They had taken the first step on the way to building a world enterprise.

While Halske and Siemens shared a fascination with telegraph technology, their personalities differed just as much as their visions of the path their joint company should take. Surprisingly, it was the firm's business success and its international growth that would cause the two pioneers of electric telegraphy to part ways 20 years later. As the collaboration continued with

Siemens, and with Siemens' brothers who came into the business, Halske—a precision mechanic through and through—found it increasingly difficult to go along with their desire for expansion. While mechanically perfect devices were an end in themselves for Halske, for Werner von Siemens they were more of a means to an end. The Telegraphen-Bauanstalt was well known for its high-quality equipment and instruments, but as far as Siemens was concerned, they served primarily to attract new clients. After all, Siemens & Halske earned its money primarily from the mass production of electrical equipment, and not so much from painstakingly constructed single pieces. After many compromises, the match between traditional craftsmanship and the ambition for industrial modernization could no longer hold together, and the partners' successful business cooperation came to an end. Nevertheless, the company retained the Halske name for many years to come: The co-founder's name would not be abandoned until Siemens AG was founded in 1966.

In any case, the severance of their business connection did not mean a personal break between the two old comrades. Even if Johann Georg Halske now pursued other interests and drew his satisfaction from his social and political commitments, he and Werner von Siemens remained friends all their lives. Siemens appreciated Halske's "practical viewpoint and understanding" and his "special knowledge of mechanics", as he wrote in retrospect, and he was aware that it was "to him alone" that the company owed "the good business results from our first years".[1]

Background, schooling, and apprenticeship

In fact, there was little to suggest that Johann Georg Halske and Werner von Siemens would ever cross paths. Halske came into the world in Hamburg on July 30, 1814, the third of four children of Johann Hinrich Halske and his wife Johanna Catharina, née Hahn. After becoming a citizen of the city of Hamburg in 1807, the elder Halske initially worked as a sugar broker and later as a cigar dealer. Late in life he played a role in the public life of the Hansa City, serving unpaid as a member of the city council.

Little is known about Johann Georg's childhood. The trail does not become clearer until he arrived in Berlin at age eleven, in 1825. In the Prussian capital, an uncle on his mother's side undertook to provide for his education. The reasons for the move are obscure. It may be that his parents thought their son would have a chance for a better future with his relative, who was apparently wealthier and more influential.

Young Halske must have received private tutoring before leaving home, because there is no record of his attending a public school until Berlin. Between 1826 and 1829 he attended the Gymnasium zum Grauen Kloster—not a "gymnasium" in the English sense, but rather an academic secondary school. With its rich tradition, this educational institution counted as one of the foremost in Berlin, where such eminences as the gymnastics educator Friedrich Ludwig Jahn, German Chancellor Otto von Bismarck, and industrialist Emil Rathenau spent their school days.[2] It was at the Graues Kloster that Halske made his first acquaintance with

1814 Hamburg is the third-largest German city with around 150,000 inhabitants.

1574 Establishment of the Gymnasium zum Grauen Kloster.

mathematics, science, and technology. His interest was aroused, and he would be working intensively in these fields for the rest of his life. In 1866, his warm memories of his physics lessons there prompted the 52-year-old master precision mechanic to gift the school with "a pair of pointer telegraph apparatus". In his letter to the director, Halske explained that the "fact that these apparatus put various principles quite visibly to work" had led him "to choose them particularly".[3]

The words demonstrate one of Halske's basic characteristics. As a man of deeds, he preferred to work on a concrete object in order to explore the principles of physical processes directly, rather than laboring with pallid theory and seeking academic honors. We do not know whether the young Halske had no taste for study, or whether he simply did not perform well enough. What's clear is that he left the school after three years, at the age of 15, without a diploma. Assessment reports from his teachers do not give a clear picture. Halske was certainly not a model scholar; his grades were too inconsistent. Sometimes he was the best in the class. Other times—probably more often—he vanished into the middle of the pack. Repeated praise for his scholastic achievements alternated with criticism. He seems in particular to have lacked the discipline for a regulated daily schedule: "He was often absent and not careful about punctuality." About his personality, teachers reported a "spirit of unruliness that could be compelled to comply with the school's regulations only with the greatest severity". In addition, he "often expressed himself [disruptively], necessitating harsh punishment".[4] It is hard to draw any conclusions about the young Halske's personality from these strobe-like glimpses that survive in the record. Nevertheless, there are hints of a few personality traits that come into better focus when we look at his later career: involvement and enthusiasm, com-

1812 In Prussia, the term Gymnasium (pl. Gymnasien) refers to the type of school from which one must graduate in order to attend university.

1812 The natural sciences become a fixed part of the curriculum at Prussian Gymnasien.

bined with a free spirit and a healthy dose of obstinacy and persistence.

In the "Great School of Mechanics"

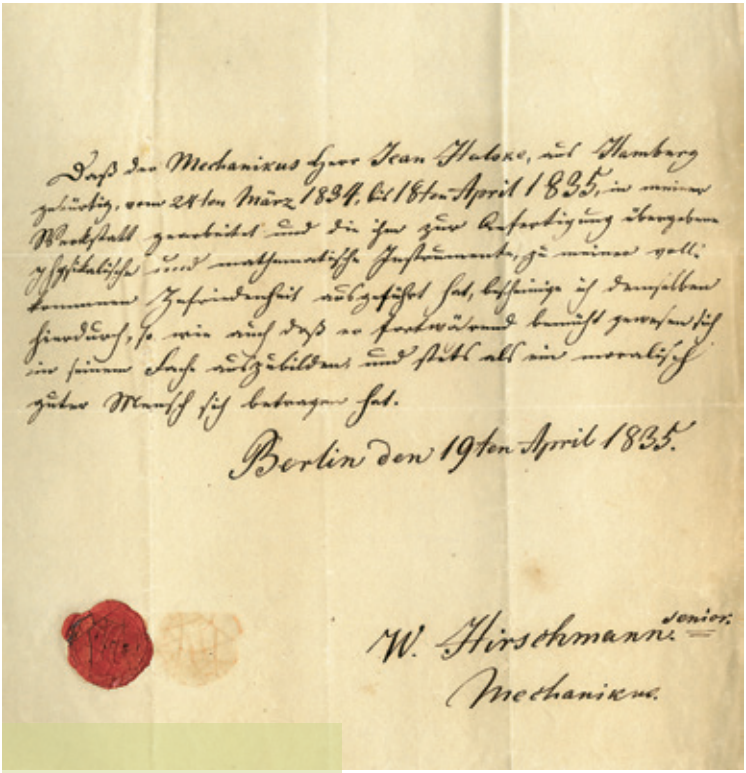
Halske left his unloved school in 1829 and began an apprenticeship in a craft.[5] The decision may have had to do with the death of his father, who succumbed at the beginning of the year to an "illness of the chest" (presumably tuberculosis). Beginning an apprenticeship might be read as an attempt to contribute his share to support his now-fatherless family. Had Halske taken the wearisome route of a secondary-school diploma and university study, he would not have been able to provide such support until much later.

We cannot reconstruct the details of his apprenticeship. All that is documented is that he began training at the workshop of a Berlin machine builder named Schneggenburger.[6] According to an acquaintance, Halske was not able to cope with the sometimes heavy physical labor—in those days, machine builders did not yet have the advantage of machine tools. He finally gave up trying to work with heavier machinery and went on to train with Wilhelm Hirschmann, a "precision mechanic". It is not clear exactly when he made the change. A letter of reference from Hirschmann states that the apprenticeship lasted from March 1834 to April 1835, and the assessment was unmistakably positive: Halske "executed the physical and mathematical instruments assigned to him entirely satisfactorily".[7] Because of his talent, he had already come into contact with physicists and physiologists from the Berlin University while he was still an apprentice.

After this early vocational experience, Halske returned to the city of his birth. In 1835 he became a journeyman in the workshop of

In the 19th century, one in seven persons dies of tuberculosis.

1844 In Berlin there are over 50 precision mechanical workshops.



Apprentice's letter of reference, 1835

Johann Georg Repsold, who enjoyed an excellent reputation as a builder of astronomical instruments. Halske stayed with Repsold for three years, rising to the status of plant manager. But then the "Assistant Mechanic" felt the need to move on. In 1838 he left Hamburg and returned to Berlin for good. The Prussian metropolis, with its many workshops, had by now become a center for the

Starting in 1800 A few precision mechanical workshops in Hamburg specialize in the construction of astronomical instruments.

precision mechanics' craft—and was attractive to the 24-year-old for just that reason. It also offered the chance of returning to Hirschmann's workshop.[8]

By August 1843, Halske had been working for Hirschmann for five years. He applied for admission to "the federation of Prussian Subjects", as the wording of the day read.[9] As grounds for his application, he cited plans to "become independently established as a mechanic" in Berlin.[10] The city promised to be a good location—after all, it was home to large numbers of scientists who needed talented, reliable instrument makers. On top of that, researchers from elsewhere often visited conferences and other academic events held in Berlin, and used the opportunity to seek out contacts with famous local mechanics.

In 1844, once his application for citizenship had been approved, Halske joined the mechanic Friedrich M. Boetticher in opening their own workshop on Karlstrasse, not far from the Berlin University. The partners knew one another from Halske's time with Hirschmann. Their workshop specialized in designing and building laboratory and demonstration equipment for physics and chemistry, as well as optical and geodetic instruments. Their clientele came from the sphere of university academics.

1809 Establishment of the University of Berlin, later known as the Humboldt University of Berlin; the natural sciences belong to the philosophy department.

Between craft and art— Johann Georg Halske as a "Mechanicus"

The precision mechanics' profession in which Johann Georg Halske worked existed at the interface between crafts and science. Workshops like Hirschmann's and Repsold's worked with physiologists, physicists, chemists, astronomers, and geodetisists who had to rely on the mechanics' precision products for their laboratory investigations and scientific experiments. Hirschmann's products, for example, included microscopes, one of the most important scientific instruments of the nineteenth century. So Halske gathered significant experience from his trainers, and learned how to work personally with the academics to convert their wishes and ideas into precision mechanical instruments. Because mechanics generally had a sufficient knowledge of mathematics and science, communication with the scientists was usually smooth. Halske profited in particular from working with Carl Philipp Heinrich Pistor, possibly Berlin's most famous precision mechanic, whom Halske got to know after returning to Berlin. Pistor, who had been working with Hirschmann since the end of the 1830s, had made his reputation with such projects as building instruments for the Berlin Observatory, and had been responsible for a large share of physicist Heinrich Gustav Magnus's extensive collection of physics laboratory apparatus.

Johann Georg Halske's career bore the special imprint of the cooperative relationship between craftsmanship and science. In an 1890 obituary, the *Vossische Zeitung* newspaper praised his "lively interest in the development of physical and medical science", and

Around 1850 Berlin workshops produce several hundred microscopes each year.

1846 Astronomers at the Berlin Observatory discover the planet Neptune using mathematical calculations.

emphasized Halske's close working relationship with academics like the famed physiologist and anatomist Johannes Müller and some of his students, including Hermann Helmholtz and Emil Du Bois-Reymond.[11] The latter was one of the academics with whom Halske had particularly close ties. In his own eulogy from 1890, the physiologist recalled this about his late friend:

> *"He possessed a rare degree of talent in design, and had a sure instinct, even without academic training, for comprehending scientific tasks and finding the simplest means for accomplishing them."*

"Many of my apparatus", Du Bois-Reymond continued, "that have not been without value to the advancement of science", received "their final design" from Halske.[12] This testimony shows that Halske's achievements as a precision mechanic go far beyond what today would be called a service provider. With this understanding of his own role, Halske became an ideal partner for Du Bois-Reymond, who had been working since the 1840s primarily on the problems of what was then called "animal electricity".

In his research, the physiologist studied the functional relationships among muscles and nerves, movement and electric impulses. The task for which he needed the mechanical experimental equipment was to detect electricity in nerve tissue and to determine its role as a trigger for the contraction of muscles. Accordingly, Boetticher & Halske—whom Du Bois-Reymond had already commissioned to build numerous items of equipment for his laboratory experiments—constructed not just stands, clamping devices, and screw apparatus for setting up experimental arrangements, but also a vast spectrum of measuring instruments, scales, stretching apparatus, electric motors for frogs, and preparations of frog muscle, all intended to trigger and measure

1810 The first professorship for anatomy and physiology is established at the University of Berlin.

1848 Volume I of Du Bois-Reymond's work entitled Untersuchungen über tierische Elektricität (Investigations on Animal Electricity) is published.

Multiplicator, manufactured in Boetticher & Halske's workshop in the late 1840s

electrical stimuli of the experimental animals' muscle and nerve tissue. Odd-sounding apparatus like "twitch telegraphs" and "frog alarms" rendered previously measured electrical impulses in animal muscle both visible and audible.

Instruments of "mechanical beauty"

The equipment, built with extreme precision and attention to detail, was far more than simply scientific instruments for both the precision mechanics and their customers. Halske did not just produce devices for Du Bois-Reymond; instead, he created mechanically perfected laboratory instruments whose design and execution combined beauty with technical utility. And when he publicly presented his experiments, the physiologist also made an effort to lend them an aura of artistry and exaltation—he always considered appropriately beautiful equipment a part of the "aesthetics of experimentation". The scientist found a congenial partner in Johann Georg Halske, whose "basic principle and endeavor", said Du Bois-Reymond, "was always to make every part, down to the last screw, the most perfect possible work of art".[13] Together, they found fulfillment in meticulously tinkering to perfect their mechanical instruments. Here is an experience with Halske about which Du Bois-Reymond wrote:

> *"It was a great pleasure, which I often enjoyed half the night, to watch him, pencil in hand, carrying an experimental arrangement or new device, step by step, toward perfection of the idea."*[14]

In the mid-nineteenth century, precision mechanics like Halske, Boetticher, and Pistor viewed themselves not as craft workers but rather as "mechanical artists"—a fact underscored by the contemporary label of "instrument builder" for their profession.

1841 Emil Du Bois-Reymond performs his first physiological experiments at his parents' house.

The relationship between Halske and Du Bois-Reymond is an exemplary case of how mechanical skill and scholarly science can work harmoniously together. This occurred in part through the reciprocal exchange of advantages between a client and a contractor, but also because both sides could encounter each another on the same social level. Social barriers and hierarchies played no significant role, either in their relations with one another or in the civic life of their associations. There was good reason for Hermann Helmholtz to retroactively categorize mechanical artists among the "German middle class", and to view their "art of practical mechanics" as a "middle-class employment".[15] The respect this wording reveals on the part of university academics was also evident in connection with the origins of the Physical Society of Berlin: When it was founded in 1845, six mechanics—Halske and Boetticher among them—were also received into its membership.

1810 New era of economic freedom in Prussia increases competition among the country's mechanical workshops.

Johann Georg Halske and the Physical Society of Berlin

The Society had its origins in the informal meetings that Berlin physicist Heinrich Gustav Magnus held at a "private laboratory" specially set up in his home. In 1843, he initiated weekly informal gatherings of ten or so younger scientific colleagues for "Physical Colloquia" to discuss topics in their field. Ultimately, some members of this group decided to institutionalize their meetings, and at the same time to open them up to a broader circle of participants.

Starting on January 14, 1845, the official founding date of the Physical Society, the group met at changing locations every two weeks. The meetings were intentionally not strictly academic in tone; they were also meant to be accessible to interested individuals from outside the university's sphere. The association was intended to encourage dialog among as many different scientific and technical disciplines as possible. For that reason, every member was entitled to bring "friends as desired" to the meetings and to induct them into the society.[16] It was no surprise that within a year, the membership had grown to 53, in a range of professions that included scientists, secondary school teachers, a technically trained lieutenant, and mechanics. This environment also offered instrument makers like Halske a chance to present their own work for discussion among an interested audience of specialists. A total of eight lectures from Werner von Siemens' subsequent business partner survive from the period between 1846 and 1865.

1845 The Physical Society of Berlin publishes one of the first academic journals in the field entitled Fortschritte der Physik (Advancements in Physics).

It must be assumed that Halske, now 32, was content with how his professional life had developed thus far. After all, he and his companion Boetticher had been able to establish a successful craft business in the prosperous city of Berlin. Concurrently, he was also able to pursue his passion for precision mechanics and earn the recognition and respect of the members of the Physical Society. Halske remained a member of the association until his death in March 1890, although his personal attendance at the meetings became increasingly rare. Shortly before he died, he provided a financial donation that showed his devotion to the institution that had been the symbol throughout his life of his professional sense of himself as a mechanical artist.

But first and foremost, the Physical Society proved to be the starting point for an unexpected change in Johann Georg Halske's career. The triggering event was the meeting with a young artillery lieutenant who was likewise one of the Physical Society's first members.

1890 Johann Georg Halske donates 10,000 thalers to the Physical Society of Berlin.

1899 The Physical Society of Berlin has 300 members.

A fateful meeting

Johann Georg Halske and Werner von Siemens encountered one another for the first time on New Year's Eve 1846, when they met through the good graces of Emil Du Bois-Reymond who was friends with both men. The physiologist knew about both Halske's mechanical skill and Siemens' decision to devote his future entirely to telegraph technology. But the lieutenant in the Prussian artillery had still not found a suitable partner—a mechanical craftsman who could build his improved pointer telegraph to his exact specifications.

After being accepted at Berlin's Artillery and Engineering School in 1835, the young Siemens studied military subjects as well as mathematics, physics, and chemistry. So he had a solid background not just in military practice but also in scientific theory, which he drew upon to improve his meager income as a young officer with inventions that he marketed. The early death of his parents in 1839 and 1840 exacerbated his already difficult financial situation, because as the eldest son he was now responsible for his siblings. He had engaged from time to time in a rather sporadic "hunt" for inventions with his brother Wilhelm, a few years younger (later, in England, Wilhelm would become Sir William; we will call him William here). But despite some minor successes, their efforts amounted to very little. For that reason, beginning in the early 1840s Siemens concentrated increasingly on experimenting with electricity. Ultimately, he turned to improving the electric pointer telegraph, an 1839 invention by the

1840s Transition from optical to electrical telegraphy.

1816 Establishment of the School of Artillery and Engineering, a predecessor to the Technische Universität Berlin.

Englishmen William Cooke and Charles Wheatstone. His words sound almost defiant: "We must try to find a firm foothold somewhere at last. Yesterday Meyer [an officer colleague of Werner's] gave me a cup with the inscription, 'You're almost thirty years old!' That is the truth. It makes me apprehensive and spurs me on. If only damned money didn't keep us stuck fast in the mud!"[17]

At first, his work improving the pointer telegraph went well. During this period Siemens was working with mechanic and clockmaker Ferdinand Leonhardt. But as time went on, personal tensions arose between them, to the point that Werner ultimately ended the collaboration.[18] The consequence: Though his apparatus was conceptually now almost complete, Siemens lacked a capable precision mechanic who would be able to build something from his ideas. Du Bois-Reymond must have known something of this situation, and so brought his friend Halske to the December 31, 1846 gathering: "I had the pleasure of calling my friend Siemens' attention to my friend Halske, as someone who might well be suitable for his purposes [...]."[19]

No record survives of what Johann Georg Halske and Werner von Siemens talked about—but it is clear that the latter's downcast spirits improved almost instantly. Just four days after the meeting, he was writing to William: "Yesterday I got the telegraph sorted out at last with the mechanics Boetticher and Halske, two active, knowledgeable young people. I am going to commission them to build the instruments."[20]

The day before, he had visited Halske's workshop and set the potential collaboration in motion, overcoming the precision mechanic's initial doubts about whether the Siemens pointer telegraph could work at all. With the aim of dispersing those doubts, Siemens had tinkered together "cigar boxes, tin plate, a few bits of iron and some insulated copper wire into a pair of autonomously

1845 Charles Wheatstone and William Cooke receive a British patent for their pointer telegraph devices.

operating telegraphs [...] that worked and stood together with complete reliability. This unexpected result made Halske so enthusiastic about the system, which could work even with such inadequate resources, that he dedicated himself with the greatest zeal to making the first apparatus [...]".[21] The enthusiasm finally advanced so far that a few months later, Halske ended his business relationship with Boetticher and formed an alliance with the young artillery lieutenant and inventor.

Deciding to launch the telegraphy adventure

Reflecting on this decision, one cannot help wondering why Halske would abandon an established workshop and throw himself headlong into the telegraphy adventure. To find an answer, it helps to briefly review the economic conditions in the mid-nineteenth century that favored the development of the telegraph system in German territory. First, we should mention railroad construction. This leading sector in the era's dynamic industrialization process was enjoying a rapid upswing. Construction on the first German rail line—over the less than 10 kilometers between the two adjacent cities of Nuremberg and Fürth—was a rather sluggish affair during the 1830s, but by about 1850 the rail network already measured nearly 6,000 kilometers. The innovations in the transportation system almost inevitably demanded an improvement in communications. Innovations in communications technology like electric telegraphy quickly gained in importance for both civilian and military uses, and thus attracted particular attention from the government." Construction on the first telegraph lines in Prussia began in 1847. As an officer and an expert in the field, Werner von Siemens had the right connections with the Prussian military administration and with the state Telegraph Commission, which

1847 Friedrich Boetticher becomes the sole owner of the workshop.

1842 In Germany, the rail construction industry employs around 45,000 workers.

worked closely with the military. These contacts brought the promise of good business—especially because with the Prussian state as a customer, there would be little entrepreneurial risk.

On top of that, at the time Prussia had no other telegraph construction to provide competition. Becoming an independent operator in this field at the end of the 1840s meant assuming a pioneering role in a market that promised strong demand. No doubt, considerations like these were not far from Johann Georg Halske's mind in the aftermath of his conversations and initial experiences working with Siemens. After all, the precision mechanic's trade within which the Boetticher and Halske workshop operated depended on niche markets. That fact may even have been part of the reason why Halske first worked with Boetticher to build Siemens' pointer telegraph. It ensured an additional lucrative source of support for their joint craft operation. Not much later, it may well have been Siemens' rapid successes in the first half of 1847 that encouraged Halske to take the next step and establish an entirely new business. Lieutenant Siemens' first move was to attract the Prussian Telegraph Commission's interest in his apparatus, which enabled him to recruit some powerful advocates. Not only that, but jointly with his brother William, the tireless inventor had developed a method for insulating the copper cables—essential if telegraph lines were to be laid underground.[22]

Halske's decision to get involved with Siemens' plan to found a telegraph construction company becomes even more understandable when we take his private life into consideration. On December 21, 1845, the mechanic had married Henriette Friederike Christiane Schmidt, 26, and she moved in with him at Schumannstrasse 15 shortly afterward. Even as Siemens was making his business pitch to Halske, Halske's wife was expecting the young couple's first child. And in May of that year, Halske's mother had

1847 The first electrical telegraph lines to cover a considerable distance in Prussia are put into operation between Bremen and Bremerhaven.

Halske and Henriette, 1846

come from Stettin to Berlin to live in their apartment, presumably to lend them her support and assistance.[23] Halske's growing family responsibilities strengthened his decision to strike out on his own. He was offered the chance—which might never happen again—to achieve an immense success in telegraph construction with Werner von Siemens.

1851 In Berlin, Siemens & Halske engineers the first telegraphic fire alarm system to operate via underground cables.

All business considerations aside, Halske's decision was probably also prompted by his love of mechanical tinkering and his ambition to advance technical developments. After all, as a precision mechanic he could see that telegraphy was a field with yet-unimagined technical potential.

At first his earlier customers, especially Emil Du Bois-Reymond, were disappointed at the decision to embark on the telegraphy adventure. In 1849, the physiologist wrote to Hermann Helmholtz: "Halske is caught up with all the German railroads, and the physics instruments must give way to telegraphs for the moment."[24] Du Bois-Reymond must have been all the more disappointed because he himself had been the one who had brokered the meeting between Siemens and Halske just a few years earlier.

Following 1849, Siemens & Halske also produces gutta percha presses, railway signal systems, water meters and electro-medical equipment.

Founding the company and the first years

The collaboration between Werner von Siemens and Johann Georg Halske—initially on an informal basis—prospered vigorously in the first half of 1847. Halske repeatedly proved his skill and character. Hungry for action, Siemens reported to his brother William that summer:

> *"Electromagnetism is territory still entirely unexplored by science and especially technology, and is capable of uncommon expansion. Working with Halske, who is knowledgeable and thoroughly practical, I feel quite called upon to help it earn the reputation it deserves."*[25]

Matters moved very fast over the next few weeks. The officer obtained the capital to found Telegraphen-Bauanstalt von Siemens & Halske from his cousin, the eminent attorney Johann Georg Siemens. He invested some of the nearly 7,000 thalers in renting suitable quarters and amassing appropriate workshop equipment. Halske's contribution to the company was his "design talent". Werner von Siemens contributed what today we would call his "network" as well as his technical innovations. They distributed the work according to the two partners' different strengths. As Siemens put it: "Halske, who is entirely my equal in the factory, will get the management of the factory, while I will take laying out the lines, signing contracts, etc."[26]

On October 1, 1847, Halske signed a partnership agreement with Werner von Siemens and his cousin Johann Georg in which

1855 Johann Georg Siemens receives a pay-out in the amount of 60,000 thalers; Werner's brother Carl joins the company as a partner.

the two active owners would each receive two-fifths of the company's income, while the cousin as a silent partner would receive one-fifth. Twelve days later the workshop opened and the work began. The business occupied 150 square meters in the rear part of a building at Schöneberger Strasse 19, not far from the Anhalt railroad station. The two company founders also moved in: "I live on the ground floor, the workshop is up one flight, and Halske up two, all for 300 thalers", as Siemens wrote his brother in London.[27]

Siemens' good contacts with the Prussian military paid off. He was by now a member of the state Telegraph Commission himself, and applied in March 1848 for a major public contract that the commission had opened for bidding. The young entrepreneur explained the reasons for such a procedure: "[The bidding competition] is really being held for my sake, because I would now look like both the applicant and the judge if the commission accepted my apparatus outright. I don't doubt that I will win and thus get the entire telegraphic affair in Prussia into my hands."[28] He was right—not least of all because Siemens was able to impress the commission with a flawlessly built telegraphic apparatus, an achievement of Halske's.

In August 1848, the Telegraphen-Bauanstalt won the contract to install a telegraph line between Berlin and Frankfurt am Main, which at 500 kilometers was Europe's longest stretch of railroad at that time. The rapid completion of the project in March of the next year, with the resulting ability to transmit messages between the two cities in just one hour, aroused immense attention both in Germany and elsewhere. This achievement brought a huge gain in prestige for Siemens & Halske.

The young company's close ties with the Prussian military and government authorities helped it win more major contracts, for

1841 Anhalt railroad station becomes Berlin's first station to be served by long-distance trains.

1848 Members of the first German parliament assemble in Frankfurt am Main.

which Halske oversaw production as workshop manager. These would ensure that the company survived its early years. But when disagreements with the Prussian Telegraph Commission arose in the summer of 1849, the arrangement displayed its other face. Inadequately insulated underground lines caused disruptions in communications between Berlin and other cities. Problems had also begun to crop up on the first project, the Berlin to Frankfurt route: The lines had been laid under heavy time pressure, and the techniques used for the purpose were still in a primitive stage. Regular disruptions and outages were the result. The consequences were inevitable: In 1851, the Prussian state canceled all follow-up orders it had placed with Siemens & Halske and terminated the business relationship. A contract the company had previously

Pointer telegraph, 1847

1849 First telegraph connection agreement between Berlin and Vienna.

1852 2,400 kilometers of telegraph cable have been laid in Prussia.

won for the Berlin-to-Hamburg rail route was unable to make up for the loss. The Telegraphen-Bauanstalt fell into its first crisis. Werner von Siemens had left the military back in the fall of 1849 and was now concentrated entirely on the company. He saw only one solution to keep the young firm running—business abroad. But this expedient would eventually be a source of discord between the company's founders.

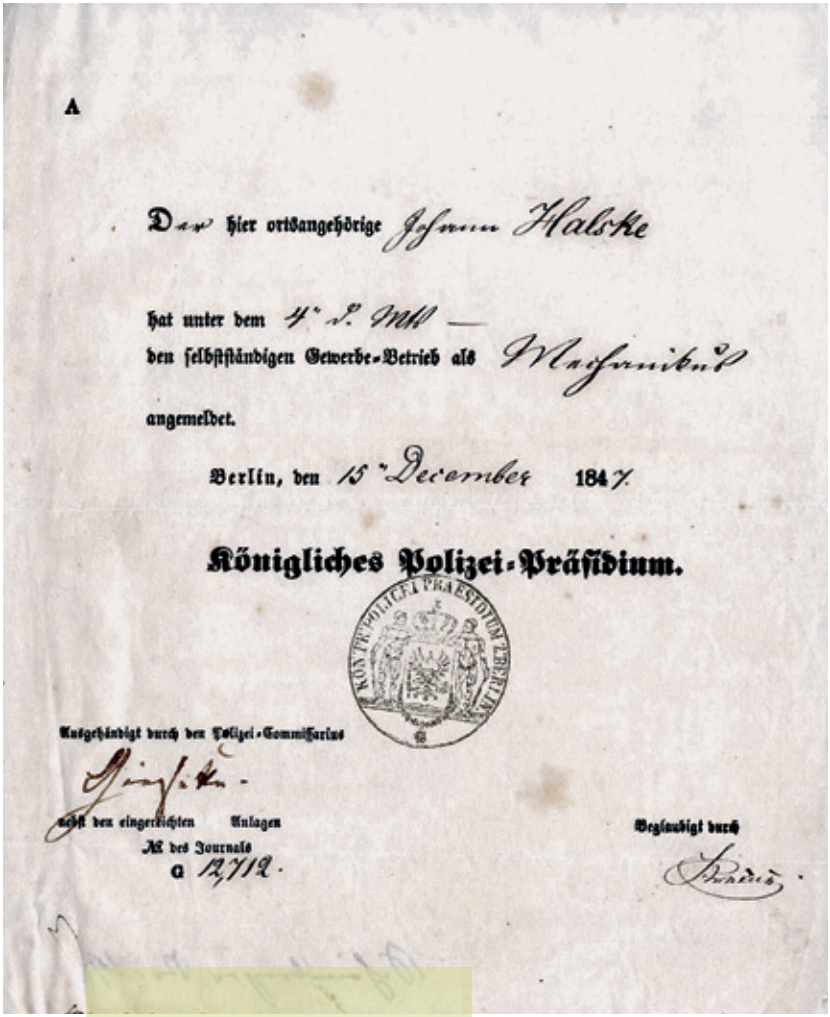
1846 The first train trip on the 270-kilometer stretch between Berlin and Hamburg takes nine hours (by comparison, modern trains take around 1 hour and 45 minutes to travel the same route).

The Berlin workshop

During the early phase of the Telegraphen-Bauanstalt, Werner von Siemens worked as the "market maker"—the one who brought in orders and made skillful use of his contacts. Johann Georg Halske, by contrast, remained more in the background. But if one feels tempted to describe his work reductively, as merely building the telegraph apparatus, that would hardly be the full truth. From the very start, the mechanic played a key role in the company that went far beyond the job of a mere instrument maker. Without Halske, Werner von Siemens would not have been able to make the most of the moment to found a telegraph workshop; as a member of the Prussian officer corps, and especially of the Telegraph Commission, he was forbidden from heading a company that operated in precisely this field. And because of their family connection, his brothers were likewise out of the question as founders.

Consequently, both a decree of the Royal Business Tax Office of October 20, 1847, and the official business registration of December 15, 1847, show Halske as the sole founder of the workshop. There is not a word about Siemens.[29] Only after he had ended his career as an officer and the business relationship had been terminated by the Prussian Telegraph Commission did he officially begin talking of "our" company—Telegraphen-Bauanstalt von Siemens & Halske—and now appeared as a joint owner.[30] This arrangement showed how completely the two partners trusted one another; after all, Halske was assuming the business risk all by himself. If this legal ploy had been discovered, it could

1840s The Prussian government supports the expansion of the telegraph network for military reasons.



A

Der hier ortsangehörige Johann Halske

hat unter dem 4ten d. Mts. —
den selbstständigen Gewerbe-Betrieb als Mechaniker

angemeldet.

Berlin, den 15ten December 1847.

Königliches Polizei-Präsidium.

KÖN. PR. POLICEI PRAESIDIUM ZU BERLIN

Ausgehändigt durch den Polizei-Commissarius

nebst den eingereichten Anlagen
Nr des Journals
a 12,712.

Beglaubigt durch

Business registration, December 15, 1847

have got the mechanic into trouble with the authorities. Between themselves, the partnership agreement provided that the two would be responsible "jointly" for the "management of business". Nonetheless, the division of work was clear: Siemens dealt with business affairs outside the workshop, while Halske headed the shop and organized its work.[31] As a result, he was in charge of business procedures and of seeing that the production process ran smoothly.

By the end of 1848, the company had ten employees. Most were metal workers and mechanics who had to be given additional training to build telegraphs. By the next year, the company's abundant order backlog had made it necessary to double the staff. But this proved to be a significant problem. First of all, the supply of adequately qualified workers was limited. Second, Halske was scrupulously concerned to hire "only the best workers".[32] And they had to work hard. As a rule, they spent about 60 hours a week at the lathe or other machine tools, sweating in the crowded, low-ceilinged, poorly ventilated factory rooms—which, still worse, were overheated by furnaces and steam pipes. The company's meteoric growth had led it to lease an adjacent space as early as 1848. Four years later, to add even more capacity, it relocated to Markgrafenstrasse 94.[33]

1848 For the most part, Siemens & Halske products are still made by hand.

Halske's "mechanical tact"

Despite this expansion, in the early 1850s the Telegraphen-Bauanstalt was still very much a mechanical workshop—even if it was now divided up among multiple work rooms. The shop was making telegraph apparatus, relays, galvanoscopes, and other electrical equipment at top speed. Under Halske's critical gaze, a master craftsman oversaw each of the individual work sections. Halske himself remained a kind of "first among equals" within the team, adding his own contributions to the work, organizing and leading it by cooperating directly on the projects. The resulting atmosphere in the workshop was largely that of a traditional craft operation, free from rigid worker-owner hierarchies.[34]

The quality-conscious mechanical designer kept a very close eye on the work, judged every piece astutely, and carefully weighed the appropriateness of each step in the construction of the telegraphs and other apparatus, which were now being produced in large quantities. He tested and tinkered with prototypes until their execution completely met his high expectations. Each additional specimen was always built with the same care. His approach was, in fact, a continuation of his customary work method, albeit on a larger scale.

Werner von Siemens was well aware of the value of this attitude. He especially praised the "mechanical tact" with which Halske created "construction plans and drawings". His "graphic art" made an important contribution to the "solid and exact execution" of the designs, which often "only attained their full value through his designing talent".[35] Siemens was aware that his partner was making a crucial contribution to the company's success: The original capital that Siemens' cousin had contributed to the company had quadrupled in just three years. But for

1863 Siemens & Halske invests in its first steam engine; gradual transition to series production.

A view of the workshop, 1857

all the esteem he felt for his companion, Siemens was becoming more and more aware that Halske's "delight in the flawless products of his talented hand" threatened to become a business liability.

1866 The workshop director of Siemens & Halske earns 700 thalers per year, the workers earn around 300 thalers per year.

From workshop to factory—expansion and internal crisis

The way Werner von Siemens characterized Johann Georg Halske is reminiscent of Emil Du Bois-Reymond and his working relationship with the craftsman. Over time, what had formerly been a matter of mutual advantage came to be a problem for the telegraph construction company. Halske's perfectionism came into conflict with Siemens' sense for business. Two developments in particular exacerbated the tension: the expansion abroad that Werner and his brothers William and Carl had vigorously advanced, and the associated evolution of the crafts shop in the direction of a factory.

The cancellation of the Prussian government contracts in 1851 posed a serious challenge for Siemens & Halske. The only real option was to bring in orders from other countries. The London Great Exhibition of that year offered an ideal opportunity for the Telegraphen-Bauanstalt to make its debut on the international scene. Werner von Siemens and his three brothers William, Friedrich, and Carl made the journey to England to pursue contacts with potential clients, but as hard as they worked, they met with no success. One consolation was that the telegraph apparatus built by Halske won a prize awarded by one of the event's organizers. Though Halske railed that the "Council Medal" was such poor stuff "that one must feel ashamed to show it to anyone", nevertheless the award helped make the company better known outside the boundaries of its home market.[36] Meanwhile, the business connections that Werner had been nurturing in Russia

1850 Siemens & Halske, under the direction of William Siemens, opens a sales agency in London.

1851 The Great Exhibition is held in London's Hyde Park.

as early as 1849 now began to pay off. In 1853 the company signed an agreement with the Russian government that would help Siemens & Halske grow to unprecedented dimensions. By 1855, the Russian contracts would cause business volume to quintuple, and operations in Russia would remain a cornerstone of the company's business for years.

Quite aside from its necessity, however, this initial foreign expansion was entirely to Werner von Siemens' liking. In his autobiography, he confessed that he had "dreamed since my youth of founding a world enterprise like that of the Fuggers". He was motivated by the personal goal of establishing lasting "power and respect" for himself and his family, in conjunction with material prosperity.[37] So with commensurate zeal and a certain degree of recklessness, Siemens pressed ahead to make the company grow—true to his motto in this era that "Time is money".[38] Halske took a less than enthusiastic view of this development. Although he ultimately lent his active support to the Russian operations and conducted negotiations himself, at first he was against the idea "hand and foot".[39] It had essentially been the immediate crisis in the business that had persuaded him, at first. But he remained skeptical of the Siemens brothers' persistent expansive ambitions.

The divergence in views between the company's two founders also began making itself felt in Halske's most personal preserve, the workshop—as the "Water Meter Affair" made evident. Early in the 1850s, William Siemens, in London, attempted to make up for the losses in the telegraph business by selling water meters. But the prototype he had designed, which Halske was supposed to produce in the Berlin workshop, did not work accurately, so the mechanic had to make improvements. And though he was able to optimize the device (with Werner's assistance), the artist in him

1853 Siemens & Halske opens a construction office in St. Petersburg.

1855 The construction office becomes an independent subsidiary.

also began to assert itself. With the goal of building not just a useful device but one that was also visually pleasing, Halske experimented with exotic materials like walrus ivory and hippopotamus tusks. William showed his annoyance; what he wanted was to bring in an order for the company, and quickly. Werner tried to mediate between his impatient brother and his perfectionist partner:

"For everything, Halske must have the time he needs. His feelings run entirely counter to hurried work — which, as he puts it, must necessarily be perfunctory."[40]

But William had had enough: "We have spent a great deal of fine work on this; but there has been no allowance for utility, time, and my requirements." He ended his letter with the curt remark that he would "now order the water meters in England".[41] In the meantime, Halske's water meter had arrived in London, where it was admired for its outstanding workmanship — yet the mechanism proved too delicate for everyday use. The affronted Halske wrote to Werner von Siemens: "Since your brother W. makes it quite clear that my work renders the Water Meter Affair an impossibility", someone else was welcome to deal with the problem.[42]

The affair clearly highlights the fundamental difference of opinion between Halske and the brothers Siemens: Halske's natural talent, his sensibility as an artist in the field of mechanics, stood in the way of the victory march of the factory system as a new form of commercial mass production, which was spreading increasingly to the former 10-employee workshop. But he was unable to escape the change — by the end of the 1850s, the Telegraphen-Bauanstalt came more and more to look like a factory. The Berlin firm now had about 150 workers; individual work rooms had specialized in specific parts of the increasingly mechanized production

Starting in 1850 Due to the expansion of water supply infrastructure in European cities, a means of more accurately measuring water use is needed.

line. When business took another downturn around 1860, Werner von Siemens considered optimizing work processes—in the face of increasing competition, among other factors—with the consequence that his focus turned sharply toward rationalizing production.

As early as 1858, a system of paying by the piece was introduced—a development that Halske had long resisted. Werner von Siemens considered production too slow, and it was a thorn in his side. His theory was that his mechanics' earlier precision work had made them unable to work at an "energetic, single-sided activity", and he inveighed against latent "artistic fecklessness". By 1858 he had reached a verdict: "The workshop has delivered only very low earnings. The prices are too low for artistic work, and my lords the artists loaf too much."[43]

His words clearly show how far apart the two founders had grown in their visions of the nature and goals of the Telegraphen-Bauanstalt. The little workshop that they had set up for Halske within the establishment came more and more to resemble an island surrounded by an alien, rationalized, accelerated, and mechanized work world. In a letter to her father, Werner's wife Mathilde summed up the situation as early as the end of 1857: "[Halske] no longer has affairs in his hands, and no longer feels needed enough. He would like to be able to run and supervise everything himself, like a master craftsman in the workshop, but since matters will now not work in this comfortable way, he would rather have nothing to do with them at all."[44] In fact, things would not go quite that far yet. Halske ultimately understood that the shop's work procedures had to evolve with the times. Still, the next round of difficulties was not slow to arrive—and differences of opinion between Johann Georg Halske and William Siemens were again the focus.

1840s In Germany, piece price systems are introduced to motivate employees to strive for order, discipline and effectiveness.

Johann Georg Halske, after a painting by F. Keil, 1865

Starting in 1850 Photography is beginning to emerge, yet intricately painted portraits are still in demand.

William had been managing the London branch of Siemens & Halske since as long ago as 1850. But business was variable. At the end of the 1850s, Werner's brother saw an opportunity for a significant turnaround—he planned to get into the submarine cable business. Laying cable underwater was extremely demanding technically and expensive, and thus an immensely risky undertaking from a business viewpoint—albeit also a lucrative one. William wanted to pursue the venture. He even linked the decision to the continued survival of the company's business in England. Werner, aware of the financial risk to the company as a whole, hesitated. Halske, for his part, was absolutely opposed to the expansion project. This type of business was far too daring for him, and diverged too far from the Telegraphen-Bauanstalt's core business, which still retained much of its craft nature. Ultimately, after extended discussions, Werner von Siemens sided with his brother and advocated getting into the new line of business.

Halske had no choice but to go along with the decision, but the wedge had struck deep. In 1861 William wrote to Werner: "I would like it best if instead of Halske, an effective source of power could come into the business. [...] Since Halske has no confidence in marine lines, he will be very glad to be rid of them."[45] William's assessment of the situation was right: Halske did indeed argue vigorously that the Berlin part of the company should pull out of the London business. But this position fell on deaf ears with his partner—Werner von Siemens intended to support his brother. When Halske's prophecies of doom were finally borne out early in 1864—a project to lay cable in the Mediterranean ended in disaster for equipment, finances, and public reputation—the mechanic decided to withdraw from the management of the English subsidiary that same year. He had let Werner know

1851 The first permanent undersea telegraph cable begins operation between Dover and Calais.

as early as 1863 that he would not renew the partnership agreement between them that would expire at the end of 1867. Once the Siemens brothers decided to take on the submarine cable contract, Halske planned to pull out of the company entirely.

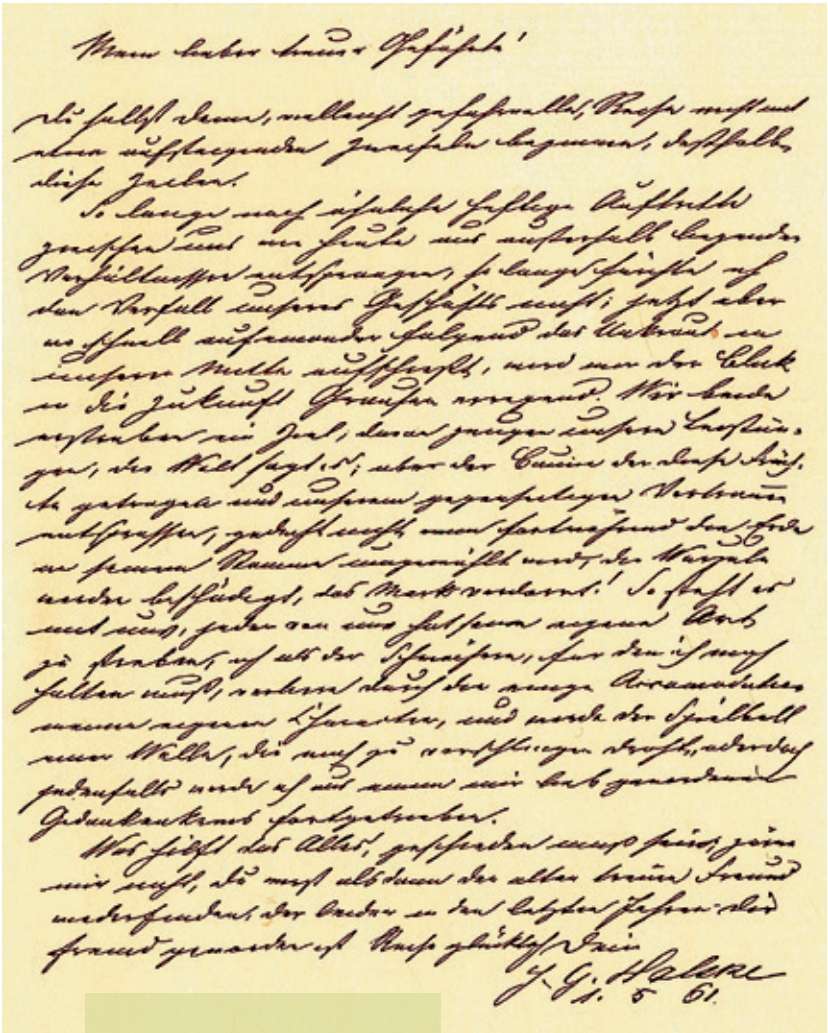
1863 The English subsidiary Siemens, Halske & Co. opens its own cable factory in Woolwich, London.

Halske leaves the Telegraphen-Bauanstalt

Johann Georg Halske's decision that at the end of 1867 he would leave the company he had helped found was anything but a spur-of-the-moment development. As early as 1861, at the time of the arguments about getting into the submarine cable business, he wrote in a letter to his long-time partner and friend: "We both aspire to a single goal, as our achievements show and the world says; but the tree that has borne this fruit and that grew out of our trust for one another will not flourish if the ground under its trunk is constantly dug up." Halske was worried that "endless accommodation" would cost him his own character, and he felt like a "ball being played with by the waves, which threaten to swallow it up".[46] He was confessing to Werner that he could find little to relate to in Siemens' entrepreneurial verve. And Siemens, for his part, was coming to the clear realization that his mechanic friend was less concerned with the financial risk of their joint projects than with his own identity as a craftsman and artist.[47]

Halske's growing dissatisfaction also began to tell on him physically. Never endowed with the strongest constitution—he had suffered a number of absences even in his school days—he was frequently ill.[48] There were particularly conspicuous bouts of health complaints that often corresponded with difficult phases in the business. The result was that trips to "take the cure" at mineral spas became almost habitual.[49] The fact that he was more and more often unable to work was a burden not only on his own mood but on the company's ongoing development. Although

1865 Siemens & Halske has 135 employees in Germany and 517 employees abroad.



Letter from Johann Georg Halske
to Werner von Siemens, May 1, 1861

those around him sometimes interpreted it unflatteringly as hypochondria, in reality his physical state was presumably the expression of a deep-seated unease. After all, Halske was less and less able to practice his beloved craft. "He used to take such delight in life, and now is completely changed", Mathilde von Siemens wrote worriedly to her husband.[50] And indeed, the cheerful, well-lubricated evenings drinking apple wine at the pub—which Halske enjoyed and which had occasionally kept him celebrating the night away—became ever rarer.[51] Retirement from managing the business seemed to offer the only promise of improvement for this professional and personal crisis. It was the act of a man who had lost all joy and substance in life.

The departure of his business partner, already announced at the beginning of the 1860s, weighed heavily on Werner von Siemens. After all, he was only too aware of what he had in Halske. But Werner could not be other than who he was, any more than his partner could. From his viewpoint, Halske was going straight into retirement—something the entrepreneur found inconceivable. "I cannot and will not retire yet, I hate a lazy pensioner's life, I want to work and be useful as long as I can."[52] Siemens' goal still remained, as it always would, to carry his company onward to more and greater successes.

During this period of the differences of opinion between his partner and his family, Werner had often expressed himself soothingly and sympathetically. But in the end, his family ties were stronger than his friendship with Halske.

Johann Georg Halske and Werner von Siemens parted in complete amity. Their friendship had been too long and close for anything else. They understood one another, even if their ideas about how the company they had built together had now almost completely diverged. Both knew how much they owed each other. And

1867–1870 Siemens & Halske achieves world-wide recognition due to its construction of the Indo-European Telegraph Line from London to Calcutta.

so, when Halske finally left at the beginning of 1868, the split was friendly. When the partnership agreement expired, Halske would have been entitled to withdraw his entire financial stake in the company. But to avoid any threat to the survival of Siemens & Halske, he left most of his business assets in the firm as a loan, in return for a share of ten percent of the profits.

The mechanic had embarked on a business adventure with Werner von Siemens in 1847 that had proved a great success. The former joint owner of a small precision-equipment workshop was now a wealthy man, a master in his profession, and a pioneer in telegraphy known far beyond the city limits of Berlin. But Halske had paid a heavy price for his professional recognition and material security. As the Siemens brothers pushed the business vigorously ahead, the master mechanic had increasingly lost his sense of professional identity. Telegraphen-Bauanstalt von Siemens & Halske had less and less room for a mechanical artist like him, and in the end, no room at all. He withdrew from business life just in time—and with a troubled conscience about his former partner, as his conciliatory words to Werner Siemens show: "It's no use, we must go our separate ways; don't be angry with me—you will then find the faithful old friend again who has sadly become a stranger to you in the past few years."[53]

Starting in 1850 Increased use of machines in factories greatly improves productivity.

Johann Georg Halske, a man of independent means

Although Johann Georg Halske left the Telegraphen-Bauanstalt at the age of barely 54, and would live from now on as a man of independent means, he still took a lively interest in the firm's development. After all, he had invested his heart and soul in the company for 20 years.[54] He also remained in contact with Werner von Siemens. The long-standing friendship between the two was far too strong, and the private ties between their families too close, for anything else. Halske continued to have the right to examine the accounts until 1881, when the Siemens brothers paid him back his share of the firm in full. A workroom also remained available to him at the company's building for many years. He very likely also assisted Werner von Siemens in clarifying this or that technical issue. He remained involved as well in his former comrades' and colleagues' lives. For example, he helped finance the wedding of a long-standing employee's daughter, and joined Werner and his brothers in paying for a valuable job anniversary present for a deserving colleague.[55] He was especially concerned with the well-being of the craftsmen and laborers: In 1872, he showed no hesitation in helping set up a pension fund at Siemens & Halske that benefited a large number of the employees who had no direct share in the profits—10,000 of the total of 60,000 thalers of the fund's founding capital came from Johann Georg Halske.

Yet though Halske continued to show a strong interest in how his former employees were doing, he still had a great deal of time and attention available for other areas of life. Following decades

1872 Establishment of a Pension, Widows' and Orphans' Fund to mark the 25th anniversary of Siemens & Halske.

of the conscientious, scrupulous workshop head's deep involvement in running the Berlin business, his family in particular was now able to benefit from his return to private life. During his last few years on the job, which had been dominated by poor health and frequent mood swings, Halske had neglected his duties as the head of the family. Now he turned his attention to the education and advancement of his four children. Though Halske and his wife had two daughters and two sons, with ages between 10 and 21, we know more only about their eldest son, Albrecht. In 1881, then age 29, he joined Siemens & Halske, where he served as a commercial director until his death in 1894.[56]

Starting in 1868 Following Halske's resignation, Werner von Siemens initially assumes direct control of the factory in Berlin.

Social commitment

Johann Georg Halske did not totally withdraw into private life: His social awareness was too strong for that. He made use of his wealth to help former companions and to become involved in social aid. He all but forced a loan of 40,000 thalers, with an unlimited term, on his financially distressed former partner Boetticher, even though Boetticher was unwilling to accept at first. In 1872, Halske was awarded a medal in recognition of his support in caring for the wounded during the Franco-Prussian War.[57] To commemorate his wife Henriette's equally strong dedication to good causes, after her death in December 1884 he donated 30,000 marks to the City of Berlin. These funds provided the base capital for the charitable Henriette Halske Foundation, which benefited occupants in need of care at a home for the aged.[58]

Patron of arts and crafts in Berlin

Johann Georg Halske took a special interest in supporting the applied arts in Berlin. In 1867, what today is the Museum of Decorative Arts was founded, initially as the private "German Crafts Museum of Berlin". It is the oldest institution of its kind in German territory, and it's goal was "to make the resources of art and science accessible to those working in the crafts".[59] Both artistic and technical artifacts and models were to be produced and exhibited here with the aim of promoting the applied arts. In place of expensive tools and machines, the collections focused on exemplary

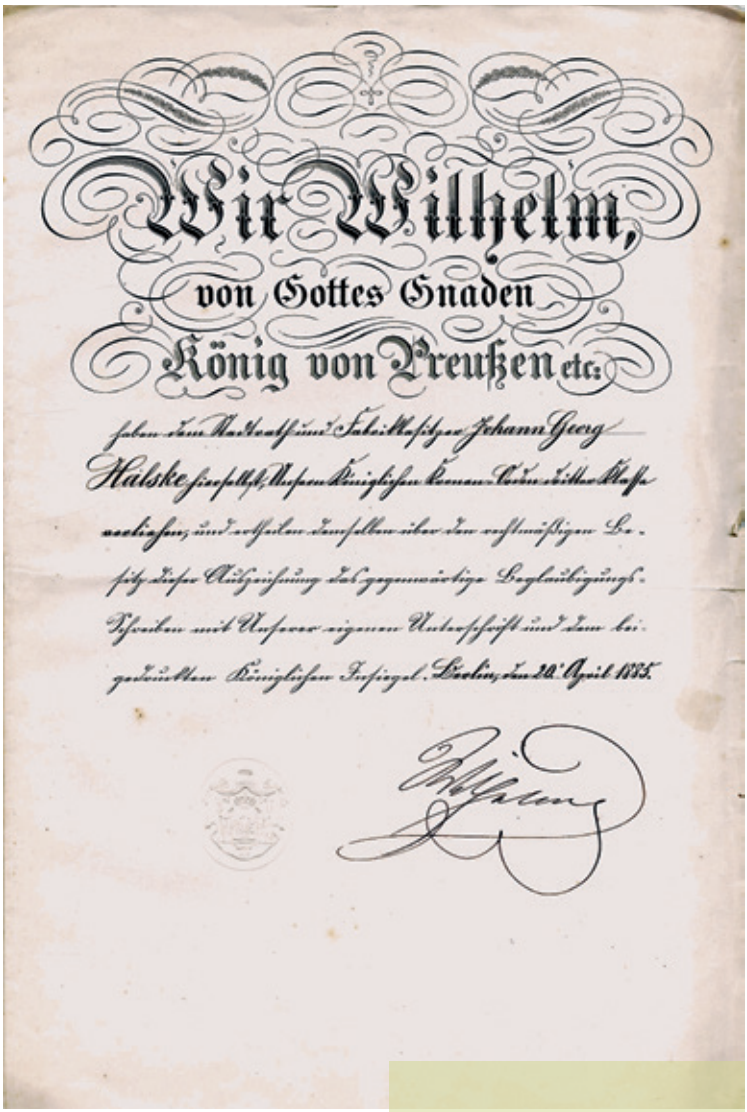
1852 Founding of the South Kensington Museum in London (known today as the Victoria and Albert Museum), on which the Museum of Decorative Arts in Berlin would later be modelled.

results of craftsmen's inventiveness and skill. The museum presented the applied arts as a kind of refuge for craft work that was increasingly threatened with obsolescence by industrialization and mechanized labor. Crafts workers were the diametric opposite of machines cranking out piecework; rather, they were virtuoso artists producing precision results, a fact that the museum's founders intended to highlight. They were concerned not only with raising pubic appreciation for crafts-people through exhibitions, but also with educating and forming the taste of both crafts workers and society at large. For that reason, the museum also included a library and a teaching facility.

The Museum of Decorative Arts was founded and established by private initiative. It was not until 1885 that the museum was incorporated into the system of Royal Museums of Berlin. Johann Georg Halske was among the institution's patrons from the very beginning. Above and beyond his annual donations, he was also involved in the museum's board of directors—as a regular member from 1867 to 1880, and as Vice Chairman from 1881 until his death. During that time, Halske donated several thousand thalers as well as various equipment and apparatus for the collection. He also collaborated in the design of the building. As a former mechanic, he saw his involvement as an ideal opportunity to express his knowledge and identify as a "mechanical artist". And in this way he actively helped encourage younger crafts workers especially.

Although the personally modest Halske never strove for public recognition, his involvement in the Berlin Museum of Decorative Arts nevertheless earned official acknowledgement: in 1885, Emperor Wilhelm I awarded him the Order of the Crown, Third Class.[60]

1830 The history of Berlin's Museum Island begins with the opening of the Royal Museum (now known as the Old Museum).



Wir Wilhelm,
von Gottes Gnaden
König von Preußen etc.

Certificate for the award of the royal Order of the Crown, Third Class, 1885

Involvement as a local politician

Halske also made an important contribution to public life in Berlin for decades as a City Deputy and as a City Councilor serving without pay. He was following the example of his father, Johann Hinrich, who had been active as a local politician in Hamburg. As early as 1859, at the age of 45, the son Johann Georg was elected to Berlin's City Parliament, where he remained a deputy until 1875.[61] His many years of membership make clear the high priority Halske set on public service. Despite extensive professional commitments, he did not shy away from playing an active role in his city's political life.

That involvement repeatedly carried the master mechanic into the deeper waters of Prussian politics—as in 1864, during his reelection as a City Deputy. These were troubled times: Prussian Prime Minister Otto von Bismarck was wrangling with the country's liberal political forces about the interpretation of the constitution. His most important opponent was the German Progressive Party, founded only a few years before, of which Halske was a member. As a result, the Prussian Ministry of the Interior's confirmation of his election became a matter of controversy. Police investigations and an official hearing showed that he had not participated in "demonstrations and agitations in a manner inimical to the government". On the contrary—according to his police record, Johann Georg Halske was categorized as a "blameless and respected man".[62] That cleared the way for another term of office.

But his party membership brought him back into the authorities' crosshairs five years later. This time, Halske had been elected an unpaid Municipal Councilor. Taking office would have made him a direct member of the Berlin magistracy. Because Halske

1809 An elected city council assembles for the first time in Berlin's history.

1862 Otto von Bismarck becomes Prime Minister of Prussia.

had publicly stumped for the Progressive Party's candidate in his district, he was not permitted to take office. The official version was that he had "declined the election" (implying he had done so voluntarily).[63] Not until 1880, when he had been out of politics for five years and the political climate had eased, did his reelection as a Municipal Councilor meet with official approval. Halske accepted the election and remained in office until 1886.

Halske was definitely an active member of the City Parliament. He sat on numerous specialized committees, like the one to reorganize the city's planning system and the funding approval deputation. In one of the most urgent and highly controversial issues in Berlin's politics of the 1860s and 1870s—the expansion of the municipal water and sewage system—he also served as a committee member, representing the interests of property owners against the city government.[64] But consistent with his nature, Johann Georg Halske remained in the background even as a local politician. He was not a "loudspeaker" who engaged in heated debate. He was never concerned with attracting public attention or applause; what counted for him was the cause involved, toward which he worked systematically and without fanfare.

1840s In Germany, Hamburg is the pioneer in the area of drinking water supply; in Berlin the first waterworks will not begin operation until 1856.

Johann Georg Halske, 1880

1880 As an unpaid city councilman, Johann Georg Halske becomes a member of Berlin's urban administration.

Last years

The last years of Halske's life were quiet. He gradually withdrew from all his volunteer activities, or at least reduced them to a minimum. His declining health severely limited his mobility. He was bedridden for the last few months before his death; several strokes had severely debilitated him. Johann Georg Halske died on March 18, 1890, at the age of 76.

The mechanical artist would surely have preferred to be buried inconspicuously next to his wife, Henriette, at the Holy Trinity Cemetery in what is now Berlin-Kreuzberg. But during his life he had achieved too much to depart without official recognition. On March 22, 1890, a ceremony of mourning was held at his private home on Königgrätzer Strasse, after which a long procession of mourners accompanied him to his resting place. In addition to friends and companions, many representatives from Siemens & Halske along with their colleagues from the English and Russian offices followed Halske's coffin through the streets of the capital. The entire Board of Directors of the Physical Society, together with many members of the Berlin magistracy and the Assembly of City Deputies, also joined in rendering Halske the final honors. The *Berliner Lokal-Anzeiger* newspaper reported at length on the moving event in which this outstanding mechanic and dedicated citizen of Berlin was borne to his grave.

1825 Berlin's Holy Trinity Cemetary is established on Bergmann Strasse.

1883 Establishment of the *Berliner Lokal-Anzeiger*; it is one of the city's 15 daily newspapers.

Endnotes

1 Siemens Corporate Archives, SAA W6064, Werner to Carl, Berlin, Feb. 17, 1866; Feldenkirchen, Wilfried (ed.): Werner von Siemens. Recollections, Munich 2008, p. 356.
2 SAA 3.Li 1003, Documents, testimony and legal instruments of Johann Georg Halske, 1814–1890: Halske's school reports, 1826–1829.
3 Cited from SAA 46.Lh 286, Heintzenberg, Friedrich: Johann Georg Halske (unpublished manuscript, 1941), p. 2.
4 SAA 3.Li 1003, School reports.
5 SAA 3.Li 1011, Biographical information about Johann Georg Halske.
6 SAA 7592, Götzeler, Herbert: Johann Georg Halske, p. 1; SAA 3.Li 1003, Hirschmann letter of reference, Apr. 19, 1835.
7 SAA 3.Li 1003, Hirschmann letter of reference, Apr. 19, 1835.
8 SAA 3.Li 1003, Hirschmann letter of reference, Jan. 12, 1841.
9 SAA 3.Li 1003, Hirschmann letter of reference, Aug. 10, 1843, Prussian citizenship, Sept. 27, 1843.
10 SAA 3.Li 1003, Citizenship proceeding, Aug. 11, 1843.
11 Cited from Heintzenberg: Halske, p. 4 f.
12 Cited from Du Bois-Reymond, Emil: Johann Georg Halske, in: Verhandlungen der Physikalischen Gesellschaft zu Berlin, 7, 9 (1890), pp. 39–44, here p. 40.
13 Cited from ibid., p. 43.
14 Cited from ibid., p. 40.
15 Cited from Dierig, Sven: Wissenschaft in der Maschinenstadt, Göttingen 2006, p. 33 f.
16 Cited from Schreier, Wolfgang / Franke, Martin: Geschichte der Physikalischen Gesellschaft zu Berlin 1845–1900, in: Physikalische Blätter 51, 1 (1995), pp. 9–59, here p. 18.
17 Cited from Heintzenberg: Halske, p. 25.
18 Siemens Archive letter collection, esp. SAA W1590, Werner to William, Berlin, Oct. 1, 1846; SAA W1594, Werner to William, Berlin, Dec. 14, 1846.
19 Cited from Du Bois-Reymond: Halske, p. 42.
20 Cited from Heintzenberg: Halske, p. 27 f.
21 Cited from Feldenkirchen: Recollections, p. 79.
22 SAA W1064, Werner to William, Berlin, Jan. 25, 1847; SAA W1072, Werner to William, Berlin, Aug. 25, 1847.
23 SAA 3.Li 1003, Marriage register, Dec. 21, 1845, registration of wife, Jan. 8, 1846, registration of mother, May 31, 1847; SAA 3.Li 1011, family tree.
24 Cited from Dierig: Wissenschaft, p. 46 f.
25 SAA W1078, Werner to William, Berlin, Dec. 20, 1847.
26 SAA W1072, Werner to William, Berlin, Aug. 25, 1847.
27 SAA W1073, Werner to William, Berlin, Sept. 15, 1847.
28 SAA W1075, Werner to William, Berlin, Nov. 6, 1847.
29 SAA 3.Li 1009, Decree of the Royal Business Tax Office, Oct. 20, 1847, business registration with Royal Police Headquarters, Dec. 15, 1847.
30 SAA W1173, Werner to William, Berlin, Jun. 9, 1849; SAA W1170, Werner to William, Berlin, Dec. 27, 1848; SAA W17, Werner to William, Berlin, Oct. 11, 1851.
31 Cited from Kocka, Jürgen: Unternehmensverwaltung und Angestelltenschaft am Beispiel Siemens 1847–1914, Stuttgart 1969, p. 76.
32 Cited from Ehrenberg, Richard: Die Unternehmungen der Brüder Siemens. Bd. 1: Bis zum Jahre 1870, Jena 1906, p. 467 f.

33 SAA 12.Lh 583, Jacobi, Hermann 1865–1895: Unterredungen mit dem ehem. Werkstatt-Direktor Jacobi über Werkstatt-Verhältnisse bei Siemens & Halske, p. 8 f.
34 Ibid., p. 6 f.
35 Cited from Ehrenberg, Richard: Fabrikant und Handwerker, in: Thuenen-Archiv/Ergänzungsheft, 1 (1906), p. 38–73, here p. 49 f.
36 Cited from Götzeler: Halske, p. 11.
37 SAA W7236, Werner to Carl, Charlottenburg, Dec. 25, 1887.
38 Cited from Ehrenberg: Fabrikant, p. 52.
39 Cited from ibid., p. 53.
40 Cited from ibid., p. 50.
41 Cited from ibid., p. 51.
42 SAA 3.Li 1005, Johann Georg Halske, Correspondence, Halske to Werner, Berlin, Oct. 23, 1852.
43 Cited from Kocka: Unternehmensverwaltung, p. 66.
44 Cited from Götzeler: Halske, p. 15.
45 Cited from Ehrenberg: Unternehmungen, p. 417.
46 SAA A54, Halske to Werner Siemens, no location, May 1, 1861.
47 SAA W193, Werner to William, Berlin, Aug. 30, 1863.
48 SAA 3.Li 1003, Halske's school reports 1826–1829.
49 Documented in numerous letters, such as SAA W1121, William to Werner, Birmingham, Apr. 12, 1850; SAA F901, Mathilde to Werner, Berlin, May 28, 1854; SAA W222, Werner to Carl, Berlin, Aug. 5, 1856; SAA F1275, Werner to Mathilde, Berlin, Nov. 21, 1856; SAA W2346, Werner to Carl, Berlin, Jan. 30, 1860; SAA W2547, William to Werner, Newcastle, Jan. 3, 1861.
50 Cited from Götzeler: Halske, p. 15; SAA F1288, Werner to Mathilde, Berlin, Feb. 11, 1857.
51 SAA F918, Mathilde to Werner, Berlin, Feb. 22, 1855; SAA W1243, William to Carl, London, Dec. 10, 1852; SAA F943, Mathilde to Werner, Berlin, Aug. 23, 1855; SAA W627, Werner to Carl, Berlin, May 2, 1873.
52 Cited from Ehrenberg: Unternehmungen, p. 158.
53 SAA A54, Halske to Werner Siemens, no location, May 1, 1861.
54 SAA W5426, Werner to Karl [sic], Berlin, Jan. 7, 1868.
55 SAA W6358, Werner to Karl [sic], Berlin, Dec. 14, 1878; SAA W7782, Werner to Wilhelm, Berlin, Nov. 24, 1879; SAA W7824, Werner to Wilhelm, Berlin, Jan. 7, 1880.
56 SAA 3.Li 1008, Collection of biographical materials on Halske.
57 SAA 3.Li 1003, Original commemorative war medal, Oct. 18, 1872.
58 SAA 3.Li 1003, Henriette Halske Foundation, Jan. 9, 1885, Henriette Halske Foundation, Jan. 21, 1885.
59 Cited from: Das Kunstgewerbe-Museum zu Berlin. Festschrift zur Eröffnung des Museumsgebäudes, Berlin 1881, p. 4.
60 SAA 3.Li 1003, Presentation of Order, May 1, 1885.
61 SAA 3.Li 1008, Collection of biographical materials on Halske.
62 Landesarchiv Berlin (LArchB) A Pr. Br. Rep. 030 Berlin Police Headquarters, Inventory No. 10606: Intelligence about factory owner Johann Georg Halske, 1864–1915.
63 Ibid.; LArchB A Rep. 000-02-01 City Chamber of Deputies, Inventory No. 220: 1849–1870: Vossische Zeitung, Reports of meetings of the City Chamber of Deputies, Vol. 2, May 27, 1869.
64 LArchB A Rep. 000-02-01 City Chamber of Deputies, Inventory No. 220: 1849–1870: Vossische Zeitung, Reports of meetings of the City Chamber of Deputies, Vol. 2, Jan. 23, 1868 and Apr. 1, 1869; LArchB A Rep. 000-02-01 City Chamber of Deputies, Inventory No. 1145: 1852–1871: Supply of Running Water to the City of Berlin, Vol. 1; LArchB A Rep. 000-02-01 City Chamber of Deputies, Inventory No. 1146: 1851–1874: Supply of Running Water to the City of Berlin, Vol. 2.

Bibliography

Deutsches Gewerbe-Museum zu Berlin: Jahresberichte, 1869–1878.

Dierig, Sven: Wissenschaft in der Maschinenstadt. Emil Du Bois-Reymond und seine Laboratorien in Berlin, Göttingen 2006.

Du Bois-Reymond, Emil: Johann Georg Halske, in: Verhandlungen der Physikalischen Gesellschaft zu Berlin, 7, 9 (1890), pp. 39–44.

Ehrenberg, Richard: Die Unternehmungen der Brüder Siemens. Bd. 1: Bis zum Jahre 1870, Jena 1906.

Ehrenberg, Richard: Fabrikant und Handwerker, in: Thuenen-Archiv/Ergänzungsheft, 1 (1906), p. 38–73.

Feldenkirchen, Wilfried: Werner von Siemens. Inventor and International Entrepreneur, Columbus, 1994.

Feldenkirchen, Wilfried (ed.): Werner von Siemens. Recollections, Munich 2008.

Feldenkirchen, Wilfried / Bartels, Almuth: Werner von Siemens, Munich 2000.

Feldenkirchen, Wilfried / Posner, Eberhard: The Siemens Entrepreneurs. Continuity and Change, 1847–2005. Ten Portraits, Munich 2005.

Die Fortschritte der Physik im Jahre 1845. Dargestellt von der physikalischen Gesellschaft zu Berlin, Berlin 1846.

Franke, Monika: Zur Gründung des ersten deutschen Kunstgewerbemuseums in Berlin, in: Buddensieg, Tilmann/Rogge, Henning (ed.): Die Nützlichen Künste, Berlin 1981, pp. 244–251.

Hahn, Hans-Werner: Die Industrielle Revolution in Deutschland, Munich 2011.

Kant, Horst: Ein "mächtig anregender Kreis": Die Anfänge der Physikalischen Gesellschaft zu Berlin, Max-Plack-Institut für Wissenschaftsgeschichte, Berlin 2002.

Kleinschmidt, Christian: Technik und Wirtschaft im 19 und 20. Jahrhundert, Munich 2007.

Kocka, Jürgen: Unternehmensverwaltung und Angestelltenschaft am Beispiel Siemens 1847–1914. Zum Verhältnis von Kapitalismus und Bürokratie in der deutschen Industrialisierung, Stuttgart 1969.

Das Kunstgewerbe-Museum zu Berlin. Festschrift zur Eröffnung des Museumsgebäudes, Berlin 1881.

Lutz, Martin: Carl von Siemens 1829–1906. Ein Leben zwischen Familie und Weltfirma, Munich 2013.

Michas, Uwe: Das Berlinische Gymnasium zum Grauen Kloster, in: Die Mark Brandenburg, III, 63 (2006), pp. 14–20.

Mohajeri, Shahrooz: 100 Jahre Berliner Wasserversorgung und Abwasserentsorgung, 1840–1940, Stuttgart 2005.

Mundt, Barbara: Die deutschen Kunstgewerbemuseen im 19. Jahrhundert, Munich, 1974.

Schreier, Wolfgang / Franke, Martin: Geschichte der Physikalischen Gesellschaft zu Berlin 1845–1900, in: Physikalische Blätter 51, 1 (1995), pp. 9–59.

Veitmeyer: J. G. Halske, in: Polytechnisches Centralblatt. Organ der Polytechnischen Gesellschaft zu Berlin, 13, 2 (1890), pp. 149–151.

Wehler, Hans-Ulrich: Deutsche Gesellschaftsgeschichte, Bd. 2: Von der Reformära bis zur industriellen und politischen "Deutschen Doppelrevolution" 1815–1845/49, Munich 2005.

Zaun, Jörg: Instrumente für die Wissenschaft. Innovationen in der Berliner Feinmechanik und Optik, 1871–1914, Berlin 2002.

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Ewald Blocher completed his doctoral studies in history at the Ludwig-Maximilians-Universität München.

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