Werner von Siemens’s Early Years

Family Background, Childhood, and Youth

Werner von Siemens was born on December 13, 1816, the child of Christian Ferdinand Siemens and his wife, Eleonore, née Deichmann, at Lenthe, near Hanover in Germany. The marriage was blessed with fourteen children, ten of whom reached adult age, two girls and eight boys. With the exception of the two boys born immediately after Werner, Hans (b. 1818) and Ferdinand (b. 1821), all the brothers cooperated later more or less closely with Werner. The father had leased a country estate and practiced agriculture. The family was a close one, and kinship ties would eventually play a prominent role in Werner’s business career.

The Siemens family cannot easily be allocated to a specific social stratum. The family originally came from the Harz Mountains in the region of Goslar and can be traced back to the time of the Thirty Years’ War (1618–48). A carefully written chronicle of the family found in the family archives documents middle-class self-confidence. Numerous ancestors held public offices—for example, as members of the town council—and a large percentage had an academic education. Medical doctors, lawyers, and people working in metallurgy can be
found in the family background; there were no outstanding
talents in technical fields, however. Werner’s father had stud-
ied agriculture at Göttingen University for several semesters.
Werner described him as a well-educated and intelligent
gentleman with a wide range of interests whose instructions in
world history and ethnology greatly impressed him as a boy at
the age of ten. The mother, Eleonore Deichmann, was the
daughter of the chief official of Poggenhagen, near Hanover.¹

Judging by their social background and the liberal-Protes-
tant ethics dominating the family, Werner’s parents belonged
to the higher educated upper middle class. However, they were
not especially prosperous. The poor economic circumstances
of the family did not match the relatively high level of educa-
tion of the parents. When Werner was eight years old, the fam-
ily left Lente after his father had had a dispute with the
aristocratic authorities of the Royal British Province of
Hanover and leased the country estate Menzendorf in the
nearby principality of Ratzeburg (Mecklenburg). The eco-
nomic situation of the family did not improve with the move.
The agricultural crisis of 1818–25—the result of extraordinar-
ily large harvests that depressed prices to rock-bottom levels—
damaged the family’s fortunes considerably. The income from
farming was totally insufficient to meet the cost of taxes, leasing
fees, and living expenses,² and the large number of children
aggravated the family’s constant worries about living condi-
tions. Nor did these worries diminish when the agricultural
economy improved greatly at the end of the 1820s. The return
to prosperity on German farms after 1825 persisted for several
decades but did not seem to noticeably improve the fortunes of
the Siemens family.

The middle-class ambitions of the family were limited by
their straitened financial means. It was especially difficult to
provide a formal education for the children. Together with his
older sister Mathilde (b. 1814), Werner was at first given les-
sions by his grandmother, who taught the children how to read
and write and made them learn poems by heart. For half a year
the father took over the lessons himself, but then sent the
eleven-year-old boy to a school in the nearby small town of
Schönberg. When Werner was not particularly successful at that school, his father finally engaged several private teachers, starting at Easter 1829. It was not until the ninth grade that Werner attended a Gymnasium, the Katharinschule in Lübeck. In retrospect, however, Werner was not very pleased with the predominantly humanistic-classical curricula offered, since he felt that he was not encouraged enough in his true abilities and favorite subjects, particularly mathematics and science. Werner tried to compensate for some of the deficiencies of the school by taking private lessons in mathematics. As early as Easter 1834, at the age of seventeen, he left secondary school for good, without any formal final examination. In the introduction to his memoirs, Werner von Siemens described his career prospects: “It will be informative and encouraging for young people to realize that a young man without inherited wealth or influential sponsors, even without a substantial educational background, can make good progress by his own efforts alone and attain useful achievements.”

Although his parents could offer him a school with only limited possibilities, and could not afford a university education commensurate with the talents of their son, Werner later looked back on his childhood and early youth as a period of happiness. The great amount of freedom in the secluded life in the country, an early responsibility for his younger brothers and sisters, and the close family ties were contributing factors. At the same time, his early experience of having to face serious economic problems, which meant that the family’s living standard was below that of an ordinary middle-class family, also provided the impetus for Werner to attain some prosperity. Accordingly, he confessed at the age of seventy-one in a letter to his brother Carl:

I certainly have sought profits and wealth, yet not so much for the purpose of reveling in them, but to obtain the means to fulfill other ideas and ventures and by success win the recognition for the justness of my actions and the usefulness of my
work. It was for that reason that since my youth I have dreamed of founding a worldwide business in the style of the Fugger family in Augsburg, which would provide not only myself but also my descendants with power and reputation all over the world, and assure the financial means to elevate my brothers and sisters and close relatives toward the higher regions of life.4

Werner von Siemens’s family background was not typical of a businessman of his time. By far most founders of firms either had a mercantile background or came from families with a tradition in a craft or trade.5 There was almost no profession, however, that did not sprout at least some enterprising spirits during the German industrial revolution. Although Werner was able to gather little practical experience in the management of a company and had practically no family capital at his disposal, his higher than average education certainly played an important role in the course of his later career. The time spent at a grammar school, even though only temporary and not greatly esteemed by Werner because of its emphasis on a humanistic curriculum, was quite untypical for businessmen of his time.

His family background and his education also provided the basis for Werner’s often expressed self-identification as a scientist and his distinct middle-class contempt for merchants and mere “money-making people,” attitudes that are evident, above all, in the letters to his brother Carl. Werner’s attitude reflected the views of the Siemens family, with its noncommercial tradition. His identification of himself as a scientist corresponded, moreover, with the general view of the educated middle class. Academics and civil servants often looked down on technicians and merchants and did not encourage their children to enter such careers.6 Only as the social respect for the profession of a businessman gradually increased was Werner able to let go of such a negative opinion of commercial and engineering careers.
Professional Training and Military Service

The tight financial situation of Werner's parents limited his opportunities for an advanced education. It was financially impossible for him to attend the Architectural Academy in Berlin, a course of study he had considered. So Werner decided to obtain an education in engineering by joining the Prussian Army. In the spring of 1834, with his father's approval, he left his parents' home in order to walk to Berlin, there to apply for acceptance into the Prussian Engineering Corps.

Upon his arrival in Berlin, Werner showed a high degree of independence and tenacity in the pursuit of his goals. The authorities in Berlin rated his chances for direct admission into the Prussian Engineering Corps fairly low, so they sent him to Magdeburg with a letter of recommendation to apply for acceptance into the artillery brigade. The artillery brigade posted officers to the Artillery and Engineering Academy in Berlin for training. Werner was successful in Magdeburg. Because his classical education had not prepared him with the knowledge of mathematics, physics, geography, and French that the artillery corps required of its officer candidates, Werner studied for the entrance examination for three months. With some luck, he passed the examination. The authorities removed the last obstacle, the fact that he was not a Prussian subject, and admitted him as an artillery officer candidate in December of 1834.

In the autumn of 1835, exactly according to his wishes, Werner von Siemens was assigned to the Artillery and Engineering Academy in Berlin. Here he at last received the thorough training he had longed for. His three-year term of duty at the academy, where the mathematician Georg Simon Ohm, the physicist Heinrich Gustav Magnus, and the chemist Otto Erdmann lectured, and particularly the high-level classes in the fundamental subjects of mathematics, physics, and chemistry, were—according to Werner's own statements—the foundation and prerequisite for his later success. The training at the military academy, which on a scientific level held a position somewhere between a trade school and an engineering college,
provided him with a clear edge over the majority of technicians with only empirical practical training. After completing the three-year course of studies, Werner received a commission as a lieutenant and obtained his first leave after being away from Menzendorf for over four years.

At home Werner was confronted with the fact that the economic circumstances of his parents had not improved and, even worse, that their health had severely deteriorated. Despite the poor opportunities for earning money, his brothers Hans and Ferdinand had decided to take up agricultural work and were helping their father. The fifteen-year-old Wilhelm was still attending school and, according to his parents' wishes, was to prepare himself to become a merchant. Werner could
not approve such a plan. He decided to take care of his brother and at the end of his leave took Wilhelm with him to Magdeburg, where the boy was to attend a business and trade school.

A year later, when Werner was no longer required to reside in the barracks, he rented an apartment in the city with his friend William Meyer, whom he had met at the academy, and his brother Wilhelm. Thus he was able to look after Wilhelm’s training even more intensively. Werner advised Wilhelm to drop mathematics at school in favor of English and began teaching his brother mathematics himself.

Werner’s taking charge of Wilhelm’s education began a lifetime of close association between the two brothers. The ties between them and also with their younger brothers and sisters grew even closer when their parents died in rapid succession. Their mother died on July 8, 1839, and their father on January
16 the next year. Werner felt responsible for his six younger brothers and sisters, who were still under age and had not finished their education. In the following years Werner always tried to support them financially and be personally involved in their education and professional training.

The close relationship between Werner and Wilhelm soon led to commercial ventures. Werner's military duties left him time for scientific experiments of his own. He particularly made good use of a period of honorary arrest (to which he was sentenced after taking part in a duel as a second), successfully conducting experiments on electrolytic plating with silver and gold. Wilhelm, after leaving school in Magdeburg at Easter 1841, entered Göttingen University, where the husband of their eldest sister, Mathilde, held a chair in chemistry, to pursue scientific studies. For financial reasons Wilhelm had to give up his studies after a short period of time; he then began practical training in engineering in Magdeburg. Wilhelm wearied of engineering training after a few months and at the end of 1842 decided to go traveling and to try to exploit Werner's electroplating inventions commercially.

Wilhelm's first stay in England in the spring and summer of 1843 turned out to be a decisive event for the two brothers. Within a few months he succeeded in applying for a patent for the electrolytic silver- and gold-plating process developed by Werner and in selling it to the English firm Elkington for £1,600 (less £110 for patent fees). This success, which earned them about 30,000 marks, not only helped the brothers to overcome a tight financial situation but also encouraged Wilhelm to consider settling permanently in England. Werner supported this plan, and Wilhelm, after a short stay in Magdeburg in January 1844, accordingly returned to England.

Wilhelm's second trip to England, however, did not produce the quick success of the previous year. Wilhelm, as a twenty-year-old foreigner without any substantial experience, did not have much luck and could not immediately get the knack of English commercial practices. In a letter to Werner he complained bitterly: "I have had the opportunity to hear much about the character of the Englishman and have arrived at the
conclusion that it is composed of pure egoism; an Englishman, for example, does not feel any shame in deceiving another person and there is no greater triumph for him than to hoodwink a foreigner, especially a German.” In the same letter Wilhelm continued, however, “Yet as a people they are great, because they are free; and the people in Germany cannot imagine what freedom is. When I have lived here for a full year, I will be spoilt for Germany for the rest of my life.”

This basic attitude is presumably what led Wilhelm to stay in England, even though for several years his subsequent efforts earned little noteworthy financial reward. The two brothers had to realize that to a large extent the selling of occasional inventions was a gamble. Among the failed projects were, for example, inventions in the field of zincography and a poorly developed machine for fast printing. Apart from trying to sell his brother’s inventions, Wilhelm kept himself busy developing some inventions of his own, including a water meter, which in later years turned out to be a very successful product. In the summer of 1844 Werner visited his brother in London and for a few weeks cooperated intensively with him on efforts to develop new inventions. On his way back Werner made a detour via Paris to attend the industrial exhibition taking place there.

During this trip to England and France, Werner came to the conclusion that, in the long run, there was no money to be made in minor unsystematic inventions. The result, eventually, was the founding of Siemens & Halske. Since his financial means were soon exhausted, Werner, after his return to Berlin, again took up serious studies in physics, established contacts with other researchers, and became more and more interested in electrical experiments. During this period he also involved himself in experiments with electrical telegraphy, concentrating on improving the magnetic pointer telegraph invented by Wheatstone. Meanwhile Werner conducted an intensive correspondence with his brother Wilhelm, supporting his work with numerous suggestions and comments. In his electrical experiments, Werner worked together with several “practical craftsmen,” first with the clockmaker Ferdinand Leonhardt, with whom he built his first devices for electrical telegraphy. Werner turned to the master mechanic Johann Georg Halske
for the implementation of his pioneering advancements in the field of telegraphy, improvements on Wheatstone’s pointer telegraph. Together with his partner Johann Friedrich Bötticher, Halske ran the mechanical establishment Bötticher & Halske, which produced precision equipment. Werner succeeded in winning Halske’s total and enthusiastic support for his projects. In the autumn of 1847 Werner even managed to persuade Halske to close down his previous business and to join him in founding a new venture, the Telegraph System Construction Enterprise Siemens & Halske (Telegraphen-Bauanstalt Siemens & Halske).

Siemens and Halske began to live together in a house, on the ground floor of which was located the workshop of the new enterprise. Since Werner at that time had next to no equity capital at his disposal, his cousin, the legal official Johann Georg Siemens, bought an interest in the firm of 6,842 thalers—somewhat more than 20,000 marks—in exchange for a share in the profits over a period of six years. On October 12, 1847, the workshop, employing ten workmen, was opened in a rear building at 19 Schöneberger Straße in Berlin. Of the profits, Werner Siemens and Georg Halske were each supposed to receive two-fifths of the total, and Georg Siemens one-fifth.

To meet his obligations to support his younger brothers and sisters, and to avoid being regarded as a “deserter” in the unstable political period prior to the March revolution in 1848, Werner stayed in the military service for the time being and devoted himself to his new enterprise in his spare time. The fact of his being, by virtue of his army position, a consultant member of the Prussian Telegraph Commission turned out to be a particularly favorable coincidence. Werner’s medium-term plans, however, were to devote himself completely to the telegraph business and to his firm. In a lecture in 1879 Werner von Siemens, looking back, summed up his impressions on the development of electrical telegraphy:

Soon after Volta, for the design of the column named after him, had discovered a way to produce a continuous electric current, Dr. Soemmerring in 1808 suggested using the current
The first Siemens & Halske workshop, 19 Schöneberger Straße, Berlin, 1847–1952
for telegraphic means. It took quite some time of serious research work, however, before his idea could be materialized in practice. Only after the discovery of the effects of electric current across some distance by Ørsted, and after the laws governing the use of electricity had been uncovered by men such as Ampère, Arago, Faraday, Gauss, Weber, Wheatstone and many more, did the implementation of Soemmerring’s audacious plan finally become feasible. But while the telegraphs, constructed at the beginning of the thirties by Gauss and Weber in Göttingen and by Steinheil near Munich, operated well, another decade passed before the pragmatic approach of the Americans and English actually started practical telegraphy. From that time on, in the middle of the forties, telegraphy began to develop and expand rapidly. . . . All nations participated in this race, with our German fatherland being one of the foremost competitors. 

Germany’s position among the leaders was, in no small measure, due to Werner von Siemens. The first telegraph he had built was a modification of an English instrument developed by Wheatstone, which was soon replaced by a design by Samuel Morse, which from then on served as a prototype and was continuously improved.

The Influence of the Political Situation on Siemens’s Business Activities

The early years of Werner von Siemens’s business activities were deeply influenced by the political conditions of the time. Contrary to the hopes of the liberal middle classes, the accession of King Friedrich Wilhelm IV in 1840 did not result in a reversal of the Prussian “Politics of Restoration” of the 1830s. After 1846 the disappointment over the failure of Prussia to develop a constitutional state was intensified by a rapidly accelerating economic recession. Poor harvests caused real famines in large sectors of the population. In this strained political and economic situation, the February revolution of 1848 in Paris triggered the March revolution in Berlin.
The Siemens brothers were among the most vigorous supporters of the revolution, whose aims completely matched the national and liberal ideas that, according to Werner, had molded their education. Wilhelm expressed this viewpoint most clearly; living in England, he could adopt an especially radical-liberal attitude. As he wrote to Werner:

F.W. [Friedrich Wilhelm], by the way, is a king who suits me well; he does his utmost to teach you how unsatisfactory his present government is, and by his opposition he also offers the advantage that the people can win liberty by their own struggle. Let us hope that in his answer to the different politicians, he will claim to have more wits in his big toe than is to be found in the heads of all the parliamentarians put together and that, for this very reason, he is unable to attach any great importance to their resolutions. . . . Our typical “German Michel” will probably get his liberty in the end and will swear by his nightcap that he will never let others make an ass of him again. Metternich, with his legions of clerics, customs officers, privy councillors, censors, diplomats, and bureaucrats requiring permits for everything, will go to hell and will so preoccupy the devil that he will never again lead any German astray. Sabers and cannons will also be unnecessary in the future.10

As a Prussian officer Werner had to be more restrained in his comments, but as a consequence of his political opinions he had to put up with the possibility of setbacks in his career. In 1845 he cosigned a declaration in support of Johannes Ronge and directed against the “shady obscurantists” (“Dunkelmänner”). He narrowly escaped reassignment as a reprimand by the military authorities only by developing a new kind of gun cotton, the report on which he dispatched directly to the secretary of the army. In his letters to Wilhelm he commented emphatically on the revolution everybody was longing for. Even before March 18 he wrote under the spell of the events in France: “Vive la France! I would shout together with you from the bottom of my heart, if one still had the luck to belong morally to the proletarian class! Yet this does not matter much; we
are making great progress. Such a commotion of minds, such an urge to throw off all the unworthy fetters and barriers, must come to fruition!" And only a few days later Werner gave a report from revolutionary Berlin: "I hurry, dear brother, to send you the first salute from a free country!"

For the business activities of the Telegraph System Construction Enterprise, however, the revolution, so enthusiastically welcomed by Werner, meant a severe setback at first. The Telegraph Commission discontinued all activities for the time being, yet without being formally dissolved.

On the other hand, events associated with the revolution allowed Werner to follow his national sentiments in his military career. In January 1848 Denmark had attempted to integrate Schleswig, which was a Danish feudal territory but was also joined in a real union with Holstein, which belonged to Germany, into the Danish nation. Both duchies, Schleswig and Holstein, took part in the revolution and tried to break their ties to Denmark and join the German Confederation. This was a constitutionally controversial situation, since in Schleswig the revolutionaries had risen against their legitimate prince. Prussia and other members of the German Confederation, commissioned by the Confederation with the conduct of war against the Danes, at first hesitated to begin an armed intervention. Werner von Siemens, acting without any official order, in April 1848 set off for Kiel, where his sister Mathilde and her husband, Professor Himly, had moved. On his own initiative, supported by his brother-in-law, Werner developed underwater mines with electrical fuses, which were employed with great success in protecting the harbor of Kiel against Danish warships.

By the time Werner received an official order from the Prussian authorities for the defense of the harbor of Eckernförde and had even been appointed commander of Friedrichsort, he had already lost interest in this adventurous diversion into warfare and immediately returned to Berlin. In his memoirs he writes in great detail and with evident pleasure about this adventure, which militarily—even if not politically—had had a victorious outcome for Prussia.
Since Wilhelm had taken up permanent residence in England, two of the younger brothers, Carl and Friedrich, had become old enough that the question of their future education, training, and professional life had arisen. After Wilhelm had succeeded in selling the gold-plating patent in England, Friedrich, Carl, and Walter had lived with Werner in Berlin and had attended school there. Before that time they had lived with their uncle in Lübeck. After leaving school, Friedrich first had the intention of going to sea, but a short probationary period revealed that he was not physically fit enough for the hard life involved. His two elder brothers therefore tried to find him a suitable place as an apprentice. When Friedrich began this mechanical training in autumn 1847 he insisted that the option of joining his brother Wilhelm in England be kept open.
At first Carl also had it in mind to go to sea. Werner succeeded, however, in directing his interests more to chemistry and physics. In 1846 Carl left school in the ninth grade and started work as a chemist with the Berlin firm Haslinger & Schondorf.

All the brothers remained very close. After the March revolution both Carl and Friedrich followed Werner to Kiel, and from there Friedrich traveled to England for the first time, to work on Werner’s telegraph projects. Working as an assistant to his brother-in-law, Professor Himly, Carl stayed in Kiel a while longer. This arrangement did not meet with the approval of his brothers at all. They were of the opinion that in Kiel Carl would probably cultivate his “phlegmatic nature” too much. The news of the discovery of gold in California led the two younger brothers, Friedrich and Carl, to consider emigrating to the United States. Werner expressed a willingness to assist them but asked them to reconsider their decision before departing, and they decided to stay in Europe.

Their decision not to emigrate probably meant that Carl and Friedrich enjoyed more good fortune than most of the men who rushed to California dreaming of quick fortunes in the gold mines. Favorable developments in the second half of 1848 and in following years opened up new and expanded business activities for all four of the brothers. They obtained contracts for the construction of telegraph lines in Germany between Berlin and Cologne and between Berlin and Frankfurt. Siemens & Halske fulfilled these contracts with great success within a few months, which allowed Werner in the autumn of 1849 to quit the army after twelve years of service. His physical and mental abilities were now fully required by the Telegraph System Construction Enterprise. Moreover, while for a time as a military officer Werner had been able to exert influence on the promotion of telegraphy, civilian uses of the telegraph had now become the growth area for the new technology. This situation was reflected in the transfer of the responsibility for telegraphy from the Prussian War Department to the Ministry for Trade and Commerce. Werner was glad to hand in his papers. His military service had provided
him with training in engineering and allowed him time for his
inventions and scientific experiments. Nor had his liberal po-
litical attitude done him any harm. Therefore, in his memoirs
he expressed a pleasant memory of his military service in gen-
eral. He mentioned that the strict hierarchical military order—
which, by the way, was dominant in the Prussian civilian
authorities as well—was always alleviated somewhat by the
“spirit of camaraderie.” All in all, however, we are left with
the impression that now Werner was finally able to make full
use of his skills as a free businessman.

Meanwhile, Wilhelm Siemens was becoming more success-
ful in England. In 1849 he found regular work with the me-
chanical engineering company Fox & Henderson in Birming-
ham. They guaranteed him flexible working hours, promised
him a share in the benefits from patents, and paid him a fixed
annual salary. With this money Wilhelm was able to improve
his precarious economic situation, which for years, apart from
occasional small profits drawn from patent licenses, had kept
him dependent on the financial support of his brother.

The status and security of the two elder brothers gave them
an opportunity to allow the younger brothers a greater share
in the joint business. With these prospects, the two soon gave
up their plans for emigration to the United States. Wilhelm
was able to win a permanent job for Friedrich also with Fox &
Henderson. Carl, for the time being, entered Siemens &
Halske in Berlin and worked as a designer of telegraph lines.