

## Werner von Siemens

(1816-1892)

Werner Siemens – the “von” was added in 1888 – lived in an age marked by revolutionary change in all spheres of life. The process of industrialization began during his youth, accelerating around the middle of the century, and in just a few decades Germany rose to become one of the world’s leading industrial nations. The developments of the time on the one hand provided the right conditions for the growth of Siemens & Halske and on the other were decisively influenced by the work of Werner von Siemens and economic activity of the company he founded.

Werner von Siemens was born on December 13, 1816, the fourth of 14 children of a tenant farmer in Lenthe near Hanover. The family’s tight financial situation precluded the formal schooling appropriate to upper middle-class ambitions, so that Werner von Siemens left “Gymnasium” without taking the final exams in 1834, in order to gain access to engineering training by joining the Prussian army. His three-year training at the artillery and engineering school in Berlin created a solid basis for his future work in the electrical engineering field.

The army was particularly interested in rapid, reliable communication. In 1847 Werner von Siemens constructed a pointer telegraph, which was absolutely reliable and far superior to previous equipment. This laid the foundation for the “Siemens & Halske Telegraph Construction Company that Werner von Siemens founded jointly with the master mechanic Johann Georg Halske in Berlin on October 1, 1847. In 1849 he left the army in order to devote himself to the company.

Within a few decades, Siemens & Halske advanced from a small precision engineering workshop, which made electrically triggered railroad warning bells, water meters and seamless insulation with guttapercha in addition to the electric telegraphs that were its main product, to one of the world’s leading electrical firms, which began operating internationally very soon after its foundation. By the summer of 1848, Siemens & Halske had already received its first large and highly prestigious state contract for the building of a telegraph line over 500 km long between Berlin and Frankfurt am Main.

Since the good relationship with the Prussian Telegraph Administration did not last very long, the young company was plunged into a crisis, which could only be overcome by concentrating on foreign markets. Orders from Russia in particular triggered an upturn in business at the beginning of the 1850s. In 1851 Siemens & Halske received the order to build the Russian telegraph network, which extended from the Baltic to the Black Sea and was completed by the mid 1850s under the management of Werner's younger brother Carl Siemens. In addition to the Russian business, the company's involvement in England became a second important pillar of the Telegraph Construction Company. Here another of Werner's brothers, Wilhelm Siemens, achieved a breakthrough on the English telegraph market with the production and laying of submarine telegraph cables.

Few entrepreneurs of that period ventured abroad with such determination as Werner von Siemens and his brothers, who sought international success with their inventions and enterprises. This was above all the vision of the company's founder, who was excited by the idea of a "world enterprise like that of the Fuggers," which he primarily saw as the sphere of operation of his family. "For me the business is only secondarily important as a source of wealth: I see it rather as a realm that I have founded and that I would like to pass on undiminished to my descendants so that they can continue to operate within it," Werner von Siemens once wrote to his brother Carl. This reveals one of the main factors that governed his business policy: his family orientation and what he saw as his duty to provide for his immediate family – initially for his siblings and subsequently for his children. At the same time Werner von Siemens involved members of the family in the company, and was thus able to fill key positions in distant places abroad with loyal and capable employees.

In addition to his business activities, Werner von Siemens also devoted himself intensively to scientific research. In 1866 he made what was probably his most important contribution to electrical engineering when he discovered the dynamo-electric principle, building on the work of Faraday, and thus opened the way for electricity to be used as a source of power. The report that he sent to the Berlin Academy of Sciences on January 17, 1867, entitled "On the conversion of mechanical energy into electric current without the use of permanent magnets" identified him not only as a scientist who set about investigating the phenomena he had observed, but also as an engineer and far-sighted entrepreneur, who, on the basis of his experience with his experimental

machine, predicted that “Technology now has the means to generate electrical current of unlimited strength in an inexpensive and convenient way wherever mechanical energy is available. This fact will become of great importance in several of its sectors.” Heavy-current engineering, as power engineering was then known, developed at a breathtaking pace, with Siemens innovations at the forefront, repeatedly introducing new applications for electric current: in 1879 the first electric railway was presented at the Berlin Trade Fair and the first electric streetlights were installed in Berlin’s Kaisergalerie, in 1880 the first electric elevator was built in Mannheim and in 1881 the world’s first electric streetcar went into service in Berlin-Lichterfelde. The name Siemens became synonymous with electrical engineering and the German word for it, “Elektrotechnik,” was coined by Werner von Siemens.

Werner von Siemens not only made a name for himself as a progressive entrepreneur through his technical innovations and daring business undertakings, but also through his social policies. He was far ahead of his time with his numerous of his social initiatives, for example the inventory premium that was first issued in 1866 and was the forerunner of today’s profit-sharing. In 1872 he founded the company pension scheme with a pension, widows and orphans fund – more than a decade before the introduction of statutory requirements governing provisions for pensions and surviving dependants. This fund was at the same time a means of reinforcing employees’ loyalty to the company. Werner Siemens described this mixture of entrepreneurial calculation and paternalistic responsibility as “healthy self-interest”. His maxim was to meld the interests of his workers with the goals of the company.

In addition to his scientific and entrepreneurial activities, Werner von Siemens was also a politician. As an elected representative of the Deutsche Fortschrittspartei he was a member of the Prussian state assembly from 1862 to 1866. In 1879 he was involved in setting up the Engineering Society (Elektrotechnischer Verein), which encouraged the introduction of faculties for electrical engineering at technical universities. Werner von Siemens was also a patron of the Physical and Technical Institute of the Reich when it was founded in 1887. He not only provided generous funding, but also donated a plot of land in Charlottenburg on which the institute was built.

The entrepreneur Werner von Siemens was not just successful because of his discovery of fundamental technical principles, but because as a scientist and

businessman he thought the whole process through from invention to marketable product and system solutions. During his lifetime Werner von Siemens received numerous honors in recognition of his services to both science and society: these included an honorary doctorate bestowed on him by the Philosophy faculty of the University of Berlin (1860), appointment to the Royal Prussian Academy of Sciences in Berlin (1873) and investiture as knight of the Pour le Mérite order in the class for scientific and artistic achievement (1886). In 1888 he was raised to the nobility by Emperor Friedrich III. Werner von Siemens officially retired from the business in 1890, but he still had an important influence on it until his death on December 6, 1892.