

Jürgen Steiner

The Glass Pioneer

Otto Schott 1851–1935



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With the involvement of
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Foreword

Otto Schott (1851–1935) occupies an outstanding place in the history of glass science and glass technology. Yet, until now, there has been no comprehensive biography of this important pioneer of glass. His 175th birthday on December 17, 2026 provided a welcome occasion to close this gap.

This biography is the first to present all facets of Otto Schott's life and work in a comprehensive way. It begins with his family background in a long-established glassmaking lineage, continues through his lasting contributions to the material glass, his successful role as founder and driving force behind the Glastechnisches Laboratorium Schott & Gen. (Glass Technology Laboratory Schott & Associates) in Jena, Germany, his support of Ernst Abbe in establishing the Carl-Zeiss-Stiftung (Carl Zeiss Foundation), his sense of responsibility toward his employees, and extends to his private life, his public minded engagement for the city and the university of Jena, and finally his political stance as a co-founder of the Deutsche Demokratische Partei (German Democratic Party). Since Otto Schott led the company he founded for more than forty years, this biography also offers a journey through the corporate and innovation history of the early decades of what is today SCHOTT AG. Likewise, it provides a journey through half a century of Jena's urban history, as Schott – through his scientific, entrepreneurial, and civic activities – left a visible imprint on the city for a considerable period.

In assessing Otto Schott's life's work, we also give contemporary voices from his former spheres of influence the opportunity to speak – representatives of SCHOTT, the Carl Zeiss Foundation, the international glass industry, and the cities of Witten and Jena. The biography is complemented by a documentation section that shows the many places where Otto Schott left his mark.

This book is not intended as an academic publication. For that reason, it does not include a scholarly apparatus of notes, sources, or bibliographic references. Nevertheless, it maintains the clear expectation that all presented facts are accurate and verifiable. The biography is intended not only for experts and researchers, but also for interested laypeople and the general public. Images and graphics, as well as highlighted quotations, are meant to enhance the reading experience. Interspersed info boxes serve to place the described events within the broader context of glass history and contemporary history.

Original materials from the SCHOTT Archives in Jena, published primary sources, and subject specific articles and monographs form the information base for this work. Special importance is due to the economic historian Herbert Kühnert. After Otto Schott's death in 1935, he was tasked with organizing Schott's estate and building a corporate archive. Kühnert's edited sources and his partial biography of Otto Schott's early years offer a true treasure trove, even if these publica-

tions sometimes dwell too much on detail at the expense of broader context. In scholarly literature, Otto Schott long stood in the shadow of his partner Ernst Abbe. Kühnert corrected previous authors' claims that Schott played a supposedly subordinate role compared to Abbe, and through his well-documented source studies, he restored Schott's life's work to its proper light.

For those who wish to conduct additional in-depth research on particular aspects of Otto Schott's work or the history of the SCHOTT company, the SCHOTT Archives offers abundant material for further source-based study.

I would like to extend my heartfelt thanks to two individuals for their exceptionally valuable support in preparing this book: Judith Hanft, History Manager at the SCHOTT Archives, for her extensive assistance with research and her personal exchanges about the content; and to student assistant Maximilian Urbaneck for his at times very elaborate image research.

For me as the author, working on this biography was an extremely enriching personal experience. The more deeply I immersed myself in Otto Schott's life, the more often I felt as though I were getting to know him ever more closely – indeed, as though I were entering directly into his world of life and thought.

I wish all readers great enjoyment in reading this book and in encountering a truly fascinating personality.

Jürgen Steiner

Born into Glass



Otto Schott was born in 1851, during the early phase of the Industrial Revolution in Germany, into an old family of glassmakers. His father was co-owner of a window glass factory in Witten, which meant that Otto was exposed to glass production from a very young age. Even as a student, he showed a special interest in the natural sciences and technology.

Friedrich Otto Schott was born on December 17, 1851, in Witten on the Ruhr. His father Simon (1809–1874) had come to the small town in what later became known as the Ruhr region in 1832 from Lorraine, where he had found employment as a window glass maker at the Müllensiefen glassworks in nearby Crengeldanz. There he met Karoline Hahne (1811–1899), the sister of two of his colleagues. Karoline and her brothers came from a farming family.

Simon and Karoline married in 1836. They had seven children: Jakobine (b. 1839), August (b. 1841), Gustav (b. 1843), Richard (b. 1845), Rudolf (b. 1848), Friedrich Otto (b. 1851), and Ewald (b. 1853). Friedrich Otto was the second youngest of the siblings. “Otto” soon became his commonly used first name, while the full name “Friedrich Otto” appeared only in official documents.

Family Roots in Lorraine

Thus, Otto Schott was born into a family of glassmakers whose roots can be traced back to the early 18th century in Lorraine, France. Family records are found in the villages of Dagsburg, Hommert, and Harreberg in the northern Vosges. While Otto’s great great grandfather Johann Sr. (ca. 1701–1756) was still listed as a farmer in the civil registry of Dagsburg, his great grandfather Johann Jr. (ca. 1730–ca. 1800) is the first documented member of the family to have worked in a glassworks – thus beginning the Schott family’s glassmaking tradition. His employer in Harreberg ran one of several glassworks that had settled in the forested regions of the Vosges, taking advantage of the local availability of raw materials and fuel.



Otto Schott's father Simon, around 1869.

Otto Schott's father Simon was born in Hommert and trained as a glassmaker in a hollow glass factory. He then embarked on the traditional journeyman travels, during which he learned window glass production in glassworks near Lyon and in the Saarland. After moving to Witten, he began working in 1832 at the Müllensiefen glassworks in Crengeldanz. At that time, it was the only window glass factory in the region and benefited from the rapidly advancing industrialization. In the second half of the 19th century, it became one of Germany's leading producers of sheet glass. Decades later, in 1932, it was taken over by Deutsche Tafelglas AG. Today, the factory still exists as a production site for automotive glazing operated by the British flat glass manufacturer Pilkington,

which has been part of the Japanese glass group Nippon Sheet Glass since 2006.

After more than 20 years as an employed window glass maker, Simon Schott became an entrepreneur himself. In 1853, when young Otto was not yet two years old, Simon founded the window glass factory Haarmann, Schott & Hahne in Witten together with three local merchants and his brother-in-law Karl Hahne. The company was established near the Witten railway station and developed successfully. Within just a few years, it surpassed Simon's former employer in production volume and revenue. In its best years, the factory employed between 300 and 350 workers.

Childhood and Youth in Witten

Otto Schott's connection to the material glass was, in a sense, placed in his cradle. From earliest childhood, he came into contact with glass production – especially since, beginning in 1855, the family lived in a house located directly next to his father's factory. As a young boy, he could already watch the glassworkers draw molten glass from the furnace and process it into window glass.

Otto Schott's childhood fell during the early phase of the Industrial Revolution in Germany, a period in which the country evolved from an agriculture and craft-based society into an increasingly industrial one.



Haarmann, Schott & Hahne glassworks in Witten on the Ruhr in the 1860s.

The Industrial Revolution

The industrialization of Europe – and later the United States – during the 18th and 19th centuries has been referred to as the Industrial Revolution since the 1830s, in conceptual analogy to the French Revolution, with its profound political changes.

The Industrial Revolution began around 1760 in Great Britain with the invention of the steam engine and the rise of the textile industry. It was characterized by the development of machinery, the use of steam power to generate energy, and the large-scale processing of coal and iron. With technological progress, industrial manufacturing in factories replaced the traditional hand-craft production of earlier workshops. The expansion of railroads and transportation systems further accelerated industrialization.

Industrialization brought far reaching changes to economic and social structures, as well as to working and living conditions – and was accompanied by enormous population growth.

In Germany, industrialization began only in the 1830s, as the country was still composed of numerous small states. This changed only with the creation of the German Customs Union in 1834, which facilitated rapid industrial development through economic integration in matters of trade and customs. The period of high industrialization – from the political unification of Germany in 1871 to the beginning of World War I in 1914 – is sometimes referred to as Germany's "Second Industrial Revolution." During this era, Germany became the world's third largest industrial nation after Great Britain and the United States.

“At the age of 6, I entered the elementary school in Witten. Owing to the rapidly increasing population caused by growing industrialization, the classes were extraordinarily overcrowded. About 70 to 80 children were taught by one teacher.”

Otto Schott in his childhood recollections, written down in 1919.



Otto Schott at age 14.

In elementary school, Otto was taught in a class of 70 to 80 children. The oversized class sizes were a consequence of the city's explosive growth. At that time, Witten belonged to the Prussian Rhine Province and was located in the southeast of the rapidly emerging Rhenish Westphalian industrial region, later known as the Ruhr area. With the expansion of the railway network and the establishment of numerous factories, Witten's population tripled from just under 5,000 in 1850 to 15,000 in 1870. One can imagine the enormous challenges this created for the schools in the booming region.

Although the Schott children were baptized Catholic, their mother Karoline raised them in the Protestant faith. Consequently, Otto Schott was confirmed in the Evangelical Church.

After three years of elementary schooling, Otto transferred in 1861 – at the age of nine – to a newly opened Höhere Bürgerschule (secondary school) in Witten. According to his own recollection, he “did not enjoy this school very much.” Apparently, his teachers failed to spark his interest in the curriculum, which included Latin and French.

“I much preferred to occupy myself with technical matters. From a practical textbook on mechanical engineering that my older brother had received for Christmas, I had read so much that during class I would freely draw various types of steam engines from memory in my notebook. And I surely knew more about the construction, shapes, and applications of steam engines at the age of 10 or 12 than what was found in my schoolbooks.”

Otto Schott in his childhood recollections.

A Longing for Technical Knowledge

Looking back, Otto Schott recalled that he had not been raised very strictly; rather, his parents allowed him considerable freedom.

From an early age, his interests lay in the natural sciences and technology. His fascination with his aunt’s sewing machine and a steam engine he built himself showed how quickly he acquired technical understanding. The carpentry workshop of his father’s glass factory, the machine shop owned by a schoolmate’s father, and the nearby locomotive factory all offered ample opportunities for him to explore technological relationships and gain his first hands on experience.

His “burning longing for technical knowledge,” as he later put it, could not (yet) be satisfied at the Höhere Bürgerschule. Although the school authorities intended to develop it gradually into a Realschule (intermediate secondary school) with

a science and mathematics focused curriculum, Otto benefited from this shift only in his final two years there.

Naturally, his interests were shaped by his family environment, where much revolved around glass, technology, and entrepreneurship. This influence grew even stronger when his older brother August – following their father’s example – founded another window glass works in 1865/66 together with business partners: the company Buchholz, Schott & Heidsieck in Annen near Witten. The 14 year old Otto showed great interest in his brother’s activities, and August gladly shared his experiences with him.

As Simon Schott rose socially and economically – from a simple window glass maker to co-owner of a glass factory – the family achieved a measure of prosperity. In 1862, they moved into a newly

“Instruction in foreign languages – apart from German – was completely absent, which allowed that much more weight to be placed on mathematics, physics, chemistry, and drawing. I remember vividly how the first lessons in the two natural sciences captivated me, so that I always received very good grades in these subjects.”

Otto Schott in his childhood recollections.



Otto Schott around 1868/69 during his school years in Hagen.

built house on Bahnhofstrasse in Witten. Fully aware of the limitations he had faced due to his own modest schooling, Simon Schott understood how important a solid education was for future professional success. So in 1867, he enabled his now 15 year old son Otto to transfer to the Gewerbeschule (technical school) in Hagen, about 20 kilometers away. The school's emphasis on science and technology suited Otto extremely well.

Technical schools like the one in Hagen were being founded in many places at this time against the backdrop of rapid mechanization and industrialization.

After two years, Otto Schott passed his school leaving examination in the fall of 1869 at the age

of 17. His certificate attested to particularly strong performance in physics, chemistry, and mineralogy.

The fact that he did not graduate from a classical Gymnasium (grammar school) but from a technical school with a strong scientific focus would become relevant again years later at the end of his university studies.

By the time Otto finished school, his father Simon had already withdrawn from the business operations of his glass factory. Since 1867, he had remained only a silent partner.

“In physics, his knowledge extends over the entire field of this science. In chemistry, his commendable knowledge is based on his own quite clear understanding, supported in particular by the numerous experiments performed during instruction. In mineralogy, his good knowledge covers a number of the most technically important minerals.”

Excerpt from Otto Schott's 1869 graduation certificate.

With his diploma in hand, Otto could in principle have begun his intended studies in chemistry immediately. But at his father's urging, he first undertook a several month educational journey through northern France to gain experience in independence and personal responsibility, improve his French, and complete short internships that gave him insights into a coal mine and various chemical and glass factories. After returning home, he also completed a six-month internship at a chemical factory in Haspe near Hagen, where he familiarized himself with the methods of analytical chemistry, which deals with the composition of substances.

Even at a young age, fundamental virtues took shape in Otto Schott: diligence, perseverance,

determination, a strong sense of responsibility, curiosity about the natural sciences and technology, and an instinct for entrepreneurial thinking. These qualities would serve him well throughout his life.

Further Reading

Herbert Kühnert: Otto Schott. Eine Studie über seine Wittener Zeit bis zur Gründung des Jenaer Glaswerkes. Witten 1940

Jürgen Steiner: Otto Schott – Wissenschaftler, Technologe, Unternehmer mit gesellschaftlicher Verantwortung. In: Jenaer Jahrbuch zu Technik und Industriegeschichte 3 (2001) pp. 7–26

