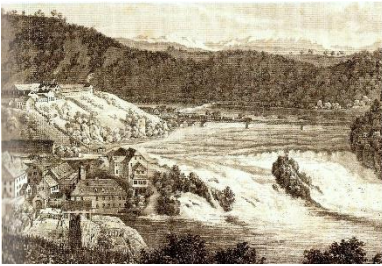


The Rhine Falls

Barrier – Power Source – Natural Wonder

**A concise Visitors' Guide to the exhibition
about the historical relevance of the most powerful waterfall in Europe,
from the Middle Ages until the beginning of the 20th century,
and about the rise of the industry in this area in the 19th century.**

Introduction and Overview



The Rhine Falls and the River Rhine played a decisive part in shaping the social, economic and industrial development of the Schaffhausen area.

As a **traffic barrier** interrupting the transport of goods on the Rhine it encouraged the **growth of trade and commerce** right up to the 1800s. (**Section 1**)

As a **source of mechanical and later electrical power** it enabled the massive **establishment of industrial enterprises** after the 1850s. (**Section 2**)

As a place of **unique, impressive natural beauty** it attracted **artists and writers** in the 18th and 19th centuries and later on **tourists** from all over the world. (**Section 3**)

A special part of the exhibition is dedicated to the transition **from manual to industrial production** and to the pioneering spirit that **gave rise to the various branches of industry** in what was to become a major industrial area in Switzerland. (**Section 4**)

Rhine Falls Facts in Brief

Age: 15'000 years

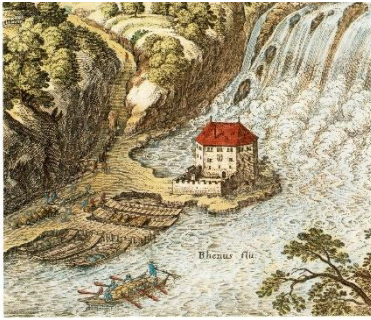
Height: 23 metres (75 ft), **width:** 150 metres (490 ft)

Waterflow: Minimum 95'000 litres/sec; maximum 1'250'000 litres/sec; average 600'000 litres/sec

First written account in 12th century, **first pictures** 1544/48

Water utilization: Milling rights granted to Allerheiligen monastery Schaffhausen in mid-11th century; first industrial plant (iron works) 1810

Section 1: The Traffic Barrier – Trade and Commerce



Goods shipped on the Rhine, a major traffic route since the middle Ages, had to be unloaded onto horse-drawn carriages and driven around the Rhine falls or stored and traded in Schaffhausen. The main cargo east-west was salt from Tyrol and Schaffhausen wine in the other direction. Trading companies and craftsmen's establishments flourished.

The benefits from the salt trade and a strong Guild System protected the home market and secured prosperity until the early 1800s. This ended with the discovery of enough salt in the Rheinfelden area to provide for the needs of the whole of Switzerland. With the end of the salt trade, the return trade with wine collapsed too. The result was an economic crisis that lasted into the 1850s and forced a considerable number of inhabitants into emigration to the Americas.

Section 2: The Energy Source – Industrialisation



The power from the cataract was used early on to drive water mills and a spinning mill. An ironworks and forge marked the start of industrialisation on the Rhine Falls.

On its heyday in the second half of the 19th century, various industries established themselves here, producing railway-carriages, small-arms (the SIG company) as well as Europe's first aluminium smelter using the pioneering electrolytic melt-flow technology (the AIAG company, later Alusuisse). The increasing demand on energy from the Rhine Falls clashed with the preservation of the natural beauty of the area, but improved efficiency of turbines and generators solved this conflict. Moreover, the industrial pioneer Heinrich Moser built a dam across the river above the Falls in Schaffhausen in 1866, which provided the energy needed to attract industries to the town of Schaffhausen and make it one of Switzerland's manufacturing centres.

Section 3: The Natural Phenomenon – Tourism



The waterfall first aroused the interest of scientists who described it and tried to understand how it had been formed. In the 18th and early 19th centuries, its natural beauty and imposing size attracted artists and writers, notably the great painter William Turner and the Romantic poet William Wordsworth. They were followed by wealthy travellers on their educational "Grand Tour" through Europe.

When roads were improved and the railways reached the area in the 1850s, travelling got cheaper and easier and gradually mass tourism set in. Hotels were built, some of them quite grand, and tourism became a new industry at the Rhine Falls. Apart from many famous artists, writers and composers, the impressive list of visitors includes the Russian Czar Alexander I, the Austrian Emperor Franz Joseph with his beautiful wife Sissi, the French Emperor Louis Napoléon Bonaparte, the German Emperor Friedrich III or the British Prime Minister Lord Palmerston. This tourist boom came to an end with the outbreak of the First World War in 1914.

Section 4: From Handcraft to Industry – The Story of Industrialisation until 1900



The economic development of the Schaffhausen area basically went through **three stages**. The first stage saw the flourishing of trade and handcrafts driven by the salt and wine trade in a well-protected market system. The crash of the salt trade caused an economic crisis that lasted into the 1850s. The foundation of the Swiss Federal State in 1848 on liberal principles of free trade and open markets encouraged pioneering entrepreneurs to exploit these possibilities. Numerous factories were established and new technologies introduced with the result that the area around the Rhine Falls and Schaffhausen developed into a major manufacturing region.

Stage 1: Heyday of the Guild System and Salt Trade (Middle Ages until c. 1800)

The River Rhine was the main east-west traffic route; most goods were transported by riverboats. The Rhine Falls made it necessary to load and unload the goods. This made Schaffhausen a prosperous trading town. After 1411 the Guilds protected their businesses with rigorous Guild Laws preventing any competition from outside. Great wealth was created by the booming trade with corn, imported goods from overseas, and above all with salt imported from Tyrol and wine exported along the same route in return. Until 1800, Schaffhausen remained an important centre for trade, commerce and transportation.

Stage 2: Crash of the Salt Trade and Collapse of the Protective Guilds System (1800-1850)

Two main causes ended this situation: First of all, salt was discovered in 1836 further down the Rhine, which made Switzerland independent from imports. This killed the salt trade in Schaffhausen as well as the wine exports to Tyrol along the same route. Secondly, the newly founded Swiss Confederation passed legislation to liberalise the economy, open the markets and create equal opportunities for everyone. The Schaffhausen businesses, up to then well-protected, were badly prepared for this new, competitive environment. Together with adverse climate conditions, a major economic and social crisis arose, unemployment and emigration were widespread. The area began to recover when entrepreneurs with a pioneering spirit grabbed the chances that an open market offered.

Stage 3: Pioneer Spirit, Growth, Industrial Hub (1850-1900)

After 1850, inventions, new technologies and industrial branches began to establish themselves. Innovation and competitiveness were the guiding principles. Dozens of major manufacturing businesses were created in the decades until 1900, and most of them flourished despite the setback created by the Franco-Prussian War of 1870/71.

Timeline of major industries created between 1800 and 1900

In **1802**, **Johann Conrad Fischer** established a small iron foundry in Schaffhausen and used it to develop new alloys. This was the beginning of the **Georg Fischer GF** company. Fischer was the first to produce cast steel on the Continent. In the same innovative spirit, his son Georg Fischer produced the first cast parts in malleable iron and developed the cast steel business.

From **1810** on **Johann Georg Neher** installed a blast furnace next to the Rhine Falls (**Eisenwerk Laufen**) and started an industrial production of cast iron products using iron ore mined locally and in eastern Switzerland. The iron business stopped being competitive in 1887, when the facilities were finally taken over by the newly founded Aluminium-Industrie AG.

In **1828**, **Jakob Ziegler** started an **earthenware factory** on both sides of the Rhine just above the Falls, producing tiles, pipes, chemical vessels and kitchenware.

In **1842**, the **Rauschenbach** brothers started a **mechanical workshop** producing agricultural machinery, soon with exports all over Europe. To this was added a wire nail factory.

1853 was the starting year for the company that was to dominate the Neuhausen industry location: The **Schweizerische Waggon-Fabrik**, to be re-named **Schweizerische Industrie-Gesellschaft SIG** in 1863. They manufactured railway carriages for the upcoming construction of railways in Switzerland. It was driven by mechanical transmission from the Rhine Falls turbine.

In **1854**, **Jakob Amsler-Laffon** exploited his inventions by founding a facility to produce **high-precision apparatus and instruments for measuring and materials testing**.

In **1857**, the **railways** reached the Schaffhausen area, with a bridge crossing the river right on top of the Falls.

In **1862**, part of the Neher ironworks plant was taken over by the **Schweizerische Industrie-Gesellschaft SIG** for the production of innovative small-arms for the Swiss Army in the making.

A key-figure for the young Schaffhausen industry was **Heinrich Moser**, a wealthy industrialist, who in **1866** realized the project of a dam across the Rhine above the Rhine Falls, with turbines driving a system of mechanical transmissions to link the newly built factories along the Rhine. By 1875, 33 plants received their energy from this "**Moser Dam**". Moser, with his dam, was the catalyst of the industrialisation and new wealth of the area. The steel cables used were produced by the **Schweizerische Seil-Industrie AG Schaffhausen**, the first steel-cable producer in Switzerland founded by **Carl Oechslin** in 1860.

In **1867** **Rudolf Schoeller** opened his **worsted spinning mill**, the first of its kind in Switzerland. Attracted to this site by the energy supply from Moser's dam, the plant was Schaffhausen's main employer in 1889 with over 400 workers and later achieved fame with its wool branded "Schaffhauser Wolle".

Another company to become world famous, the **International Watch Company IWC**, was founded next door by the US-watchmaker **F.A. Jones** in 1868. It was taken over by **Johannes Rauschenbach** in 1879, after Jones faced financial problems with his expansion plans.

Innovative technology was the basis of another start-up: **Heinrich Theophil Baeschlin** pioneered the industrial processing of degreased cotton into absorbent cotton. He started the **Internationale Verbandstoff-Fabrik IVF** producing antiseptic, hydrophilic bandaging material.

Since 1874, the **Schweizerische Bindfadenfabrik** producing strings, cords and packthreads sourced its energy over a 150 meters-long inclined shaft from Moser's dam 50 meters below the plant.

In 1888, another major step was made at the Rhine Falls: The **Aluminium-Industrie-Aktiengesellschaft AIAG** opened Europe's first aluminium smelter using the new electrolytic melt-flow technology. The considerable amount of electric energy necessary was supplied by efficient turbines made by Escher-Wyss Zürich and dynamos from Maschinenfabrik Oerlikon, driven by water from the Rhine Falls. The company grew rapidly and expanded production to the Valais area in southern Switzerland in 1905.

An exhibition at the Museum am Rheinfall by the Museum im Zeughaus Schaffhausen.

www.museumimzeughaus.ch