Bridges that Changed the World.

In the Land of the Aryans and Khorasan
The Beam Bridges of Afghanistan

"The giant raised a hill onto his shoulders and cast it into the river. 'I want to see how big the hill is,' cried the prince, starting to run over the hill that formed a bridge across the river. He ran until dawn and then the whole of the next day before reaching the other side. Only in this way is it possible for a mortal being to cross the river into the realm of the fairies."

A river crossing as described in the Afghan fairy-tale The King with Forty-One Sons

Just as native North Americans were able to make use of the 32-meter-high Landscape Arch in present-day Utah to cross a mountainside, in the Afghan tale, the king's eldest boy uses a natural bridge to cross a river. In his case, however, the crossing was not created by erosion, but by a giant. It also happened to be the way to the land of the fairy queen, Shah Bolshah Pari, whom the prince hoped would be able to cure his ailing father. Figures in other Afghan tales were not quite so lucky; the king's three sons leading a caravan in the tale The Prince with the Magic Horse, for instance, are always on the lookout for fords where their camels and horses can cross rivers in safety.

Rivers played an important role in the history of Afghanistan's Stone Age inhabitants, the Aryan peoples of antiquity, as well as the Ghaznavid and Ghurid rulers in medieval Khorasan. They offered the people some protection from their enemies, but the Persians, Greeks, Huns and Mongols eventually conquered the fiercely disputed territory and ravaged it. Rivers also proved to be obstacles for the people they protected, cutting off trade and military traffic. To increase long-distance trade and ease of movement for their own military expeditions, the region's peoples built beam bridges such as the one that has survived east of Qala Panji.

Tree trunks were laid across rivers and secured at either side using boulders, while branches and flat stones were used to make the walkway. A large span could not be created using such a technique, so to bridge a wide river, local builders had to take their inspiration from the advanced and densely wooded Chinese provinces to the northeast. As long ago as 305 B.C., the Chinese prince Chao Hsiang had a 2,000-foot-long wooden bridge built across the Wei river. Forty-eight years later, at the command of the ruler Chao Hsiang from Ch'in, a similarly sized wooden pontoon bridge was built across the Yellow River. An ancient Chinese book called Rivers by Li Dao Yan (c. 472–522) even describes a wooden bridge near Paohan in the province of Gansu that was built during the Yi era (405–418) on the cantilever principle and which had a span of 13 meters. These examples illustrate how Chinese bridge building techniques were far in advance of those found in the realms of the Aryans and Khorasans where war and destruction greatly hindered technological progress.
The Eighth Wonder of the World
The Göltzsch Valley Bridge in the Vogtland 1846–51

Look upon this masterpiece/The eighth wonder of the world, the Göltzsch Valley Bridge! This bridge that arches up to the blue of the sky/Is dedicated to its valiant builders.

Declaimed as the keystone was set in place,
September 14, 1850

The guests attending the ceremony marking the completion of the Göltzsch Valley Bridge in 1850 regarded the construction as the eighth wonder of the world — and not without reason. At 78 meters high and 574 meters long, the bridge had been built to symbolize a successful process of industrialization. King Frederick August II of Saxony (reigned 1836–54) set the last stone and with three hammer blows thanked all those whose physical strength and intellectual power had contributed to the project. In his speech, Prince Albert (1828–1902) in particular stressed the name of foreman Robert Wilke as the creator of the bridge. No mention was made of its structural engineer, Professor Johann Andreas Schubert (1808–70), who had fallen out of favor, having two years earlier expressed his support for democratic principles in an "Open Declaration" to the German National Convention at Frankfurt. Initially, Schubert enjoyed the greatest confidence and in 1845 was installed as the chairman of a committee that was to judge designs submitted for an international competition. He was, after all, the man who built the first German steam locomotive, the Saxonia.

King Ludwig I of Bavaria (reigned 1825–48) signed a treaty in 1841 with the King of Saxony that would allow the construction of a railway line from Nuremberg to Leipzig, an undertaking that would require engineers to span the deep valleys of the Göltzsch and Elster rivers. None of the 81 submissions passed the scrutiny of the judges and so the Interior Ministry of Saxony assigned the task of structural analysis to Professor Schubert himself. He favored a solid construction of granite and brick. Taking the view that a pier construction with round arches would be both the cheapest and sturdiest option, Schubert designed a four-tier viaduct across the Göltzsch.

The first train crossed the Göltzsch Valley Bridge on a rainy July 15, 1851, a much-anticipated event that was attended by Prince Albert and other prominent figures from Saxony. Yet again, no invitation had been extended to Schubert. The annals of the Saxon Engineering Association record the following comment: "Whenever musicians play a waltz, the program mentions the composer's name. Whenever a steam locomotive thunders across the tallest of bridges at dead of night in complete safety — bridges built under inconceivable hardship and danger—only too often in a short space of time no one round about can recall the name of the man who designed them.

Johann Andreas Schubert (1808–1870)
1808 born March 19 in the Vogtland, the son of an impoverished farmer
1824–28 studies at the School of Building at Dresden's Art School
1828 assistant to the mathematics professor at Dresden's Technical College
1832 becomes professor at Dresden's Technical College
1836 sets up a mechanical engineering company to manufacture efficient steam boilers
1837–39 builds first German steam locomotive, Saxonia, first Saxon Elbe steamer, Königin Maure
1845 structural analyses for the Göltzsch and Elster Valley bridges
1852 member of State Examination Commission for Engineers
1859 dubbed a knight of the Royal Saxon Order of Public Service
1870 dies October 6 in Dresden

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