Woodwork in Šumava and the Bavarian Forest

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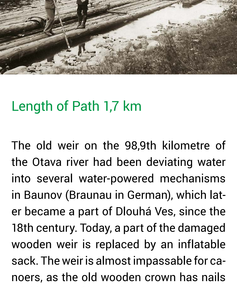
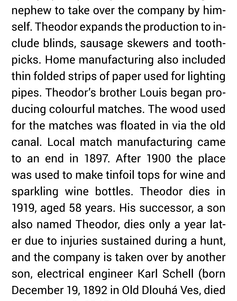


Length of Path 1,7 km

The old weir on the 98,9th kilometre of the Otava river had been deviating water into several water-powered mechanisms in Baunov (Braunau in German), which later became a part of Dlouhá Ves, since the 18th century. Today, a part of the damaged wooden weir is replaced by an inflatable sack. The weir is almost impassable for canoers, as the old wooden crown has nails sticking out of it which can cause damage to passing boats.

The earliest depiction of the flume comes from the first military mapping project (1764–1768). Here it powers a water wheel of the local hammer mill (no. 44). In 1788, the mill was owned by Andreas Hatzinger. A point of interest is a hill southeast of the hammer mill, named Einsiedlerey, depicted with a chapel and a house, which could potentially be a former hermitage. The cadastral map (1824–1843) depicts the flume powering the hammer mill as well as two other mills (house numbers 45 and 46). In those days, the village also boasted a sawmill and five lordly houses.

In 1882, the old hammer mill is purchased by Johannes Schell, originally from the German Hanau am Main, and is rebuilt into



a workshop to produce long thin wooden pieces called wooden wire. In 1885, together with his nephew Theodor Schell, Johannes begins to build a match factory, eventually selling his products under the name Schell & Neffe, Langendorf (Dlouhá Ves). They sometimes take advantage of the popularity of their competitor matches from Sušice by calling them Schüttenhofen (Sušice). At first, the factory employed only 25 workers servicing four basic machines. The first matches were round with a sulphur head, coming in round packages usually decorated with either fairy-tale or carnival motifs. They were also exported into exotic countries, which might be why other common motifs included foreign birds or insects. Unfortunately, the match factory burned down almost completely in 1888 and had to be rebuilt. To make matters worse, Johannes Schell suffered a fatal injury only two years later, leaving his nephew to take over the company by himself. Theodor expands the production to include blinds, sausage skewers and toothpicks. Home manufacturing also included thin folded strips of paper used for lighting pipes. Theodor's brother Louis began producing colourful matches. The wood used for the matches was floated in via the old canal. Local match manufacturing came to an end in 1897. After 1900 the place was used to make tinfoil tops for wine and sparkling wine bottles. Theodor dies in 1919, aged 58 years. His successor, a son also named Theodor, dies only a year later due to injuries sustained during a hunt, and the company is taken over by another son, electrical engineer Karl Schell (born December 19, 1892 in Old Dlouhá Ves, died there June 2, 1945). Karl modernises the factory and restarts its match production in 1922. Given the growing use of electricity, he also begins to modernise the power plant. Around 70 workers spend several years building a new flume and changing the turbine. After the modernisation was completed, the plant also supplied power to the village.

In 1934, Karl Schell marries the daughter of a former glassworks owner from Annín, Betty Novotná, and ends up buying the glassworks. As he has plenty of electrical power, he decided to use it to melt raw glass. Despite that, he adds another turbine to the power plant and invites glassmakers from northern Bohemia to assist him with the furnace. The glass melted here is then transported to Annín for final adjustments. At the time it was only the second electric furnace in Czechoslovakia. Schell received several awards for it, including a diploma from the Chamber of Commerce in Prague and a golden medal from the Brussels exhibition of 1936.

Whole text

DLOUHÁ VES

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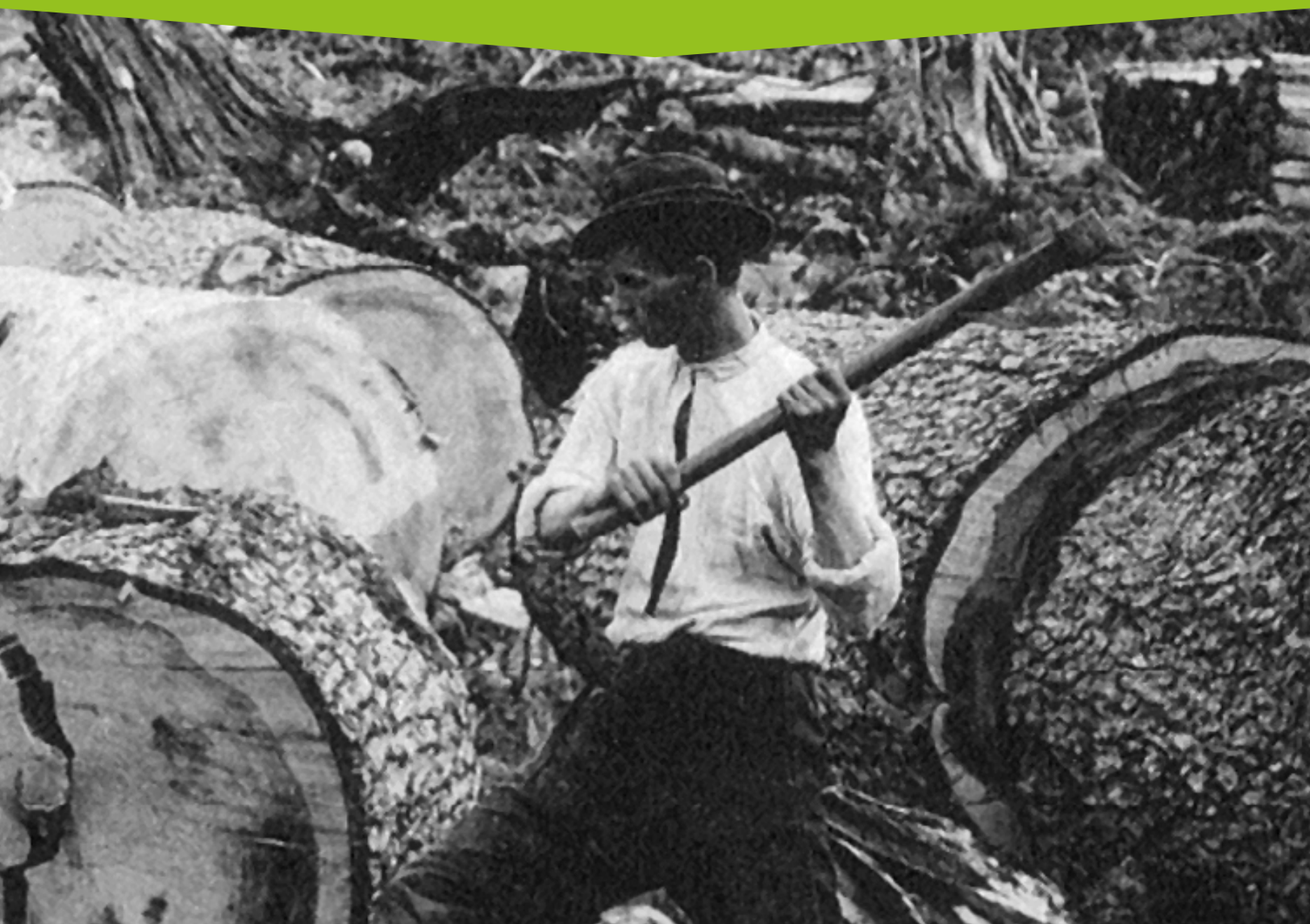


Length of Path 1,7 km

We learn about the species composition of the original Šumavian forests from pollen analyses of sediments found, for example, at the bottom of Šumava's lakes. We know that towards the end of the Ice Age, about ten thousand years ago, pines and hazels used to be dominant in these forests. Spruces appeared about eight thousand years ago and gradually came to outnumber other species even in medium elevations. Approximately two thousand years ago, spruces made up 40% of the forest cover while beeches and firs together accounted for 37%.

The forests were initially utilised as a source of fire fuel, and the ashes from slash-and-burn and clearing processes would eventually be used as fertiliser for new small fields. Later, wood ash was used to make potash used in glassworks and timber was used to produce tar as well as grease for carriage wheels or for charcoal production. Local forestry changed once the majority of Šumavian forests came to belong to the Schwarzenberg house (they acquired the Krumlov duchy and the Vimperk estate in 1719, the Prášily estate in 1798 and Dlouhá Ves in 1800). They realised that directly selling the timber would be more profitable than using it for glass production. To improve transportation, they constructed floating canals as well as new settlements to house more workers.

It was not until the mid-18th century that anxieties over possible timber shortages were voiced. In 1753, Marie Therese introduced the Forest Law which aimed to “improve and preserve forests”. According to the law, forest administration was to be overseen and careless uneconomical cutting was forbidden. Cut down forests had to be clearcut and regrown. Trees could only be cut down between November and February. Building wood could not be sold for fuel and international sales required the highest permission status. This law was in use until a new one was passed in 1852.

The oldest logging practice was the so-called “wandering cut”, wherein people simply cut older or diseased trees for their own need, unobstructed by regulation.

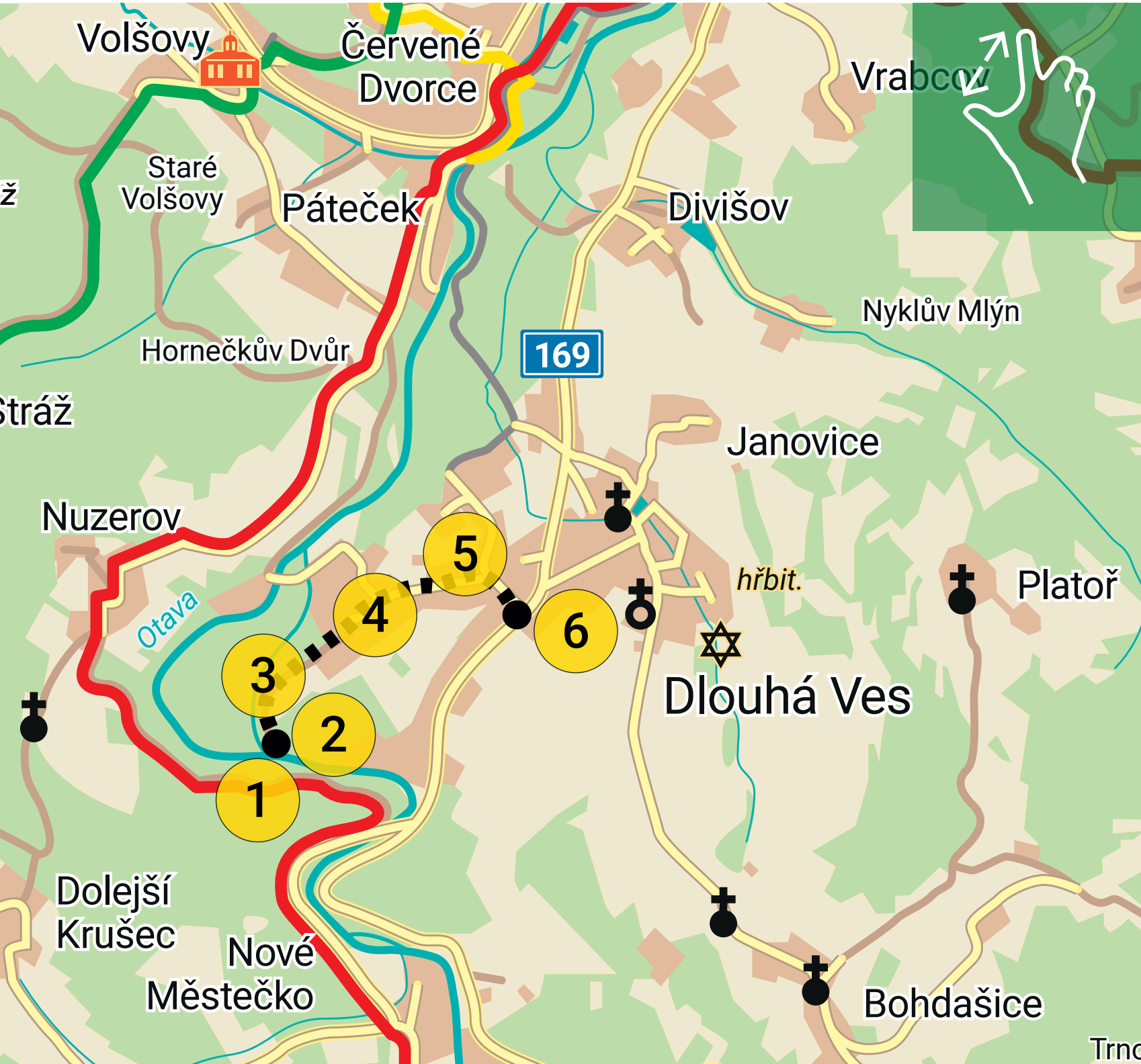
This changed in the early 16th century and was replaced by clearing cuts which would leave some sections of the forest completely bare. Logging was either as part of forest corvée work or done for a wage. The timber was initially sold as standing crop, later per wagon. Trade in timber experienced intense growth from the 18th century. Prices of wood and wooden products were very low. The wood was processed either on the logging site or nearby. However rafting has been recorded as early as 14th century.

Reforestation was at first done by natural regrowth, i.e. by leaving seedlings. The created clearings would be fenced off from livestock. From the second half of the 18th century, reforestation was done by planting new seeds and later nursery plants. The first forest tree nurseries came to be around that time. Only in mid 19th century do young trees with balled roots begin to be planted. Regular thinning begins in the 1840s. Opening up forests from the inside has been forbidden since the 16th century so as to prevent windthrow.

The transportation of building timber for floating was done in winter using a steer-drawn sleigh or a carriage. Timber for fuel was transported using a small sleigh – 'ro-hatky' - which could carry up to three cubic meters of it. While going down a steep hill, a couple of logs tied together by chains were dragged behind the sleigh to slow down the descent. The rafts were assembled at tying station. Logs were bound and held together by a transverse rod and withes. The raft was 150 meters long, 3 meters wide and contained up to 70 cubic metres of timber. During floating, each raft was controlled by a single oarsman in the front and attended by a helmsman and two floaters.

People who lived in places through which the rafts passed were allowed, usually free of charge, to fish out so-called ‘sinkers’ – the logs that became so soaked with water they sank to the bottom of the river. Up until the 18th century, most wood was used up in glassworks to make potash (K_2CO_3). Potash is added to the glass preparation mixture to lower the melting point of silica. One to two tons of wood had to be used to produce just one kilogram of potash.

Šumavian production of wood ash in charcoal piles is tied to iron processing. In the Železná Ruda area, iron had been melted at least since the 13th century. In the mid-19th century, wood ash came to be replaced by coke. The amount of wood used up for wood ash production was significant, an ironworks would consume up to 18,000 meters. Tool hammermills would make their own wood ash. Ferdinand Denkscherz was still building charcoal stacks in the 1950s.



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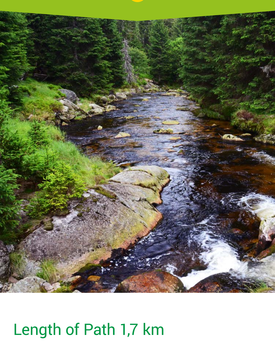

Length of Path 1,7 km

To power itself, the sawmill used the flow of Šumavian streams and rivers which had enough water throughout the year. If that was not the case, small ponds were constructed above mills and sawmills and their water could be used to power the mill wheel instead. Planks made up the majority of Šumavian sawmills' products (the German name die Brettsäge = plank sawmill). In winter, or just as a supplement to the main production, sawmills would also make wooden boxes of various sizes and purposes. The products were then taken from the sawmill to the nearest train station and from there to bigger towns.

The carpenter would make half-timbered structures, log structures, wooden ceilings, rafters, doorframes, wooden staircases, and floors. He would also cover the rafters in laths and shingles, make barn doors or build fences. His tools included axes, wedges and a hammer. To work on wooden beams, he needed a hatchet, a straight and a curved adze, a drawknife, pitons, and measuring equipment such as a plumb line or a compass. To build ceilings, either round logs, carved beams, or planks. Woodworking specialisations developed over time. Joiners specialised in furniture, while others focused on building shops and pens. Some were specialised bridgebuilders and shipbuilders, and some drilled wooden pipes for water distribution. Hatchet men built simple mechanisms, such as mills. The trade was usually passed down within families, from one generation to the next.

During the Middle Ages, joiners were often called 'table-makers' as tables were their main products. Joiners would then specialise further in either common, artistic, or furniture joinery. Some would also specialise in making specific furniture pieces, such as chairs, benches, cradles, or beds. The very skilled ones could become carvers or make musical instruments. Furniture was usually made out of spruce or fir wood, the more expensive pieces from chestnut. Individual parts were fitted into each other using either dovetailed joints or other methods and glued together. The surfaces were then smoothed and evened out by grinding or by using a putty. The joiners also able to make their own varnish, oil, and polish. Wheelers would make not only wheels but whole carriages. In this, they often collaborated with blacksmiths who made the metal parts. Felloes were made mainly from beech, wheel hubs from elm, and wheel spikes from oak. The tongue used to pull the carriage was made out of young elms or maples and the sides from oak or birch.

Wooden wire, long thin pieces of wood used in match production, was often made at home and sold to match factories. It was be 'pulled' out of spruce wood. The production of wooden wire was fairly simple. It was made using a jack-plane with a modified blade. The jack-plane was fitted onto a sawbuck. The finished wooden wire was left to dry out and then bound into packages of 100 pieces. Later it began to be made using machinery directly in match factories. The wire was cut into ten centimetre long pieces of wood which were then packaged and dipped in melted sulphur and phosphorus. Even round matchboxes were often made at home. Wooden wire was also used to in the production of window shutters.

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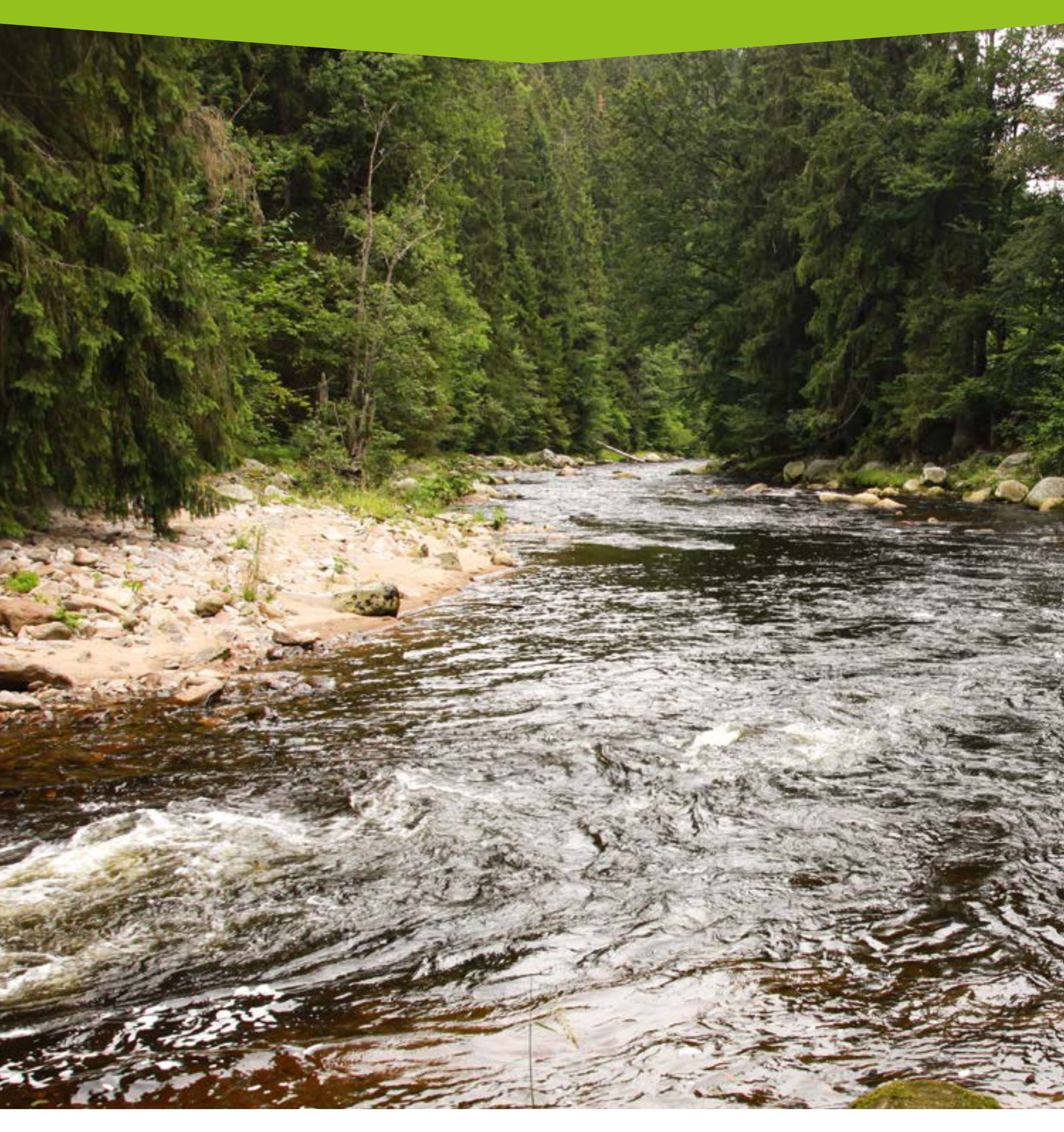
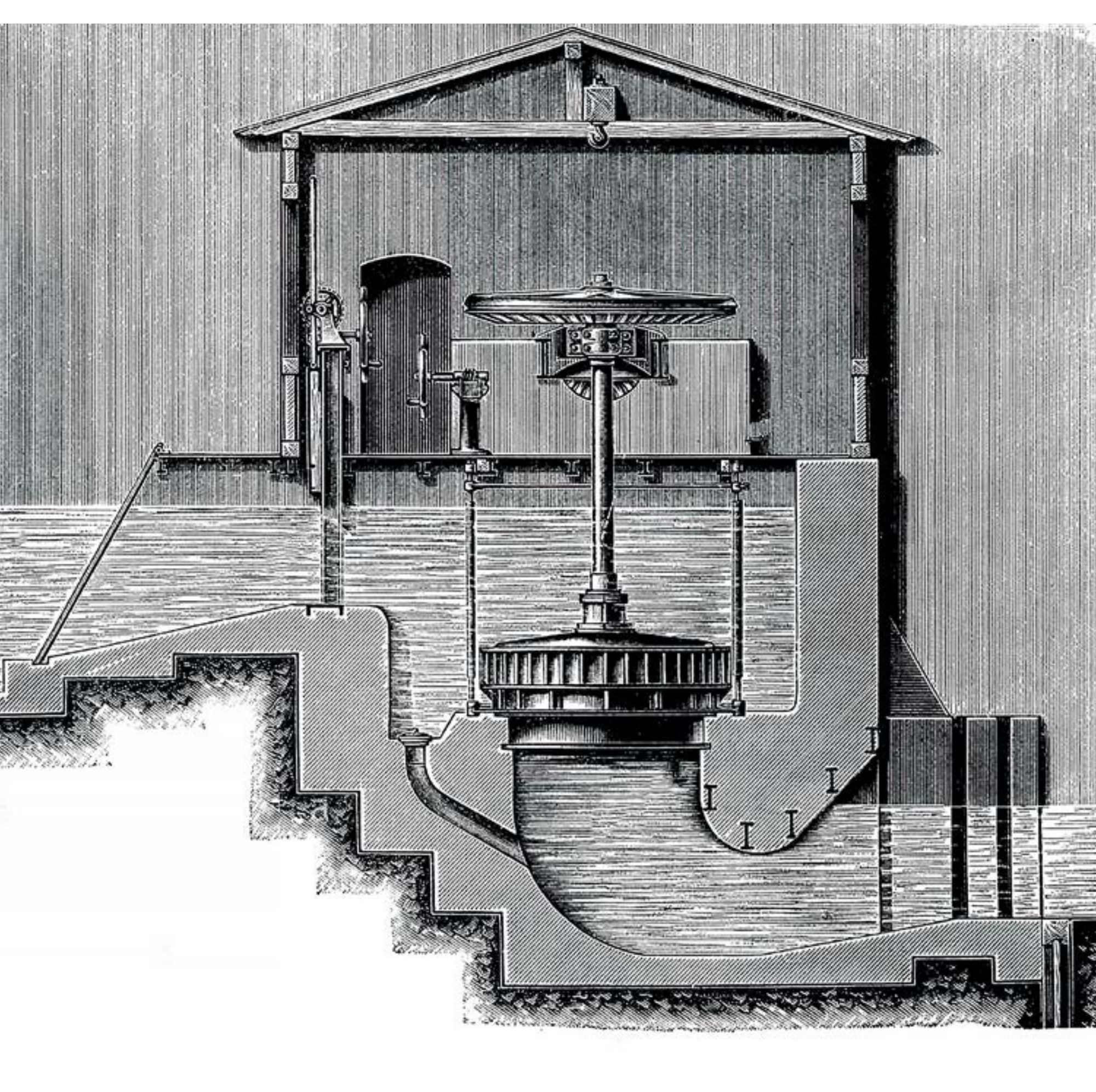


Length of Path 1,7 km

Hydroelectric power is a form of renewable energy, meaning it has the ability to either partly or wholly renew itself. Apart from hydropower, renewable energies includes solar, wind, or biomass power. Hydropower is sourced by taking advantage of the permanent water cycle on Earth. Hydroelectric power stations use both the water's potential energy, which is dependent on the difference in height through which the water falls, as well as its kinetic energy, which depends on the speed of the water flow. The water coming into the power station gives this energy to the turbine, which begins turning the generator connected to it via a shaft. With the use of electromagnetic energy, the mechanical energy of the generator's rotor then turns into electricity. The turbine's output is mainly influenced by the fall gradient, the flow rate, and the turbine's efficiency. The most important part of the turbine is the runner. A number of types of turbines were developed over the years. Here in Dlouhá Ves, they use a Francis turbine, a type of pressured

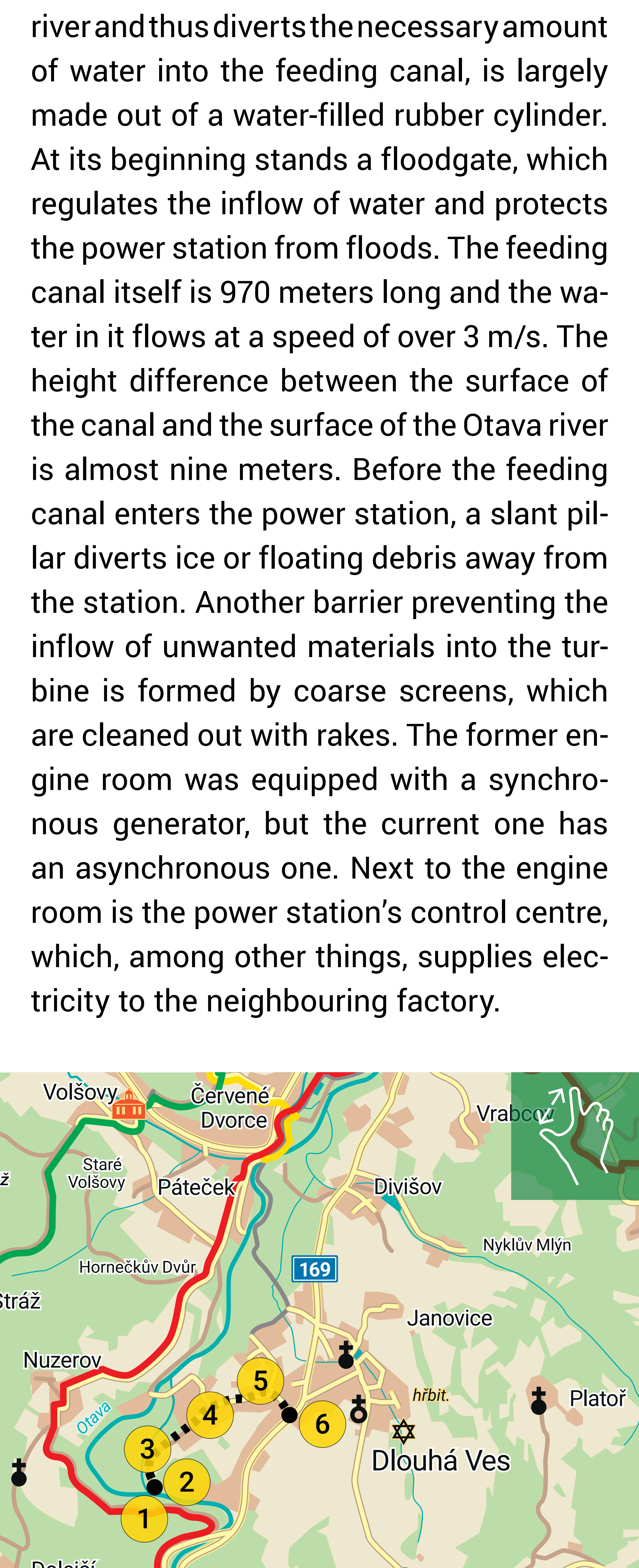


turbine where the water enters horizontally in a spiral case wrapped around the runner. It is the longest used modern turbine. Other types include the Kaplan, Pelton, or the cross-flow turbine. Depending on their output, we differentiate between small hydropower stations such as this one (output to 10 MW), medium stations (100 MW) and large stations (over 100 MW). The local power station can also be classed as a low-pressure one, given its small fall gradient (up to 20 metres). Another attribute which classifies the power station is the way it uses the water course. The Dlouhá Ves power station is run-of-the-river (ROR) and derivational, meaning that the used fall gradient is created by a shortening of the riverbed with a canal.

By the end of 2017, Czech Republic had 1457 small hydropower stations, over 1000 of which were added after 1989. The combined output of these plants is 351 MW. On the 112 km long Otava river alone, 22 hydropower stations with the combined output of 3,6 MW have so far been built. With an installed output of 334 kW (real output 270 kW), the Dlouhá Ves power station is the second most efficient and has the highest yearly output (2,166 GWh).

Other parts of a small hydropower station include a feeding canal which leads the water to the turbine, a trash rack which prevents debris and mechanical impurities from entering the turbine, and an output canal returning water back into the riverbed.

The weir, which lifts the surface of the Otava river and thus diverts the necessary amount of water into the feeding canal, is largely made out of a water-filled rubber cylinder. At its beginning stands a floodgate, which regulates the inflow of water and protects the power station from floods. The feeding canal itself is 970 meters long and the water in it flows at a speed of over 3 m/s. The height difference between the surface of the canal and the surface of the Otava river is almost nine meters. Before the feeding canal enters the power station, a slant pillar diverts ice or floating debris away from the station. Another barrier preventing the inflow of unwanted materials into the turbine is formed by coarse screens, which are cleaned out with rakes. The former engine room was equipped with a synchronous generator, but the current one has an asynchronous one. Next to the engine room is the power station's control centre, which, among other things, supplies electricity to the neighbouring factory.



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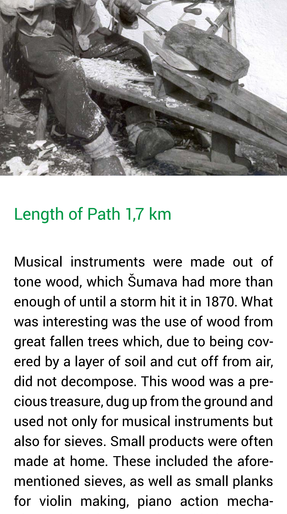


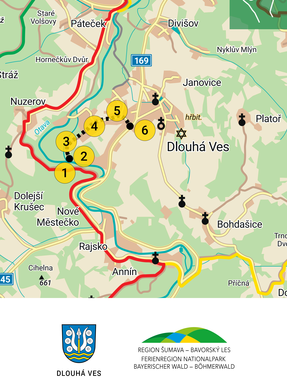
Length of Path 1,7 km

Musical instruments were made out of tone wood, which Šumava had more than enough of until a storm hit it in 1870. What was interesting was the use of wood from great fallen trees which, due to being covered by a layer of soil and cut off from air, did not decompose. This wood was a precious treasure, dug up from the ground and used not only for musical instruments but also for sieves. Small products were often made at home. These included the aforementioned sieves, as well as small planks for violin making, piano action mechanisms, rakes, brooms, shoes, kitchen utensils such as wooden spoons, felloes, shutters, or spinning wheels.

A traditional Šumavian custom involved laying the dead upon funeral planks. This was done in winter when the earth was too frozen for a burial. Once the weather allowed it, the body was put in the ground and the plank was decorated, had the deceased's name carved into it, and was placed either at a crossroads or at the deceased's favourite place. The plank was smoothed out, usually made out of spruce, fir, or even oak. After the funeral, the plank was decorated by carpenters or carvers and painters. The top was adorned with a small roof and the bottom was put into the ground.

In areas that had enough wood, shingles were used in roofing. The oldest ones were long and wide and made out of fir. Sometimes they were laid loosely upon the underlying roof laths and weighted down with stones. Later, the shingle was slanted on one side and the wider side of the plank was placed over the slated side. These were secured with nails. Even later, a spring and slot mechanism was incorporated. Due to the transport cost, shingles used to be made on site, often by Šumavians themselves – the better ones could then be sold while the rest was used for their own need.

Apart from clog shoes, 'neyshls' were also made for everyday use at home. Because most rural inhabitants could not afford leather shoes, 'neyshls' were made partly out of wood and partly out of leather. The bottom part of the shoe was made out of fir. In Old Dlouhá Ves, 'neyshls' were made by Willibald Müller in house no. 103. Willibald made them during his free time for his family and friends. The wooden part, as long as the foot it was made for and about 10 centimetres thick, was worked on while fastened in a carpentry stool or a workbench. The shape of the foot was drawn directly onto the wood before cutting and the heel was carved out with a small handsaw. The rough shape was cut with a drawknife, a round chisel was used to hollow out the inside of the shoe and a dull knife was used to soften the whole product. Appropriately sized and shaped piece of leather was fastened to it with upholstery nails. The leather edges were reinforced with leather straps. Shoes made wholly out of wood, clogs, could be made out of beech wood. They lasted a longer but were very uncomfortable. Their waterproofness was heightened by smoking the finished clogs in the chimney. In winter, they could be "cold-proofed" by stuffing the insides with hay.



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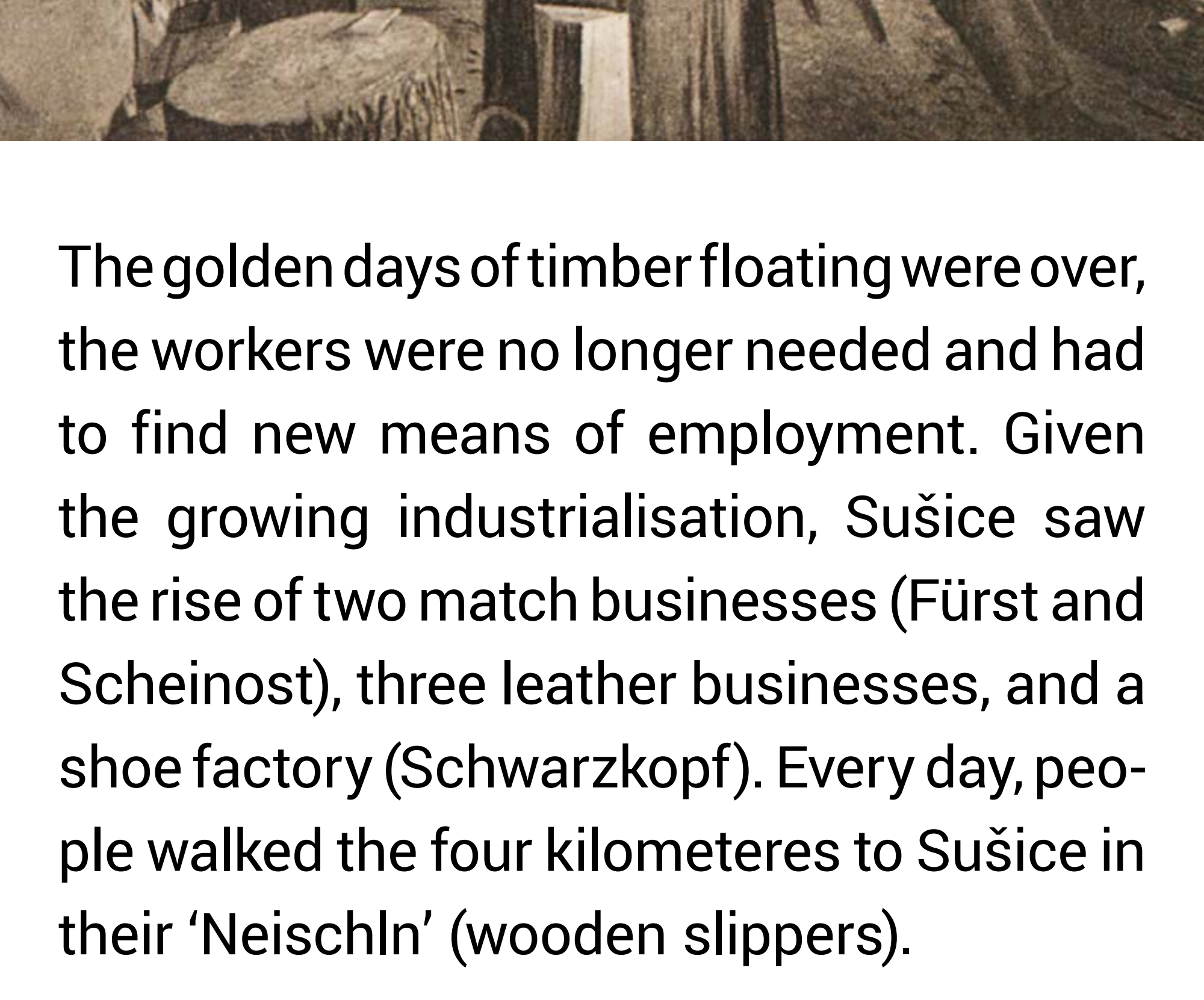
Length of Path 1,7 km

The village of Dlouhá Ves, founded in the 13th century, experienced an unusual level of development after the local estate was purchased by the Schwarzenberg House. According to a contract dated July 12, 1800, prince Josef Schwarzenberg bought the Dlouhá Ves estate for 95 thousand golden pieces and immediately joined it with the recently purchased Prášily estate, making Dlouhá Ves his seat and keeping Prášily as an administrative centre for forestry. The chief reason for the purchase of the Dlouhá Ves estate was to gain a large storage area for wood extracted from the border forests as well as land desperately needed by the loggers, rafters, and other workers required for timber floating. According to the estimates of Ing. Rosenauer, all that work would require the labour of 312 workers, and Josef Schwarzenberg thus began the construction of 22 semidetached houses for 44 families in 1803. This new part was referred to as New Dlouhá Ves, so as to differentiate it from the original buildings in Old Dlouhá Ves. Qualified workers were sourced primarily from Bavaria, as well as Tyrol and Styria. Each new inhabitant was given a home, a barn for two cows, young cattle and poultry, as well as a shed in front of the house. They were also given half a hectare of garden land to own plus a hectare and a half of land to rent. In return, the settlers had to work as timbermen and accept no other employment. Based on the origins of the settlers, the new builds were referred to as Bavarian houses, or 'Bojerhäusla'. Even a century later, local inhabitants spoke in a different dialect to the people of Old Dlouhá Ves. Their customs were different as well. Even by the era's standards, they led hard lives. After finishing their spring work in the fields, men with their wives, children, cows, goats, chickens, dogs and cats set off towards the 35 kilometre distant mountain forest. The men would then leave their quickly built forest cottages every day to do hard labour, while their wives and children prepared food and took care of livestock. In the summer, the women would return to Dlouhá Ves to harvest hay from meadows and grain from fields. After this work was done, they had to return, carrying heavy loads, back to the forest. One woman, Theresia Anger, would carry half a hundredweight of flour and a six-month-old child all the way from Dlouhá Ves to Březník (Pürstling), a nine-hour journey. Over the years, woodworker's settlements sprung up in the woods and were named them, for example Hetzendorf, Josefsstadt, Golihütten, Schoußlhütte or Bartlseppnhütte. After the wood was extracted, the settlements were abandoned and soon engulfed by the forest. Women would return home at the end of autumn, while men would get ready for the 'winter train'. The wood extracted during the summer would get carefully towed on a sleigh towards floating streams.

When the snow began to melt, the wood was floated down towards the big storage station in Dlouhá Ves, where it would be pulled out, sorted and gathered together. In this intermediate storage facility, the logs were left to dry out, thus preventing great losses caused by sinking of the soaked wood. As the Prague railway started facilitating coal transportation in the mid 19th century, timber floating slowed down and was eventually stopped completely. However, given the lack of other transport routes from the forest regions of Poledník, Ždánidla, Roklanу and Luzný, timber floating remained untouched there until the Second World War. The annual extraction in those years numbered around 80 000 m³, approximately 30 000 of which was transported via the water. In years of calamity, such as in 1931 when gales and hails caused a lot of damage to the forest, the numbers climbed up to 131 000 m³, the biggest amount of wood ever extracted, floated and pulled out at the storage station in Dlouhá Ves. For the villagers, this extraordinary annual load was welcome seasonal work. The transportation of solid wood from the storage station to the train station in Sušice was facilitated by the local farmers' waggons, as well as the prince's waggons.

After the abolition of serfdom in 1848, the people of New Dlouhá Ves wanted to register their leased and promised 1,5 hectares of land in their own name. This resulted in a years-long dispute with the prince's administration. The people of Dlouhá Ves eventually ran out of money, and a majority thus had to reach an agreement with the administration. Only twelve of them continued with the dispute and eventually lost. The losers had to give up 250 square meters of the land surrounding their homes in favour of their neighbours who were willing to reach an agreement with the prince. They were also no longer allowed to work in the prince's forests and thus became unemployed and impoverished.



The golden days of timber floating were over, the workers were no longer needed and had to find new means of employment. Given the growing industrialisation, Sušice saw the rise of two match businesses (Fürst and Scheinost), three leather businesses, and a shoe factory (Schwarzkopf). Every day, people walked the four kilometeres to Sušice in their 'Neischln' (wooden slippers).

Whole text

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