Sir Lindley arrives

When two opponents fight ...

The evaluation of the two projects was carried out by the construction consultant at Frankfurt am Main, Sir Ing. William Heerlein Lindley (1853 - 1917), a builder of modern sewerage and water-supply systems in Europe. After ascertaining the situation in Prague, Lindley evaluated both projects in detail. He commented upon the too conservative approach of Kaftan, particularly the inability of draining areas at lower levels if the level of the river was too high. As regards the other project, he appreciated the idea of a sewer tunnel; however, he pointed out that Václavek and Ryvola failed to find a solution to the same problem faced by Kaftan, despite the fact that the deep tunnel offered sufficient capacity. Lindley also commented on the insufficient range of the drained area in both projects, as well as insufficient depths and profiles of the sewers at some points. He claimed that Prague could not count on self purification in the river and that it therefore needed an efficient waste-water treatment plant. He supported the location of the plant in Bubeneč; however, he did not trust circular tanks. In conclusion, Lindley did not recommend either of the projects for construction.

After this negative assessment, everyone expected the municipal authorities to reopen the previously closed Sewerage Office, in order to modify the project submitted by Messrs. Václavek and Ryvola in line with Lindley's comments. The fact that the project work was assigned to Lindley was therefore understood as an expression of distrust in all Czech experts. Lindley submitted his project in July 1893. His proposal was evidently based on the ideas used by both competitors, however they were perfected and complemented in many aspects. The united system was again divided into two levels, avoiding the risk of sewer congestion. Full use of the tunnel under Letná enabled drainage of the lowest areas even under extreme conditions. The tunnel made way for deeply founded sewers, thus enabling the drainage of basement premises. Thanks to the large profile of the sewers, the canalised area could be extended in the future, which supported the long life of Lindley's work. Among other advantages, there was the fact that sewers ran along lands owned by the city - which helped avoid complicated negotiations with owners and compulsory acquisitions. The budget for Lindley's work reached an astronomic 6.5 million florins, with a canalised area of 2588 hectares.

William Heerlein Lindley (1853-1917), the designer of the modern Prague sewerage.

During this time, the construction of some parts of the sewerage was already in progress, particularly in Holešovice, where it was necessary to provide drainage for the new municipal abattoir. Lindley's project was accepted by the Municipal Council on April 21, 1894, and after negotiations with other authorities involved, a building permit was issued in 1895. The scope and intensity of the work carried out towards the end of the 19th century may be compared to today's construction of the underground railway.

In the spring of 1896, the passionate discussions among the Czech technical public flared again. The question was asked as to who would carry out the canalisation work, that is who would run the re-opened Sewerage Office. The Czech professional people felt deeply hurt by the fact that the Municipal Council authorized Lindley to carry out this task. The Association of Architects and Engineers expressed their bitterness over the Council ignoring credits and skills of

Czech engineers and also their fears of the imperfections of Lindley's construction management, if Lindley is 500 km avay in Frankfurt. Some considered Lindley's annual salary of 10,000 florins to be too high, as it was three times higher than the salary of the head of the building control department. The Association's "Memorandum" published on May 14, 1895 reads as follows:

"Honourable Municipal Council of Royal Capital Prague, we would like to ask you to make a decision according to which the project preparation and supervision of canalisation works cannot be commissioned to a foreign expert but to the re-opened Sewerage Office and completed with new forces for this purpose."

"... reffering to the reasons expressed with respect to our sewerage, the Association hereby declares to the entire public:

... that Czech experts, who developed the general project (from which Lindley assumed his ideas in his project), are also able to carry out the detailed design, ... that neither the construction of sewers nor the inverted siphon, Letná tunnel and the sewage works are such complicated tasks that they could not be adequately managed by Czech experts, ... that as regards responsibility issues, it appears much more beneficial for the city to assign the supervision to a Czech engineer, ... providing that the sewerage project is assigned to a foreign expert, Czech engineers will consider this to be an expression of discredit."

Unofficially, there appeared many unfortunate personal insults and gossip which the official authorities had to settle. This is also evident from a speech by the second deputy Major, Dr. Kühn: *"Mr. Lindley is insulted for being called a German and a Jew; however, he is an Englishman, and a member of the Church of England"*. The important thing is that Lindley could not be criticised as regards his professional skills. Professor Kristian Petrlík said in his speech given on March 11, 1896 to members of the Association: *"I have known Mr. Lindley since 1885, I have seen his work in Frankfurt, which I visited with my students; I know his latest work, the sewerage in Warsaw; I know his involvement in international conferences, I have also read some of his publications and in conclusion, I respect Mr. Lindley as an excellent engineer and a notable person"*. That statement was the end of all disputes.

Construction of Prague's new sewerage network

In May of 1896, the Sewerage Office was re-opened without much publicity, with the main objective being to process detailed projects for the system of sewers constructions and the treatment plant in Bubeneč.

The area of Prague was divided into four categories for the purposes of designing the basic sewer system, which was approximately 90 km long:

a) "Inner City", sewage flow rate 1 litre/hectare per a second, i.e. approximately 150 l per capita and day;

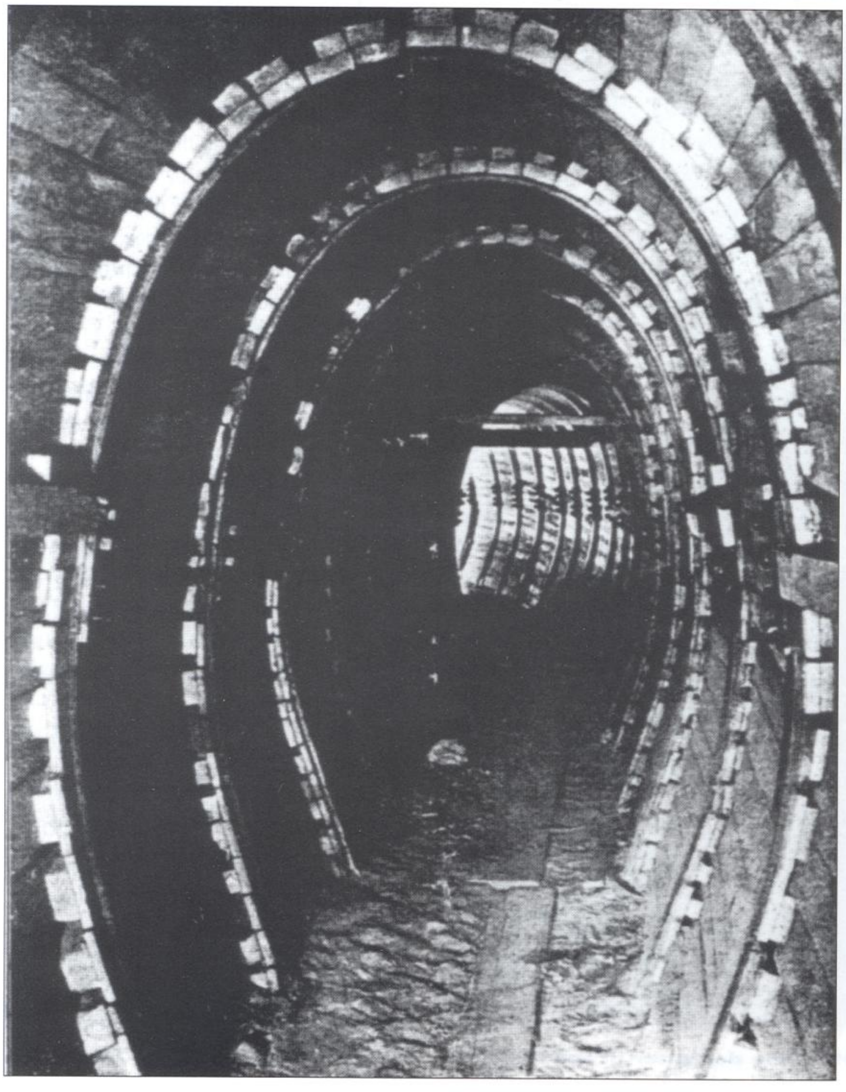
b) "Outer City" (Vinohrady, Vyšehrad, Podolí, some parts of Holešovice, etc.), with a flow rate of 0.75 l/ha.s;

c) "Further Quarters of the Outer City" (Bubny, Hradčany, Žižkov, etc.), with a flow rate of 0.67 l/ha.s;

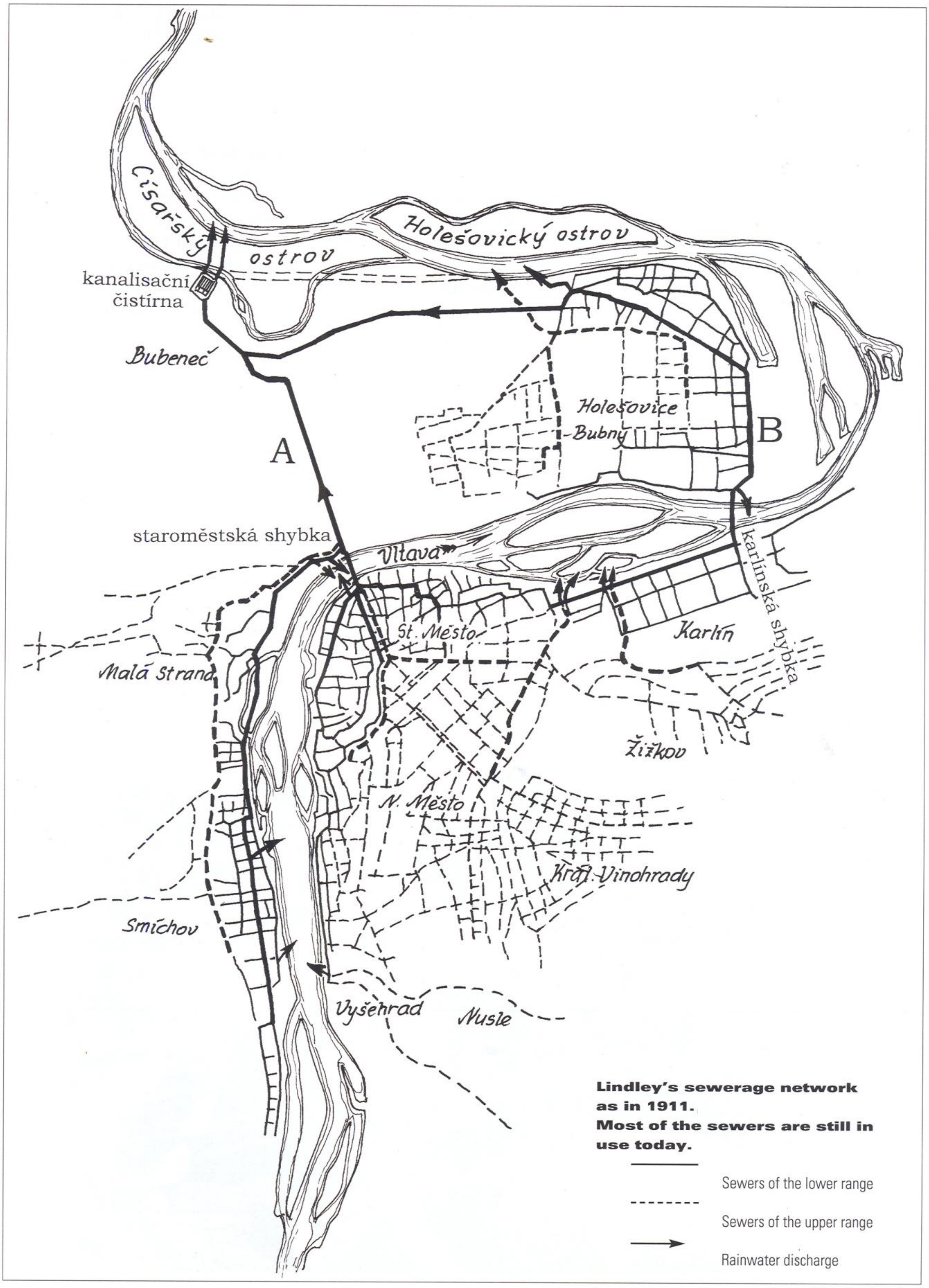
d) Periphery and other settlements, e.g. Nusle and Michle, with a flow rate of 0.5 l/ha.s.

The canalized area comprised two zones. The right-bank historical centre and city quarters on the south were drained into collector "A".

The most important nodal points were the two junction chambers - under the Old Town Square and on the embankment before the inverted siphon. The collector "A" passed under the river through the inverted siphon, to join the sewer from Smíchov, Malá Strana and Hradčany, further leading through a tunnel to Bubeneč into the future sewage works.



Casing of the main collector under Prague city centre.



Lindley's sewerage network as in 1911.
Most of the sewers are still in use today.

Sewers of the lower range

Sewers of the upper range

Rainwater discharge

The second main collector "B" started in Karlín, joining sewers from Žižkov, passing under the Vltava River, and leading through an inverted siphon under Rohanský Island to Holešovice, where it collected sewers from Bubny and Letná, finally reaching Bubeneč along the Royal Deer Park. The collector "C" canalised the zone west of the city centre.

Areas, drained by collectors "A" and "B", were divided into two level zones, whose main sewers, before entering the appropriate collector, were connected to a rain discharge chamber and so to the Vltava river. This arrangement protected the lowest quarters from flooding. Otherwise, if there were higher volumes of water entering the sewerage during rains, thaws, etc., and there were no zones, water from higher levels would "press out" water in lower sewers and exceed the capacities of the inverted siphons, main sewers and the tunnel. Water from lower areas could not flow away and these zones would be flooded. According to Lindley's clever solution, it was possible to avoid critical situations where there was too much water in the river and also in the sewer system and to drain all water from the higher zones into the river, using a simple system of flood gates, thus saving the capacity of the main collector and tunnel for threatened lower Prague quarters.

In February 1897, Lindley visited a number of brickworks around Prague in order to arrange for the supply of the required eight million sewer bricks. Subsequently, Professors Goller and Slavík carried out detailed testing of raw material from selected localities. The first order for bricks was issued in March: 300,000 bricks from Zákolany, 3,250,000 bricks from Uhříněves and 1,500,000 bricks from Bližejov, for approximately 30 florins per thousand bricks. In August 1897, the Municipal Council decided to commission the construction of an inverted siphon on Sewer "A" to Budapest-based firm Gregersen and Sons, for 246,000 florins. This company previously had proved its skills during the repair of the Gothic Charles Bridge, damaged during flood in 1890. The 174-metre-long inverted siphon comprises two cast-iron pipes with a diameter of 1 metre. Due to the fragility of the material, the inverted siphon was installed in sections into a trench on the bottom of the Vltava. The adjacent tunnel is 1,200 metres long, with an oval profile of 1.8 x 2.6 m. With a gradient of 1:1200 the capacity of the inverted siphon is 3,500 litres per second. The tunnelling and walling was carried out by Kress & Bernard, for 415,000 florins. During the construction, several strong underground water springs had to be diverted through special drainage tunnels. As a result, water disappeared from several nearby wells and the owners had to be compensated.

In June of 1898, the structure of the inverted siphon was concreted on the embankment, and a trench for the pipes was excavated in the river bed by using a Priestmann's excavator. In September, a tunnel was dug and subsequently lined with bricks. Both main constructions, i.e. the inverted siphon and the tunnel, were completed by the end of 1899. Simultaneously, construction of sewers was in progress throughout the entire canalized area. It has to be pointed out that Lindley designed a reconstruction of Chotkova Street, which was carried out during the construction works at Prague Castle, including a tramway track and access into the Castle moat.

On June 13, 1901, the Emperor Franz Josef I. visited the construction of the sewerage tunnel. After initial speeches given by representatives of Prague authorities, he saluted his own bust and descended into the tunnel 3 metres under the level of the Vltava to see the process of river water flushing. *"The flowing water was roaring so powerfully that His Excellence uttered his admiration of its vehemence."* The Emperor was satisfied: *"It is worth being here! I am glad I could see it all."* On August 30, 1901, the construction of a combined by-pass sewer for the future sewage works was completed, and on the same day, the gates were opened and water began to flow from Prague's centre into the Vltava river adjacent to Císařský Island.

Construction of a smaller inverted siphon in Prague.

Sewage works

Construction and commencement of the operation

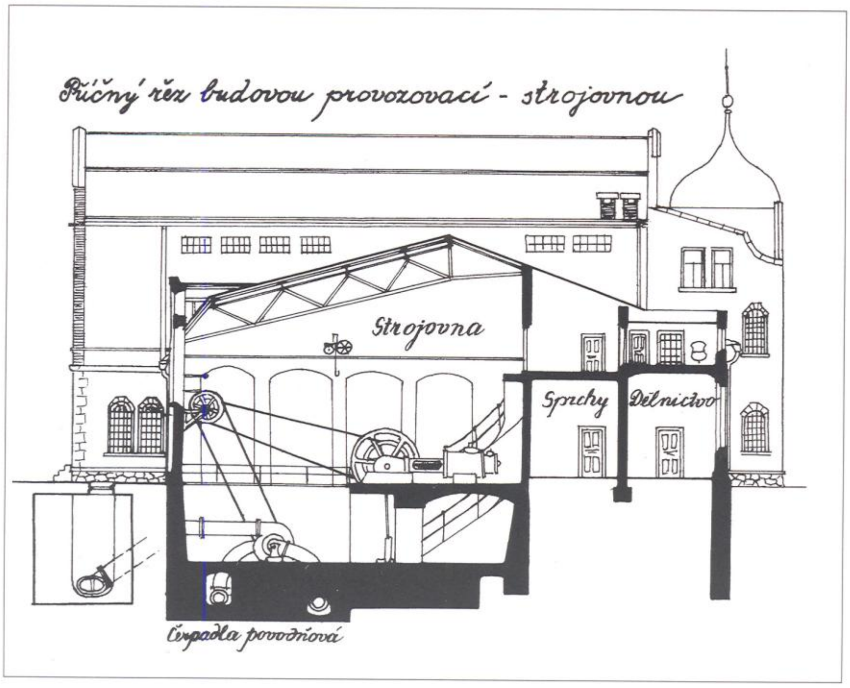
The position of the wastewater treatment plant in Bubeneč was beneficial both concerning the distance from the city and the gradient conditions. The difference in levels between the waste-water treatment plant and the river, into which purified water was drained, was sufficient even in case the level of the river increased. The situation was also positive thanks to the regulation of the riverbed. Water flowing from the plant passed under the ship canal and the Císařský Island, through inverted siphons, entering the river in the centre of the river channel behind the island and not along the bank which was more usual at that time. The purpose of this solution was to ensure ideal mixing of the treated water flowing from the sewage works into river water.

The land for the waste-water treatment plant was acquired in 1896 and 1897. In some cases the city failed to reach agreement with owners due to the high price of compensation they required and so in April of 1897, the city authorities decided to compulsory purchase some of the contested lands.

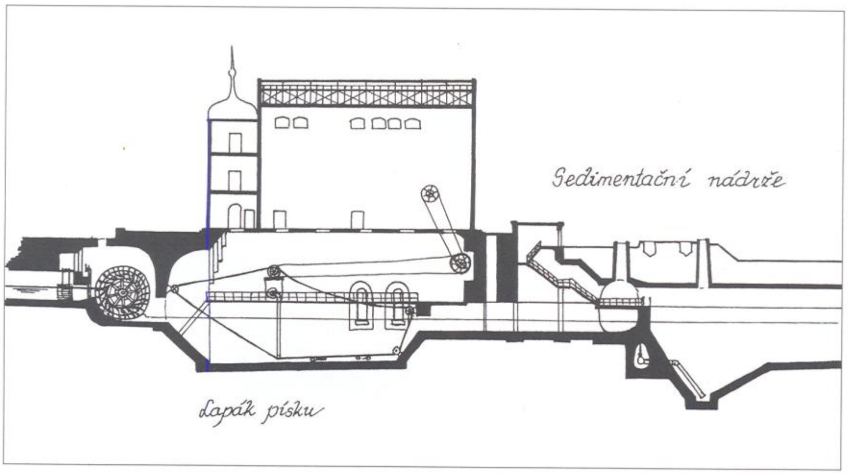
According to a contract concluded by the Council and Mr. Lindley, the detailed design for the sewage works was to be completed by May 15th 1899. In January 1900, the project was discussed by teams of health and chemistry experts, and in February the water-management proceedings were initiated. Among the comments submitted was an appeal by the Agrarian Council for the Czech Kingdom, which requested operators to abstain from ferrous salts, *"... which reduced the value of sludge as a fertilizer"*.

In March of 1901, Lindley gave a speech regarding the project of the sewage works to members of the Association of Architects and Engineers in the Czech Kingdom, resuming previous lectures given by his deputy, Ing. Heinemann, concerning the sewerage network. Lindley presented a comprehensive explanation of the drawings and also mentioned the budget which was planned to reach 1,850,000 Crowns. During the following discussion, participants asked about the protection of sludge drying beds on the Císařský Island from floods and whether the surrounding Royal Deer Park would be bothered by the smell. Mr. Kalousek requested that the project should focus more closely on *"bacteriological purification, which may be anticipated in the future."* Failure to respect this request was one of the few deficits of Lindley's concept. In consequence, it was necessary to look for a place for a new mechanical and biological water treatment plant in the late 1920s and early 1930s.

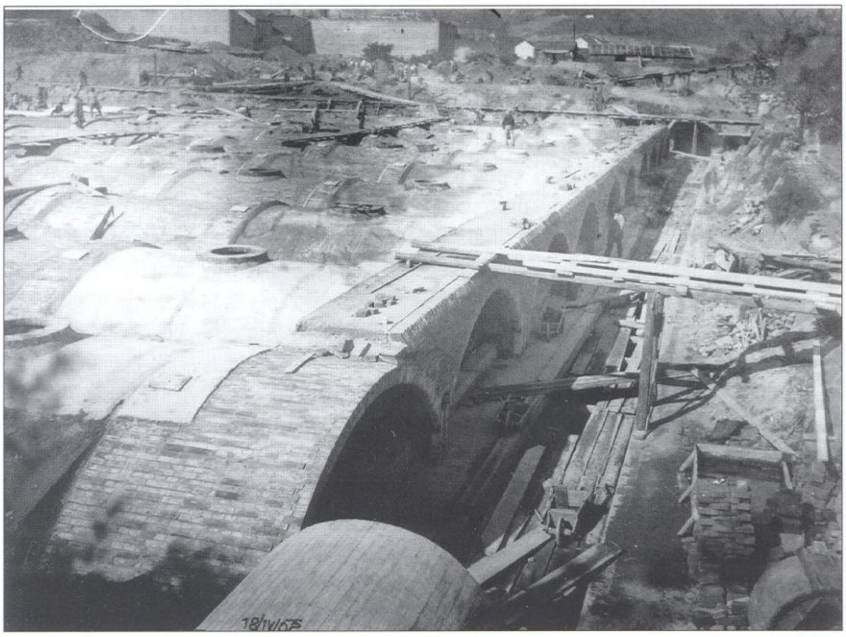
The sedimentation treatment plant in Frankfurt am Main was the prototype for the Prague system. It comprised modern technologies and all dirty operations were placed underground in order to protect the sur-



Cross section of the sewage works service building.



Longitudinal section of the underground structures within the sewage works.



Construction of the sedimentation tank arches.

all three sewers then entered a 34-metre-long and 6-metre-deep sand trap, where pebbles, sand and soil settled down at the speed of 90 mm per second. The suspension was removed from the bottom by a centrifugal pump and delivered to a rinsing tank located within the premises. The purified sand was then sold as a building material.

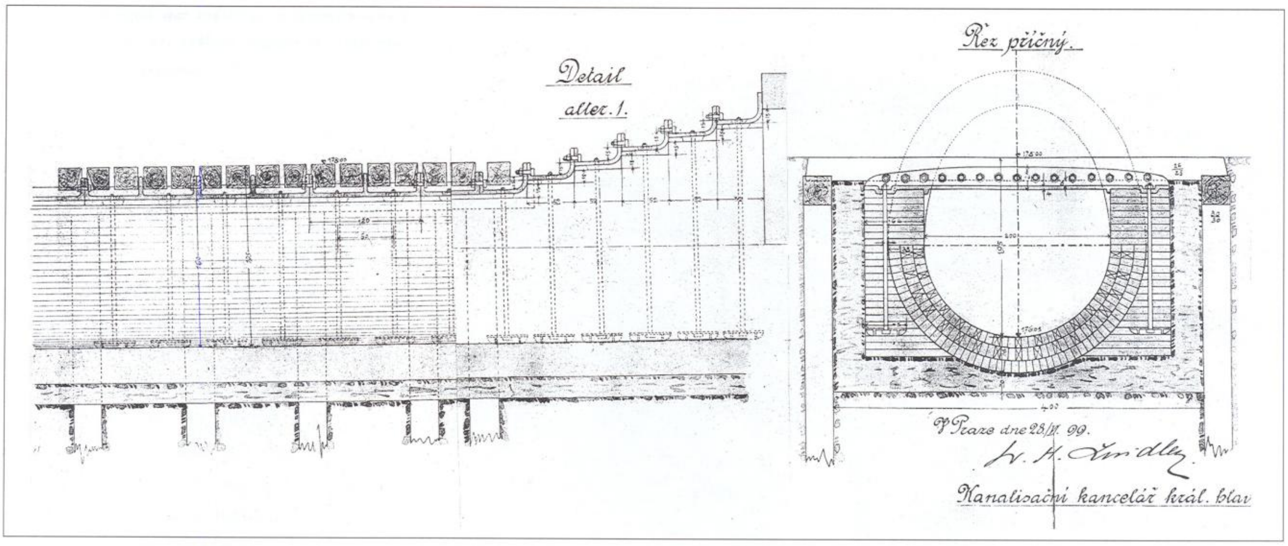
Rubbish was trapped in fine screens, with 7 mm gaps between bars, and removed from the screens with special rakes. The screenings were put into an elevator which conveyed them to a deposit site located within the Císařský Island. There were approximately 4 tons of screenings collected every day.

Behind the sand trap, there was a dosing and mixing device for lime milk and an aluminium sulphate solution for the intensification of the following sedimentation. This progressive facility was used only for a trial run and subsequently shut down. This was because it was impossible to make use of

rounding area from bad smells. This was a considerable progress compared to field irrigation.

Primary treatment, i.e. coarse screens, sand trap and fine screens, was located under the service building, whilst the sedimentation tanks were under the land between the building and the ship canal. The inflow rate was 450 litres per second, flowing from the three main collectors described above (the largest of them, sewer "A", passed through a chamber with a water wheel) and

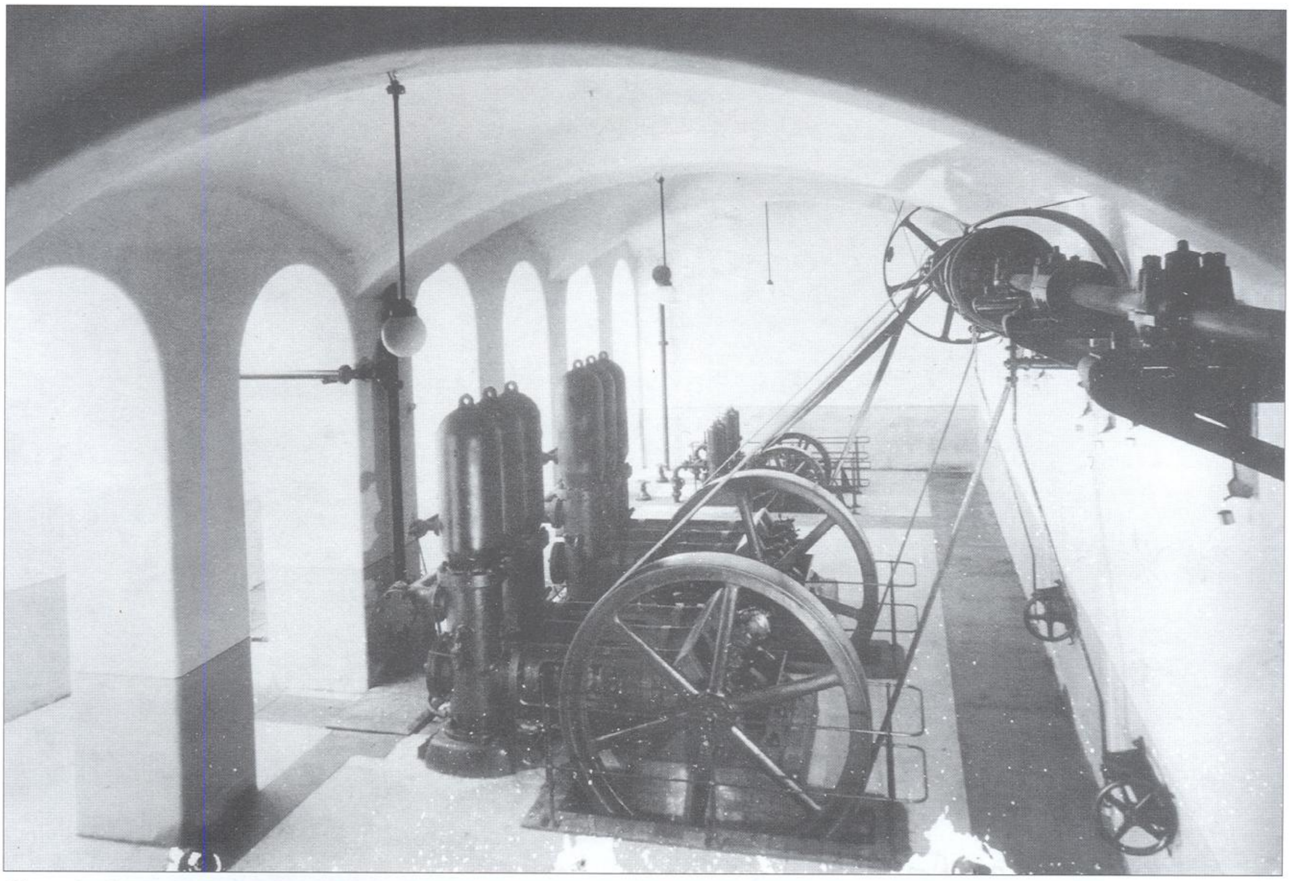
One of ten underground sedimentation tanks, with a capacity of 1,200 cubic metres.



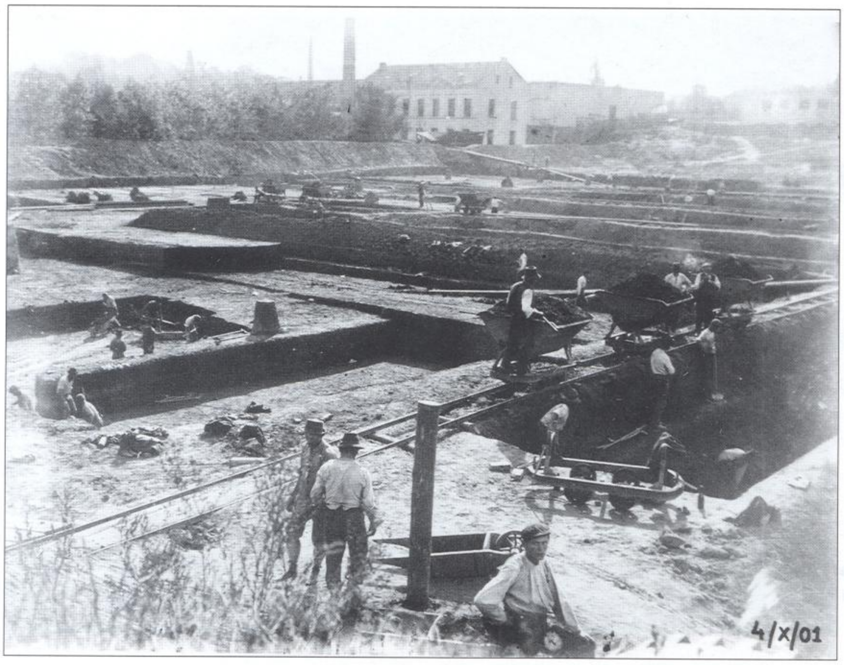
Drawing of the tunnel under the ship canal, draining treated water from the plant to the river. The ceiling is made of cast-iron U-shaped profiles.

sludge which included these chemicals in agriculture, since the farmers refused to buy it.

The final stage of the treatment process comprised sedimentation in ten tanks, each almost 90 metres long with a capacity of 1,200 cubic metres, in which waste-water was distributed from the sand trap through manually controlled gates. The bottom of the tanks was sloping against the flow direction. Sewage passed through the tanks at the speed of approximately 1 cm per second, leaving behind what we now call primary sludge. Thus treated water was drained into the Vltava river, through two outlet sewens with the profile of 200 x 250 cm with inverted siphons under the ship canal and Císařský Island. In case of a breakdown or repairs,



The sludge pump machine room in the 1930s. In the front, there are triple-throw sludge pumps and behind them two river water pumps.



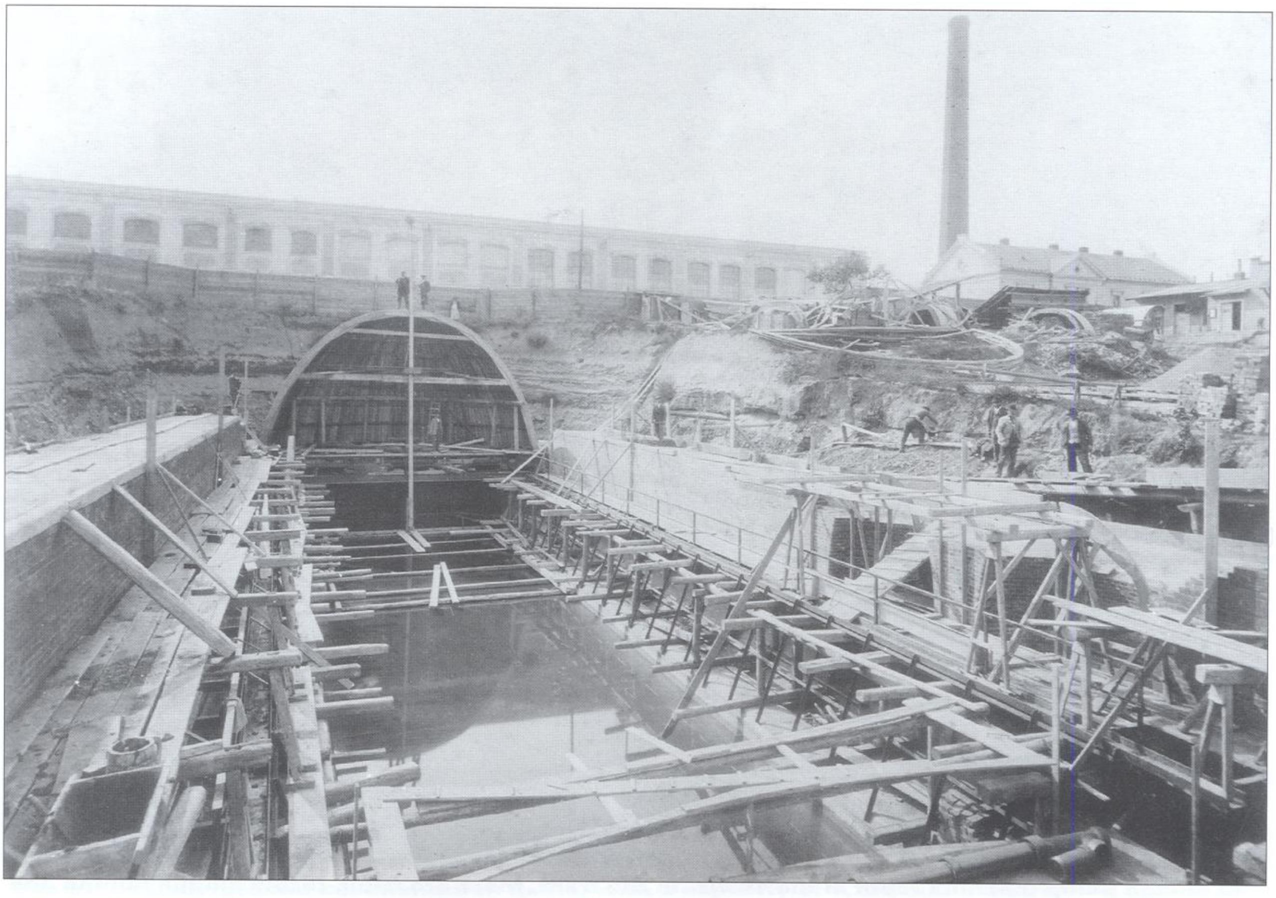
The construction of the sewage works began with an excavation for the sedimentation tanks.

it was possible to disconnect the plant and discharge raw waste-water directly into the river through by-pass tunnels, with a diameter of 180 cm.

There were approximately 100 tons of sludge produced during the sedimentation process every day, and this was removed from the bottom by triple-throw pumps.

Sludge was pumped either directly to the sludge drying beds located in Císařský Island (during winters), or onto a wooden sludge vessel which took it away for further drying outside Prague. Sludge wells by the service building served for temporary storage of sludge during manipulation. The sludge pumps located in a separate underground machine room were driven by steam engines, comprising a system of belt transmissions passing through the vault. Originally, there were two smaller pumps for river water, used for washing the emptied tanks, for the preparation of precipitating agents, for feeding boilers and also for staff baths. One was removed in 1980 and scrapped, and the second one was acquired by the Technical Museum in Brno, and was unfortunately also scrapped in 1998 during moving of the depository ...

The overall efficiency of the Lindley's plant process reached 70% (with chemically intensified sedimentation).



The construction of a sand trap under the main building.

The construction of the sewage works was commissioned to Quido Bělský and opened on September 9, 1901. Before the winter, the inverted siphons under the ship canal were completed, together with the excavation works for the sedimentation tanks. The tanks were built by the end of 1902. Subsequently, the foundation for the walls of the underground sand trap hall was completed and a narrow gauge railway bridge approved for use. A year later, the entire sand trap was finished, together with the vault, three inlet sewers, access staircase into the underground, foundation of walls for the building and backfill of the sedimentation tank vaults. In 1903, a public tender was announced for the complete supply of machinery, invited from three large Czech firms: První Českomoravská továrna na stroje v Libni (First Czech-Moravian Engineering Works in Prague-Libeň), Akciová společnost strojírny dříve Breitfeld, Daněk a spol. v Karlíně (Joint-stock engineering works, formerly Breitfeld, Daněk and Co. in Karlín) and finally the Engineering works Märky, Bromovský and Schulz from Hradec Králové. Subsequently První Českomoravská supplied all the pumps, tanks, pipelines and bridge and crane constructions, Breitfeld & Daněk produced the steam engines and boilers, including all fittings, and Märky-Bromovský-Schulz supplied all the transmissions with consoles, belt pulleys, shafts and other accessories.

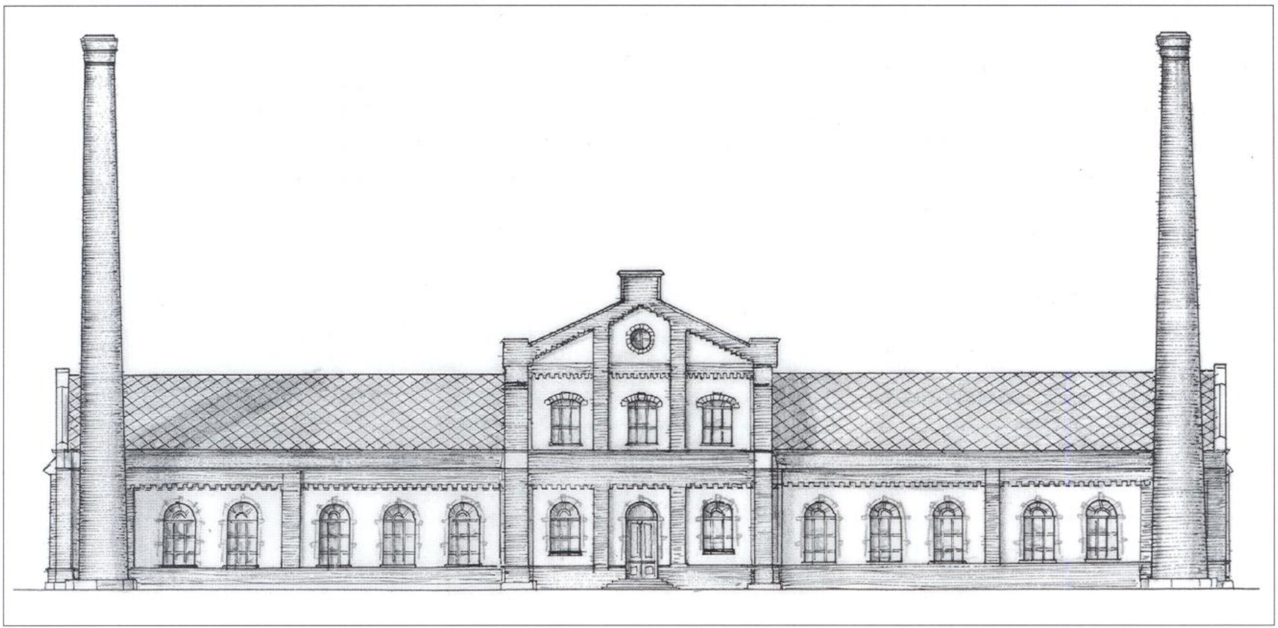
The complete construction was finished in 1905. On June 27,1906, a yearly pilot run was launched. After the correction of operating troubles, official approval inspections were carried out on May 21, and June 11, 1907.

The actual costs of the construction totalled 2 million Crowns; lands were acquired for another 550 thousand Crowns. The overall expenses of the Prague sewerage, constructed between 1893 and 1907 reached as much as 15 million Crowns.

Even though the construction of the waste-water treatment plant is well documented, one question nevertheless remains unanswered. The original design of the building, probably developed by the Sewerage Office, was subject to significant modification; however, the reason for this is dubious. If we compare the detailed drawings of 1903 with the actual design of the facade, we see that the windows are different, that there is a decorative stucco lining and other decorative elements typical of the Art Nouveau style: French roof construction, bossages on the corners, gables with volutes, convex ledges interchanging with concave ones, staircase imperial roof, etc. These changes were made only after the underground premises of the plant were completed, including the perimeter and load-bearing walls of the building. Lindley's budget had already been exceeded by then and the strategy was to save money wherever it was possible. It is possible that separate selection procedures were announced for the facades; however, it is obvious that the architectural value of the old sewage works increased considerably as a result of these changes.

The entire structure is like a handbook for brickwork. The place is full of masterly vaults, passages through complicated forms, corridors, recesses and sewers. Among the notable items, there is the skylight in the water wheel chamber, passing from a wide oval into a circular shape.

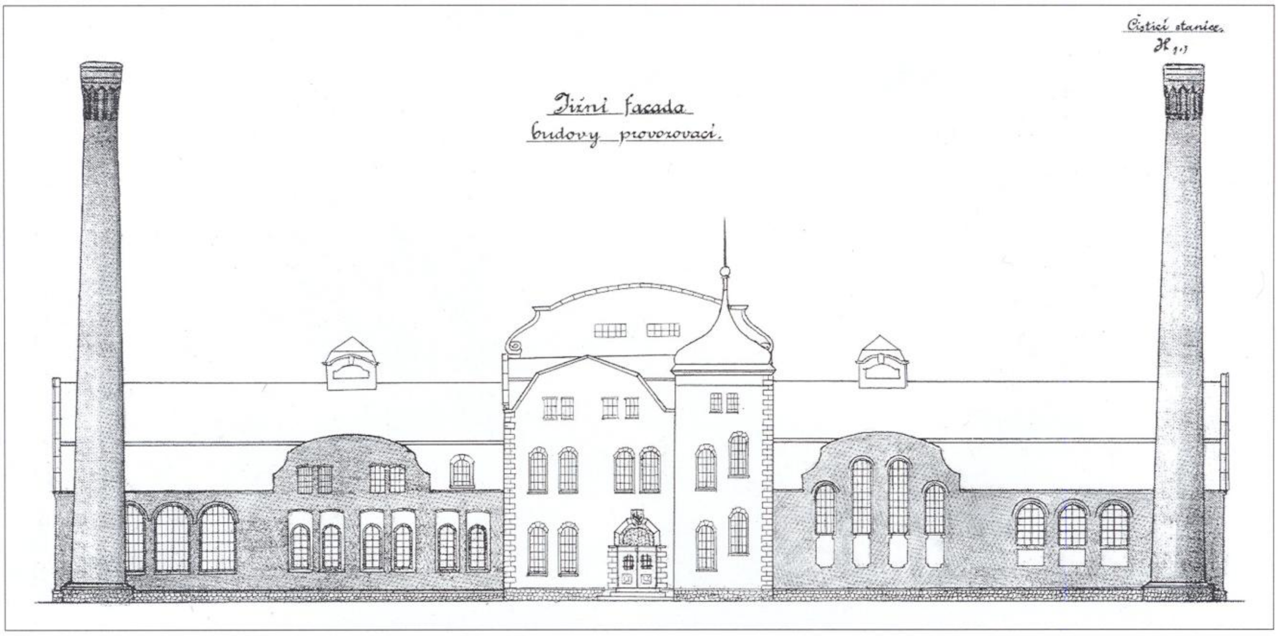
The sand trap hall during a trial run in 1906. The screens along its edge can bee seen, as well as piles of screenings in the grooves.



The first design of the building, as presented by the Sewerage Office.

This uncommon construction was chosen because there was a large water wheel in the chamber, with a diameter reaching almost 6 metres, driven by the incoming sewage water, and there was a belt pulley suspended in the skylight, driving a fan for the ventilation of the underground. The air was exhausted into a ventilation stack. In the 1930s the worn water wheel was removed and replaced with an electric motor. The chamber thus lost its reason for being there as it was no longer needed for the operation.

The service building was designed as an almost symmetrical structure with wings on the side of a higher central part. Adjacent to the corner of each wing, there is a 30-metre-high chimney with a decorative top. The right stack was used for ventilation whilst the left one was used to exhaust combustion gases from the steam boilers. The entire building of the plant is a combination of white plaster and red brick. The entire impression is majestic, intensified with blocks of sandstone used for the ledges, bases and corners. The underground is the most impressive part of the structure since under the cylindrical vault of the sand trap, terminated with a curve passing into a portal from formed bricks, the visitor feels as if he is in a temple. This is why the sand trap hall is also referred to as the "dome". The three sewers entering from the south are also vaulted. The specific atmosphere is intensified by light, i.e. the shadow and light modify the space from various angles. Above the sand trap, there is a 15-metre-high central hall with a surface



The design of the service building bears signs of The Art Nouveau Style.

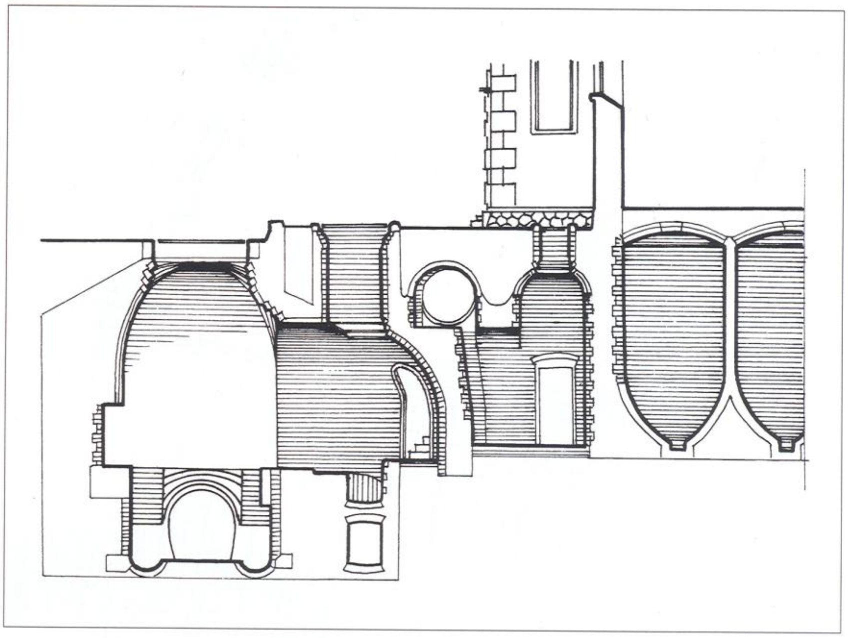
area of 300 sq metres, which was not necessary for the operation of the plant but played an important role for the stability of the building, as it applied load on the underground walls and stabilised the vault of the sand trap dome. The hall in the central part of the building passes into an administrative section with offices, laboratories and other facilities for the operating staff. At the commencement of the operation, there were 19 employees - a foreman, engineman, stoker and 16 operators in the underground chambers.

The steam engine hall with its boilers and coal bunker located in the west wing of the building was the steel heart of the plant. Two flue-tube boilers of the Cornish system in a brick setting were fitted with a steam superheater and the so-called economizer, i.e. a facility for the pre-heating of feeding water to the temperature of approx. 90°C. This helped to save coal and also protected the boiler from heat stresses during the introduction of water which was fed through two piston pumps, driven by special driving rods from the steam engines. In addition, there was a suction injector, which served as a backup device in case of a longer shutdown of the engines. The boilers generated steam at 11 atm and at a temperature of 350°C.

The supply of coal was similar to the system used in ocean liners: the storage site, coal bunker in the building and the boiler room were connected by a direct narrow-gauge railway track along which coal was supplied through a hopper wagon. The advantage of this system was particularly in the reduction of dust content and the physical stress of the staff.

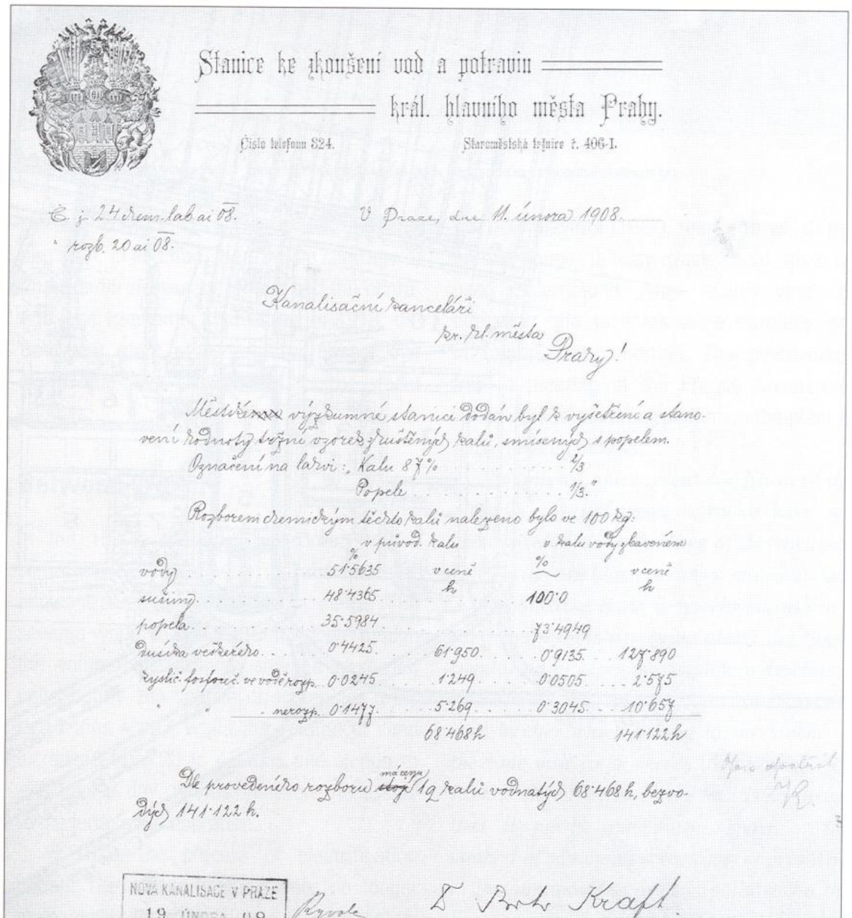
The machine room is divided into two floors. In the lower part, there are two centrifugal flood pumps, protecting the underground premises during flooding. In the upper part, supported by five vaults, there are two Schmidt-type steam engines, each with an output of 100 HP. Steam engines were constructed for maximum economical operation - steam was not exhausted into the atmosphere, which is the case for most railway steam locomotives, but led into a condensation cylinder where it generated a vacuum in combination with cold water. The discharging steam was in fact sucked out from the engine which helped to reduce the harmful back pressure on the piston.

The output was transmitted to the driven machinery through a transmission shaft,



The beauty of brick masonry is seen in the cross section of the water wheel chamber.

Certificate issued by the municipal laboratory, with the outcome of a sludge analysis.



Stanice ke zkoušení vod a potravin
král. hlavního města Prahy.
Číslo telefonu 824. Staroměstská tržnice č. 406-I.

Č. j. 24 chem. lab. ai 08.
rozb. 20 ai 08.

V Praze, dne 11. února 1908.

Kanalisační kanceláři
kr. hl. města Prahy!

Městskému výzkumné stanici dodán byl k vyšetření a stanovení hodnoty hnojní vzorek zhuštěných kalů, smíšených s popelem.
Označení na lahvi: „Kalu 87% ... 2/3
Popele ... 1/3."
Rozborem chemickým těchto kalů nalezeno bylo ve 100 kg:

	v původ. kalu %	v ceně h	v kalu vody zbaveném %	v ceně h
vody	51·5635			
sušiny	48·4365		100·0	
popela	35·5984		73·4949	
dusíka veškerého	0·4425	61·950	0·9135	127·890
kyselin fosforeč. ve vodě rozp.	0·0245	1·249	0·0505	2·575
" " nerozp.	0·1477	5·269	0·3045	10·657
		68·468 h		141·122 h

Dle provedeného rozboru má cenu 1 q kalů vodnatých 68·468 h, bezvodých 141·122 h.

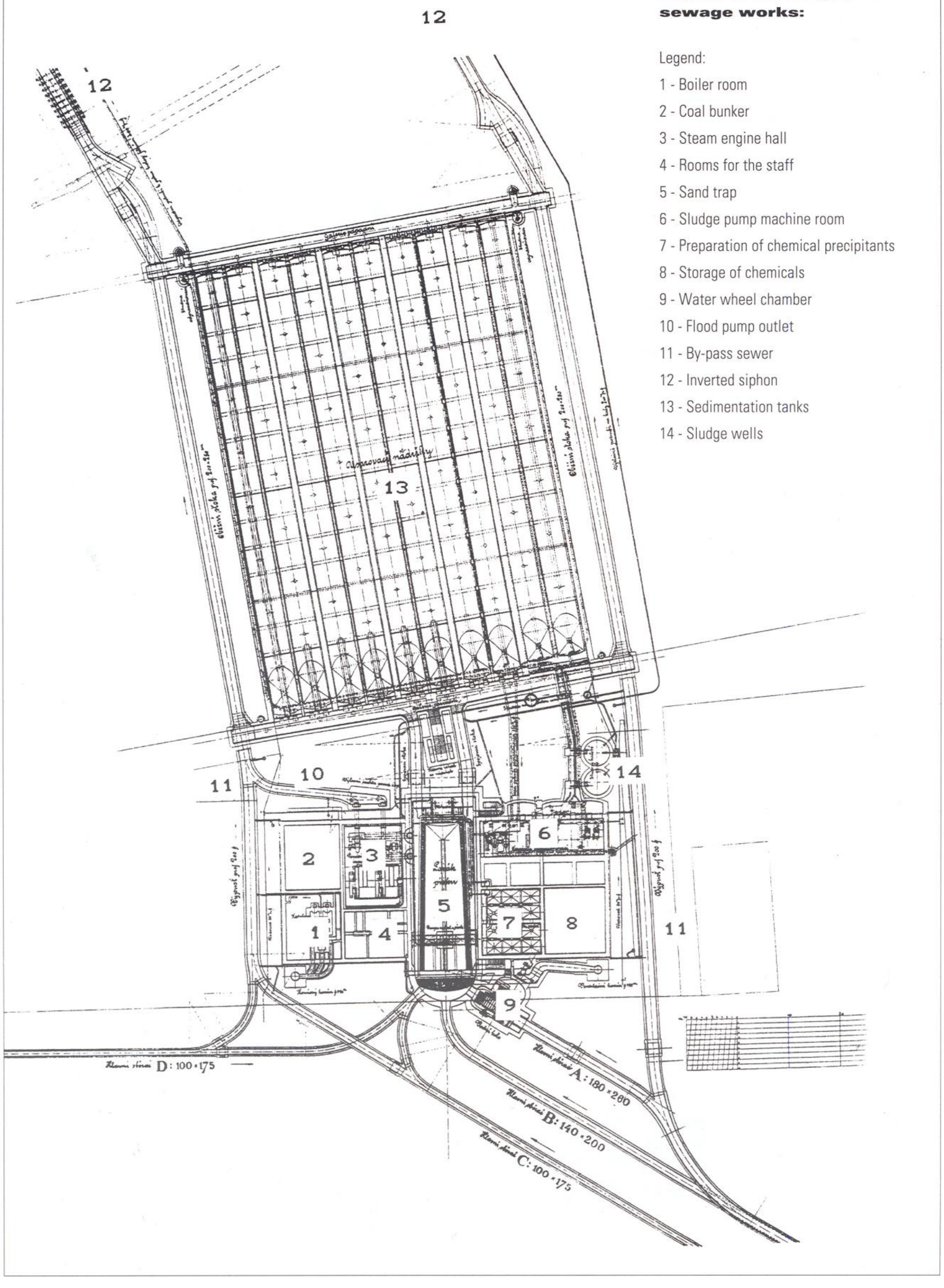
NOVÁ KANALISACE V PRAZE
19 ÚNORA 08
Čís. reg. 40845

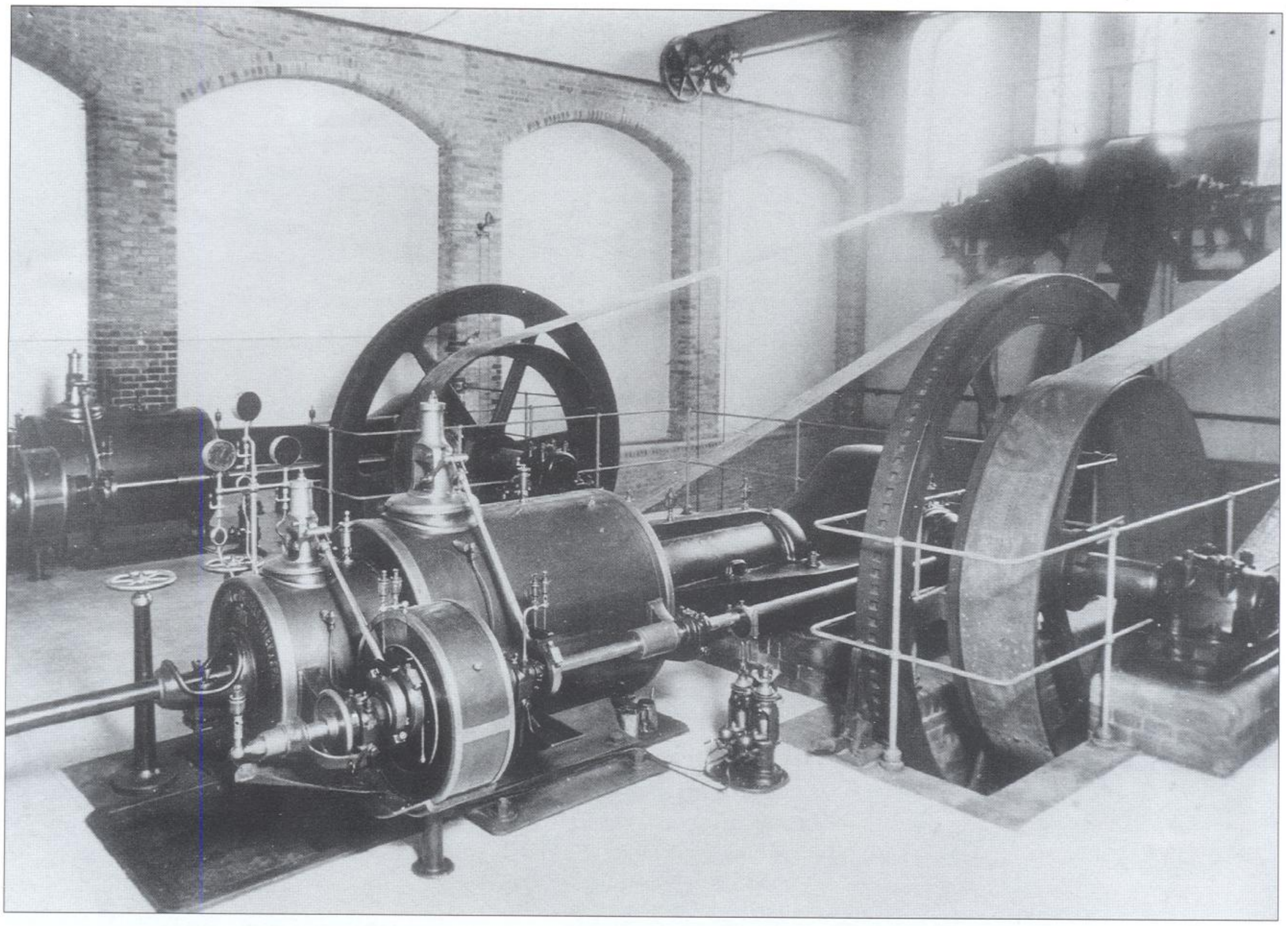
Rywole
D. Bohr Kraft
Mr. Ph. Jar. Starý

Layout of the Prague sewage works:

Legend:

1 - Boiler room
2 - Coal bunker
3 - Steam engine hall
4 - Rooms for the staff
5 - Sand trap
6 - Sludge pump machine room
7 - Preparation of chemical precipitants
8 - Storage of chemicals
9 - Water wheel chamber
10 - Flood pump outlet
11 - By-pass sewer
12 - Inverted siphon
13 - Sedimentation tanks
14 - Sludge wells





The steam engine hall with the drive arrangements for the sewage works machinery.

originally leading from the engine hall through the entire building. In addition to flood pumps, steam engines also drove sludge and water pumps, a sand pump in the underground chamber, a small power generator for lighting, a screenings elevator and the chemical management, i.e. mills and mixers of precipitating agents, which used to occupy the entire east wing of the service building.

The new technology was an important source of knowledge for the Czech professional people. The waste-water treatment plant was the subject of frequent technical visits and its operation was under permanent supervision of water-management authorities. Tests were carried out concerning the characteristics of the sludge and the most convenient methods for its processing, comparing the content of fertilizing substances in water before and after the treatment process; laboratories monitored the quality of underground water in the surrounding area, etc.

World War I interrupted the operation after seven years of its existence. Two thirds of the employees were mobilized and the sewage works suffered from a lack of operating staff. In addition, there was a shortage of finances for necessary repairs and the operation was frequently shut down. In 1918, the treatment plant stood idle for almost one month due to a lack of coal for the steam engines.

Between Wars

In the 1920s, the so-called Great Prague came into existence, with the absorption of adjacent communities to the city centre. The sewage works faced new times. Even though the volume of incoming sewage increased only slightly, the volume of screenings grew to 16 tons a day, while the volume of sand increased from 20 to 45 tons and sludge to 270 tons a day. It was therefore necessary to modernise the operation.

In 1920, the process of electrification began. The steam engines were no longer used, except for spring floods. Electric motors were used to drive the sand pump in the sand trap dome (1920), sludge pumps (1924) and the new elevator (1927), thanks to which the narrow-gauge railway track could also be used underground. After twenty years of operation, the facilities were obsolete and in rather poor condition. The proceedings from a meeting of the Prague Committee, which carried out an inspection in the plant in 1926, read as follows:

"In general, the current condition of the plant is unsatisfactory ... rooms have not been painted since the time of its construction, walls are black, window panes broken ... the machine room is poorly maintained and dirty, tools are lying about the floor, insulation of pipes is completely destroyed ... there were 15 pigeon cotes found in the coal bunker which belong to the stoker ... the lime mill room serves as a storage for junk ... the elevator in the hall is so rusted that it needs immediate repair ... the method of removing screenings is primitive ... the surrounding area is polluted by the Feca cooperative which stores its finished fertilizer product adjacent to the building, and the front yard is in ruins ..."