
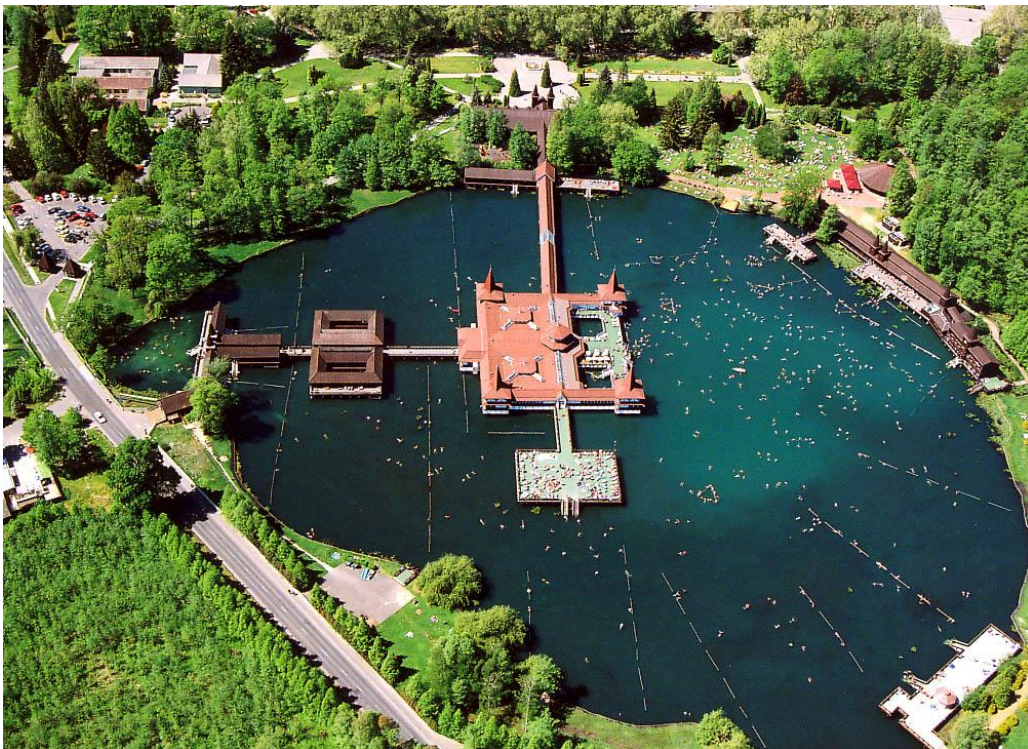




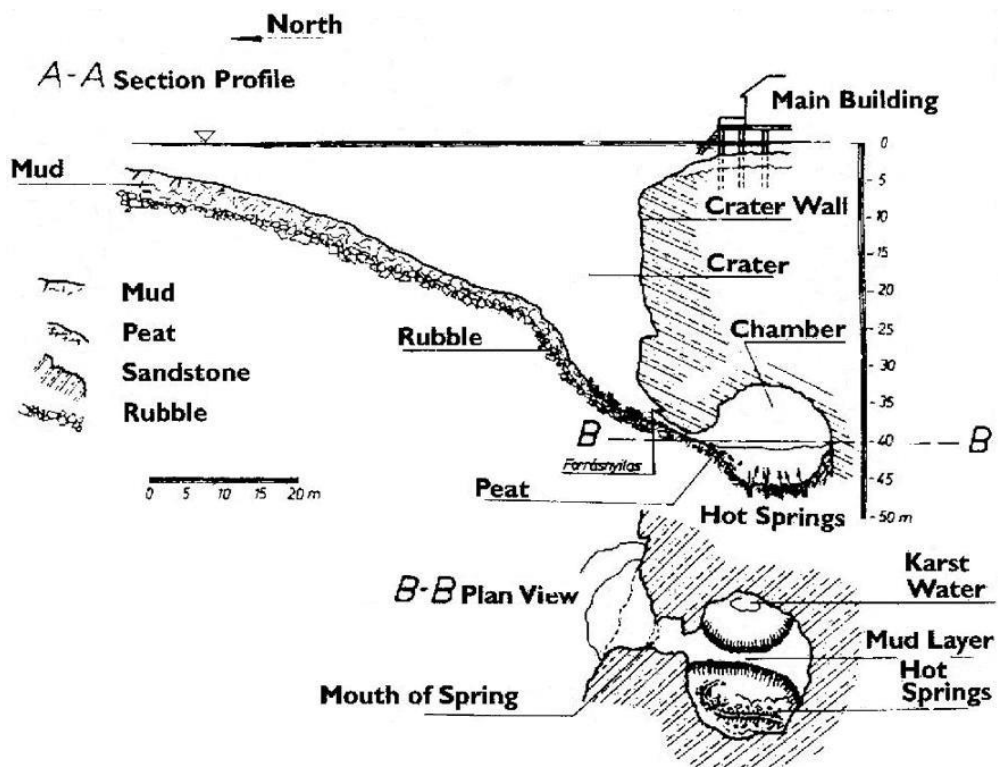
Country	MIKAS springs	Coordinates / Nearby City	Spring discharge (Q in l/s,min/av/max) / tapped or not	Criteria* in order / Main justification */ H-historic, A-aesthetic, S-scientific, E-Economic, Ec-ecologic	Data collected by
Hungary 	1. Hévíz Thermal Lake spring	N 46°47'12.8" E 17°11'34.0" Z = 109 m asl Heviz, Balaton	? / 410 / ?  Not-tapped, used locally for balneological and recreational purposes	<b>S, E, A, Ec, H</b>  <i>The Hévíz Thermal Lake is the largest biologically active natural thermal lake worldwide. The village near the Hévíz lake has been mentioned as early as 1328. Mineral-rich source springs feed the lake from depth of 38 metres where hot (7800 years) and cold (6500 years) karst water mix. The lake has a flow rate of 410 l/s, the retention time of water is only three days, and the temperature never drops below 22°C in winter and reaches 38°C in summer. The lake is one of the most significant groundwater-dependent ecosystems in Hungary. The lake's biota is unique due to the temperature and composition of its water. The most significant plants of Lake Hévíz are the fairy roses, i.e. water lilies. In addition, it is one of Hungary's most important sites in the spa and wellness tourism field. Sulphur is the main active ingredient in medicinal water and mud. Lake Hévíz belongs to the Nature Reserve area, which covers an area of 60 ha (of which the lake's surface is 4.6 ha).</i>	Katalin Hegedűs-Csondor,  Judit Mádl-Szőnyi
	2. Jósva Spring (spring group of Medence Spring, Táró Spring and Cső Spring)	N 48°29'0.91" E 20°32'32.03" Z = 216 m asl  Jósvafő, Aggtelek	? / 130-150 / ?  Not-tapped	<b>H, S, Ec, E, A</b>  <i>The Jósva Spring is the largest cold-water spring in Hungary. It drains transboundary aquifer of Aggtelek-Slovak karst and the Baradla-Domica Cave System. The Baradla-Domica Cave complex is a UNESCO World Heritage site and is under Ramsar Convention. The underground drainage system is formed in the Middle and Upper Triassic limestones of the Silica Nappe. The spring feeds the Jósva stream, the most significant water flow in the Aggtelek karst. The other two nearby springs are Medence and Cső Spring. The water of these springs originates from the Long Lower Cave, while the Short Lower Cave feeds the Táró Spring. All springs are located in the Aggtelek National Park.</i>	Katalin Hegedűs-Csondor,  Judit Mádl-Szőnyi
	3. Boltív Spring	N 47°31'05.0" E 19°02'08.3" Z = 104 m asl  Budapest	? / 81 / ?  Partly used for recreational purpose	<b>H, S, E, A</b>  <i>The Boltív spring, located in the foothills of the Rose Hill (Budapest), is one of the few springs that still discharge naturally on the Buda thermal karst. Permanent lukewarm water flows from Upper Triassic limestones and drains longest underwater cave system of Hungary (Molnár János Cave) with active hypogene karstification. Part of lukewarm water (21 °C) is used by the</i>	Katalin Hegedűs-Csondor,  Judit Mádl-Szőnyi

				<p><i>Lukács Spa (through a pipe taking water from the protected part of the Molnár János cave), but most of its water freely flows into the Danube. Springwater also feeds the artificial Malom Lake, which existence was firstly mentioned in 1540. During the Turkish rule, a watermill was operated here. In the MJ cave area, mixing of waters with different temperatures and geochemical compositions takes place and this process is responsible for the formation of the cave. Av. EC is c.1000 <math>\mu</math>S/cm. The cave that feeds the spring is protected, located in the Danube-Ipoly National Park, which can only be visited with a research permit.</i></p>	
	<p><b>4. Spring of the Gellért Spa (Ósforrás)</b></p>	<p>N 47°29'02.6" E 19°03'11.4"  Z = 95 m asl  Budapest</p>	<p>27 / 30 / 46  Tapped for balneological and recreational purposes</p>	<p><b>H, A, S, E, Ec</b> <i>Another thermal spring issuing from the Buda thermal karst at Danube riverbank. The ancestor of the Gellért Spa was so-called "Muddy Spa", as place got its name after carbonate and biogeochemical muddy accumulation. Later, the Gellért Spa opened its pools in 1918. They also used this spring and constructed a capture room above it. It is a ~ 100 m<sup>2</sup> pool with trenches, with 17 spring outlets. The room's height is 9.5 m. The discharge mechanism is influenced by the water level changes of the Danube. Water temperature varies (33.5-43.5°C) while EC av. is 1884 <math>\mu</math>S/cm.</i></p>	<p>Katalin Hegedűs-Csondor,  Judit Mádl-Szőnyi</p>

MIKAS - Heviz



Thermal Lake Hévíz (source: Civertan Grafikai Stúdió)



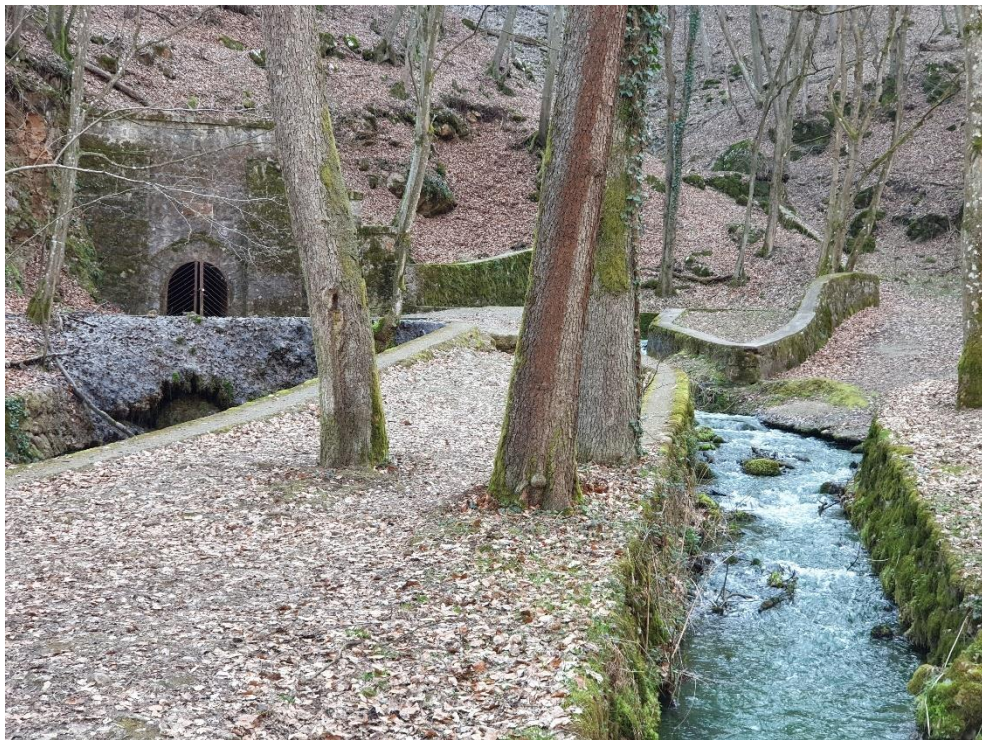
Section of Hévíz Lake and Amphora spring cave (Amphora Divers Group, 1976)



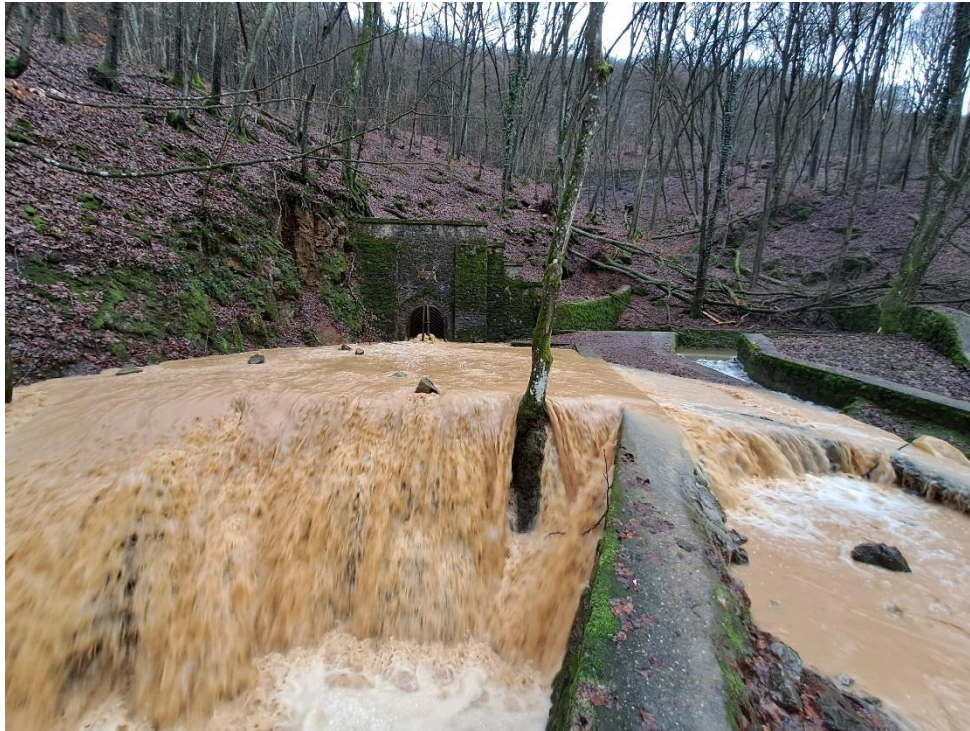


*Spring cave (photo by Dénes Szieberth)*

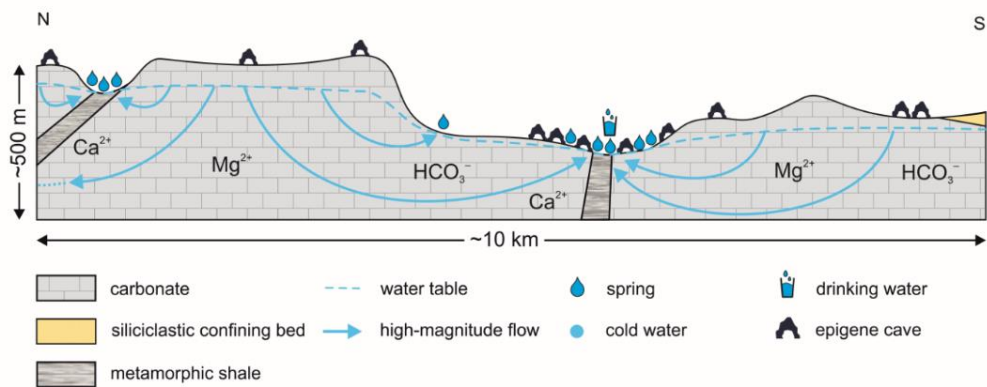
### **MIKAS - Jósua spring**



*Jósua Spring at normal flow rate (photo by Péter Gruber)*



*Jósva Spring in flood conditions (photo by Péter Gruber)*



*Generalized hydrogeological cross-section for the plateau of the Aggtelek Karst (Mádl-Szőnyi et al., 2022)*



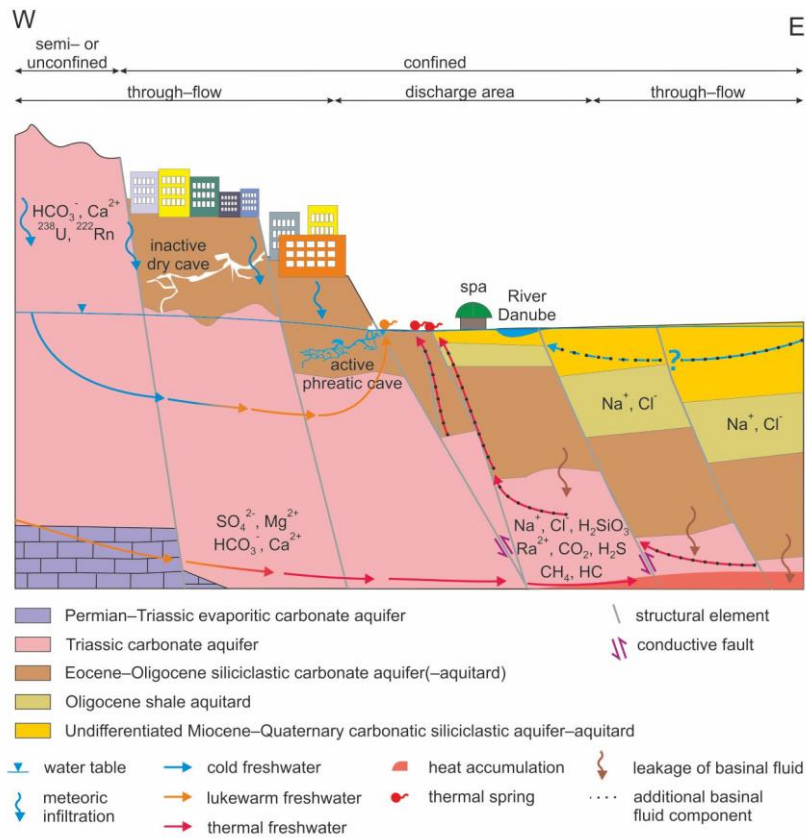
## MIKAS - Boltív Spring



*Boltív Spring and Malom lake (photo source: <https://hu.wikipedia.org>)*

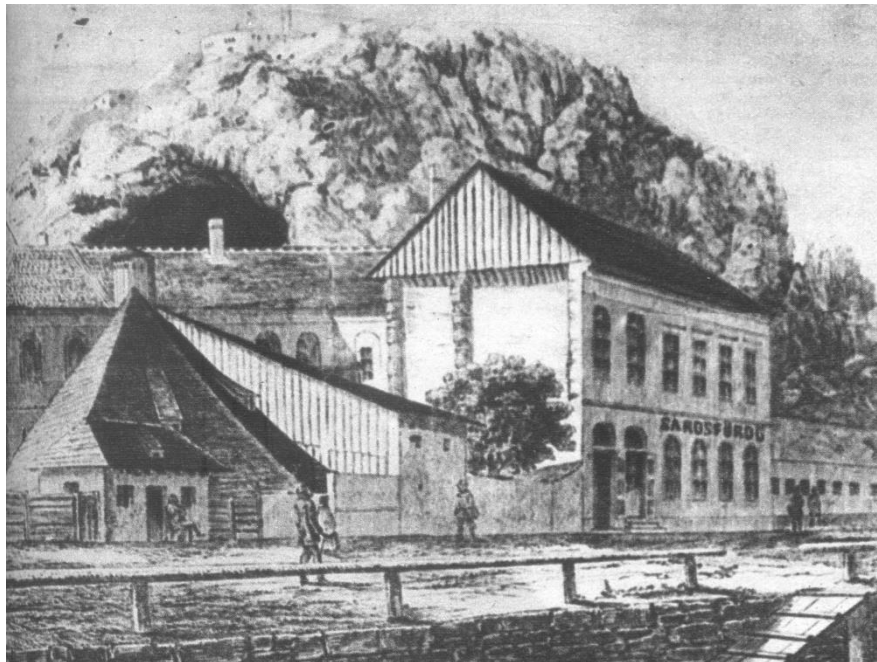


*Molnár János Cave (photo by József Spanyol)*



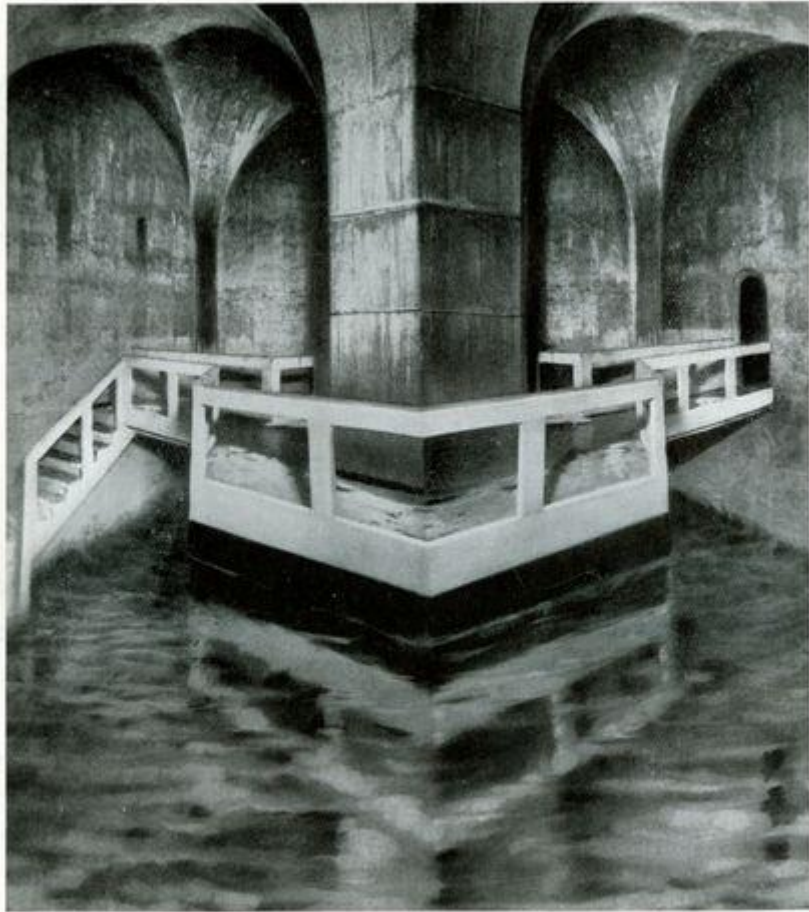
Conceptual flow model for the Rose Hill discharge area (after Erőss, 2010, modified)

### MIKAS - Spring of the Gellért Spa (Ósforrás)



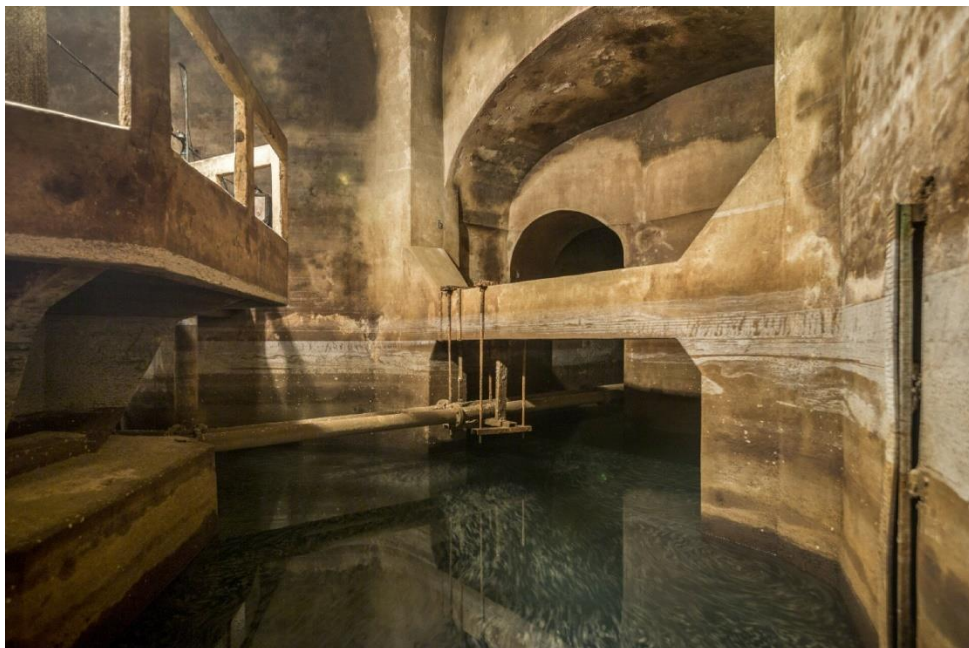
The so called "Muddy Bath", the ancestor of the Gellért Spa in the 19th century (from the archive of I. Dobos)





A régi Sárosfürdő egykori közös medencéje, amely még valószínűleg a török hódoltság elejéről való építkezés, — a közepén látható támasztóoszloppal való megerősítése és bebörtönzése után. Jelenleg ide vezeték a Szent Gellért-gyógyfürdő forrásainak vizét.

*Sketch of the Ósforrás spring*



*Spring of the Gellért Spa*