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"THE BOYS ARE BACK IN THE MINE"

Excursion to Sümeg–Mogyorós-domb, the open-air exhibition site of a prehistoric flint mine

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The open-air exhibition site in the vicinity of Sümeg in West-Central Transdanubia includes the remains of a prehistoric flint mine. The renovation of the site, finished last year, involved reinforcing the masonry supporting the prehistoric quarry walls, building a new protective roof, and building a visitor centre on the territory of the Kovakő Camp [Flintstone Camp] to present the geological, palaeontological, and archaeological finds. Visitors can explore these while walking a two-kilometre-long educational route with eight stations.

Keywords: Sümeg–Mogyorós-domb, prehistoric flint mine, open-air site, exhibition, renovation

Being a private correspondence student in the early 1980s, I did not have a chance to visit the site because I had worked full jobs in the town museums in Pápa and Vác, and I could not participate in the study trips organised by the university. I learned in the mid-1990s that the prehistoric mine became overgrown with scrub (or, as it was said later, euphemistically, 'maintenance was rather problematic'). Therefore, after the field technician training in Szombathely started in 1994, I did not organise study trips to the open-air presentation site for my students.

Fig. 1. Details of the Sümeg–Mogyorós-domb open-air exhibition site. The two rows of standing concrete slabs mark the location of the original geological key section. Protective roofs have been erected over the exposed parts of the prehistoric mine

A couple of months ago, geologist János Futó, my friend and the former director of the Zirc Natural History Museum, told me about the new attractions of the Mogyorós-domb [Mogyorós Hill] site: a prehistoric mine and a geological exhibition in the neighbouring camping site. The development, financed by the EU, was realised between 2019 and 2023 as part of a joint project by the Directorate of the Balaton-Felvidék National Park and the town of Sümeg. In October 2024, I finally made it to the hill, giving home to one of the seventeen known prehistoric mines in Hungary (*Fig. 1*).[2]

In 1978, academician József Fülöp (1927–1994), chairman of the former Központi Földhivatal [Central Land Registry] at the time, initiated the establishment of a Research, Education and Advanced Studies Centre in Sümeg. The place remained a constant venue of summer fieldwork sessions for geology, geophysics, engineering geology, and mining engineering students until 1990. Why there? The answer is simple: the geological survey of the country reached the Bakony Mountains in the late 1950s.

One of the key sections, extending over 300 metres, was opened on Mogyorós-domb at Sümeg with the help of a miner, Lajos Kocsis, and his team from the Geological Institute of Hungary (MÁFI) in 1958–59. After removing the topsoil and lithic debris layers, the trench had to be deepened in the central part of the hill to reach the bedrock. Kocsis found antler tools in the removed soil and detected use-wear traces on them. He

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[2] The other prehistoric flint mine open for visitors is the Open-air Geological Museum in Tata.

Fig. 2. Relatively thick flint layer in the limestone, collected by the author from the surface of a spoil pile

Fig. 3. A prehistoric miner at work. Life-size reconstruction in the exhibition of the urban camping next to the open-air exhibition site

Fig. 4. Red deer antler and pebble tools from the collection of MÁFI in the exhibition

sent them to József Fülöp, who was in charge of the project and informed archaeologist László Vértes (1914–1968) in the Hungarian National Museum. Vértes investigated a part of the mine for months in 1960–61. The hill was declared a natural conservation area in 1976, and the excavations (led by Erzsébet Bácskay) continued for three more years. Miklós Pattantyús-Ábrahám conducted an electrical resistance survey in 1979, detecting trenches dug by the one-time miners in the unexplored parts. By today, the geological site has become known worldwide for its complete record of 35 million years of continuous marine sedimentation from the end of the Middle Jurassic to the middle of the Lower Cretaceous Period.

Traces of prehistoric mining of the Lower Cretaceous radiolarite deposits could be detected on Mogyorós-domb in an approximately 320 m long, 60 m wide zone with 40–50-cm wide flint lenses or up to 15 cm large lumps, stretching northeast to southwest (*Figs. 2–3*). The lumps were the best for producing blades and blade tools. Based on the radiocarbon dates obtained from charcoal samples collected by Vértes and other indirect evidence, the deposit was quarried from the Middle Neolithic (by people of the Central European Linear Pottery Culture) through the Copper Age (see the lithic record of, e.g., Nagyrécse, Sárvár, and Zalaszentbalázs) until the end of the Bronze Age (as confirmed by the presence of raw material from this deposit on sites at Balatonmagyaród and Gór). The southern parts of the mine had been exploited earlier, perhaps a millennium before the others. The mine yielded an estimated 11,600 m³, that is, 30,000

tons of siliceous rocks, one-third of which is considered to have been suitable for further processing.

The one-time miners, using red deer antler tools (pickaxe, wedge, hoe, 'rake', bone billet/soft hammer: *Fig. 4*), clearly followed the parallel siliceous rock layers, tilted almost vertically due to tectonic movements. The system they created consists of trenches and arched, 1–5 m wide, sometimes more than 3 m deep cuts (*Fig. 5*). The tools were scattered unevenly; at some places, 5–8 pieces per square metre were found. About 40% of the tools were complex artefacts suitable for several functions, such as the hammer-drop-hammer, the strainer-lifter, and the hammer-pickaxe. Only three antler tools had shaftholes.

Artefacts made of non-local materials include an andesite shafthole axe and a basalt hammer. Besides, several hundred non-local pebbles originating from nearby deposits have been found. Only a small part of them shows traces of processing related to their removal from the calcareous bedrock and splitting. Most of them are palm-sized, but some are bigger. According to the current state of research, the flint quarried here was especially popular with the people of the Middle Copper Age Balaton-Lasinja culture inhabiting the lands southwest of the mine in today's Zala County. That is not surprising, as this deposit was likely the closest available for them. However, the most popular raw material north of Lake Balaton remained the radiolarite from Tűzköves Hill near Szentgál.

The animals represented by the raw material of the antler tools and other bones recovered from the site are evidence of a relatively small part of the related people's diet. The species include the so-called 'prehistoric eastern' (Caspian) red deer (461 pcs) and the roe deer (11 pcs), as well as other wild and domesticated animals such as wild horses, auroch, cattle, goats, and pigs. Of the tools that include the burr of the antler, nineteen came from animals killed for food and raw material for tools, and a hundred were made of shed antlers.

According to Endre Krolopp's (1935–2010) evaluation, the few Molluscan species from the site indicate a humid prehistoric environment with lush vegetation dominated by shrubs and bushes, more varied and with a wetter climate than today. The vegetation cover must have also influenced the mining, especially the locating of siliceous rock

Fig. 5. Bottom of a mining trench with almost vertical limestone layers, the places where the rock was removed from, and the regrowing vegetation

Fig. 6. Information board in the mine

layers and near-surface exploitation. József Stieber (1925–?) identified charred oak, maple, beech, and sweet chestnut remains in the soil samples collected on the excavations by László Vértes. Moreover, Mária Mihált-Faragó (1913–2010) and Magda Járai-Komlódi (1931–2012) identified pine, hazel, downy birch, goosefoot, sedge, fescue, and grass pollens in the record of the site. Some of these plants must have been growing on Mogyorósdomb or in its immediate surroundings when the mine was exploited; these species also indicate a humid environment. Green toad, an animal identified, together with other small animals, from bones by Miklós Kretzoi (1907–2005), also prefers wet and shady environments.

The renovated, cleared, and cleaned archaeological site can be visited again after two to two and a half decades. This is a great pleasure for the Hungarian and international community of geologists, archaeologists, miners, and interested outsiders. Although the mine was (correctly) fenced off again, the footprints appearing in the enclosed part indicate that the sheep and goats pastured in the area still find their way there (or can grazing be an environment-friendly way of maintenance applied there?).

Unfortunately, no walkways have been built for visitors, and the uneven surface covered by 40–50 cm high vegetation makes it difficult to advance for the elderly, as well as the youngest, who often prefer running around. The lush vegetation started reconquering the prehistoric trenches, gradually covering the heritage elements to be observed again. The bilingual (Hungarian and English) information boards made of wood will likely remain serviceable for a few years (*Fig. 6*).

The geological exhibition in the former education centre (now an urban camping site) is not accessible to the disabled. The texts have not been translated and are presented only in Hungarian, which is most unfortunate because they, together with some unique geological models made by former university students, represent high-quality entertainment for everyone.

The photos in the paper were taken by the author on 5 October 2024.

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