Bosnian Pyramid of the Sun Foundation

Summer excavation – July/Aug 2018

Ravne Tunnels

The subterranean approach towards the Bosnian Pyramid of the Sun continues in Summer 2018 through the nearby Ravne tunnel network. Excavations at Ravne began in 2006 when Dr Sam Osmanagić excavated a small cave he suspected was associated with the ancient pyramid complex, located 2.5 km away. Excavations at the site have since revealed over 1 km of passageways that were previously unknown to history, which had later been purposely blocked up with loose gravels. Archaeological features along the passageways include water channels, chambers and over 50 stone drywall structures. Several large megaliths, each weighing at least several tons have also been uncovered within the tunnels. Their form and the material they are composed of is not like anything else found within the surrounding geology.

More recently, another partially infilled cave has been identified near to the 2006 cave discovery. It is possible the cave may contain a blocked tunnel at its backwall. The existence of interconnected passageways from this site would extend the Ravne underground network by at least 200 m, further increasing the likelihood of identifying more archaeological features. Excavation of a secondary entranceway into the labyrinthian network will also accelerate efforts towards the interior of the Bosnian Pyramid of the Sun by improving works access and current safety measures.

Brief Technical Summary:

Location: Ravne, Visoko; 2.5 km northwest of Piramida Sunca.
Local Geology: Sarajevo-Zenica freshwater basin; Lašva Formation- conglomerates, sandstones and marls.
Age: Late Miocene.

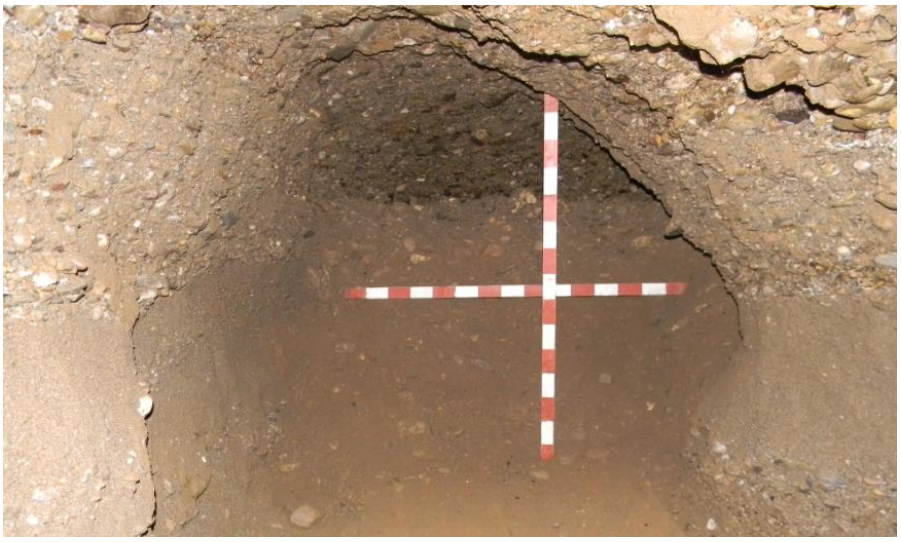
The Ravne tunnels found near Visoko cut through a horizontally bedded loosely consolidated extraformational polymictic conglomerate found at the top of the local Lašva series. It is composed of gravel-grade clasts, ranging in size from pebbles to small boulders. Calcareous clasts dominate, including limestones, dolomites and siltstones rich in carbonate. Sandstones, vein quartz and an assortment of metamorphic and igneous rocks are secondary. Clasts are rounded to angular. Internal fabric is heterogeneous and highly variable both vertically and laterally. A coarse sand matrix is not always present. The poorly sorted clasts are weakly cemented with calcium carbonate, most often only occurring as a thin sheen over clast surfaces. Bed thickness is no greater than 15 m. Base is in contact with underlying marls and interbedded sandstones. Overburden consists of clay, sub-soil and soil layers.

Ravne conglomerate – Poorly sorted and loosely consolidated clasts of mixed composition with coarse sand matrix. Image; Richard Hoyle, 2010

Partially infilled passageway cutting through Ravne conglomerate.
Image; Richard Hoyle, 2010

Nature of tunnels:

Horizontal tunnels occur at base of conglomerate bed and range in size both laterally and vertically from a few 10s of cm's to over 1 m. Tunnels are most often observed to be backfilled with unconsolidated gravel-grade material and sand, similar in composition to the Ravne clasts and sand matrix. Sections of passageways have been found without blocking material, others flooded and containing channels cut into the underlying clay beds. A number of chambers have been identified where several passages intersect. The drywalls contained within the tunnels are composed of mainly large sandstone pebbles and small bounders. Drywalls are commonly found at particular junction points between minor passages and the main thoroughfare. Principle purpose of the drywalls may be to stabilize and contain backfilled material within each tunnel section.



Passageway (>1m) blocked by unconsolidated homogenous sand and gravel material. Image; Richard Hoyle 2010

The first infilled cave identified and excavated by Dr Sam Osmanagić. Image; Pyramid of the Sun Foundation, 2006

Small passageway (<1m) and chamber with water pool. Blocking material was not present. Image; Richard Hoyle, 2010

Drywall revealed by removal of blocking material. Backfilled passageway behind structure. Image; Richard Hoyle, 2010

Original cave of 2006 after excavation.
Image; Richard Hoyle, 2010

Excavation Locality:

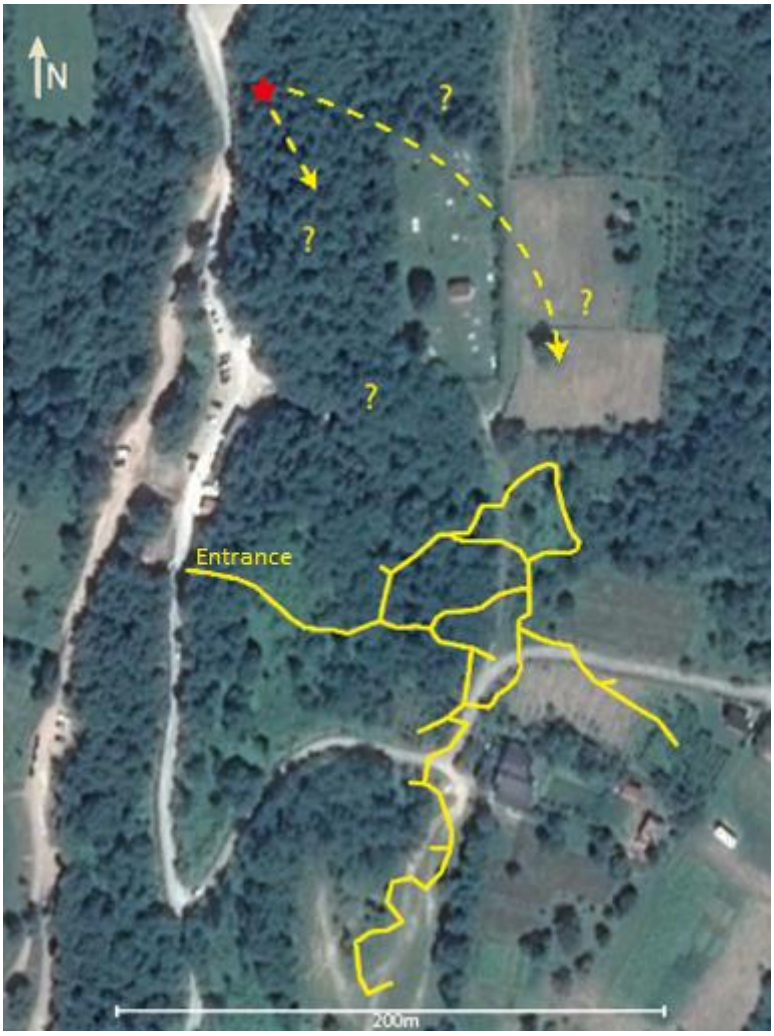
The recently identified cave is located approximately 200 m north of the present Ravne tunnel network main access point. The cave occurs within the same conglomerate unit and at the same stratigraphic level as the previously discovered cave entrance and subterranean passageways. The cave opening is approximately 5.5 m wide and 1 m high, with the backwall of the cave 5 m deep. The cave is partially infilled, like the 2006 cave, with soil and unconsolidated lithic debris.

Excavations at this locality will commence mid-July 2018. The initial phase of work will be to improve work access to the cave opening. Following this activity, removal of material from within the cave will allow access to the backwall for inspection of any existing infilled passages.

Exterior of cave and possible tunnel entrance found within Ravne conglomerate. Image; Richard Hoyle, 2018

Interior view of cave, looking outwards
Image; Richard Hoyle, 2018

Conglomerate appears absent at backwall of cave. Possible passageway infilled with unconsolidated soil and debris. Image; Richard Hoyle, 2018



* indicates new cave locality. Yellow hashed lines indicate possible directions potential tunnels will take towards known and excavated parts of the Ravne tunnel network.

"Entering a cave or rock was a metaphor for a shaman's altered state; therefore, caves (and rocks more generally) were considered entrances or portals to the supernatural world"
– James Lewis-Williams, 'The Mind in the Cave'.