Face to Face with Prehistory

Mos'anne Revealed

The ROAM project, led by an interdisciplinary team at Ghent University in collaboration with national and international experts, is revolutionizing our understanding of the last hunter-gatherers of Belgium. Through a combination of archaeology, bioarchaeology, stable isotope analysis, ancient DNA research, and more—the project examines migration, diet, and health among the last hunter-gatherer communities to live in Belgium. By integrating cutting-edge scientific techniques, they are uncovering unprecedented details about the prehistoric humans, their lifeways and the environment in which they lived.

This reconstruction of a Mesolithic woman buried once in Grotte Margaux (close to the current day village of Freÿr in the Namur province) is a precise blend of science and artistry. Her skull was scanned and 3D printed before layers of paraffin wax clay sculpted her muscles, with fine ropes mapping arteries and flexible silicone cartilage for her nose. Five layers of translucent silicone recreated a lifelike skin tone, and the strands of hair were implanted one by one. Ancient DNA analysis revealed she had blue eyes, like many Western Hunter-Gatherers, but a lighter, medium-toned complexion—an intriguing variation in post-Ice Age Europe. This detailed process, informed by archaeology and genetics, transforms ancient remains into a vivid, scientifically grounded portrait, offering a rare glimpse into the diversity and lifeways of early European hunter-gatherer societies.

The woman's expression is strikingly lifelike, capturing both resilience and wit. Her tanned complexion reflects a life spent outdoors, exposed to the elements. Ochre-stained leather bands woven into her hair suggest personal adornment, whether symbolic or practical. Pierced animal teeth speak to traditions of decoration and identity, while delicate but purposeful mallard feathers add texture, hinting at cultural significance or status. Every detail, informed by archaeology and creative interpretation, strengthens our connection to her world—allowing us to meet her gaze and glimpse the individuality of a hunter-gatherer who lived 10,500 years ago.

In the laboratory, a small fragment is extracted from the tooth or skull in order to carry out a DNA analysis. © vakgroep Archeologie, UGent.

Anatomical model of the skull showing accurate muscle structure and cranial thickness. © Kennis & Kennis.

Close-up of a perforated tooth, drilled using a traditional flint awl and bow technique. © Vakgroep Archeologie UGent.

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On the menu: Food remains from the Mesolithic

Mesolithic people lived as hunter-gatherers, relying on what nature provided. To understand their diet, scientists use isotope analysis, which looks at the levels of stable carbon (C) and nitrogen (N) isotopes in human bones. In diet reconstruction, high nitrogen levels often point to a diet rich in protein, especially from fish. This is supported by the many fish remains found at Mesolithic archaeological sites. The mix of land and water-based food sources shows how these communities adapted to the changing seasons. They combined fishing, hunting, and gathering plants in a flexible way that helped them survive in different circumstances and environments during the Mesolithic period.

Use-wear analysis helps researchers understand how stone tools were used by examining tiny marks and wear on their surfaces. By comparing these old marks to those made on experimental tools, scientists can tell what materials the tools were used on. In this project, both use-wear and residue analysis were done on stone tools. The Mesolithic toolkits include typical forager tools: microliths for hunting, knives for butchering, scrapers for working animal hides, and tools for cutting or scraping plants. At the site of Le Grognon (Namur), some tools still had traces of what they were used on—like collagen, bird feathers, and even resin used for attaching handles. These traces were studied under a microscope, stained to highlight organic material, and in some cases analyzed using proteomics, the study of peptides. Chemical tests also revealed the inorganic makeup of the residues, helping to better understand how the tools were used.

Mesolithic communities depended heavily on large animals like red deer, wild boar, and roe deer. These animals are the most common in archaeological bone collections and show many butchery marks. But smaller animals were also important. At sites like Abri du Pape and Kerkhove in the Scheldt Valley, bones from otters and beavers show signs of skinning, likely for their fur. A beaver bone even shows cuts from taking the meat apart. This shows that Mesolithic people used both large and small animals for food, clothing, and tools—demonstrating a flexible and efficient way of living.

In the laboratory, a small fragment is drilled from the tooth or skull in order to perform a dietary analysis and carbon dating (14C).
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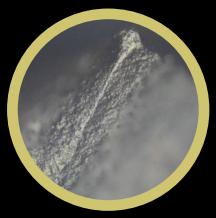

Close-up of a stone tool showing wear from cutting bone — smooth, greasy, flat, and shiny with a rounded cutting edge. © vakgroep Archeologie, UGent.

Cut marks on animal bones show how they were used for food and tools, with evidence of meat and skin removal. Cut marks on deer from Kerkhove (CAD: C. Pironneau, modified after J.-G. Ferrié,
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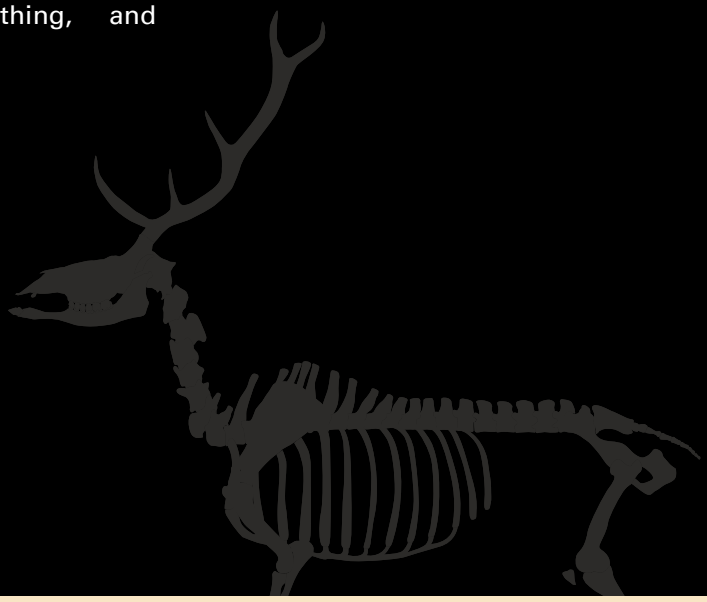

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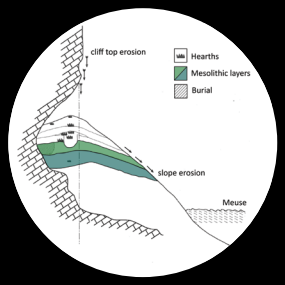
Life Between Rock and River

The reconstruction , created by graphic artist Ulco Glimmerveen, is based on scientific data collected during excavations in the 1980s and 1990s at a Mesolithic campsite known as Abri du Pape, located in the immediate vicinity of Grotte Margaux. The site lies at the foot of a massive rock formation, the Rochers de Freÿr, beneath an overhanging cliff. Excavations revealed several Mesolithic occupation layers, with remains of hearths, animal butchery waste, and flint tools. The oldest layers date to the same period as the collective burials in Grotte Margaux and at Abri des Autours; the latter is located just above the campsite at the highest point of the Rochers de Freÿr. It is therefore quite possible that the individuals buried there were indeed part of the hunter-gatherer group that inhabited the camp.

The reconstruction offers a view of the landscape at the beginning of the Boreal period, around 10,000 years ago. Based on charcoal fragments found in the hearths of the campsite, the vegetation could be reconstructed. It consisted mainly of pines and hazels, and possibly also some rare birches and elms. This corresponds perfectly with the image we have based on pollen grains preserved at other Mesolithic sites in the Meuse Valley (e.g., at Namur "Grognon"). The frequent presence of hazel is a defining feature of this landscape. In addition to being a source of firewood, hazel also provided an important food source for Mesolithic hunter-gatherers. Due to their high fat content, hazelnuts were highly prized. Two "wicker" baskets in the canoes are therefore filled with freshly gathered hazelnuts. It is likely that Mesolithic people also consumed other edible plants and fruits, such as wild apples, berries, and tubers, but unfortunately, no remains of these have been preserved.

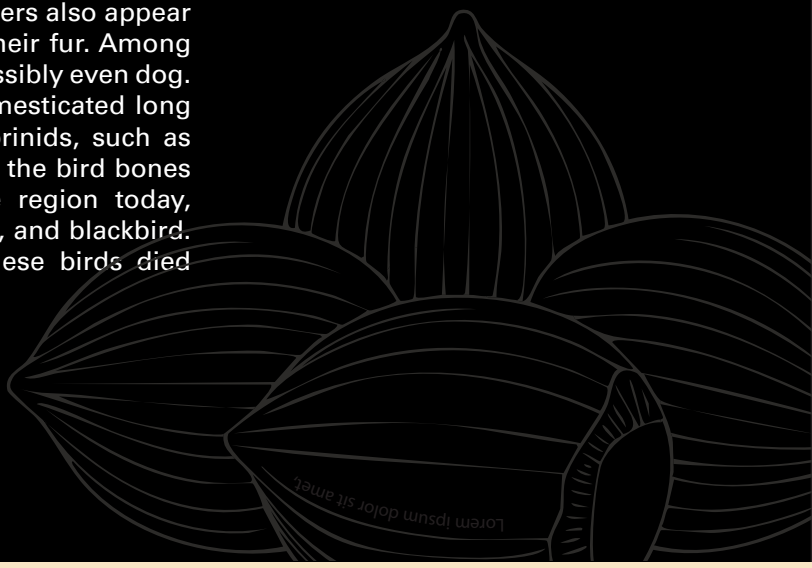
The hundreds of bones from mammals, birds, and fish collected at Abri du Pape also offer a unique insight into the diet of Mesolithic people. Most bone fragments come from medium to large game, such as wild boar, red deer, and roe deer. These animals provided not only fat-rich meat but also hides for clothing, bones and antlers for making tools, and sinews as binding material. Foxes, wildcats, and otters also appear to have been frequently hunted or trapped, likely for their fur. Among the bone remains are also some fragments of wolf or possibly even dog. This is not surprising, as wolves had already been domesticated long before the Mesolithic. Fishing focused mainly on cyprinids, such as chub and roach, and to a lesser extent on pike. Among the bird bones are remains of dozens of species still found in the region today, especially hawk, snipe, wood pigeon, house martin, jay, and blackbird. The absence of cut marks suggests that many of these birds died naturally and were not all killed by Mesolithic humans.



Stratigraphic cross-section of l'Abri du Pape © Léotard et al., 1999.

Charred hazelnut shells © Wessex Archaeology.

Flint projectile from l'Abri du Pape. © Vakgroep Archeologie UGent.



Above the Camp, Beneath the Earth: Mesolithic Burials in the Meuse Basin

During the Early Mesolithic as climate rapidly improved following the last glacial period, a little over 11.000 years ago, the Meuse River basin became increasingly populated. Archaeological evidence reveals a sharp rise in settlements and burial activity during the ninth millennium BCE. At least eight Mesolithic burial sites have been identified along the Meuse and its tributaries, all located in caves or rock-shelters. These include Margaux Cave, the Abri des Autours rock shelter, and others such as Bois Laiterie, Loverval and Claminforge. Burial practices varied widely: some graves were placed at cave entrances, while others, like those at Margaux and "Faille du Burin," were located deep within darker recesses. Inhumation was the dominant practice, though a rare cremation was discovered at Autours. Burial spaces were often confined, using natural cave features or constructed elements like low walls or stone piles. Most burial grounds contain remains of multiples individuals, between two and 12. Single graves are the exception.

A particularly interesting spatial relationship exists between the small Mesolithic encampment of Abri du Pape, nestled along a river bend, and the nearby burial sites. Just above this camp lies Abri des Autours, a rock shelter used for collective burials, including one rare cremation. About 500 meters away stands Grotte Margaux, a larger cave with more complex burial arrangements. This clustering of habitation and mortuary sites suggests a deliberate landscape of memory and ritual, where the living and the dead coexisted in close proximity.

Grotte Margaux and Abri des Autours stand out for their distinct funerary practices. At Margaux, burials were often secondary, with rearranged remains and ochre-sprinkled corpses, all of whom were women. Most bodies were positioned in an oval pit that was covered with stone fragments, indicating careful spatial planning. One individual has cutmarks on her skull, which were applied after death. Abri des Autours includes at least 12 individuals, the fragmentary remains of which were dispersed over the cave floor and a small pit. Despite the diversity of burial methods, associated artifacts were generally sparse in most of the burial sites, suggesting a symbolic rather than material emphasis in funerary customs. Together, these sites offer a rich glimpse into the spiritual and social lives of Mesolithic communities along the Meuse.

Elevation map with Abri du pape, Abri des Autours and Grotte Margaux.© Adapted from WalOnMap, AWaP.

Burial plan of Bois Laiterie showing generally commingled state of Mesolithic burials. © Cauwe & Toussaint 2007.

Cutmarks on the skull of Margaux 3 interpreted as the ritualistic removal of the jaw and scalp. © Toussaint, 2013.

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