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## PALAEOANTHROPOLOGY

# An early modern human outside Africa

**Analysis of two fossils from a Greek cave has shed light on early hominins in Eurasia. One fossil is the earliest known specimen of *Homo sapiens* found outside Africa; the other is a Neanderthal who lived 40,000 years later. [SEE ARTICLE P.500](#)**

ERIC DELSON

**T**he origin and early dispersal of *Homo sapiens* has long been a subject of both popular and scholarly interest<sup>1</sup>. It is almost universally agreed that *H. sapiens* (modern humans) evolved in Africa, with the earliest known fossil representatives of our species dated to around 315,000 years ago in Morocco (at a site called Jebel Irhoud)<sup>2</sup> and approximately 260,000 years ago in South Africa (at Florisbad)<sup>3</sup>. Stone tools comparable to those found with both of these fossils have been excavated in Kenya (at Olorgesailie)<sup>4</sup> and dated to about 320,000 years ago. On page 500, Harvati *et al.*<sup>5</sup> describe their analysis of a fossil from Apidima Cave in southern Greece that they report to be an early modern *H. sapiens* at least 210,000 years old. This fossil is the oldest known modern human in Europe, and probably in all of Eurasia, and is more than 160,000 years older than the next oldest known European fossil of *H. sapiens*<sup>6</sup>.

The Apidima Cave complex was excavated in the late 1970s. Two partial crania (skulls without the lower jaw), named Apidima 1 and Apidima 2, were recovered in a single block of a type of rock called breccia. Neither fossil was previously described in detail. Apidima 2 includes the facial region of the skull and had been identified as a Neanderthal<sup>7</sup>. Apidima 1 consists of only the back of the skull and had not been previously allocated definitively to a species. Harvati and colleagues used computed tomography to scan the fossils, and generated a 3D virtual reconstruction of each specimen. They analysed each fossil to assess aspects of its shape, and thus to determine the fossils' similarity to those of other species.

Apidima 2 is badly damaged owing to previous breakage and distortion. Analyses of all four generated reconstructions of the fossil were consistent with it being an early Neanderthal. Apidima 1 is also damaged, but the specimen is not too badly distorted,

so mirroring its right and left sides yielded a good reconstruction. The authors' extensive comparative analysis indicates that this fossil is an early member of *H. sapiens*. The posterior part of the cranium is rounded like that of *H. sapiens*, and it lacks classic Neanderthal features, such as the distinctive occipital 'chignon' — a bulge at the back of the skull that is shaped like hair tied in a bun.

Earlier dating<sup>8</sup> of a fragment of Apidima 2 using a method called uranium-series analysis indicated a minimum age of around 160,000 years. Harvati and colleagues report a more extensive set of uranium-series dating analyses, which surprisingly reveal that Apidima 1 and Apidima 2 are of different ages, even though they were found in close proximity. Apidima 2 is around 170,000 years old — well within the age range of other Neanderthal fossils found across Europe (Fig. 1). Apidima 1 is dated to be at least 210,000 years old, which is much older than any other widely accepted *H. sapiens* fossils found outside Africa.

This finding reveals that at least two species of hominin (humans and human relatives from the branch of the family tree after our split from chimpanzees) inhabited southeastern Europe approximately 200,000 years ago. The discovery of an *H. sapiens* fossil in Apidima raises questions about what happened to this population. Given that this *H. sapiens* existed at a time when there is substantial evidence for a Neanderthal presence at other European sites, was it part of a population that was unable to compete successfully with Neanderthals, especially in the unstable climate of that time? Perhaps one or more times, the two species replaced each other as the main hominin group present in this region.

Such patterns of replacement characterize the distribution of modern humans and Neanderthals in the Levant region of the Middle East between 250,000 and 40,000 years ago. *Homo sapiens* replaced Neanderthals across Europe between approximately 45,000



## 50 Years Ago

By the time the lunar samples brought back by Apollo 11 have been wrung dry of scientific information, the second American expedition to the Moon will have already been mounted ... [T]he next landing will be at one of the two sites in the eastern hemisphere which have been chosen as smooth enough for a landing ... This way by the end of the year NASA will have recovered samples of typical mare regions in both the eastern and western hemispheres of the visible face of the Moon. What the Apollo 12 astronauts ... will be instructed to look out for will depend on the first-hand descriptions of the surface radioed by Armstrong and Aldrin on Monday morning (BST) and on preliminary analyses of the samples ... Armstrong's first description that "the surface appears to be very finely grained as you get close to it, it's almost like powder" matches the Surveyor results which point to a matrix made up of finely divided particles sometimes aggregated in lumps.

**From *Nature* 26 July 1969**

## 100 Years Ago

The possibility of growing New Zealand flax (*Phormium tenax*) on a commercial scale in the British Isles has for many years been under consideration, and the publication of an important paper on the subject ... is of considerable interest ... The article, which mainly consists of an account of Lord Ventry's successful experiments in co. Kerry, is illustrated by several photographs of New Zealand flax under cultivation in Ireland showing a remarkably vigorous growth ... It is pointed out in the article that only certain parts of the United Kingdom are suitable for the growth of New Zealand flax ... but as the results so far obtained are promising, it is to be hoped that every encouragement will be given to the enterprise.

**From *Nature* 24 July 1919**