Did Neanderthals create cave art?

Philip Guelpa
10 July 2012

A newly published article in the journal *Science* (Pike et al, 15 June 2012, "U-Series Dating of Paleolithic Art in 11 Caves in Spain") indicates that Paleolithic cave art in Europe dates even earlier than previously known, to at least 40,800 years ago. This is only a few thousand years, at most, after the earliest documented appearance of anatomically modern humans on the continent and at least 4,000 years older than the previous estimates for the earliest cave art in Europe. Tests run on samples from the 11 caves identify the earliest image as a red disk dating to 40,800 years ago, followed at 37,300 years by a hand stencil, and a claviform-like (key-like) symbol at 35,600 years.

Over the following millennia, artistic representations painted on cave walls developed tremendously in variety and sophistication, including a whole range of abstract symbols as well as exquisitely life-like animal representations, which demonstrate a fully human intellectual and aesthetic capability. However, these early simple designs, assuming that they do indeed predate the more elaborate images, may illustrate an aspect of the artistic tradition that modern humans brought with them when they first migrated out of Africa.

The newly applied dating technique uses the ratio of radioactive uranium to thorium in the calcium deposits (calcite) that have formed on the cave walls after the paintings were created. Uranium gradually decays into thorium at a predictable rate. Once a calcite deposit is formed the initial ratio of the two elements will progressively shift; thus the older the specimen the greater the proportion of thorium to uranium.

This technique is more accurate for the time range in question than radiocarbon dating of organic compounds in a painting's pigment, since the latter technique becomes unreliable for dating materials more than about 30,000 years old. Since the uranium-thorium technique dates material deposited over the paintings, it gives only the latest possible date. The actual age of the paintings may be even older.

Given the time frame of this earliest known cave art, the authors of the *Science* article suggest the possibility that some of this work may have been created by Neanderthals (also spelled Neandertals) rather than by modern humans. If true, this would tend to further reduce the previously postulated evolutionary distinction between Neanderthals and modern humans. However, the proposal is controversial and, at this time, speculative.

Nevertheless, the corporate media and some scientists have been quick to sensationalize it. These accounts play up the novelty of the idea that Neanderthals, once thought to be hulking, sub-human brutes, actually had the intellectual capacity and aesthetic sense to create art, which is taken to indicate abstract, symbolic thought, while minimizing the tentative and so far very weak scientific basis on which this hypothesis is based.

Neanderthals had been present in Europe at least 150,000 years ago and, so far, there is no evidence of cave art over more than two thirds of that time period. Currently available data indicates that modern humans only arrived on the continent sometime between 40,000 and 45,000 years ago. Neanderthals became extinct or were genetically absorbed into the modern human population within 10-15,000 years of the latter's arrival. Some recent research suggests this may have happened even more quickly.

While there may have been sufficient genetic compatibility for successful mating, as recent genetic research seems to suggest, the overwhelming preponderance of data currently available indicates that Neanderthals, at least prior to the appearance of modern humans, had very limited artistic capabilities, confined to small items of personal adornment.

Unfortunately, the stratigraphic integrity of the principal source of this supposed evidence, Grotte du Renne at Arcy-sur-Cure in central France, is in question. Modern humans also occupied the cave, so the separation between

artifacts associated with each group cannot be confirmed.

Similar objects are clearly associated with undisputed sites of modern human occupation. There is also evidence that Neanderthals employed red ocher (iron oxide) pigment, which is often used in cave paintings, in some contexts, such as the decoration of burials. However, their technological capabilities, as illustrated by stone tools, while exhibiting a certain degree of sophistication, appear to have been markedly inferior to those that modern humans brought with them from Africa.

By contrast, there is gradually accumulating evidence that anatomically modern humans had by the time of their spread out of Africa already developed intellectual and aesthetic capabilities beyond those so far documented among Neanderthals. For example, new dating of a cave site in southern Germany reveals that modern humans were making flutes out of bird bone and mammoth ivory at about 42,000 to 43,000 years ago, very soon after their initial arrival on the continent.

Recent research at Blombos Cave in South Africa indicates that modern humans were already exhibiting abstract, symbolic thought, as represented in a variety of objects, including pieces of ochre engraved with abstract designs and beads made from shells, at least as early as 75,000 years ago. Evidence that modern humans used red ocher as a pigment has been found at Qafzeh Cave in Israel dating back to 90,000 years ago.

Evidence from other parts of the world suggests that as they spread out of Africa modern humans carried an already established artistic tradition wherever they went. Petroglyphs (rock engravings) appear in Australia at roughly 40,000 years ago. As in Europe, this artwork dates to shortly after the likely first arrival of the humans on the continent.

Unless new dates for European cave art push its origins even earlier, well before the arrival of modern humans on the continent, it would appear that the hypothesis that Neanderthals painted in caves remains unproven at this time.

There is no doubt that modern humans were responsible for at least the great bulk of known European cave art since they continued to paint on the walls of caves many thousands of years after the disappearance of Neanderthals. It is possible, however, that the simple representations such as disks and negative hand prints, which the new dating indicates were the earliest forms of cave art, were, in fact, originated by Neanderthals. And, as modern humans intruded into Neanderthal territory, perhaps interbreeding with them, they adopted the idea of cave painting and rapidly expanded upon the simple efforts of the indigenous people.

Alternately, the appearance of cave art so soon after the earliest documented arrival of modern humans in Europe would seem to support the interpretation that the immigrants from Africa already had a well developed artistic tradition which they quickly adapted to the particular opportunities presented by European caves. Since the use of the uranium-thorium technique to the dating of cave art has only been applied to a very small number of sites so far, the answer to the question of when the tradition of cave painting in Europe was begun and by whom must await further research.

This issue is important not only regarding the evolution of art *per se*, but for its broader implications about the development of human intellectual capabilities. If the production of art is based on the capacity for abstract, symbolic thought, then its first appearance would mark the evolution of intelligence equivalent to that of contemporary humans. Available evidence indicates that anatomically modern humans first appeared in Africa and possibly Asia about 100,000 years ago and subsequently spread throughout the world. Older forms of humans, including Neanderthals, were already present throughout much of Eurasia.

The fundamental question is this: Was fully modern intellectual capacity found only among anatomically modern humans or did it already exist among the pre-modern forms?

The author recommends:

New research may show that Neanderthals did not go extinct
[27 December 2011]

Neanderthals and modern humans—a key to understanding human evolution
[3 October 2008]