

THIS WEEK

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Prior art

The earliest known drawing — crayon on a rock shard — suggests early humans engaged in abstract art.

If a picture tells a thousand words, a cross-hatched design drawn on a fragment of rock some 73,000 years ago could speak volumes. The problem will be understanding what it tells us. The design, reported in *Nature* this week (C. S. Henshilwood *et al.* *Nature* <https://doi.org/10.1038/s41586-018-0514-3>; 2018), occurs on a lentil-shaped rock flake, and was found in Blombos Cave, on the southern shore of South Africa, by archaeologist Christopher Henshilwood and his colleagues. The flake bears an abstract design drawn, the authors say, using a crayon made of red ochre.

It is hard to claim that the design is beautiful, dazzling or engrossing. But the artwork is destined to be priceless and famous, because it seems to be the earliest evidence for a drawing in the archaeological record, by some margin. Apart from some cave paintings from Spain dated to around 64,000 years ago — presumably the work of Neanderthals (D. L. Hoffmann *et al.* *Science* **359**, 912–915; 2018) — the next instance of drawing came around 40,000 years ago with cave paintings found at opposite ends of Eurasia: in the spectacular art decorating the walls of caves in Spain and France, and the more recently discovered cave art in Sulawesi in Indonesia (M. Aubert *et al.* *Nature* **514**, 223–227; 2014). Despite being located 12,000 kilometres apart, cave paintings such as these contain images that we instantly recognize as figurative art, including a range of animals, and stencils of hands that speak to us, millennia later, as signs of human self-awareness.

A key distinction of this latest piece is that it is a drawing — a design made by applying pigment — rather than an engraving, made by scratching or cutting a design into a surface. Engraving has a longer prehistory than art. The earliest engravings known are on pieces of shell from Trinil, Java, dated to around 540,000 years ago, well before modern humans evolved, and presumably made by *Homo erectus*. Other ancient engravings have been found around the world; all are extremely simple: just lines, sometimes cross-hatched. There is nothing remotely similar to what we would recognize as imagery, and there is insufficient evidence to say whether they might represent something utilitarian, such as tally sticks or calendars. So, were these Palaeolithic hashtags actually designs intended to convey meaning, or mindless graffiti? Some might have been the unintentional result of another action, such as cutting food items, just like the scratches left on a chopping board after slicing a loaf.

A drawing, by contrast, is much harder to dismiss. To be sure, the one from Blombos is as cross-hatched as the engravings, but it could not have been created as the accidental by-product of another process. Although proving intentionality is extremely hard, the authors examine the evidence they have — including detailed study of the ochre residues — with forensic thoroughness. It seems clear that the drawing was a fragment of something bigger, because some of the lines look as if they continued on to pieces now long gone. In addition, the authors attempted to restage history, using pieces of ochre themselves to show that such drawings can be made using crayons carved out of ochre (rather than, say, by brushwork), and that creating the design on such a rock fragment is possible only by deliberate rotation of the design

through an angle, much as later artists might rotate their canvas.

That the ancient artist chose to sketch with red ochre is less of a surprise. The mineral, largely consisting of iron oxide, has been used as a pigment since time immemorial. Its earthy red hues clearly meant a lot to the early modern human inhabitants of Blombos Cave and other nearby sites. They used it as an ingredient in paint, and perhaps even as a sunscreen. Between around 100,000 and 73,000 years ago, the people of the region produced artefacts tens of thousands of years in advance of humans anywhere else in the world, including finely worked stone and bone tools and engraved ochre pieces.

That the early *Homo sapiens* living there were able to produce such designs suggests they possessed relatively 'modern' cognition and behaviour. What we cannot know is why they made the marks, or what they represent; unlike images of animals or hands, the drawing's abstract nature offers no clues. And that raises a fascinating question about the history of art. Whereas the humans living in South Africa 100,000 years ago were using technology as yet undreamed of elsewhere, they had yet to invent figurative art. So, are the cave paintings of Lascaux and Sulawesi unconnected, independent inventions, or did modern humans create cave art somewhere else along the way, and then take it with them as they moved through the world? What is clear is that they started a trend, one that eventually led to Piet Mondrian, Jackson Pollock, Bridget Riley and the many great artists of today. ■

“It seems clear that the drawing was a fragment of something bigger.”

Noether's legacy

It's time to acknowledge the lasting impact of a brilliant mathematician.

Emmy Noether was a force in mathematics — and knew it. She was fully confident in her capabilities and ideas. Yet a century on, those ideas, and their contribution to science, often go unnoticed. Most physicists are aware of her fundamental theorem, which puts symmetry at the heart of physical law. But how many know anything of her and her life?

A conference in London this week, the Noether Celebration, hopes to change that. It's a welcome move. In a world where young scientists look for inspirational female role models, it is hard to think of a more deserving candidate.

Noether was born in 1882 in Erlangen, Germany. Her parents wanted all their children to get doctorates, so although many universities at the time did not formally accept women, she went. After graduation, sexist regulations prevented Noether from getting jobs in