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Insight
Archeology

We don't always think of early modern humans as being smart

Dr Jan De Vynck, left

Ancient geometric patterns created in sand on the Cape coast are hailed as one of the most profound artefact finds of our species, writes **Heather Dugmore**

TIME TRIP On the rugged southern Cape coast near Still Bay, palaeontologists have found a rich repository of ancient human prehistory, with artefacts dating to more than 100,000 years ago. Pictures: Supplied

A day on the beach 100,000 years ago

THE DAWN OF GEOMETRY

Above, this circle, drawn compass-style in the sand between 70,000 and 158,000 years ago, was found in the Garden Route National Park. The circle has been preserved for millennia because the sand it was drawn in cemented into solid rock.
Left, Dr Charles Helm demonstrates how early humans could have drawn a circle in the sand with a stick 'compass'.

Humans delight in creating patterns in the sand, and more than 100,000 years ago it would appear we were no different. People were drawing triangles in the dunes along SA's southern Cape coast. They had also mastered how to draw perfect circles and sculpted something that closely resembles a stingray, between 70,000 and 158,000 years ago.

"Our most recent finds in this same area are two large triangles on loose slabs of cemented Pleistocene dune surfaces," says Dr Charles Helm from the African Centre for Coastal Palaeoscience (ACCP) at Nelson Mandela University. These examples of "palaeoart", or what we call ammoglyphs – carvings, images or symbols made in dune sand that are now cemented into rock known as aeolianite – indicate that early modern humans were capable of creating exceptional geometric patterns.

"We don't always think of early modern humans or hominins as being smart but there is so much evidence of their innovations found on this coast," says Dr Jan De Vynck, director of ACCP. "Consider that they had already mastered the use of fire in a sophisticated way to make heat-treated stone tools at least 130,000 years ago."

Each side of the larger of the two triangles is about 1m long and remarkably straight. One possibility the scientists are considering is that very straight sticks or reeds were used to create them. "This wasn't random, it was an intense and well executed pattern," says Helm. "The bisector groove that seems to be associated with the larger triangle is slightly off, and might not meet Euclid and Pythagoras' exacting standards, but it is extremely difficult to create something so perfect in the sand."

Part of the triangles' uniqueness is that sand was the canvas and Helm says the scientists with whom he is working on this find are not aware of anything anywhere else in the world from the period like this or drawn at this scale. They also don't know if the triangles were part of something larger as the corners have broken off.

This discovery by Helm, De Vynck and Helm's wife, Linda Helm, is one of the most profound artefact finds of our species worldwide, created between 80,000 and 140,000 years ago.

They chanced upon the triangles while covering a very rugged stretch of the coast near Still Bay in search of fossil track sites. Over the past fifteen years they have discovered over 300 fossilised vertebrate tracksites, including four sites with human footprints from the same era on the southern Cape coast. "We came over this rise and said 'Look at that! What is that?', pointing at one of the triangles," Helm recalls.

The untrained eye would either not notice the triangles or see them as anything interesting, but the three knew they were looking at geometry in the aeolianite.

"We had this moment of disbelief, asking ourselves if this might be graffiti or created by natural forces," De Vynck says: "Graffiti was the main consideration to rule out. From subsequent research and analysis we were able to do so, as graffiti is etched on the surface of rock while the triangles were created around 100,000 years ago when the rock was sand. Both triangles are similar in design and for nature to replicate them on two rocks a few metres apart, with a very similar design (both triangles are split in half by a dissecting line) is further evidence of the human agent that created these forms."

Having ruled out these other possible causes, they felt the weight of the find on their shoulders, as Helm explains: "It is something that has never been found before that takes us back to the roots of our humanity and it is our duty to not only try to deliver good science but to share this with the world, which we did through the article in Rock Art Research and now with a wider audience through this feature." In so doing they say the weight of the find is partially relieved.

De Vynck recently returned to the site and the smaller triangle has already been taken away by storm surge as both triangles are at the base of cliffs that are covered by the ocean at high tide. "These finds offer brief windows into our very distant past as the solidified sand surfaces of the period have been fortuitously re-exposed by natural forces, but not for long as the same natural forces will destroy or cover them in weeks, months or years, and then they are gone forever. When I saw that the smaller triangle had gone after a few months I felt very anxious as it means the bigger one could also go soon."

A triangle etched near Still Bay about 100,000 years ago when the rock (called aeolianite) was sand. It is the larger of two triangles discovered, about a metre long, with remarkably straight lines.

The scientists are trying to work out how to recover the bigger triangle but it is in an extremely difficult location. They are trying to raise funds to retrieve it as it would cost up to R40,000 to attempt it by helicopter.

With the help of SANParks they have managed to recover a circle drawn compass-style from the Garden Route National Park and what appears to be an ancient, symmetrical sculpture resembling a stingray from the Still Bay area, both created in sand that cemented into rock. They will be exhibited in the museum in Still Bay.

Pre-1990, modern human culture was thought to have developed in Europe some 40,000 years ago, but we have far earlier evidence of this on South African shores from the middle to late Pleistocene era, approximately 158,000 to 70,000 years ago. And the finds keep coming, confirming that humans have been expressing themselves all this time.

"A key indication of human cognitive development is self-expression, through symbolism such as art, adornment and body painting," says De Vynck. "Another of our most provocative finds to date is the 'stingray'. If our speculation is correct then this is the oldest example ever found of a human creating an image of another creature."

They are currently having all these works precisely dated at Leicester University in the UK, along with 30 other samples from the 300-plus fossilised human and vertebrate tracks they have found in the aeolianite from the same era. The dates are obtained from samples of the rock in which the tracks and traces are found.

"We know people were doing 'palaeoart' engravings in this area," says De Vynck. "At the world-renowned Blooms Cave, about 30km to the west of the triangles site, professor Christopher Henshilwood has, since the 1990s, made a series of finds, including engraved ochre and drawings dated to 77,000 and 73,000 years ago respectively, and other finds such as deliberately perforated shells indicating they were used to make necklaces 75,000 years ago, as well as bone awls and a paint processing kit all made by hominins."

Possibly the oldest examples of cognitively modern human beings are at Pinnacle Point Cave near Mossel Bay. Here, honorary professor at Nelson Mandela University and international director of the ACCP Dr Curtis Marean and his team found what is being called "the oldest human seafood restaurant in the world".

"There is evidence that humans started to forage from the sea 164,000 years ago, as supported by the vast deposits of discarded shells in middens in the cave. We know from these shells that humans had been harvesting shellfish in the intertidal zone, which required in-depth knowledge of the lunar cycles," De Vynck says. "The intertidal zone is only viable for shellfish harvesting for three days before, on and three days after the spring tide, which happens every new moon and full moon – a total of 14 days in a 28-day lunar cycle. Also, shellfish and other marine resources are nutritionally very beneficial for brain growth and fertility. This could have played a significant role in our cognitive revolution along the Cape's south coast."

The burning question with regards to the triangles and circle is why would these early modern humans create geometric drawings?

"Jan, I and others have been extremely cautious in how we interpret the 'why'," says Helm.

At the same time they are intrigued. Hominin appreciation of pattern and symmetry could have been derived from the natural world around them, which is full of symmetry and patterns. Hominins also showed an extraordinary capacity for symmetry in the stone tools they fashioned.

Another notion is that the triangle may be a female fertility symbol, which becomes manifest in palaeoart in Europe in the Aurignacian, particularly in southern France going back 37,000 years. The symbols for fertility here are a very similar pattern to the two triangle rocks.

The scientists say that whatever their meaning may be, the appearance of these motifs relatively soon after modern humans are purported to have entered Europe from Africa lends credence to the possibility that such motifs had an older, African origin.

"The ball is in the court of others to debate and discuss this," says Helm.

"We have presented what we found, and we await the dating with great anticipation – the results will be out later this year."

Above, a sculpture thought to be of a stingray created in beach sand by early humans between 70,000 and 158,000 years ago. The sand cemented into rock over time.
Top, a live stingray seen from below, underwater.
Picture: 123rf.com