

Ancient humans may have made patterns and sculptures on South Africa's beaches

September 23 2019, by Charles Helm



A rock surface containing a circular pattern with a central depression. The scale bar = 10 cm. Credit: Proceedings of the Geologists' Association (2019)

One of the first things many kids—or even adults—may do when they are on a beach or dune is to make patterns in the sand, or sculptures in the form of sandcastles.

Many generations of humans have enjoyed these activities. But until now there has been no reported evidence to suggest how far back in [human history](#) this may have occurred. Now my colleagues and I believe we may have [found such evidence](#) at sites along South Africa's Cape south coast.

Southern Africa boasts [an extensive record of palaeo-art](#), and South Africa's Cape south coast, stretching eastward along the coast from Cape Town, contains one of the richest [Middle Stone Age archaeological records](#) in the world. This includes [an engraved piece of ochre](#) and the [oldest reported example of rock painting](#). Evidence suggests that the area may have been critical to [the survival](#) of the human species.

This [coastal region](#) now contains extensive aeolianites (cemented dune deposits) and cemented foreshore deposits. These rocks are the cemented remains of the dune and beach surfaces that existed when our distant ancestors and many other vertebrates were [making tracks](#) in the region in the Middle-Late Pleistocene, approximately 158,000 to 70,000 years ago. We know the ages of the rocks from [the results](#) of previous [dating studies](#).

It may seem that tracks and patterns made in the sand are ephemeral, destined to be covered by the effects of the next wind storm or tide. However, perhaps surprisingly, many of these records are preserved, ready to be identified when they are re-exposed through cliff collapse or through forces of erosion. Our team has identified more than [140 vertebrate tracksites](#) along this coastline. For example, as many as 40 footprints made by hominins traveling down a dune surface, and estimated as being 90,000 years old, [were identified](#) at one site by

members of our research team in 2016.

So, given that we know humans moved across these landscapes, we wondered whether there might also be evidence of other forms of human activity on these surfaces of sand, such as patterns, symbols, sculptures, or foraging. If so, could such ancient canvases have left evidence of human activity that can be discerned and interpreted today? Indeed, could such evidence form a previously undocumented form of Middle Stone Age hominin expression and activity? Our findings suggest the answer to these questions may be "yes."

A plethora of patterns

At one site we found a large almost perfectly circular groove, along with a depression in the centre of the circle. Beside this feature was a pair of oval shapes that may represent knee impressions. If this circle was generated by a human, then a possible mechanism could have involved the use of a forked stick, in the same way that a compass is used by kids in maths classes.

Other patterns included groove features beside possible human footprints, and a "hashtag" pattern that [resembles known paleo-art in the region](#). We also identified two possible animal images, one of which may conceivably have taken the form of a sculpture of a sting-ray. We have proposed a new term to describe patterns made in sand by humans, which become lithified over time through a natural cementation process: ammoglyph ("ammos" being Greek for "sand," and "glyph" being Greek for a carving, image or symbol).

If our interpretations are accurate, these findings represent two important things. Firstly, evidence of a human presence on these ancient dunes and beaches is more substantial than has been thought. Secondly, this evidence would buttress that of other avenues [of research](#) that [attest](#)

to the [cognitive abilities](#) of early humans [in this region](#).



The author demonstrates how a forked stick may have been used by a kneeling human to create a circular pattern in the sand. Credit: Linda Helm

Varying interpretations

There is a multitude of lines, grooves, patterns and shapes on these rock surfaces.

One of our challenges therefore lay in identifying whether a hominin "signature" could reasonably be inferred among this plethora of forms. We outlined other possible agents that may have caused such patterns (such as wind, water, fossil roots and branches, and traces made by invertebrates, reptiles, birds and other mammals). We also considered how to distinguish between ancient patterns made in sand and more recent patterns etched in rock—that is, graffiti.

In some of the cases we described we simply pointed out features that appeared puzzling, that may possibly have been created by humans, but where other causes could not be reasonably excluded. One site contained patterns that we had never encountered before, and that do not appear anywhere in the ichnological (trace fossil) literature. After due consideration we interpreted this as possibly representing a seal tracksite, and will be reporting on this elsewhere.

In other cases, such as the circular feature with the central depression, the presence of grooves beside possible human footprints, and the "hashtag" pattern, the evidence for a human origin appeared more compelling. However, we took a cautious approach, acknowledging that absolute certainty is elusive.

Next steps

Samples have been taken for dating, adjacent to a number of the sites we described. We eagerly await these results. Non-invasive imaging studies may aid in the investigation of the rocks with patterns that suggest foraging behavior.

We hope that other scientists will critically examine the findings and interpretations that we have presented. Recognising that ancient sand surfaces were not all "perishable," but that some of them have preserved an extraordinary record of what transpired on them, suggests a previously under-appreciated means of interpreting ancient human expression.

The resulting search for ammoglyphs on the Cape south coast has the potential to become a new field of study, at a meeting point of archeology, art, ichnology, paleoanthropology, pattern recognition and sedimentology.

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