REPORT

Sand towers on a raised beach near El Medano, Tenerife

The Canary Islands lie 200-300 km off the northwest African coast and rise from the Atlantic Ocean floor where it is 4000 m deep. They are mainly basaltic shield volcanoes formed over an intraplate mantle plume or 'hot spot'. The oldest island, Fuerteventura dates to 22 Ma, and Holocene eruptions have occurred on all islands except La Gomera. Teide is a massive, complex volcano rising 3718 m above sea level on Tenerife. The later vulcanism is substantially felsic with trachyte and phonolite magmas.

While on a tour of the Canary Islands volcanoes, led by Dr Simon Day for the Natural History Museum, we stayed at El Medano, a small resort on the south coast of Tenerife, too close to the new airport to now be popular. A headland at the south end of the bay is crowned by the rather elegant scoria cone of Roja, and was an excellent destination for an evening walk. Our route took us round the bay and up onto a raised beach. In a flat sandy area with sparse vegetation, we came across some unusual features – reminiscent of the Clanger's homes on 1970s children's television!

There were at least fifty of these structures in a single group, each protruding from loose sand, and up to a metre apart. The basic shape was a small circular tower, 100-200 mm in diameter, with walls of cemented sand 20-40 mm thick around a central hole. Some were amalgamated into oval structures with a larger central hole, while others had a number of branching tubes leading to circular holes on the outside. They stood about 200 mm high above the general ground level. They were firmly anchored to underlying rock, which appeared to be a pale, fine-grained, Holocene ignimbrite, similar to others exposed along the coast.

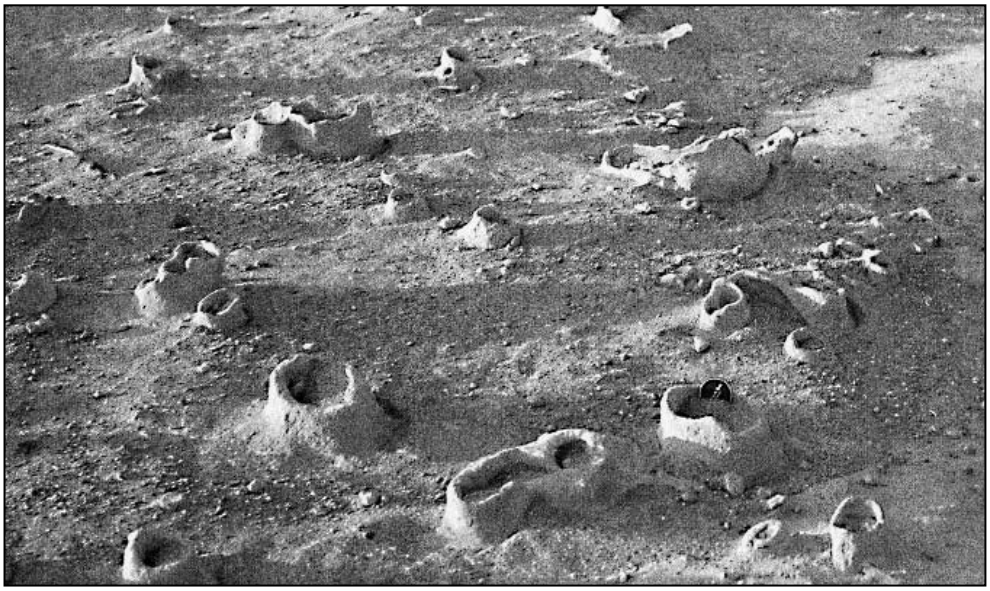
The cemented sand was a little greyer than the pale loose sand that surrounded the towers. Seen through a hand lens, the sand grains were angular, sorted to a fairly uniform size, with some grain alignment in the lower part. Black, beige and brown mineral crystals were mixed in with cream shell fragments. Hundreds of serpulid worm tubes, each > 1 mm in diameter, were seen on the inside and outside of some towers, mainly on the northern faces, but broken surfaces showed that they were superficial and were not inside the sand.

We consider that these structures were formed within the beach sand, during the Holocene, when hot aqueous fluids were rising through the ground during an eruptive episode. Hydrothermal fluids tend to rise through bedrock at fissure intersections, discharging as point sources into the sediment cover. As the fluids rose though the sand, they created pipes by mineralising and cementing the sand immediately around them. Subsequently the surrounding loose sand was removed by wave or wind action. The small worm tubes on both inner and outer surfaces indicate subsequent immersion in seawater, and further erosion may have taken place following uplift of the beach. We will never know the height of the original structures. Pipe feeders were not observed in the rock below the sand towers, but there was no opportunity for excavation and investigation.

The site is threatened by aggregate quarrying, but the towers are strong enough to last for years, and may remain accessible for examination.

Comparisons may be made with pipe structures elsewhere. The Pinnacles near Crater Lake, Oregon, some towers on the ignimbrite now flooring the Valley of 10,000 Smokes, Alaska, and the tufa columns at Mono Lake, California, are all on a much grander scale. They were all formed by rising mineralised water, but their processes varied in detail. The Tenerife features are perhaps most akin to the Alaskan towers. Write to the editor if you have any other ideas.

Philip and Judy Small



The sand towers of El Medano. The lens cap in the tower on the right is 50 mm across