HOLIDAY GEOLOGY

Algarve Coast of Portugal

Cabo de Sao Vincente is the most southwesterly point of Portugal. From Praia do Amado 20 km to the north, round to Praia de Porto do Mos 30 km to the east, there is an almost complete succession of rocks from the Carboniferous to the Quaternary, with only the Permian missing. These are well displayed in cliff exposures that are easily examined from numerous beaches.

Near Praia do Amado, the Lower Carboniferous is represented by very disrupted and faulted carbonates. These are intruded by dykes and other dolerite igneous bodies. Farther south, Upper Carboniferous turbidite sequences are exposed, most of which are very steeply dipping or in places overturned. Small basic intrusions have many xenoliths of the shale component of the turbidites. Triassic red sandstones can to seen lying unconformably on the Carboniferous rocks, and these reach beach level towards the south. Jurassic limestones and sandstones appear a few kilometres north of the main cape and continue along to the east. The cape is capped by a prominent limestone pavement, and the cliffs expose a gentle anticline within the limestone, which is distinguished by numerous bands of chert.

The origins of chert were enthusiastically discussed on Society field excursions in the summer of 2017 to both Ravenstonedale and Monsal Dale, and it appears that opinion is divided between an organic origin sourced on sponge spicules and a chemical origin, though chert may be polygenetic with both applying. Chert nodules in limestone generally form almost complete layers in line with the bedding, lie with their longest sides parallel to the bedding, and are mostly black or white. In the Algarve limestones, the individual nodules were scattered about and most were vertically aligned. At many sites chert occupies vertical fractures across the bedding, and were purple in colour.

Eastwards along the coast, the well-known dinosaur footprints at Praia Salema are exposed in a horizontal Lower Cretaceous sandy limestone at beach level.

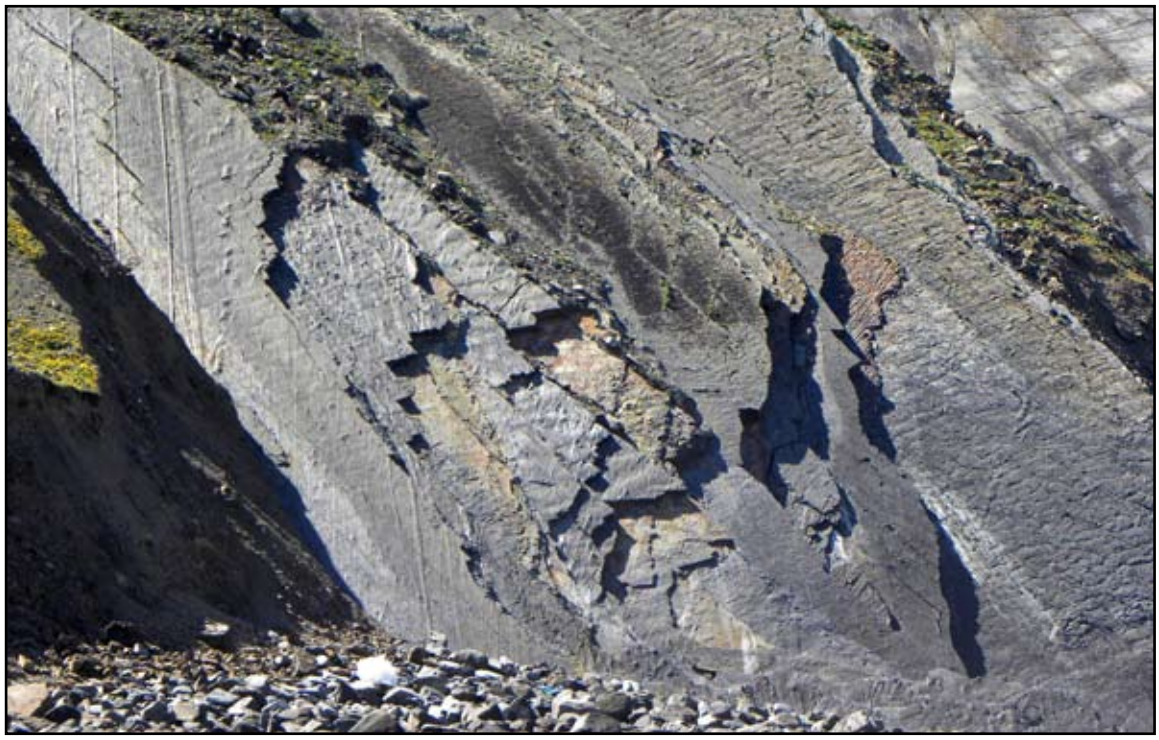
The red Triassic sequence unconformable above Carboniferous turbidites exposed near Praia do Amado.

Steeply dipping Carboniferous turbidite sequence.

During the 2017 excursion organised by the Cumberland Geological Society, and led by John Rodgers and Fiona Harwood, the interpretive notice was missing and the footprints were buried under beach sand, though this was soon removed. Sceptical members of the group wondered whether the prints were fake, but other investigators are not known to have raised doubts. The prints were made by a three-toed dinosaur, and their lack of claw marks is interpreted as indicating it was a biped herbivore. The prints are almost in-line, which is taken to indicate that the hips were swivelled on each stride, counterbalanced by a large tail. It is estimated the creature stood 2.2 metres at the hip and was moving at about 2 km/hour. Three further sets of prints have been reported a few hundred metres south, but these were not found, and have probably been buried under a cliff fall. A return visit in March 2018 revealed that considerable beach erosion had occurred and that the slab with the footprints was now more than a metre above beach level.

Farther east, the Upper Cretaceous succession includes extensively faulted carbonates. Numerous marine caves have been eroded by wave action following the weaknesses provided by these faults. Once a cave is initiated, waves can compress the air in the caves and the percussive effect rapidly extends

Pale purple chert as beds and fissure fills in limestone.



Sole marks that include flutes, long grooves and skip marks, which were created by turbidity flows; these are now exposed on the undersides of near-vertical sandstone beds that lie within the Carboniferous set of turbidites exposed at Paria do Castelejo near Vila do Bispo.

A splendid algar with Quaternary sediments that filled the sea cave and its blowhole, with some of the host limestone exposed on the left.

the caves inland, at some sites for more than a hundred metres. Any collapse of the roof at the inland end creates a blow hole. During stages of lowered sea level during the Quarternary, sediments were washed in to fill many of the caves. The subsequent rise in sea level is eroding the cliffs back to expose sections through some of these blowhole infills. The exposed blowhole and cave is locally known as an algar. Numerous algars can be seen in various stages of erosion, and in some the infill is more resistant that the surrounding Cretaceous rock.

These are just three of the many excellent geological features that are easily seen from beautiful beaches along this attractive coast of the Algarve.

Alan Filmer

Cretaceous dinosaur footprints in sandstone exposed after being cleared of beach sand on the foreshore at Praia Salema.