Day 3 – The Centre
Saturday 23 March 2019

Summary

The day was centred on the small village of Ajuy on the west coast. We examined the mouth of the barranco near the village, the environs of the beach and a stretch of the coast to another barranco north of Ajuy. Finally we drove south to Sisacumbre at the top of a pass close to an astronomical observatory. The overriding theme of the day was dykes!

On the journey to Ajuy

Alan referred us to pages 20, 21and 23 of the handout which show the configuration of the cliffs at the north end of Ajuy beach, a geological map of the area and geology diagrams respectively. We passed the cinder cone of Gairia on the left-hand side. It was breached on one side causing large lava flows. There are areas of almost 100% dykes and some columnar basalt layers. Signs of old terracing are sometimes confused with lava flows. Alan also talked about the local agriculture, pointing out aloe vera farms and old windpumps.

In the barranco at Ajuy

In the dry stream-bed the dark rocks were holocrystalline pyroxene. These are plutonic rocks which cooled slowly underground. They have weathered and were transported here by erosion. There was also caliche: the calcium carbonate breccia of which we saw a lot on this trip. We also saw striped, metamorphic zebra rock. The veins are partial melt which can cause pooling of felsic magma. The white stuff in zebra rock is phonolitic or syenitic. It is under-saturated in silicon, so there is no silica, but silicates instead. We looked at horizontal, orange-coloured veins which had invaded horizontal weaknesses or sills. We could see where the orange material had branched out from a dyke. We also noted a green surface effect caused by the action of cold seawater, containing sodium chloride, on cold rock.

Southern end of Ajuy beach

Again we saw the effect of halide salts on basalt causing a green colour. The cliff was riddled with dykes (dyke swarm) caused by the land being pulled apart, probably as a result of a land-slip into the sea. Also visible at the southern end of the beach was part of a sandstone layer.

Northern end of Ajuy beach

Here we saw a large, light-coloured dyke or sill. Its angle of dip made it something in-between. Its composition is a mixture of trachyte and phonolite and it dates from 18MA. The lower part of the cliff consists of very old, uplifted, sedimentary ocean sea-floor dating back to more than 66MA, just after South America separated from Africa. The uplift could have been caused by an expanding magma chamber. Siliciclastic rock was banded with shale, the banding caused by turbidites. Above the ancient sea-floor is a raised beach with rounded pebbles. In a dark basalt dyke we noted holes where geologists have taken out plugs to investigate magnetic orientation.

The next bay north

On our way up the cliff path off the north end of the beach we noted dykes, sandstone, unconformity, pillow lava and shield lava. We also found vesicular basalt with an infill of calcite (amygdaloidal). Round the corner towards the next bay we saw weathered sandstone with some dissolution of calcium and calcite cementation. After a high-level walk we looked across to the promontory at the north end of this bay. The lower part is early basalt with dykes, some sticking out and branching higher up (anastomosing). Above is a line of caliche and sandstone. There is an area of pillow lava and two raise beaches, one above the other.

Rock arch

After a further walk along the top of the promontory we had just viewed, we came to a second barranco with a rock arch at its mouth, El Valle del Arco del Jurado. After a lunch break we viewed further dykes in the barranco. Then we inspected the arch which had been formed by the sea breaking through a dyke. It was capped with a layer of breccia above an unconformity. The high rock with near-vertical stripes is seriously displaced country rock.

Sisacumbre

After retracing our steps to the bus, we drove south to Sisacumbre at the top of a pass where there is an astronomical observatory. From the lay-by we looked down a steep, water-carved valley covered by a layer of unconsolidated sediments (colluvium) caused by erosion and surface runoff, so you cannot see the lava flows. A pointed basalt peak stood out compared with most which are rounded. There are lots of dykes, their angles of dip depending on the way the rock has been pulled apart. On the other side of the road dykes were aligned in a different direction.

We walked down the road seeing many dykes on both sides, those on the left running through sedimentary rock. At the farthest point we walked we noted a green

colour which may be caused by magma mixed with halides. There were also near-horizontal sills. We were at the head of a valley, so the rock is particularly weathered, rendering some parallel dyke swarms very unclear. On the way back to the bus we did an exercise in measuring the direction of strike and angle of dip.

On the way back to the hotel on the bus we noted a striking mountain, Melindraga, which has two series of basalt on the top and erosion zones.

Robin Waterhouse

11 June 2019