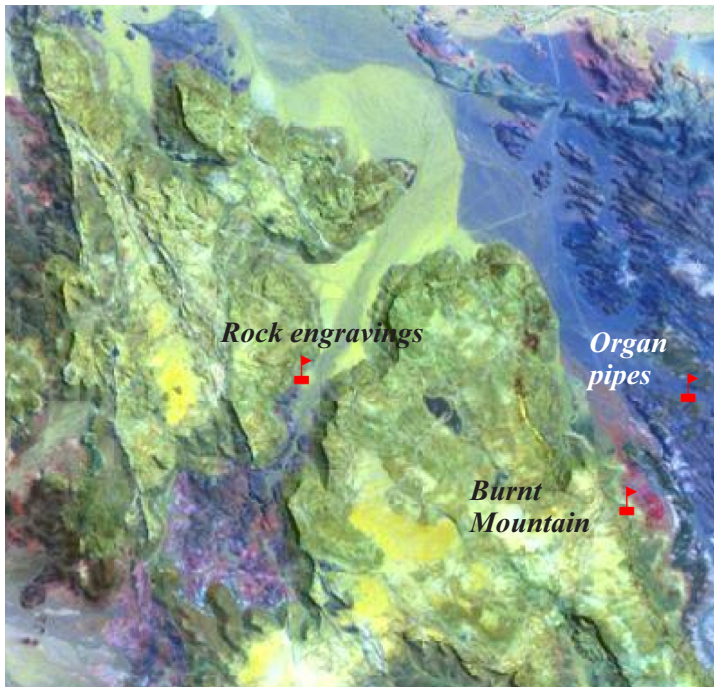


# TWYFELFONTEIN, BURNT MOUNTAIN & ORGAN PIPES

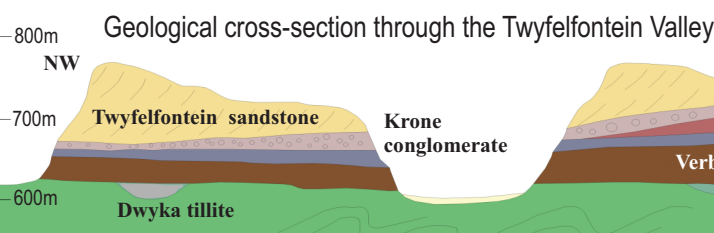
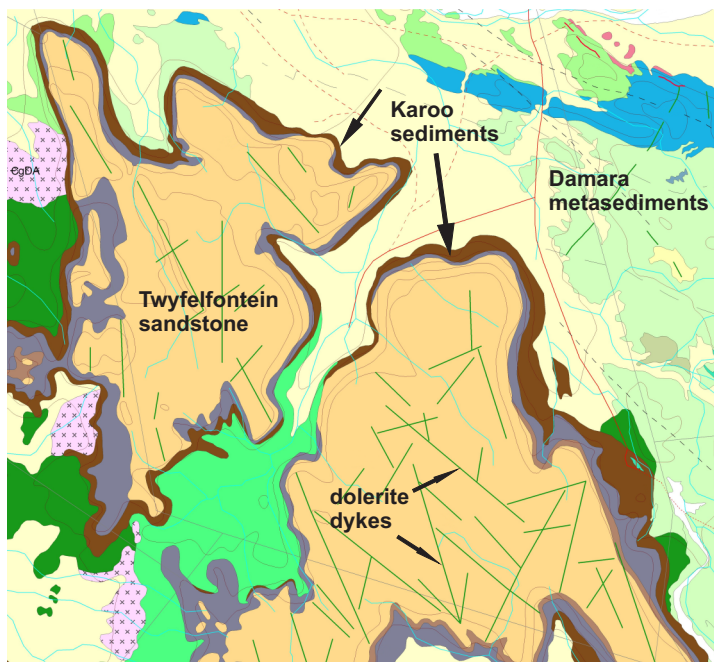


Source: *Roadside Geology of Namibia*

Until the 1990s, the Twyfelfontein Valley some 60 km west of Khorixas was still fairly remote and undeveloped, and its famous rock engravings known only to a handful of travellers. Since then, the establishment of a visitor's centre has rapidly led to its becoming one of the major tourist attractions in Namibia. With some of the engravings probably being Middle Stone Age (ca. 30 000 years), the site was proclaimed a National Monument as long ago as 1952, and in 2008 also became a UNESCO World Heritage Site. Due to the dry climate the almost 2000 engravings and rock paintings are well preserved; they mostly depict animals, the most prominent species being giraffe (234), rhino (121) and zebra (75). But although best known for its archaeological interest, rock art is not all the area has to offer.



Satellite image (above) and geological map (below) of Twyfelfontein and surroundings



**Twyfelfontein** lies in a valley carrying a tributary of the Huab River, which was incised into sandstones of the Twyfelfontein Formation and Karoo shales and mudstones (140 to 280 m. y.), which are unconformably underlain by schists of the Damara Sequence (>600 m. y.). The juxtaposition of porous aeolian and fluvial sandstones and impermeable shales and mudstones resulted in the formation of a freshwater spring near the base of the slope, whose name "Twyfelfontein" ("dubious spring") refers to its small yield of only 1 m<sup>3</sup>/day. Nonetheless, people have been attracted by it for a long time as it brings a variety of game to the area. While waiting for prey, ancient hunters, whose stone artefacts still litter the landscape, used the large flat faces of the thick-bedded aeolian sandstone as a canvas for their art.



The nearby "**Burnt Mountain**" consists of altered shales with coal seams and sandstone lenses, which were deposited in a lacustrine environment during Karoo times. Ascending doleritic magma (molten rock) heated the fine-grained sediment to about 1000°C, evaporating the organic material and leaving behind blackened shales mainly composed of fritted clay minerals to which a coating of manganese minerals adds a purple luster. The dark clinker-like rock forms a sharp contrast to the white, yellow and red unaltered sediments and gave the locality its name.

Dolerite dykes related to Etendeka volcanism and the opening of the South Atlantic are widespread within the Karoo sediments. Often they form (mostly) hexagonal columns, which originated through contraction during magma cooling at a depth of several hundred metres. Cracks developed perpendicular to the upper surface of the intrusion (cooling front), thus creating the characteristic shapes known as „**Organ Pipes**“.