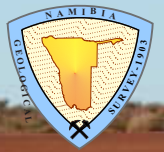


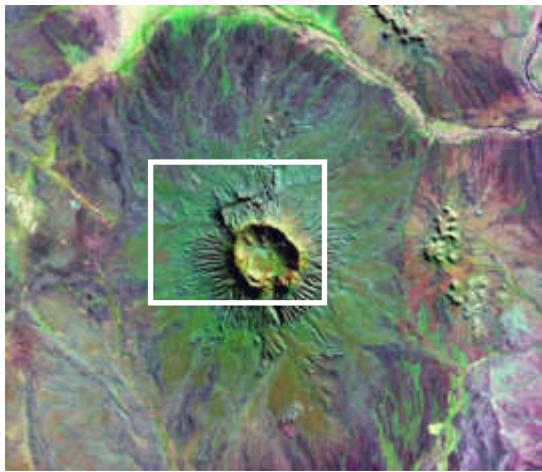
BRUKKAROS



Source: *Roadside Geology of Namibia*

An impressive inselberg rising some 600 m above the surrounding plain and 1600 m above sea level, Gross Brukkaros is the only topographic feature relieving the monotony of the flat country between Mariental and Keetmanshoop, which is part of the Nama-Karoo Basin. It has a basal diameter of ca. 7 km, and with a steep-sided ring-shaped ridge bordering a central depression, has the typical shape of an extinct volcano, but actually resulted from the interaction of hot magma (molten rock) and groundwater known as phreatomagmatism.

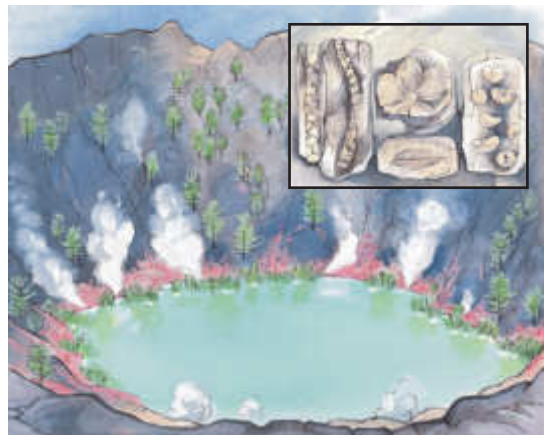
Brukkaros rests upon flat-lying reddish-brown sandstones and shales of the upper Nama Group (ca. 530 million years), which were overlain by tillites and shales of the Karoo-age Dwyka Group (ca. 220 m.y.) during the Gondwana glacial period. Subsequent uplift of the southern African sub-continent caused most of the Dwyka beds to be removed, but a few remnants which escaped erosion occur locally on the eastern and southwestern slopes of the mountain.



Satellite image of Brukkaros and surroundings; white box indicates map area shown below

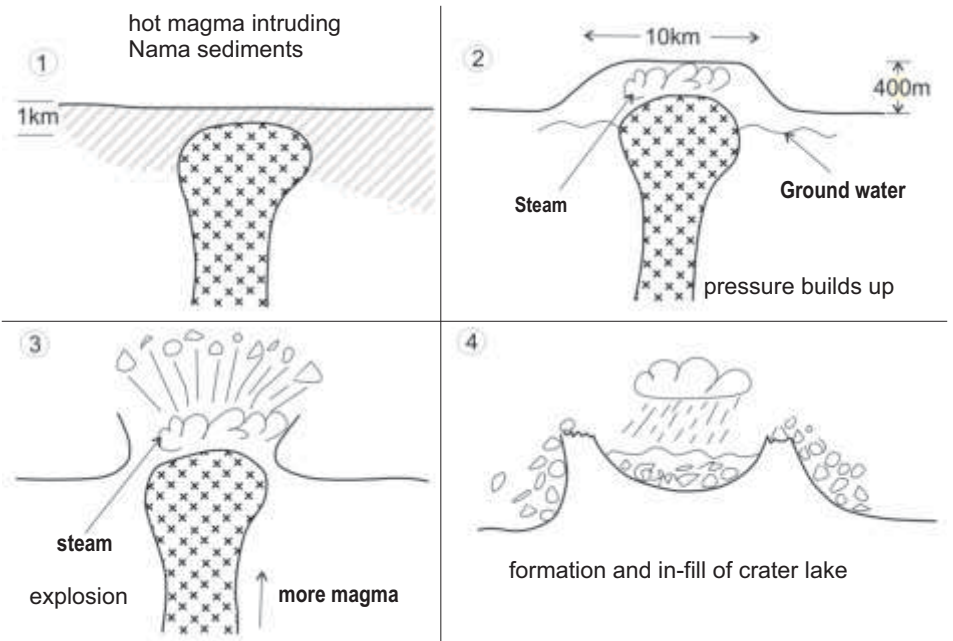


Geological map of Brukkaros Mountain (M. Werner, 2001)



Reconstruction of the Brukkaros crater lake; inset: Brukkaros fossils (Drawings by C. Marais)

The evolution of Brukkaros began ca. 75 million years ago towards the end of the Cretaceous period, with the intrusion of carbonate-rich magma into the Nama sediments then covering southern Namibia. Some distance below the surface the hot magma encountered groundwater, which was immediately flushed into steam. The resulting pressure caused the overlying rocks to bulge upwards and form a 400 m high and 10 km wide dome, into which more magma intruded, producing more steam. Eventually superheated steam blew out the centre of the dome in an immense explosion. Groundwater drained into the new crater, where it again came into contact with magma, leading to further explosions from deeper levels within the earth's crust; in the final stages of explosive activity material from 2 km deep was blasted out of the crater.



Ejected rubble and ash built up a crater rim, but after the cessation of explosive volcanism, rain washed the fine material back into the crater to deposit layer upon layer of sediment on the bottom of the new lake. A number of hot springs formed around the lake edge which brought up fine-grained quartz to cement the soft sediment into a hard and resistant rock.

Although the explosive stage that laid the foundations of Brukkaros probably lasted only a year or two, deposition and cementation of the lake bottom sediments took hundreds to thousands of years, before slow erosion removed the surrounding Nama and Karoo rocks, leaving only the weather-resistant crater lake sediments that make up Brukkaros Mountain.

Among the fossil material recovered from the lacustrine Brukkaros beds are pieces of wood, plant stems, seeds, leaves and an angiosperm flower with five main petals. While most of the plant life presumably clung to the lake shore, hardier conifers may have climbed the crater walls.