

## C The Namib Fog Desert in Southern Africa

### General

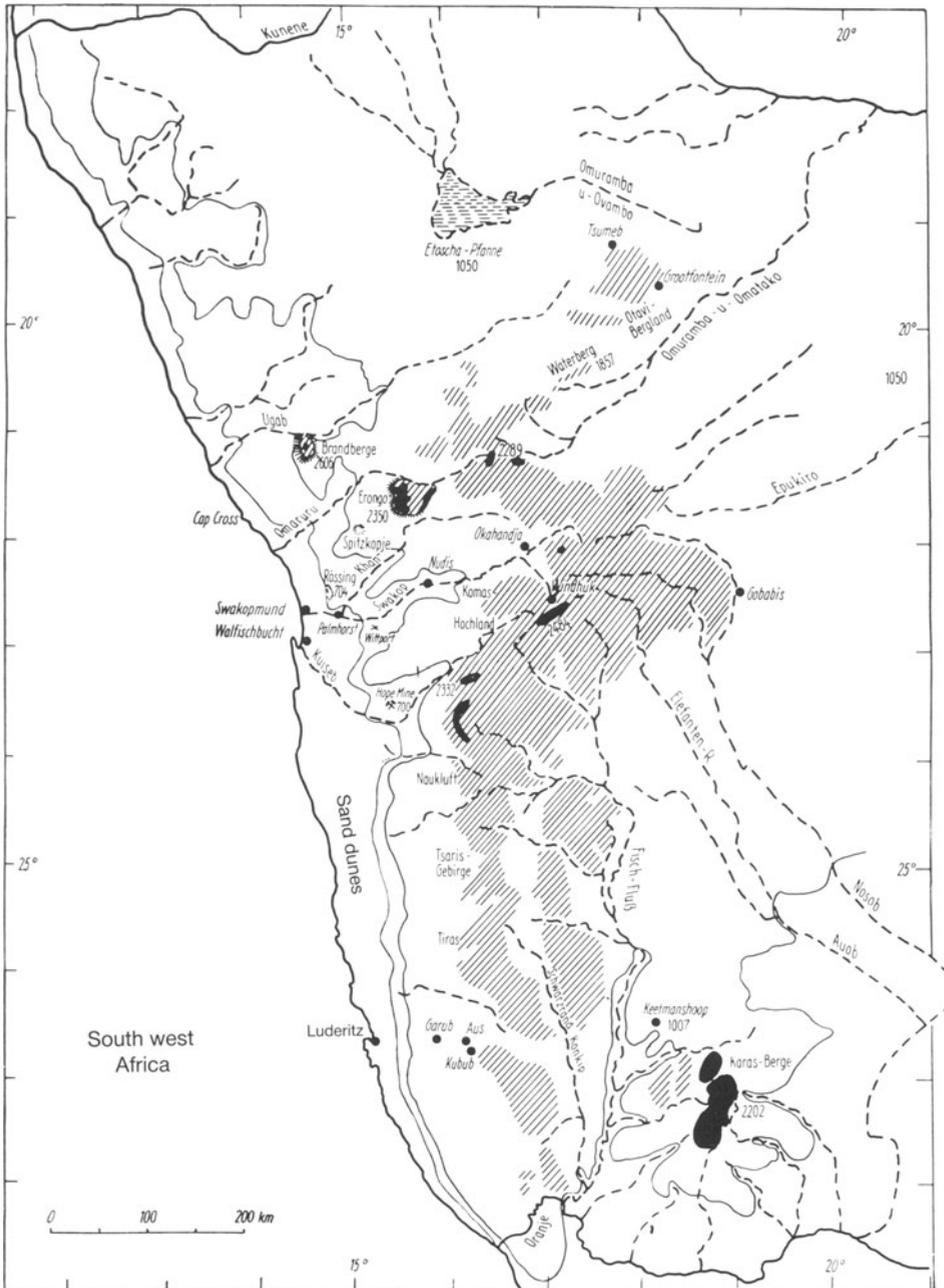
There is much evidence that both the Namib Desert and the Peruvian-Chilean Desert were formed in the Pleistocene, following the development of a cold southern ocean and westerly circum-arctic winds. These brought winter rain to the southern part of the west coast of Africa. At times, the influence of these winds extended as far as 23°S, so that the winter-rain area of zoniobiome IV, now limited to the extreme south, stretched further to the north. Many plant relicts in moist habitats of the highland ridge (Fig. 3.49) bear witness to this former winter-rain vegetation; examples are *Euclea undulata*, *Rhus* spp., *Eriocephalus*, *Pteronia* and *Ficus* spp. Only when the aridity of the climate increased did the Namib Desert develop, while zoniobiome IV was pushed back to the southern tip of Africa (Tankard and Rogers 1978; further literature is cited by Weger 1978). This change in climate was brought about primarily by the development of the cold Benguela current, in the same way as the Peruvian-Chilean Desert is created by the Humboldt current.

The Benguela current begins west of the Cape Peninsula as a narrow strip and moves northwards at about 40 km day<sup>-1</sup>. By the time it reaches the mouth of the Orange River it has achieved a breadth of 150 km and off the Angolan coast of more than 400 km. The rotation of the earth causes a deflection of the current towards the west, resulting in an upwelling of cold water from the depths; this is most intense along the coast so that the surface water here has a temperature of 12°C, whereas 300 km from the coast it is 16°–20°C. In consequence there is a thick bank of fog above the Benguela current. Seen from the air the surface of the fog bank looks like a closed snow

cover, with undulations running at right angles to the direction of the warm southeasterly wind which blows over the surface of the fog bank, causing movement of the light, uppermost wisps of cloud. At the mouth of the Kunene River the fog disperses above the warmer river water. The river water is diverted northwards by the Benguela current; the dark seawater then looks like a broad river in the bank of white fog.

Once or twice a century an amazing event occurs in the Namib: heavy rain falls in this otherwise rainless desert. Following on three extremely dry years, 1934 was just such an unusually rainy year. At this time, the Benguela current changed direction and flowed southwards. Evidence for this was as follows: the muddy water of the Orange River where they flowed into the sea were diverted towards the south; the temperature of the sea at Swakopmund was a mean 3°C warmer between March and September; a passenger ship which had a 2-day delay in its departure from the Canary Islands, contrary to expectation, arrived punctually in Walvis Bay because it had been travelling not against, but with the current. Evidently the air circulation of the tropical summer-rain area extended further south in this year, bringing heavy rain to the whole of the northern part of Namibia, while further south, near Lüderitz Bay, there was very little more than normal (see "El Niños", p. 263).

Dr. G. Boss, a biology teacher at the German School in Swakopmund reported on this event at a meeting of the German Botanical Society and persuaded the senior author to interrupt his return journey to Europe in 1935, from East Africa via the Cape, in Walvis Bay, to investigate the flowering desert. Dr. Boss had already made various measurements with his pupils and these were made available to me. More detailed investigations were made in February and March 1935 (Walter



**Fig. 3.49.** Map of Namibia, showing the Namib Desert which occupies a strip about 100 km wide along the coast. The two *contour lines* (continuous) in the west correspond to isohyets 500 m and 1000 m above sea level, respectively. *Hatched*: highland, 1500–2000 m above sea level; *black*: areas above 2000 m. The eastern part, described as sand veld, belongs to the Kalahari. *Dotted lines*: dry river valleys or riviers (from Walter 1973)