

DESERTS

Greening Of Thar

LUSH vegetation in the Thar? Groves of *jamun* trees? Mighty rivers the size of the Ganga and Indus? Seasons of monsoon-like rainfall? None of this is the fantasy it might appear at first sight. It was true in the distant past of the vast, inhospitable expanse of the Thar desert known to be one of the most inhospitable places in the world. More to the point, it can—in some measure—once again become a reality.

These are among the startling conclusions announced last month by a five-member multi-disciplinary team that has been probing the secrets of the Thar at Didwana, 220 km to the north-west of Jaipur, for the last five years. The results have come slowly but surely. Says team leader Dr Virendra Nath Misra, professor of pre-history at the Archaeology Department of Pune's Deccan College, "The desert is an excellent laboratory for the study of fluctuations in climate that have occurred since pre-historic times."

The team set up four work sites—a deep cut into a canal embankment near the town, a limestone quarry at village Amarpura, 2 km from Didwana, a well sunk into a dried lake just outside Didwana and a gravel ridge at Jayal, 50 km to the south-west of Didwana.

Findings: The canal cut exposed three distinct layers of sand, and stone age artefacts found confirmed that the actual desert began to build up 70,000 years ago, and that each dune layer formed after a period of relative wetness. At Amarpura, a 10-metre thick layer of highly pelletised and calcareous loam created by a once-mighty river yielded stone tools, proving that man had lived there in times of better rainfall.

If the first two sites had been archaeologically fertile, the other two were even more so. Near the bottom of the well was a metre-thick salt layer and most important, between 1.3 m and 3 m below the surface was another deposit of finely laminated black clay (locally called *kaajalia*). Said Misra: "This proves that around 7,000 years ago the area experienced a period of abundant rainfall, and the lake filled up. This is when the clayey sediments were deposited."

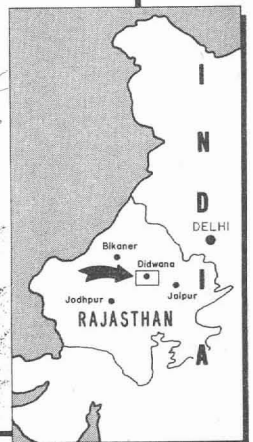
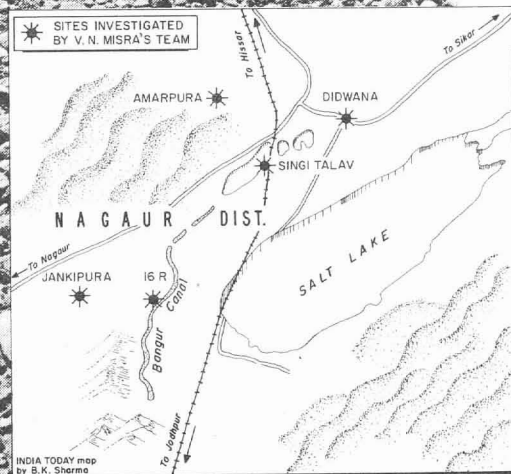
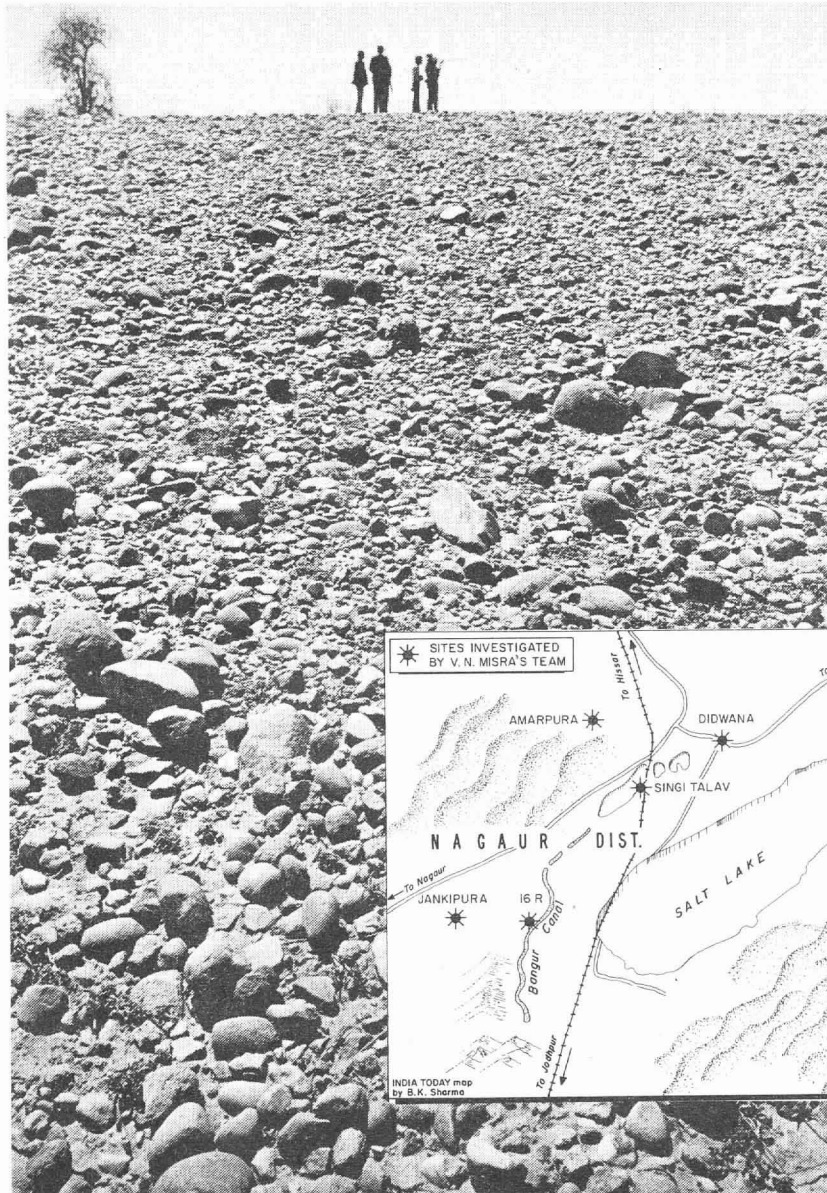
Palynologist M.D. Kajale of Deccan College—palynology is the study of pollen and spores whether living or fossil—went

through the pollen in the clay to establish the presence of several plants, trees and shrubs, including the *jamun* and an acacia-like growth. He even found evidence of a marsh plant called *Cyperaceae*. If any more proof was needed that the Thar was not always a grim wasteland, it was found in the gravel ridge—once the bed of a large river, thousands of stone age tools lay strewn on it, testifying to man's thriving presence.

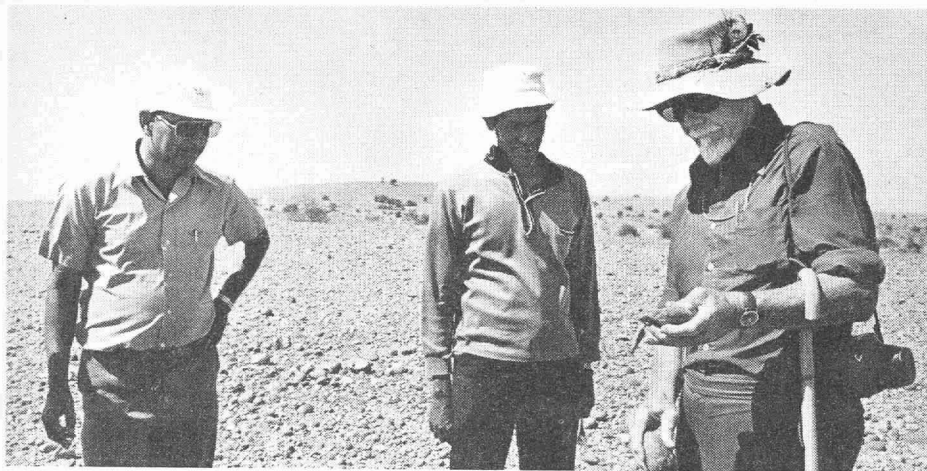
History: Putting all this evidence together, the team—which includes Dr S.N. Rajaguru, environmental archaeologist and geo-morphologist at Deccan College, dating experts Dr Dharma Pal Agrawal and V.K. Singhvi of the Physical Research Laboratory, Ahmedabad and soil analyst Dr R.P. Dhir of the Central Arid Zone Research Institute, Jodhpur—reconstructed the Thar's history. One million years ago, much before the desert formed, the region was

watered by mighty rivers comparable in size to the Indus and the Ganga. Rainfall was good and the vegetation lush. A half-million years ago, however, powerful tectonic movements distorted the river system and the great streams began to slow down and meander.

Then man made his entrance on the scene—as attested by the scores of campsites that have been unearthed. *Homo erectus* moved about in nomadic groups, hunting large herbivores with stone weapons, gathering wild fruit. But catastrophe struck around 100,000 years ago when rainfall



The Jayal ridge: testimony to a thriving past



(From left) Misra and Rajaguru with visiting archaeologist: digging up desert secrets

declined sharply and the already sluggish river system began shifting westward. Strong winds lifted sand and silt particles from alluvial sediments and deposited them in the region, and the true desert began to form. Aridity, however, repeatedly gave way to humidity, and then the sand dunes stabilised, soil formed and vegetation sprang back to life. Man thrived during these congenial periods.

The harshest period of aridity ended around 7,000 years ago, and the area received unprecedented rainfall. As the vegetation reverted to its pre-desert lushness, the people turned to nomadic pastoralism, tending sheep and cattle—a life-style that endures till today. The wet stretch lasted 3,000 years, but then semi-arid conditions set in—and man was able to adapt to that too. Misra sums up: “The Thar Desert was created because of climatic and hydrological changes, and man’s role has been minimal. In fact, man has adapted very well to the semi-arid conditions.”

Conservation: Nomadic tribes still inhabit the region—among them the Vanvavris, who collect money, hunt small game and live in the open on the dunes. There is an ingrained conservation instinct: the *khejri* tree, one of the handful that exist in the area, is stripped of foliage for fodder, but this is done cyclically so that the tree has enough time to recover its leaf cover. Misra claims: “The desert can support large populations if agriculture is helped by intensive irrigation. Otherwise the old pattern of nomadic pastoralism has its own in-built safeguards.”

Misra’s advice about intensive irrigation is all the more timely because the Thar is now supporting an exploding population of around 10 million. The grazing lands are shrinking and the scanty—and rare—rainfall encourages piecemeal agriculture in areas where the sand dunes have stabilised over several thousand years. This loosens topsoil and aids wind erosion, adding to the damage caused by overgrazing. As Misra

warns: “If we try to mix unirrigated agriculture and concentrated grazing, that spells doom.”

The one way of greening the sands is to bring water to them in a systematic way. The ambitious Rajasthan canal’s upper reaches in Ganganagar district have already transformed the desert there. Rajaguru points out: “The stabilised dunes that prevail in this region consist of mature soil and will react very well to proper irrigation.” But these ideas have not yet become prevalent and work on the canal is proceeding at a pace that would put even a snail to shame. As for archaeology, India is not a signatory to the World Heritage Commission of Unesco, although Rajasthan alone holds such treasures of archaeological and geological material. Nor is there a department of archaeology in any of Rajasthan’s three universities.

Warnings: Conservationists abroad hold views that reinforce the Didwana team’s findings. In his book *Losing Ground*, Erik P. Eckholm points out that north-west India is the world’s most densely populated arid zone. Unplanned and unirrigated cultivation on the one hand, and shrinking grazing lands on the other, says Eckholm, have seriously affected “the productivity of an arid area covering more than a fifth of India, an area larger than France”. Reid Bryson and David Baerreis of the University of Wisconsin, USA, say that the dense pall of dust annually covering north-west India and eastern Pakistan has led to a discernible fall in the area’s rainfall.

Rajasthan has been experiencing severe drought for the last two and a half years and has witnessed large-scale migrations of livestock out of the state. Asserts Agrawal: “Our entire ecological consciousness is topsy-turvy. We should treat environment not as an entity but as a process.” Modern man may yet live in the Thar as his ancestors did long ago—leading a comfortable existence alongside life-giving rivers.

—CHAITANYA KALBAG

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