FOUR

SOURCE OF MUD OF ALLEPPEY MUDBANK: MUD CONE AND THE MESSAGE IT CONVEYS

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ABSTRACT

The chapter embodies the authors' findings, and the logical conclusions they drew from them, on the mud cones (or 'mud volcanoes') they found in the intertidal zone and on the beach of the Alleppey mudbank region in 1972. Their experiment with regard to these mud cones confirm beyond doubt the viscous nature of the mud that underlies at Allepey, and its being, for all probability, the source of Alleppey mudbank.

Similar mud cones observed earlier by some workers are also discussed briefly.

INTRODUCTION

Crawford (1855) was the first to report on the mud cones, or 'mud volcanoes,' at Alleppey. He has inferred from this phenomenon that there exists a subterranean mud at Alleppey that may be the source of mud for the Alleppey mudbank. Subsequently, Philip Lake (1889) and Davey (1903), too, observed mud cones at Alleppey. However, after 1903 there had been no further records of mud cones in this region and, therefore, their role in the formation of mudbanks was not taken seriously. But, in the course of our intensive investigation on the mudbanks of the Kerala coast we came across active mud cones in the vicinity of the mudbank, that formed at Ambalapuzha, in July 1972. The following account describes in detail these mud cones and the insight they give into the nature of the underlying mud at Alleppey region, which in all probability contributes the mud for the formation of mudbank at Alleppey, as well as into the mechanism by which the mudbank is brought about.

OBSERVATIONS

Six active mud cones, in different stages of formation, were seen at Kakkazham, a place about a kilometer from Ambalapuzha, about

the northern limit of the mudbank then in existence (See, Fig. 1), of which three were on the beach, a few meters away from the high-

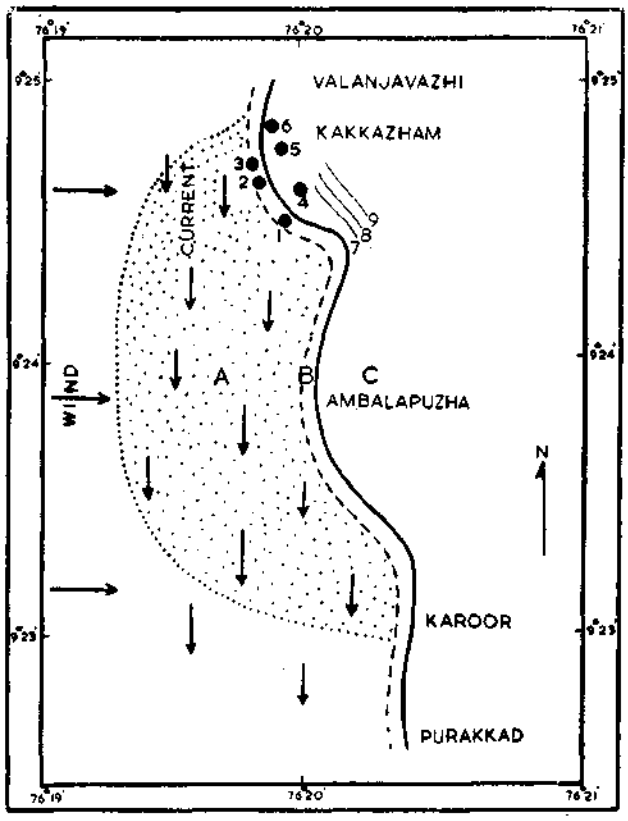

Fig. 1. Diagram showing the places of mud cones at the beach and at the inter-tidal zone, and the cracks observed on the beach.

water mark, and three in the water at the intertidal zone (see Table 1). One of the cones that were in the intertidal zone, measuring 7.5 meters across, was found feeding the waves

TABLE 1. *Details of the mud cones at Kakkazham, observed in 1972.*

Mud cone	Mean diametar (cm)	Height of cone from ground level (cm)		Distance between cones (m)
		at centre	at periphery	
In water				
1	425	—	—	2
2	535	—	—	45
3	750	—	—	
On shore				
4	271	40	27	
5	128	17	15	25
6	106	20	15	34

with loose mud as well as lumps of it, while in others fresh mud was oozing out adding to the cones. There were also 'cracks' found to have developed in three places on the surface of the beach more or less parallel to the shore, about 29 m away from the mud cone that was feeding the waves. Each crack was about 2 cm wide,10 to 15 m long and separated from each other by about 3 to 5 m (Plate I,A & B). During the high tide the sea water covered this area. obliterating the cracks, but they reappeared at the time of low tide.

Attempting to gauge the depth of mud beneath the cones, we found that a half-inch-thick GI pipe failed to touch any hard bottom even when inserted to its full length of 6 meters; but when tilted the hard sides could be felt all round, showing that the cones were mounts, crusted by exposure, of loose mud emerging out of what appeared to be deep wells, full of soft and unconsolidated mud. In the tidal zone ones, on the other hand, this emerging mud, as and when it did, was carried away by the waves, and what remained was only open mud wells, which at times could be like quagmire, very dangerous to fishermen. This is borne out by a sad incident told us by the fishermen when we enquired why a particular spot on the tidal zone was marked out by a partly buried coconut trunk (see: Plate IV, C). A few days earlier to our visit, we were told, a boy, jumping into the water from a home-bound canoe, to haul it ashore, had, instead, jumped unnoticingly into one of these gaping holes and sank down to its depth,in such a way that even his body was not able to be recovered. It was this mud well, which was later covered by sand brought by the oncoming waves, that was thus marked, to ward off any further accidents.

The mud cones, which were active when the S. W. monsoon was intense, became inactive or subsided with the subsidence of the latter, obviously because the forces then responsible for bringing the mud out from beneath had now languished. Within a few days the upper crust of the beach cones became hard and broken down to pellets, due to sun light (Plate II, A-C); but those in the intertidal zone gradually subsided and covered over by sand deposited by the onshore waves (Plate III, A).

Table 2 gives the successive changes the mud cones undergo during a period of time.

TABLE 2. *Observations on the behaviour of cones at Kakkazham*

Mud cone No.	Date of formation	Active phase (days)	Dormant phase (days)	Date of complete subsidence
At the inter-tidal zone				
1	19-7-72	12	6	6-8-72
2	19 7-72	9	9	6-8-72
3	27-7-72	10	3	9-8-72
On the beach				
4	18 7-72	9	10	6-8-72
5	14-7-72	10	9	2-8-72
6	15-7-72	12	11	5-8-72

DISCUSSION

Toward the close of the last century and the beginning of the present, the subterranean mud was held to be the source of mud for the Alleppey mudbank by those authors who had chances to observe mud cones. However, the laterinvestigators, who never had any opportunity of seeing the phenomenon in operation, were reluctant to accept this view and they, instead, suggested alternate views about the source of mud for the Alleppey mudbank (see Chapter 3).

Crawford (1855), on seeing the mud cones in operation on the beach and on the roads of Alleppey, wrote that "the beach and roads presented then a singular appearance, nothing to be seen but these miniature volcaneso, some silent, others active". He also noticed subsidence of shore, after or during the rains, causing long fissures, varying from 120 to 360 ft in length.

Philip Lake (1899) also had the experience of seeing mud cones and land subsidence in the vicinity of the Alleppey mudbank. He found subsidence of land to a depth of 2-3 ft; the strip of shore subsided being to 60 ft in breadth and 900 ft in length. Further north of this he found the shore sunk in little steps so that there were a number of "little terraces" each a few inches high, rising one above the other from the sea towards the shore. At the northern end, within the inter-tidal zone, a heap of mud rose to a height of 2 or 3 ft above the level of the sand. All along the seaward edge of the subsided areas there were a number of "basin-shaped holes" in the sand having a diameter of 4 to 5 ft and a depth of 3 to 4 ft. In 1903, Davey had observed mud oozing out, as from little volcanoes, all around the old pier (Alleppey pier) and bringing with it decayed stems of trees.

Our observations well confirm these earlier observations and conclusions. The occurrence of cracks on the beaches, suggesting the sinking of the coastline, and ejection of mud in the form of mud cones (and the continuing oozing of mud through it) show beyond doubt that the source of mud for the Alleppey mudbank is of subterranean origin, the mechanism of bringing it out being the same as indicated by the formation of the mud cones.

MUD CONE

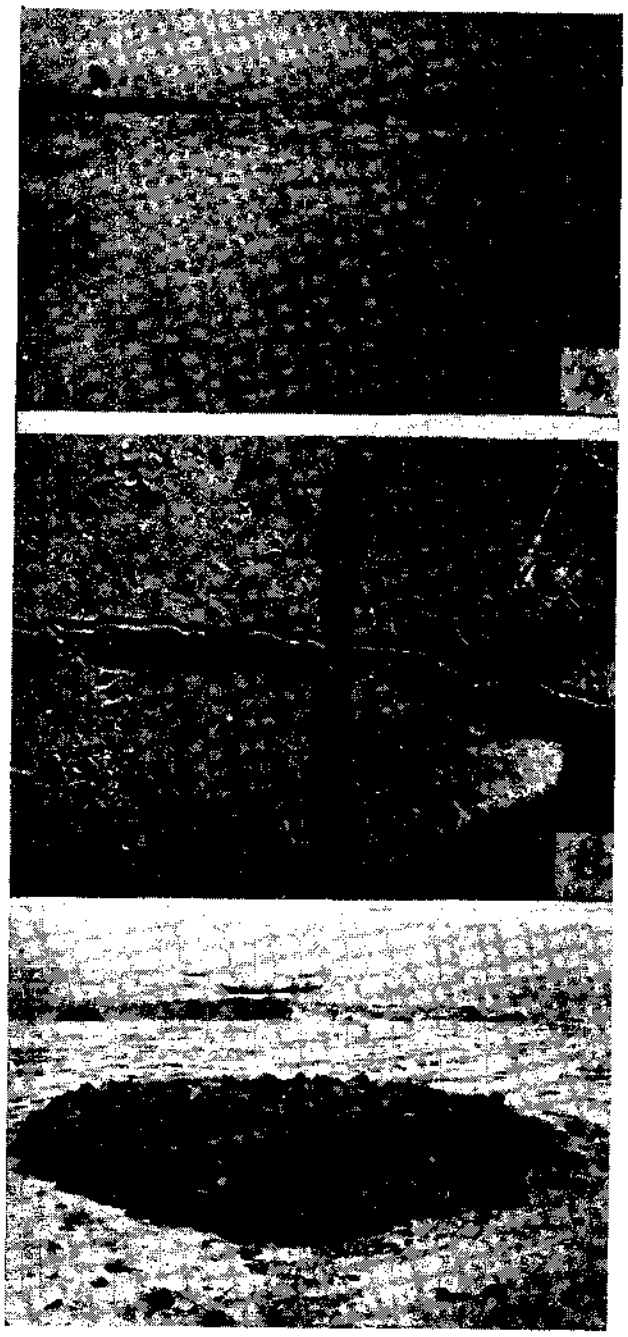

Plate-I. A: The mud, in pellet form, scattered all over the beach. Also seen is a long crack along the beach as a result of subsidence. B: A close-up of the crack showing the subsidence of the seaward portion of the land. C: An active mud cone.

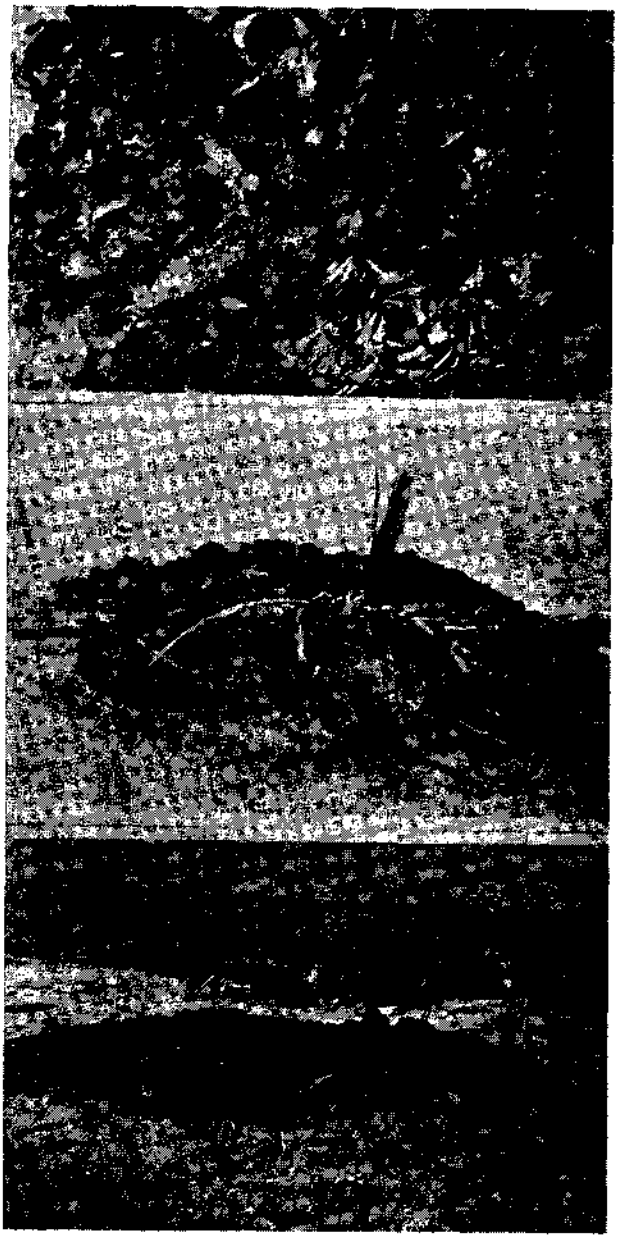

Plate-II. A: The dry crust of a dormant cone; B: The mud cone starts subsiding. C: A fully subsided mud cone.

MUD CONE

Plate-III. A: A subsided intertidal mud cone covered over by sand. B&C: Measuring the depth of the mud cone with a 6-m G. I. pipe.

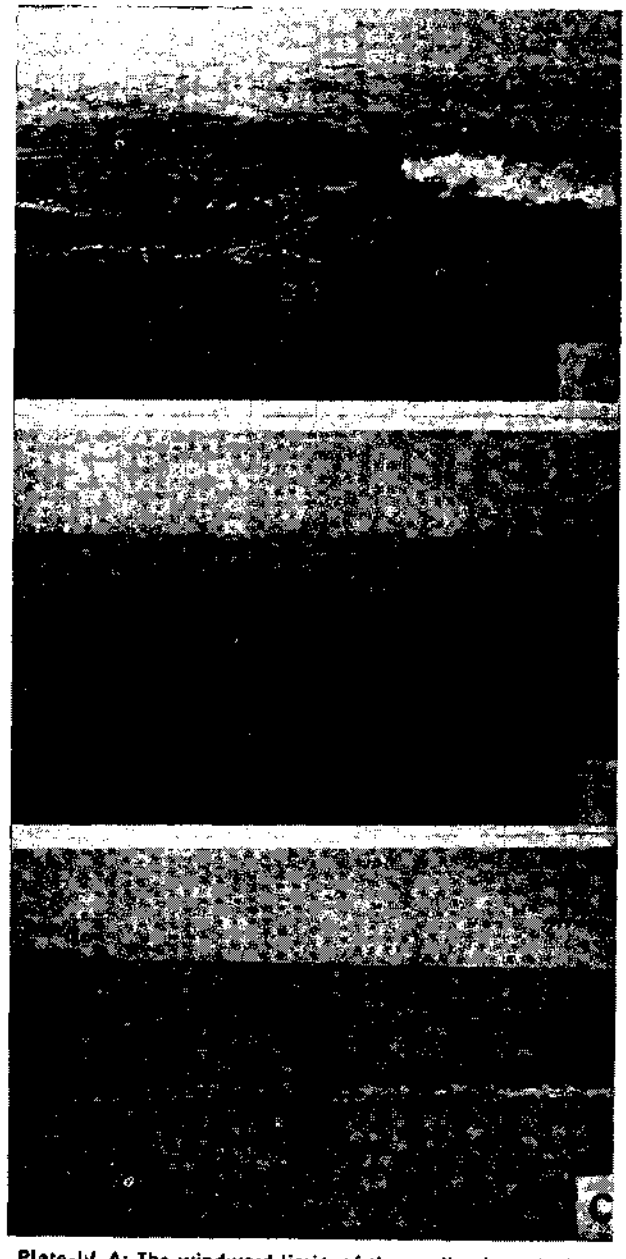

Plate-IV. A: The windward limit of the mudbank marked by the breaking of the waves.
B: An active mud cone seen feeding the waves with subterranean mud. C: The spot, marked by a coconut trunk, where the mud well had been, in which a boy was reported to have sunk.