

# Onshore Excavation at Bet Dwarka Island, in the Gulf of Kachchh, Gujarat

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## Abstract

Several ancient habitational sites were discovered in the coastal area of Bet Dwarka island during the last two decades of marine archaeological exploration. A large amount of protohistoric and historical pottery was collected from the sites. An excavation was undertaken at Bet Dwarka during 2001-2 to obtain a cultural sequence of the island. The following cultural sequence was observed from the excavation. The remains of the Late Harappan period were found near Balapur village on the island. This is a single culture site. A large number of potsherds including carinated dishes, bowls, and jars were recovered. A few sherds with black painting on red were also collected. Important antiquities from this trench include a copper fish-hook and an antimony rod. The remains of the historical period were noticed over a large area of the island. Three trenches were laid on the southern coast. The important activity during this period was the exploitation of marine resources like different types of shells and fish. The important factor which led to a continuous habitation at Bet Dwarka was the availability of marine shells which were exploited on a large scale. The island also served as a safe harbour.

## Introduction

A large number of sites associated with the Harappan civilization have been discovered in Gujarat during the last quarter of the 20th century and many of them have been excavated extensively. Archaeological discoveries indicate that maritime activities including trade and commerce were important in Gujarat since the Harappan times (Rao 1979). During the last two decades extensive offshore explorations have been undertaken along the Gujarat coast especially in Okhamandal region where modern Dwarka is situated. Following the lead from literary references, a massive underwater archaeological investigation was launched in Dwarka, Bet Dwarka and Somnath waters. There are a fairly large number of finds from Bet Dwarka dating from the protohistoric period to the modern times. The island of Bet Dwarka is located at the mouth of the Gulf of Kachchh and archaeological evidence suggests that it played a significant role in maritime activities in the past. To obtain a proper cultural sequence and understand the human-sea relationship, an onshore excavation was carried out in the 2001-02 season. The present paper reports the findings from this excavation.

The island of Bet Dwarka is situated in Okhamandal taluka of Jamnagar district of Gujarat. It is 3 km away from the mainland and the nearest port is Okha. It is 13 km long (NW-SE) and 4 km wide. The southeastern part of the

island consists of high cliffs and clayey beaches, while to the northwest is a low lying area with fine sandy beaches. The vegetation includes shrubs, cactus and a few neem trees. Some land is cultivated. The main crops are maize and *bajra*.

## Previous Work

The earliest excavation on the island was carried out by Hiranand Shastri in the 1930s and dated the earliest habitation to the 3rd century B.C. (Rao 1987). However, onshore explorations in 1969-70 brought to light a large number of potsherds of periods ranging from the Late Harappan to the Medieval period (IAR 1969-70). Extensive onshore and offshore exploration by the Marine Archaeology Centre of NIO, Goa, during the last two decades yielded similar results (Rao 1987; 1988; 1999; Rao and Gaur 1993; Sundaresh and Gaur 1998; Gaur 2000; Gaur *et al.* 2000). Thermoluminescence dates obtained on 9 potsherds from the earlier surface explorations (Table 1) suggest that the earliest habitation on the island commenced in the mid-second millennium B.C. (Vora *et al.* 2002). Recently offshore explorations brought to light a large number of stone anchors of the Medieval period, a lead anchor and remains of amphorae of the Early Historic period (Sundaresh *et al.* 2002).

**Table 1:** TL Dates from Bet Dwarka island supplied by Wollongong University of Australia

No.	Site	Lab Ref.	Uncorrected TL Dates	Corrected for fading
1	BDK-VI	W-2876	3260±470	3380±490
2	BDK-I	W-2877	2460±330	2790±370
3	BDK-VI	W-2878	2300±200	2430±210
4	BDK-I	W-2879	1380±150	1440±160
5	BDK-I	W-2880	1960±160	2140±170
6	BDK-I	W-2881*	740+50	890±60
7	Khuda Dost site	W-2882	1000±170	1060±180
8	BDK-II	W-2883	1270±380	1370±410
9	BDK-I	W-2884	970±120	1060±130

\* This sample (W2881) exhibited a TL fading factor of more than 20% over the period of the test. This casts a degree of doubt upon the reliability of the final TL age

### The Excavations

Six trenches were laid in different parts of the island (Fig. 1). Among them three trenches namely BDK-I (5 x 5 m), II (5 x 2.5 m), III (5 x 2.5 m), were dug in the southeast coast of the island near the Nilakanth Mahadev temple. BDK-IV, near the Khuda Dost Dargah was scraped while BDK-V (2.5 x 2.5 m) was laid out in Sundarvan, south of the present Balapur village. BDK-VI (2.5 x 2.5 m) was laid in agricultural land near Par village. The excavation was carried out to the virgin soil in each trench. The layers were distinguished on the basis of color, composition and texture. A brief findings from each sites are given below.

#### BDK-I

The excavation was carried out up to a depth of 2.65 m and 9 layers identified. The foundations of two structures were found in this trench (Fig. 2). The structure is made of irregular stone blocks with mud as a binding material. The structure has an extension towards the southern side. The structure appears to be a part of a room of a house-complex. On the other side of the structure, in the same trench, a hearth and flooring was found, which, might have been a part of a kitchen. The size of this room is 3 x 3 m, with a what appears to be a door on the northern side, which, however, had been enclosed later. Two other adjoining structures were noticed on either side. A few areca-nut shaped terracotta beads (Fig. 3) are the important antiquities contemporary to this structure. Shell artefacts like bangles and beads were also noticed. Other important finds include a broken decorative sandstone block. This

block depicts a seated lion and floral design. A copper ear ring was also recorded from this trench.

From layer 6, two copper coins of the Kushana period; one awl and one stylus of bone; and a large number of iron objects including nails, sickles, arrowheads were found. More than 50% of artefacts from layer 6 and 7 are of shell and the rest are potsherds.

The important potsherds include Red Polished Ware, Plain Red Ware and a few sherds of Black Ware. The major shapes are jars of different sizes, bowls of various types such as bowl with in turned sharpened rim, bowl with featureless rim, bowl with an internally ribbed rim, dishes, lids, basins and cooking vessels. Basins were found of different sizes, often with a flange on the exterior.

The habitation started on slope of the hill area and extended towards the shore area. Presently the lowest remains of habitation are limited to about a metre parallel to the shore with the remains towards the offshore eroded. The lowest cultural level in the trench is lower than present high water line by about 60 cm.

#### BDK-II

The trench was laid at the highest point in southern coast of the island. A total habitational deposit of 3.45 m was noticed with 11 layers. The initial habitation was lying on a sloping area that extends in a similar manner to BDK-I. However, at later stage the habitation was also extended in the opposite direction. The foundation of a structure was noticed in southeast corner of the trench. The structure was

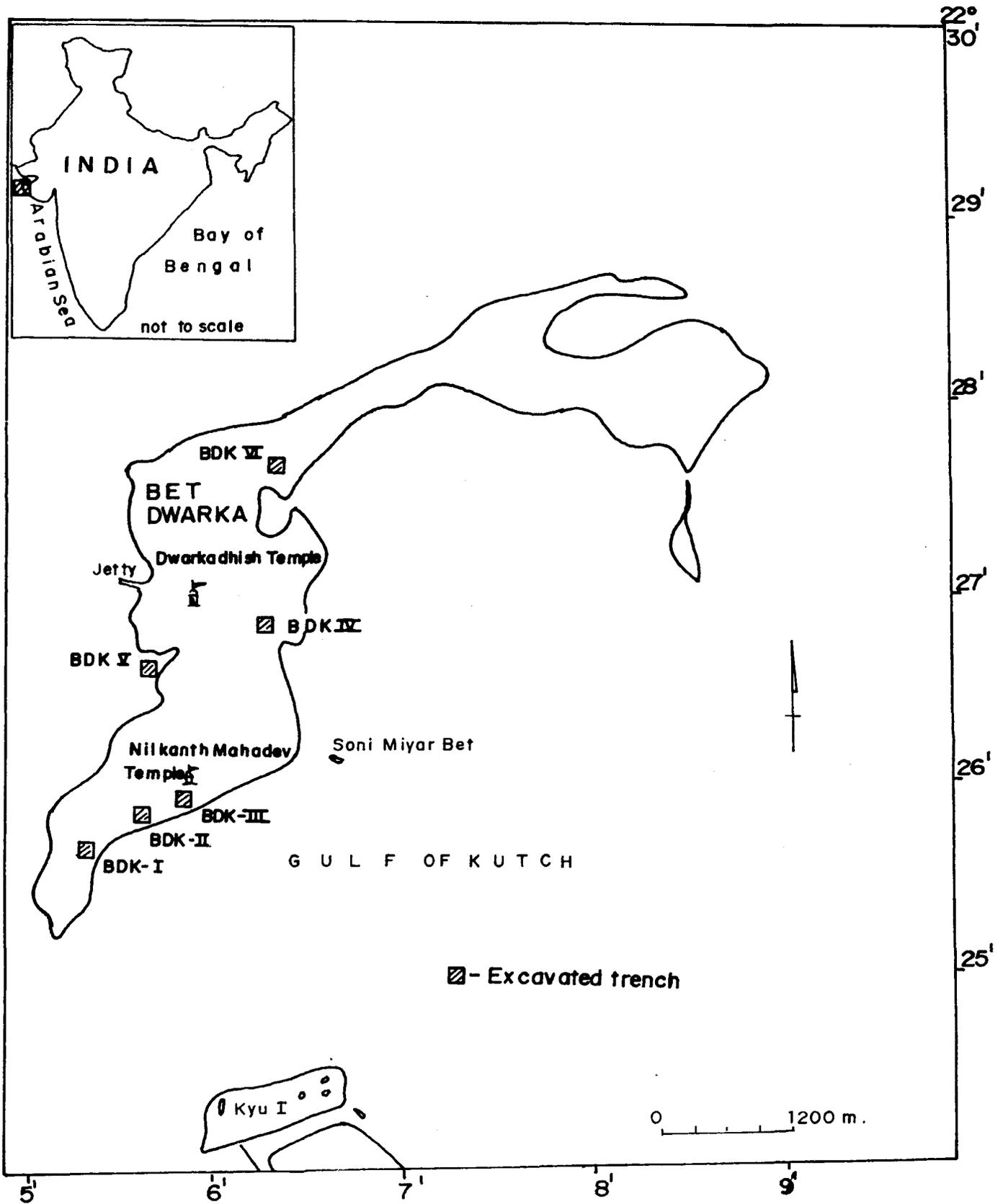


Fig. 1: Location of Bet Dwarka island



Fig. 2: Bet Dwarka: stone structures of phase III of historical period exposed in BDK-I



Fig. 3: Bet Dwarka: terracotta beads from BDK-I

sealed by layer 3 and the foundation of structure runs up to layer 4. A number of disturbed blocks were noticed in layer 3 and 4 which are the remains of some collapsed structure. Shell artefacts including beads and broken bangles were recovered from this trench. A large number of potsherds was collected from all the layers. The pottery comprises of Red Polished Ware, Red Ware and a few sherds of Black Ware. The important shapes are bowls, basins, jars, dishes, different type of lids and cooking vessels. One of the sherds of a Red Polished Ware bowl has a Brahmi letter 'A' (Fig. 4). A few other graffiti marks were also noticed. A large number of iron artefacts were also noticed from this trench which include sickles, nails, arrowhead, rings, etc. The lowest cultural level in the trench is lower than present high water line by about 70 cm. A study of the layers by the seismologists suggest that layer 10 is formed by the liquefied material thus providing the evidence of earthquake during early centuries of the Christian Era (Rajendran *et al.* 2003).



Fig. 4: Bet Dwarka: Red Polished ware sherd with Brahmi letter "A" from BDK-II

#### BDK-III

The trench was laid on the eastern side of the trench BDK-II near the present water pump house. A total deposit of 2.35 m was found in which 10 layers were identified. It was noticed that the foundation of a structure was sealed by layer 6 and it ran through layer 7 and 8 (Fig. 5). The structure is made of bigger stone blocks compared to other structures noticed at BDK-I and II. The exposed portion of the structure was in a 'L' shape, and possibly extends towards the south and west, probably being part of a house complex. Important shell artefacts such as beads and bangles besides a large number of wasted shells were found. One small copper coin, still unidentified, was also recovered from this trench. A number of terracotta beads, balls, a toy-cart, wheel with painted spokes were noticed from the lower level. A carnelian bead, glass beads and a pestle were important finds besides a few iron artefacts. Plain Red ware, Red polished ware, Red burnished ware, Black ware and a few Grey ware sherds were found. The important shapes are jars, basins, dishes, bowls, cooking vessels and lids.

#### BDK-IV

The trench was laid out at eastern side of the island, in agricultural land known as Sundaravan, located south of the village Balapur. A large number of potsherds were collected earlier from the surface. However, during the excavation no artefacts were recovered. Excavation was stopped after digging up to 75 cm.



Fig. 5: Bet Dwarka: stone structures of phase I of historical period exposed in BDK-III

#### BDK-V

The site is near Khuda Dost Dargah on western coast of the island. This site gets submerged during high tide. During the low tide, the section facing towards the sea was scraped and pot sherds and broken shell bangles were recovered from this place.

#### BDK-VI

The trench was laid in an agricultural land east of the village Par near a Mosque. The antiquities and pottery collected earlier from this location were associated with the Late Harappan phase (Sundaresh and Gaur 1998). The habitation deposit was noticed up to a depth of 95 cm and 2 layers were identified. A large stone block on western section of the trench was encountered which could be of some structure. However, continuity of the same could not be traced. The important finds include a large copper fish-hook (Fig. 6) and a copper antimony rod besides a large number of dentalium beads, broken shell bangles and waste of shells. Pottery includes Plain Red Ware, Painted

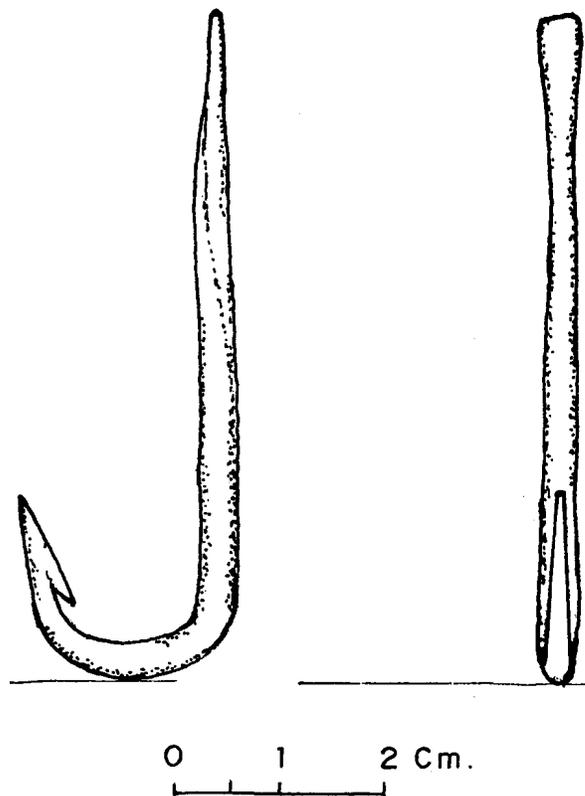


Fig. 6: Bet Dwarka: copper fish-hook

Red Ware, Buff Ware and Black Ware. The major shapes are carinated dishes, convex sided and stud handled bowls, jars and miniature vessels.

#### Discussion

The habitation of the island commenced at the beginning of the 2nd millennium B.C. and continued until today at different places in different times. From the above findings the following cultural sequence has been reconstructed:

##### *Protohistoric period*

This is the first habitation located in northeastern part of the island near Par village on flat and high tableland. The pottery and antiquities clearly indicate that they belonged to the Late Harappan phase and are very similar to other Late Harappan sites of Saurashtra region. The primary reason for the settlement may be the availability of shells which have been exploited to a great extent by the Harappans in Gujarat. Possibly, the Harappans from Nageshwar migrated to the island of Bet Dwarka which is situated just opposite to Nageshwar on the mainland. Hegde *et al.* (1990) report that Nageshwar shows Sindhi Harappan traits without the influence of Saurashtra and Kachchh Harappan traits. However the pottery at Bet Dwarka is very similar to the Late Harappan sites of

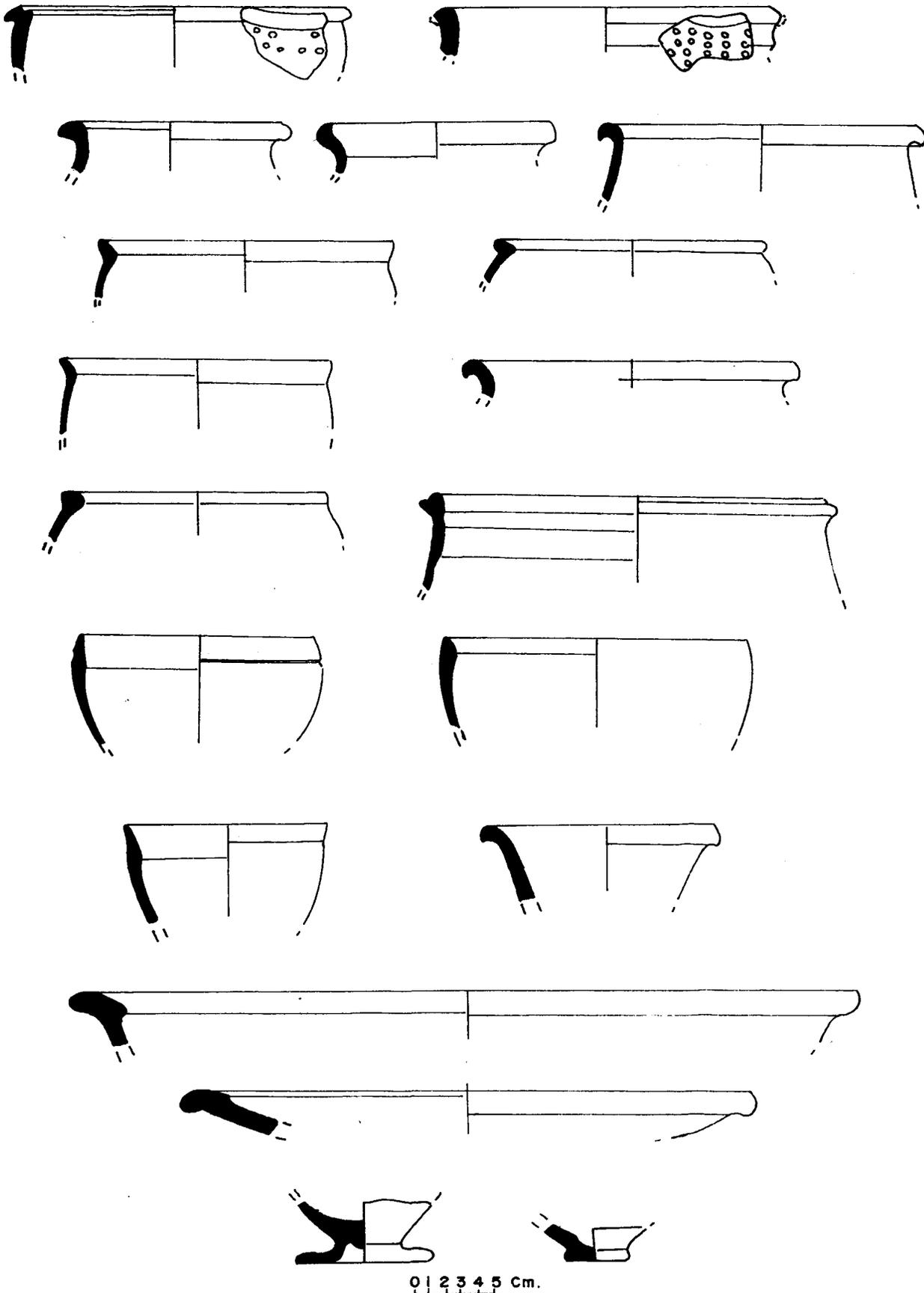


Fig. 7: Late Harappan pottery from Bet Dwarka

Saurashtra specially Rangpur IIC. A stud handled bowl, a characteristic feature of Gujarat Harappans, is found here. Coarse Red Ware, Buff Ware and Black Ware sherds are also found from Bet Dwarka. Convex-sided bowls, carinated dishes, jars and miniature vessels similar to the other Saurashtra Harappan sites are found (Fig. 7). Also, a few sherds of perforated jars were observed from surface explorations. A well-preserved copper fish-hook suggests that they were fishing in deeper waters and a large number of fish bones were also found from the excavated site. The fish-hook is very similar to those reported from Mohenjodaro (Marshall 1973), Harappa (Vats 1974), Lothal (Rao 1979) and Padri (Shinde and Thomas 1993). The fish-hook of Bet Dwarka is measures 7 cm in length, while the biggest fish-hook reported from the Harappan levels at Padri is 14 cm long. The economy of Late Harappans in Bet Dwarka was based on marine resources as there is no fertile agricultural land in the island. The excavation has not revealed the evidence of any house planning which may suggest that this island might have been a seasonal habitation. Radiocarbon and TL dates from this site indicate a time bracket for the habitation between 1600 and 1400 B.C. (Table 2).

#### Historical period

During the Early Historic period the island was inhabited at many places and huge deposits were noticed at BDK-I, II, III and V. During this period maritime activities were at their zenith and the island was visited by foreign boats. This period can be divided into three phases without any significant break on the basis of pottery and other antiquities.

#### Phase I

The evidence occurred from the lowest level of BDK-I and BDK-III where pottery similar to that at Prakash, Amreli and Hastinapur, where it is associated with NBP, was encountered. The habitation was concentrated on a sloping area along the present shoreline and the remains of this phase have been destroyed by the sea resulting in a lot of pottery and antiquities being exposed during low tide from the inter-tidal zone (Gaur *et al.* 1994). Pottery of this phase comprises Red Ware with a thick slip and burnished surface. Different types of bowls, dishes, jars, ring footed vessels and cooking vessels were important finds. Pottery is made on a well-levigated clay. However, uniform firing is lacking because an un-oxidized core has been noticed in all the vessels. A thick coat of slip which has been burnished was noticed on the vessels. Important antiquities of this period are a carnelian beads, terracotta toy carts, wheels, beads of fish bone, terracotta, shell and glass. A large number of shell bangles and collumellae were noticed from this phase. Radiocarbon and TL dates for this phase suggest a time bracket between the fifth to the first century B.C. The important finds of this phase are a few shapes of bowls, which are similar to the Late Harappan pottery, especially Rangpur III. However, some more data are required in order to consolidate the aspects. The remains of houses were not encountered, perhaps, due to limited excavation.

The measurement of present high water line and the earliest levels of Historic period suggest that the sea level was lower at least by 2 m during this phase as the habitation was concentrated towards present inter-tidal zone and has been destroyed. Remnants of the same are encountered in the layer extending towards the offshore.

**Table 2:** Radiocarbon dates from Bet Dwarka Island sample collected during the excavation in December 2001 and analyzed by Birbal Sahni Institute of Palaeobotany (BSIP), Lucknow

No.	Site	NIO Sample No.	Depth in cm	Layer	BSIP Lab number	C14 date Year in BP	Calibrated date
1	BDK-I	BDK-I /charcoal/2001/20	70	4	2010	3600±90	4070-3730*
2	BDK-II	BDK-II/shell/2001/21	240	8	1998	1940±80	1990-1820
3	BDK-II	BDK-II/shell/2001/22	275	10	1996	2000±80	2040-1870
4	BDK-III	BDK-II/charcoal/2001/23	70	4	2005	2200±100	2340-2060
5	BDK-III	BDK-II/charcoal/2001/24	225	9	2009	2590±100	2780-2500
6	BDK-VI	BDK-VI/shell/2001/26	50	2	2000	3140±100	3470-3260
7	BDK-VI	BDK-VI/shell/2001/27	20	1	1993	3470±80	3830-3640

this date is not corresponding to the archaeological findings as from this layer Kushana coins were collected.

### Phase II

During this phase population increased manifold and a lot of maritime activity is recorded. Regular house building activity was noticed as one of the trenches revealed the foundation of a wall which is L in shape and extends towards the western and northern sides of the trench. The structures were made of irregular stone blocks and mud mortar was used as binding material. A lot of pottery continued from phase I, however, Burnished Red Ware sherds were not encountered and there was a substantial decrease in dishes and ring-footed vessels. A unique shape of bowl appeared which has a rib internally just below the rim and the frequency of the same increases in upper layers. Different types of bowls which include convex-sided, and bowls with flaring sides with a sharp rim are the important types pottery from this phase. The introduction of a lid with round flange in the middle, which is very similar to ink-pot type lid reported from many other Historic period sites is present. This particular variety of lid might have been used for covering jars and amphorae during transportation by boats as a similar type of lid is also reported from a suspected shipwreck containing amphorae and a lead ingot in Bet Dwarka waters. However, this needs confirmation with additional data. The exploitation of conch shell was at peak as shell artefacts in BDK-I layer 6 and 7 form more than 50% of the total finds. A large number of worked collumella, broken bangle, beads etc. have been recorded from this site. A lot of sherds of Red Polished Ware are also found during this phase. The important shapes are bowls and jars.

Copper coins which appear to be of Kushana kings were noticed from this phase. A lot of antiquities including beads of terracotta, glass, shell and semiprecious stones, awls, stylus, a pendant and a duck, made of bone are the important finds. Iron artefacts were found extensively from this phase which include arrowheads, sickles, and different types of nails. On the basis of archaeological finds and radiocarbon dates this phase may be dated between the first century B.C. and the second century A.D.

### Phase III

This phase is found in the upper layers in BDK-I, II and III. Extensive structural activities were noticed during this period. A large room measuring 4 x 4 m was recorded in BDK-I, showing the presence of multi-roomed houses. The structures were made of small limestone blocks and mud mortar was used as binding material. A working floor with a hearth was also noticed from this phase. Pottery of the earlier phase continued but the clay used during this phase was not well levigated. A lot of sherds of Red Polished Ware also occurred and the frequency of ink-pot type lid increased substantially. Important antiquities of this phase include beads of glass, terracotta, shells and dentalium shells. A copper pendant, earring and finger rings are the

important finds. A potsherd is engraved with a Brahma letter 'A' which may be datable to the 3rd century A.D. On the basis of archaeological findings and radiocarbon dates this phase may be dated between the second and the fourth century A.D.

Another important point which may be mentioned here is that people of Bet Dwarka had greater contacts with Saurashtra than the Okhamandal region. The excavations at Dwarka in the Okhamandal region by Deccan College, Pune (Ansari and Mate 1966) and the Archaeological Survey of India (IAR 1979-80) suggest that Historical period pottery is different from the pottery of Bet Dwarka while the Bet Dwarka pottery has much more similarity with Saurashtra pottery of the Early Historical period.

### *Sea level considerations*

The data on sea level changes in Gujarat coast suggests that the sea level was higher than the present by 2 to 6 m during 4000 years B.C. (Gupta 1977). This was the period when the Indian Subcontinent witnessed the rise of a well-developed civilization and Gujarat was a major province of Indus civilization. Higher sea level would have attracted Harappans to use tidal and back water channels for anchoring boats. There is ample evidence on the exploitation of marine resources along the Gujarat coast during Harappan times which continued until the Late Harappan period as many Late Harappan sites are reported along the coast (Gaur and Vora 1999). Therefore, it may be reasonable to think that the sea level was higher even along the Bet Dwarka island until the Late Harappan phase as the lone Late Harappan site is found about 4 m above present high water line.

The lowest habitations in BDK-I and II are below the present high water line by about 70 cm. Similarly the site BDK-V near Khuda Dost Dargah is also flooded during the high tide. The time bracket of both sites is between the second century B.C. and fourth century A.D. During the early phase habitation extended towards the offshore and gradually extended landwards during the later stage. However, the remains of the later phase are also destroyed which suggest that up to 4th century A.D. the sea level was lower than the present. With this simple logic one may consider that the Early Historical period settlement took place on the island when sea level might have been lowered by 2-3 m compared to the present. If the sea level is lower by 2-3 m during early centuries of the Christian Era then a few places in Bet Dwarka island would have been connected to mainland during low tide. A local belief in this area that in the past people could reach the island by walking and bullock carts might reflect a past reality. Radiocarbon dates of the lowest level of BDK-II is 2040-1860 years B.P. Excavation of the present Dwarka suggests that around the Christian Era the sea level was lower than the present (Sankalia 1966) in Okhamandal area. In

general, the sea level during Christian Era was lower than the present by 2-3 m. Another important point may be mentioned here is that until the Medieval period the anchoring point for boats would have been near present Bet Dwarka jetty. A large number of amphorae, lead anchors and a lead ingot possibly from a shipwreck were noticed besides a large number of stone anchors datable between the Historical and Medieval periods.

### Conclusion

The present excavation has thrown a light on the cultural sequence of Bet Dwarka Island. Around the 17th century B.C. Late Harappan people had established their settlement and they perhaps migrated from Nageshwar which is close by. They have exploited marine resources such as fish and conch shells. It appears that Late Harappans of Bet Dwarka island had interaction with the Saurashtra Harappans and they might be visiting ports on the coast of the northern Saurashtra region. The scanty habitational deposit suggests that the site was abandoned after a couple of centuries. The island was again inhabited during the 8th century B.C. on the southeastern coast of the island. However, at a later stage the habitation was vastly extended. Hectic maritime activities were witnessed during this period and Mediterranean boats also visited the island. The reference of Baraca may be identified with Bet Dwarka island. Perhaps one of the Roman ships was also wrecked here and that may be one of the reasons that the author of *Periplus of the Erythraean Sea* has mentioned the difficult navigation in the Gulf of Baraca. The island continued to be an important centre of maritime activity until the emergence of the Okha port in the Okhamandal area. The discovery of a large number of anchors of different types near present jetty suggests that this point has served as an anchoring point of the ships for a long time.

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