

INDIAN ARCHAEOLOGY 2006-07

- A Review



INDIAN ARCHAEOLOGY 2006-07 - A REVIEW

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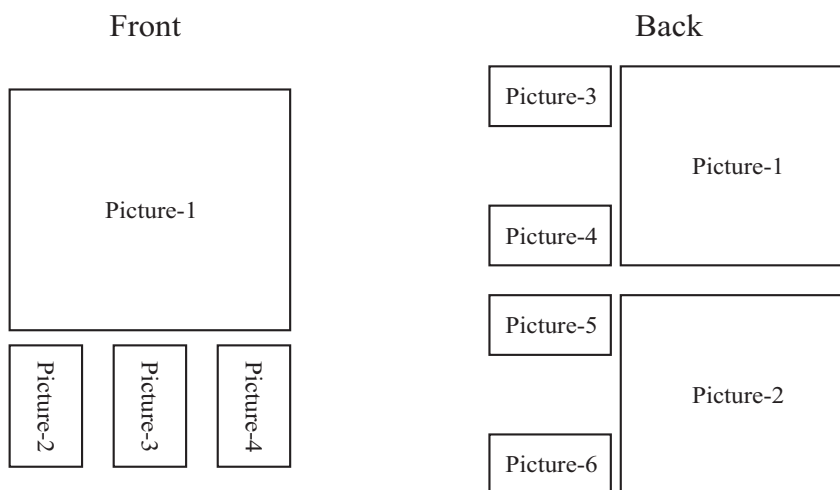
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- Front Cover : 1. *Exposed remains (Kanthamanenivarigudem)*; 2. *Terracotta snake figurines (Juafardih)*; 3. *Gold coin of Devaraya-II (Daulatabad fort)*; 4. *Pot with graffiti (Sembian Kandiyur)*
- Back Cover : 1 and 2. *Harshnath temple (Sikar), before and after conservation*; 3 and 4. *Ahmed Shah Wali tomb (Bidar), before and after chemical conservation*; 5 and 6. *Ancient site (Nagari), before and after landscaping*.

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PREFACE

I am happy to present this issue of *Indian Archaeology 2006-07 - A Review*, before the scholars and general readers, though belatedly. In order to clear the backlog of the issues of the *Review* to record the achievements of archaeology of the country, it was decided in the month of July, 2014 to entrust the work to some of the officers of the Survey, who volunteered to take up the editing of the *Review*. This presentation is the outcome of such painstaking challenging endeavors.

This issue includes information on archaeological research undertaken during the year 2006-07 throughout the country and abroad including explorations, excavations, epigraphy, numismatics, outstanding discoveries, palaeobotany, museums, structural/chemical conservation as well as landscaping work by the Archaeological Survey of India and other organizations. I thank all the contributors and heads of archaeological organizations in States, Universities, Museums and Research Institutes including our own colleagues in the Survey for their cooperation in bringing out this publication in present form. In editing this vast material, some errors might have crept in for which I must tender my apologies. However, in respect of information furnished by the respective contributors, the responsibility lies with them only.

I would be failing in my duty if I do not mention my gratitude to Dr. D.N. Dimri, Director (Publications) and his team in the Publication Section for their positive efforts in bringing out the publication promptly.

I also record my special appreciation to Dr. Jeeban Kumar Patnaik, Superintending Archaeologist (I/C), Excavation Branch-IV, Bhubaneswar as the present task was assigned to him after his successful submission of *Indian Archaeology 2012-13 - A Review*. He and his staff especially Shri Ajaya Kumar Sasmal and Ms. Barsarani Rout, who have compiled, edited and made it camera ready in a record time deserve my sincerest thanks. Last but not the least, I would like to thank Shri C. Dorje, Former Joint Director General, Archaeological Survey of India for going through the final manuscript and suggesting necessary corrections.

Date:...../...../2016
New Delhi

(Rakesh Tewari)
Director General
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INDIAN ARCHAEOLOGY 2006-07 - A REVIEW

I. EXPLORATIONS AND EXCAVATIONS

ANDHRA PRADESH

1. EXCAVATIONS AT BUDDHIST SITE, PHANIGIRI (V), THIRUMALAGIRI MANDAL, DISTRICT NALAGONDA

The Department of Archaeology and Museums, conducted excavations at Buddhist sitess, Phanigiri (V), Thirumalagiri Mandal, Nalagonda District. During the field season excavations were taken up on the south eastern side of Mahastupa in order to trace the further continuation of votive stupas. A circular stone votive stupa and a brick circular votive stupa were exposed. Exterior wall of stupas were plastered with lime. One appears that the stupa is built with in a square platform demarcated with lime concrete. The core part of stone votive and brick votive stupas were filled with brick bats and stone pieces, etc. To trace the further continuation of already exposed *vihara* located on the eastern side of monastic complex, diggings are continued. Three cells were exposed. Lime plaster on the exterior surface of brick wall was noticed. Further to trace the extension of these cells of *vihara* towards northern direction, six trenches were laid and exposed twelve cells. Each cell measures 2.40x3.30m with partition of the *vihara* was created by constructing single course of brick wall.

To trace the further continuation of stone pillared congregation hall located north of Mahastupa diggings were taken up. During the course of excavations, lime stone pillar

stumps with brick masonry platform are brought to light. By observing, the above evidences, it appears to be a fortyeight pillared congregation hall. Lime stone alignments in rectangular shape were exposed around this congregation hall. There is a provision of sockets on the top portion of these lime stone beams so as to fix the wall with railing. Upright Cuddapah slabs are exposed abutting the alignment at some places. The purpose of these Cuddapah slabs probably meant for supporting the parapet wall. On the north west side of the Mahastupa excavations brought to light two square brick structures with moulded bricks and off-setting. Entrances and purpose of these two structures is yet to be ascertained. Associated with the structures yielded meagre antiquities such as a decorated male head in lime stone, coins of Ikshavakus, iron nails, terracotta beads and lime stone pieces with two letters in Brahmi characters, a stone ball and early historic pottery datable to 1st-3rd century CE.

2. EXCAVATIONS AT BUDDHIST SITE, JAGATHIPADU (V), POLAKI MANDAL, DISTRICT SRIKAKULAM

The Department of Archaeology and Museums, Andhra Pradesh carried out excavations at Jagathipadu (18° 13'N; 84° 15'E) is a small village situated on the left bank of the river Vamsadhara in Sirkakulam district of Andhra Pradesh. It is about 12km from Narasannapeta town and opposite to Salihundam, a famous Buddhist site in the district. A small modern temple dedicated to god Siva, locally called Jagadeswara temple is

constructed in recent times over the mound which disturbed the mound to some extent.

In continuation of last year field season 2005-06 on the stupa area to know the plan and architectural embellishments, a brick structure (20.50x1.75m) in fifteen courses running in north south direction was brought to light. The brick structure is externally decorated with pilaster motifs. Another brick structure with decorated with pilaster motifs in equidistance of 1m was brought to light in south eastern direction having sufficient space, another square brick platform with a water channel was also brought to light. It has abraded Brahmi a label inscription reading "*Thapa*" on locality available khondalite stone.

In continuation of the previous year's excavation the western, southern and eastern areas of the main elevated mound were taken up with a view to expose the main structure. During this field season total six trenches were laid in Div.I and ten trenches excavations conducted in Div.II.

During this field season lengthy outer wall running in the east-west direction is brought to light. The bricks were used for the construction measures 53x27x8cm, 54x28x7cm with four to seven courses of bricks. Adjacent to this structure, open drain/channel running parallel to this structure was brought to light. During the course of digging in Trench A6 tiled floor with traces of lime was brought to light. During the course of excavation, three hemispherical mounds on the northern side of stupa with traces of brick structures on the south-eastern portion of the tank locally called as Subhanna Cheruvu have to be tapped to know their plan, nature and purpose.

3. EXCAVATION AT KANTHAMANE-NIVARIGUDEM IN KAMAVARAPUKOTA MANDAL, DISTRICT WEST GODAVARI

W.V.S. Narasimham, Ch. Babji Rao, A. Suresh, N. Subba Rao, Ch. Vijayanand and K. Veeranjanyulu under the direction of D. Jithendra Das of Hyderabad Circle of the Archaeological Survey of India¹, carried out trial excavations at Kanthamane-nivarigudem, located about 45km north-northwest of Eluru, the district headquarters of West Godavari and lies about 24km west of Tadikelapudi village on Eluru-Jangareddygudem state road. The site with archaeological remains is situated 2km west of the present day settlement at village Kanthamane-nivarigudem (16°59.779'N; 81° 878'E) and is under cultivation resulting in leveling of surface besides partial quarrying of the mound for agricultural purpose. Prior to the present work, while laying out water pipe line by the land owner for cultivation, lime stone pillar/slab fragments got accidentally surfaced at the site and attracted the attention of archaeological spade work. One of the lime stone slabs measuring 1.13x0.41x0.13m contain a series of four small sockets in a circular manner. The two pillar fragments together form one side part of the pillar. It has a half medallion in double lines with nine petals in the inner row and eleven on the outer row. Below the flower motif is a row of animals showing lion and goat or deer. The pillar fragments measure 1.30x0.20m and 0.75x0.20m respectively. After joining them together, the total width of pillar is of 0.20m. A fragmentary pillar bears a three lined Brahmi inscription "*sa dam he, ga ha pa ti na ni ga ta na bha ra ya ya ba bha ya sa ju hu te kaya da nam ma ha na ga pa va te ari (ya) sa gha sa sa va da khi ni ya nam sa mo ra ne*" was also found amongst them.

¹Archaeological Survey of India is referred to in the following pages as the Survey only.

The ancient mound contains about 0.5m to 1.5m deposit. Fragments of a life size seated Buddha figure in red sand stone are noticed here measuring about 82x60cm, while its thickness is about 30cm. The figure is badly mutilated.

The prime objective of excavation was to know the nature of structural remains and their archaeological chronology, trial trench was taken at the site around the tree covering an area of about 250m. The cuttings have brought to light remains of two brick *chaityas*, in northwest-southeast orientation at a distance of 10.40m facing each other; monastic cells to further north-west of the *chaityas* a votive brick stupa and squarish brick platforms, probably the foundation courses of votive stupas (Pl. 1). Of these two *chaityas*, the eastern *chaitya* with entrance from its western side is a Buddha *chaitya* and the western *chaitya* with an entrance from the east is a apsidal *chaitya*. The Buddha *chaitya* is constructed over a rectangular brick foundation measuring 10.8x5.2m containing six courses. The apsidal *chaitya* has an offset at entrance and the curved end on eastern side with a maximum of 10 brick courses. The apsidal *chaitya* measures 10m in length and width of side walls is 1.23m that becomes broad and ends with 1.45m at the curved end. The available height of the structure is 1.2m including the base. A stone step is found at the entrance. The interior of the *chaitya* is divided mainly into two parts of 3.25x2.6m for the main shrine and 2.65x2.6m space at the entrance, separated by a horizontal brick base of 1m width, followed by another small walls of about 0.5m width each marked by a space of 0.55m. A small stone (pedestal?) measuring 0.38x0.50m is found with in shrine, where the Buddha figure was supposed to be erected. Traces of evidence of brick paved floor have also been noticed here (Pl. 2).

The exposed remains of stupa *chaitya* which is in the same orientation as of Buddha *chaitya*, measures 10.40x5.75m and the thickness of wall is about 1.25m. The diameter of the base of stupa is 1.30m; it had vertical wall projection on either side to a thickness of 0.65m each. At the entrance on the eastern side, it has two uniform rectangular projections on plan and a mini brick base 0.80x0.55m inside. The height of exposed structure is 0.62m with nine brick courses marked by mouldings at the top. Remains of a brick circular votive stupa have been exposed adjacent to stupa *chaitya* at its north eastern corner Trench YA1. This structure has nine brick courses over a squarish base of two brick courses. It had a moulding at the top. The total height is 0.70m. Traces of two squarish brick platforms measuring 1.8x1.8m were unearthed in the Trench XA1. The maximum exposed heights were 0.25m and 0.5m with 3 and 7 brick courses respectively. Remains pertaining to a monastery in the form of three brick cells are exposed to further northwest of stupa *chaitya*. In the absence of any other material evidence, on paleographical and architectural style, the Buddhist establishment at the site can be dated to 2nd-3rd century CE.

The other structural finds of the site include remains of a thoroughly disturbed stone temple basement of a temple probably of a later period which were unearthed on the north eastern side of the Buddha *chaitya*. The ceramic evidence from the site comprises red ware, meager percentage of polished red ware and black and red ware. The principal shapes noticed are of vase, *handi*, basin and bowl. The other important surface finds include a small stone plaque containing two seated images of male and female divinities, from one of the sections and a fragment of a small shell bangle.

ARUNACHAL PRADESH

4. EXPLORATION IN DISTRICT EAST SIANG

Exploration was conducted in East Siang district Arunachal Pradesh under the direction of D. Bhengra, Director (Prehistory) assisted by K.M. Girhe, R.K. Dwivedi, N.K. Nimje. Exploration yielded four lower Palaeolithic sites at Bodak (95° 16'N; 28° 10'E), Pasighat (95° 19'N; 28° 5'E), Ranighat (Pegging) (95° 17'N; 28° 8'E) and Yingkiong (95° 14'N; 28° 29'E).

ASSAM

5. ARCHAEOLOGICAL SITE DEOPARVAT, NUMALIGARH, DISTRICT GOLAGHAT

The Directorate of Archaeology, Assam exposed the stone temple plinth located at Deoparvat, Numaligarh in district Golaghat jointly under the direction by H.N. Dutta and Ranjana Sharma. Systematic removal of the relics of the mound 3m in height exposed the stone basement or *adhithana* of a temple, laid upon on a stone platform measuring 10.70x9.40x0.40m. The basement of the stone temple exposed upon the stone platform is 32.5m in diameter and 2.55m in height. The basement of the stone temple between the stone platform at bottom and the cella floor of the *garbhagriha* atop is endowed with several series of sculptures of human, animal and floral designs in the entire circumference, all symmetrically arranged in a horizontal manner in superb artistic finish. Stylistically, the ground plan of the temple has a circumferential *garbhagriha* with a short *mukhamandapa*.

The exposed ground plan of the temple at Deoparvat is unique and first of its kind in Assam.

Laid in circular ground plan upon which a monolithic platform is build with a raised cella

floor of the *garbhagriha*. A short *mukhamandapa* with a stunted artificial *sikhara* is raised upon a massive ceiling slab of artistic finish with a blooming lotus, the seed vessel of which bears relief of a figure of flying *vidyadhara*. Enormous carving of figures of gods and goddesses, human, animal, floral and ornamental designs is executed in the entire surface beginning from the basement to the *sikhara* of the temple. The exterior of the temple at Deoparvat was ornamented with sculptural representations. Curved panels of sculptures, friezes, coner pieces, coping pieces from *torana*, pillar capital, door jamb, series of *gajathara*, *vidyadhara*, geometrical and floral carvings, sculptural depictions of scenes from the epic Ramayana, Mahabharata, mythological episodes, *kala-makara* have been found very elegant. The sculptures have been carved with flat nose, eyes, lips in a tapering face, which represents the native physiognomical features. Tall decorated *mukuta*, large round *patrakundalas* in ears, attenuated waist, bulging breasts and hips, wearing of sophisticated dress, costumes, ornaments, depiction of sculptures in profile view, bearded chin of some human figures, carving of grotesque and animal figures to exposed salient features of Deoparvat School of Art.

Scholars try to link up the *kala-makara* from the four cardinal points of the temple, now lying in the site with temple architectural plan found at Java in South-east Asia as reported in (Annual Report, ASI 1936-37, p.58). Yet a remote influence of central Indian art specially from art of Bharhut at Deoparvat cannot be ruled out. But the artists at Deoparvat generated a local art style enriched with regional feature which is unique in Assam.

Art work of *kala-makara*, *kirttimukha* doorframes, flying *vidyadhara*, *gajathara*, scenes from the epics of Ramayana,

Mahabharata, Bhagavat *purana* and many such other non-iconic art work as lotus, head hunting scene, rhinoceros, and other floral geometrical carvings bear significant trace of the local art style developed at Deoparvat in Assam datable to c. 1100 C.E.

6. SCIENTIFIC CLEARANCE AT MADAN KAMDEV ARCHAEOLOGICAL SITE, DISTRICT KAMRUP

Madan Kamdev archaeological site is situated (92° 30'N; 26° 15'E) in North Guwahati near Baihata Chariali at a distance of about 35km from Guwahati city. The site has ruins of thirteen stone temple plinths in east-west direction. The main temple enshrines a figure of seated Siva and Parvati in *alingana* posture.

During scientific exposition of the stone temple plinths at Madan Kamdev archaeological site was taken up by H. N. Dutta, Director Assam State Archaeology. Twelve stone temple plinths have been exposed by removing grass and weeds. Out of these, the work of six stone temple plinths have been set into their original layout by following methods of systematic exposition and restoration as per the original. All the stone components of the six temple plinths lying scattered in and around have been brought back and set to the plinths as per the original.

The plinth 1 measuring 1.98x2.27x10m in south eastern section was unearthed by removing displaced stone boulders for exposition of the plinth. Its south-western section 1.85x0.68x50m was exposed by removing soil from its surface. In west, between plinth 1 and 2 evidence of a brick floor measuring 66x52x0.04m was exposed. Resetting of the plinth 1 measuring 9.75x1.80x50m was done by maintaining original alignment of the temple plinth. The plinth 2 measures 1.96x2.44x28m. The displaced stone sculptures have been removed and resetting of the plinth of *garbhagriha* of

the stone temple done measuring 1.96x2.44x28m. Resetting of the *mandapa* measuring 3.50x3.26x28m was done as per original. The plinth 3 measuring 6.60x29x60m was exposed in west. The exposed northern part of the temple plinth was also set to alignment and it measures 7.20x1.85x40m. Trees on the stone temple plinth 4 and displaced stone boulders were removed to expose the outer alignment. Displaced stone sculptures of the east facing temple were removed and was set in proper alignment. It measures 6.35x4.64x40m.

Displaced stone sculptures of temple 6 were removed and resetting was done. It measures 4.85x4.50x45m. The stone plinth 7 was exposed by removing soil and displaced stone sculptures. The *yonipitha* of the *garbhagriha* of the temple plinth was laid into the original position along with its *pranala*. The exposed stone temple plinth measures 4.45x4.40x30cm. Further the stone temple plinth 8 measures 5.08x 4.82x0.10cm and stone temple plinth 9 measures 4.75x3.42x0.12m, plinth 10 measures 5.75x5.75x0.15m and stone temple plinth 11 measures 15.20x10.50x30m. Plinth 12 measures 16.10x10.5x30m were exposed.

Evidence of a brick floor measuring 4.70m in length 2.70m in width exposed in northern side of the plinth with two brick courses. Besides another brick course was exposed in south eastern corner measuring 0.72x0.41x18m. Evidence of brick floor was also exposed in south-western corner. It measures 2x1.65x0.17m. The exposition of evidence of brick floor implies that each of the stone temple plinth is surrounded by a brick floor which might be served as apron of the temple as floor around the temple complex. The ruins of the stone temple plinths are datable to 11th-12th century CE.

During exposition work, evidence of stone temple plinths with *beki*, *gajavyalas*, *yonipitha*, and ceiling slab and stone temple relics were found at a distance of 200m in northern side of the stone temple plinth 12 in Madan Kamdev Reserve Forest area. It needs preservation protection and further exposition of the temple ruins.

BIHAR

7. EXCAVATION AT JUAFARDIH, DISTRICT NALANDA

The Excavation Branch-III, Patna of the Survey, under the direction of S.C.Saran, assisted by N.G. Nikoshey, Sujeet Nayan, Jalaj Kumar Tiwari, Abdul Arif, Neetesh Saxena, O.P. Pandey, S.P. Gupta, M.K. Bramhachari and Dhananjay Kumar conducted excavation at Juafardih (25° 08'N; 85° 25'E) situated about 3km west of the ruins of Nalanda University.

The mound roughly measured 1.05x1.00m with a height of about 10m situated in the western side of the village Juafardih was divided into grid pattern and altogether thirty trenches were taken for excavation. A preliminary study of the site revealed the cultural sequence of the following periods (Pls. 3-4).

- Period I : Chalcolithic
- Period II : Northern Black Polished Ware (NBPW)
- Period III : Post-NBPW (Sunga to Post-Gupta period) (Fig. 1)

No structural remains of Period I were found. A separate horizon of this period was noticed only in the square ZA over the natural soil. The 52cm thick deposit contained

potsherds of Chalcolithic black and red ware, black slipped ware and red ware. Bowls, dishes and vases are the common shapes of this period. Due to limited scope of excavation, no antiquity was found. Period II had a total deposit of 10.61m including the height of mud stupa. The total habitational deposit of Period II was 3.44m (excluding the packing of mud stupa). In the Period II at the NBPW level in the trenches, a good number of wattle and daub impressed burnt clay pieces have been encountered in the Layers 6, 7, and 8. It indicates the structural activities of the NBPW period. Some consecutive floors with postholes are also noticed in the Trenches in the Layers 6, 7, 8 and 9. In this period, ceramic industries marked with lustrous polished pottery popularly known as NBPW. The NBPW of this period are very fine fabric with thin section. Other ceramic assemblages are black slipped ware, red slipped ware, red ware and grey ware (Figs. 2-4).

It was observed that an area of about 80x80m at Layer 5 was leveled and a 5cm to 12cm of fine riverine sand was spread all over which most possibly represented the base of the earliest mud stupa in three successive phases. In the phase I, the mud stupa was erected on a solid circular base by piling up natural earth dug up from the surrounding area. The maximum diameter of the tumulus was 9.80m with a maximum height of 0.97m. Stupa was further raised upto the height of 1.45m in the second phase and diameter of the stupa was also enlarged. In the phase III, the height of the stupa was further raised to 4.65m and the diameter of the tumulus was enlarged and measuring about 63m during Period II. The mud stupa was encased with brick masonry set mud mortar during Period III (Pls. 5-6). The maximum width of the encasing was 6m enlarging the stupa to a diameter of 77m. The evidence of *pradakshinapatha* around the stupa at ground level was also encountered during excavations.

This additional *pradakshinapatha* was resting over a compact mud platform and was having six courses. The width of the *pradakshinapatha* was 7m. The second *pradakshinapatha* was most possibly added to the stupa to arrest possible erosion and allow devotees to have circumambulation at a higher level. The remnants of third *pradakshinapatha* were also noticed at further height, much closer to the center of the stupa. This upper-most *pradakshinapatha* was single coursed and was laid over a compact mud platform having a height of 0.60m with width of 3m. The bricks used in the encasing of mud stupa measured 37x28x7/8cm, 36x27x7/8cm, 35x25x6cm. Mud was used as chief binding material, sometimes mixed with tiny potsherds as mortar (Pls. 7-8).

Period III is represented by 2.04m thick of red ware occupational deposit. The potteries of this period are characterized by the occurrence of red ware, dull red ware and red slipped ware. From Layer 1 to 5 the discovered potsherds have mixed in nature. A few shreds of black and red ware, huge amount of NBPW, and grey ware found at together (Figs. 5-8).

The excavation has yielded a total number of six hundred eighty six antiquities including five hundred fifty four terracotta, fifty four stone, thirteen bone, seventeen copper, thirty seven iron, eight glass and a solitary silver object. Terracotta objects include human, animal and snake figurines (Pls. 9-10), beads, hopscotches, wheels, gamesman, toy discs, discs, crucible, dabber, net sinkers, etc. fragments of arrow heads, daggers, knives, axes, chisels, sickles, hoe made of iron were also found (Pls. 11-12). Among the copper objects bangles, antimony rods, coins are noteworthy. Points, discs, wheel and bone made of combs were also discovered (Pls. 13-14). Beads of semi-precious stone (Pl. 15), quern, pestles,

sling balls, caskets and tool sharpeners are the other stone objects (Pl. 16). Gadhaiya silver coin and inscribed hopscotch with *Brahmi* letters “MUGA” on obverse and “VA or MA” on reverse are the other noteworthy findings (Pl. 17).

A good quantity of palaeobotanical samples were collected by using flotation technique at Juafardih, under the guidance of M.D. Kajale and S.S. Naik of the Department of Archaeology, Deccan College Post Graduate Research Institute, Pune. The preliminary report gave a fair idea of the agriculture practices during Period I and Period II. The plant species identified were mainly cereals and pulses. The palaeobotanical evidences are as follows: Wheat: *Triticum* spp. (*Triticum vulgare/aestivum* type), Rice: *Oryza* sp. (of *sativa* Linn.) three morphotypes, Barley: *Hordeum vulgare* Linn, Moong Bean: *Vigna radiate* (L.) Wilcz., Common Pea: *Pisum arvense* Linn., Gram: *Cicer arietinum* Linn.

On the basis of charcoal samples analysed by Birbal Sahni Institute of Palaeobotany (BSIP), Lucknow the first, second and third phases of mud stupa could safely be dated between *circa* 600-400 CE which rests over Layer 5 as the calibrated date for the sample collected from Layer 6 has given a date of 1002 CE (i.e. 2850+80 B.P.). It is clarified that no charcoal either from the first or second phase of mud stupa was found from the excavations. The date suggested for the Period III of stupa by BSIP is *circa* 100BCE to 100 CE. It may hence be observed that the ancient site of Juafardih was inhabited sometime during Chalcolithic period, which on the basis of radio carbon dates as obtained from four samples could be safely date between *circa* 1600-1200BCE. Significantly, the occupational levels did not yield even a solitary sherd of NBPW. Period II has a rich deposit of 10.60m,

including the height of mud stupa (phases I, II and III) i.e., 7.17m which predominantly yielded black and red, black slipped, grey, NBPW and red wares. BSIP on the basis of samples obtained from Layers 8,7 and 6 (all belonging to middle phase) has suggested a long date bracket of 900BCE to 600BCE. Since the earliest stupa was raised over the habitation deposit of Layer 5 of Period II, its initial construction has reasonably been dated to about 6th-5th century BCE the most outstanding contribution of the excavation of Juafardih is the early date for Period II (NBPW) which goes as early as *circa* 1200BCE, a fact which may surprise many scholars. Although many have been thinking that dating NBPW levels in Magadh region as late as 600BCE conventionally, need to be re-examined but none

has so far dated the beginning of NBPW as early as *circa* 1200BCE it is interesting to bring forth that there are not one or two but all-together four C14 dates which have given early dates for NBPW levels. It is further pointed out that these four dates have come from Layers 8,7 and 6 which belong to middle phase of the NBPW of Period II. Unfortunately no charcoal sample could be collected from Layers 12, 11 and 10 belonging to early phase of Period II. However, Layers 13, the uppermost deposit of Period I, has provided a C14 date of 1354BCE it may thus be seen that the C14 dates of Period I and II are consistent and justifiably indicate that the conventional date bracket for NBPW requires a fresh review at least for the sites in Magadh region.(See Chart-I)

CHART - I

Sample No. Depth (C.M.)	Layer	B. S. No.	Age of the sample based on the value of half life 4470#30yrs.	Calibrated age
3527, JFD-5 4.36 M	13	2705	3100 + 110 (B.P.)	1354 CE
3528, JFD-3 2.25-2.28 M	8	2706	3010 + 90 (B.P.)	1259 CE
3529, JFD-2 2.05 M	7	2707	3280 + 90 (B.P.)	1562 CE
3525, JFD-6 2.7-3.26 M	6	2703	2850 + 80 (B.P.)	1002 CE
3526, JFD-8 2.15 M	8	2704	2740 + 100 (B.P.)	857 CE



1



2

Kanthamanenivarigudem: general view of the exposed structures, See p. 3

8. SCIENTIFIC CLEARANCE WORK OF RAJA BALI-KA-GARH AT BALIRAJGARH, DISTRICT MADHUBANI

Patna Circle of the Survey under the guidance of P.K.Mishra with the assistance of B.Gartia carried out scientific clearance work of the site with the objective to examine the nature of corners of the fortification wall. Accordingly the work was started at the south-eastern corner of the site and extended towards the eastern arm of the fortification wall. As a result the remains of wall at south-eastern corner has been exposed on the exterior side. It is made of burnt bricks and laid on mud mortar. Each course of bricks are arranged in diminishing order towards its core. Altogether the available courses of bricks are 25 in number. At the lower part of the wall the brick size is 47 x 24 x 7cm; whereas at the upper part it is 48 x 22 x 6cm., and 34 x 24 x 8cm. This wall is found to be surmounted by a brick platform with the remains of 12 courses of bricks. The size of the bricks are 29 x 23 x 7 cm and 40 x 20 x 8cm. The section of this structure is straight sided and its characteristic suggests about probable existence of a watch tower. The extant height of the structure measures from the ground level as 4.15m.

9. SCIENTIFIC CLEARANCE WORK AT NALANDA, DISTRICT NALANDA

With an objective to remove the unwanted debris for ensuring clear visibility of the temple at Sarai Mound, scientific clearance work has been conducted by Patna Circle of the Survey under the guidance of P.K.Mishra assisted by K.C. Srivastava and Radha Kisto. Site of the Sarai mound has been taken up for operation. The area about 1200sqm to a maximum depth of one m. has been cleared so far. During the clearance, remnants of a brick wall having the width of

1.55m running east-west was exposed. The brick used in the wall are measuring 36 x 28 x 6cm. In addition to this a bricks lined well having external and internal *dia.* of 2.20m and 1.05m respectively also brought to light. Mention may also be made of remains of few platforms and other minor structures which were encountered during the clearance work. A good number of vases kept *in situ* and a drain running north-south indicate the working level of the structure. The working level and the structures are extending beyond the area of operation and are likely to continue further. The present clearance work has revealed the evidence of two enclosure walls all around the temple.

10. SCIENTIFIC CLEARANCE WORK AT RUINED FORTRESS OF CHANKIGARH, CHANKI, DISTRICT WEST CHAMPARAN

P.K. Mishra assisted by P.K. Mukherji and Aftab Hussain of Patna Circle of the Survey conducted scientific clearance work at Ruined Fortress of Chankigarh. The huge mound seems "L" shaped. The longer arm being indicated by the lofty main ridge, running east to west and showing traces of massive brick structures at its sides. The shorter arm is a continuation of the main ridge from its eastern end towards the south where, after a short distance it turns to the west in a gradual slope meeting with the ground level. Hence, the present work was initiated with a view to know the nature of structure underneath it. Accordingly the structure identified as remnants of a ramp in east-west orientation has been brought into light. The ramp was constructed of burnt bricks and bonded in mud mortar. It is interesting that the bricks used in the ramp were all square in shape and measure as 32 x 32 x 7cm.

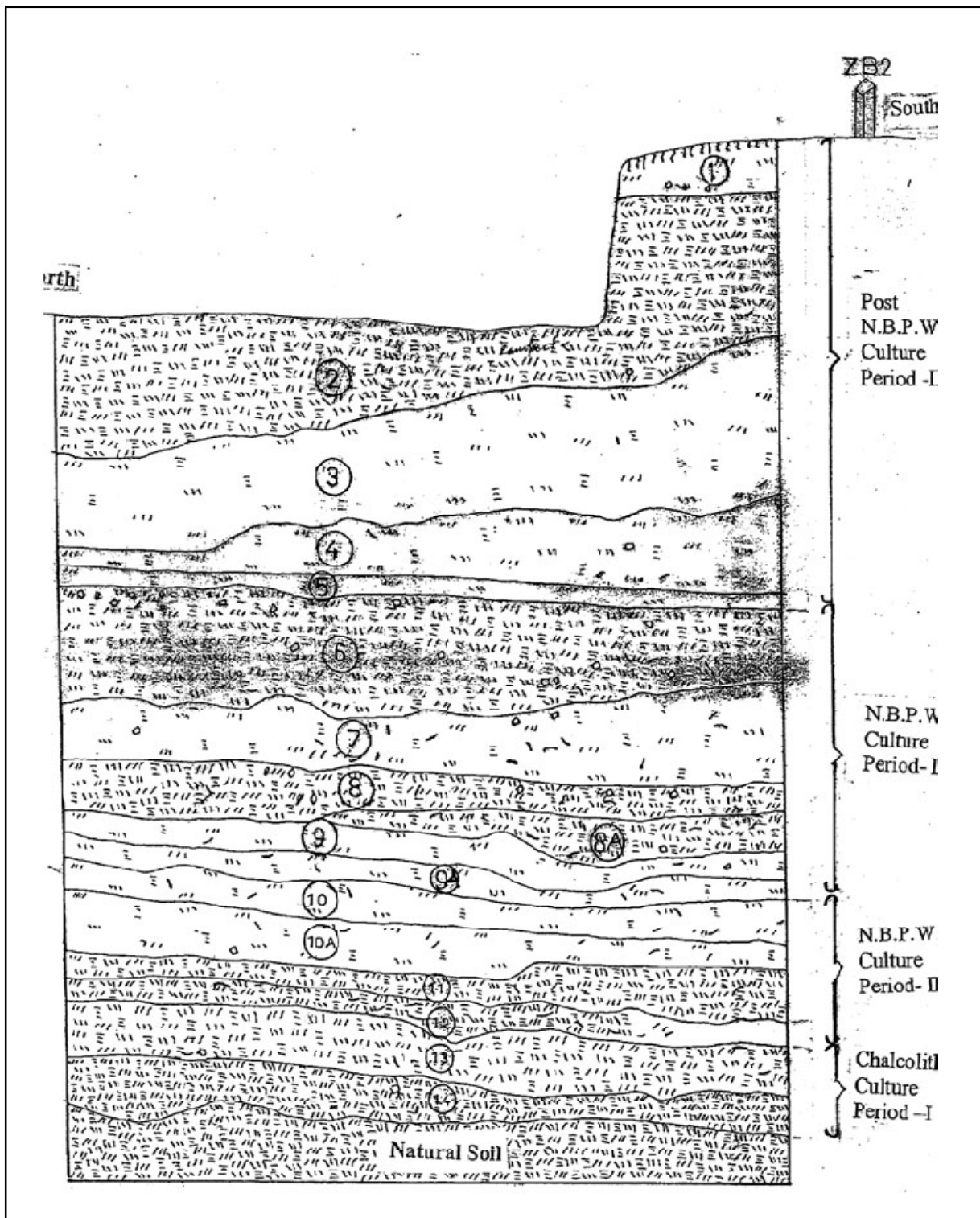


Fig.1: Juafardih: excavated section showing successive periods. See p.6

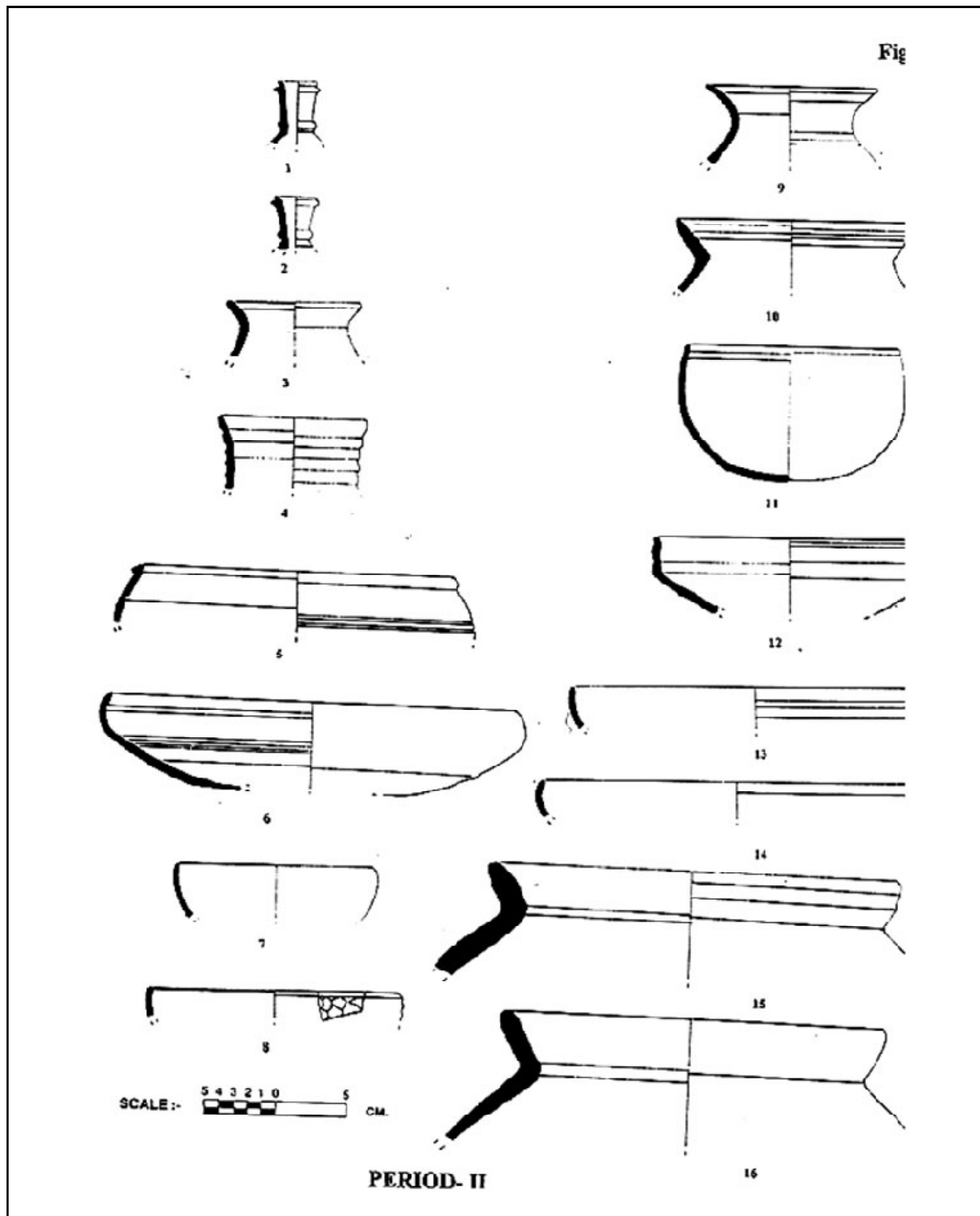


Fig. 2: Juafardih: NBPW and othe associated pottery. See p.6

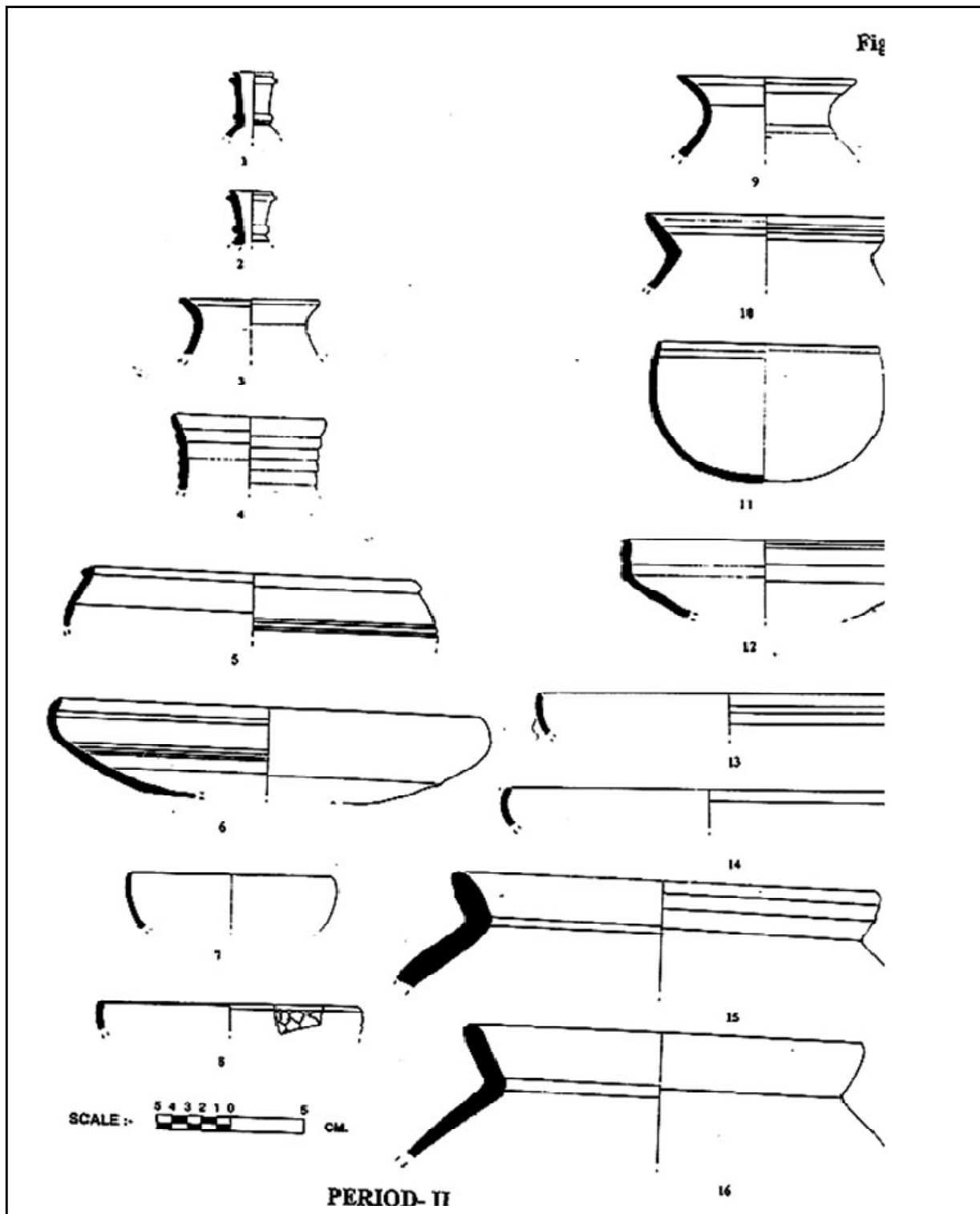


Fig.3: Juafardih: NBPW and other associated vases. See p.6

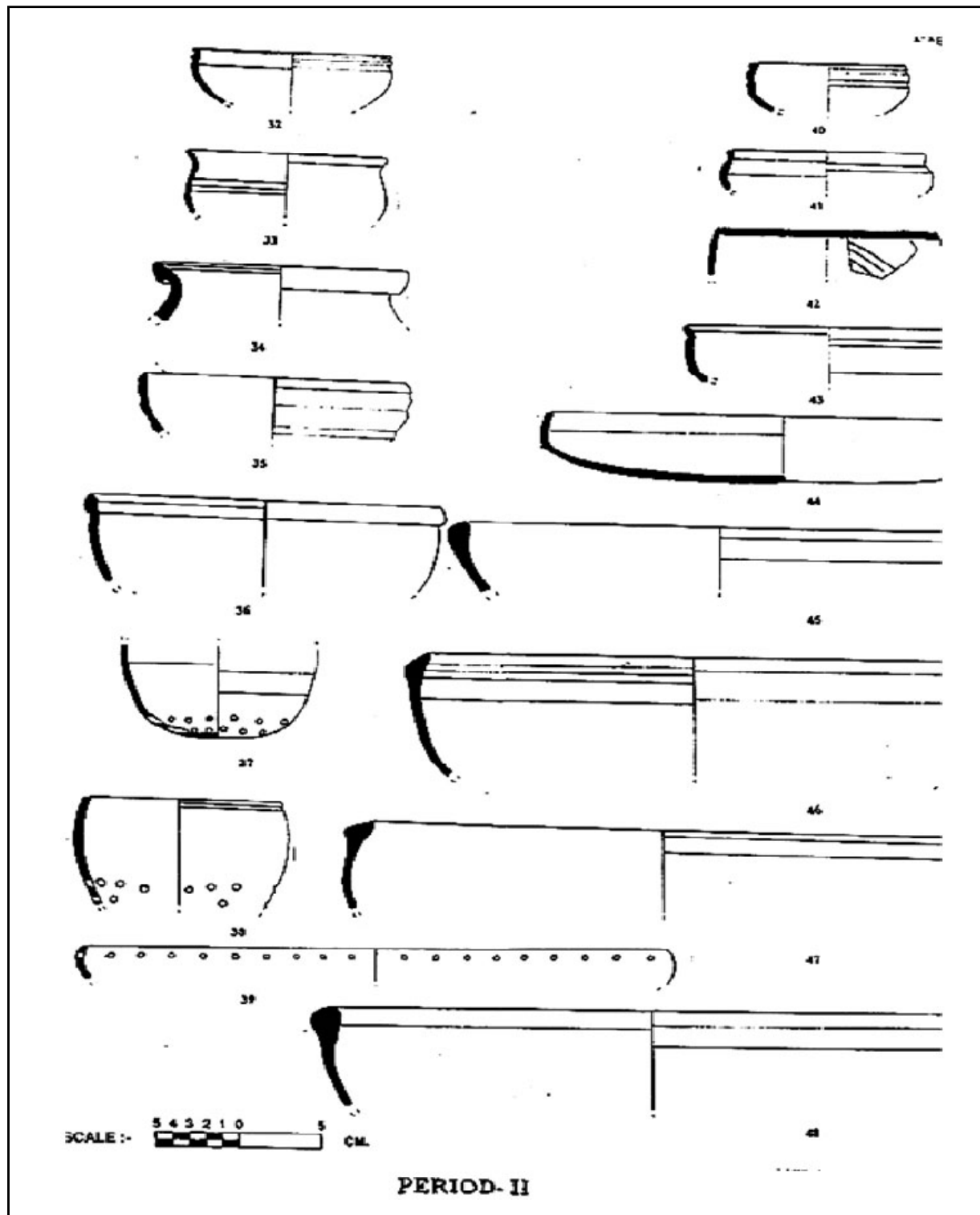


Fig.4: Juafardih: NBPW and other associated potteries. See p.6

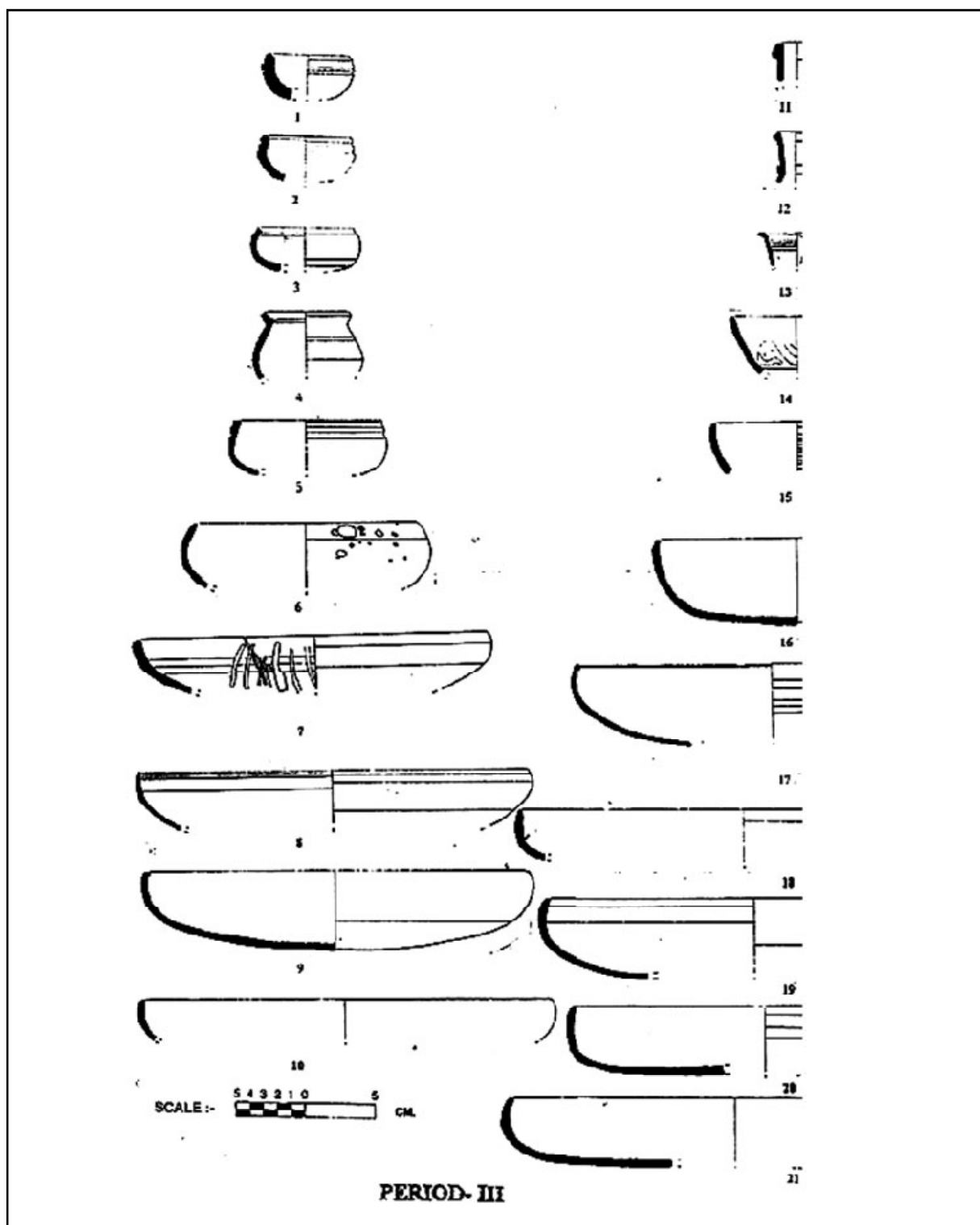


Fig. 5: Juafardih: NBPWares. See p.7

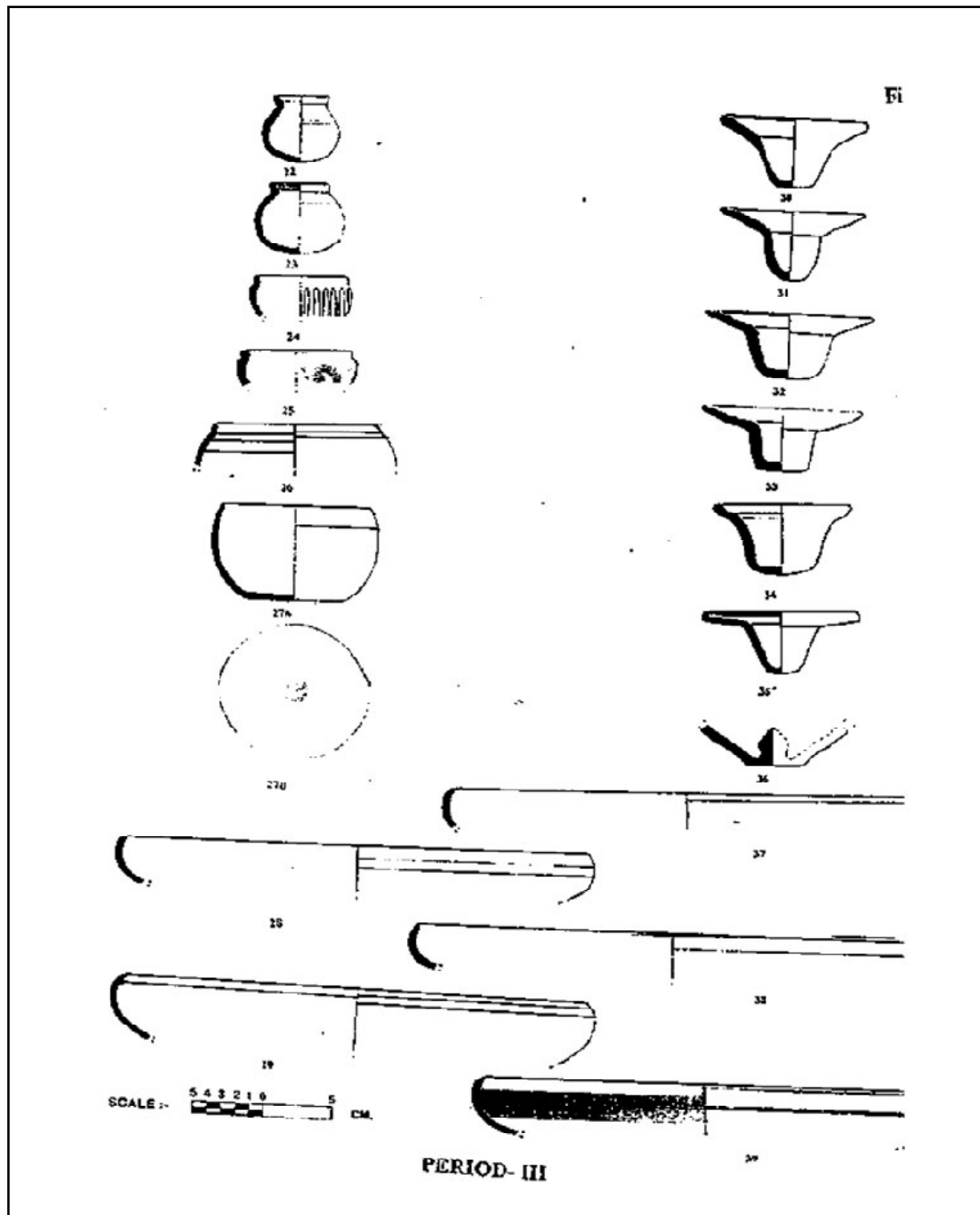


Fig. 6: Juafardih: Black and red ware and grey ware. See p.7

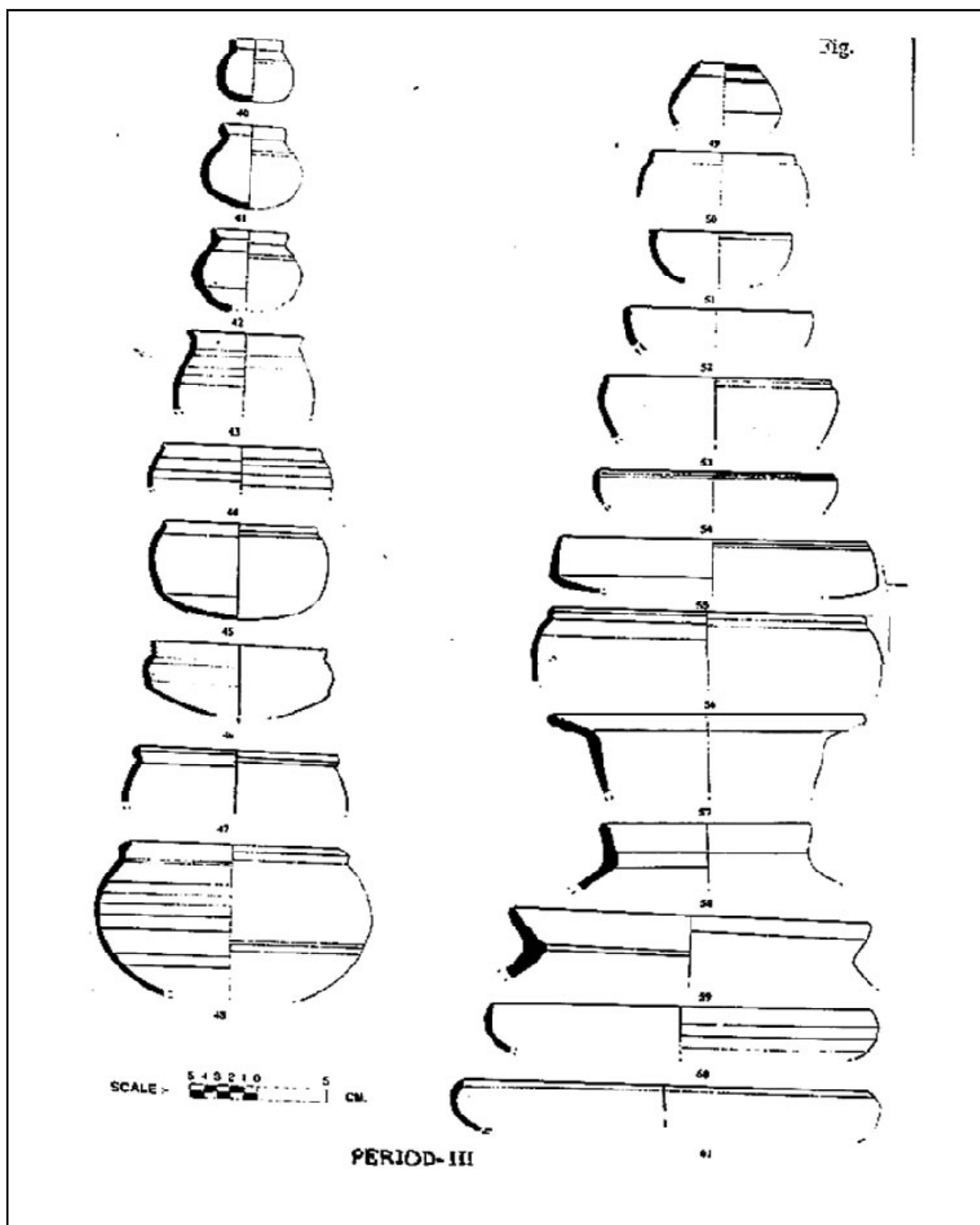


Fig. 7: Juafardih: Black and red ware. See p.7

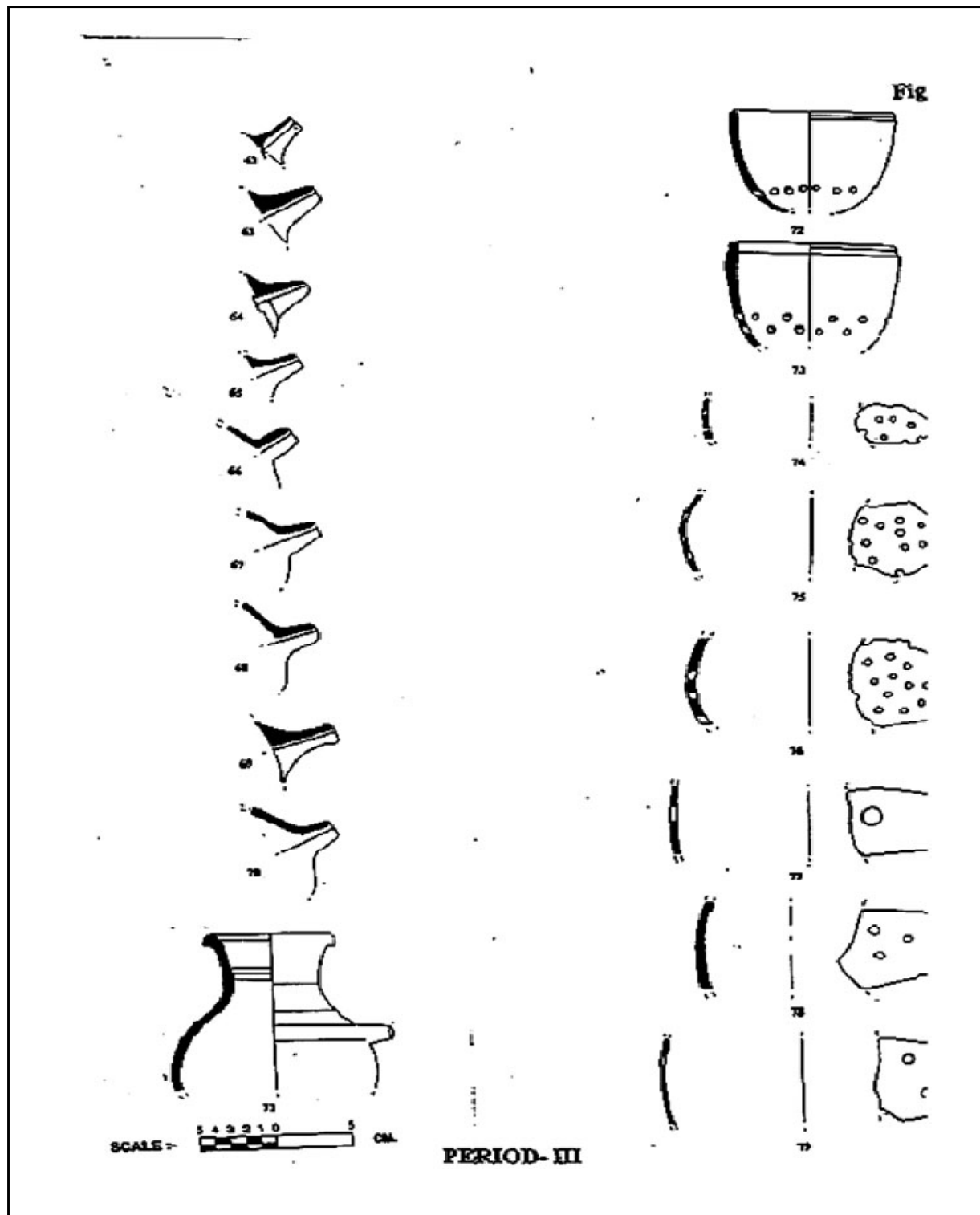


Fig. 8: Juafardih: Grey ware. See p.7



3



4

Juafardih: 3 and 5, general view of tank and stupa mound before excavation. See p. 6



5



6

Juafardih: 5 and 6, general view of stupa mound during excavation and rammed flooring, paved brick-bats pradakshinapatha of stupa, Period III. See p. 6



7



8

*Juafardih: 7 and 8, brick paved pradakshinapatha of stupa and burnt-brick encasing wall of stupa Period III,
See p. 7*



9



10

Juafardih: 9 and 10, terracotta human head and other objects, Period III. See p. 7



11



12

Juafardih: 11 and 12; iron objects, Period II and III. See p. 7



13



14

Juafardih: 13, decorated bone comb, Period III and 14, bone points, Period II and III. See p. 7



15



16

Juafardih: 15, semiprecious stone beads and 16, stone objects, Period II, and III. See p. 7



Juafardih: 17, inscribed hopscotch MUGA on obverse and MA or VA on reverse. See p. 7

11. EXPLORATION IN DISTRICT NALANDA, SAHARSA AND MADHEPURA

Patna Circle of the Survey under the guidance of P. K. Mishra assisted by S. K. Ghosal, B. Gartia, Aftab Hussain, J. Bandyopadhyay and

K. K. Jha conducted exploration to assess the archaeological significance of the sites. A list of explored sites with their cultural assemblage is as follows: (see Chart-II)

CHART-II

Tehsil	Village/Site	Nature of remains
Nalanda	Jagdishpur (25° 8' N; 85° 27' E)	The mound locally called as Garhpar measuring about 75x75m with a height of 5m represents elevated portion at top four corners. It is tentatively identified as the remains of bastions. The potsherds came into notice during the exploration include red ware, black slipped ware and NBPW.

Tehsil	Village/Site	Nature of remains
Saharsa	Mahisi (25° 51' N; 86° 28' E)	The sculpture of Ugratara attended by Ekajata and Nila Saraswati on either side has been found in the sanctum of the temple at Tarasthan. Besides, the fragments of stone sculptures like image of Buddha in reclining posture, image of Buddha in <i>bhumisparsamudra</i> and Siva- <i>linga</i> have been found. All the sculptures are carved out in black basalt stone and ascribable to 10 th -11 th century CE.
Saharsa	Mahisi (25° 51' N; 86° 28'E)	The mound known as Mandan Mishra <i>dham</i> having an area of 60x60m with a maximum deposit of about 1m to 1.25m is strewn over with red ware pottery. According to local hearsays, it is the probable spot where the philosophical discussion between Mandan Mishra and <i>guru</i> Shankaracharya was taken place.
Saharsa	Devna (25° 52' N; 86° 34' E)	Baneshwar temple enshrining one Siva- <i>linga</i> at the sanctum has been dated to 16 th -17 th century CE. On its periphery, fragments of stone doorjamb and pillars have also been observed. A stone <i>pranala</i> dated to 4 th -5 th century CE has been noticed at Bandurga temple near it.
Saharsa	Devna (25° 52' N; 86° 34' E)	Red ware pottery was brought to notice over an ancient mound which measures 20m in radius approximately. The maximum height is about 3m.
Saharsa	Kantho	A temple dedicated to Lord Siva is standing on an ancient mound. Few architectural members, red ware potsherds and remains of a terracotta ring well dated to <i>circa</i> 10 th -11 th century CE have been noticed.
Saharsa	Chainpur	Beautifully carved image of Visnu and Surya are installed in Nilakantha <i>dham</i> temple. These are carved out in black basalt stone and may be dated to 10 th -11 th century CE.

Tehsil	Village/Site	Nature of remains
Saharsa	Bangaon (25° 52' N; 86° 31' E)	Two numbers of temple such as Bhagwatisthan and Laxmeshwarnath temple dedicated to goddess Kali and Lord Siva respectively have been found. The former has a curvilinear spire while the latter one is pyramidal in shape. Both the temples may be datable to late medieval period.
Madhepura	Singheswarsthan (25° 59' N; 86° 48' E)	The temple of Singheswarsthan is enshrined with a Siva-linga. The pyramidal spire is resting on an octagonal base. The gateways and entrance of the sanctum are decorated with the depiction of foliage and various divine figures. On its stylistic ground, it may be datable to late medieval period.

CHHATTISGARH

12. SCIENTIFIC CLEARANCE WORK AT TIVARA DEV VIHARA, SIRPUR, DISTRICT MAHASAMUND

Scientific clearance in front of the gateway of Tivara deva monastery at the centrally protected site of Sirpur was undertaken by A.K. Shrama and C.L.N. Shastry of the Raipur Circle of the Survey with the objective to expose the buried archaeological remains. During the course of scientific clearance remnants of a staircase measuring 7.60x4.00m constructed of schist stone along with a stone pavement have been exposed. A flight of five steps leading to the gate of the monastery from the exposed stone paved structure on eastern side has been noticed. The flooring on the western part was found heavily damaged.

GOA

13. EXCAVATION AT CHURCH OF ST. AUGUSTINE, OLD GOA, DISTRICT NORTH GOA

In continuation of previous year's excavation the Goa Circle of the Survey has carried out further excavation at St. Augustine under the direction of N. Taher assisted by Abhijit Ambekar and G. L. Gaikwad. This season's excavation was initiated with a working hypothesis that the ruins of the church complex situated on the holy hill must have had a frontal approach beneath the accumulated debris of previous year excavation within the St. Augustine complex. Hence the debris was removed from a corner in close proximity of the entrance to the convent along the boundary wall and excavation was conducted with differential depth from 0.50m to 4.00m.

As presumed, steps constructed in laterite blocks were encountered running in east-west orientation having a width of approximately 45cm. The next flight of steps continued after 10m in a descending fashion following the contour of the slope of the hill on which the complex is situated. The remaining steps encountered were highly disturbed and out of alignment keeping with the view that much of the building material was either auctioned off when the new capital was being constructed at Panaji or were later pilfered from the site. However, the partial evidence has confirmed the assumption and accordingly an animated conjectural view has been prepared drawing parallel from the remains at other sites in close vicinity i.e., Our Lady of the Mount and Cross of Miracles.

GUJARAT

14. EXCAVATION AT KANMER, DISTRICT KACHCHH

In continuation of previous year's excavation at Kanmer (23° 23'N; 70° 52'E) further excavation under the direction of J. S. Kharakwal and Y.S. Rawat and Toshiki Osada was taken up in order to understand the nature and history of fort wall, the late phase of Harappan settlement or Late Harappan deposit, to enquire if there is any lower town to undertake site catchment analysis and to train young students in field archaeology.

The various scholars both from India and Japan also participated in the excavation such as D.P. Agrawal, M.D. Kajale, Anil Pokharia, Shahida Ansari, Manikant Shah, Pankaj Goyal, Takao Uno, K. Saito, H. Teramura, A. Uesugi, K. Miyahara, Y. Kondo, Sanjeev Kataria, L.C.

Patel, R. Meena, S. Meena, H.Seth, A. Hussain, K.P. Singh, S. Vyas, B. Varhat, A. Sarcar and A. Reddy. The mound at Kanmer is roughly squarish (115m x 105m) on plan and suddenly rises up to a height of about eight meters from the ground level (i.e., 20m above the mean sea level). Large stone blocks and some stone alignments were visible on the eastern margin of the site, whereas the western and south-eastern slopes were littered with huge boulders. The mound has a shallow depression on top.

A few trenches were laid in the north eastern corner of the main mound to understand the history nature of the fortification wall. Among these the outer one or addition was exposed up to a length of 14.30m whereas the inner one up to a length of 10.80m was exposed. However, the north-eastern corner has survived only up to a maximum height of 1.70 m. The inner face or the original wall was made of better dressed stones compared to the outer ones. Both of them were raised right on the natural soil (brown sandy clay). The total width of wall was measured about 18m in the middle level. Similar addition was also identified in the eastern arm of the fort, which join to the addition of the northern arm at north eastern corner.

A few trenches were also laid in the north western corner to understand the nature of bastion, if any, in the fort wall. In course of the excavation the outer arm could be partially exposed up to a length of 10.20m and at the corner (joining of northern and western arm) unfortunately only lower most coarse of the outer arm was found surviving. It was raised right on the bed rock at a depth of 1.70m from surface (9.50m from datum point). The western outer arm, oriented roughly (north to south), was exposed for a distance of 9.60m. These faces have survived up to a height of 3.30m and form an obtuse angle. While cutting

down the deposit against the fort wall lances of sorted sand and rounded boulders were also found at the lower level. It was found that the inner face has survived up to a much higher level compared to the outer one or addition. In case of northern arm the gap between addition and outer arm gradually decreases from west to east and the maximum gap was measured about 1.50m. On the other hand, the southern outer area was exposed up to a length of 12.20m close to the south eastern corner. Here the gap between the outer area and addition varies from 80cm to 2.06m. This kind of situation in northern and outer arm leads us to think if there was a slight change in orientation. Large dumping of ash, sometimes mixed with soil and other garbage, was found all along northern and eastern outer arm. It appeared that this garbage was thrown from top when people were living on the upper level.

The eastern outer arm of the fort has survived much better than any other wall. To confirm the additions and nature of outer wall and to confirm deposit outside the main mound a few trenches were selected on the eastern slope. The outer arm was exposed just below the humus zone whereas the addition was exposed at a depth of 1.60m from surface. The outer arm was found made of better dressed large stone blocks compared to the addition. Like the northern slope a huge quantity of ash dumping was noticed in this area along the eastern wall. At the termination of the mound was found a circular stone alignment of stones at a depth of 40cm from surface. This alignment (diameter 3.40m) was discovered in the eastern half of JJ20 and it was sealed by Layer 2 i.e., Historic deposit. Along with the alignment was found rolled Harappan pottery.

Another cutting, close to the south eastern corner was undertaken to enquire if any external bastion exists in the fort wall. It was found that

14 courses of addition have survived with a total height of 3.77m. It also rests on a very thick bed of brown clayey sand locally known as *lilva*. Perhaps this battering was a support to the original wall. Against this face was found rolled Late Harppan material mixed with historic pottery. The historic pottery however gradually disappeared at the lower level. It was noticed that the south eastern corner of the fort wall has been dug out by the villagers while digging for a well.

In the south eastern area, it was found more or less parallel to the inner arm (southern wall) of the fort and was erected 1.50m off the wall. As many as three rooms of a structural complex were partially exposed. They were sealed by dark greyish soil, which represents break between the Harappan and the Historic deposit. One of these rooms yielded three successive floor levels and a hearth. Also was found Ahar type white painted black and red ware, Sorath Harappan elements. A flimsy structure located right on the fort wall yielded a small bulbous red ware pot with a hoard of steatite beads (11,707).

Period I was mainly identified on the basis of bichrome and polychrome red ware, coarse red, cream slipped, red slipped and un-slipped exposed in a very small area in the first field season. Many of the bichrome design patterns or shapes are identical to Anarta or Padri assemblage. With the presence of Harappan fossils in this assemblage and absence of characteristic 'S' shaped or perforated jars, terracotta cakes, weights or beads of typical Harappan types have tentatively identified this phase as Early Harappan.

Period II, the site was represented by the fortification, structures associated with urban Harappan pottery. This deposit has been further sub-divided into KMR IIa and IIb on the basis of introduction of white painted black and red

ware and Sorath elements at the site. It has large number of minor objects.

Period III, the ceramic assemblage discovered from the upper levels of the Harappan deposit has a very distinct feature. The entire assemblage on the whole appears ocherous compared to rest of the material. Of course Harappan shapes continue but gradual change in their shapes and sharp difference in surface treatment and decoration pattern is visible. This deposit has been tentatively identified as Late Harappan.

This Period IV, historical deposit was marked by residential stone structures, red polished ware, Rang Mahal type red ware, amphorae, large number of iron objects and Brahmi seal impressions (datable to the early centuries of the Christian Era).

Period V is represented by medieval remains at the site. A few medieval stone alignments, visible on the surface and belonging to the medieval phase, were identified on the peripheral region of the main mound. Although a few fragments of medieval red ware were found in Layers 2 and 3 in the central part (Trench Y30).

The faunal analysis was carried out by P.P. Joglekar and Pankaj Goyal of Deccan College, Pune. Though faunal remains were recovered from almost all the trenches, they were not evenly distributed. In most of the trenches bones were encrusted with soil, but they were able to identify cut marks on bones and charred bones in some cases.

They have identified several animal taxa, which include mammals, birds, fish, reptiles and molluscan species. Among the domestic animals, cattle, buffalo, sheep, goat, pig and horse were identified. More than a dozen wild animals were identified in the collection,

including the *nilgai*, antelopes, deer, carnivores and rodents.

In the Historic phase seven domestic mammals cattle, buffalo, goat, sheep, pig, dog, and the cat have been identified. Discovery of charred bones of buffaloes suggest that they may have been consumed during this phase. Bones of wild-mammals include antelopes (*Gcizellci bennetti*, Antelope *cervicicprci* and *Tetracerus quadricornis*), deer (*Axis axis*) and birds and reptiles were also identified.

In KMR Period III (Harappan phase) domestic animals predominate like other cultural phases at the site. Among the domestic animals (cattle, buffalo, sheep and goat) the cattle and buffalo constitute a majority and many of them bear cut marks or are chained suggesting that these were consumed. The wild animals such as bovid, wild pig, antelopes, deer, carnivores and small mammals like hare and rodents have been identified. However, in the Mature Harappan phase 96% faunal remains belong to cattle and buffalo, followed by sheep and goat. Among the wild animals *nilgai*, four-horned antelope, a *suidae* species and the porcupine were identified.

Thus as many as twenty-five species were identified, out of which the domestic mammals were represented by eight species (cattle, buffalo, sheep, goat, pig, dog, cat and horse) wild mammals were represented by 14 species (*nilgai*, wild pig, antelopes (blackbuck, *chinkara* and four-horned antelope), deer (*sambar*, *chital*, and mouse deer), a felid species, porcupine, hare and rodents (house rat and desert rat). Besides these, a few birds, reptiles, fish and shells were also identified. Evidence of charring, butchering and cut marks has been found on a large number of bones which indicate that these animals may have been part of their diet. Some of the bones of cattle/

buffalo and sheep/goat were fire hardened and it is likely that they may have been used as tools.

In order to understand subsistence of the Harappans, Ami K. Pokhari of Birbal Sahni Institute of Palaeobotany, Lucknow palaeobotanical remains at the site. He has identified remains of Jowar-millet (*Sorghum bicolor*), Pearl-millet (*Pennisetum typhoides*), sesame (*Sesamum indicum*), and horse-gram (*Macrotyloma uniflorum*). Remains of weeds and other wild taxa were also encountered reflecting the ecological conditions and ground vegetation.

Among the important minor objects Harappan weights, beads of terracotta, steatite, faience, carnelian, agate, terracotta cakes, bead blanks, blades of Rohri chert and local chert and agate, iron objects like nails, knife fragments and shell bangles were discovered.

15. EXPLORATION IN DISTRICT ANAND

Smt. Shubhra Pramanik assisted by Shri Bipin Chandra explored the area mostly on the banks of the sea shore in Khambhat taluk of Anand district. Medieval step-well has been located at Dnovaran (22° 21'N; 72° 40'E) and Historical well and Medieval ruined temple at Badaipur (22° 23'N; 72° 46'E).

HARYANA

16. EXPLORATION IN THE GHAGGAR BASIN AND EXCAVATIONS AT GIRAWAD, FARMANA AND MITATHAL, IN DISTRICTS OF ROHTAK AND BHIWANI

Exploration carried out in Haryana and Rohtak under the direction of V. Shinde of Deccan College in collaboration with M.M. Sharma of M.D. University, Rohtak assisted by Vinay Rao, V.G. Vishwas Rao, Pramod Shirvalkar, Amol Kulkarni, S. K. Salim, Amrita

Sarkar, Anjana Reddy, Neha Kothari, Bratatee Barman, Vivek Dangi and Appu Singh. M. D. Kajale and S. K. Saraswat visited the site for palaeobotanical studies. Parts of the districts of Hanumangarh and Ganganagar of Rajasthan and Rohtak and Bhiwani of Haryana were extensively and intensively surveyed. During the course of survey, twenty five sites particularly pre/early Harappan, mature Harappan and late Harappan were visited. Most of the sites visited by the team were already discovered earlier. However, detailed surface recording and collection of systematic sampling was done in order to put these sites in proper chronological order.

Besides, the sites of Girawad (Rohtak district), Farmana (Rohtak district) and Mitathal (Bhiwani district), were selected for excavation with the following aims and objectives:

To understand the spread and settlement pattern of the pre and early Harappan cultures in the Ghaggar basin, to reconstruct the of holocene climatic sequence and study impact of climatic fluctuations on the origin and development of human cultures in the study area, to understand regional variations of the Harappan culture in the Ghaggar basin and study the role of the regional cultures in the development of the Harappan elements in this region, to study cultural process from the early to the late phases of the Harappan culture, and to study socio-economic organizations of the Harappans in this region.

To identify the linear pattern of distribution of archaeological sites in Ghaggar and Chautang river banks, different regional centres farming villages industrial site on the basis of their locations, dimensions, duration of their occupation and to study of surrounding ecological conditions. During the course of exploration in Rohtak district, a

large scale disturbance of sites was noticed; mention should be made of three sites, namely Girawad, Farmana and Mitathal where the habitation deposit was being lifted by the people for various reasons. Rescue excavation work was therefore undertaken immediately at these sites.

The site of Girawad (28° 58' 41"N; 76° 28' 47"E), one of the important early Harappan sites was selected for excavation mainly to salvage the remains, which otherwise would have been lost forever. The ancient site known as Kheri lies roughly 3.5km to the east of the present village Girawad. The ancient site, circular on plan is an extensive early Harappan site spread over an area of roughly 8 hectares. A metal road between Girawad and Samar Gopalpur runs through the site. The major portion of the site lies on the northern side of the metal road indicating a number of features including a part of the mud platform, pits, large burnt patches, brick attribution and even a complete plan of couple of fire places. Most of the features visible on the surface area are well confined to the southern side of the metal road. The team decided to undertake rescue excavation in this part of the site. From the datum point fortyone trenches measuring 5x5m were laid. All the trenches were located on the northern side of the datum point. These Trenches have been given simple numerical numbers starting from Trench 1 to 5, situated near the datum point were not excavated simply because the features were not visible on the surface. Trench 6, 7 and 8 are located on the Eastern margin of the area. They are numbered from south to north. The trenches are all located to the western side of the mound. Some of the trenches in a series were not excavated as they were located outside the area, where remains were visible on the surface.

Different features which were visible on the surface of the site and are actually dug into a solid mud platform. The mud platform was visible over an area of 50m (east-west) x 30m (north-south). All the features have been excavated belong to the earliest occupation of the site. The ceramic assemblage found here appears to be earlier in date than that of Kunal and can be dated to around the beginning of 4th millennium BCE. The pottery though different from the later indicates early stage of development as it is partly wheel made and partly hand made unlike Kunal pottery, which is fast wheel made. The outline of the features became visible immediately after scraping the area selected for excavation. The features which have been excavated in the designated area include circular and irregular oblong shallow pit dwellings with post-holes on their periphery, garbage and storage pits, small circular shallow depressions for accommodating large jars, post-holes, full pots survived in the form of their bases and fire places. The pit-dwellings formed different complexes and each complex consisted of features like storage and garbage pits, sometimes storage jars and even shallow pits identified as bases of large round-based pots. In all sixty different features were excavated and they were found to be associated with thirteen different pit- dwelling complexes identified in the excavated area. The identification of the function of each feature is based on location, nature and contents. The following are the different complexes.

PIT-DWELLING COMPEX 1: (Feature 1, 4, 5, 6, 37, 37A, 38, 38A and 38B) (orientation - 10 slightly north east, south west) - Feature 1 is a shallow pit dwelling to which were associated nos. 37, 38A (possibly garbage pit), 37A (depression for holding saddle quern), 4 (extension of pit-dwelling 1), 5 and 6 (storage

pits) and 38B (identified as a depression for holding round based water storage pot).

PIT- DWELLING COMPLEX 2: (Pit 7, 7A, 8, 8A and 21) - Feature 7 is a pit- dwelling of the complex whereas other features of the complex include storage pits (2A, 7A, 8, 8A) and a garbage pit (2).

PIT-DWELLING COMPLEX 3: (Pit 3 and 9) - These two circular pits are forming one big pit-dwelling in the shape of English numeral '8'. The other features of this complex could not be detected as they most probably lay to the north and north east area, which is unexcavated.

PIT-DWELLING COMPLEX 4: (Pit 11, 15, 12, 13, 17 and 17A) - Features 11 was the main pit-dwelling of this complex. The other features associated with this could be identified as storage pits (15, 17, 17A), a depression for holding a round base storage jar (12) and garbage pit (13).

PIT-DWELLING COMPLEX 5: (Pit 14B, 14, 14A, 14C and 40) - Feature 14B has been identified as a pit-dwelling of the complex. The other features include depressions for holding a round-base pot (14C and 14A), garbage pits (14 and 40) and a storage jar. The dwelling pit of the complex is small. It is quite likely that the open space available within this complex may also have been used for carrying out lot of domestic activities.

PIT-DWELLING COMPLEX 6: (Pit 39, 19, 18 and 14) - Feature 39 is identified as a pit-dwelling of the complex. Feature 19, 18 could be identified as storage pits and 14 as garbage pit.

PIT- DWELLING COMPLEX 7: (Pit 20, 20A, 21, 16, 17B and 22) - Feature 20 and 22 could be pit-dwellings of this complex. Futures 17B,

20A and 21 could be storage pits, and 16 may have been used for collecting dirty water resulting from the cleaning of pit 22.

PIT-DWELLING COMPLEX 8: (Pit 42, 43) - Feature 42 is a pit-dwelling, whereas feature 43 as storage pit of this complex.

PIT-DWELLING COMPLEX 9: (Pit 28, 29, 31, 45, 44 and 33B) Features 28 and 29 have been the sunken dwellings of the complex. Some domestic activities were carried out in Feature 31 and 45 and 44 was a storage pit of the complex.

PIT-DWELLING COMPLEX 10: (Pit 27, 27A, 27B, 32, 26, 25 and 26A) - Features 27, 25, 26 and 32 could be identified as a pit-dwellings of this complex and they were surrounded by Features 27A, 27B, (both identified as storage) and 26A (for carrying out some domestic activities).

PIT-DWELLING COMPLEX 11: (Pit 35A, 35, 34, 33A, 33B and 33V) Features 35A and 35 could be the main dwelling pits of the complex. Feature 34, the garbage pit, 33A, the storage pit, 33 for domestic use and 33B, a base for a round pot, located in the proximity of the main pit-dwellings, could be associated with this complex.

PIT-DWELLING COMPLEX 12: (Pit 36, 47, 48) Only three features of this complex have been excavated. Feature 48, partially excavated could be the main pit-dwelling of this complex. This complex may belong to a potter as Feature 36 is a pottery kiln of the complex. Feature 47 may have been used for some domestic purposes.

PIT- DWELLING COMPLEX 13: (Pit 46, 50, 50A, 50B, 23) This complex consisted of a pit-

dwelling (46), storage pits (50, 50A and 50B), a fire pit (23) and a storage jar.

The fire pit (23) found associated with this complex may have actually been used for a community cooking as it is large in size and appears to have been used for a lengthy period. The fire pit is circular on plan with a rectangular fire chamber. Inside the fire pit are found two vertically placed clay slabs meant for supporting a vessel.

There is one more fire pit (Feature 30) found near the Complex no. 9, which is even bigger in size compared to Feature 23. It has a *yonī* like shape. It is circular on plan with a narrow but long fire chamber. Inside the fire-pit, almost in the centre is a large circular clay stump. This stump also may have been used for community cooking.

The ceramic assemblage consisted of typical pottery that is usually associated with the Hakra culture. Three wares of this culture namely clay applique, incised ware and chocolate slipped ware are found associated with this. Some of the common shapes include small to medium-size globular pots with slightly out-turn sides in all the three different wares. The chocolate ware is devoid of any painted decorations. The incised patterns found on the incised comb ware include a group of wavy lines, both vertical and horizontal. A number of loop-handled cups and small globular pots are associated with this ware. The culture is characterized by the presence of micro steatite beads, beads of semi-precious stones terracotta and a few bone beads.

The ancient site (29° 02' 22"N; 76° 18' 02"E) that falls in the jurisdiction of three different villages; Farmana, Seman and Bhaini Chandrapal (Bada Bahen) all following in Mehem block of Rohtak district is locally

known as Darksh khara. Since major portion of the sites lies in the jurisdiction of Farmana village, it is also treated as a part of that village.

The site was selected for excavation mainly because of the presence of classical Harappan pottery, characteristic of an urban Harappan site and the presence of early Harappan evidence. A couple of Index Trenches at different places within the site were selected for excavation. The first index trench was laid on the highest point of the site which is to the north of the datum point of the site. It is located 20m to the north and 5m to the west of the datum point. A second trench was located 10m further north from the first Index Trench and the third Index Trench 20m further north from the second Index Trench 10m west of the 2nd Index Trench. The Trenches were given simple numbers starting from the trench located at the highest point. Excavations could not be continued in the lower levels in Trench 01 and 02 because of the discovery of brick structures in them, whereas the team managed to reach to the natural soil in Trench 03. It was possible to obtain a complete stratigraphy and cultural sequence in all these three Trenches in a stepped manner.

The total habitation deposit at the site is 2m where 8 habitation layers were found. On the basis of the nature of the layer and the content it appears that Layers (7), (7A) and (8) belong to the early Harappan phase (total thickness 50cm). Layer (6) appears to be a transition from early to mature and the first five earlier Layers belong to the mature Harappan period. This will have to be confirmed by the study of the ceramic assemblage.

Three storages pots were discovered in the north and one small cylindrical storage pit at the base of Layer (7) along the western section of the Trench 03. Two pots and a storage pit in the section in a straight and one pot 1m to the east of the western section and 1.25m to the

south of the northern section. It is 45cm to the east of the storage pit. All the pots of red ware were partially visible and kept in a pit whose surface was lined with clay and hardened by firing.

Along the northern section was found an oblong pit with a few post-holes along its periphery (the major portion of the pit lies to the north of the trench which is left undug) dug into the natural soil by the first occupants (early Harappans) of the site as it is sealed by the last Layer (8). It is oriented 40° southwest-northeast. The pit is 3.20m long and excavated to a width of 90cm towards its western end and 10cm towards its eastern end. It has a depth of 87cm. The sides are perfectly vertical and the bottom flat. Considering the presence of postholes and well-made sides and bottom, it appears to be a pit dwelling, exactly similar to those found in the earliest levels at Kunal.

At the base of Layer (3) was encountered a rectangular mud brick structure of the mature Harappan period, which is oriented 30° in the southeast-northwest direction. The structure from the inner side measures 3.60m (North-South) by 2.60m (east-west). All the walls are made of mud-bricks. The average size of the bricks is 30x15x7.5cm in the ratio of 1:2:4. Inside the structure almost in the centre was found a typical Harappan steatite seal with the symbol of water buffalo and a few Harappan letters engraved on its surface. The back side has a loop.

A large multi-roomed brick structure which is sealed by Layer (1) was exposed in Trench 01, 01A, 01A1 and 01B. The main structure is divided into two parts by a partition wall. On the northeastern side of the main structure is a thick and large rectangular platform. At a later stage, the thickness of the original walls was broadened by adding more brick courses on the outer side. The original

structure lies over an area of 6.20m long (from outer edge to outer edge) and 4.20m broad. The chamber located on the northern side has been named 2A and one on the southern side as 2B. The partition wall is 2.65m long (east-west direction) and 50cm broad. The northern part of the structure termed as 2A is roughly squarish in plan measuring 3.05m (north-south) by 2.80m (east-west) from the inner edge of the walls. This is relatively a large room, which may have been used for dwelling purposes. The southern room measures 2.80m (east-west) by 1.20m (north-south), in the eastern end of which is located a small bathroom made of wedge-shaped burnt bricks. Two mud platforms, one on the eastern side and the other on the southern side were added to this structure sometime later.

The pottery associated with the early Harappan phase looks exactly similar to the one found at the site of Girawad. The Harappan pottery found at the site looks close to the classical Harappan pottery in terms of the fabric and shapes. The painted motifs, however, are much fewer compared to those found on the classical Harappan pottery. Besides the typical squarish steatite seal with incised water buffalo symbol and letters, the discovery of a clay sealing embossed with a unicorn and Harappan letters, is a noteworthy find of this season. A large number of terracotta bangle fragments, a few shell and faience bangle fragments, beads of lapis-lazuli, steatite, plain and also etched carnelian, agate, paste, shell and terracotta, a few copper fragments, bones tools, large number of triangular terracotta cakes, *mustika*, grinding stones, etc. form the repertoire of the objects found in the excavation.

The site of Mitathal (28° 53' 3"N; 76° 10' 08"E) is located roughly 12km to the south west of the district headquarters Bhiwani. The site is represented by 2 mounds separated by a narrow

gully. Excavation at Mitathal was initiated mainly with a view to freshly understand the cultural sequence of the site and study cultural processes from early to late phases of the Harappan period. It was decided to dig one Index Trench in the centre of the main mound, termed by the earlier excavator as a citadel mound. The Index Trench was located 20m away towards south from the datum point. This trench could not be excavated till the natural levels due to want of time. Only four layers were excavated. In the upper levels in Layer (2) was noticed a circular furnace. It is located almost in the middle of the trench, 1.68m to the east of the western section, 1.23m to the north of the southern section. It is perfectly circular on plan with a diameter of 0.85m. It has a small opening of 20cm-22cm on the southern side. The circular wall of the furnace survived to a maximum height of 23cm is made of clay which is burnt red due to its constant use. The average thickness of the wall is 5cm. Inside the furnace at the base and also on the sides are the remains of slag most probably that of faience production. The site of Mitathal was most probably a major centre of faience production in this area as the surface of the mound is littered with fragments of faience articles mostly bangles and in the north west part of the other mound, termed as lower town, are seen on the surface of remains of half a dozen, either circular or semicircular, squarish or rectangular

furnaces and a heap of faience slag, resulting from the production.

The excavation continued in the northern half of the trench in the lower levels. It was stopped at a depth of 1.69m from the datum point. In the (north-west) quadrant at a depth of 1.59m was discovered a slightly oblong clay bin. It is located 20cm to the east of western section and 28cm to the south of northern section. It measures 1.05m (east-west) and 88cm (north-south). It is 89cm deep. It is lined with clay plaster which is 5cm thick. The inner surface of the clay bin is smoothened and the remains of rice in the clay lumps retrieved from inside clearly indicate its function as a storage bin. The excavation has yielded fragments of faience and terracotta bangles, beads of carnelian and steatite. The pottery from the excavation is yet to be studied.

17. VILLAGE-TO-VILLAGE SURVEY OF ANTIQUARIAN REMAINS IN DISTRICT BHIWANI

Sh. Ashish Kumar of Chandigarh Circle of Survey conducted exploration of 73 villages in Loharu *tehsil*. Altogether 73 villages were explored in Loharu *tehsil* (28° 75'N; 75° 45'E). Thirteen villages have been found with antiquarian remains. (see Chart-III)

CHART-III

Name of Village / Town	Tehsil	Antiquarian / Pottery Remains	Period
Loharu	Loharu	Structure	Medieval and colonial
Dhani Rahimpur	-do-	Pottery	Medieval period
Gignaw	-do-	Brick and sculptures	Rajput period
Budheri	-do-	Pottery	Medieval period
Pahari	-do-	Pottery	Medieval period
Manfarct	-do-	Pottery	Medieval period

Name of Village / Town	Tehsil	Antiquarian / Pottery Remains	Period
Budhera	Loharu	Pottery	Harappan and Medieval period
Kharkhari	-do-	Pottery	Medieval period
Barahlu (Parvezpur)	-do-	Pottery	Medieval period
Pharatia Tal	-do-	Haweli	Late Medieval or colonial period
Sohasara	-do-	Haweli	Late Medieval of colonial period
Sohasara	-do-	Haweli	Late Medieval of colonial period
		Copper plate	1397 CE
Jhanjara Sheoran	-do-	Iron nodules and pottery	Medieval period
Gagarwas	-do-	Pottery	Medieval period

JAMMU AND KASHMIR

18. EXPLORATIONS IN DISTRICT ANANTNAG, JAMMU, KATHUA AND LEH

Umoh (33° 32'N; 75° 14'E; Topo Sheet No. 43 0/2) is located in the *tehsil* Dora, on the left side of the Srinagar-Jammu Highway 2km West from Verinag. Potsherds noticed during the course of exploration consist of red ware, black on red ware, red slip ware and glazed ware. The shapes are mainly of bowl, basin, *handi* and storage jar etc. and belong to Medieval period 12th-16th century CE. Besides, the remains of a Mughal *sarai* in a dilapidated condition have also been noticed. The *sarai* is built in *lakhauri* bricks with lime mortar.

Larkipora (33° 38'N; 75° 10.5'E; Topo Sheet No. 43 0/2) is located in the *tehsil* Dora, on the right side of the Anantnag - Verinag road. Potsherds are noticed during the course of exploration consist of red ware, dull red ware, red slip ware, black ware, gray ware and

stamped red ware. The shapes are mainly of dish, bowl, basin, storage jar etc. belongs to early historic period.

Lookbhawan (33° 38'N; 75° 11'E; Topo Sheet No. 43 Q/2) is located in the *tehsil* Dora, situated 12km from Anantnag on the right side of the Anantnag - Verinag road. Remains of an arched structure made of brick with lime mortar was noticed.

EXPLORATION IN DISTRICT JAMMU

Kot-Garhi (32° 52'N; 74° 41'E; Topo Sheet No. 43 L/9) is located in the *tehsil* Akhnoor, on the left side of the Jammu-Akhnoor-Pallanwala road, is about 38km from Jammu.

During the course of exploration are found red ware, some are dull red ware, red slip ware. These shapes mainly consist of bowl, vase, *handi*, basin, dish and lamp etc. and belong to post-Gupta period i.e. 7th-9th centuries CE. Other important discoveries during exploration at the site are a copper coin showing a standing male

figure probably of a king and on reverse with an animal most probably of a horse and a fragment of carnelian bead.

Nad-Da-Khu (32° 52'N; 74° 39'E; Topo Sheet No. 43 L/9) located in the *tehsil* Akhnoor, on the right side of the Jammu-Akhnoor-Pallanwala road, 40km from Jammu. Plenty of potsherds are noticed during the course of exploration. The pottery mainly consist of red ware and dull red ware. The shapes are of dish, bowl, basin, vase, *handi* and lamp etc. belongs to Early Medieval period i.e. 10th-12th century CE.

Manda (32° 52'N; 74° 42'E; Topo Sheet No. 43 L/9) is located in the *tehsil* Akhnoor, on the left side of the Jammu-Akhnoor-Pallanwala road 10km from Akhnoor. Plenty of potsherds noticed during the course of exploration consist of red ware and grey ware. The shapes are mainly of bowl, basin, lamp, *handi* and dish, etc. and belong to Early Historic period.

Lam (32° 52'N; 74° 38'E; Topo Sheet No. 43 L/9) is located in the *tehsil* Akhnoor, on the right side of the Jammu-Akhnoor-Pallanwala road 59km from Jammu. Plenty of potsherds noticed during the course of exploration consist of red ware, dull red ware, red slip ware and black painting on red ware. The shapes are mainly of dish, bowl, basin, *handi* and lamp, etc. belongs to post-Gupta period i.e., 7th-9th century CE.

EXPLORATION IN DISTRICT KATHUA

Bhaiya (32° 27'N; 75° 16'E; Topo Sheet No. 43 P/7) is located in the *tehsil* Hiranagar, on the Jammu-Kathua highway, 56km from Jammu. Plenty of potsherds are noticed during the course of exploration, in one of the rain gullies of the site. Pottery mainly red ware some are dull red ware, red slip ware and black painting on the red. The shapes mainly consist of dish, bowl, vase, basin, *handi* and lamp, etc.

The findings can be dated to post-Gupta period i.e., 7th -9th century CE.

Satura (32° 27'N; 75° 17'E; Topo Sheet No. 43 P/7) is located in the *tehsil* Hiranagar, on the left side of the Jammu-Kathua highway, 60km from Jammu. Plenty of potsherds are noticed during the course of exploration at the site. Pottery mainly of red ware, some are dull red ware. The shapes consist of bowl, basin, vase, dish and lamp etc. Brunt bricks are also found on the surface, size is 37x22x7cm the findings can be dated to post-Gupta period i.e., 7th- 9th century CE.

EXPLORATION IN DISTRICT LEH

Prakash Kumar, assisted by Tsering Wangchuk and B.R.Sharma of Srinagar Circle of the Survey was carried out exploration and discovered a pre-historic site at Nyar-mo (34° 17'N; 76° 43'E; Topo Sheet No. 52 B/15) is located in *tehsil* Khalsi. The site is situated about 15km from Khalsi on the left side of the Srinagar-Leh highway, on lower Ladakh towards Batalik Road on the right bank at Nyar-mo stream which is a tributary of the Indus river and it is about 115km from Leh. It lies on the ancient trade route between Leh to Purig and Skardu *via* Chorbat area was one of the important trade routes of Ladakh region in the ancient times. A lower Palaeolithic tool, a hand axe is collected during course of exploration on the right bank of the Nyar-mo stream.

JHARKHAND

19. EXPLORATION IN DISTRICT EAST SINGHBHUM

Ranchi Circle of the Survey under the direction of T. J. Baidya, assisted by N. K. Sinha, R. Dehuri, R. K. Raj and M. Ekka conducted exploration in and around the Ruam locality under Ghatshila block.

In course of exploration towards 2km east of Ruam, on flat top of the small hill, a circular brick structure was discovered. Apparently it looks like either the portion of a stupa or a circular temple. Wedge shaped bricks are used for constructing of this structure. The other bricks used for constructing this structure measures 38x26x7cm. It appears to be as of post-Gupta period.

MAHARASHTRA

20. EXCAVATION AT DAULATABAD FORT, DISTRICT AURANGABAD

In continuation of the previous year's excavation, the Aurangabad Circle of the Survey has carried out excavation at Daulatabad fort (19° 56' 39.64"N; 75° 13' 02.63"E) under the direction of K. Veerabhadra Rao assisted by R. Krishnaiah, H. R. Desai, Manoj Kumar Kurmi, Shilpa Rangari, D. L. Sirdeshpande, V. R. Satbhai, A. K. Ture and S. A. Pandit. The excavation was carried out to the south and southwest corner of the Bharatmata temple and was confined only in 7 trenches of upper two phases of the occupation deposits at the site. Evidences of medieval township within the fort such as house complexes along with mud floors and lime plastered walls were found in this area.

The previous excavations at Daulatabad suggest that it was a flourishing settlement covering a time span between 10th -18th century CE. The aim of the present season's work was to confirm the previous year's findings. The excavation was also taken up to find out the stratigraphic and chronological relation of the southern portion of the Bharatmata temple to the rest of the settlement.

The habitation mound with successive constructional activities covered with thick

vegetation rises to a maximum height of 4m from the surrounding plain. After removal of vegetation cover from the entire mound, trenches were laid near the southwest corner of the Bharatmata temple as well as on the western side in the same alignment to cover the entire habitation area of the fort. The area under excavation forms the southeastern part of the fort where there is a gentle slope towards east. Excavation was carried out in the Trench YE4, YE5, YE6, YF4, YF5, YF6 and YG4 following the grid plan that was laid out during previous season's work.

The habitation deposit inside Daulatabad fort is divided into following periods on broad lines as Period I: Yadava, Period II: Sultanate and Period III: Mughal. The present excavation brought to light a maximum deposit of 4m which comprised of Medieval and late Medieval periods roughly assignable from 14th-17th century CE comprising regime of Bahamani (1347-1527 CE), Nizamshahi (1490-1636 CE) and Mughal (1526-1707 CE) rulers. The entire deposit in this area is divided into three structural phases. The excavation was mostly confined to upper two structural phases i.e., phase II and phase III (**Pl. 18**) which revealed nearly fourteen structural remains. Phase III which is the last structural phase at the site has revealed evidence of medieval township that includes house complexes built of stone masonry having rammed mud floors and mud plaster (**Pls. 20-21**). The houses are small and without proper foundation. At times it has been observed that the houses are built with dressed stones that were probably taken from the structures of earlier phases (**Pl. 19**). The streets and lanes of the earlier phase were encroached upon by irregular constructions. Remains of terracotta tiles suggest its use in the roof of the houses. This phase also witnessed construction of a rectangular hall 20x18m and rectangular 9x5m and almost

square 5x4m shaped rooms with *in situ* pots and column capitals. Besides, an open courtyard 20.5x8m having a bathroom 2.5x2.5m (**Pl. 22**) on the western side is exposed to the North of the main hall. Another room is located on the west, which also opens to the courtyard. There is a *varanda* with columns probably supporting beam of the roof has also been exposed. The walls are constructed of random rubble masonry of varying thickness between 0.40m and 0.75m. The structural remains of this phase shows mud plaster. A limited number of phase II structures could only be exposed due to the presence of large number structures belonging to phase III. The phase II is represented by three massive walls (average thickness 1.10m) found below the courtyard of a large structure of phase III. These walls are built of rubble masonry also with the materials of phase I. The stones were extensively reused for construction of structures in phase II. The dressed stones along with carvings on them belonging to the temples of early period were also used in the masonry work. The use of lime plaster is also noticed in some structures.

The ceramic finds of this season are represented by red ware, red slipped ware, black ware, black slipped ware, glazed ware and Chinese porcelain. The red ware is sturdy, coarse in section and often ill-fired. A dull variety of red ware is also noticed in phase III. The shapes include bowls, vases, dishes, spouted vessels, storage jars and miniature pots. The red slipped ware is less in number when compared to red ware which is of medium fabric, well fired and represents mostly vases, dishes and small vessels as table utensils. The black ware found here is mostly ill-fired with medium to thin section. The prominent shapes noticed are vases, carinated *handis*, dishes, spouted vessels, etc. A small quantity of ceramic fragments comprising small dishes and shallow

bowls that include glazed ware with and without decorative patterns. A few sherds of porcelain ware have Chinese characters and painted outside in blue colour belonging to the Ming and Ching dynasties datable to 15th-16th century CE. A shallow plate with ring base, painted inside in blue colour depicting flowers, trees, deer, frog, etc. are also found. Mention may also be made of sturdy grey ware and dull red ware with slip of medium fabric and red slipped ware of medium to fine fabric. The shapes include shallow dish and bowl.

The important antiquities found include one circular gold coin belonging to Devaraya II (1423 - 1446 CE) of Sangama dynasty (**Pl. 23**). This is identified as half Varaha or the Pratapa varaha. The obverse of the coin has the depiction of Ganesa seated in *padmasana* with his consort Shakti on left thigh, he is depicted with *karanda mukuta*; holding noose in upper right hand, and snake in lower right, upper left is shown in *abhayamudra* while with lower left hand embraces his consort. The consort is shown with folded hands and seated in *lalitasana*. The reverse of the coin has the depiction of a legend in *nagari* in three lines runs as follows: “*Sri Pra Ta Pa De Va Ra Ya*”

Besides this important finding, numerous other antiquities in various materials are reported from this excavation. The copper coins issued by Islamic rulers of various dynasties such as Tughluq and Mughal are also recovered (**Pl. 24**). Among the gold objects, fragmented ear rings, wires, foils and beads are noteworthy. An ornamented silver ring, nose ring, earrings, ear cleaner (**Pl. 25**) and ear ornaments, finger rings, bangle fragments, pendant, toothpick, rod clip, hook, lid, an antimony rod, chain, miniature bells and signets are significant objects made in copper or bronze. Beads recovered from this season's excavation display good variety of material and shapes. Beads of agate, carnelian, crystal (**Pls. 26-27**),

pearl, glass, paste, ivory and bone are reported. Among these elongated beads with circular section is the most common variety while drum shaped and cylindrical beads with circular and hexagonal section also show their presence. Among terracotta beads, elongated cylindrical beads with tapering ends, short cylindrical beads having parallel edges with circular and pentagonal section and short circular beads are the most common varieties. Other terracotta antiquities include animal figurine, hopscotches, broken *hookah* and lamps in glazed and non-glazed variety. Glass bangle fragments in black, grey, blackish green and very few in deep red colour are reported. Iron objects include nails, knives, rings, clips, needles, keys, arrow heads, hooks, wheel, chain etc. Buttons and inlay pieces made on semi precious stones, stone balls (cannon balls) and sling balls are also some of the noteworthy collections. Besides, a fragmented sculpture identified as of Mahisasurmardini, the upper half of which is broken has also been collected. The lower portion of this figure is shown wearing *sari* in *alidha* posture keeping left foot upon a buffalo head and a trident with long shaft stabbing the demon.

21. EXCAVATION AT BHON, DISTRICT BULDANA

In continuation of previous year's excavation at Bhon, B. C. Deotare assisted by Satish Naik, Sunil Rokade, Gurudas Shete, Reshama Sawant of the Department of Archaeology, Deccan College Post-Graduate and Research Institute, Pune conducted further excavation at Bhon (20° 55'N; 76°39'E). Located about 30km north west of Shegaon, a *taluka* in place on Mumbai-Nagpur rail route. The present village is situated on the ancient mounds leaving partly undisturbed areas in western side yielding lot of structural remains of pre-Satavahana period.

The devastating flood in middle Purna basin last year has partly exposed new features in the form of brick structures at various places near the river bank and link channel at Early Historic site of Bhon. Accordingly, excavation is undertaken initially at three localities where brick structures were partly exposed, two spots on mound VII and one at link channel about half a kilometer north of present village, where we could locate 16th brick well on the pleistocene surface which got exposed due to severe flood. Animal fossil bones were recovered from this pleistocene horizon which will be subjected to fluorine analysis for determining their relative age. Initially it was thought of reaching bottom of the well since it was exposed in pleistocene surface but even digging up to 4m bottom of the brick well thereby supporting claim of drinking water well rather than soak pit as earlier claimed could not be reached. This area of link channel seems to be a part of ancient habitation contemporary to main occupation; may be a sort of satellite settlement as indicated by brick well and also a rusted copper coin similar shape and size found at the main settlement of Bhon.

Mound VII located near river bank has revealed brick structural remains suggestive of water canal with meter high brick walls rested on a brick platform running about 100m from the river bank towards north. The ancient water canal up to about 100m inland from the river bank by trenching pits at specific interval was traced. A main trench located 50m inside had a brick structure with square shaped chamber at the centre constructed by 50x24x8cm bricks. This main square shape brick structure is of 3x3m at top with 4m in depth; centrally located square chamber is of 1x1m at the surface with 3.7m deep, it has got an opening on opposite sides which led to the exposed channel both sides *i.e.* north and south. Further work is in progress but preliminary observations and evidence of

structural remains suggest that this site is first of its kind having an evidence of water management during Early Historic period; and also this will be the first evidence of lift irrigation in ancient time because the slope of canal is from river bank to inland.

The structural remains so far exposed in the form of the stupa, sixteen brick wells, ten ring wells, 100m water canal, brick walls etc. indicates huge construction activity in main occupational as well as surrounding areas. Such activities together with a satellite settlement in link channel prove that Bhon is one of the largest pre-Satavahana sites in Maharashtra, may be a major regional centre of that time period on the ancient trade route of Dakshinapatha.

22. EXCAVATION AT JUNNAR, DISTRICT PUNE

Vasant Shinde and Shreekant Jadhav assisted by Bharat Dighe, Krishna Malap, Shreekant Walunj, Prabodh Shirvalkar, Amol Kulkarni, Amita Sarkar, Anjana Reddy and others of Deccan College, Pune conducted excavation at Junnar (19° 12' N; 73° 53' E), one of the important settlements of the Satavahana rulers in the beginning of the Christian era. The site lies roughly 100km to the north of Pune, the district headquarters. It was aimed to study pre-Satavahana period at the site and to understand more about the nature of the Satavahana period occupation, the work was mostly carried out on the ancient archaeological site.

In all five trenches of 5x5sqm were selected for excavation this year. These trenches, located at the foot of the slope have only Satavahana deposit present as the later period deposit has been washed away. The southeastern quadrant of Trench E14 was excavated below the Satavahana levels, but not yet reached to the natural level. In all 16 layers were excavated in this trench. Layers (7) to (14) belong to the Satavahana period, Layer (15) a transition and Layer (16) of the pre-Satavahana period. The

exact nature and characteristic features of the pre-Satavahana period are not yet clear as the area excavated was very small and no substantial material has been recovered so far.

The only noteworthy features discovered are portions of walls of two structures, one of the later and one of the earliest phases of the Satavahana period. The wall of the later period was found in Trench C13 at the base of Layer (8) at a depth of 80cm from the surface. The wall runs in north-south directions and exposed to a length of 5m. It further extends into Trench C12, which is not yet excavated. The wall is made of clay, lined on both sides with burnt brick bats and clay lumps. The average width of the wall is 1.10m and appears to have belonged to a bigger structure. The other wall was discovered in the southeastern quadrant of Trench E14 at a depth of 1.35m from the surface of the trench at the base of Layer (13). The wall, very well made of complete typical Satavahana burnt bricks (size 32x28x7cm) runs in east-west direction. It is exposed to a length of 2.5m and is 90cm broad. The wall extends both towards the eastern as well as western ends. It is survived to a thickness of 40cm. The wall was built over a thick (55cm) foundation made of black clay and stones.

Besides typical Satavahana pottery and the Roman red polished ware, the most important discovery is that of a black ware, which has a green glaze on its surface. Small quantities of green glazed pottery fragments excavated in Western India may have arrived from the Persian gulf. The black ware has been described by Hannestad in Salles as a special group characterised by a pale yellow clay and a heavy dark green glaze which decays into a dark brownish-yellow. The black ware found at Junnar can be dated to the beginning of the Christian era. This is broadly in consonant with



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Daulatabad fort, Aurangabad: view excavated streets and lanes. See p. 40



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Daulatabad fort, Aurangabad: exposed structural remains Phase III. See p. 40



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Daulatabad fort, Aurangabad: 22, structural remains of Phase III and 23, gold coin of Devaraya II. See p. 41



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Daulatabad fort, Aurangabad: 24, copper coins and 25, silver ornaments. See p. 41



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Daulatabad fort, Aurangabad: semiprecious stone beads. See p. 41

the period of the black ware which has been placed from 2nd century BCE to 1st century CE in the Persian gulf region. The other objects found in the excavation include beads of glass, semiprecious stones, terracotta, shell, etc., pendants of terracotta, glass and shell bangle fragments and a few terracotta moulded human figurines. One of the female figurines found has a typical Indian face and Roman hair style.

23. EXCAVATION AT MORGAON, DISTRICT PUNE

Excavation of the Palaeolithic (Acheulian and microlithic) site of Morgaon (15° 17'N; 74° 18'E), district Pune, was carried out jointly by Sheila Mishra and Sushama Deo of the Department of Archaeology, Deccan College, Pune assisted by Gurudas Shete, Reshma Sawant, Riza Abbas and Ruman Bannerjee.

The excavation was continued with the aims to obtain more artefacts from the gravel layer for which only a small number were found in the earlier (2002-2004) excavation, to document lithostratigraphy of the sediments exposed around Morgaon, to collect samples for laboratory analysis and palaeomagnetic dating and to expose the microlithic bearing gravel and collect samples for further work. To achieve these aims a total of five trenches were taken up. Trench MRG7-A was a 5x5m trench laid out to the southeast of the previous year's trench on the divide between two gullies. The trench was located on the gully divide as it was a less eroded area. Acheulian artefacts were present in the gully bed showing their presence in the sediments. The trench was excavated to bed rock level which was 2.39m below the southwest corner of the trench.

The topmost layer is gravel. In this gravel the clasts are calcrete nodules. Cross bedding is seen, but there is a large amount of clay in the matrix. This gravel is present in the middle part of the trench. It is about 3m in width

and oriented in a northwest to southeast direction. Where the gravel is absent there is black fissured clay which is devoid of artefacts. Around 40 abraded microlithic artefacts were found in this layer along with fragments of ostrich egg shell. Previously, ostrich egg shell from Morgaon had been dated to 22,485±320BP (A 8846). The total absence of mollusk shells from this gravel is interesting. It most probably indicates that the water flow that deposited the gravel was of such a short duration that no water fauna could complete its life cycle. Which such arid conditions the human presence also might be quite sporadic. Most of the microliths in this gravel are abraded supporting the idea that they are recycled from earlier occupation of the area.

In the western side of the trench a series of lenses of sandy gravel are seen. These gravels have a "reddish" colour due to the patina on the basalt pebbles. They show cross stratification. Due to the patina on the pebbles, it was initially considered that this gravel belonged to the "Acheulian" period. However, a few microliths were found in this gravel. These gravels are also within the black fissured clay which continues upto the surface and also contains the gravel with the ostrich egg shell. The contrast in the lithic components of the two gravels and the weathering seen on the basalt clasts must be due to the re-working of the weathered Acheulian gravel. One abraded basalt flake was also found in this unit.

In this trench Acheulian artefacts were found in one horizon only. They occur as part of an armored gravel bar. This bar is first exposed in the north eastern part of the trench. The top of the gravel has cobble size material. This is called an armored gravel bar and is typical of arid zone streams where rainfall and stream discharge are highly variable. The armored bar forms when large material is brought by the river in an unusually large flood. Subsequent

floods are not able to transport it so it remains in the channel bed. The cobble horizon is oriented from north west to south east and dips from the east where it is encountered at 50cm below the datum to the west where it is encountered at 1m below the surface. In the excavation we followed this layer and exposed it before removing the artefacts from it. One hundred seventyfive artefacts were found in this cobble layer. We collected and counted the non artefacts from this layer as well. The non artefacts were 826 in number. The total number of artefacts and non artefacts is 1001, so that the artefacts comprise about 17.5% of the cobbles on the gravel bar. The archaeological assemblage contains a few very abraded artefacts which might have been brought to the river bed along with the other cobbles. However, most of the artefacts show very little abrasion and it is most likely that they were made on the bar itself, whose cobbles might have been exploited for making tools.

After exposing the Acheulian horizon, digging was continued in the western half of the trench only, where bedrock was found at a depth of 2.39m. Below the cobble layer in which the artefacts the gravel is pebbly and sandy. The basalt clasts are well patinated. Angular chert nodules occur. No transported calcrete was observed. The gravel is differentially cemented. The top of the gravel, with its contact with the overlying clay is the most strongly cemented layer. The lowest part of the gravel shows more rounding and higher amount of chert nodules indicating slightly better discharges. One artefact was found in the lowest part of the gravel. The gravel rests on weathered compact basalt.

For collecting sediment samples for palaeomagnetic dating following 2 Trenches were dug *viz.*, MRG7-C (18° 16' 43.7"N; 74° 13' 45.0"E) and Trench MRG7-D (18° 16'

43.6"N; 74° 13' 45.7" E). From these trenches the black fissured clay which is found below the main artefact horizon was exposed and sampled.

Two trenches were taken up to better understand the context of the microliths (Late Pleistocene) at Morgaon. The first trench to be taken up was named Trench MRG7-M (18° 16' 40.3"N; 74° 55' 43.5"E). It is about 150m to the South of Trench MRG7-A. A sandy pebbly gravel with mollusk shells and microliths is exposed here. This gravel can be traced both to the east and west for some hundreds of metres and so represents a distinct Karha palaeochannel. Quarrying of this gravel had provided us with a ready made section. A trench of 1x2m dimension was taken in this gravel and it was dug to a depth of 1.35cm. The entire trench was a single gravel layer, but cross beds and a few layers with muddy matrix were encountered. The frequency of microliths in the gravel was not very high. Fifty microlithic artefacts were collected from the excavated gravel sediment. Mollusk shells were abraded bivalves. No ostrich egg shell pieces were found in this gravel. Previously, mollusks from Morgaon were dated to 26,370±710 (BS 1230). The previously dated samples were collected from the surface and thought to belong to the same horizon. However, the excavation of these two trenches shows that the different dates come from different horizons. The nature of the gravels is quite different. The gravel in Trench MRG7-M is a sandy pebbly gravel of a perennial stream in which bivalves which live within the water submerged gravel could live. Gravels dated to 26k year are also found on the Narmada river at Bhedaghat and Dharampuri where they have an unconformable relationship to the underlying deposits. 25k year is globally known as a humid event. Most of the microlithic artefacts probably belong to human activity at this time. The microliths from gravel

in Trench MRG7-M are minimally abraded in contrast to those from the gravel in Trench MRG7-A associated with ostrich egg shell.

The second trench taken for understanding the microlithic context is Trench MRG7-B (18°16' 29.7"N; 74°19' 30.1"E), on the southern bank of the Karha river. A 4x4m trench was laid out. After 30 cm, it was dug only in the western side as gravel was only found in the western part. Later the trench was extended on the eastern side. Artefacts were only found in the gravel. In the yellow brown sandy silt in the eastern side although no artefacts were found a patch of burned mud was found just below the surface. This appears to be some human activity. In this trench ostrich egg shell was found on the surface and in the uppermost layers. Below 20cm only mollusk shells were found, confirming the stratigraphy implied by the dates. In Trench MRG7-B, 57 microliths were found. The density of artefacts on the surface was much higher showing they accumulated by the erosion of several metres of overlying sediments.

This year's excavation yielded an Acheulian assemblage in sealed geological context. This assemblage is comparable to that of the previous excavation, also from a sealed geological context. The palaeomagnetic studies will help in dating the site. The small excavations into the microlith yielding gravels have clarified their context and yielded important palaeoenvironmental evidence.

24. EXPLORATIONS AT DAHANU-CHINCHANI, EARLY HISTORIC PORT AND THE INSCRIPTIONS OF THE BUDDHIST CAVES IN WESTERN INDIA

Vishwas Gogte of Deccan College Post-Graduate and Research Institute, Pune along with the research-team comprising Shrikant Pradhan, Abhijit Dandekar, Sachin Joshi, Shivendra Kadgaonkar and Suresh

Bombie conducted archaeological explorations at Dahanu-Chinchani. Dahanu is located at a distance of 124km north of Mumbai on the north bank of the Dahanu creek. Dahanu, a *taluka* headquarters is densely populated town. Chinchani standing between the north bank of the Chinchani-Tarapur creek and the south bank of the Dahanu creek is about 13km south of Dahanu. Several localities of ancient habitation were identified at Chinchani and nearby hamlets such as Chandigaon, Asangaon and Tanashi belong in to different periods *viz.* Early Historic, the Early Medieval and the Late Medieval periods.

Early Historic site at Chinchani (19° 53' 11.3"N; 72° 41' 10.8"E) is in the Bhandar-Aali area. The present habitation is in thick coconut-betelnut plantations along the sea shore between Chinchani-Tarapur and Chinchani-Varor creeks. Ringwells of the Early Historic period have been found by local farmers while constructing houses and wells. Resistivity survey undertaken for location analysis in one a ring-well was found about twenty years ago while digging for a well. Pottery was found sporadically scattered in the plantation. The resistivity survey was done in a grid pattern using Wenner method. Four metal electrodes were inserted in the ground for recording the resistances of the underlying soils. Buried archaeological deposits and structures give higher resistance values as compared to the surrounding soils. Areas of high resistivity were identified for taking trenches. Three small exploratory trenches (1x1m) were dug up to about 2 to 3m depths where occurs hardened sand/ beach rock locally known as *karal*. The general description of the trench is as follows:

Layer (1) is a thick compact dark brown clayey silty soil with a lot of root activity. The thickness is from 20 to 60cm in the western section. Layer (2) is similar to Layer (1) in composition but has some white grainy material. Average thickness is 60cm. Both layers

contained a lot of potsherds. Layer (3) is formed by light brown sand containing some clay. This layer runs in undulating manner in the southern and northern sections and somewhat horizontal in the eastern and western sections. Its maximum thickness is 70cm in the north-western corner and the thinnest, 5cm in the southern section. The number of potsherds decreased rapidly from Layer (2) to Layer (3). Layer (4) is a thick, 60cm even layer of white sand. No pottery was found in this and the underlying layers. Layer (5) consists of reddish sand of the average thickness of 35cm. Layer (6) consists of beach rock of the average thickness of 20cm. Layer (7) is a very thin, 7cm layer of black sandy soil. Layer (8) is a 20cm thick layer of beach rock.

In the Layer (1) pottery was found but it was not densely populated. Layer (2) gave a good quantity of potsherds in clayey silty deposit which was about 60cm thick. A layer of sand again occurred below this habitation deposit and then *karal*, the hardened sand or beach rock. The beginning of the habitation at this location thus, took place directly on the sand layer overlying the hardened sand. Sherds of the black and red ware were found in profuse quantities which comprised more than seventy percent of the total number of potsherds. The shapes of the black and red ware were mainly of dishes and bowls with a small number of conical bowls similar to the drinking cups of the Satavahana period. The pottery can be broadly classified into coarse and fine varieties. Fine-grained mica could be seen in the fine variety of the black and red ware. This variety of pottery could have been brought from the North India as it mineralogically matches with the days from the Gangetic plain.

The pottery closely matches with the black and red ware found at Nasik where it has been securely dated to 500-200BCE. Other antiquities were almost absent except for a broken stone muller, an arecanut clay bead and

a piece of opaque light brown glass bangle. Pottery of other periods was nearly absent except for a couple of bases of the typical drinking cups of the Satavahana period.

Dahanu-Chinchani was the closest port, about 103km to the major early historic site at Nasik. It is therefore, not surprising that the black and red ware from Nasik matches well with that from Chinchani. The ancient trade route to Nasik could be traced as Dahanu-Chinchani to Kasa Khurd to Dengatichi met at the base of the lower range of the Sahyadri mountains; then to Jawhar on the plateau of the lower range. The explorations at Jawhar have given evidence of large bricks and a few potsherds but it is difficult to assign a definite period for these finds. From Jawhar onwards, the route follows the traverse along the main mountain range up to Khodala. From this point onwards starts an easy climb *via* Shri pass towards Nasik passing through Tringalwadi and Pandu *lena* where rock cut caves have been reported. It is to be noticed that near Tringalwadi the main mountain range of the Sahyadri has the lowest height which offers a relatively easy and convenient pass to the main land. Another trade route from Jawhar could be Jawhar-Mokhada-Khodala-Trimbakeswar-Mahiravani-Nasik.

Early Medieval site at Chandigaon is situated on what could have been the left bank of the Dahanu creek. Explorations in agricultural fields close to Chandigaon revealed a location (19° 56' 05.4" N; 72° 43' 08.7" E) where a brick structure made of large bricks was found by a farmer while digging a ditch for compost. In contrast to the soils of Chinchani, the soils at Chandigaon are highly clayey almost totally devoid of sand or silt. The surface of the agricultural field has become extremely hard and developed large cracks. This is typical of soils containing montmorillonite as the clay mineral. Montmorillonite expands by absorbing water,

more than 15% of its weight which when dried contracts into hard masses and develop huge cracks. It is difficult to recovery archaeological material from such deposits in good condition as the large hard lumps are required to be broken by hammering with either stone or wooden hammer.

An exploratory trench (1x1m) was taken in this locality. After painstaking efforts, however, it was possible to recover from a deposit of about 70cm, the pottery belonging to the Silahar period (8th-12th century CE). This deposit could be securely dated on the basis of the occurrence in this trench of the hatched Sgraffiato ware of the Persian origin. This ware is rare on the Indian archaeological sites except that was recently found in the excavations at Chaul and Sanjan. It also occurs on many coastal sites of the Indian ocean such as Kilwa, Shanga and Manda on the east coast of Africa. No other antiquity was found in this trench. The evidence of habitation of the earlier and the later periods is also absent.

The copper plates (926-1053 CE) found at Chinchani belong to this phase of habitation. Reference to the ancient site of Sanjan occurs in these copper plates. It says that the Rastrakuta king Indra (926 CE) gave administrative control of Samyan (Sanjan) region to Madhumati of the Tajjik race. Madhumati is the Sanskritized form of Mahmud. The copper plates further mention that Madhumati took control of all ports in the Sanjan region. The port of Dahanu-Chinchani, which is only 27km south of Sanjan must have been controlled by Madhumati. The ten verse of the copper plate of Krishna III (939-67 CE) says that he conquered certain enemies even when he was a crown prince. Among other names, *Parsikas* (Parsi) and *Tajjikas* (Tajjik) are important in the context of the maritime interaction. This is perhaps the earliest well dated evidence of the Parsi community who

migrated from Persia and said to have arrived and settled at Sanjan. *Madhumati* a Tajjik could be from the present Tajjikistan, north of Iran. The trade between India and Persia could be in a flourishing state from the times of *Madhumati* as seen from the occurrence of the hatched Sgraffiato ware from Persia found in the excavations both at Sanjan and Chandigaon. The satellite imageries clearly show that the site was right on bank of the Dahanu creek in ancient times. The river has now moved away from the site by about 800m due to siltation. The Dahanu creek is heavily silted so much, so that only a narrow channel of the creek has now remained. The mouth of the creek has narrowed down due to deposition of sand bar across creek. If the phenomenon of the rise in the sea level during past 2000 years as observed at Chaul and Palshet is also applied to this region it becomes clear that the silt could not go in to the sea but got deposited in the creek. It is therefore obvious that the silt brought by the Dahanu river, particularly during the monsoon, has been getting deposited in the creek itself. It is feared that within a short span of about a decade the creek will be completely filled with the silt.

At third location at the mouth of the Chinchani-Varor creek, a habitation deposit of 13th-15th century CE has been located (19° 53' 58.8"N; 72° 40' 56.6"E). It comprises the monochrome ware of blue, green and grey glazes and the Chinese blue-on-white pottery. This ware is commonly found on the coasts of India and East Africa and in the coastal sites of the Persian gulf. Besides this, there are three Portuguese structures including a fairly well-preserved fort in Dahanu-Chinchani area. Although it was possible to locate the port activity at Dahanu-Chinchani, further detailed survey is required for understanding the extent of habitation. Unlike the ancient settlement at Chaul, which gave continual layers of

habitation from the Mauryan to the Late Medieval periods, the habitation of different periods at Dahanu-Chinchani was spread over a wider location. The habitation of the Mauryan period was found only in the Bhandar-Aali area of Chinchani, the Early Medieval settlement was located at Chandigaon and the evidence of the Late Medieval habitation was found over a wider area but mostly restricted to the mouths of Chinchani-Tarapur and Chinchani-Varor creeks

Dahanu-Chinchani region as Dhenukakata occurs in many inscriptions in the Buddhist caves at Karle, Pitalkhora, Kahneri and Shelarwadi in the western Maharashtra. It is in the context of donations given by the people from Dhenukakata for excavations of the caves and water cisterns. In all, the place name occurs in nineteen inscriptions at Karle and one each at Pitalkhora.

Kahneri and Shelarwadi although have been identified with Dharanikota in Andhra Pradesh, it is difficult to imagine that the people from such a far off place would give donations for excavations of caves in the western Maharashtra. Various other places have been proposed for Dhenukakata; Dongri village near Vasai in Thane district Devghar near Karle and Junnar. However, Dhenukakata can be identified with Dahanu on the following ground.

Ancient place names on the bank of rivers end with the suffix, *kata* e.g., Karhataka on the bank of river Krisha and Benakata on the bank of river Vainganga. Similarly, a place on the bank of Dahanuka (Dahanu) river could be Dahanukakata. The modern town of Dahanu is on the Dahanu river/creek. The most plausible transliteration of Dahanukakata is Dhenukakata. Since the explorations have now revealed the existence of the early historic and the later settlements over a wider areas of Dahanu and Chinchani close to the sea shore and along the

banks of the Dahanu river/creek, not only Dahanu but the areas covering Dahanu-Chinchani taken together should be equated with Dhenukakata that occurs in the inscriptions of the caves in the Western India.

MEGHALAYA

25. THE ABANDONED ANCIENT SETTLEMENT NEAR LAITDUH VILLAGE, DISTRICT EAST KHASI HILLS

The Art and Culture Department of State Government has conducted exploration at Laitduh (25° 20'N; 91° 43'E) a small village of about 10km West of Cherrapunjee (Sohra). Adjacent to this village in the south is an abandoned ancient fortified settlements of about one sqkm in area containing a number of ancient remains like number of Cromlechs, hewn stone vessels etc. The ancient Rangjyrteh village was a place of trade center during the ancient times of around the 15th-16th century CE. The inhabitants of the hills and the plains of Sylhet (Bangladesh) had their trade transaction of various items.

26. BAITBARI ARCHAEOLOGICAL SITE AND REMAINS, DISTRICT WEST GARO HILLS

Baitban (25° 47'E; 90° 05'N) site is situated at a distance of about 80km west of Tura, the headquarters of the west Garo Hills district with countless number of archaeological mounds. During 1991 - 1992, the Pre-history Branch, Nagpur of the Survey had conducted excavation mainly on four mounds and unearthed three structures viz., the stupa and the two basements of the temples and a section of the fortification walls. Again a number of mounds and revealed ruined structures may be of temples along with tiles depicted god and goddess exposed by Government of Meghalaya.

ODISHA

27. EXCAVATION AT BARABATI FORT, CUTTACK, DISTRICT CUTTACK

In continuation of the previous year's work the Excavation Branch-IV, Bhubaneswar of the Survey took up excavation under the direction of P. K. Trivedi, assisted by S. Khamari, P. K. Dikhit, M. K. Chauley, Mahendra Pal, S. K. Dey, B. B. Badamali, S. K. Khuntia, R. N. Sahoo, S. K. Bhoi, Ajaya Kumar Sasmal and B. Behera at the north-eastern part of Barabati fort complex (Pl. 28). The main objective of the work was to unveil the buried structures and correlate them with the earlier excavated ones. To the north of previously excavated laterite complex the digging resumed (Pl. 29). The 4.30m thick deposit assignable to *circa* 14th-17th century CE was marked by two structural phases (Fig. 9). The structures were made of laterite, khondalite and coarse sandstone and mud/lime mortar. Sporadic traces of plaster made of lime, *kankars* and shells were noticed on the surface of the walls.

A 3.9m wide and 12.25m long east west wall of phase-I running below the eastern arm of the citadel was found. It has been robbed off but at places retains as many as eleven courses. This wall in Trench ZD3 Qdt. 1 turns towards south remains of which are scantily represented in squares Trench ZD2, ZD1 and D1 (Pl. 30). Contiguous to the already excavated laterite citadel wall of phase-II (east-west) was found to be extended upto a distance of 5.50m. in the same direction (Pl. 31). It is 4m wide. To its northern end were added two laterite squares the purpose of which could not be precisely ascertained (Pl. 32, Fig. 10). Its further extension towards the east joins the north-south citadel wall. This wall has been almost robbed off retaining only few traces in trenches that eventually connects with eastern

facet of northern citadel wall (Pl. 33, Fig. 10). Its extension towards the north is traceable on plan and partly embedded in the section looking north. This too has been robbed off and its nature could be determined through further excavations (Pl. 34, Fig. 10). In this phase from Trench ZD2 Qdt.2 a skeleton of an animal belonging to the *equas* family was found at a depth of 2m (Pl. 35).

Within the north-eastern corner of the fortification was exposed a floor rammed with *kankars*. Few terracotta tiles were also recovered from this area. The antiquities include a copper coin of East India Company (one quarter *anna*) dated 1835 CE (Pl. 36), broken sculptural and architectural fragments illustrating an *apsaras* (Pl. 37), a seated goddess (Pl. 38), *gandharva*, lion-head etc. The stone objects comprise censer, stone lamp, balls and fragments of pots while the terracotta objects comprise of balls and fragments of animal figurines (Pl. 39) and the iron objects being represented by an axe and a stylus (Pl. 40). The pottery comprises of storage jars, spouted vessels (Pl. 41), lamps, pot stands, knobbed lids, miniature pots (Pl. 42), dishes and bowls, finial portion of a *hookah* and pieces of Chinese porcelain.

28. VILLAGE TO VILLAGE SURVEY OF ANTIQUARIAN REMAINS IN THE MIDDLE BRAHMANI VALLEY, DISTRICT DHENKANAL

Bhubaneswar Circle of the Survey under the direction of D. N. Dimri assisted by N. K. Swain and D. N. Bhoi, resumed the exploration work under the scheme 'Village-to-Village Survey of Antiquarian Remains' in the middle Brahmani valley (Pls. 43-44) within the limits of Hindol, Dhenkanal and Gondia *tehsils* of Dhenkanal district in central Odisha. A stretch of approximately 45km on the right bank of river Brahmani from Baulpur to Mandar was systematically surveyed. The sur-

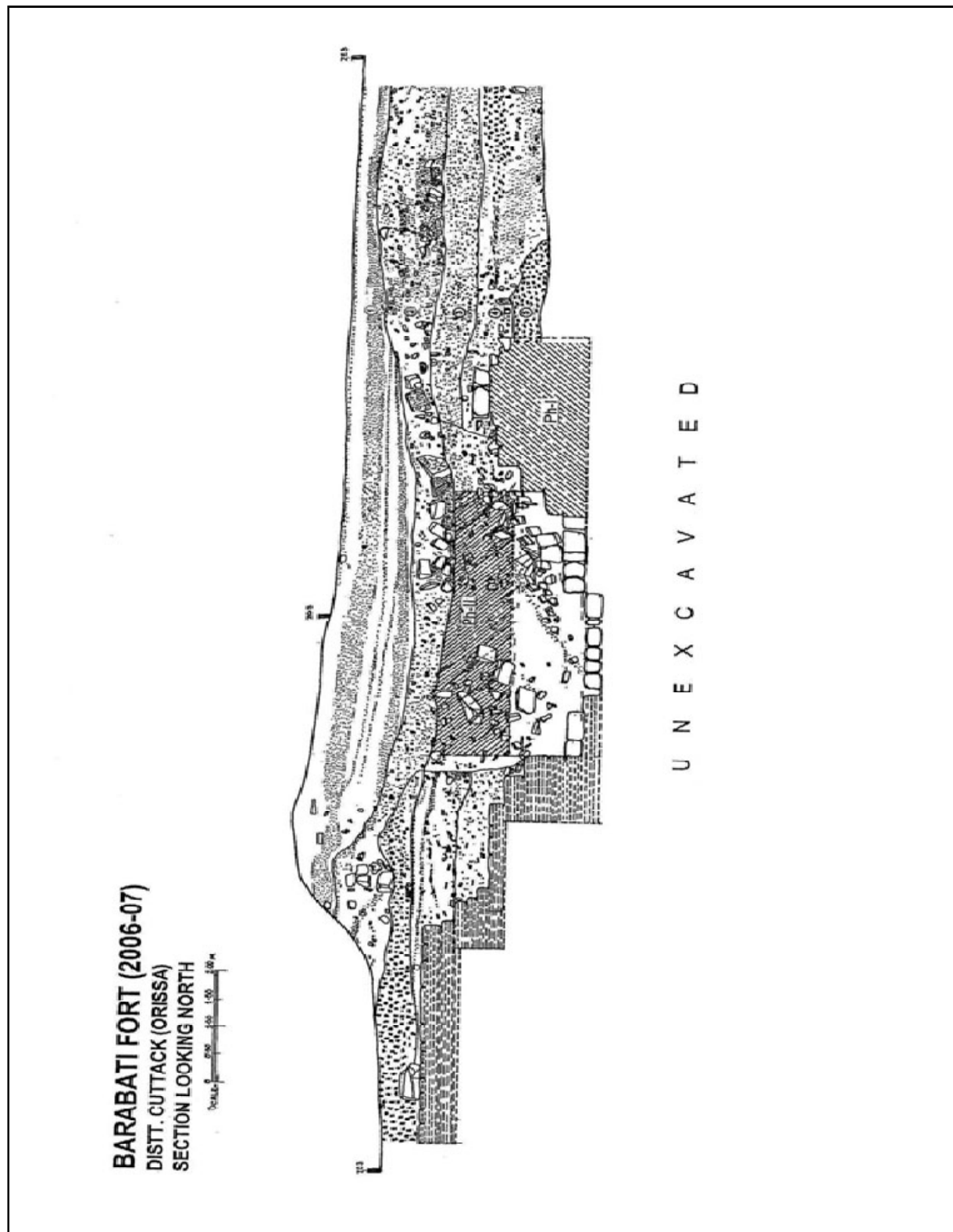


Fig.9: Barabati fort, Cuttack: Excavated section looking north. See p. 55

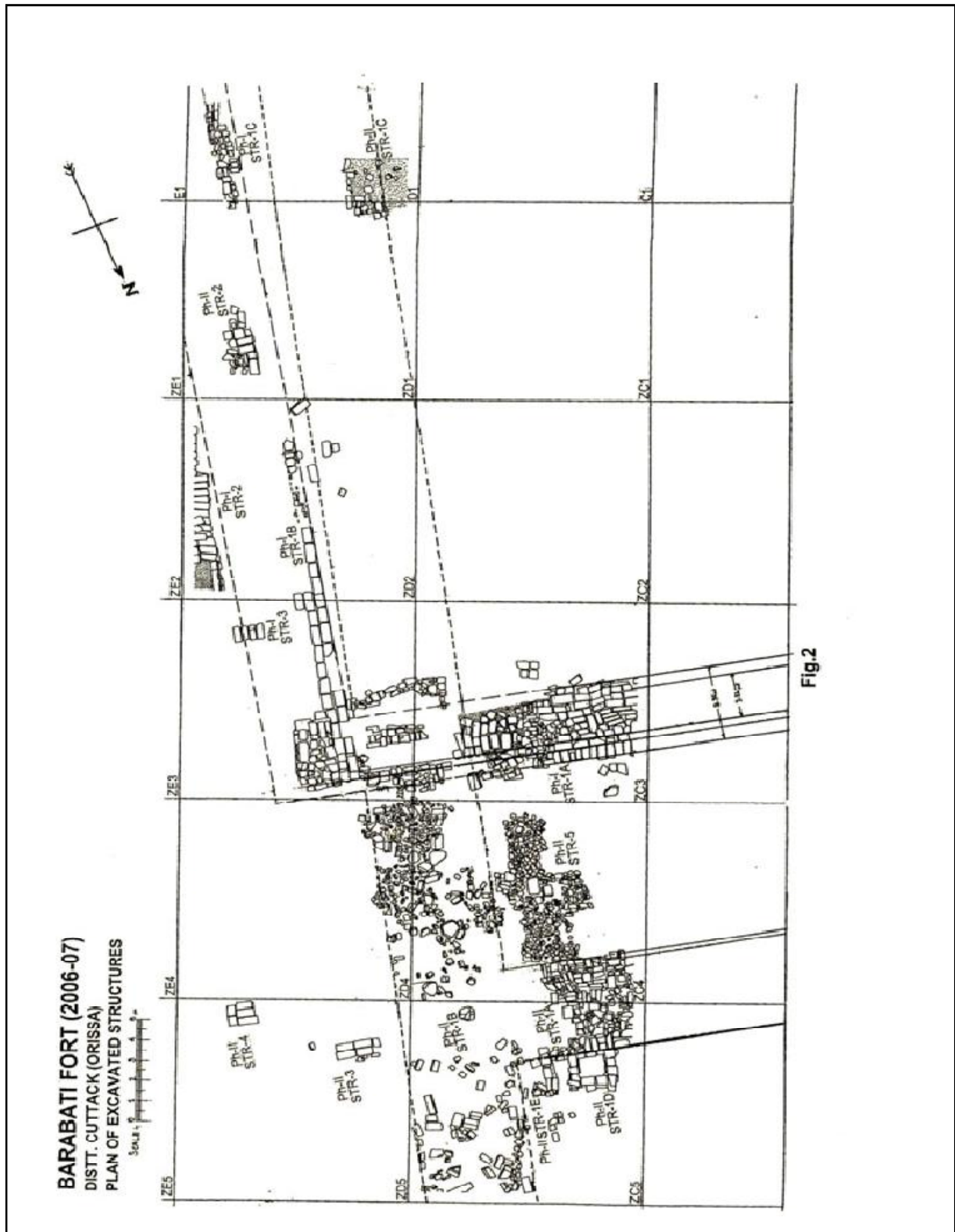


Fig.10: Barabati fort, Cuttack: plan of excavated structures. See p. 55



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Barabati fort, Cuttack: North eastern part of the fort complex (before and after excavation). See p. 55



Barabati fort, Cuttack: excavated extension of corridor wall (phase I). See p. 55



31



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Barabati fort, Cuttack: excavated extension of citadel wall and two laterite squares attached to the northern end of citadel wall (phase II). See p. 55



33



34

Barabati fort, Cuttack: remains of north-south oriented eastern citadel wall (phase II). See p. 55



35



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Barabati fort, Cuttack: 35, skeletal remains of equas and 36, copper coin of East India Company. See p. 55



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Barabati fort, Cuttack: 37, apsaras and 38, a seated goddess. See p. 55



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Barabati fort, Cuttack: 39, animal figurines and 40, iron objects. See p. 55



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Barabati fort, Cuttack: 41, storage jar and spouted vessel and 42, miniature pots. See p. 55



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Middle Brahmani Valley: view of pre-historic sites. See p. 55

vey was extended further to the catchment areas of the river and its tributaries up to a maximum distance of about 10 to 15km. The mode of investigation was based mainly on locating, recording and study of archaeological sites and antiquarian remains from the surface and the exposed section of the mounds, hills, oaks including the stratified deposits like gravel beds, cemented gravels, conglomerates

etc. in a systematic and scientific manner. During the exploration a total number of 143 localities and villages were subjected to investigation, out of which 70 localities yielded antiquarian remains belonging from lower palaeolithic to medieval period. (see Chart-IV)

CHART-IV

Village/Site	Tehsil	Geomorphology	Nature of Remains
Ambanali (ABL) (20° 41'N; 85° 43'E)	Dhenkanal	Right bank of river Brahmani at a distance of 13km. The site is located on the slope of the Kapilas hill and Reserved Forest to the north-east of the village. Fairly dense mixed jungle. Red and yellowish soil mixed with <i>kankars</i> .	Mesolithic: fluted core of jasper and blade of green chert. Neolithic: chisels, celts and ring stones of dolerite. Iron Age: heaps of iron slags along with evidences of iron smelting activities.
Ankaranipura (ATR) (20° 43' N; 85° 33' E)	Hindol	5km away from the right bank of river Brahmani. The site is located to the north-east of the village. Sal forest, Red and yellowish soil mixed with gravels and <i>kankars</i> .	Neolithic: celt and ring stone of dolerite.
Anlasahi (ANH) 20° 46'N; 85° 39' E)	Dhenkanal	3km away from the right bank of river Brahmani. The site is located on the northern slope of a rocky knob of laterite deposit. <i>sal</i> jungle and shrubs.	Neolithic: celt of dolerite
Asanbatia (ABT) (20° 42'N; 85° 39' E)	Dhenkanal	7km away from the right bank of the river Brahmani and on the eastern bank of a seasonal nala locally called Badanala to the north of the village. Rocky knob. Open mixed jungle and shrubs. Red soil of secondary laterite deposit	Middle Palaeolithic: hand axes and scrapers of quartzite. Mesolithic: blade of jasper and scraper of quartz. Neolithic: celt, chisel and debitage of dolerite. Hand made crude potteries of dull red ware.

Village/Site	Tehsil	Geomorphology	Nature of Remains
Atinda (ATD) (20° 47'N; 85° 43' E)	Gondia	9km away from the right bank of river Brahmani. The site is located on the slope of a small hillock to the north-east of Rupabalia hill. Open mixed jungle and shrubs. Red soil of secondary laterite deposit.	Neolithic: celts of dolerite. Iron Age: iron slags and iron smelting evidences.
Bandha Nuagan (BDN) (20° 43'N; 85° 42' E)	Dhenkanal	Right bank of river Brahmani at a distance of 10 km and left bank of Deuljhar, a tributary of Brahmani. The site is located to the north of the village. Greyish soil of alluvial deposit.	Historical: remains of a <i>panchayatana</i> Siva temple datable to circa 8 th -9 th century CE.
Barada (BRD) (20° 43'N; 85° 32' E)	Dhenkanal	3km away from the right bank of the river Brahmani. The site is located on the south western slope of Patali <i>parvat</i> . Dense mixed jungle. Red soil mixed with boulders and gravels. Site is disturbed due to collection of boulders.	Neolithic: celt of basalt.
Barada (BRD) (20° 49'N; 85° 49' E)	Gondia	Right bank of river Brahmani at a distance of 5km and a close proximity to a perennial stream, originating from the hill. The site is located on the southern slope of Aswakhola <i>parvat</i> within the Sarhangi reserved forest and to the north-east of the village. Dense mixed jungle. Red soil of secondary laterite deposit.	Neolithic: celt of dolerite. broken ring stone of quartzite.
Barahata (BRT) (20° 46'N; 85° 39' E)	Dhenkanal	4km away from the right bank of river Brahmani. The site is located on the southern slope of Rupabalia hill and reserved forest. Fairly dense mixed jungle. Yellowish and red soil of secondary laterite deposit.	Neolithic: unfinished celt of dolerite. Iron Age: iron slags indicating iron smelting evidences

EXPLORATIONS AND EXCAVATIONS

Village/Site	Tehsil	Geomorphology	Nature of Remains
Belatikiri (BTR) (20° 42'N; 85° 41' E)	Dhenkanal	Right bank of the river Brahmani at a distance of 10km and to the north- eastern proximity of a palaeo-channel. The site is located on a rocky knob to the south west of the village. Boulders of big size. Red soil of secondary laterite deposit.	Mesolithic: blades, scrappers and points of jasper, agate and quartz. Neolithic: chisel and celt of dolerite.
Bhatakateni (BKT) (20° 47'N; 85° 39' E)	Dhenkanal	Right bank of the river Brahmani at a distance of 3km. The site is located on the north-western slope of Rupabalia hill and reserved forest. Open mixed jungle. Red soil of secondary laterite deposit.	Neolithic: ring stone of quartzite Medieval: ruins of a fortified settlement of medieval period locally called Nuagada. Pottery of grey and red wares.
Bheji Bolua (BJL) (20° 47'N; 85° 41' E)	Gondia	Right bank of the river Brahmani at a distance of 5km. The site is located on the northern slope of Rupabalia hill and the reserved forest. Dense mixed jungle. Red soil of secondary laterite deposit.	Neolithic: chisel, celt, ring stone and debitage of dolerite. Hand made crude pottery of dull red ware.
Bhojadeipur (BJR) (20° 44'N; 85° 33' E)	Hindol	Just on the right bank of the river Brahmani. Plain lands with alluvial deposits.	Mound with grey and red wares of Medieval period.
Biradia (BRD) (20° 40'N; 85° 43' E)	Dhenkanal	Right bank of river Brahmani at a distance of 14km. The site is located on the north-western foot hill of the Kapilas hills and reserved forest to the south of the village. Fairly dense mixed jungle. Red soil of secondary laterite deposit.	Mesolithic: scrapper of jasper and point of quartz. Neolithic: celts of dolerite and unfinished ring stone of quartzite. Iron Age: iron slags indicating iron smelting activities.

Village/Site	Tehsil	Geomorphology	Nature of Remains
Birikhunti (BKT) (20° 45'N; 85° 43' E)	Gondia	Right bank of river Brahmani at a distance of 7km and close proximity to a seasonal water channel. The site is located on the northern slope of a hillock. Open mixed jungle and shrubs. Red soil of secondary laterite deposit.	Neolithic: celt and debitage of dolerite and unfinished ring stone of quartzite.
Biswanathpur (BNR) (20° 43'N; 85° 46' E)	Gondia	16km away from the right bank of the river Brahmani and on the close proximity of a palaeo-channel and to the north-west of the village. Open mixed jungle. Soil is red and yellowish mixed with <i>kankars</i> .	Lower Palaeolithic: handaxes and cleavers of quartzite. Mesolithic: blades, scrapers and points of jasper and quartz. Neolithic: celts of dolerite. Iron age: iron slags including remains of iron smelting activities.
Borapada (BPD) (20° 39'N; 85° 38' E)	Dhenkanal	10km away from the right bank of the river Brahmani and 3 km away from the right bank of Badajora, a tributary of Bramhani. The site is located on the foothill. Locality is surrounded by Megha hill and Tigiria hill on either side. Dense mixed jungle mainly <i>sal</i> and bamboo. Red soil of secondary laterite deposit.	Neolithic: chisel of dolerite.
Chandrasekharpur (CSR) (20° 43'N; 85° 43' E)	Dhenkanal	Right bank of the river Brahmani at a distance of 11km. The site is located to the north of the village. The locality is having laterite deposits of red colour. Open shrubs.	Mesolithic: fluted cores of jasper and quartz, blades, triangle, trapeze and point of jasper. Neolithic: fragmentary ring stones of quartzite.
Chhanabolua (CBL) (20° 40'N; 85° 42' E)	Dhenkanal	Right bank of the river Brahmani at a distance of 12km. The site is located to the north of the village. Outcrop is a rocky knob covered with open shrubs. Red soil of secondary laterite deposit.	Mesolithic: fluted core, blades, trapezes, scrapers and points of quartz and jasper. Neolithic: celts and debitage of dolerite. Iron Age: iron slags indicating iron smelting activities.

Village/Site	Tehsil	Geomorphology	Nature of Remains
Chhatia (CHT) (20° 46'N; 85° 42' E)	Dhenkanal	8km away from the right bank of river Brahmani and close proximity to a palaeo-channel. The site is located on the south-eastern slope of the Rupabalia hill and reserved forest. Open mixed jungle mainly <i>sal</i> . Red soil of secondary laterite deposit.	Lower Palaeolithic: handaxes and cleavers of quartzite. Mesolithic: blades of quartz. Neolithic: chisels, celts, unfinished ring stone and debitage of dolerite. Handmade crude pottery of dull red ware. Iron Age: iron slags indicating iron smelting evidences.
Dalara (DLR) (20° 51'N; 85° 49' E)	Gondia	1km away from the right bank of river Brahmani. The village is located on the north-eastern slope of the Aswakhola <i>parvat</i> . The site is located on the southern slope of a small laterite hillock to the north of the village. Dense mixed jungle. Laterite deposit mixed with calcareous <i>kankars</i> and pebbles.	Mesolithic: blade, scrapper and point of jasper. Neolithic: celt and debitage of dolerite.
Derasingh (DRS) (20° 42'N; 85° 38' E)	Dhenkanal	6km away from the right bank of river Brahmani. The site is located on the north-eastern slope of a hill. Fairly dense mixed jungle and shrubs.	Lower Palaeolithic: handaxes of quartzite.
Gahamakhunti (GMT) (20° 39'N; 85° 39' E)	Dhenkanal	10km away from the right bank of river Brahmani and 1½km away from the right bank of Badajora, a tributary of Bramhani. The site is located on the south-eastern foot hill of Megha hill. Dense mixed jungle mainly <i>sal</i> and bamboo. Laterite beds. Red soil.	Lower Palaeolithic: handaxes of quartzite. Mesolithic: fluted core of chert. Neolithic: ring stone and debitage of dolerite.

Village/Site	Tehsil	Geomorphology	Nature of Remains
Gopalpur (GPR) (20° 52'N; 85° 46' E)	Gondia	1km away from the right bank of river Brahmani and on the left bank of Debakundi nala, a tributary of Bramhani. To the north-eastern proximity of the site is a palaeo-channel. The site is located on the north-eastern slope of Aswakhola <i>parvata</i> and reserved forest. Dense mixed jungle mainly <i>sal</i> . Red soil of secondary laterite deposit.	Neolithic: chisels and celts of dolerite. Broken ring stone of quartzite. Hand made crude pottery of red ware.
G o v i n d p u r (Tanlagarh) (TLG) (20° 38'N; 85° 39' E)	Dhenkanal	14km away from the right bank of river Brahmani and on the left bank of a perennial stream locally called Badajoara, which is also a tributary of Bramhani. The site is located on the foot hill of the Patapuri hills and reserved forest and to the north-east of the village.	Historical: remains of a fortified settlement, locally called "Tanlagarh" datable to circa 5 th -6 th century CE. Potteries of red and grey wares.
Gundichapada (GCD) (20° 42'N; 85° 33' E)	Dhenkanal	6 km away from the right bank of river Brahmani. The site is located on the north-western slope of the Korian hill and reserve forest. Dense mixed jungle mainly <i>sal</i> . Red soil.	Neolithic: celt and ring stone fragment of dolerite.
Haladibari (HDR) (20° 43'N; 85° 34' E)	Dhenkanal	2½km away from the right bank of river Brahmani. The site is located on the north-western slope of Sankaraduburi hill. Open mixed jungle and shrubs. Red soil of secondary laterite deposit.	Neolithic: chisels of dolerite. Hand made crude pottery of dull red ware.
H a l a d i g u n d i (HGD) (20° 43'N; 85° 37' E)	Dhenkanal	3½km away from the right bank of river Brahmani and also on the right bank of	Lower Palaeolithic: handaxes and a cleaver of quartzite. Neolithic: Chisels and a celt of dolerite.

Village/Site	Tehsil	Geomorphology	Nature of Remains
		Badajora, a tributary of Bramhani. The site is located on the south-western foot hill of Barakanya <i>parvata</i> . Dense mixed jungle. Red soil containing yellowish patches.	
J a m u c h a k a d a (JCD) (20° 42'N; 85° 28' E)	Hindol	8km away from the right bank of river Brahmani and on the right bank of Beganala, a tributary of Bramhani. Mixed jungle mainly <i>sal</i> and shrubs. Red soil of secondary laterite deposit mixed with <i>kankaras</i> and nodules.	Lower Palaeolithic: handaxes of quartzite. Neolithic: chisel and celt of dolerite.
Jandapasi (JPS) (20° 43'N; 85° 45' E)	Gondia	Right bank of the river Brahmani at a distance of 15km and western side of a palaeo-channel. The site is located on the slope of a hill-ock to the north-west of the village. Open mixed jungle. Red soil of secondary laterite deposit.	Mesolithic: blade of quartz. Neolithic: celts of dolerite. Broken ring stone of quartzite. Iron Age: iron slags indicating iron smelting activities.
Jankhira (JKR) (20° 41'N; 85° 41' E)	Dhenkanal	Right bank of the river Brahmani at a distance of 9km and closed proximity to a water channel. The site is located on the western foot hill of a hillock and to the south-west of the village. Fairly dense mixed jungle mainly <i>sal</i> . Red soil of secondary laterite deposit.	Neolithic: chisel and celt of dolerite.

Village/Site	Tehsil	Geomorphology	Nature of Remains
Jhili (JHL) (20° 44'N; 85° 46' E)	Gondia	Right bank of the river Brahmani at a distance of 15km and on the right bank of a palaeo-channel. The site is located to the north-west of the village. Open mixed jungle. Red soil of secondary laterite deposit.	Mesolithic: fluted core, scraper and blade of jasper. Neolithic: celt of dolerite. Broken ring stone of quartzite. Iron Age: large heaps of iron slags indicating iron smelting activities.
K a d u a m a d a (KMD) (20° 43'N; 85° 29' E)	Hindol	Right bank of river Brahmani at a distance of 6km and on the right bank of Beganala, a tributary of Brahmani. The site is located on the south-eastern slope of a hill. Mixed jungle mainly <i>sal</i> and open shrubs. Alluvium mixed with <i>kankars</i> , nodules and pebbles.	Lower Palaeolithic: handaxes of quartzite.
Kamalapur (KLR) (20° 49'N; 85° 51' E)	Gondia	Right bank of river Brahmani at a distance of 8km. The site is located on the eastern slope of Aswakhola <i>parvat</i> and reserved forest. Dense mixed jungle. Red soil of secondary laterite deposit.	Mesolithic: blades and points of jasper. Neolithic: celts of dolerite.
Kandua (KDA) (20° 40'N; 85° 43' E)	Dhenkanal	Right bank of river Brahmani at a distance of 14km. The site is located on the north-western foothill of Kapilas hills and reserve forest and to the south-east of the village. Fairly dense mixed jungle. Red soil of secondary laterite deposits.	Neolithic: ring stones of quartzite, chisels of dolerite.

Village/Site	Tehsil	Geomorphology	Nature of Remains
K a n k a d a h a d (KKD) (20° 38'N; 85° 33' E)	Dhenkanal	Right bank of river Brahmani at a distance of 12km. the site is located on the slope of the hill within Kankadahad reserve forest to the south-west of the village. Fairly dense mixed jungle. Yellowish soil mixed with <i>kankars</i> .	Lower Palaeolithic: handaxes and cleavers of quartzite. Mesolithic: blades and scrapers of quartz. Neolithic: celt of dolerite.
K a n k a d a p a l a (KDL) (20° 41'N; 85° 37' E)	Dhenkanal	6km away from the right bank of river Brahmani. The site is located on the western slope of a hillock located to the east of the village. Open shrubs. Red soil.	Lower Palaeolithic: hand axes of quartzite.
Kapilas (KLS) (20° 41'N; 85° 45' E)	Gondia	Right bank of river Brahmani at a distance of 16km and near a perennial stream originating from the hill. The site is located on the slope of Kapilas within the reserve forest fronting the Chandrasekhar Jew temple. Fairly dense mixed jungle, red soil of secondary laterite deposit.	Neolithic: celt of dolerite.
Karamul (KML) (20° 52'N; 85° 45' E)	Gondia	Just on the right bank of river Brahmani and left bank of Devakundinala, a tributary of Brahmani. Situated on the northern slope of a hill. Locality is surrounded by <i>Aswakhola parvata</i> on either side. A palaeo-channel to the south of the site. Dense mixed jungle. Red soil of secondary laterite deposit.	Mesolithic: blades and points of jasper. Neolithic: chisels, celts and axes of dolerite. Broken ring stones of quartzite.

Village/Site	Tehsil	Geomorphology	Nature of Remains
K a t a k a m a d a (KMD) (20° 43'N; 85° 39' E)	Dhenkanal	7km away from the right bank of the river Brahmani and on the eastern bank seasonal <i>nala</i> , locally called Badanala. The site is located on the north eastern foothill of Kandanal <i>parvata</i> to the north-east of the village. Rocky knob of laterite deposit red soil.	Middle Palaeolithic: handaxe, scraper and point of quartzite. Mesolithic: blades and scrapers of quartz (Pls. 45-46) Neolithic: chisel and celt of dolerite
Katani (KTN) (20° 49'N; 85° 48' E)	Gondia	Right bank of river Brahmani at a distance of 5km and close proximity to a seasonal water channel originating from the hill. The site is located on the southern slope of Aswakhola <i>parvata</i> within Sarhangi reserved forest and to the north-west of the village. Dense mixed jungle. Laterite deposits containing calcareous <i>kankars</i> and gravels below red soil.	Neolithic: chisels and celts of dolerite.
K e n d u p a r h a (KPR) (20° 42'N; 85° 39' E)	Dhenkanal	7km away from the right bank of river Brahmani and on the western bank of a seasonal <i>nala</i> , locally called Badanala. The site is located on the north-eastern slope of the Kandanal <i>parvat</i> to the north of the village. Fairly dense mixed jungle. Red soil of secondary laterite deposits.	Lower Palaeolithic: handaxes of quartzite. Mesolithic: blades of jasper. Neolithic: chisels, celts and debitage of dolerite.
K e u t a b a r e n i (KBN) (20° 43'N; 5° 36' E)	Dhenkanal	2km away from the right bank of river Brahmani and on the left bank of Badajora, a tributary of Brahmani. The site is located on the north-western slope of a rocky knob. Red soil of secondary laterite deposit.	Neolithic: celt of dolerite.

Village/Site	Tehsil	Geomorphology	Nature of Remains
K h a l i b a n d h a (KBD) (20° 44'N; 85° 37' E)	Dhenkanal	2½km away from the right bank of river Brahmani and to the close proximity of a palaeo-channel. Mixed open jungle mainly <i>sal</i> . Red soil of secondary laterite deposit.	Mesolithic: fluted core, blades and scrapper of jasper. Neolithic: celt and debitage of dolerite. Handmade pottery of dull red ware. Iron Age: iron slags indicating iron smelting activities.
Krushnakumarpur (KMR) (20° 41'N; 85° 42' E)	Gondia	Right bank of river Brahmani at a distance of 5km and close proximity to a seasonal water channel. The site is located on the southern slope of Aswakhola <i>parvata</i> within Sarhangi reserve forest and to the north-east of the village. Dense mixed jungle. Laterite deposits containing calcareous <i>kankars</i> and gravels below a deposit of red morum.	Mesolithic: scrapers and blades of jasper. Neolithic: chisels, celts, ring stones and debitage of dolerite. A Neolithic tool manufacturing primary site.
Kokeida (KKD) (20° 49'N; 85° 47' E)	Dhenkanal	Right bank of river Brahmani at a distance of 12km and close proximity to perennial stream, originally from Kapilas hill ranges. Open shrubs. Red soils of secondary laterite deposit.	Mesolithic: blades, scrapers, points, triangles, trapezes of jasper and quartz. Neolithic: celt and debitage of dolerite.
K u k u d a j h a r (KDR) (20° 39'N; 85° 39' E)	Dhenkanal	10km away from the right bank of river Brahmani and close proximity to a perennial stream. The site is located on the north-eastern foothill of a Megha hill and reserved forest. Dense mixed jungle mainly <i>sal</i> and bamboo. Laterite beds. Red soil.	Neolithic: chisels of dolerite.

Village/Site	Tehsil	Geomorphology	Nature of Remains
Mahapada (MPD) (20° 47'N; 85° 42' E)	Gondia	7km away from the right bank of river Brahmani. The site is located on the northern slope of Rupabalia hill and reserve forest. Dense mixed jungle. Red soil of secondary laterite deposit.	Neolithic: celts of dolerite. Iron Age: slags indicating iron smelting evidences.
Majuri (MJR) (20° 38'N; 85° 34' E)	Dhenkanal	Right bank of river Brahmani at a distance of 12km. The site is situated on the slope of the hill to the south-west of the village. Fairly dense mixed jungle. Light yellowish soil mixed with <i>kankars</i> .	Mesolithic: blade of green chert, scraper, and points of jasper. Neolithic: chisel and celt of dolerite.
Meghatalabaheli (MBL) (Megha Reserved Forest) (20° 39'N; 85° 38' E)	Dhenkanal	10km away from the right bank of river Brahmani and close proximity to a perennial stream. The site is located on the western foothill of Megha hill within the reserve forest. Mixed dense jungle mainly <i>sal</i> and bamboo. Red and yellowish soil mixed with <i>kankars</i> .	Lower Palaeolithic: handaxes of quartzite Mesolithic: blade of jasper. Scraper and points of quartz. Neolithic: chisels, celts, ring stones and debitage of dolerite. Handmade crude potteries of dull red ware. Neolithic tool manufacturing primary site.
M u k u n d a p u r (MDR) (20° 50'N; 85° 51' E)	Gondia	Right bank of river Brahmani at a distance of 2½km and on the southern side of a palaeo-channel. Situated on the north-western slope of Aswakhola <i>parvat</i> and reserve forest and to the east of the village. Locality is surrounded by hillocks on either side. Dense mixed jungle. Red soil of secondary laterite deposit.	Mesolithic: blade and point of quartz. scraper of jasper. Neolithic: chisels and celts of dolerite.

Village/Site	Tehsil	Geomorphology	Nature of Remains
Nagana (NGN) (20° 47'N; 85° 38' E)	Dhenkanal	Just on the right bank of river Brahmani.	Historical: beautiful sculptures of four-armed sand stone Varahi (64x32x22cm) seated in <i>lalitasana</i> , four-armed standing Ganesa (70x35x25 cm) of chlorite, a Naga image of khondalite and Navagraha panel affixed into a well, all datable to circa 10 th -11 th century CE. Late Medieval temple of Naganathesvara.
Nathua (NTA) (20° 46'N; 85° 40' E)	Dhenkanal	5km away from the right bank of river Brahmani. The site is located on the southern foot hill of Rupabalia hill and to the south of the village also. Open shrubs. Red soil of secondary laterite deposit.	Neolithic: chisel and celts of dolerite. ring stone fragments of quartzite. Hand made crude pottery of dull red ware. Iron Age: slags indicating iron smelting evidences.
N u a n a g a n a (NGN) (20° 43'N; 85° 46' E)	Gondia	Right bank of river Brahmani at a distance of 15km. Situated to the north-west of the village. Open mixed jungle. Yellowish soil mixed with <i>kankars</i> .	Mesolithic: blades, scrapers and points of jasper. Neolithic: celts of dolerite. Ring stones of quartzite.
Orasinga (OSG) (20° 51'N; 85° 50' E)	Gondia	Right bank of river Brahmani at a distance of 1km. Situated on the north-eastern slope of Aswakhola <i>parvata</i> and reserve forest. Locality is surrounded by hills on three sides. Dense mixed jungle. Red soil of secondary laterite deposit.	Mesolithic: blade, scraper and point of jasper. Neolithic: celts and fragmentary ring stone of dolerite.
Parikhoda (PKD) (20° 49'N; 85° 40' E)	Dhenkanal	7km away from the right bank of river Brahmani and on the eastern proximity of a water channel. Mixed jungle mainly <i>sal</i> and shrubs. Red soil of secondary laterite deposit.	Lower Palaeolithic: handaxes of quartzite Mesolithic: blades and scrapers of quartz and jasper. Neolithic: shouldered celt, chisels, celt and broken ring stone of dolerite (Pls. 47-48).

Village/Site	Tehsil	Geomorphology	Nature of Remains
Patia (Nagiapasi) (PTA) (20° 42'N; 85° 42' E)	Dhenkanal	12km away from the right bank of river Brahmani. The site is located on the slope of a rocky knob to the north-east of the village. Red and yellowish soil mixed with <i>kankars</i> . Open shrubs.	Mesolithic: blade of green chert and fluted core of chert. Neolithic: chisels, celts and debitage of dolerite.
Siminai (SNI) (20° 43'N; 85° 33' E)	Gondia	Right bank of river Brahmani at a distance of 6km. Situated on the southern foothill of Aswakhola <i>parvata</i> within Raitala reserve forest and to the north of the village. Dense mixed jungle. Red soil of secondary laterite deposit.	Mesolithic: blade and scraper of jasper. Neolithic: celt of dolerite. Ring stone of quartzite. Iron age: iron slags indicating iron smelting activities.
Ranapasi (RPS) (20° 42'N; 85° 34' E)	Dhenkanal	Right bank of river Brahmani at a distance of 3km. Situated on the western slope of the hill. Mixed jungle and shrubs. Red soils over a layer of <i>muram</i> mixed with boulders and pebbles.	Neolithic: celt and ring stone of dolerite.
Rupabalia Reserved Forest (RRR) (20° 46'N; 85° 40' E)	Dhenkanal	5km away from the right bank of river Brahmani and on the close proximity of palaeochannels. The site is located on the horse shoe shaped valley on the southern side of Rupabalia hill bordering village Nathua. Fairly dense mixed jungle mainly <i>sal</i> . Red soil of secondary laterite deposit.	Mesolithic: fluted core and blade of jasper. Neolithic: chisels, adzes, axes, celts, ring stones and debitage of dolerite (Pl. 50). Hand made crude potteries of dull red ware. A neolithic tool manufacturing primary site. Iron Age: slags indicating iron smelting evidences.

Village/Site	Tehsil	Geomorphology	Nature of Remains
Sankulei (SKL) (20° 43'N; 85° 35' E)	Dhenkanal	1km away from the right bank of river Brahmani and also the right bank of Badajora, a tributary of Brahmani. The site is located on the northern slope of a rocky knob.	Neolithic: celt of dolerite. Ring stone of quartzite.
Sarakhia (SRK) (20° 41'N; 85° 38' E)	Dhenkanal	8km away from the right bank of river Brahmani. The site is located on the north-western foot hill of Megha hill. Open mixed jungle. Red soil of secondary laterite deposit.	Neolithic: chisel, axe, celt and ring stone of dolerite.
Sarakhia (SRK) (20° 41'N; 85° 38' E)	Hindol	5km away from the right bank of river Brahmani. The site is located on the slope of a small hillock called <i>Dosandhi parvata</i> . Open shrubs and <i>sal</i> forest. Red soil of secondary laterite deposit.	Neolithic: ring stone of dolerite.
Singha (SGH) (20° 48'N; 85° 47' E)	Gondia	Right bank of river Brahmani at a distance of 6km. Situated on the southern slope of <i>Aswakhola parvata</i> and reserve forest and to the north-east of the village. Dense mixed jungle and shrubs. Red soil of secondary laterite deposit.	Mesolithic: blades, scrappers and points of jasper. Neolithic: chisels and celts of dolerite. unfinished ring stone of quartzite.
Sogarapasi (SGS) (20° 44'N; 85° 40' E)	Dhenkanal	6km away from the right bank of river Brahmani and on the western side of a palaeo-channel to the south of the village. Red soil of secondary laterite deposit. Plain lands devoid of any shrubs.	Lower Palaeolithic: handaxes of quartzite (Pl. 49) Mesolithic: blade of agate. scraper, point, trapeze of jasper. Neolithic: celt of dolerite.

Village/Site	Tehsil	Geomorphology	Nature of Remains
Sundarakhal (SKL) (20° 39'N; 85° 37' E)	Dhenkanal	10km away from the right bank of river Brahmani and close proximity to a perennial stream. The site is located on the northern foot hill of Tigiria hill within the Megha reserve forest. Mixed dense jungle. Red soil of secondary morum deposit.	Neolithic: chisels of dolerite. Ring stone of sand stone.
Sundarapada (SPD) (20° 46'N; 85° 38' E)	Dhenkanal	1km away from the right bank of river Brahmani and on the right bank of river Badajora, a tributary of Brahmani. The site is located on the south-western slope of a small hillock.	Neolithic: celts of dolerite, unfinished ring stone of quartzite.
Tarabha (TRB) (20° 44'N; 85° 37' E)	Dhenkanal	3km away from the right bank of river Brahmani and on the right bank of river Badajora, a tributary of Brahmani. The site is located on the northern slope of Barakanya <i>parvata</i> . Open mixed jungle and shrubs. Red soil of secondary laterite deposit.	Neolithic: celt and debitage of dolerite. Ring stone of khandolite.
Tavapal (TVL) (20° 46'N; 85° 38' E)	Dhenkanal	1km away from the right bank of river Brahmani and on the right bank of river Badajora, a tributary of Brahmani. Cultivable lands. Alluvial soils of river deposit.	Medieval: mound with grey and red wares of Medieval period
Tubinali (TNL) (20° 43'N; 85° 32' E)	Hindol	3km away from the right bank of river Brahmani. The site is located on the south-western slope of a hillock. Shrubs and <i>sal</i> forest. Red soil of secondary laterite deposit.	Neolithic: celt and chisel of dolerite.

29. EXCAVATION AT KHAMESWARIPALI, DISTRICT SUBARNAPUR

The ancient mound of Khameswaripali (20°50'18.5"N; 84°02'55.0"E) is located about 5km south-west of Birmaharajpur town and about 12km east of the district headquarters of Subarnapur. Oriented north-west to south-east along the left bank of the river Mahanadi the mound is roughly oblong-shaped on plan, measuring about 130x80m in length and width. The south-western face overlooking the Mahanadi represents almost a vertical section, which rises to a height of about seven to eleven meters from the normal water level of the river. The village occupies almost the entire surface area of the existing mound. Intensive modern agricultural activities, mainly towards the north-eastern and northern parts and house building operations, besides seasonal floods, have already rendered serious damage to the ancient settlement.

The site was brought to light in 1994-95 and trial excavations were conducted during 1996-97 under the joint direction of Pradeep K. Behera and S. Pradhan, Department of History, Sambalpur University.

The excavation resulted a metal-free antecedent cultural phase characterised by the profusion of white-painted BRW potteries hitherto unknown in any other excavated sites in Odisha. The samples collected from the lower level of sub-Period IA in KSP-I and the upper level of sub-Period IB in KSP-III have provided calibrated radiocarbon dates as (IP-273) 1550 ± 60 BCE and (IP-307) 1065 ± 66 BCE, respectively. Further trial excavations were conducted during the season 2006-07 to determine the extent of Chalcolithic deposits at the site and to collect materials for radiocarbon dating under the direction of Pradeep K. Behera, Department of History, Sambalpur University. Four new Trenches, viz.

KSP-IY (measuring 2.5x2.0m), KSP-VI (measuring 2.5x2.0m), and KSP-VII (measuring 3.0x2.5m), were laid and Trench KSP-V (measuring 3.0x2.5m), was taken almost at the center of the mound. However, the 175cm thick habitation deposit in KSP-VII and that of 88cm thick in KSP-VI yielded cultural remains belonging to sub-Period IB, and Period II and III, traced during the 1996-97. Except a flat axe of iron from the deposit of Period II in KSP-VII, all other materials, viz. potteries, bone tools, etc., recovered during this season's excavation are similar in characteristic features to those yielded earlier. The trial excavations conducted at Khameswaripali revealed that it is a multi-period site, represented by Chalcolithic (Period I), Iron Age (Period II) and Late phase of Iron Age/Early Historic (Period III) habitation remains. On the basis of two available calibrated radiocarbon dates and comparative studies of cultural material remains it may be said that the Chalcolithic culture at Khameswaripali flourished between the second half of the second millennium BCE and early first millennium BCE and gradually it was succeeded by Iron-Age and Early Historic cultures. The early habitation area was confined to the northwestern corner of the existing mound and much of this (>90%) area has already been washed away through seasonal floods in the Mahanadi.

30. EXPLORATION IN THE DISTRICT SUBARNAPUR

D. N. Dimri assisted by K. P. Padhy, J. K. Patnaik, S. K. Kar, D. K. Lakhonde, R. Kumar of Bhubaneswar Circle of Survey carried out exploration in the foothill of Trikuta hill situated in Birmaharajpur sub-division of Subarnapur district and discovered a factory site of mesolithic period. The tools include blades, burins, points, lunates, fluted cores (Pl. 51),debitage, etc. and the materials are mainly of chert, jasper and agate (Pl. 52).



45



46

Middle Brahmani Valley: stone tools. See p.76



47



48

Middle Brahmani Valley: microliths and neolithic tools. See p. 79



49



50

Middle Brahmani Valley: 49, neolithic tools; 50, ring stones and mace heads. See pp. 81-80



51



52

Kotsamalai: 51, fluted cores and 52, microliths. See p. 83

31. EXPLORATION IN DISTRICT MAYURBHANJ

Bhubaneswar Circle of the Survey under the direction of D. N. Dimri assisted by J. K. Patnaik, S. K. Kar, D. N. Bhoi, D. K. Lakhonde and R. Kumar re-explored the site Kuchai in Mayurbhanj district and discovered one palaeolithic handaxe along with neolithic adzes and chisels. The pottery of the site recovered are crudely hand made red ware.

PUNJAB

32. EXPLORATION IN DISTRICT FIROZPORE (FIROZPUR)

Akshat Kaushik of Chandigarh Circle of the Survey explored 103 villages in Firozpur district under village-to-village survey scheme. Out of which 15 villages yielded antiquarian remains. (see Chart-V)

CHART-V

Name of Village	Tehsil	Antiquarian remains	Period
Barapovind	Zira	Burj	British period
Pheruke (Feroke)	Zira	Ancient mound	Late Medieval period.
Kabar Bachha (Kabrabachha)	Firojpur	Ancient mound	Historical period
Kamalgarh Kalan (Kamalgarh)	Zira	Palace	Historical period
Kamal Wala (Kanwalwale)	Makhu (Zira)	Ancient mound	Late Medieval period
Kassuana (Kassuwala)	Zira	Ancient mound	Historical period
Kassuana Ponchha Pir	Zira	Ancient mound	Historical period
Mallanwala (Mallawale)	Makhu (Zira)	Well	Early Historical period
Mansurdeva	Zira	Burj	Late Medieval period
Rode jalle Wala (Rod dewala)	Makhu (Zira)	Ancient mound	British period
Shahbux Bakar (Shahbukra)	Zira	Burj	Historical period
Shahidganj	Firozpur	Ancient mound	British period
Shekhwan Pind	Zira	Ancient mound	Historical period
Sodhiwala	Zira	Tomb (Paintings in blue, red and chocolate red colour depicting the scenes from the legend Hir Ranja)	Late Medieval period
		Ancient mound	Historical period
Zira	Zira	Jain mandir	British period
		Sarai	British period
		Gurudwara	British period

RAJASTHAN

33. EXPLORATIONS IN DEEG AND KAMA TEHSILS, DISTRICT BHARATPUR

Jaipur Circle of the Survey under the guidance of C. B. Misra assisted by Shiv Kumar Bhagat, K. L. Saini, Vivek Nigam and R. P.

Mathur surveyed 51 villages of Deeg and Kama tehsils of Bharatpur district and found thirty villages having remains of heritage buildings in the form of temples, pavilions, *ghats*, palaces, *kundas*, garden, natural and artificial caves and ancient archaeological sites. (see Chart-VI)

CHART-VI

Name of Site	Latitude & Longitude	Nature of remains
Punchhari	27° 27' 23" N; 77° 25' 57" E	<i>Chhatris</i> (one containing an inscription of 1846 CE), temples and <i>kundas</i> of 19 th -20 th century CE.
Kheda	27° 25' 33" N; 77° 24' 03" E	Early medieval remains
Didawali	27° 30' 16" N; 77° 18' 33" E	<i>Chhatri</i> (19 th - 20 th century CE)
Tankoli	27° 31' 13" N; 77° 17' 33" E	Temple (19 th - 20 th century CE)
Guhana	27° 32' 03" N; 77° 17' 11" E	Kushana period site
Khoh	27° 31' 43" N; 77° 15' 09" E	Early and late medieval remains
Adibadri	27° 31' 03" N; 77° 12' 20" E	Temple (19 th -20 th century CE)
Jhiri Kedarnath	27° 37' 14" N; 77° 11' 46" E	Rock shelter and <i>ekmukhi-linga</i> of early medieval period
Lahsar	27° 38' 34" N; 77° 13' 07" E	Mosque and <i>haveli</i> of late medieval period
Boulkheda	27° 39' 11" N; 77° 11' 30" E	Temple (19 th -20 th century CE)
Sunehra	27° 39' 00" N; 77° 20' 15" E	Temple remains of late medieval period

34. EXCAVATIONS AT ASTOLI NALA, DISTRICT BUNDI

The Acheulian site of Astoli (25° 25'N; 75° 34'E) is 7km to the west of district Bundi, was excavated jointly directed by Sheila Mishra of Deccan College and Riza Abbas of the Indian Rock Art Research Centre, Nashik, assisted by Sushama Deo, Shobha V, Prabodh Shilwarkar and Tosha Bantha.

The Acheulian artefacts are found in a quartzite rubble deposit exposed by the Astoli *nala* to the west of the village. The main objective of the excavation was to understand the typo-technology and frequency of cultural material belonging to the Acheulian tradition in these sediments and to document the nature of the rubble and understand its formation. The Astoli *nala* drains an area of Vindhyan quartzite which outcrops to the north of Astoli. The quartzite forms a ridge formed by dipping sandstone beds with the gentle slope towards Astoli. This quartzite hillslope is presently being quarried for rubble and building stone and removing the cover of weathered material. Acheulian artefacts and microliths are found on this surface. The foot of the hillslope Astoli *nala* exposes a 4 to 5m thick quartzite rubble. This rubble contains Acheulian tools but lacks any calcrete formation. A remnant of mediaeval mound overlies the rubble. Around half kilometer from the hill slope, the ongoing road construction has dug into the rubble deposit. The upper part of the rubble lacks calcrete but has developed a red colour, while the base of the rubble has calcrete coatings and nodules in the matrix. At this location (25° 25' 36.5" N; 75° 34' 32.5"E), Trench AST-2-A measuring 2x1.5m was laid out on top of the section exposed by the *nala* and excavated to the *nala* bed at a depth of 120cm. 472 artefacts were recovered from this Trench AST-2-B (25° 25' 35.7"N; 75° 34' 32.1"E) measuring 2x1.5m, was laid further downstream of the *nala*, in

the bed dug up to a depth of 178cm. About 700 artifacts belonging to Acheulian tradition were recovered from this trench.

35. EXPLORATION AND EXCAVATION OF ROCK-CUT CAVES, MALPURA, DISTRICT JHALAWAR

Rajendra Yadav of the Rajasthan State Archaeology and Museums, has discovered a group of five rock-cut caves at Malpura (75° 48' N; 24° E), Rajasthan 2.5km south of Kolvi and 14km north of Dag in tehsil Gangadhar. The area is an extension of Malwa plateau marked by several small lateritic hillocks and seasonal rivulets originated from the hilly slopes and finally meet to river Kyasari which is flowing near village Kolvi. A small hillock named as Bhutadia is situated about 200m south of village Malpura revealed evidences of six rock-cut caves which are now in ruined condition (Fig.11).

The caves are excavated in the flat topped lateritic formation on Bhutadia hill which are modest in size. Out of six, four caves are monasteries, one is stupa-shaped shrine and one is left incomplete. These monastic excavations are small and roughly square or rectangular on plan entered through a small entrance. The monastic excavation of Cave 5 is the largest measuring 5x4.6m while the smallest Cave 3 measuring 2.33x2.87m is in size. The interior walls of the caves are unfinished but plastered with mud mixed with cow dung, *murram* and hay. The Cave 4 is rectangular in shape measuring 4x2.90m. The dilapidated Cave 1 is a stupa-shaped shrine is most important among them. Located on the northern edge of the hillock, it is carved from a large isolated lateritic hillock from internally and externally like a temple. Facing east, the shrine consists of a square sanctum and an anti-chamber on the axial plan with an entrance on the east. Outwardly, in elevation the shrine has a moulded square platform with side projections on cardinal directions, an elon-

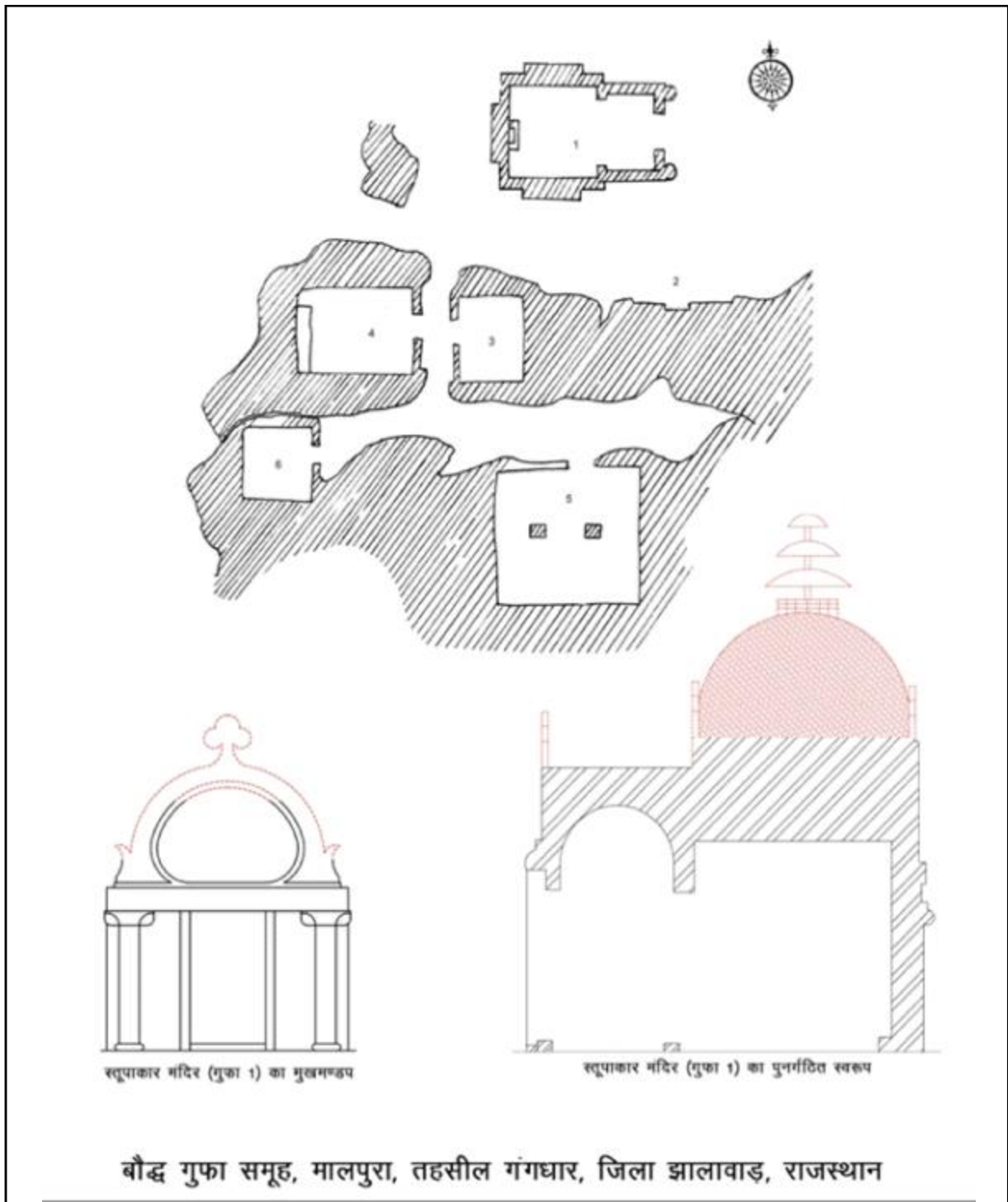


Fig.11: Malpura: Sketch-site plan of the caves and reconstructed front elevation and sectional-elevation of Cave 1 (stupa-shaped shrine). See p. 90

gated drum and hemispherical *anda* on the top of which is missing now. The elongated drum is separated from the *anda* by a set of a moulding, embellished with a large *chaitya*-window on their cardinal points (Pl. 53). Here, the central medallion of *chaitya* is circular and plain, while similar *chaitya*-windows of stupa-shaped shrines of Kolvi Cave 2 and Binnayaga Cave 14, depicts stupa in the centre of *chaityas*. The missing portion of the shrine seems to be low in height and partially structural. Perhaps, the crowning *harmika* and *chhatravali* of the shrine might be made of perishable material like wood as suggested by the evidences from other stupas in the neighbouring sites viz., Kolvi, Binnayaga, etc.

The sanctum is square on plan and it is plain inside with flat roof. A pedestal attached to the rear wall (west) of the sanctum carries a square recess in the centre for fixing a sculpture of Buddha (?). To the east of the sanctum a wide passage connected to the anti-chamber called as *mandapa* is having vaulted ceiling with *vallabhi* type of roof. The wide entrance of the *mandapa* has a plain doorjamb and a pilaster on either side crowned by *chaitya* dormer (Pl. 54). The square platform and superstructure of the shrine is diagonally broken and slides towards north while the roof of *mandapa* has fallen down inside the nave. Once, the stupa was externally and internally plastered with fine lime only traces of which are noticeable.

Conceptually, the rock-cut stupa-shaped shrine at Malpura is unique design having similarity with stupa-shaped shrines of Kolvi and Binnayaga and seems to be associated with Buddhist pantheon but without any inscription and sculptural evidence. These stupa-shaped shrines with *vallabhi* type of roof seem to emulate from Brahmanical temples which is prevalent in northern India during the 8th-9th century CE. On stylistic consideration,

the caves of Malpura may be assigned to circa 8th-9th century CE.

36. EXPLORATION OF ANCIENT MOUND, KHANDAR, DISTRICT SAWAIMADHOPUR

Rajendra Yadav, of the Department of Archaeology and Museums, Govt. of Rajasthan has discovered an ancient mound at Khandar, district Sawaimadhapur. Khandar, the tehsil headquarters is situated about 50km East of the Sawaimadhapur. The mound is located within the suburb of Khandar on the northern slope of the hillock and presently the southern part of the mound is partly under occupation while on the hill side (southern) is open. Several rain gullies have been formed due to high gradient of the hillock exposing cultural deposits of several centuries. The site has yielded a large number of red ware and associated grey ware datable to Kushana to Gupta periods. The main identifiable shapes, common in both red ware and grey ware are vases of different sizes and basins. Several broken stone pestles are found on the surface. There is an ancient ruined fort atop the hill, known as *Khandar* fort which witness the history of Early Medieval period to the modern period. There are several ruined temples, mosques, palaces datable to early medieval period to 18th century CE.

37. EXCAVATION AT ISWAL, DISTRICT UDAIPUR

Department of Archaeology of Institute of Rajasthan, Udaipur and Deccan College, Pune jointly excavated ancient site Iswal under directions of Lalit Pandey and Basant Shinde assisted by Jagdish Meena, Chain Singh, Kulshekhar Vyas and Hemendra Choudhary and students of Janardan Rai Nagar Rajasthan Vidyapeeth University (Pls. 55-58).

Iswal village (24°44'N; 73°37'E) is located about 20km north-west of Udaipur city on the Udaipur-Jodhpur State Highway. Iswal is surrounded on the west, south and east by

the hills known as Mandaro, Ada Magra and Kathriyeewani respectively. The ancient site, located to the north-west of the village is spread over an area of one square kilometer. Comprising several iron slag mounds on the eastern site and habitation area on the western side. The site is on the vicinity of iron ore mining.

During the last four seasons excavation at Iswal, the site has provided the evidence of iron metallurgical activities at industrial scale with the evidence that the inhabitants at Iswal were also engaged in glass production. Thus, the Iswal had gained the status of pyrotechnological activities at industrial scale. Besides the metallurgical activities the site also provides the evidence of habitation with the close proximity of the industrial activity area. Because of it, the present season's excavation work was focused in the probable habitation area. Therefore, the excavation team decided to continue the excavation at the habitation area to know about the material culture.

To fulfill the above objectives two new Trench HB 19 and HB 20 were laid down and also resumed the excavation in Trench HB 18 of the fourth season i.e., 2005-2006. Before the commencement of actual excavation, the team of the excavators cleaned the site. A coin of copper, a small brass bowl, a nail of iron and cowries recovered during the cleaning. The new Trench HB 19 and HB 20 divided into four quadrants i.e., south-west, south-east, north-west and north-east and the separate lot of numbers given to the each quadrant for digging. During the previous season, the Trench HB 18 had been dug only at the depth of 11.30m. Therefore, the excavation work resumed to expand the excavation in Trench HB 19 and HB 20 and to know the extension of stone walls which had been exposed during the previous season to determine the structural plan. The excavation Trench HB 18, HB 19 and HB 20

provided the evidence of stone structures of the various phases. Broadly these structural phases may be divided into Early Historic, Early Medieval and Medieval phases. The structures of Medieval phases were not distinctive because of the desertion of the site.

During the previous season the Early Historic phase was divided into two sub-phases phase I and phase II, but in the current season no remains of phase I could recover. In north-east quadrant of Trench HB 18, two walls were exposed. The surviving north-south wall measured 2.19m and the east-west wall measured 1.62m in length. The total coarse of both the walls were nine in number with a surviving height of 65cm. The floor level of this incomplete structure was made of clay and *kankar*. The remains of the iron slag and ash was also noticed. It appears that the early habitants were primarily engaged in iron metallurgical activities. The phase II A was restricted in last three layers (9) (10) and (11) only. The phase II A provides the evidence of habitation activities in abundance. During the course of excavation in south-east and north-east quadrant of Trench HB 18 two floor levels noticed out of which one floor level was made of slag and clay. It was about 9cm thick and it was at a depth of 11.85m. During the sieving of the soil, the remains of the charred bones were recovered which proved the human activities. The another floor which was beneath the former was made of pebbles and it was about 20cm thick. A semicircular stone structure also noticed at this floor level which was 20cm in length and it had a width of 15cm. It was full of ash. A saddle quern was recovered from the surroundings of the semi-circular structure in (north-east) quadrant of the Trench HB 18. It was in close proximity of the western section of the (north-east) quadrant of Trench HB 18. A good number of charred bones also recovered from the ash. It reflects that some kind of

cooking had been done there. A squarish structure in (south-east) Trench HB 18 also exposed during the course of excavation. It was made of mud and was spread in (east-west) and (north-south) direction. Its (east-west) direction was 75cm in length though its (north-south) direction had a length of 60cm. The central part of the structure was full of loose soil. Its measurement was 16x30cm. A stone of 25x21cm size was also exposed at its north-south direction. The upper surface of the whole area was covered with a layer of red thick soil. A good amount of ash and charcoal also recovered from it. During the course of excavation it observed that the surroundings of the squarish structure had been made quite compact. All the four corners were covered with the bricks and pebbles. Thus it was spread in an area of 82x53cm. On the basis of the circumstantial evidence, it can be presumed that the squarish structure could be the forging furnace.

During the course of excavation, no structural remains could be noticed in early historic phase IIB but the nature of the soil provide the evidence of human activities. The Layers (7) and (8) belong to this phase. Layer (8) on the top of Layer (9) is separated by a compact deposit of slag. The soil composition of both the (7) and (8) layers are quite hard. The Layer (7) measured 28cm thick and its colour was reddish-brown and shows certain kind of burning activity. A few broken brickbats also noticed from this layer. The Layer (8) measured 38cm thick and was sealed by a uniform level of slag at the top. The thickness, colour variation within the layer and its hardness compels to presume that it would have been used as a floor level.

On the basis of the structural remains, early medieval phase has also been divided into two phases i.e., phase I and phase II. The Layers (4) to (6) belong to the phase I and the Layers

(1) to (3) belong to the phase II. The structures of both the phases were spread in Trench HB 18, HB 19 and HB 20. The structures of phase I shows a clear distinction. Two phases of foundation walls provide the evidence that phase I, again, exhibits two sub phases i.e., phases IA and IB. The structural plan of phase IB was spread in all the three Trench HB 18, HB 19 and HB 20. A gap of 1.20m was also noticed in the (east-west) wall of the (north-west) and (north-east) Trench HB 18. Probably, it was the entrance gate. The structure of phase IA was also divided by brick wall. The brick wall was on the conjunction of Trench HB 19 and HB 20. The partition wall was found in (south-east) and (north-east) Trench HB 19 in (north-south) direction. The Medieval phase has been divided into two phases, Early Medieval and Medieval. The most of the pottery of Early Medieval phase are red ware. Again, the red ware has been divided into fine and coarse. The fine red ware includes spouted vessels and the bowls with knife edged bowls. Especially the bowls are properly baked and fine variety of clay has been used in them. In some sherds of fine red ware beautiful floral designs have also been marked. The coarse variety includes storage jars and basins. The red ware of medieval phase is coarse and some of them of have white bands on their body parts. The fine and coarse both the varieties of grey ware have been found in Early Medieval phase also. The fine variety of grey ware includes spouted vessels. The spouted vessels in grey ware are burnished and the outer surface of the spout has a pinkish red band. It is an unique pottery, which appears a distinctive regional feature of the site. The carinated *handis* are also the major form in grey ware and they belong to the coarse variety.

During the fifth season of excavation total eighty four antiquities recovered out of which thirty nine broken glass bangles, nineteen



53



54

Malpura: view of stupa-shaped shrine. See p. 92



55

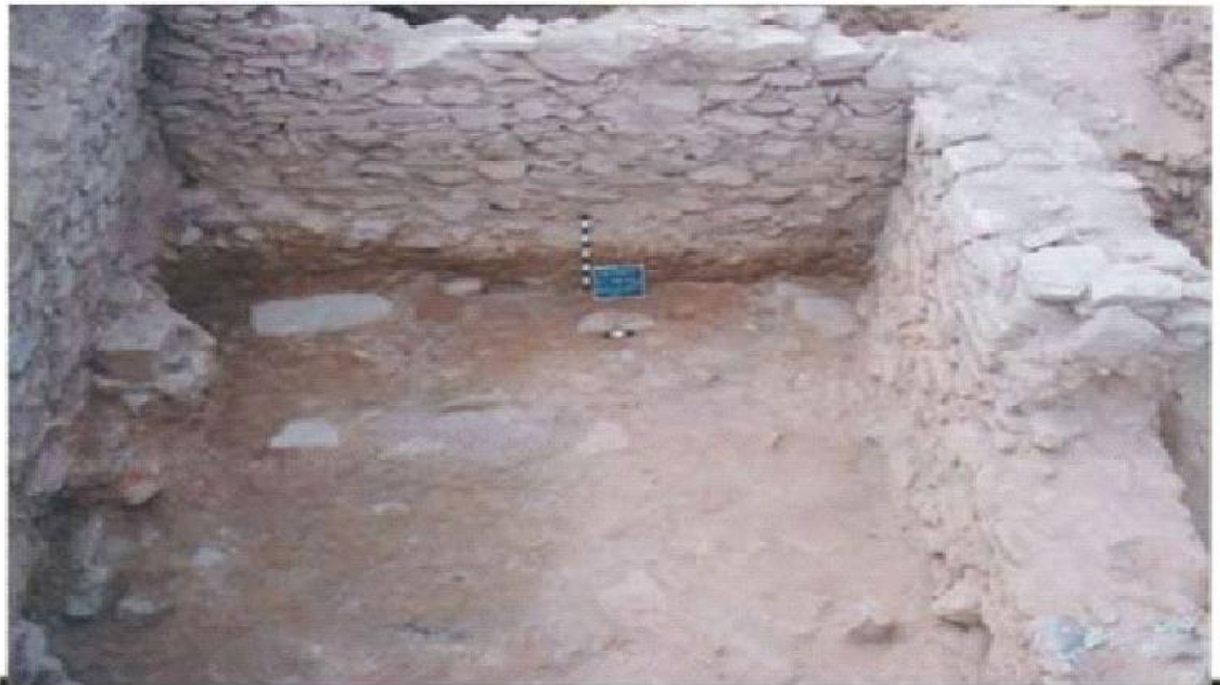


56

Isval: 55, stamped red ware and grey ware; 56, exposed brick wall structure. See p.92



57



58

Iswal: 57, hearth and burning activities; 58, exposed structure. See p. 92

fragments of ivory bangles and eleven nails of iron one intact rod two arrowheads and one axe of iron are major findings. All these findings belong to Early Medieval phase. A unique figurine of lord Ganesa is an important discovery from the Early Historic phase. It is made of schist and belongs to the Kushana period.

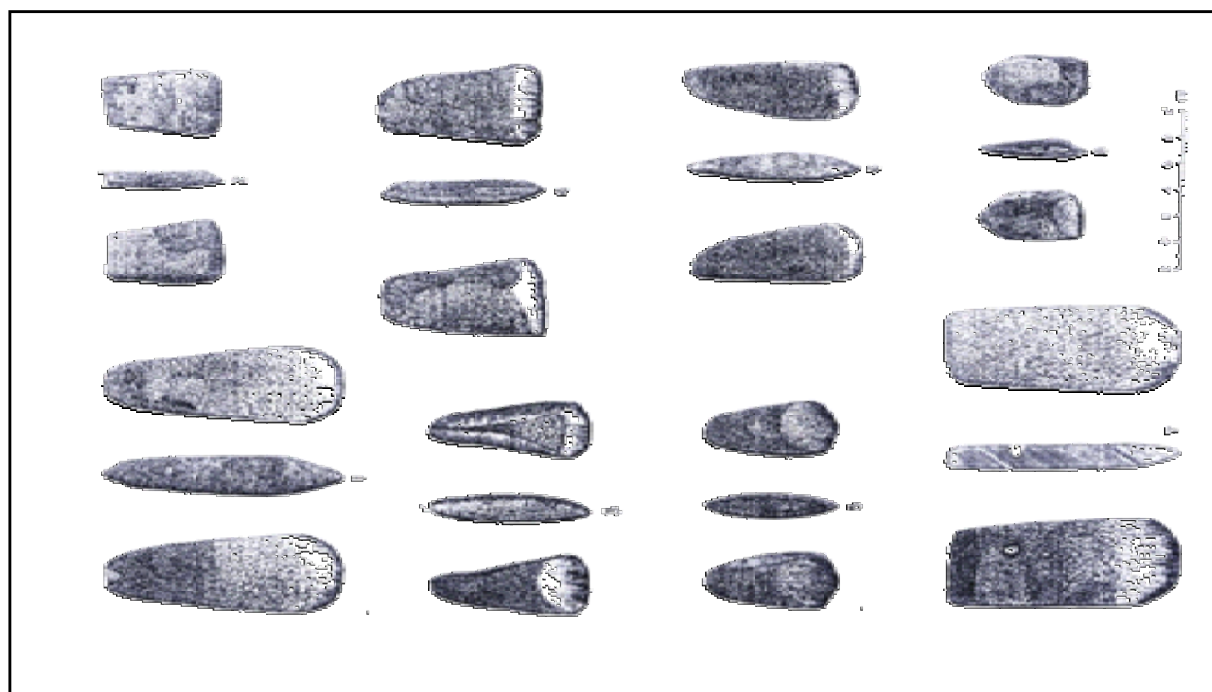
In (south-east) and (north-east) quadrant of Trench HB 18 the excavators reached on the virgin soil at a depth of 13.75m. The major composition of the virgin soil is red ochre. The last Layer (11) measured 12cm which was rested on the virgin soil. The major content of the Layer (11) was slag and ash. Thus, it appears that the earliest inhabitants at Iswal were the blacksmiths and they had settled there for the purpose of metallurgical activities. The material culture of various levels prove that iron working was the major activity of the inhabitants of the site.

SIKKIM

38. EXPLORATION IN DISTRICT EAST SIKKIM

Prehistory Branch of the Survey undertook exploration in East Sikkim district under the direction of D. Bhengra, assisted by Rajeev Dwivedi, Gajanan Laxmanrao Katade and Anil Kumar, K. M. Girhe, R. K. Dwivedi, N. K. Nimje and P. S. Pashine. Extensive exploration was carried out in Tista river valley and its tributaries. Exploration yielded eight sites namely, Aho Basti (88°31'N; 27° 16'E), Radang Basti (88° 32'N; 27° 15'E), Bhusuk (88° 40'N; 27° 18'E), Ahoyantam (88° 36'N; 27° 17'E), Pancheshamsing (88° 34'N; 27° 15'E), Namchepong (88° 39'N; 27° 14'E), Lingdok (88° 35'N; 27° 23'E), Aho Site (88° 37'N; 27° 16'E) with Neolithic tools (**Pls. 59-61**).

Plate 59



Neolithic tools from East Sikkim. See p. 98



60



61

East Sikkim: 60, neolithic tools and 61, Tista river valley containing neolithic tools. See p. 98

TAMILNADU

39. EXPLORATION IN DISTRICTS OF CHINGLEPUT, PONNEN, MADURANTAKAM, SRIPERUMBUDUR, KANCHIPURAM AND TIRUVALLUR

Explorations were undertaken by the Sharma Centre for Heritage and Environment (SCHE), under the direction of Shanti Pappu and co-direction of Kumar Akhilesh, in the basins of the rivers Arani, Kortallaiyar, Cooum, Adayar and Palar in Chingleput, Ponnem, Madurantakam, Sriperumbudur. The archaeology of the east coast of India forms a continuum ranging from Tamilnadu to Bengal, in particular as related to prehistoric sites in lateritic or ferruginous sediments. In order to examine the archaeology of coastal India, it is necessary to establish a clear database of the nature and context of these sites and to situate them within the framework of quaternary environmental changes. An attempt was also made to recover samples for obtaining chronometric dates and for sedimentology, micropalaeontology and pollen/phytolith analysis in order to investigate palaeoenvironments during the quaternary. A significant component included that of documenting the extent of destruction of archaeological sites in this region, to devise strategies for salvage archaeology which is to be undertaken in the next field season.

Survey was also conducted by this same team in the district of Kanchipuram, Tiruvallur with a focus on demarcating quaternary deposits; e.g., laterites, ferricretes, alluvial and colluvial deposits, marine, estuarine and Aeolian deposits within the study region. This was supplemented by satellite images provided by Indian Space Research Organisation (ISRO) /Regional Remote Sensing Service Center (RRSSC), Bangalore, for some regions studied. Survey forms consisted of recording more than 30 variables related to the geo-coordinates of the site, its area, artefact density, geographical and geomorphological context, culture sequence, stratigraphy, degree of integrity, etc. A database for the site was prepared and careful collection of lithics was made. The coordinates provided were taken at the centre of the area surveyed. Digital photograph was also employed and all data was entered into the computer for further processing. In the laboratory, detailed studies of the lithics are being carried out to ascertain the cultural phase represented, the technology and nature of cultural transitions through time and spatial variability of assemblage structure within and between sites. Localities studied not only included archaeological sites but also sections which had the potential for informing on quaternary stratigraphic sequences (see Chart-VII).

CHART-VII

LOCALITIES STUDIED IN DETAILS ARE GIVEN IN THE TABLE BELOW

Locality/Site	Latitude/Longitude (GPS)	Comments
Akkapuram	12° 58' 27" N; 79° 46' 00" E	Section
Alapakkam-1 quarry	13° 15.788' N; 79° 54.633' E	Acheulian within top 20cm of a lateritic gravel capping primary laterites. Artefacts (n) ⁶ =121 destroyed by quarrying

⁶. Number is referred to in the following pages as (n) only.

EXPLORATIONS AND EXCAVATIONS

Locality/Site	Latitude/Longitude (GPS)	Comments
Amerumbedu- Locality 1	13° 24.170' N; 80° 00.449' E	Acheulian artefacts embedded within lateritic sediments. Artefacts (n)=74 destroyed largely for cutting Kava-water channels and construction
Ammambakkam Quarry	13° 16.445' N; 79° 52.421' E	Acheulian tools within upper part of lateritic gravel. Artefacts (n)=231 destroyed by quarrying
Aryathur	13° 14' 10" N; 79° 51' 23" E	Section
Attantangal	13° 11.986' N; 80° 08.905' E	Previously reported. Section studied
Between Maduramangalam and Singalpadi	12° 57.662' N; 79° 47.47' E	Middle Palaeolithic in lateritic shingly gravels. Artefacts (n)= 13
Between Parandur Eri Madugu	12° 57.162' N; 79° 44.12' E	Acheulian to Middle Palaeolithic in gravels. Artefacts (n)=13
Between Singalpadi and Akkamapuram	12° 56.637' N; 79° 46.108' E	Middle Palaeolithic in lateritic shingly gravels. Artefacts (n)=7
Bommajikulam	13° 25.614' N; 79° 58.377' E	Acheulian artefacts embedded within lateritic duricrust. Artefacts (n)=61 destroyed largely for quarrying for road building
Bt. Alapakkam and Sengupram, Mailapur reserve forest	13° 16.318' N; 79° 55.014' E	Acheulian on surface of laterites. Artefacts (n)=87
Bt. Balakrishnapuram and Kannankotai	13° 24.075' N; 79° 38.333' E	Acheulian from within the the upper horizons of lateritic sediments and Middle Palaeolithic on the surface. Artefacts (n)=40 destroyed largely for quarrying
Bt. G.R. Kandigai and Amridamangalam	13° 23.930' N; 80° 03.274' E	Late Acheulian to Middle Palaeolithic artefacts on the surface of duricrust. Artefacts (n)=154 destroyed largely for quarrying/construction

Locality/Site	Latitude/Longitude (GPS)	Comments
Bt. G.R. Kandigai and Amridamangalam	13° 23.930' N; 80° 03.274' E	Late Acheulian to Middle Palaeolithic artefacts on the surface of duricrust. Artefacts (n)=154 destroyed largely for quarrying/construction
Bt. Injur-Ummipedu	13° 27.952' N; 80° 10.874' E	Section
Bt. Motur and Injambakkam. Motur locality 1	12° 54.035' N; 79° 42.911' E	Late Palaeolithic on surface Late Palaeolithic on surface. Artefacts (n)=47
Bt. Palavakkam and Karadiputtur	13° 20.120' N; 79° 57.973' E	Acheulian tools within lateritic sediments. Artefacts (n)=21 destroyed largely for quarrying
Bt. Perumbakkam and Gudapakkam	12° 30.894' N; 79° 48.219' E	Section
Bt. Placepalavam and Allikulli	13° 16.485' N; 79° 46.658' E	Acheulian on surface of colluvial gravel spreads. Artefacts (n)=28
Bt. Thervoy and Kollanur	13° 22.417' N; 80° 00.468' E	Acheulian to Middle Palaeolithic within lateritic gravels. Artefacts (n)=43
Bt. Manellore (Manallur) and Shankarnarayanapuram	13° 26.964' N; 80° 01.391' E	Section
Bt. Vedal to Karai	12° 52.647' N; 79° 44. 560' E	Late Palaeolithic on surface. Artefacts (n)=63
Btw. - Pallavada and Pondavakkam	13° 28.464' N; 80° 00.575' E	On the surface of duricrust overlying primary laterites artefacts are late Acheulian to Late Palaeolithic (n)=139 destroyed largely for quarrying
Btwn. Kilay and Appanayakankandigai	12° 59.366' N; 79° 54.847' E	On surface of lateritic gravel: Late Palaeolithic. Artefacts (n)=111
Budur	13° 24.932' N; 79° 57.600' E	Late Middle Palaeolithic artefacts embedded within duricrust. Artefacts (n)=151 destroyed largely for quarrying

Locality/Site	Latitude/Longitude (GPS)	Comments
Damal locality 1	12° 52.844' N; 79° 36.066' E	Destroyed for quarrying road building
Erumaivettipalayam	13° 14.453' N; 80° 07.321' E	Late Acheulian to Middle Palaeolithic on duricrust surface. Artefacts (n)=12 destroyed by quarrying
G. R. Kandigai	13° 23.635' N; 80° 03.515' E	Artefacts are late Acheulian to Middle Palaeolithic on the surface of duricrust. Artefacts (n)=56 destroyed largely for quarrying
Gollapalayam	13° 15' 52" N; 79° 01' 00" E	Section
Gollapalayam	13° 16.136' N; 79° 51.728' E	Acheulian on surface of lateritic colluvial gravels. Artefacts (n)=56
Govindavadiagaram complex	12° 57 095' N; 79° 39.879' E	Section
Gunipalavam colony	13° 17.502' N; 79° 49.847' E	Acheulian on surface of lateritic colluvial gravel. Artefacts (n)=84
Gunipalavam quarry	13° 16.706' N; 79° 50.360' E	Acheulian within lateritic sediments. Artefacts (n)=150 destroyed by quarrying
Gurupuram complex	13° 14.925' N; 79° 57.379' E	Acheulian artefacts within upper horizons of a lateritic sediment, capped by lateritic gravel lag with Late Middle Palaeolithic artefacts. Artefacts (n)=337 destroyed by quarrying
Irungattukottai	12° 59.244' N; 79° 58.686' E	Section
Kalakalavada	13° 14.926' N; 79° 49.831' E	Acheulian associated with colluvial gravels. Artefacts (n)=100
Kambirajapuram	12° 45.000' N; 79° 47.765' E	Late Acheulian to Middle Palaeolithic on surface. Artefacts (n)=53

LOCALITY/SITE	Latitude/Longitude (GPS)	Comments
Kambirajapuram complex	12° 45.000' N; 79° 47.765' E	Middle to late Palaeolithic on surface. Artefacts (n)=53
Kammavaripalem	13° 15' 25" N; 79° 59' 05" E	Section
Kanjipadi	13° 12' 00" N; 79° 48' 00" E	Acheulian on surface of lateritic colluvial gravels. Artefacts (n)=11
Karadiputtur	13° 21.933' N; 79° 57.450' E	Acheulian from within lateritic sediments in quarry sections and late Middle Palaeolithic embedded within the duricrust. Artefacts (n)=104 destroyed largely for quarrying
Katpuli (Navalakuppam)	13° 16.299' N; 79° 56.565' E	Acheulian artefacts on the surface of the duricrust. Artefacts (n)=103
Kattagudalur reserve forest	12° 27.450' N; 79° 47.015' E	Middle to late Palaeolithic on surface. Artefacts (n)=132
Kilacheri (on road between Perambakkan and Mappedu)	13° 02.075' N; 79° 50.806' E	Middle Palaeolithic in lateritic shingly gravels. Artefacts (n)=10
Kilay complex	12° 59.027' N; 79° 56.042' E	On surface of lateritic gravel. Late Palaeolithic artefacts (n)=121
Kirinayattam	13° 40' 06" N; 79° 46' 10" E	Section
Koliyqlam -1	12° 32.160' N; 79° 48.802' E	Section
Kondansarai	12° 58.323' N; 79° 35.207' E	Late Palaeolithic and Middle Palaeolithic on surface. Artefacts (n)=27
Kunjaram complex	13° 15.655' N; 79° 53.533' E	Artefacts (Late Middle to late Palaeolithic) on surface of lateritic uplands. Artefacts (n)=1156 destroyed for quarrying and construction of village houses, tanks, etc.

Locality/Site	Latitude/Longitude (GPS)	Comments
Kunnam complex	12° 53.587' N; 79° 52.830' E	On surface of lateritic gravel: Late Palaeolithic artefacts (n)=114
Kunnankolatur	12° 35.928' N; 79° 52.829' E	Section
Kunnavakkam hills	12° 50.456' N; 79° 54.784' E	Section
Kutchchur 1	13° 17.239' N; 79° 53.847' E	On the surface of lateritic gravel: Middle to late Palaeolithic: artefacts (n)=25 destroyed largely for quarrying
Malaivavaivavur	12° 33.716' N; 79° 53.476' E	Section
Malayankulam	12° 42.243' N; 79° 47.957' E	Middle to late Palaeolithic on surface. Artefacts (n)=114
Mallyakaranai Madugi	12° 37.779' N; 79° 47.414' E	Section
Manjankaranai	13° 16.094' N; 80° 06.847' E	Previously reported. Section studied
Mannur	13° 01.054' N; 79° 57.561' E	Late Palaeolithic on surface of laterities artefacts (n)=27 destroyed by construction of colleges
Melmaligaipattu	13° 17.333' N; 80° 00.162' E	Acheulian artefacts within ferruginous gravels derived from Satyavedu artefacts (n)=98 destroyed by quarrying
Mettupalayam complex	13° 14.075' N; 79° 49.627' E	Acheulian within lateritic gravels. Artefacts (n)=107
Mettur to Mettupalayam	13° 40' 06"-13° 45' 08"N; 79° 49' 00"- 79° 47' 00"E	Section-Section
Mummadikuppam-Kottayur	12 59.504" N; 79 52.637"E	Acheulian within lateritic sediments. Artefacts (n)=133 destroyed largely for quarrying
Nambakkam hill	13° 14.082' N; 79° 51.136' E	Acheulian to Middle Palaeolithic on surface of lateritic gravels in upland outliers of Allikulli hills. Artefacts (n)=159

Locality/Site	Latitude/Longitude (GPS)	Comments
On the road between Alapakkam-Uttirampattu	12° 55.231' N; 79° 30.450' E	Late Palaeolithic and Middle Palaeolithic on surface. Artefacts (n)=9
On the way to Kattubanikandrigai	13° 16.299' N; 79° 56.565' E	Section
Opasamudram	13° 29.311' N; 80° 09.664' E	Section
Oragaddam	12° 50.402' N; 79° 56.093' E	Section
Orattur-1	12° 29.436' N; 79° 47.610" E	Middle to Late Palaeolithic on surface. Artefacts (n)=17
Pallavada quarry section	13° 28.337' N; 80° 01.509' E	Late Acheulian to Middle Palaeolithic in the top 20cm of a lateritic gravel resting on a primary lateritic sequence Artefacts (n)=53 destroyed largely for quarrying
Panapakkam	12° 51.523' N; 79° 58.152' E	Section
Parandur	12° 56' 33" N; 79° 44' 20" E	Section
Parikulam	13° 11' 00" N; 79° 52' 00" E	Section
Peddeatapakkam	13° 29.294' N; 79° 58.773' E	On the surface of duricrust overlying primary laterites. Artefacts are Late Acheulian to Middle Palaeolithic Artefacts (n)= 89 destroyed largely for quarrying
Pennallur	12° 59.127' N; 79° 58.834' E	On surface of lateritic gravel: Late Palaeolithic on surface of lateritic gravel. Artefacts (n)=24 destroyed largely for industrial construction
Perumbakkandigai	12° 23.665' N; 79° 49.879' E	Section
Picchivakkam: deposits of the Coom	13° 00.382' N; 79° 45.144' E	Section

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Locality/Site	Latitude/Longitude (GPS)	Comments
Polivakkam	13° 03.899' N; 79° 54.938' E	Middle Palaeolithic in lateritic shingly gravels. Artefacts (n)=25
Poongalum village	13° 28.959' N; 80° 10.737' E	Section
Pungalum locality 2	13° 28.968' N; 80° 10.665' E	Section
R. Kortallaiyar section at anicut near Simaveram	13° 15.754' N; 80° 15.240' E	Section
R. Palar Pudur North Bank	12° 51.513' N; 79° 30.630' E	Section
Ramchandrapuram-complex	13° 26.556' N; 80° 12.971' E	Late Acheulian to Middle Palaeolithic on surface of primary laterite artefact (n)=41 destroyed largely for quarrying
Ramnathapuram complex	13° 16.027' N; 79° 52.997' E	Late Palaeolithic tools within a lateritic grace. Acheulian embedded within underlying lateritic sediments. Artefacts (n)=220
Rangapuram	13° 13.186' N; 79° 51.943' E	Middle Palaeolithic on surface of lateritic gravels in upland outliers of Allikulli hills. Artefacts (n)=531
River Arani-section at Kuppam	13° 21.800' N; 80° 15.464' E	Section
River Arani: section at Lingapaiyanpettai	13° 20.585' N; 80° 13.364' E	Section
Senrayanpalayam quarry	13° 14.453' N; 79° 50.274' E	Acheulian within lateritic gravels. Artefacts (n)=57 destroyed by quarrying
Singadivakkam complex	12° 52.306' N; 79° 47.851' E	Within fluvial gravels: Middle Palaeolithic artefacts (n)=381 destroyed for construction of factory
Sirunai quarry	12° 53. 849' N; 79° 38.318' E	Late Palaeolithic on surface. Artefacts (n)=659

Locality/Site	Latitude/Longitude (GPS)	Comments
Siruvallupettai	13° 23.780' N; 80° 4.656' E	Late Palaeolithic to microlithic artefacts occurring within a sandy lateritic deposit resting on compact indurated ferruginous silts. Artefacts (n)=453 destroyed largely for quarrying
Sittatur	12° 33.729' N; 79° 49.398' E	Section
Situnjeri	13° 17.230' N; 79° 53.369' E	Acheulian artefacts on surface in association with Satvavedu Fm. gravels. Artefacts (n)=51 destroyed by quarrying
Srikrishnapuram	13° 17' 03" N; 79° 00' 50" E	Section
Srikrishnapuram gully	13° 17.136' N; 79° 51.399' E	Acheulian within colluvial lateritic gravels. Artefacts (n)=37
Srinivasapuram Kandrigai	13° 18.137' N; 79° 50.661' E	Acheulian to Middle Palaeolithic on surface of colluvial gravels. Artefacts (n)=29 destroyed by quarrying
Takkolam: confluence of the Cooum and Kortallayar	13° 01.236' N; 79° 44.176' E	Section
Tammanur-1	12° 45.624' N; 79° 47.931' E	Section
Todukadu section	12° 59.852' N; 79° 55.850' E	On surface of lateritic gravel: Late Palaeolithic on surface of lateritic gravel Artefacts (n)=130
Ulandai	13° 00.365' N; 79° 54.084' E	Late Palaeolithic on surface of lateritic gravels and few reworked Acheulian. Artefacts (n)=12 destroyed by quarrying
Vadamadurai	13° 17.505' N; 80° 02.138' E	Previously reported. Section studied
Vedavakkam	12° 32.796' N; 79° 53.732' E	Section
Veliyur	12° 55' 35" N; 79° 42' 00" E	Section
Vendivakkam well section	12° 40.633' N; 79° 49.217' E	Section
Virangivedu Madugu	13° 21. 711' N; 80° 12. 814' E	Section
Yigavaripalayam complex	13° 26.347' N; 80° 04.668' E	Late Acheulian to Middle Palaeolithic on surface of primary laterites: Artefacts (n)=404 destroyed largely for quarrying

As a result of these studies, a database of sites, stratigraphy and culture sequence is being constructed for northern Tamilnadu. The quaternary geomorphological history of the region, in relation to changing hominin land use patterns could be focused on. As regards the Holocene a clear mapping of the palaeo-channels of the palaeo-palar could be achieved and field studies led to the sampling of these deposits for purposes of sedimentological studies and for collecting Optically Stimulated Luminescence (OSL) and C^{14} samples for geochronology. Aeolian deposits along the shores of the Pulicat lagoon and coast, could be sampled for the same purposes, in order to build up a sequence for Holocene sea level changes in the region. Sections noted at and south of the modern course of the River Cooum, were identified as palaeo-channel deposits. The horizon for the Acheulian varied greatly. While sites such as Attirampakkam (Manamedu) yielded Acheulian within Argillaceous deposits and lateritic gravels, as per our excavations, this was not so in other regions. Acheulian occurs within the top 20-30cm of lateritic gravels (either cobbly-pebbly or sandy in nature), resting on pre-to early Pleistocene lateritic profiles developed on sandstones or shales, etc. In most cases, late Acheulian to middle palaeolithic tools are embedded within a lateritic lag gravel and embedded within the duricrust, which are capped by archaeologically sterile reddish-brown indurated sands. Middle Palaeolithic tools also occur on the surface of lateritic gravels, within fine sandy-pebbly lateritic gravels, non-ferruginous fluvial pebbly gravels, or on the surface of weathered granite 'murrum'. Numerous sites which may be termed as falling within a Late Palaeolithic phase were noted. These are characterized by an assemblage which is neither typically Upper

Palaeolithic blade-based, nor truly microlithic. Their relationship to the other assemblages needs to be ascertained.

A significant feature of this season's field work was the documentation of sites which are being rapidly destroyed by quarrying for purposes of road-building, lining of canals, construction, and industrial development and cultivation. Many of these sites could be documented and artefacts could be studied. However, in many cases, clear sections were not visible and thus it is deemed essential that during the next season, test pits might be taken to study these sites in detail before they disappear completely, destroying the last vestiges of this region's prehistoric heritage.

40. EXCAVATION AT SALAVANKUPPAM, DISTRICT KANCHIPURAM

The Chennai Circle of the Survey continued the archaeological excavation at Salavankuppam (12°39'25"N; 80° 12'52"E) a coastal village in district Kanchipuram under the direction of Sathyabhama Badhreenath assisted by G. Thirumorthy, J. Kuppusamy, R. Manikam, H. Ragavendra and N. Muthusamy with a view to trace out the possible plan and elevation details of the buried structures of the ruined Subramanya temple.

The removal of accumulated sand just 130m from the coastal line of the Bay of Bengal, had revealed (2005-06) temple remains consisting of *garbhagriha*, *ardhamandapa* and *mukhamandapa* all enclosed by a cloister *prakara*. The excavation work had yielded pottery, antiquities and inscribed pillars dating back to Pallava and early-Pallava periods. Further excavation work was continued with a view to trace out all the possible structural remains of the temple especially its complete plan and elevation details. The archaeological excavation work in

an area of 70m (north-south) and 40m (east-west) had revealed the north oriented temple consisting of *garbhagriha*, *ardhamandapa* and *mukhamandapa* enclosed by a cloister *prakara* of 35.45m (north-south) and 18.30m (east-west) and *mahamandapa*, stone platforms and ring wells further north of *mahamandapa*. The sanctum (*garbhagriha* and *ardhamandapa*) is rectangular and measured 7.50m (east-west) and 8.00m (north-south). It is built with bricks. The *garbhagriha*'s brick walls measure 2.65m thickness on east and west, whereas its thickness varies on south and north as they measure 2.75m and 3.35m respectively. The *garbhagriha* inner hollow portion 2.20m (east-west) and 2.00m (north-south). It has a strong brick foundation built upon four courses of laterite blocks. The brick wall of *garbhagriha* has twentythree courses of brick to a height of 2.45m. The *garbhagriha* inner hollow portion was filled with rammed earth and it was provided with thin granite slabs at the plinth level. The bricks of *garbhagriha* measure 40x21x7cm.

The *ardhamandapa* is 2.30m. (north-south) and 3.50m (east-west) and it is raised along with *garbhagriha* on same foundation as a single unit. The walls of the sanctum were covered with fine lime plaster which is well preserved on northern side only. The wall above the plinth of the *ardhamandapa* has brick core veneered by granite cut stones. The sanctum is approached by stone steps of width 1.4m on lateral sides of the *ardhamandapa* which have been subsequently made defunct by the construction of a stone *ardhamandapa*. The extant *mukhamandapa* measures 9.10m (north-south) and 7.65m (east-west). It is built with cut stones and the core is filled with stone rubbles. It has a height of 2.00m. The *mandapa* has four sockets at the centre. The sockets which are rectangular and measures 30x17cm

and they must have intended for ejection of stone pillars.

The brick sanctum with *mukhamandapa* and the elliptical rock are covered by cloister *prakara* 35.45m (north-south) and 18.30m (east-west). The walls are built with bricks of the same size of the sanctum. It has width of 2.50m with the outer and inner veneer walls measure 0.55m thickness. The core of the *prakara* is filled with brick bats and lime mortar. The walls were covered with fine lime plastering. Stone pillars are erected at a regular interval of 3.30m. One of the pillars on south western corner has the inscription of the Rashtrakuta king Krishna III (936-967 CE). The walls on northern sides which are adjacent to the sanctum are less damaged as they measure a maximum height of 2.35m. The cloister *prakara* on northern side is important as it exhibits the *Tripatta kumuda* moulding as its bottom. The walls on the eastern side are leaning towards western side which indicates that damage might have been caused by the tidal action. Fine river sand was encountered at a depth of 3.65m.

A completely ruined *mahamandapa* has been traced out just in front of *mukhamandapa* but outside the cloister *mandapa* probably of a later period. It measures 10.50m (north-south) and 7.80 (east-west) on an elevated area of about 1.15m height. The stone pillars and small cut stones are arranged for wall like alignment on west and northern sides are extant. One of the broken pillars on northern side bears an inscription belongs to characters of 8th century CE. The *mahamandapa* is important as it contains a unique stone spear 1.75m height. A rare cylindrical stone pillar 1.70m length 0.18m diameter with flutings lies nearby. A rectangular stone platform was found 1.40m to the north western corner of ruined *mahamandapa*. It was found at a depth of 1.15m. It measure 1.50m

(north-south) and 0.75m (east-west). The stone platform was lined with two course of bricks at its edges and it was sloping towards north. Another stone platform circular in shape was encountered 2.60m to the east of the rectangular stone platform and at the same level. The circular stone which was having two portions measures 1.25m diameter. A rectangular stone slab (97x3x7cm) was found to have placed over the circular stone slab. The circular stone slab was also lined with two courses of brick at its edges. Two terracotta ring wells were encountered on the northern side of the temple but at different levels. One of the ring wells was encountered on north-western corner of the temple. A total number of four courses were exposed. Each ring well measured 0.88m diameter and a height of 0.20m. The other terracotta ring well was found 5.25m to the north of ruined *mahamandapa*, but at a depth of just 1.15m. The ring well was small and measured 0.70m diameter. The top of the ring well had circular ornamental motifs.

A fallen brick wall runs in (north-south) orientation was encountered at a depth of 1.00m on north western corner of the temple. It has width of about 0.60m. The bricks are laid with clayey earth as binding material. The wall runs towards north, to a length of 16.0m. The wall seems to have been displaced on the eastern side. At its southern end were found buried two numbers of grinding stones in inverted position. These grinding stones are made of granite and sandstone respectively.

It is important to record the occurrence of thick deposit pure lime paste on north-western corner of the *mukhamandapa*. An area of 2.50x1.20m to a thickness of about 0.15m was found to have pure lime paste along with terracotta ring well portions.

The excavation of the ruined temple has already revealed stone pillars with inscriptions

in *grantha* and Tamil belonging to Pallava, Rashtrakuta and Chola dynasties. Few more inscriptions were discovered in this season including an inscription of Pallava King Nripatungavarman, a certain chieftain named Tirukin Kilavar and Chola Raja Raja I (985-1012 CE). The inscription of Pallava chieftain records the gift of 5 *kalanju* of gold towards supply of oil for burning the perpetual lamps.

The excavation work has yielded pottery, specially moulded bricks, roofing tiles, stucco figurines, terracotta lamps and figurines, copper objects belong to the period right from early historic times i.e., about 2nd-3rd century CE to c.13th century CE. Besides the pottery of red ware, red shipped ware, orange slipped ware and course red ware, a Chinese Celadon ware was also found. Bowls, shallow dishes and dish on stand were main pottery types. Storage vessels were also recovered. A few bottom portions of conical jars were also found. Important terracotta objects include a solid terracotta figurine of Nandi (28cm length), two terracotta object (spirally designed), 16cm width with a hoard of twenty six terracotta votive lamps with a small votive semiprecious stone *Siva-linga*, a copper spoon, specially moulded bricks such as bar bricks (18x6x6cm), brick with edging, curve bricks, and a brick (20x25x5cm) with chequered pattern are important. A few stucco figurine include head of a man and portions of lime plaster with floral designs, lime plaster covered with red ochre are also important. A few furnace pipes, copper slags and iron slags were also recovered during excavation.

41. EXCAVATION AT NEDUNKUR, DISTRICT KARUR

A systematic excavation at Nedunkur 25km from Karur (10°57'N; 77°57'E) in Aravakurichi *taluk* of Karur district was carried out. During exploration in and around

Nedunkur village megalithic appendages (**Pl. 62**) viz., black and red ware sherds and iron objects (**Pl. 63**) were collected from the mound, called Nattam *edu* an important historical town as it is located on the ancient Rajakesari highway, which connects both west and east coast of South India. This highway goes through the Palaghat pass and connects the important-trading center of ancient period. Excavation conducted in the habitation site as well as in burial site yielded black and red ware sherd, coarse red ware sherds, black ware sherds and iron objects viz., knife, arrow heads and spear. More than fifty potsherds with varied forms of graffiti (**Pl. 65**) marks were unearthed from the five trenches (named NDR) laid at Nedunkur. The occurrences of few urns and Sarcophagus in broken condition were also noticed in the cairn circle type of burial. Nedunkur excavation has revealed the presence of iron age culture i.e., 300BCE to 300 CE.

42. EXCAVATION AT MANGULAM, DISTRICT MADURAI

Excavation at Mangulam Village 25km from Madurai, (10°02'N; 78°17' E) known for early Jaina caves and rock beds in the hillock called Ovamalai was conducted under the direction of Sitharam Gurusurthy, Principal Commissioner of Archaeology assisted by C. Santhalingam and Thiru. S. Selvaraj and Dharmapuri N. Marxia Gandhi. In order to trace the early habitation excavation was conducted under the direction of four trenches (MKM) were laid accordingly. The first trenches laid near Meenakshipuram at the foot hills of Ovamalai. Potteries viz., black and red ware sherds, coarse red ware sherds, pieces of quartz stones, small sling stone and a copper coin (at 15cm depth) of Pandya period were collected from the trench. A circular coin datable to 13th-14th century CE found with two fish symbols in the obverse side. Trenches laid

on the terrace of Jaina cave exposed the flooring of a rectangular chamber and brick wall, made of eleven courses of bricks. The size of the bricks are 35x18x6cm and the clay mortar has been used as binding material. Fourth trench exposed a small structure in pedestal form, which may be assigned to Sangam period. Iron nails (**Pl. 64**), grooved tiles with holes hand made coarse red ware sherds were also collected from this trench. Excavation has exposed the presence of two cultural periods viz., Early Historic and Medieval period. On the basis of the antiquities it can be ascertained that this village has been inhabited since 300BCE.

43. EXCAVATION AT SEMBIAN KANDIYUR, DISTRICT NAGAPATTINAM

Exploration of the site of Sembian Kandiur (11°06'N; 79°34'E) was conducted by the Tamilnadu State Department of Archaeology, under the guidance of Sitharam Gurusurthy assisted by S. Vasanthi, S. Selvaraj, P. Gouthamaputhiran and G. Muthuswamy unearthed antiquities pertaining to Megalithic period. Totally four trenches were laid at the potential sites named as Trench SKR-I to SKR-IV (**Pls. 66-67**). Excavation unearthed potteries viz. black and red ware, black ware, red slipped ware and coarse red ware in good numbers. Big and small pots, lids and plate and thirteen graffiti marks were observed on the potteries collected at Sembian Kandiur. Iron objects viz. nails, knives, hip-hops made of terracotta and stones were also recovered from the trenches. Besides this, occurrences of eight urns in a row were also exposed during excavation, in Trench SKR-II. A celt commonly found in the urn burials in Tamilnadu also unearthed from the Trench SKR-III. On the basis of antiquities, it is ascertained that Sembian Kandiur was inhabited by the Iron age people 2000BCE.



62



63

Nedunkur: 62, cist burial; 63, iron objects. See p. 112



64



65

Mangulam: 64, iron nails; Nedunkur: 65, graffiti potsherds. See p.112



Sembian Kandiur: small celt and pot with graffiti. See p. 112

44. EXPLORATION/VILLAGE TO VILLAGE SURVEY, TALUK GINGEE, DISTRICT THANJAVUR

Under Exploration village to village survey in the Gingee *taluk* of Villupuram district,

Arun Malik of Chennai Circle of the Survey explored the following sites (see Chart-VIII).

CHART-VIII

Village/Site	Latitude & Longitude	Cultural assemblage
Alumpundi	79° 15' 30.2" N; 120 14'15.2"E	Temple site (Siva-linga in open field)
Bhardantangai	79°20' 23.9" N; 12°14'24.0"E	Ruined Pilliyar Kovil (Ganesa temple)
Devadanampatti-I	79° 20' 46.4" N; 12° 1 T03.2"E	Megalithic site, early historic site and ruined Siva temple
Devadanampatti-II	79° 18' 06.2" N; 120 10'23.7"E	Megalithic site, rock shelter with paintings of later period
Nailanpllai Pettai	79°15' 25.5" N; 12°10'11.3"E	Early Medieval site

Village/Site	Latitude & Longitude	Cultural assemblage
Odiyathur	79° 21' 40.7" N; 12° 12'08.2"E	Early Historical site and inscription
Pakkam	79° 16' 21.1" N; 12° 1' 52.1"E	Megalithic and ruined Siva temple of early Medieval period
Palavalan	79° 16' 11.6" N; 12° 07'57.4"E	Ruined Siva temple (Eswareshwara temple) and ruined fortress of foot hill
Perungapur	79° 22' 01.6" N; 12° 13'39.0"E	Early Historical site
Puttagram	79 °15' 30.4" N; 12° 12'53.5"E	Loose sculpture of late Medieval period
Ramarajan Pettai	79°16' 28.4" N; 12° 08'39.1"E	Medieval inscription on a boulder in the field
Sattavari	79° 16' 01.3" N; 12° 09'50.3"E	Pre-historic rock shelter with paintings, early medieval site, loose sculptures of Mahishasuramardini and Saptamatrikas
Semmedu	79° 16' 51.2" N; 12° 14'17.10022"E	Ruined Siva temple Chola period
Tadagam	79° 15' 39.8" N; 120 09'04.2"E	Loose sculpture of Lord Visnu and Ganesa of Medieval period

45. EXPLORATION IN TALUK TIRUVAIYARU, DISTRICT THANJAVUR

Chennai Circle of the Survey, noticed the following antiquarian remains(see Chart-IX).

In the course of exploration under village to village survey scheme in the Tiruvaiyaru taluk of Thanjavur district, C. R. Gayathri of

CHART-IX

Village/Site	Latitude & Longitude	Cultural assemblage
Agarapatti	78°54'40.0" N; 10°50' 29.0"E	Medieval temple ruins
Arcadu	78° 58'00" N; 10° 49' 00"E	Early historical site, early Chola temple, brick <i>mandapam</i>
Kachchamangalam	78° 58' 03" N; 10° 49 ' 04"E	Medieval temple and habitation site

EXPLORATIONS AND EXCAVATIONS

Village/Site	Latitude & Longitude	Cultural assemblage
Agarapatti	78°54'40.0" N; 10°50' 29.0"E	Medieval temple ruins
Arcadu	78° 58'00" N; 10° 49' 00"E	Early historical site, early Chola temple, brick <i>mandapam</i>
Kachchamangalam	78° 58' 03" N; 10° 49 ' 04"E	Medieval temple and habitation site
Kuttur	78° 58 '44" N; 10° 52' 08"E	Medieval ruined temple and loose sculptures
Maharajapuram	78° 59' 45"N; 10° 52' 08"E	Temple ruins, inscription and potsherds
Marneri	78° 54" 42" N; 10° 48 '43.6"E	Early Chola temple, sculptures and inscriptions
Nattamangalam	78° 56' 15" N; 10° 58' 27"E	Early Historical site, Medieval temple, <i>Siva-linga</i> and Nandi in open field
Nemam	78° 55'35" N; 10° 50' 50"E	Early Chola temple with inscription, loose sculptures, few red ware potsherds
Palamaraneri	78° 56'39" N; 10 °50' 52" E	Mound with red ware and black ware potsherds, loose sculptures
Pavamangalam	78° 57' 50" N; 10°52' 21"E	Medieval <i>chhatram</i>
Rajagiri (liiangadu)	78° 55'39" N; 10° 50' 00"E	Temple ruins with inscription (Chola period) loose sculptures and potsherds of red ware
Sembiyankalari	78 °58'11" N; 10° 49' 01"E	Early Historical site, Jaina image and <i>Siva-linga</i> in open field
Tiruchchadaivalandai	78° 53'04" N; 10° 49' 01"E	Old sluice with inscription
Tiruppaiyur	78° 59'14" N; 10° 52' 64"E	Early Historical site, ruined Chola temple and potsherds
Tirukattupalli	78° 57'33" N; 10° 51' 26"E	Early Chola temple with inscription, loose sculptures of Chola period
Vanarangudi	78° 58' 27" N; 10° 53' 03"E	Temple ruins (Chola period), loose sculptures and potsherds
Vittalapuram	78 0 58' 30 N; 10° 16' 07"E	Medieval mound with potsherds



67



68

Sembian Kandiur: 67, exposed urns; Mechittamur: 68, western section of MCR-3. See pp. 112-120



69



70

Melchittamur: 69, terracotta human figurine and 70, shell bangles. See p.120

46. EXCAVATION AT MELCHITTAMUR, DISTRICT VILLUPURAM

Melchittamur (79°35' N, 12°16' E) the headquarters of the Digambara Jaina sect in Tamilnadu, lies 17km west of Tindivanam and 12km East of Gingee in Villupuram district. In 2006, two trenches, viz., MCR-1 and MCR-2, measuring 6x5m and 3x3m respectively were laid out at a distance of about 300m and 28m east of the local Parsvanatha temple. Excavations revealed a habitational deposit of one meter thick, divisible into two cultural periods, Period I and Period II, commencing from the early centuries of the Christian era down to medieval times (*circa* 1st century CE to 9th century CE). Further, A. Ekambaranathan of Department of Ancient History and Archaeology, University of Madras assisted by the P. D. Balaji, P. Jayakumar, J. Soundararajan, and M. Seran resumed excavation MCR-3 measuring 6x5m was laid to the east of MCR-1 accordingly. Excavation at the site revealed a habitational deposit to a thickness of about 1.9m (**Pl. 68**), divisible into two cultural periods, Period I and Period II, commencing from the early centuries of the Christian era down to medieval times (*circa* 4th century CE to 13th century CE). Period I was represented by black ware, black and red ware and red slipped ware. These potteries are not of fine varieties. Besides, terracotta objects like head figurines (**Pl. 69**), ear ornaments, seals, gamesman, and spindle whorl, shell objects like bangle (**Pl. 70**) and beads, and semiprecious stone beads, etc., were found in the first period. Among these the head figurines depicting different hair dressed reserves special mention. Besides, remains of animal bones were also collected in this level. On the basis of potteries and associated materials this period is tentatively dated to 4th century CE to 6th century CE. The Period II was marked by the survival of black ware, black and red ware and red slipped ware of inferior qual-

ity. Apart from this, more number of coarse red ware sherds was also noticed in this level. Antiquities like hopscotches, glass beads and bangles were found in large number. Presence of a copper coin more likely assignable to medieval period deserves special mention. On the basis of the potteries and associated material this period is tentatively dated to 6th century CE to 13th century CE..

UTTARAKHAND

47. EXPLORATION IN DISTRICTS OF ALMORA, DEHRADUN, PITHARGARH AND UDHAM SINGH NAGAR

Dheradun Circle of the Survey under direction of S. Jamal Hassan assisted by M.S. Chauhan, Neeraj Verma, Manoj Saxena and Rajeev Pandey carried out exploration in district Almora, Dheradun, Pithargarh and Udham Singh Nagar. The details are as follows:

A miniature stone shrine dedicated to Siva, locally known as Vakramundeshwar is located on the right bank of river Ramganga on Chaukhutia Masi road in Almora. It is *triratha* on plan and consists of a *garbhagriha* and *ardhamandapa*. The square *garbhagriha* is preceded by the *ardhamandapa* supported with two pillars. The *vedibandha*, *jangha* and *sikhara* are devoid of any ornamentation except *bhumiamlakas* on the *sikhara*. The *garbhagriha* enshrines a Siva-linga in the centre. The group of miniature shrines locally known as Rampaduka temples are located in village Masi, Chaukhutia on the right bank of river Ramganga. These temples have terrace type *sikhara* arranged in a linear pattern. Stylistically these shrines can be assigned to *circa* 14th-15th century CE. The temple of Naithana devi dedicated goddess Durga is located on the Naithana devi hills near the village Naubara, Block Bhikyasain, tehsil

Dwarahat. It consists of a *garbhagriha*, *antarala*, and a circumambulatory passage supported by heavy square pillars. The temple is simple devoid of any ornamentation on the outer or inner walls. On the basis of architectural style, it can be placed to *circa* 18th century CE. The fortress known as Gorkha *garhi* is situated at about 200m to the north-south direction of Naithana devi temple. The plan of this fortress measures 20x15m and can be approached from western side. It is surrounded by a 2m deep *kuchcha* moat. As per record it was built by the Gorkhas between 1790 to 1815 CE.

In a floor of burnt bricks with bricks measuring 30x22x5.5cm and 32x22x6cm in size has been found in the vicinity of Gaurishankar temple at Lakhanpur, Bazpur in Udham Singh Nagar. This structure is assignable to post-Gupta period. The Nadia *Dham* (Nadia Khaata) temple is located in a dense forest and about 5km west of Tanda and 26km east of Bazpur in Rudrapur. Below the level of modern temple of Nadia *dham mandir* shows that the ancient remains which are buried underneath. Only six courses of burnt bricks could be noticed, the size of the bricks measures 28x20x5cm.

Three terraces on the hill slope have been noticed near the village Gorilkot that lies about 5km north-east of district Pithargarh. On the top, the remains of an ancient structure on the middle terrace a modern temple and on the lowest terrace a rock on which cup marks have been found of which three are in east-west and four are in north-south orientation. The cup marks are 12cm to 20cm in diameter and varies in depth from 20cm to 40cm. The edges of the cup marks are slightly tapered, narrowing downwards. These cup marks might have been used for grinding purpose. The objects found include the broken piece of quern, sharpening

stone and perforated stones along with a few red ware sherds.

The remains of Nalapani fort is found on Nalapani hill, about 10km north-east of the district headquarters Dehradun. The fort is significant as it was one among the Bawangarh i.e., fiftytwo forts of Kedarkhanda (ancient name of Garhwal). Stretching around 5km, the fort is buried inside the earth over which and a dense forest is grown. The remains of rubble masonry wall of the fort and chambers exist at the site. In the battle of Nalapani the site was destroyed by the Britishers in 1814 CE. and the Gorkha General Balbhadra Thapa along with his army left the site.

The village Nigma is situated about 25km south-east of Tiuni, a sub-division headquarters of district Dehradun. A fortress has been located on the spur of the hill just opposite to the village Nigma. The rubble masonry fort is surrounded by a fortification wall. It consists of four to five chambers and water bodies inside the fortress. On the basis of architectural designs it can be assigned to late medieval period.

The Naula i.e., water spring is situated near Kerad village and about 27km south-east of sub-division headquarter Tiuni. The Naula is rectangular on plan, decorated with the miniature shrines embedded on the walls. These shrines are dedicated to different gods and goddesses as the images of Seshasayi Visnu, Surya, Ganesa and Mahishasuramardini are depicted there and can be assigned to *circa* 10th-12th century CE.

The remains of a fortress are found near the village, Hanol near Partad which is about 24km south-east of Tiuni a sub-division headquarters in the district Dehradun. The remains comprise the evidence of the fortress including residential structures, fortification wall and flight of steps, etc.

UTTAR PRADESH

48. EXPLORATION AT JHANSI, DISTRICT JHANSI

Suresh Kumar Dubey of Regional Archaeological Unit, Jhansi of U.P. State Archaeology Department undertook village-to-village exploration of development blocks Babina and Baragaon of Jhansi district under the direction of Rakesh Tewari, Director, U.P. State Archaeology and explored 196 villages and their hamlets as well as valleys of the river Betwa, Pahunj

and its minor tributaries in the above mentioned development blocks. The exploration revealed pre-historic sites, mounds, temples, stone sculptures, forts, *baolis* (stepped well) and other archaeological remains from the following villages (see Chart-X).

CHART-X

BARAGAON DEVELOPMENT BLOCK

VILLAGE	CULTURAL ASSEMBLAGE
Achharu ka khirak	Microliths
Ambavay	Remains of stone temple and Siva- <i>linga</i> of Medieval period and brick built temple of late Medieval period
Ari	An image of Hanuman and <i>argha</i> of Medieval period
Bachaoli Buzurg	Fragmentary pieces of stone sculptures of Medieval period
Bachaoli Khurd	A medieval stone sculpture of Hanuman
Banguan	Factory site of microliths, stone images of Anjani-mata, Hanuman and a <i>sati-patta</i> of late Medieval period
Barataghat	Ancient mound comprising B and RW, BSW, NBPW, RW, fragment of stone temple and sculptures of Medieval period
Barethi	Fragments of stone temple and sculptures stone sculptures of Hanuman, <i>sati-patta</i> and Anjani-mata of late Medieval period
Bargarh	An image of Hanuman of late Medieval period
Bari Sarmau	Remains of stone temple and an image of Hanuman of Medieval period
Baruasagar	Fragments of Medieval stone temple and sculpture of Ganesa, late Medieval <i>baoli</i> (stepped well)

EXPLORATIONS AND EXCAVATIONS

VILLAGE	CULTURAL ASSEMBLAGE
Benhata	Microliths
Bhagvantpura	Late Medieval <i>garhi</i> and reservoir
Birguan	A stone sculpture of Hanuman of Medieval period and a mound and <i>baoli</i> of late Medieval period
Burha Khera	Microliths, mound, iron-slag and late Medieval <i>baoli</i>
Chandara	A stone sculpture of Hanuman of Medieval period
Chhapra	A grand <i>baoli</i> and ruined palace of late Medieval period
Chiplaota	Seven <i>kolhus</i> and two <i>sati-patta</i> of late Medieval period
Digara	A well preserved <i>garhi</i> of late Medieval period
Damrauni	Stone built two temples, <i>sahasra Siva-linga</i> , image of Hanuman and fragmentary pieces of stone images of medieval period, <i>garhi</i> and brick built temple of late Medieval period
Futera	Microliths, mound, remains of stone temple and an image of Anjani-mata of late Medieval period
Ganai khurd	Remains of stone temple and <i>baoli</i> (stepped well) of late Medieval period
Gangawali	Fragmentary pieces of stone sculptures of Medieval period
Garhmau	Microliths, a medieval mound, reservoir and <i>kolhu</i>
Goramachhiya	Remains of stone temple, <i>Siva-linga</i> of Medieval period and late medieval brick built temple
Grassland	A <i>baoli</i> of late Medieval period
Harpura	Fragments of stone temple and sculptures of Medieval period; an image of Anjani-mata and a reservoir of late Medieval period
Hastanapur	A <i>baoli</i> of late Medieval period
Isagarh	Church and buildings of British period
Jagannathpuri	Fragmentary pieces of stone sculptures of Medieval period and a stone image of Hanuman of late Medieval period.
Jaravon	Ancient mound, fragmentary pieces of stone sculptures, <i>Siva-linga</i> of Medieval period and a <i>garhi</i> , palace, <i>sati-patta</i> , <i>vir-patta</i> of late Medieval period

VILLAGE	CULTURAL ASSEMBLAGE
Konchha-Bhanwar	Remains of an ancient mound comprising B&RW, BSW and RW, stone images of Visnu, Ganesa, Nandi, <i>panch-mukhi</i> Siva-linga, and fragmentary pieces of stone images of Medieval period. A <i>baoli</i> and palace of late Medieval period
Kolva	Microliths, iron-slag and late Medieval <i>sati-patta</i>
Kot	Fragmentary pieces of stone sculptures of medieval period and a <i>garhi</i> and <i>kolhu</i> of late Medieval period
Madora	Microliths, a grand well, rectangular building, <i>sati-patta</i> and a <i>baoli</i> of late Medieval period
Mustara	Remains of stone temple and an stone image of Hanuman of Medieval period
Padari	A grand well, <i>baoli</i> and structural remains of late Medieval period
Pailguan	Remains of stone temple of Medieval period stone image of Hanuman and a <i>sati-patta</i> of late Medieval period
Palar	Remains of stone temple and Siva-linga of Medieval period and an image of Anjani-mata of late Medieval period
Pali	Stone image of Hanuman of late Medieval period
Parichha	Stone sculpture of Ganesa and other unidentified sculptures of early Medieval period
Parivara	Late Medieval <i>baoli</i>
Pichhor	Remains of Medieval stone temple
Pohara	A <i>sati-patta</i> of late Medieval period
Rampura	A stone paved reservoir and a stone image of Hanuman of late Medieval period
Raonija	Stone sculptures of Siva, <i>panch-tap</i> Parvati, Siva-linga, fragment of Visnu and remains of stone temples of early Medieval period and medieval mound
Singarra	Fragmentary pieces of stone images and Siva-linga of Medieval period
Talaitha kalan	<i>Vir-patta</i> of late Medieval period
Tanda	Natural rock-shelter, Siva-linga and fragmentary piece of Visnu of Medieval period

VILLAGE	CULTURALASSEMBLAGE
Tanki (Banguan)	Microliths
Tankori	Brick built temple of late Medieval period
Tendol	Rock-cut Siva-linga, <i>vir-patta</i> and <i>sati-patta</i> of late Medieval period
Tilaitha khurd	Microliths and late Medieval <i>sati-patta</i>
Urena	Medieval stone sculptures of Uma-Mahesh and Hanuman

BABINA DEVELOPMENT BLOCK

VILLAGE	CULTURALASSEMBLAGE
Amarpur	Fragmentary pieces of stone images, Anjani-mata Hanuman, Siva-Parvati and a <i>baoli</i> of late Medieval period
Athondana	Ruins of medieval temple and sculpture of Anjani-mata
Babina	Microliths, fragments of stone temple and sculptures, resevoir, remains of <i>garhi</i> and <i>baoli</i> , Siva-linga of Medieval period
Bachhauni	A <i>sati-patta</i> , <i>argha</i> and Nandi of late Medieval period
Badora	Fragement of medieval stone temple and sculptures, a <i>baoli</i> , ruins of a <i>garhi</i> and stone image of Hanuman of late Medieval period
Baghaora	Microliths
Baichpur	Stone image of Hanuman, Anjani-mata, reservoir of late Medieval period
Bajna	Remains stone temple <i>baoli</i> and <i>garhi</i> of late Medieval period
Ballora	Brick temple of late Medieval period
Barua	Temple fragment and mutilated stone sculptures of Medieval period
Basai	Late Medieval brick temple
Bharari	Remains of stone temple of Medieval period
Bhojla	Late Medieval <i>baoli</i>
Bijouli	A stone temple of Medieval period, reservoir, images of Hanuman, Anjani-mata, ruined <i>garhi</i> , palace and <i>sati-patta</i> of late Medieval period
Budpura	Medieval stone temple
Burha	An image of Hanuman of Medieval period

VILLAGE	CULTURAL ASSEMBLAGE
Chamaraua	Stone sculptures of Visnu and fragmentary pieces of stone sculptures of Medieval period
Chhatpur	Late Medieval <i>baoli</i>
Dhikauli	A medieval mound, stone images of Ganesa, Siva- <i>linga</i> and broken image of Visnu
Dagarwaha	A stone image of Harihar of c. 9 th century CE and fragmentary pieces of stone images; a <i>garhi</i> of Medieval period
Domagor	Fragmentary pieces of stone sculpture of Medieval period
Dongari	Temple and stone images of late Medieval period
Gagoni	Saiva image of Medieval period
Garhiyagaon	A Siva- <i>linga</i> , fragmentary pieces of stone sculptures and remains of stone temples of Medieval period
Gevara	Fragmentary pieces of stone sculpture of Medieval period
Ghisoli	A mound and stone image of Medieval period
Gurha	A <i>baoli</i> of late Medieval period
Guvavali	Medieval stone temple and late Medieval <i>garhi</i> and <i>baoli</i>
Hansari	Fragmentary pieces of stone images of Medieval period
Hirapur	Stone image of Hanuman of Medieval period
Imliya	Stone images of Ganesa, Hanuman and Siva- <i>linga</i> of late Medieval period
Kanchanpura	Remains of medieval stone temple and sculptures
Karari	Ruins of a <i>garhi</i> and fragmentary pieces of stone sculptures of Medieval period
Khailar	Remains of stone temple and fragmentary pieces of stone sculptures, and a mound of Medieval period, images of Hanuman and Anjani-mata, a <i>baoli</i> , <i>sati-patta</i> , brick built temple and <i>garhi</i> of late Medieval period
Khajarahah	Fragmentary pieces of stone sculptures of Medieval period, stone images of Hanuman, Anjani-mata and a <i>baoli</i> of late Medieval period
Khanri	A <i>baoli</i> , <i>sati-patta</i> and <i>vir-patta</i> of late Medieval period
Khera Naya	Fragmentary pieces of unidentified stone images and a mound of Medieval period
Kilchuwara	Reservoir and brick built <i>baoli</i> of late Medieval period
Kotkhera	Medieval mound

EXPLORATIONS AND EXCAVATIONS

VILLAGE	CULTURAL ASSEMBLAGE
Koti	Remains of stone temple and an image of Hanuman of Medieval period
Lahar	Stone temple and sculpture of Hanuman of Medieval period
Mankuan	Fragments of stone temple and sculptures of Medieval period and late Medieval image of Hanuman
Manpur	Stone sculpture of Hanuman of late Medieval period
Math	Temple of late Medieval period
Mathurapura	Medieval stone sculpture Siva-Parvati, Ganesa Anjani-mata of Medieval period and a <i>baoli</i> of late Medieval period
Nohara	Fragments of stone temple and sculptures of Medieval period, stone image of Hanuman, <i>vir-patta</i> Anjani-mata and a <i>baoli</i> of late Medieval period
Pali Pahari	Remains of stone temple of Medieval period, stone image of Anjani-mata, Nandi, Siva-linga, and <i>baoli</i> of late Medieval period
Palinda	Temple, stone image of Hanuman and <i>sati-patta</i> of late Medieval period
Parasai	Ruins of a <i>garhi</i> of late Medieval period
Parvai	Fragmentary pieces of stone, sculptures of Hanuman and other unidentified sculptures
Pathari	Medieval mound
Punaoli	Remains of stone temple, fragmentary pieces of stone sculptures, <i>garhi</i> , a <i>baoli</i> and stone image of Hanuman of late Medieval period
Pura	Fragmentary pieces of stone sculptures and image of Hanuman of Medieval period
Rajapur	Ruins of a <i>garhi</i> of late Medieval period
Raksa	Fragmentary pieces of stone sculptures and remains of a <i>garhi</i> of late Medieval period
Rasoi	Fragmentary pieces of stone sculptures of Medieval period
Safa	Medieval stone sculptures of Visnu, Siva-linga and image of Hanuman of Medieval period and a <i>baoli</i> of late Medieval period
Sainyar	Brick built temple of late Medieval period
Satu (Silaiyan)	Microliths
Sijwaha	Remains of stone temple and sculptures of Medieval period and a <i>baoli</i> of late Medieval period

VILLAGE	CULTURAL ASSEMBLAGE
Simaravari	Late Medieval image of Hanuman and a <i>baoli</i>
Simardha	Medieval temples, <i>kolhus</i> and <i>baoli</i> of late Medieval period
Simraha	Fragmentary pieces of stone sculpture of Medieval period
Simaria	Fragments of stone temple and sculptures of Medieval period, a late Medieval image of Anjani-mata
Sukuvan	Medieval stone sculpture of Hanuman
Thakurpura	Fragments of stone temple and sculptures, late Medieval <i>garhi</i> and brick temple
Ugaria	A stone image of Durga of late Medieval period

49. EXPLORATION IN DISTRICT AZAMGARH

Under the scheme of village-to-village survey work Anil Tiwari of Patna Circle of the Survey has explored twenty two villages in Lalganj tehsil. A Siva temple of 150-200 years old village Rampur Kathatwan enshrines a *linga* in the sanctum has been noticed. The temple is surrounded by a pillared verandah. The approximate height of the temple is 12m. Besides this some dull red ware sherds scattered over the agricultural land has also been found.

50. EXPLORATION IN MIRZAPUR, DISTRICT MIRZAPUR

Shri Manoj Kumar Dwevedi, U.P. State Archaeology conducted village to village exploration of seventy five villages of Kone Pahari Development Blocks in district Mirzapur (see Chart-XI).

CHART-XI

Sl. No.	Block	Village/Site	Nature of remains
1	Kone	Lakhanpur	Mound of loose sculpture of Vishnu (Medieval period)
2	-do-	Vash	A sand stone <i>kolhu</i> (late Medieval period)
3	-do-	Saripatti	Well and <i>kolhu</i> (late Medieval)
4	-do-	Cheksari	Loose sculptures of Ganesa, Parvati, Siva-Parvati, Nandi, Sun god and ruind of temple (Medieval to late Medieval)
5	-do-	Pakha	Sculpture of Hindu deity (late Medieval)
6	-do-	Akodi	<i>Kolhu</i> and Hanuman sculpture (late Medieval)
7	Kone	Maniharpur	A well of late Medieval period

EXPLORATIONS AND EXCAVATIONS

Sl. No.	Block	Village/Site	Nature of remains
8	-do-	Gohani	Red ware, grey ware, buff ware (Medieval period), bangle pieces of iron nail, terracotta bead, iron ring, sling ball of terracotta and broken head of sculpture of Hindu deity (Medieval period), <i>kolhu</i> (late Medieval)
9	-do-	Pakka	A sculpture of Hanuman (late Medieval)
10	-do-	Tilthi	Loose sculptures of Hindu deity (Medieval period)
11	-do-	Majhgawa	Sculptures of Siva, Ganesa, Visnu, sthanak Siva, <i>chaturmukhi</i> Siva- <i>linga</i> , sati stone, <i>singhviyal</i> and ruins of temple (Medieval to late Medieval period)
12	-do-	Damodarpatti	Loose sculpture of Hanuman, Parvati, Ganesa, Sun god, Nandi (broken) late Medieval period
13	-do-	Husainipur	Red ware of late Medieval period and unidentified brahmanical sculpture
14	-do-	Mahagipur	Loose sculptures of Ram, Sun god, Siva Visnu, Ganesa, Ganga, Bhairava, Hanuman, Parvati Nandi (late Medieval period)
15	-do-	Majhalipatti Maihalipatti	Late Medieval brahmanical sculptures
16	-do-	Karerua	Red ware, red polished ware, dull red ware, micaceous ware (Sunga to Kushana period), terracotta skin rubber, sprinkler, spouted pot, miniature pot, dish, fragment pieces of big jar <i>surahi</i> . Animal figurines and one bladelet also recovered from the same site. Ruins of temple and loose brahmanical sculpture of Medieval period.
17	-do-	Gobarahan	A brahmanical sculpture (Medieval period)
18	-do-	Anurudhapur	Brahmanical sculpture of Medieval period
19	-do-	Jagapatti	A <i>kolhu</i> of late Medieval period
20	-do-	Dhavrahara	Inscribed stone pillar inscription is not clear. Another brahmanical sculpture of late Medieval period

Sl. No.	Block	Village/Site	Nature of remains
21	Kone	Pakhvaiya	Sculpture of Hanuman, Ganesa, Devi (late Medieval period)
22	-do-	Gadgedi	Sculptures of vishnu, Hanuman, Ganesa, Kubra, Uma-Mahesvara and <i>sati-patta</i> of Medieval to late Medieval period.
23	-do-	Maladharpur	Late Medieval brahmanical sculptures
24	-do-	Chilha	Sculptures of Bhairava, Parvati, Brahma, Nandi, Narshinga, Uma-Maheswer, Laksmi, Sun god, Visnu, Ganesa, Hanuman, Kali (late Medieval period)
25	-do-	Bhogaon	Ruins of temple (10 th -11 th century CE) Decorated pillars of temple, loose sculptures of Siva, Siva- <i>linga</i> also measures height 98 & dia 58cm (Medieval period), Visnu, Durga, Parvati, Ganesa, Uma-Mahesvara, Nri-Varaha, Nandi, Siva- <i>linga</i> , Dwarpalaka, Vishnu Lakshmi (19 th century CE). Red ware, buff ware, dull redware, grey ware. Some fragmentary any pieces of vases and pots, bangle piece of lac from same site (Medieval period).
26	-do-	Mujehara Kalan	Sculptures of Uma-Mahesvara, Hanuman and another brahmanical sculpture (Medieval period)
27	-do-	Mujeharakhurda	Ruins of temple (Medieval period)
28	-do-	Akabarpatti	Two sandstone <i>kolhu</i> (late Medieval period)
29	-do-	Pachevara	The mound containing red ware, dull red ware, grey ware, minature skin-rubber, bangle piece of lac, iron nail, stone bead, etc. of Sunga to Mediaeval period.
30	-do-	Navadia	Red ware baoli of late Medieval period

EXPLORATIONS AND EXCAVATIONS

Sl. No.	Block	Village/Site	Nature of remains
31	Kone	Chidlikh	Medieval brahmanical sculpture.
32	-do-	Migradham	Loose sculptures of Sun god, Hanuman, Parvati, Bhairava, Nandi (Medieval to late Medieval period)
33	-do-	Digurpatti	Late brahmanical sculptures
34	-do-	Dalapatti	Medieval brahmanical sculptures
35	-do-	Bhatevara	Medieval brahmanical sculptures
36	-do-	Madanpatti	Medieval brahmanical sculptures and bungalow built of <i>lakhauri</i> bricks
37	-do-	Maksudan patty	Lose sculptures of Ram, Lakshman, Sri Krishna, Hanuman, Bhairava, Nandi and Parvati assignable to Medieval period.
38	-do-	Kamasin	Medieval brahmanical sculptures and <i>Kolhus</i>
39	-do-	Khulwa	Mound yielding Medieval pottery, terracotta wheel, stone sculptures of Medieval
40	-do-	Jagish patti	Late Medieval brahmanical stone sculpture, well of <i>lakhauri</i> brick size 20x11x4cm, <i>kolhu</i> .
41	-do-	Bhuleypur	Remains of temple and <i>kolhu</i> of Medieval period
42	-do-	Mavaiya	Sculptures of Ganesa, Visnu, Hanuman, Nandi (Medieval period)
43	-do-	Harsighpur	Medieval to brahmanical stone sculptures
44	-do-	Devaparva	Panel of musician, Hanuman, Siva- <i>linga</i> of Medieval period
45	-do-	Valliparva	Medieval brahmanical sculptures
46	-do-	Kolhua shah	Door jamb of temple and loose sculptures of Medieval period

Sl. No.	Block	Village/Site	Nature of remains
47	Kone	Gahiya	Brahmanical stone sculptures of Medieval period
48	-do-	Pradhan dadiya	A Visnu sculpture of Medieval period
49	-do-	Chandel dadiya	Brahmanical sculptures and <i>Kolhu</i> of Medieval period
50	-do-	Rampur	Ruins of temple and loose sculptures of Ganesa, Lakshmi, Parvati, Sun god, Siva-Nandi and <i>kolhu</i> of Medieval period.
51	-do-	Porjagir mujehara	Brahmanical sculptures and <i>kolhu</i> of Medieval period.
52	-do-	Purjagir mavaiya	Loose brahmanical sculptures of and <i>kolhu</i> of Medieval period
53	-do-	Jagdishpur	Brahmanical sculpture and two <i>kolhus</i> bearing <i>nagari</i> inscription (Medieval period.)
54	Pahari	Chatahan	Red ware, red slipped ware (Historical period), brahmanical sculptures of Medieval period.
55	-do-	Dharmdeva	Kolhus of Medieval period
56	-do-	Sikadi	Sculptures of Hanuman, Sun god, Ganesa, Uma-Mahesvara, Nandi and Ekmukhi- Sivalinga of Medieval period inside temple.
57	-do-	malaika pura	Remains of Medieval period and <i>kolhus</i> of Medieval
58	-do-	Aksavli	A stone <i>kolhus</i> of Medieval period
59	-do-	gadainala	A sand stone pillar
60	-do-	vallukapura	A stone <i>kolhus</i> of Medieval period.
61	-do-	Balak ka pura	Brahmanical sculpture of Medieval period
62	-do-	Rasavra	Baoli of <i>lakhauri</i> brick (22x12x40)cm
63	-do-	Ranichaukia	Stone <i>kolhus</i> of Medieval period

Sl. No.	Block	Village/Site	Nature of remains
64	Kone	Javsara	Temple and sculptures and loose sculpture (Medieval period)
65	-do-	Bedavli	Red ware, brahmanical sculpture and pillar of Medieval period.
66	-do-	Kakrahan	Brahmanical sculpture and stone <i>kolhus</i> of Medieval period.
67	-do-	Chauhan patti	Brahmanical sculptures and singhviyal of Medieval period.
68	-do-	Chauhan patti	Three <i>kolhus</i> of Medieval period.
69	-do-	Bhusraul	Loose sculpture of brahmanical deity (Medieval period)
70	-do-	Kanaura	Brahmanical sculptures and <i>kolhus</i> of Medieval period.
71	-do-	Bhagesar	<i>Baoli</i> of Medieval period
72	-do-	Pidapur	Decorated <i>kolhus</i> of Medieval period
73	-do-	Katopur	Decorated <i>kolhus</i> of Medieval period
74	-do-	Devahi	Loose sculptures of Surya, Nandi and Genesa stone <i>kolhus</i> bearing <i>nagari</i> Inscription of Medieval period.

WEST BENGAL

51. EXCAVATIONS AT BALUPUR, DISTRICT MALDA

Excavation was carried out by Arun K. Nag, co-directed by Sheena Panja assisted by Malay K. Sain of the Department of Ancient Indian History Culture and Archaeology, Visva at the site of Balupur (25° 03'N; 88° 03' E) in Malda district for the third season. Eleven trenches were taken this season in the eastern, southern and north-eastern parts of the site. Four cultural levels were identified based on stratigraphy and pottery types. Multidisciplinary geoarchaeological work was also carried out to understand the palaeo-pluvial system and the

formation of an archaeological site in an alluvial setting. The first cultural phase represents the pre-early medieval period stretching from 5th-7th century CE from the nature of pottery. The sediment is a sticky clay almost pedogenised formation, indicating a sort of stability in the initial phase of this alluvial site. There is a red and bright ware. Shapes include large bowls and vases. The next phase is the Early Medieval phase (8th-12th century CE) with characteristic dull red ware having shapes like large bowls with corrugated sides and jars and dishes. The next phase, termed intermediate medieval (12th-13th century CE) from the pottery types in this strata are pit ridden with evidence of organic decomposition of the pottery, artifacts are all in a semi-fresh condition. The last phase which belongs to the late Me-

dieval period (13th-16th century CE) which is present in almost every trench is full of pits with pottery and bones. This is probably a colluvial deposit. Pottery types include red, black and grey wares with shapes like bowls, jars, and dishes.

The overall pottery recovered covers a huge range from orange wares, grey wares and red wares. Besides there are few black wares and glazed wares. Antiquities were numerous including a small sculpture of Uma-Mahesvara as well as organic remains like bones. Charcoal samples, sand, iron artifacts, bones have been sent for C¹⁴, OSL, fluorine-phosphate and Accelerator Mass Spectrometry (AMS) dating. Soil samples have been sent for textural and chemical analyses. The cultural remains indicate the occupation are entirely in the late Medieval period. The early medieval habitation seems to be concentrate in the southern part of the area excavated this season. A geo-archaeological study conducted shows that the site was a buried floodplain settlement of the meandering system of the Kalindri which is being hypothesized was a part of the Ganga itself.

52. EXCAVATION AT BANGARH, DISTRICT SOUTH DINAJPUR

S. C. Saran, assisted by N. G. Nikoshey, Sujeet Nayan, Jalaj Kumar Tiwari, Abdul Arif, Neetesh Saxena, O. P. Pandey, S. P. Gupta, M. K. Brahmchari and Dhananjay Kumar of the Excavation Branch-III, Patna of the Survey, carried out excavation at the mound in Bangarh (25° 34'74"N; 84° 54'30"E) which is situated on the left bank of Punarbhaba river a tributary of the Ganga river. It is located about 75km north-east of Malda town in the south Dinajpur district Bangarh ruins is about 1.5km towards north from Gangarampur bus stop by a motorable road. It is situated about 350km north to Kolkata and is about 300km south of Siligudi. Balurghat is about 35km west from

Bangarh, is the district head quarter of South Dinajpur. Bangarh is referred as Devikot, Kotivarsha, Banapura, Sonitpura in Sanskrit and Prakrit literature in early and medieval period.

The excavation area was divided into grid pattern and altogether ten quadrants of three squares each measuring 10x10m taken up for digging. Due to heavy rains excavation work was suddenly stopped and brick structures exposed belong to only early medieval period. In the Trench B1 a massive wall was found, having the width about 1.60m with its four offsets and each offset having 6 to 7 courses. The wall was raised by using of various sizes of brick i.e. 14x14x4.5cm, 15x15x5cm. The total height of the wall is about 200cm length of the wall about 12m and its shape looks like as alphabet 'Z'. The same wall is also traced in the Qdt. II of the Trench A1 and it is running from east to west respectively in the Qdt. II of the Trench A1 and it is running from east to west respectively in the Qdt. III, IV and I of the Trench B1 also in Qdt. III and II of the Trench A1 in the northern part of the wall four bases of square shape pillars made of bricks traced in a same alignment at a distance of 1m. Two other bases of pillars also traced in the Qdt. II of the Trench B1 (Pls. 71-72). In the Qdt. I of the Trench B1 a floor was found at the depth 35cm from the ground level, made of brick bats and given a protective layer by plastering with jelly of '*surkhi chunna*' contemporary to first offset of the wall. Some other brick structures also found in all four Qdt. of the Trench C1, but that all Qdt. are not fully exposed due to continuous heavy rain fall in the end of the second week of this month. Only 3-4 courses of the above structure are exposed. In the Qdt. II some bricks structure exposed, are constructed by the moulded and diamond cut bricks. A good number of terracotta tiles, stone pieces and fragment of architectural member collected from the Trench A1 and B1 which

might be used to maintained the super structure. Few shreds of Sultanat glazed ware, red ware sherds are encountered during the excavation. Iron nails, terracotta plaques and few stone breads were the main antiquities recovered from the excavation.

53. EXCAVATION AT TILPI, DISTRICT SOUTH 24 PARGANAS

The Directorate of Archaeology and Museums, Govt. of West Bengal, conducted excavation at Tentultala, Mollapara (Plot .960) and Kachharidanga, Masjidpara (Plot 884 and 995) at Tilpi, under Chandaneswar Gram Panchayat, Police Station Joynagar, sub-division Baruipur and district South 24 Parganas under the direction of Amal Roy. The village falls under the geocoordinate (22° 14'4.5"N; 88° 33' 52.49"E). The excavation at Tilpi during the last season established the fact that the site was under occupation during the early historic period i.e., from 2nd century BCE to 3rd century CE as revealed through the study of the successive deposits, excavated antiquities (also collected antiquities from the villagers and the local museums) and the potteries. The main objectives of the present excavation was to know the settlement pattern, residential structures and the causes of abandonment of the site till the mediaeval period. To fulfil the objectives, a series of trenches of 6.00x6.00m each at Mollapara and Shekhpara were laid and 2 of such trenches dug upto the natural soil. Tilpi I i.e., Mollapara and B1 and YB1 at Tilpi II i.e., Masjidpara also called Kachharidanga / Shekhpara (**Fig. 12, Pl. 73**).

The excavation in all these trenches did not yield any brick-structure, though several brick-structures are occasionally being exposed through sporadic diggings by the villagers for excavating tanks and wells. The area under digging operation yielded mud walls and mud-floors. A large number of terracotta roof-tiles

with or without perforation indicate that the dwelling houses built with mud-walls and tiled-roof with the help of bamboo or wooden posts (supported by post-holes in Trench YB1). The series of hearths, iron slags, flakes, semiprecious stones, etc. indicate that the operation area was occupied by the common people, more speciously the worker group. A large number of antiquities and huge potteries are evidently substantiate the fact that the site was occupied under thick population. The people were well acquainted with the technology of copper, bronze, iron, bead-making, preparing of ivory and bone objects, ceramics of different varieties and the terracotta figures and plaques. During the previous year's excavation the natural soil was traced in Trench XC1 and digging continued through 7 successive layers of depositions. The Layer 7 was denoted as natural soil. This year the Trench ZD3 was considered for deep-digging to touch the natural soil for confirmation of the cultural sequence of the site and obtained the same as recorded earlier. The sequence of the site is confirmed i.e., from the Sunga to the pre-Gupta period. Though the sporadic occurrences of NBP wares and the single-beaded *yakshi* figures (hand-made and through mould) indicate the Mauryan legacies, yet the present excavation at Tilpi cannot substantially prove the cultural phase belong to the Mauryan period. This may be established through further excavation and extensive exploratory survey.

The sequence of the site through stratifications may be framed in the following way viz., Layers (5) and (6) may be assigned to the Sunga-Kushana phase (2nd century BCE to 1st century CE) under Period I; Layers (3) and (4) may be assigned to the later Kushana phase (1st century CE to 2nd century CE) under Period II; Layers (1) and (2) may be assigned to the pre-Gupta phase (2nd to 3rd century CE) under Period III. Layer (7) is denoted as natural

soil as it did not yield any artifacts and devoid of human activities. It is sticky clay and black in colour with full of organic material, contains with charcoal type materials. The remaining root-part of the '*sundari*' tree, a common phenomenon of Sundarvana region, has been traced and recorded in this deposit. This deposit was covered with the yellowish alluvium soil (riverine deposit), compact in nature, which is denoted as a part of the natural soil, over which the occupation of the site occurred and flourished with all characteristics of an urban settlement, including the trade relations with other places through the river Piyali, (a tributary of the Matla) and the Bay of Bengal. This is corroborated with the materials, recovered through the excavation, like copper, bronze and its alloys, iron, semiprecious stones (carnelian, chalcedony, agate) rouletted wares, etc. The study of the depositions indicate that the area was covered with the mangrove forest and was destroyed with the fire activities through natural process and subsequently it was flooded with the long-term fluvial activities with thick alluvium deposit in the region. The soil under the purview of Period III is characterised with the nature of salinity and water-borne sedimentations. The site was abandoned since 3rd century CE due to submergence under water and after long time, during the *nawabs* of Bengal, the site was occupied again and now it is a flourished thickly populated village with agricultural practices. A large number of antiquities have been found through excavation at Tilpi. Among the antiquities, terracotta sealing, terracotta figures and plaques like *yakshi*, human figures, horse, ram, elephant, monkey, lotus medallion; copper coins (both square and circular); beads of terracotta, semiprecious stones, copper and glass; copper points; ivory and bone points (Pl. 74); ivory object like musical instrument(?) (Pl.75);

terracotta toy-cart including wheel; terracotta dabber; iron objects with slags; terracotta balls; terracotta and glass bangles, terracotta balls and other house-hold objects of daily use.

Huge quantity of potsherds have been recovered through excavations at Tilpi. Red wares including dull-red, buff red and ill-fired are predominant varieties of the ceramic assemblage. Grey wares including dark-grey and grey with red patches are common varieties. Among the other varieties, black-slipped wares and black and red wares are also available at the site. The stamped-designs on the red and on the grey wares are commonly available. A few pieces of rouletted wares and NBPW have also been collected from the site through excavation. A grey sherd with the *grafitti*-mark like Brahmi '*ka*' is an interesting finding of this year. Two grey sherds have been found with a figure of human and the mouth of a bird, deserves special mention, which was drawn with incised lines. Various incised designs and stamps on the sherds have been recorded, viz. floral design, mat-impressed-design, leaf-pattern-design, impressions with solar-designs, dotted lines and oblique lines, designs with knife-tip-impressions, lotus-petal-impressions, etc. A circular dish like medallion with the design of full-blown lotus (red ware) is interesting. The common shapes are vase, vessel, storage jar, bowl with round-base, flat-base and ring-base, deep-bowl, carinated-vase, fry-pan, spouted-vase, sprinkler-type vase, amphora-type long-naked jar, tumbler-type cylindrical pot, etc. The miniature pot, bowls with round base, dishes with high neck and stamped designs on the inner surface, are predominantly grey in colour. Most of the potteries are well-fired, wheel-made and are of well-levigated clay, though the hand-made potteries with coarse-grained fabric are also available, though the number is restricted. The NBPW and the black-slipped sherds are too



71



72

Bangarh, South Dinajpur: 71, view of the brick structures and 72, view of the brick structures (B1 Qdt. III). See p. 134

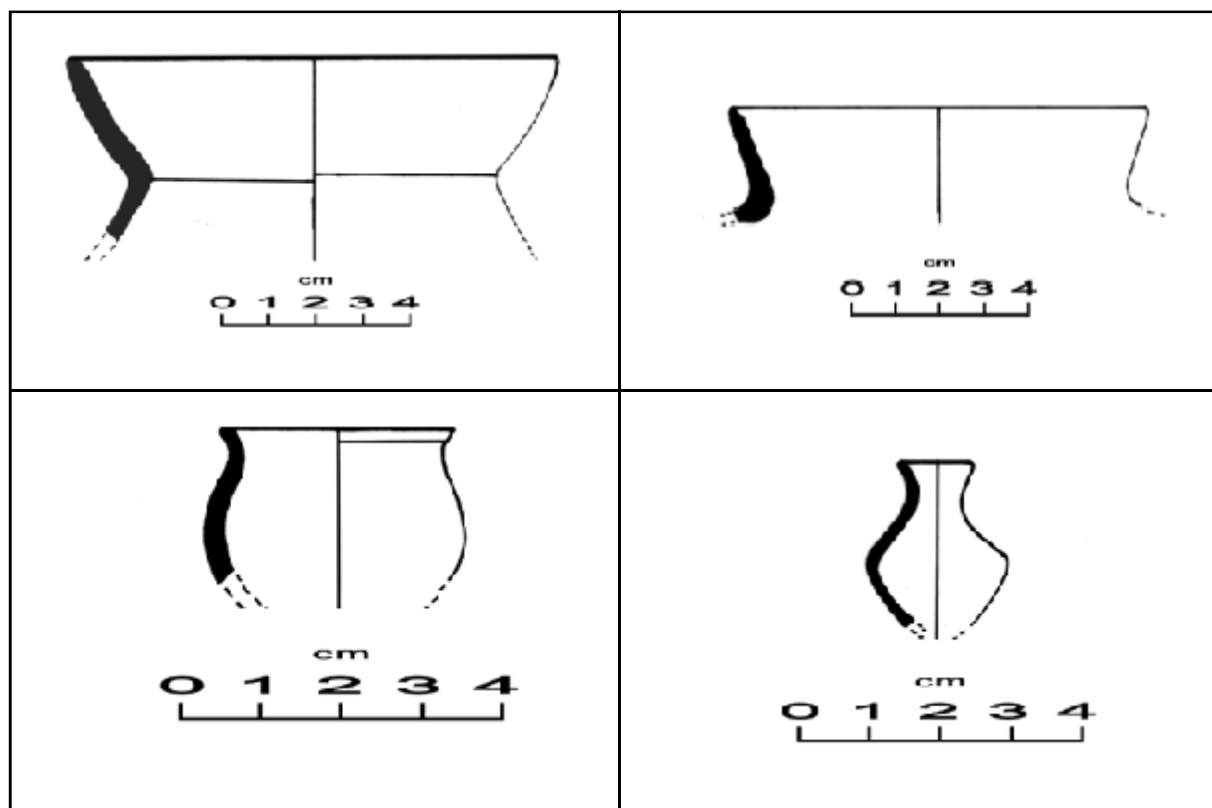


Fig. 12: Tilpi: bowl, miniature pot and vessels. See p. 135

Plate 73



Excavation at Tilpi: Bone points. See p. 135



74



75

Tilpi: 74, cast coins and other metal objects and 75, general view of the excavated trenches. See p. 136

limited to draw the shapes, though the fabric and the body-sherds are indicative of miniature pots.

54. EXCAVATION AT MOGHALMARI, DANTAN, DISTRICT WEST-MIDNAPUR

The Department of Archaeology, University of Calcutta resumed the excavation at Moghalmari after a gap of two years. The excavation was directed by Asok Datta assisted by Rupendra Kumar Chattopadhyay, Bishnupriya Basak, Durga Basu, Rajat Sanyal, Sharmila Saha, Mummun Mandal, Sharmista Bhattacharyya, Tanmoy Gantait, Subhasis Paul, Shubhendu Mukherjee, Dulal Sen, Santosh Sharma and Sanjoy Mandal.

Altogether twentyone trenches measuring 6x6m were taken up for excavation covering a total area of 75 square meter. The trenches were excavated to different levels. Of the twenty one trenches, eight were in the western part of the mound while twelve trenches were laid out in the eastern part of the mound and one more trench was taken up in MGM3 to know the cultural sequence of the site. However, the basic objective of this year excavation is to trace the complete alignment of *tri-ratha* plan of the structure exposed partially in the western part of the mound through last year's excavation. Besides finding the entrance of the monastic complex in the eastern part of the mound is also another major basic objective. Naturally, excavations were undertaken in Trench XA, C, D, E, H, I, J and K series trenches to trace the alignment of *tri-ratha* plan of a small monastic complex measuring 22x22m in the western part of the mound. In the eastern side of the mound an extensively stucco decorated wall running north-south in K series trenches was discovered. The entire wall excavated to a depth of 3.75m was found plastered with stucco/lime over exquisitely decorated bricks. The major area of

decoration was confined between 50cm and 118cm below surface level in K7. The wall continued along K6 and K5 towards north with the decorated stucco panel continuing with a uniform range in depth and thickness. This wall possibly formed the outermost wall of the eastern temple of the monastery, as it appears from a comparative study of the excavated monastic sites in eastern India.

The excavation of MGM1 confirmed the earlier indications beyond doubt. The excavations have further revealed the existence of a pre-Pala monastic establishment having different structural phases, the earlier one representing a large monastery with a frontal temple complex (**Fig.13**).

The outer wall of the temple, having its brick rammed external platform at a depth of 3.75m below surface represents possibly the most extensive architectural stucco art decoration in the whole of the delta. Plastered with thin lime and/stucco and constructed with a variety of plain and decorated bricks set in mud mortar, the structure at Moghalmari is definitely parallel to those found at Nalanda, Karnasuvarna and other pre-Pala monastic establishments of eastern India. A large number (22 types) of foliated and geometric motifs on bricks have been recorded from excavation. Moghalmari possibly exhibits the largest monastic site so far discovered in West Bengal. Its Buddhist character is established by the discovery of a stone image of Buddha in *bhumisparsa* pose from a stratified context in Trench C6 at a depth of 96cm below surface.

Excavations at MGM3, which is primarily a habitation area contemporary to MGM1 have yielded some important evidences of which the assemblage related to iron smelting activity. Artefacts include a large number of iron objects found in association with huge deposits of charcoal at different depths. But the

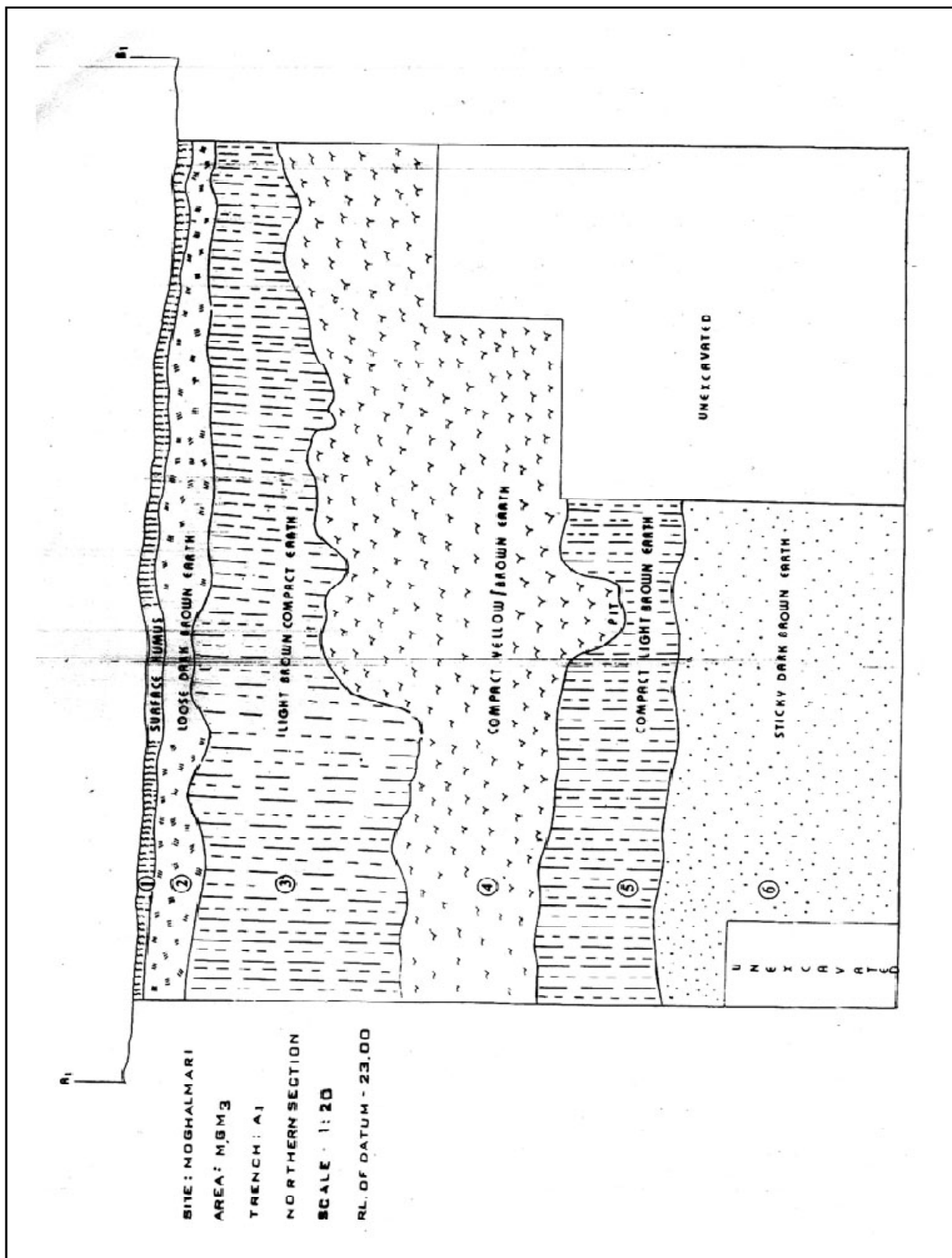


Fig. 13: Maghalmari section. See p. 140

most notable discovery of MGM3 is a terracotta seal matrix found at a depth of 1.96m the excavation in this trench continued upto a depth of 3.80m which is again divisible into six layers of different thickness, from surface level containing four indistinct incuses, each bearing the name of a person at least two of which can be read probably as “*Srivarma*”. The script represents the eastern variety of post-Gupta Brahmi datable to the 7th-8th century CE.

The excavations at Moghalmari thus revealed that the site was in continuous occupation since black and red ware culture (the excavation of 2003-04 has revealed 1.45m deposit of BRW culture in MGM2) with a break and afterwards the settlement reappeared in early medieval period. The site represents a unique character of having one of the few sites where both religious and non-religious habitations can be demarcated on the basis of archaeological materials and nature of settlement character.

II. EPIGRAPHY

SANSKRITIC AND DRAVIDIC INSCRIPTIONS¹

ANDHRA PRADESH

1. MAHAMEKHAVAHANA INSCRIPTION, GUNTUPALLI, DISTRICT WEST GODAVARI

This fragmentary pillar inscription was brought to light during the Guntupalli excavations conducted by the Hyderabad Circle of the Survey. It is in Prakrit language and Brahmi characters of the 2nd century CE. It belongs to the king “Siri sada” of Mahamekhavahana dynasty of Kalinga. It records the grant of a *mandapa* (where the inscription is found engraved in question) by one Chula-Goma.

2. PRAKRIT INSCRIPTION, GUNTUPALLI, DISTRICT WEST GODAVARI

This stone inscription brought to light during the excavations conducted by the Hyderabad Circle of the Survey and is now preserved in their store-house at Guntupalli. It is in Prakrit language and Brahmi characters of the 2nd-3rd century CE. It records the gift of the (sculptured panel of) *dharmachakra* to the *arya-samgha* at Mahanagapurvata by the *gahapati* (house-holder) Nigatana alongwith his wife Babha and daughter.

3. EASTERN CHALUKYA COPPER-PLATE INSCRIPTION, GUNTUR, DISTRICT GUNTUR

This copper-plate is preserved in the A.P. State Archaeology Museum in Guntur, in Sanskrit language and Telugu-Kannada script of

the 9th century CE. It belongs to the eastern Chalukyan king Rajamahendra (Ammaraja II) and the charter recounts the genealogy of the rulers of this dynasty from Kubjavishnuvardhana to Rajamahendra. It registers a gift of land to Rajasarma, a childhood friend of Chalukya Bhima (father of Ammaraja II), a resident of Kunduru village. The above gift was made by the king for his own wealth and prosperity on the auspicious occasion (of the commencement of) Uttarayana.

4. KALYANA CHALUKYA INSCRIPTION, MALLAM, DISTRICT KARIMNAGAR

This Kannada inscription is found on a loose slab in the village. It belongs to the Kalyana Chalukya king Bhulokamalla (Somesvara III) and it is dated in *saka* 1047 (1124 CE). It records the gift of some land to the god Parsvanatha for the worship, offerings and also repairs, etc. at Gangapura by Bammisetti of Mannakere.

5. IKSHVAKU INSCRIPTION, GUMMADIDURRU, DISTRICT KRISHNA

This pillar inscription was found at the excavated site in Gummadidurru, Nandigama taluk. It is in Prakrit and Sanskrit languages and Brahmi characters. The record belongs to the Ikshvaku king Ehuvala Chamtamula and was issued in his 10th regnal year (305 CE). It records the construction of a *chaitya* at Udagiri-mahavihara by the Dopam Baraka of

¹. Information from: 1-5 and 8, K. Munirathnam of Epigraphy Branch, Mysore; 9, 11-16, 18-25, S. Rajavelu and 10 and 17, K. Karuppaiah of Epigraphy Branch, Chennai; and 6-7 and 26, Jai Prakash, Epigraphy Branch, Lucknow of the Survey.

Khamudakula family, a resident of Madda-Kadapara village, alongwith his wife Jadika and his children viz., Dopa, Akasa, Chamula and Ukhasa and also other members viz., Phalikamodiya, Chulamodiya, Gharesu, Duyadammodiya, Buchadiya and Kadiya.

JHARKHAND

6. EARLY NAGARI INSCRIPTION, GHORANEI, DISTRICT SARAIKELA KHARASAWAN

The inscription is engraved on a stone slab kept in the Siva temple locally called Jayada Siva *mandir*. This inscription in early Nagari characters and corrupt Sanskrit language is datable to about the 9th century CE. It records the construction of a temple (*devakula*) (obviously at Ghoranegi where the inscribed stone has been found) by a person named Pavra who was the son of Gremnaka. The name of the deity for whom Pavra constructed the shrine is not clear.

MADHYA PRADESH

7. NAGARI INSCRIPTION, CHANDERI, DISTRICT ASOKANAGAR

This inscription engraved on a stone slab is preserved in the Archaeological Museum (Simhapur palace). This inscription is in Nagari characters and corrupt Sanskrit language and dated [Vikrama] 1544 (1487 CE). It records the construction of a step-well (*vapa*) probably by Dai Phula, a benevolent woman, during the time of Sher Khan, Governor of Chanderi and Maharajadhiraja Ghiyasuddin and it refers to Chanderi-gadh-durga. The *sutradhara* was Jasaraja and the writer was Prayagadasa, son of Chadenadasa.

ODISHA

8. BHAUMAKARA COPPER-PLATE, PATLINGA, DISTRICT CUTTACK

This single copper-plate inscription is found in the village Patlinga, now preserved in the Sub-collectors office at Athagarh in Cuttack district. It is in Sanskrit language and Nagari script. The record belongs to the Bhaumakara queen Dandi Mahadevi, and it is dated in Bhauma year 190 (926 CE). It records the gift of the village Tadata to Bhattaputra Daddananda, a learned brahmana of Kasyapagotra.

TAMILNADU

9. COPPER-PLATE INSCRIPTION, DISTRICT CHETTIKULAM

This copper plate is in the possession of Sekhar Pandaram, the trustee of Dhandayudapanisvami temple at Chettikulam in Kunnam *taluk* of Perambalur district. It is a single plate charter written on both sides in Tamil language and characters of the 18th century CE. The inscription is dated in *Saka* 1696 (1774 CE). It refers to the grant (*pattayam*) made for undertaking renovation (*tiruppani*), construction of a *madalayam* and a flower garden, by a group of people belonging to *anjujati panjalattar* and 74 *aganattar* at the temple of the Lord Arumugasamiyar at Vadapaliyangiri in Chettikulam. The above work was executed as per the command of the god conveyed in the dream of one Subrahmanyapandaram, the son of Pallattandipandaram. It further states that the people belonging to the *idangai* group undertook to maintain the grant (deed) by collecting a toll from the people on the occasion of Talai-Kattu and marriage.

10. RASHTRAKUTA INSCRIPTION, IDAICHCHERUVU, DISTRICT CUDDALORE

This inscription, engraved on both sides of a slab is set up in a field of Idaicheruvu to the right side of Ayyanar temple at Idaichcheruvu. It is in Tamil language and characters of the 10th

century CE. It is dated in the 23rd regnal year of Kannaradevar, who is identified with the Rashtrakuta king Krishna III. The record refers to the purchase of land by a person Moorthi-Tayan, a resident of Vayalur-Padi in Ugalur-kkurram from the Urar of Siruvayilur in Porasappadi, apparently for the purpose of maintaining the lake (*eripatti*).

11. PANDYA INSCRIPTION, MANGALAMKOMPU, DISTRICT DINDIGAL

This stone slab inscription with the figure of a tiger is found in the coffee estate of the hilly village Mangalamkompu in the Kodaikkanal range. It is in Tamil language and characters. It is dated in the 10th regnal year. (1247 CE) of the Pandya king Kulasekhara. It mentions the name of a refugee centre, known as Cheyadaikkalanallur which was situated in Parpa-nadu. Symbols like the sun, the moon, lamp-posts and a pitcher are depicted in the inscription.

12. HOYSALA INSCRIPTION, AYALUR, DISTRICT ERODE

This Tamil inscription is found engraved on either side of a stone slab planted in a field in the village, belongs to the Hoysala king Viravallaldeva and dated in the cyclic year *pramadi*. On Palaeographical grounds it is assignable to the 13th century CE. It records the gift of the village Ayiriyur in Kuruppu-nadu, with exemption of taxes, to the Visnu temple known as *Tirivikrama Vinnagaram* at Nambiyur.

13. VIJAYANAGARA INSCRIPTION, KARAPPADI, DISTRICT ERODE

This stone slab inscription is copied from the village Karappadi in Gobichettipalayam taluk of Erode district. It is in Tamil language and characters. It is dated in the *Saka* 1352, *saruvai*, cyclic year, corresponding to 1430

CE which is, however, irregular, as the said cyclic year actually occurred in *Saka* 1342 *i.e.*, ten years earlier (1420 CE). It records the gift of the village Karagappadi in Alukkarkuli, situated in Kanjikkul-nadu to the Tiruvenkatamudaiyar temple of the village in Kanchikkulnadu as *tiruvidaiyattam* by the local chiefs, Kungumaraya udaiyar, Kamanarasa udaiyar and the Kaniyalar of the Alukkukuli village.

14. PALLAVA INSCRIPTION, SIRUVAKKAM, DISTRICT KANCHIPURAM

This inscription is found engraved on a stone slab lying in a ruined Vinayaka temple of the village Siruvakkam in Kanchipuram *taluk* of the same district. This inscription is in Tamil language and characters of the 7th century CE. It records that the temple (*devakulam*) belonged to or was constructed by the king Mahendravarman's great physician. This is one of the earliest Tamil inscriptions of the period of Mahendravarman (I), the Pallava king, and it gives the most important information about his royal physician and erection of a *devakulam*, probably a structural temple. The name Mahendrapottarasar is mentioned in yet another inscription at Vallam rock-cut cave temple belonging to the same king, near Chengleput town.

15. PALLAVA LABEL INSCRIPTION, KANCHIPURAM, DISTRICT KANCHIPURAM

This inscription is engraved in one of the sub-shrines in the inner wall of the enclosure (outer *prakara*) of Kailasanatha temple. Due to peeling of the painted layer of the fresco walls, this label inscription is exposed. It is in Sanskrit language and written in Pallava Grantha characters of the 8th century CE. It records the epithets of the Pallava king Rajasimha, as Atyantakamah and Avanalanta.

16. LABEL INSCRIPTIONS, TIRUPPULIVANAM,

DISTRICT KANCHIPURAM

A few label inscriptions in Tamil language and characters are found engraved on the pillars in cloistered hall of the first *prakara* of the siva temple in the village. Each pillar records the names of Saiva saints (Nayanmaras) such as Enatinatan, Apputiyatikal, Nampikatanampi, Manakkanjar, Thirunilakanta-pperunkusavan, etc. On palaeographical grounds these inscriptions are assignable to the 10th century CE. The Saivacharya names have been already noticed along with the sculptural representations at Darasuram (A.R.Ep. 1915, no. 2).

17. CHOLA INSCRIPTION, VARAGUPADI, DISTRICT PERAMBALUR

This inscription engraved on a stone slab erected in front of the Mandaveli Ayyanar temple is written Tamil language and characters of the 12th century CE. The name of the king is addressed as Tribhuvana Viradevar (Kulottunga Chola III). Dated in the 15th regnal year (1193 CE.) of the king, it records the construction of a temple and the installation of the images of the deities Ayyanar [T]errikkuttar and Narashimar therein by a certain Paluvurudaiyansan-korran, a potter hailing from Valanattu-Tandalai of Karikalakanna-valanadu.

18. TAMIL INSCRIPTION, PINNANKUDI, DISTRICT PUDUKKOTTAI

This inscription in Tamil language and characters is found engraved on the door-jamb of a Siva temple in the village. It records the gift of a door-jamb (*tirunilaikal*) to the temple by Ponnalvan Alvan. On Palaeographical grounds this inscription may be assigned to the 12th century CE.

19. SLUICE STONE INSCRIPTION, SATYAMANGALAM, DISTRICT PUDUKKOTTAI

This sluice stone inscription in Tamil lan-

guage and characters, is copied near a lake namely Alankulam madai in the above village and it records the setting up of a sluice stone (*manavalakkal*) in the lake by Malai Tirupperuman alias Mudikondacholanadalvan of the village. On palaeographical grounds this inscription may be assigned to the 12th century CE.

20. PANDYA COPPER-PLATE INSCRIPTION, TIRUCHCHENKODU, DISTRICT SALEM

This copper plate inscription is under the possession of a coin collector at Tiruchchenkodu. The original find-spot of the copper-plate is not known. The first plate is missing and the remaining three plates are intact. The script employed in this copper-plate is Vatteluttu of the 8th century CE and the language is Tamil. It belongs to the Pandya ruler, Ter maran *i.e.*, Arikesari Parankusa Maravarman, dated in his 36th regnal year (corresponding to 836 CE). It begins with the geneology of the Pandya kings and refers to the gift of the village Ilayanputtur as brahmadaya to a brahmana Narayanabhatta Somayaji of Bharadwaja-gotra who was well-versed in *sastra*, *tarka*, *vedanta*, *siddhanta* and *purana*. The gifted village was previously in the possession of Kampalai marava (warrior of Kampalai) in Asi-nadu. The village was captured by the Pandya king and the lands in the village were reclaimed before it was given to the donee. The gifted village was exempted from taxes.

21. EARLY TAMIL-BRAHMI INSCRIPTION, TATAPPATTI, DISTRICT TENI

This Tamil inscription in early Tamil-Brahmi characters assignable to the 3rd Century BCE, on palaeographical grounds, is found engraved on a menhir in the midst of the megalithic cluster in the village. The beginning portion of the inscription is lost. It reads '*nadion*

pakal paliyi kal' meaning this stone is erected for a servant (*adi on*) (the name of the servant and his lord are lost).

22. TWO LABEL INSCRIPTIONS, TIRUCHCHIRAPPALLI, DISTRICT TIRUCHCHIRAPPALLI

There are a number of single line label inscriptions found engraved on the pillars of the lower rock-cut temple at Tiruchchirappalli referring to various names of the sculptors. The two inscriptions reviewed here are in Tamil language and characters of the 9th century CE. One of the inscriptions refers to the names of the sculptors as *Chola kula tilaka peruntachchan* and another one as *Tenantinal*, who were probably responsible for some carvings in the rock-cut temple.

23. PALLAVA INSCRIPTION, VADATORASALUR, DISTRICT VILUPPURAM

This inscription engraved on a stone slab found lying in front of the Perumal temple, is written in Tamil language and characters of the 9th century CE. Dated in the 3rd regnal year of the Pallava king Nandi *Vikrama* paruman (843 CE). It refers to the gift of a lamp to be burnt before the god Mahadevar by one Annariyan, the son of Vijay Araiyan of Mulappatti. The above gift was made at the instance of Madevadigal.

24. CHOLA INSCRIPTION, VADATORASALUR, DISTRICT VILUPPURAM

This inscription in Tamil language and characters of the 10th century CE and is engraved on a stone slab lying near a well in the Mariamman temple. It is dated in the 3rd regnal year of the Chola king Parakesarivarman (910 CE), who may be identified with Parantaka I. It records the gift of 96 sheep by one Siddhavadavan, a chieftain of Miladu to the god Mahadevar of Adittach-chaturvedimangalam, a

brahmadeya in Palur-kurram in Miladu.

25. TWO MISCELLANEOUS INSCRIPTIONS, PALLAGACHCHERY, DISTRICT VILUPPURAM

The first inscription engraved on the *kumuda* portion of the south wall of Sivaramesvaramudaiya temple, is written in Tamil language and characters of the 13th - 14th century CE. It records the construction of *Kumudappadai* (an *adhishthana* moulding of the temple) by one Manikkam, the brother of Senavudaiyar, son of Panniyavattiyar belonging to a group called ponparappina-Nayanar-Mudaligal.

The second one is an undated inscription, engraved on the south wall of the central shrine of Tiruviramesvaramudaiya-nayanar temple, is written in Tamil language and characters of the 13th-14th century CE. It records the gift of 4000 *kuli* of land as tax free *devadana* and another 2000 *kuli* of land as tax free *tiruvidaiyattam* to the gods Tiruviramesvara-mudaiya-nayanar and Chitrameli *vinnagarapperumal* for providing food offerings and conducting other sacred services in the temple.

UTTAR PRADESH

26. SATI INSCRIPTION, TETA, DISTRICT LALITPUR

This inscription engraved in Nagari characters and corrupt Sanskrit language is dated in [*Vikrama*] 1526 (1469 CE). The record belongs to the reign of the king Mahmud Shah (of Khalji dynasty) and records the performance of *sati* and mentions *Chanderi-desa*.

ARABIC AND PERSIAN INSCRIPTION²

DELHI

27. MUGHAL INSCRIPTION, NEW DELHI

This important Persian record comes from a marble slab fixed in the northern wall of the tomb of celebrated Persian poet Hadrat Amir Khusrau within the *dargah* of Hadrat Nizam-ud-din Auliya, New Delhi. The text mentions that the tomb was built in the reign of the Emperor Nuru'd-Din Muhammad Jahangir Badshah Ghazi (Pl. 76). Another record in Persian verse from the walls of the same tomb mentions the construction of the tomb by Tahir Muhammad son of Sultan Ali Sabzwari in AH 1014 (1605-06 CE). The verses composed by the builder himself are of high degree and contain eulogy of Hadrat Amir Khusrau.

MADHYA PRADESH

28. MISCELLANEOUS EPIGRAPH, AHMADABAD IN BHOPAL, DISTRICT BHOPAL

This epitaph in Persian prose mentions the demise of Maulana Diya-ud-din Faruqi Naqshbandi, disciple of Maulana Abul-laith, who was spiritual successor to famous theologian and Saint Hadrat Shah Wali-ullah. The date of demise recorded is AH 1251, Muharram 6 (1835 CE, May 4) in the text inscribed by Ain-ud-din.

29. INSCRIPTIONS OF NAWABS OF BHOPAL, FATEHGARH FORT, DISTRICT BHOPAL

This bilingual record from the headstone of the grave of Nawab Dost Muhammad Khan mentions the date of birth of the Nawab in AH 1087 (1676-77 CE) and also that of his death in AH 1153 (1740 CE) at Bhopal. The Nawab has been mentioned in the text as the founder of the state (*Riyasat*) of Bhopal. Another epitaph from the same place registers in Persian prose the demise of Fathu Begum, the wife of Nawab Dost Muhammad Khan. It is inscribed by Sami-ud-din.

30. PERSIAN EPIGRAPHS, BHOPAL, DISTRICT BHOPAL

This Persian epigraph from the tomb of Nazir-ud-daula, in a graveyard called Bada-Bagh, contains in a chronogram the date of death of Nazir-ud-Daula, a famous physician, in the year AH 1235 (1819 CE).

31. MISCELLANEOUS INSCRIPTIONS, HARDA, DISTRICT HARDA

One epitaph from the local graveyard mentions in metrical Persian the death of Ahmad Abbas Bilgrami (i.e. of Bilgram in Hardoi district of Uttar Pradesh) on AH 1310 Rabi II, 7 (1892 CE, October 29). Another epitaph from the same place registers the death of a lady, who is mentioned as the sister of Sayyid Ali Naqi Beg, in AH 1311, Dhilqada (1893 CE, September).

32. TRILINGUAL INSCRIPTION, SEHORE, DISTRICT SEHORE

² Information from G.S. Khwaja, Director (Epigraphy)/I/C, Arabic and Persian Inscriptions, Epigraphy Branch of the Survey, Nagpur.

This interesting record in three languages i.e. English, Hindi and Urdu mentions the erection of a gate by Seth Hansraj and Amar Singh the two sons of Seth Bains Prasad in commemoration of Jubilee of Her Majesty the Empress of India in 1889 CE. Also mentions that a *sarai* (i.e. inn) was also rebuilt in the same year.

MAHARASHTRA

33. FRAGMENTARY EPIGRAPH, AURANGABAD, DISTRICT AURANGABAD

A historically important epigraph of the time of Tughluq Sultans was copied from a loose and fragmentary slab found in the store of town hall, Aurangabad. This slab registers the construction of a pleasure house by Amir Qutlugh Malik Safdar, the deputy commandant (*naib kotwal*) of the fort of Deogir (i.e. Daulatabad) during the time (governorship) of Malik-ush-Sharq Saif-ud-Din, in AH 733 (1333-34 CE). It is an important record of Tughluq period, so far as its date is concerned but as its beginning part is lost, the name of the ruling monarch could not be ascertained. On the circumstantial evidences it can be assigned to Sultan Muhammad Tughluq who reigned during this period and had shifted his capital from Delhi to Deogir (Daulatabad). The *naskh* style of calligraphy employed for the execution is conforming to the style that of Tughluq Sultans (Pl. 77).

UTTAR PRADESH

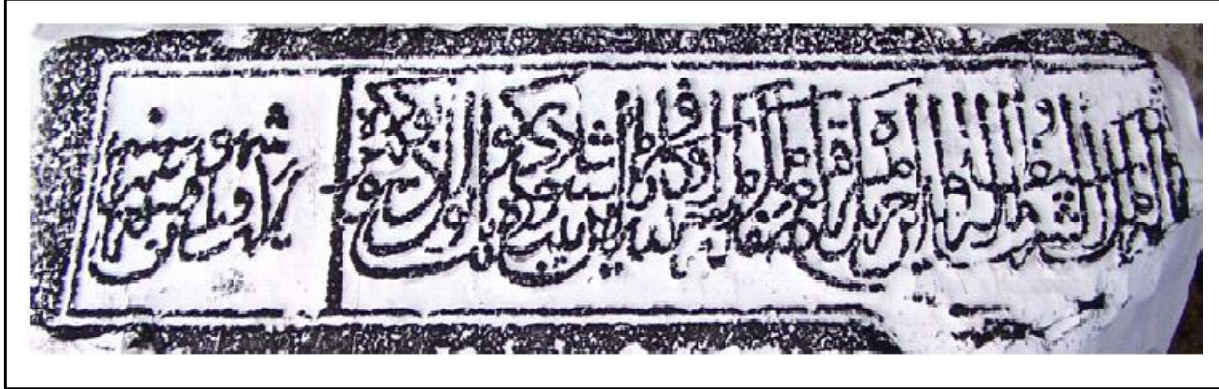
34. MISCELLANEOUS INSCRIPTION, FARRUKHABAD

One construction record from Tinkuni *masjid*, in the city, mentions in metrical Persian the erection of a mosque by a pious man Sadullah in AH 1279 (1862-63 CE). The text and the chronogram for its date is composed

by Tabib. The builder has been mentioned as the brother of Wali Muhammad and son of Ahmad, the *mimar* (i.e. mason). Two epigraphs have been copied from a mosque in the *dargah* of Shah Mujib. These epigraphs in Persian verse assign the construction of this mosque to Agha Jan, probably a concubine, the work of which started in AH 1293 (1876-77 CE) and was completed after one year i.e. in 1294 (1877-78 CE). The text and the chronograms of the dates have been composed by Najaf. One more record from the *dargah* of Shah Mujib mentions in Urdu verses the construction of a gate and a *naqqar-khana* (drum-house) by Allah Yar Khan in AH 1295 (1878 CE). The composer of the text is Najaf, mentioned above.

35. MUGHAL INSCRIPTION, KANNAUJ, DISTRICT KANNAUJ

This important inscription coming from the façade of an inn called *sarai* Mir records the construction of a *sarai* during the time of Emperor Aurangzeb in AH 1094 (1682-83 CE). The place-name has been mentioned as Muhammadabad which is a reference to renaming of Kannauj during the medieval period.



Fragmentary epigraph of Tughluq period dated AH 733 (1333-34 CE) from Aurangabad. See p. 148



Epigraph of Emperor Jahangir from the Tomb of Hadrat Amir Khusrau, New Delhi. See p. 149

III. NUMISMATICS AND TREASURE TROVE

PUNJAB

1. SILVER COINS, DISTRICT FATEHGARH SAHIB

Seventy five silver coins were collected from Shri Parampal Singh, Ex-Sarpanch and Chairman of Market Committee, Chanarthal through Senior Superintendent of Police, Fatehgarh Sahib.

IV. OTHER IMPORTANT DISCOVERIES

JAMMU AND KASHMIR

1. BRONZE OBJECTS AT ZURHAMA, DISTRICT KUPWARA

On the receipt of specific information from G. H. Hassan Malik of Zurhama village about 13km from District headquarters, M.S.Zahid, Ehsan-Ul-haq, Gh.Rasool and Mushtaq Ahmad Bhat of Archaeology, Archives and Museums, Jammu and Kashmir visited ancient spot and conducted a trial dig of the site. During the trial dig, besides pottery fragments, a magnificent bronze sculptures were recovered from upper layer of the ancient site of Zurhama, district Kupwara. Four headed four armed Vishnu riding on *garuda* with four female attendants, two each on either sides. The Vishnu is holding principal objects in its different hands. The entire figure is shown standing on lotus designed pedestal, (size 23x13cm). Four armed Vishnu with its consort Vaishnavi shown seated on a pedestal holding the principal objects. The Vaishnavi is seated on the left thigh of his consort (size 12x6cm). Vaishnavi seated cross legged on a lotus design pedestal (size 27x15cm).

This is the first type of Archaeological discovery from Kupwara side of the valley.

JHARKHAND

2. TEMPLE REMAINS, BENISAGAR, DISTRICT WEST SINGHBHUM

Ranchi Circle of the Survey carried out scientific clearance at the protected site, Benisagar in the district West Singhbhum under the supervision of T.J. Baidya assisted by N.K. Sinha, R. Dehuri, R. K. Raj and M. Ekka, exposed the remains of a brick temple on the small island located in centre of Benisagar tank (Pl. 78). The exposed temple is in the form of

brick platform measuring 6x6m and consists of two constructional phases. This platform is enclosed within a 64cm wide enclosure wall, providing a 1.40m wide *pradakshinapatha* all around the square platform. The entrance is provided from the east in the shape of semi-circle (*chandrashila*) type. The evidence of three steps were also noticed attached with the eastern portion of the platform. The brick sizes used for construction of this temple are 36x23x7cm, 37x24x7cm, 35x21x6cm and 36x23x6cm. Further, in the eastern bank of the tank, a bathing ghat was exposed, made of brick on edge, measures 6.28x1.70m (Pl. 79). The remains of another brick temple was exposed towards further east of the bathing *ghat* where in a sanctum, measuring 2.32x1.23m with a *Siva-linga, in situ*, was noticed.

The remains of another temple was exposed on the south-east of the tank, constructed of laterite stone blocks and *triratha* in plan (Pl. 80). A model of small temple in stone was also collected from the site (Pl. 81).

KARNATAKA

3. SCIENTIFIC CLEARANCE OF KEERTIHARAYANA TEMPLE, DISTRICT TALAKED

After the collapse of *srivimana* of the temple on 24th November 2000, the temple has been dismantled up to the *pada*-moulding after detailed documentation. Trial excavation has been taken up for the study of foundation, nature of filling, habitation on below the foundation and in the neighborhood of the monument etc.

In all four trenches were laid in east, west and south adjacent to the *pada*-moulding of the temple. In Trench I (6.00x6.00m), a *yaga* or *homakunda* was found nearly 2m towards the eastern *mukhamandapa* at a depth of 0.30 m parallel to the working level of the first *jagati*

(plinth) course. In the north eastern corner of the *upāna* of the eastern *mukhamandapa*, evidences of ritualistic deposits like ash, shells and charcoal were found. Standing to a height of 1.90m, the *hōmakunda* is uniquely shaped like a *yōni-pītha* with the *pranāla* facing to north as envisaged in Mayāmata text (Pls. 82-83).

In addition, the evidences of a sacrificial pavilion built for the ritual are also seen in the form of post holes surrounding the fire altar, as seen in the sections. Built in six courses of brick and measuring 2.40x1.50m, the sacrificial altar appears to have had a cow dung-mud plaster coat as an act of purity and insulation. The circular fire pit measured 0.20m in diameter, and had been found filled with river sand as a base for the fire altar. The excavation further below revealed the disturbed habitation deposit of the Ganga-Chola period (9th-11th century CE).

In Trench II, portion of a brick built wall with drainage system towards south of Ganga period (9th-11th century CE) has been found indicating the possible existence of a structure below the Hoysala (12th century CE) levels.

This is supported by the finding of a finely executed sculpture of Visnu-Madhava (without any mutilation) exhibiting Ganga-Chola stylistic features. The work in Trench II, laid in the region covering *garbhagriha*, *antarāla* and western aisle of *mahāmandapa*, was initiated at the level of the *pāda*-moulding of the dismantled temple and was excavated up to a depth of nearly 2.50m. The longitudinal trench of 6.50x3.00m, laid bare three distinct layers the first, starting from the top, compact clayey soil mixed with brick bats, pot sherds, pebbles immediately below the floor slabs as the core filling; the second layer representing river sand alternating with smaller stone nodules and boulders once again as core filling; the third layer was of loose river sand mixed with huge boulders the concentration of which was more

in the region of sanctum. This loose nature of strata posed a problem of retaining a vertical section. A depth of nearly 2m has been achieved with great difficulty and the work was suspended after proper record (Pls. 84-85). Excavation in Trench IV (3.00x3.00m), on the western side outside the *garbhagriha* of the temple has revealed structural activity of the Ganga-Chola (9th-11th century CE) period in the form of disturbed brick structures.

KERALA

4. NEOLITHIC AXE FROM MAMPALLIKUNNAM NEAR CHATHANNUR, DISTRICT KOLLAM

During a recent archaeological exploration around Mampallikunnam area near Chathannur Karamcode P. Rajendran and Balakrishnan found rolled neolithic axe in a paddy field at the foot of a laterite hillock. P. Rajendran and a University Grants Commission (UGC) researcher, Deptt. of History, Kerala University at Kariavattom proved it as a well finished stone axe of the neolithic cultures. Similar implements were earlier reported from other sites. According to Rajendran the neolithic evidences in Kerala, found from all the three physiographical zones indicate that the region was well inhabited by the neolithic people during the late Holocene period. The present find from Mampallikunnam is the second evidence next to the one from Mantrothuruth discovered by Rajendran in 1989 from Kollam district. The implement measures 15x8x5cm in length, breadth and thickness respectively. The tool has a wide slightly convex working edge at the distal end and it retains pointed proximal end. The implement has an oval cross section and bilateral symmetry and is made by flaking, pecking, and grinding.

5. MESOLITHIC IMPLEMENTS FROM MURIKATTUKUDIYL GOVERNMENT TRIBAL SCHOOL COMPOUND, DISTRICT IDUKKI

During an archaeological exploration in and



78



79

Benisagar: exposed bricks temple and with Siva-linga during scientific clearance. See p. 153



80

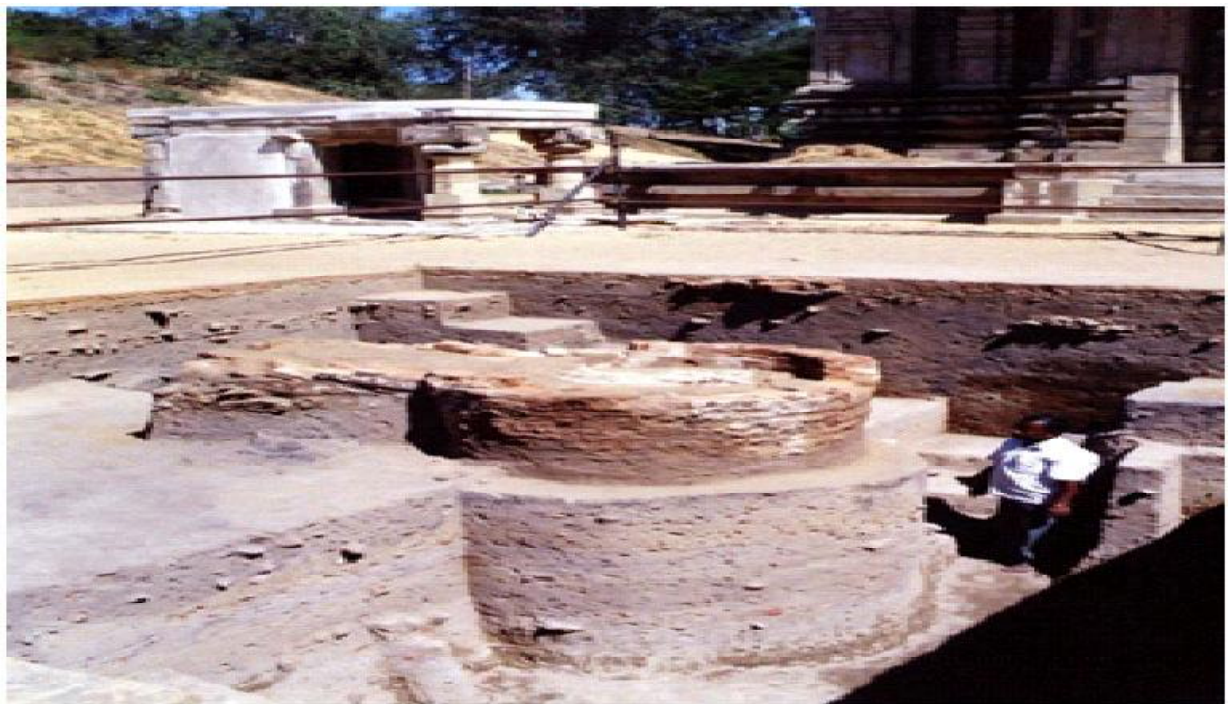


81

Benisagar: 80, exposed brick structure along with stone structure during scientific clearance; 81, replica of temple. See p. 153



82



83

Keertinarayana temple, Talakad: Trial trench, homakunda. See p. 154



84



85

Keertinarayana temple, Talakad: 84, Trial trench, Ganga period brick structure; 85, Nature of foundation deposit, garbhagriha. See p. 154

OTHER IMPORTANT DISCOVERIES

around Uppinangadi near the Periyar river basin in Idukki district, mesolithic implements made of quartz have been discovered from within the laterite clay in the tribal school compound at Murikkatukudi by P. Rajendran, UGC researcher in the Deptt. of History, Kerala University at Kariavattom. The artifacts consist of points, lunates, scrapers, blades, borers, blade cores, flakes, etc. Both milky and crystal quartz which are locally available in pebble forms in the river bed were used by the Mesolithic people to prepare the implements. Their typology and morphology amply prove the technological expertise on the quartz raw material by the stone age people who inhabited in this part of the country.

6. NEOLITHIC STONE AXE FROM PALARUVI, DISTRICT KOLLAM

J.S. Deepu, UGC researcher in the Deptt. of History, Kerala University at Kariavattom, in Kollam district has discovered a broken neolithic stone axe from the down stream away from the Palaruvi water fall on the pebble bed in the highland region. The tool is made of granite rock and it is a broken piece retaining the distal half end of the tool. The cutting edge of the tool is very much blunted definitely due to extensive use. It is for the first time a neolithic axe has been discovered from the higher reaches of the Kallada river basin.

MANIPUR

7. SECONDARY URN BURIAL SITE, KHANGABOK, DISTRICT THOUBAL

State Archaeology, Govt. of Manipur reported the discovery of an Urn burial site. The site yielded bones, ancient bell-metal coins, bronze rings, iron objects, pots and bowls.

RAJASTHAN

8. BUDDHA IMAGE AT NILKANTHA, DISTRICT ALWAR

Rajendra Yadav, Exploration and Excavation Officer of the Department of Archaeology and Museums, Govt. of Rajasthan has discovered a Buddha image at Nilkantha situated (27° 15' N; 76° 21' E) about 10km away from Tehla and 45km south-southwest of district Alwar in tehsil Thanagazi. Nilkantha or Paranagar was the capital of Badagujar Rajputs who were ruling in 9th-10th century CE as a feudatory chief of Pratiharas of Kannauj branch. The Buddha image found seems to be the only independent Buddha image reported from Rajasthan so far. The standing image of Buddha carved on pinkish-buff sandstone measuring 109x54x31cm in size. Buddha is standing in *samapada* with right hand is in *abhayamudra* and left is in half bend position holding *chivara*. He is flanked by Padmapani and Chakrapani, standing on either side near the leg. Buddha is shown with curly hair and long ears touching to the shoulder. Both hands and face of the Buddha are slightly mutilated. Stylistically, it is datable to 9th -10th century CE.

TAMILNADU

9. DISCOVERY OF BRONZE IDOLS, AIRVATESWARA TEMPLE, DARASURAM, DISTRICT THANJAVUR

During the current year, the work of conservation of the dilapidated out of plumb corridor on the northwest corner of Airvateswara temple, Darasuram, district Thanjavur, thirteen bronze idols and one bronze bowl were unearthed from a depth varying from 1-2m. The type of bronze idols show that they are of *utsavamurti* meant for carrying around during occasions. The bronze idols includes Tirujnanasambandar, Ganesa, Parvati, Siva, Manikkavachakar, Nataraja and a bronze cash box. The idols are typically of the later Chola period assigned to c. 12th century CE. The bronze idols are made on solid casting and are intact without much damage. These bronzes were photo documented.

V. PALAEOBOTANICAL AND POLLEN ANALYTICAL INVESTIGATIONS

The present report incorporates the work done on the subject of at Birbal Sahani Institute of Palaeobotany, Lucknow, during 2006-07; on the botanical remains recovered from the excavations at ancient Lahuradewa, District Sant Kabirnagar and ancient Sanchankot/Ramkot, district Unnao, Uttar Pradesh.¹

UTTAR PRADESH

1. LAHURADEWA, DISTRICT SANT KABIRNAGAR (26°46'N; 82°50'30"E)

Analyzed archaeobotanical samples from an early lake-side settlement datable to c. 4000-3200 yrs BP (chalcolithic). The evidence revealed an advanced state of agriculture. The finds include the remains of *Oryza sativa* (rice), *Triticum aestivum* (bread wheat), *Triticum sphaerococcum* (dwarf wheat), *Hordeum vulgare* (hulled barley), *Sorghum bicolor* (jowari millet), *Lens culinaris* (lentil), *Pisum arvense* (field pea), *Cicer arietinum* (chick pea), *Lathyrus sativus* (grass-pea), *Macrotyloma uniflorum* (horse gram), *Vigna radiata* (green gram), *Vigna aconitifolia* (moth bean), *Trigonella foenum-graecum* (fenugreek) and *Gossypium arboreum/ herbaceum* (cotton). Associated with these crop remains as an admixture, the remains of the seeds and fruits of weeds and other wild *taxa* have also been identified as *Vicia sativa*, *Setaria glauca*, *Oryza rufipogon*, *Chenopodium album*,

Grewia asiatica, *Ziziphus nummularia* and species of *Polygonum*, *Cleome* and *Melilotus*.

2. SANCHANKOT/RAMKOT, DISTRICT UNNAO, (26°S9'10"N; 80°19'150"E)

Morphological investigation of seed and fruit remains samples carried out from cultural horizon of PGW, NBPW, Sunga and Kushana periods (approx. 1000BCE to 300 CE) to build up plant economy practiced by the ancient settlers and the ecological conditions in this region of Ganga plain in the past. The site exhibits ancient plant economy comprising of the field-crop finds belong to cereals viz., barley (*Hordeum vulgare*), rice (*Oryza sativa*), sawan (*Echinochloa crus-galli*), kodo millet (*Paspalum scrobiculatum*); pulses-lentil (*Lens culinaris*), pigeon pea (*Cajanus cajan*), khesari/grass pea (*Lathyrus sativus*), field pea (*Pisum*), green gram (*Vigna radiata*), black gram (*Vigna mungo*), horse gram/kulthi (*Macrotyloma uniflorum*), aconite/bean (*Vigna aconitifolia*); seeds of oil yielding plant- field (*Brassica juncea*), jujube (*Ziziphus sp.*) and Leguminous fruiting pod; seeds of silk-cotton (*Salmalia malabarica*) fibre.

Nearly thirty types of weeds and wild *taxa* have been recovered, belonging to wild grasses viz., *Andropogon sp.* (blue stem grass), *Dactyloctenium aegyptium* (crow foot grass), *Eleusine indica* (goose grass), *Panicum sp.* (panicum grass), *Poa sp.* (blue or meadow

¹. Contributed by Chanchala Srivastava of the Birbal Sahani Institute of Palaeobotany, Lucknow

grass); sedges viz., *Cyperus sp.* (flat sedge), *Elaeocharis sp.* (spikerush sedge), *Fimbristylis* with three species (fimbristylis sedge), *Scirpus sp.* (bulrush), *Scleria ciliata*; other finds are of *Desmodium gangeticum* (clover/savivan), *Indigofera sp.* (indigo), *Indigofera hirsuta* (hairy indigo), *Medicago sp.* (blue alfalfa), *Melilotus alba* (sweet clover, safed senjhi), *Asphodelus tenuifolius* (piazi), *Verbascum thapsus* (mullein), *Vicia sativa* (common vetch), *Amaranthus sp.* (pigweed), *Chenopodium album* (white goose-foot, bathua), *Commelina behghalensis* (day-flower faint), *Trianthema portulacastrum* (lalsabuni), *Solanum sp.* (night-shade); *Polygonum barbatum*, *Rumex dentatus* (labbibi, khat-palak), *Sida sp.*, and some Convolvulaceae

member. *Dactyloctenium aegyptium* and all the sedges, *Commelina benghalensis*, *Trianthema portulacastrum* may have been the weeds in summer group crops like rice; whereas *Indigofera hirsuta*, *Melilotus alba*, *Vicia sativa*, *Amaranthus sp.*, *Chenopodium album* represent the weed components in winter crops like wheat and barley in the ancient agriculture at the site. *Verbascum thapsus* (mullein) is an occasional member along water channels whereas *Polygonum barbatum* and *Rumex dentatus* represent moist and swampy localities in the surrounding of ancient habitational deposits.

VI. MUSEUMS

1. ARCHAEOLOGICAL MUSEUM, AIHOLE

Polychrome transslides showing views of major conservation works attended to the Chalukyan monuments at Aihole, Badami and Pattadakal are prepared and exhibited with suitably designed boxes around the valley model. Newly prepared texts and illustrations highlighting pre and proto-history, epigraphy and new discoveries including excavation are displayed appropriately in showcases. The front (west facing) wall surface of the museum is plastered with rough granular mortar and colour washed to match with the ambience. Reserve collection is reorganized by providing MS angle welded with heavy gauge MS sheets. The sculptures kept along the museum building are displayed over masonry pedestals in an organized manner aesthetically pleasant open-air gallery. Teak wood shutters are provided to the doors and windows of the office building. Solar electrical fittings and street lights are provided to the office and surroundings of the museum as an additional security measure.

2. ARCHAEOLOGICAL MUSEUM, BADAMI

Newly prepared text and illustrations highlighting the human evolution, pre and proto-history, epigraphy and new discoveries including excavation, conservation and quarry site are displayed appropriately in the well-designed showcases. Extended labels are provided to some more important exhibits. The reserve collection room is upgraded by adding MS iron frames fitted with MS sheets and the collection is re-arranged. Solar street lights are fixed in the museum premises for additional security. *Chhajjas* are provided to the doors and windows to avoid rainwater splashing in to the office.

3. ARCHAEOLOGICAL MUSEUM, BIJAPUR

The wooden showcases including sale counter are polished to give a better aesthetic look. The damaged veneering of the pedestals in Gallery 3 exclusively exhibiting Persian, Kannada and Sanskrit inscriptions are provided with fresh veneering, using quality decolam sheet of suitable colour. The stone head of a royal person (generally identified as Aliya Ramaraya, the Vijayanagara king, who was beheaded in the decisive battle of Rakkasatangadi) lying in the reserve collection is now displayed in a suitably designed wooden pedestal. Godrej glass door almirahs are acquired for preserving the manuscripts in the reserve collection. MS iron collapsible gate is fixed on the interior of the main entrance of the museum as an additional security measure. The damaged cable from electric pole to the main switchboard is changed to ensure continuous power supply. Solar home lights are fixed in the galleries as an additional measure of safety and security. Some more visitors' benches are provided in the galleries for the use of tourists.

4. ARCHAEOLOGICAL MUSEUM, BODHGAYA

Gallery 2 of the museum is extended further by removing the partition wall of the adjacent room. In the gallery wall showcases on sunmica veneered wall have been provided. Effective signages of the museums are fixed at prominent places of the museum. Four numbers of culture notice boards (CNB), two each on flex and MS sheet were prepared. Both the flex boards are fixed in the museum gallery while that of MS sheet are installed near the booking counter. In addition to this a flex board depicting the details of railing pillars has also been installed to provide information to the visitors. A masonry structure (kiosk) with

arched facade for installation of water cooler has been constructed in the garden of museum premises. It is provided with glazed tiles and floor tiles.

5. ARCHAEOLOGICAL MUSEUM, DHOLAVIRA

Site museum at Dholavira was inaugurated on 23rd March, 2007 and thrown open to public. The museum houses antiquities retrieved from the excavations and also surface findings from Dholavira.

6. ASSAM STATE MUSEUM, GUWAHATI

Ever since its inception, the directorate has initiated a concerted drive for its various programmes and it served more varied and ever expanding audience.

The year also witnessed the opening of five new galleries namely, pre-history and proto-history gallery, bronze sculptures and gallery on coins, epigraphy and sculptures gallery, textile gallery and manuscript gallery, etc. The improvement and reorganization of these galleries was done under the department of Culture, Govt. of India's Scheme- 'Modernization of Museum programme' and the work was executed by the Indian Museum, Kolkata. Through these galleries, it was intended to provide the public to see the original art objects of Indus valley civilization in the pre-history and proto-history gallery. Kushana coins, punch-mark coins, sultanate coins and coins of different dynasties of Assam are in view in the gallery on coins. Copper plates and stone inscription from the time of Varmana dynasty, Salasthambha dynasty, Pala dynasty to Ahom period are exhibited in the epigraphy gallery. It informs about the socio-political background of this state and the inscriptions are also important for providing information about the development of Assamese scripts. Original illustrated manuscript paintings of Assam and splendor of textiles are on display

in the manuscript gallery and in the textile gallery respectively.

The setting up of new galleries with improved display technique at the district museum, Nagaon plus the extension of the Nilima Barua folk art museum building at Gauripur in the Dhubri district are almost completed. It may be added that Nilima Barua of Gauripur, the art collector of Assam collected exquisite specimens of ornaments, textiles, terracotta, folk art and paintings etc. After her death, a major portion of her collection was handed over to the Directorate of Museums, Assam by her family member for setting up of a folk art museum at Gauripur. The museum has a rich collection of more than 1000 exquisite exhibits of folk art and crafts, textiles and ornaments. Vivid picture of art and social tradition, folk beliefs and motifs, aesthetic assimilation and cultural influences in the western part of the state.

7. ARCHAEOLOGICAL MUSEUM, GWALIOR

Twenty masonry pedestals were prepared in the lawn area in front of the museum building. Sculptures were shifted from the jail building to display on them. Gallery 4 was repainted with an eye appealing colour. All the worn out labels were replaced and a new bilingual board was provided at the entrance of the museum giving details of the history and antiquities of the area and the museum.

8. SALARJUNG MUSEUM, HYDERABAD

The museum has organised temporary exhibitions on various occasions under different banners like Sree Rama, Bharat Ratna Dr. B.R. Ambedkar, Museum Heritage, Islamic Heritage, Hyderabad – 'A Photo Journey', 'Melody of Mother and Moppet', 'Galleries of Dewan Deodi', 'Sikh Heritage', 'Mouled-E-Kaaba', 'India's Freedom Struggle', 'Culture and Heritage of India', 'Historical Monuments', 'Ma-

hatma Gandhi -Father of the Nation', 'Ivory and Parchment Manuscripts', World Mythology, Budding Artists (Art Creations of School Children), Towards Crystals, Museum Acquisitions, Dreams of an Inhabitant Moghul, Culture and Heritage of India (Mobile van exhibition), 58th Republic Day, Manuscripts Heritage and Iqbal Hussain -The greatest Martyr.

Besides, museum organized monthly lectures in collaboration with Historical Society of Hyderabad, and special lectures were also arranged during the time of Salar Jung's birthday function and on visit of museum experts from India and abroad. Lectures that were delivered during the period are on "defence technology" (with special reference to the forts of Deccan), "Hyderabad then and now", "Deccan Jewellery", "Bagalkot - A Cultural Museum", "Prevention of Kidney Diseases", "Transcendental Meditation", "Indonesia - Special reference to Borobudur and Prambanan", "Recent Archaeological Discoveries", "Contribution of Coins to Indian History", "Twin Cities Bonalu Festival - a Historical Perspective", "East World Trade of Mughal India and Indian Law for Women".

Various workshops were also organized that included preventive and curative conservation of manuscripts and conservation of manuscripts as part of National Mission of Manuscripts, and conservation and restoration of art objects. Training programmes were also organised on manuscripts and conservation. Besides, a training programme was organised for the teachers under museum awareness scheme. An advanced course in Manuscriptology was conducted as part of National Mission for Manuscripts unit in the museum.

9. ARCHAEOLOGICAL MUSEUM, JAGESHWAR

Carved wooden door frame of traditional

style of the region is placed at the main entrance of the museum. Ornamental railing of cast iron is provided in the front side of the boundary wall in place of barbed wire fencing. The construction of toilet block with modern facilities has been provided. The work of false ceiling and false wall with carpeting on the floor has been completed after removing the partition wall of reserved collection and the Assistant Archaeologist's office. In the process of re-organization work of galleries, eleven sculptures with wooden pedestals have been shifted to this newly created Gallery 3 from Gallery 1 and defused lights are also provided to the gallery. Translides of the monuments are displayed in galleries and central hall.

10. ARCHAEOLOGICAL MUSEUM, KANGRA

The collection of coins in the museum, are both displayed and kept in reserve collection. These thirty coins belonging to Khalji dynasty and are datable to *circa* 16th-17th century CE. These were photo-documented.

11. ARCHAEOLOGICAL MUSEUM, KHAJURAHO

Construction of the new museum building has been completed. Fifteen sculptures were sent to the "Festival of India" named as TEJAS at Brussels and SACH exhibition in China.

12. MATTANCHERRY PALACE MUSEUM, KOCHI

The museum has been taken up for major reorganization. The proposal includes (i) extension of galleries, (ii) shifting of office from the galleries to the ground floor which will pave way for circular movement of visitors around the galleries, (iii) improving lighting arrangements, (iv) reorganization of galleries, chronology wise and (v) provision of proper signage, etc. The long hall where temporary exhibitions are generally conducted has been taken up in the first phase, where in the Kerala history gallery is being organized.

13. ARCHAEOLOGICAL MUSEUM, KONARK

The photo documentation of museum objects displayed in the galleries was taken up. The work has also been completed. Attractive laminated colour blow ups of Odishan monuments and some rare photographs, drawings of Sun Temple, Konark were also prepared and displayed on the walls of corridor of the museum for the benefit of visitors and scholars. Brochures in Hindi, English and Odia were also printed for free distribution to the visitors, scholars and V.I.Ps. The existing toilet blocks were renovated for the convenience of visitors. The roof of the museum building has been repaired by way of laying PCC to arrest the seepage of rain water. Besides, the museum building and its corridor were facelifted by way providing plastic paint with weather coat. Proper lighting arrangement was made inside and out side the museum complex in view of the safety and security. Besides, a generator set along with accessories was also installed to meet the emergency during power cut.

14. ARCHAEOLOGICAL MUSEUM, NALANDA

Three pedestals in Gallery 1 and one in the main hall have been modernized by way of replacing old and damaged board with fresh sunmica laminated boards. With a view to highlight the images, the background has been provided with a contrast border. The damaged and heavy false ceiling of gypsum has been replaced by a light weight, accoustical ceiling in the main hall of the museum. Four number of granite slabs depicting the text (two Hindi and two English) with highlights of Nalanda, museum have been placed at prominent points within the premises. Attractive brass name plate signage (both Hindi and English) have been provided on either sides of the entrance of the museum building. With a view to check sound pollution, two gensets (10 KVA and 3.5 KVA) have been provided with accoustical canopy. Deep bore well

with submersible pump has been provided to ensure sufficient water supply within the premises for convenience of the visitors. A multicolour informative brochure entitled “Grandeur of Nalanda- as described in stone inscriptions preserved in Nalanda Museum” has been brought out. World museum day was observed in a meaningful way involving students, teachers and local people.

15. ARCHAEOLOGICAL MUSEUM, LOTHAL

Colour wash has been provided on the external part of the museum building. Proper lighting arrangements were done in all galleries and showcases. Pedestals and exhaust fans provided in all galleries. Anti-termite treatment has been carried out in the museum.

16. HAZARDUARI PALACE MUSEUM, MURSHIDABAD

Renovation of thirty numbers of old antique furniture including repairing and polishing has been completed. Repairing and colouring of seventy five number wooden frames of paintings, litho paintings as per original have been completed. Further the *farmans* and maps have been listed for better upkeepment. Besides, preparation of labels, charts, direction boards, etc. have been fixed in different galleries of the museum. An international standard toilet blocks for ladies and gents has been constructed.

17. ARCHAEOLOGICAL MUSEUM, RATNAGIRI

The accessioning and documentation work of the antiquities of reserve collection have been taken up along with their packing and storing. For the safety and security as well as beautification of the museum, proper lighting has been provided in front of the museum building. The damaged termite affected main wooden door has been replaced by the aesthetically designed metal and glass door. To keep a close vigil eye over the displayed antiquities as well

as the movement of the staffs and visitors in the galleries, the existing CCTV monitor has been shifted to the office room of Assistant Archaeologist. Repair to the roof of museum building has been taken up through CPWD and the work is in progress.

18. ARCHAEOLOGICAL MUSEUM, SANCHI

New wooden pedestals were provided to the sculptures in place of damaged and termite infected pedestals. Besides, all the galleries were painted with an eye appealing colour.

19. ARCHAEOLOGICAL MUSEUM, SARNATH

The antiquities both major as well as minor are lying haphazardly in the reserve collection which are giving a shabby look and inconveniences to the scholars and students. In view of eradication of the problem said antiquities are kept in a lucid manner, the bigger objects were kept on the shelves and wrapped with cotton and placed in the wooden boxes. Remarking of the objects have been done where rubbing of old markings were observed. Photo documentation of almost two thousand five hundred antiquities has been completed. Replicas of selected antiquities have been prepared by way of moulding and casting in plaster of Paris and are kept for sale in the departmental publication sales counter.

20. ARCHAEOLOGICAL MUSEUM, SRI SURYAPAHAR

All the antiquities of the site museum have been accessioned and displayed antiquities are documented. The galleries have been reorganized and provided with false ceilings. The galleries are also illuminated properly to highlight the exhibits.

21. ARCHAEOLOGICAL MUSEUM, VAISHALI

Vertical blinds have been provided to the doors and windows of the museum building. CNB both in Hindi and English made of granite

stone with the depiction of the history and main exhibits of the museum are installed at conspicuous places for imparting information to the visitors. The false ceiling of the museum galleries are repaired and repainted to increase its aesthetic quality.

22. ARCHAEOLOGICAL MUSEUM, VELHA GOA

The showcase displaying the Chinese ceramics of the medieval period was upgraded by depicting fragments of Azulejos (tiles) which were mended and fixed at the St. Augustine complex. To facilitate the traveling exhibition titled 'Heritage Trail', the period images as sketched by the geographer Lopez Mendes in his book "An India Portuguesa Vol I, II (1986)" were enlarged and framed. A showcase has been fabricated and suitably displayed in the key gallery with the photographs displaying the complete process of transplantation of Mahadeva temple from Kurdi to its present location near the Salaulim dam about 17km away from its original location.

The old damaged pedestals in the portrait gallery were replaced with new steam beach veneer to match the ambience. Some wooden frames which were badly damaged got repaired and some replaced. The wooden model of the ship Sao Gabriel was given anti-termite treatment by fumigation (bubble technique). The wooden partition of the office was replaced by canfor design boards including concealed wiring. The missing wooden balustrade (railing) leading to the first floor was fabricated and fixed to facilitate movement of visitors. Handrail of non-corrosive steel along with an emergency gate was provided at the entrance to regulate the visitors (**Pls. 86-87**).



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Archaeological Museum, Velha, Goa: providing wooden railing. See p. 166

VII. ARCHITECTURAL SURVEY

SOUTHERN REGION

The Temple Survey Project (Southern Region) of the Survey took up the exploration of structural temples of imperial Rashtrakutas' as a part of a long term project that was initiated since 2002-03 by L.S. Rao. Subsequently, the project continued under the direction of K.T. Narasimhan and completed in all respects during 2006-07.

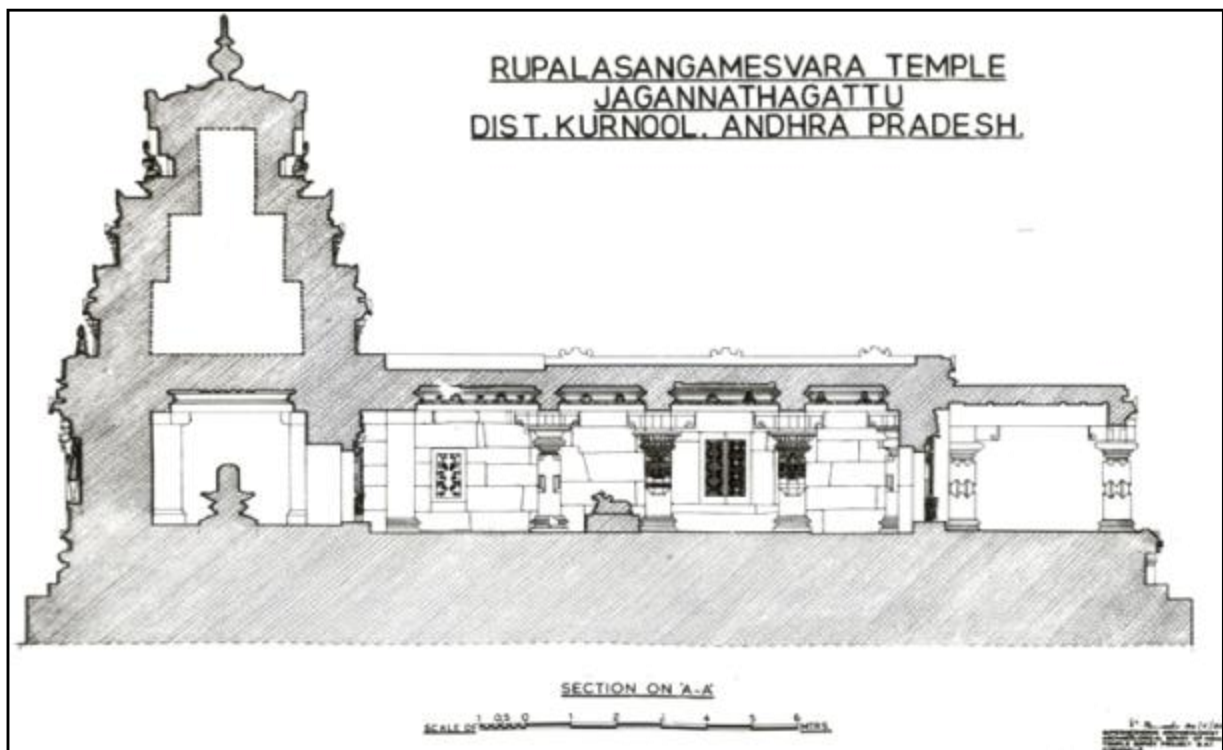
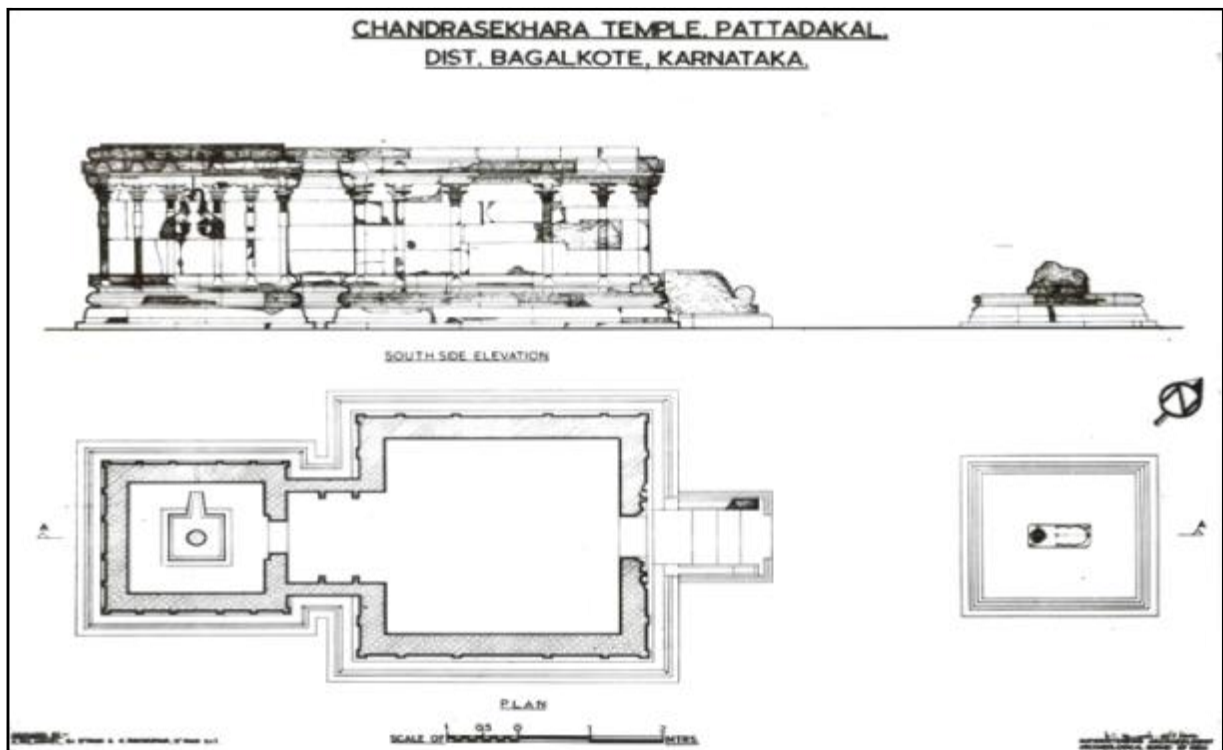
This project was aimed to highlight the imperial Rashtrakutas' contribution in the field of art and architecture. This work covered from 8th to 1st half of 10th century CE when the Rashtrakutas' were ruling Karnataka, part of Maharashtra, Andhra Pradesh and Tamilnadu. Keeping this in view, sixty one temples were taken up for field study, which are situated in the states of Andhra Pradesh, Karnataka and Tamilnadu and architectural details were collected during survey and critically studied. Some temples which are located in remote villages having no direct access to go there were also taken into account for this project work.

In the first phase of this project, temples in the district of Bagalkot in Karnataka were taken up for field study, where a quite number of temples were constructed at Aihole, Hallur, Pattadakal, Bachhenagudda and Badami. Besides, temples at Ron in Gadag district were inspected (**Fig. 13, Pls. 89-90**).

During the second phase of this ongoing project, structural temples of imperial Rashtrakutas' in Andhra Pradesh were taken up for critical study. The Rashtrakuta temples built in Nandikotkur *taluk* of Kurnool district were inspected (**Fig. 14**)

In Tamilnadu for the first time the Rashtrakuta influence in a Pallava temple was noticed. Therefore, the Sundara Varada Perumal temple at Uttiramerur in Kanchipuram district was studied. Necessary technical notes, drawings and photographs have been made for this project. In Tamilnadu, some Rashtrakuta influence was noticed in Ranganatha temple at Erukkampet and Cholesvara temple at Melpadi in Vellore district. These temples were also critically studied and included in this project.

Down the century, they built many structural temples with special features of their own. Such temples were built in Aihole, Hallur, Pattadakal, Badami and other places in Karnataka; few temples in Vengi region of Andhra Pradesh, in the Tondainadu of Tamilnadu. The current project will speak the contribution of Imperial Rashtrakutas to the Indian art and architecture by throwing light on many lesser known and unknown temples situated in the states of Maharashtra, Karnataka, Andhra Pradesh, Tamilnadu and Pondicherry.





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Aihole: general view of Jaderagudi from north east. See p. 168

VIII. PRESERVATION OF MONUMENTS

MONUMENTS OF NATIONAL IMPORTANCE

AURANGABAD CIRCLE

MAHARASHTRA

1. BIBI-KA-MAQBARA, AURANGABAD, DISTRICT AURANGABAD

The decayed and pulverised lime plaster of several layers on the southern and eastern high enclosure wall around Bibi-ka-Maqbara, constructed with brick and basalt set in lime mortar was removed and re-plastered in lime mortar (Pls. 90-91). The brick-on-edge pathway within the *charbagh* in Bibi-ka-Maqbara is damaged at several locations. The damaged brick-on-edge pathway on the eastern periphery adjoining the eastern enclosure wall on its interior side and immediately to the southwest of eastern *baradari* is also extensively damaged. This damaged portion of the pathway was removed and laid with fresh bricks following the existing design pattern. The accumulated silt in the ancient wells and tanks in around the *maqbara* were de-silted. Besides, the work of providing an iron grill fencing on angle iron posts over a dwarf wall around the parking area located to the south-southwest of Bibi-ka-Maqbara has been started, and the work is in progress.

2. AURANGABAD CAVES, AURANGABAD, DISTRICT AURANGABAD

The approach pathway leading to Cave no. 5 of Western Group (Cave 1-5) has been damaged due to collapse of overhanging rock mass that was used for visitors' movement. Keeping in view, the problem of collapsing of the overhang rock masses, an alternate pathway passing over a small stream in front of the caves

has now been provided so that one can directly reach Cave 2. This work of providing the alternate pathway and the construction of a pedestrian footbridge over the stream is in progress. Likewise, the existing stepped pathway leading to Cave 10-12 of Eastern Group (Cave 6-11) was diverted due to the danger of weak overhanging rock mass. This alternate pathway runs in front of Cave 9 and leading to Cave 10-12. The work of pathway is in progress which is provided with basalt stone flooring and parapet wall with basalt stone coping. The doors and windows have been provided to the caves with galvanised iron crimped wire mesh in teak wood frame to prevent the entry of bats.

3. AJANTA CAVES, AJANTA, DISTRICT AURANGABAD

The pathway provided for the visitor movement from the entrance of Cave 16 to the forest gate is being repaired by removing the existing damaged concrete and in its place fresh cement concrete has been provided. The basaltic rock formation at Ajanta has several voids and overhangs at many locations; some of which are directly above the caves. These cavities are filled in with debris that retains water and gradually let out the moisture and water affecting the caves. One such long and continuous cavity is noticed at the top of Cave 1-6 that has resulted seepage in the ceiling of rear aisle of Cave 1. As a trial basis, a portion of the cavity has been filled up with uncoursed rubble masonry set with cement mortar and plastering the exterior surface including finishing as rock texture above Cave 1 and provided with proper drainage for water. The archaeological area on the top of Ajanta caves was provided with fenc-

ing using iron angle post with galvanised iron chain link to stop unauthorised access from the top of the caves. In order to prevent the entry of bats into the painted caves, crimped mesh doors and windows have been provided to all the openings in Cave 4 to 8, 11 to 15, 19 to 28 and 30.

4. ELLORA CAVES, ELLORA, DISTRICT AURANGABAD

With a view to connect each and every cave for easy movement of visitors through the undulating terrain, a pedestrian pathway topped with roughly dressed basalt stone slabs is being provided. The work of providing stone paved pathway up to Cave 27 is completed (Pls. 92-93), whereas the pathway from Caves 19 to 34 is in progress. In order to make the pathway continuous and stable, retaining walls and small culverts are also being provided. A retaining wall has been constructed in uncoursed rubble masonry between *nala* near Cave 23 and Cave 25 including the work of fixing stone slabs over the pathway over a cement concrete bed. The archaeological area at Ellora caves has been provided with galvanised iron chain link fencing on iron angle posts. The work of providing galvanised iron pipe railing around the *kunds* as a safety barricade has also been taken up. The archaeological area in front of the caves was fenced with mild steel grill over a dwarf wall interspersed with square basalt posts which have been taken up in continuation of previous year's work. Besides, the work of providing mild steel grill fencing over the masonry wall of the office of Conservation Assistant to Cave 34 has been completed. The road signages in cut stone have been provided on the pathway leading to the caves.

5. DAULATABAD FORT, DAULATABAD, DISTRICT AURANGABAD

The work of removal of decayed plaster of *Chand minar* and re-plastering it with fresh lime plaster has been taken up as per the origi-

nal shade and colour (Pls. 94-95). The damaged lime concrete over the floor of Hathi tank was removed and re-laid with fresh concrete. After dismantling the dislodged stones from the steps of main entrance of the tank, these have been reset as per original alignment. The rock-cut moat located to the west of Rang Mahal was taken up for desilting and removal of debris which has been completed. In continuation of previous year's work of reconstruction of fallen moat wall to the west side of Rang Mahal is in progress. The fallen staircase leading to first floor of Rang Mahal has been reconstructed. The antiquities discovered from the Daulatabad excavations have been displayed at the entrance gate of Aam khaas building.

6. PITALKHORA CAVES, PITALKHORA, DISTRICT AURANGABAD

The construction of galvanised iron pipe railing fixed with angle iron posts all along the steps leading to Pitalkhora caves has been taken up.

7. MALLIKARJUNA TEMPLE, GHOTAN, DISTRICT AURANGABAD

The fallen portion of retaining wall on the north and northwest corner of Nagar khana has been reconstructed keeping in conformity with the existing wall. The work of erection of galvanised iron chain link fencing over the dwarf compound wall is in progress.

8. RAJE LAKHOJI JADHAV SAMADHI, SINDHKHEDRAJA, DISTRICT BULDHANA

The protected area around the monument has been provided with galvanised iron chain link fencing on iron angle post over a dwarf masonry wall.

9. LONAR GROUP OF TEMPLES, LONAR, DISTRICT BULDHANA

In continuation of previous year's work of replacing the broken beams and *chhajjas* with new stones of similar sizes has been carried out



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Bibi-ka-Maqbara, Aurangabad: 90, before; 91, after replacement of plaster of eastern enclosure wall, See p.171



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Ellora caves, Aurangabad: 92, before; 93, after laying of the stones slab pathway. See p. 172



95

Daulatabad fort, Aurangabad: 94, before; 95, after replacement of plaster of Chand Minar. See p. 172



94



97



96

Daityasudana temple, Lonar: 96, before; 97, after, replacement of broken beams. See p. 178



98



99

Daityasudana temple, Lonar: 98, before; 99, after replacement of broken beams. See p. 178

in Garuda *mandir* near Daityasudana temple. The work of water tightening the roof by laying fresh brick jelly concrete has been completed at Garuda *mandir*. At the Daityasudana temple, the broken beams were replaced with new stone beams of the same texture and the pipes which were obstructing inside the temple were removed (Pls. 96-99).

10. BALLARSHA FORT, BALLARSHA, DISTRICT CHANDRAPUR

The missing veneering stones of the fort wall near the main entrance are being provided with new stones of similar size and nature after providing a suitable foundation. The top portion of the wall is being provided with lime concrete to check water seepage.

11. GROUP OF TEMPLES, BALSANE, DISTRICT DHULE

Galvanised iron chain link fencing on iron angle posts erected over the masonry dwarf wall, and an iron gate have been provided at the entrance.

12. SEVEN MOHAMMEDAN TOMBS, THALNER, DISTRICT DHULE

The protected area of the group of monuments is provided with galvanised iron chain link fencing on iron angle posts over a dwarf wall. Besides, an iron gate has been provided on the approach road.

13. MARKANDADEO GROUP OF TEMPLES, MARKANDA, DISTRICT GARHCHIROLI

In continuation of previous year's work, the bulged out stone blocks from the west side *prakara* wall of Dasavatara shrine was dismantled and reconstructed from inner and outer sides using the same stones after strengthening the foundation. The work of providing mild steel grill fencing with iron angle frames is provided over a masonry dwarf wall to stop the thorough fare.

14. MODAI TEMPLE, WAGHALI, DISTRICT JALGAON

A stone masonry retaining wall has been constructed on southern side of the temple to stop erosion from the river side.

15. PATNADEVI TEMPLE, PATNA, DISTRICT JALGAON

An apron has been provided around the temple with stone slab over a cement concrete bed to prevent seepage of water into the foundation. Apart from this work, galvanised iron chain link fencing on iron angle posts has been provided over the dwarf masonry. The construction of causeway with hume pipe has been completed.

16. SANGAMESHWAR TEMPLE, SANGAMESHWAR, DISTRICT JALGAON

The construction of stone masonry wall for plinth protection is in progress.

17. CHANGDEO TEMPLE, CHANGDEO, DISTRICT JALGAON

The old and decayed plaster from the walls of the inner portion of the temple has been removed carefully and re-plastered with lime mortar, and finally provided with a finishing layer on the top.

BANGALORE CIRCLE

KARNATAKA

18. FORT, DEVANAHALLI, DISTRICT BANGALORE

The disturbed, out of plumb and fallen portion of the fort wall on the western side has been reconstructed with available stones and the core filled with lime mortar mixed with brick bats (Pls. 100-101).

19. VITTALA TEMPLE, VENKATAPURAM, DISTRICT BELLARY

Debris accumulated along the enclosure wall at north-east was cleared to expose the plinth portion. The out of plumb and over hanging architectural members in the north-eastern side of the enclosure wall has been dismantled, documented and reconstructed to its original position and alignment.

20. ZANANA ENCLOSURE, KAMALAPURAM, DISTRICT BELLARY

The out of plumb *prakara* wall in the north-eastern side of the *zanana* enclosure has been dismantled and reconstructed with available stone as per the original.

21. KRISHNA TEMPLE, KRISHNAPURAM, DISTRICT BELLARY

The out of plumb, dislodged and disturbed steps of *lokapavani* tank has been dismantled. The tank filled with silt and rolled boulders were removed. The flight of steps has been restored as per the original (Pls.102-103).

22. DOUBLE STORIED MANDAPA, VENKATAPURAM, DISTRICT BELLARY

The out of plumb, dislodged and over hanging architectural members were carefully dismantled after removing the decayed and weathered proof course over the *mandapa* with proper documentation (Pls. 104-105).

23. VISNU TEMPLE III, VENKATAPURAM, DISTRICT BELLARY

The out of plumb, over hanging architectural members of the main entrance and enclosure wall were dismantled and restored as per the original.

24. ACHYUTARAYA TEMPLE, VENKATAPURAM, DISTRICT BELLARY

The out of plumb pillars, beams and over hanging roof members of the kitchen (*paka-shala*) has been dismantled and restored as per

the original by using available stone members.

25. SHRINE DANNAIKA ENCLOSURE, KAMALAPURAM, DISTRICT BELLARY

The out of plumb fortification wall at north west has been dismantled after proper documentation and reconstructed in its original position. During the clearance of the debris accumulated over to a depth of 2.80m, a shrine with a sanctum and a *mandapa* was exposed outside the restored enclosure wall. From its features, the shrine appears to be contemporaneous to the palace of Vira Harihara (1376-1399 CE).

26. ACHYUTARAYA TEMPLE, VENKATAPURAM (HAMPI), DISTRICT BELLARY

During the course of scientific clearance of the dried up and silted *pushkarini* in the Achyutaraya temple complex, various architectural members such as veneer stones, pillar units of the surrounding cloister *mandapas* and other members were retrieved. Accumulated debris was cleared to expose the ancient working level. The out of plumb and collapsed flight of steps of the tank and the cloister around was restored as per the original using the available members.

27. KRISHNA TEMPLE, HAMPI, DISTRICT BELLARY

The out of plumb, over hanging architectural members of the roof of the *mandapas* in the Krishna temple *bazaar* consisting of ceiling stones, beams, capitals, pillars and steps nearer to the temple were dismantled and reconstructed as per the original.

28. DANNAIKA ENCLOSURE, KAMALAPURAM, DISTRICT BELLARY

The debris accumulated in the enclosure was cleared to expose the ancient working level and the fallen and out of plumb enclosure wall

was set to plumb by retrieving and reusing the collapsed members.

29. LOTUS MAHAL, KAMALAPURAM, DISTRICT BELLARY

The debris accumulated along the enclosure wall was cleared to expose the ancient working level and the fallen and out of plumb south-eastern and eastern enclosure walls were restored as per original by retrieving and reusing the collapsed members.

30. RUINED TANK (PUSHKARINI), EAST OF PATTABHIRAMA TEMPLE, KAMALAPURAM, DISTRICT BELLARY

The out of plumb, overhanging architectural members of the out of plumb cloister *mandapas* of the *lokapavani pushkarini* consisting of beams, capitals, pillars and veneering members of the steps of the tank were dismantled and stacked for reconstruction.

31. RAGHUNATHA SWAMY TEMPLE, MALYAVANTHA HILL, VENKATAPURAM, DISTRICT BELLARY

The original working level and buried plinth of the temple was exposed by clearing the debris accumulated and a plinth protection course was provided all around the main temple.

32. RAMESVARA TEMPLE, NARASAMANGALA, DISTRICT CHAMARAJANAGAR

The dilapidated Saptamatrika shrine was completely dismantled up to the foundation and after relaying the foundation in size stone masonry, the structure was rebuilt using the same pillars, beams and roof slabs. Provided fresh stones wherever is missing. The sculptures of Saptamatrikas were repositioned as per the original over their respective pedestals (Pls. 106-107).

33. BHOGANANDISHWARA TEMPLE, NANDI HILLS, DISTRICT CHIKKABALLAPUR

The damaged and deteriorated brick lime concrete over the *mahadvaramandapa* and other sub-shrines were removed and was provided with fresh weather proof course.

34. RAMESVARA TEMPLE, NARASAMANGALA, DISTRICT CHAMARAJANAGAR

The dilapidated Saptamatrika shrine was dismantled after documentation and the sculptures have been shifted to the main temple for security.

35. FORTRESS AND TEMPLE ON THE HILL, CHITRADURGA, DISTRICT CHITRADURGA

A platform in front of Ekanatheshvari temple has been restored. The fallen fort wall was reconstructed and the top surface has been water tightened in the northern side of the fortification. The missing portion of the retaining wall of the moat has been reconstructed in between the third and fourth gateways. Earth work excavation has been carried out inside the moat for collecting the stone members and leveling the undulated areas in between the third and fourth fortifications.

36. INSCRIPTION AND JATINGI RAMESVARA TEMPLE, (RAMESVARA HILL), SIDDAPURA, DISTRICT CHITRADURGA

The disturbed and dilapidated steps of the hillock leading to the temple were restored as per the original.

37. ASOKAN INSCRIPTION, BRAHMAGIRI, DISTRICT CHITRADURGA

The protected area was provided with barbed wire fencing for protection of the inscribed boulder.

38. FORT, CHITRADURGA, DISTRICT CHITRADURGA

The missing portion of the retaining wall was constructed as per the original and the moat towards the northern side near Kamanabagilu was provided with pitching. Pathways were provided and minor landscaping was done at Maddubisuvakallu and other localities. An encroachment prevention wall has been constructed towards north-northeast of the outer fort. The fort wall (north) has been reconstructed and the top surface has been water-tightened (Pls. 108-109).

39. KALLESWARA SWAMI TEMPLE, BAGALI, DISTRICT DAVANAGERE

Repairs were carried out to the tank bund on the southern side of the temple. During the course, the buried portion of the sub-shrine like Veerabhadreswara was exposed. Many architectural units used for constructing the tank bund were carefully retrieved and used for reconstruction after documenting them.

40. FORT, CHENNAGIRI, DISTRICT DAVANAGERE

The fallen and disturbed portions of the fort wall on the east and south sides have been restored.

41. MUSAFIRKHANA AND HONDA, SANTEBENNUR, DISTRICT DAVANAGERE

The protected area was provided with barbed wire fencing for developing landscape garden.

42. KALLESWARA SWAMI TEMPLE, BAGALI, DISTRICT DAVANAGERE

The damaged and out of plumb revetment wall of tank bund, which had bulged out and buried the sub-shrines, was reconstructed and the shrines exposed. A landscape garden was laid within the protected limits (Pls. 110-111).

43. MALIKARJUNA TEMPLE, KURUVATTI, DISTRICT DAVANAGERE

The damaged stucco figures on the *gopura* was restored and a fresh weather proof course was provided over the roof of the temple.

44. PARSVANATHA BASTI, HALEBID, DISTRICT HASSAN

The out of plumb and collapsed stone veneering of the wall of the temple on the western and southern sides was reset to plumb with suitable core filling in brick and lime concrete.

45. HOYSALESVARA TEMPLE, HALEBID, DISTRICT HASSAN

The dead lime concrete over the leaky roof of the twin temple has been removed and water tightened by providing a fresh course of *surkhi* mixed with lime mortar (Pls. 112-113).

46. AMMAN SHRINE KESHAVA TEMPLE, BELUR, DISTRICT HASSAN

Fresh weather proof course was provided to the leaky roof of the shrine after careful removal of the damaged and deteriorated brick and lime concrete.

47. SADASIVA TEMPLE, NUGGEHALLI, DISTRICT HASSAN

The disturbed, fallen and out of plumb enclosure wall has been dismantled after proper documentation and restored as per the original using available stones.

48. INSCRIPTIONS, SRAVANABELGOLA, DISTRICT HASSAN

Toughened glass covers mounted on a top edged silicon base frame was provided to some of the important inscriptions engraved on the parent rocky surfaces of Chandragiri and Vindhyagiri hills for protecting the inscriptions from weathering. Suitable requisite cultural text nearby the inscriptions was also provided.

49. RAMALINGESVARA TEMPLES, AVANI, DIS-

TRICT KOLAR

The leaky roof was provided with a fresh weather proof course in lime concrete and plastered. The stains over the stone surface were cleaned and stucco figures on the *gopura* were consolidated.

50. KOLARAMMA TEMPLE, KOLAR, DISTRICT KOLAR

Fresh weather proof course in lime concrete was provided to the roof and the parapet was re-plastered besides carrying out repairs to the stucco figures of the *vimāna*

51. SOMESVARA TEMPLE, KOLAR, DISTRICT KOLAR

Fresh weather proof course in lime concrete was provided to the roof and the parapet was re-plastered.

52. LAKSHMINARASIHMASWAMY TEMPLE, MAREHALLI, DISTRICT MANDYA

A compound wall has been constructed around the temple complex.

53. SAUMYAKESHAVA TEMPLE, NAGAMANGALA, DISTRICT MANDYA

The decayed wooden members inside the *mahadwaragopura* have been replaced.

54. PANCHAKUTA BASTI, KARNBADAHALLI, DISTRICT MANDYA

The damaged and bulged out walls of the Shāntinatha *basadi* of the Panchakūta *basadi* complex have been dismantled after documentation.

55. SRI SRIKANTESHWARA TEMPLE, NANJANGUD, DISTRICT MYSORE

The exterior wall of the *ugrāna* (store-room) was provided with fresh veneer stones

wherever missing. The *vimāna* over the subshrines of Tāndavēswara, Nārāyana and *utsava-mūrtis* were applied with a weather-proof paint coat. The sunken flooring slabs in the kitchen were removed and re-laid with proper gradient to drain out the rain water.

56. VAIDYESHWARA TEMPLE, TALKAD, DISTRICT MYSORE

The undulated stone flooring in the courtyard of the temple was removed and relayed with proper gradient to drain out the rain water. Fresh flooring was provided on the western side of the temple with suitable kerb-stone to avoid lateral movement and shifting of the sand below.

57. TRIPURANTESVARA TEMPLE, BELLGAVI, DISTRICT SHIMOGA

The dismantled and out of plumb entrance *mandapa* and *garbhagriha* of the temple has been restored as per the original (Pls. 114-115).

58. FORTRESS AND RENUKA TEMPLE, CHANDRAGUTTI, DISTRICT SHIMOGA

The out of plumb fortification wall on the slope of the hill towards the south eastern side of the temple has been reconstructed. The ancient steps near Sula Beerappa shrine were re-laid as per the original.

59. TEMPLES AND INSCRIPTIONS, UDRI, DISTRICT SOUTH KANARA

The entire monument was dismantled after removing the heavy growth of tree roots and other vegetation after proper documentation and reconstructed the same after strengthening the foundation. A retaining wall on northern side of the Ishwara temple has been constructed to arrest the soil erosion and to prevent damages to the monument (Pls. 116-117).

60. FORT, KAVALEBURGA, DISTRICT SHIMOGA

The thick rank vegetation grown in the palace area has been cleared and various structures of the palace of 16th-17th centuries CE, like court-yard, bath room, toilet blocks, kitchen with a five burner stone oven *in situ*, worship room, backyard along with a stepped tank and fresh water well, etc., were exposed. The work also laid bare harvesting, storage facility and optimum utilization of rain water through a network of tanks, wells and channels supplying water to the kitchen, bath rooms, toilet blocks, etc. Remains of the royal pleasure garden with provision of erecting a swing supported by pillars were also exposed. The sunken and damaged ancient stone balustrade pathway from the first gate to third gate has been re-laid. The fallen fortification near the palace site has been reconstructed as per original. The disturbed, out of plumb fort walls of the second and third fortifications have been reconstructed as per original (Pls. 118-119).

61. SHIVAPPA NAIK'S FORT, NAGAR, DISTRICT SHIMOGA

The fallen fortification near *darbar* hall has been reconstructed as per original (Pls. 120-121).

62. TRIPURANTESVARA TEMPLE, BALLIGAVI, DISTRICT SHIMOGA

The out of plumb and sunken entrance *mandapa* of the temple has been dismantled and reconstructed its original after strengthening of the plinth. The cracked beams and roof slabs of the same *mandapa* has been mended by using suitable non-corrosive stainless dowels and re-set as per the original.

63. TEMPLES AND INSCRIPTIONS, KUPPAGADDE, DISTRICT SHIMOGA

A wall has been constructed on northern side of Iswara temple to prevent soil erosion. Plinth protection course has been provided around

Rameshwara temple and Jaina *basadi*. A dwarf wall has been constructed around the Parswanātha *basadi* and crimped wire mesh fencing has been provided.

64. KAITABHESVARA TEMPLE, KUBATTUR (KOTIPURA), DISTRICT SHIMOGA

A compound wall has been constructed with lateritic stone around the temple complex on west, north and part of the southern sides.

65. PARSVANATHA BASADI, KUBATTUR (KOTIPURA), DISTRICT SHIMOGA

Plinth protection course has been provided around the Parsvanatha *basadi* besides constructing a dwarf wall with crimped mesh fencing around the *basadi*.

66. RAMESHWARA TEMPLE, KUBATTUR, DISTRICT SHIMOGA

Plinth protection course has been provided around the temple.

67. JAMALABAD FORT, NADA AND LAILA, DISTRICT SOUTH CANARA

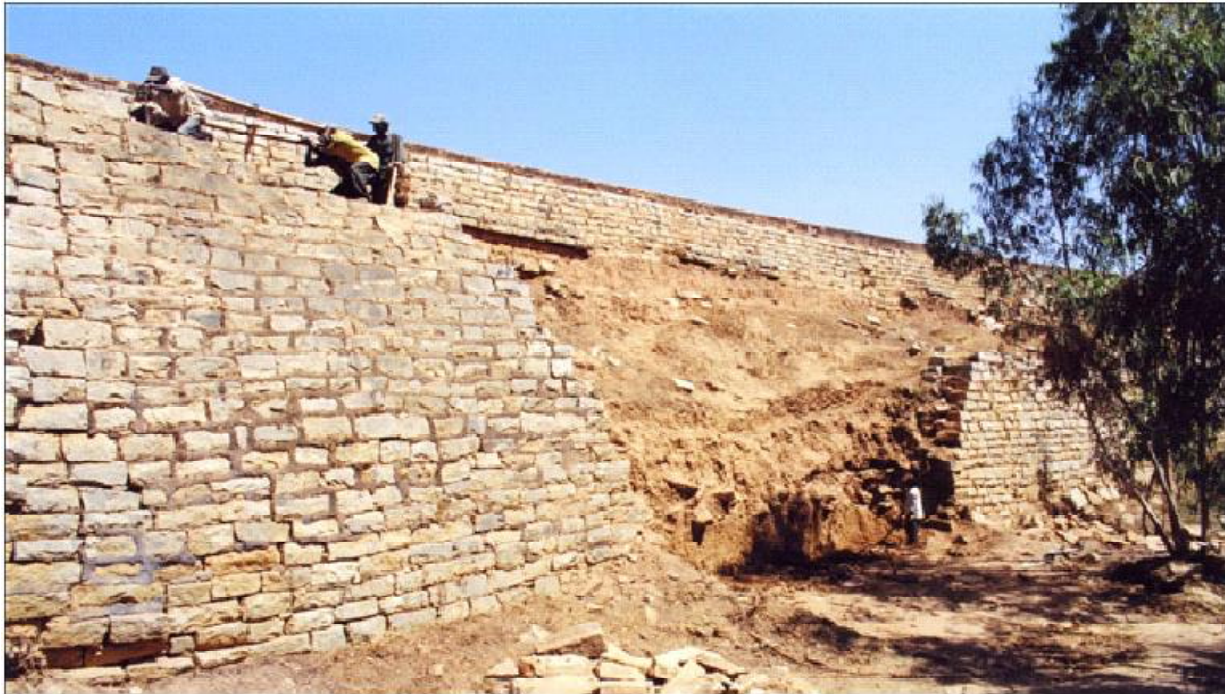
The out of plumb watch tower has been dismantled and restored with available stones followed by the proper documentation.

68. CHATURMUKHA BASADI, KARKAL, DISTRICT UDUPI

The dead concrete over the roof of the Chaturmukha *basadi* has been removed and fresh weather proof course of lime concrete has been provided to arrest leakages.

69. ANANTHAPADMANABHA TEMPLE, KARKAL, DISTRICT UDUPI

Fenced the archaeological area with crimped mesh over a dwarf wall around the temple and the fallen *prakara* wall has been restored as per original.



100



101

Fort, Devanahalli: 100, before; 101, after conservation. See p.178



102



103

Krishna temple, Krishnapuram: 102, before; 103, after conservation. See p. 179



105



104

Double storied mandapa, Venkatapura: 104, before; 105, after conservation. See p. 179



106



107

Rameshwara temple, Narasamangala: 106, before; 107, after conservation. See p. 180



108



109

Fort wall, Chitradurga: 108, before; 109, after conservation, See p. 181



110



111

Kalleswara temple, Bagali: 110, before; 111, after conservation, See p.181



112



113

Hoysaleswara temple, Halebidu: 112, before; 113, after conservation. See p. 181



114



115

Tripurantesvara temple, Belligavi: 114, before; 115, after conservation. See p. 182



116



117

Temple and inscription, Udri: 116; before: 117, after conservation. See p.182



118



119

Fort, Kavaledurga: 118, before; 119, after Conservation. See p. 183



120



121

Fort, Nagar: 120, before; 121, after Conservation. See p. 183

BHOPAL CIRCLE

MADHYA PRADESH

71. SIVA TEMPLE, AMARKANTAKA, DISTRICT ANUPPUR

As the foundation of the temple has subsided, the platform is damaged which was taken up for restoration. Stone apron has been provided around the temple to avoid further water stagnation in the surrounding area that was causing dampness inside the temple and also the cause for deterioration of the structure.

72. PATALESWAR TEMPLE, AMARKANTAKA, DISTRICT ANUPPUR

For the safety and security, a dwarf wall has been provided around the temple.

73. TEMPLE GROUP 6, KADWAHA, DISTRICT ASHOK NAGAR

In continuation of previous year's work, Temple Group 6 was taken up for restoration as the architectural members of the *garbhagriha* and the *mandapa* portion were displaced. Detail documentation of the entire temple was carried out before dismantling the structure. Before re-erecting the temple structure, foundation trench was dug up to a depth of about 2m and raft foundation was provided to sustain any given load of the superstructure. During the period under report, re-erection of the temple up to the ceiling level has been completed.

74. SHAHZADI-KA-ROJA, CHANDERI, DISTRICT ASHOK NAGAR

Restoration of *chhajja* stones of ground floor and first floor with pointing and water tightening was carried out (Pls. 122-123). Simultaneously the pathway leading to the struc-

ture was paved with flag stone flooring.

75. NAVKHANDA MAHAL, CHANDERI, DISTRICT ASHOK NAGAR

Restoration of the bastion located at the south-east corner has been completed. During the course of restoration of the foundation, coarse rubble stones have been utilized, whereas for the veneering purpose random rubble stones have been used. Besides, re-erection of pillars, repairing of *chhajja* and beams, etc are in progress inside the Navkhanda mahal. Restoration of the damaged fort wall near the Khilji Mosque has also been taken up.

76. KOSHAK MAHAL, CHANDERI, DISTRICT ASHOK NAGAR

For the safety and security of the Koshak Mahal, a dwarf compound wall has been provided around the protected limit of the monument.

77. BADAL MAHAL, CHANDERI, DISTRICT ASHOK NAGAR

For the safety and security of the temple a dwarf compound wall has been provided around the protected limit of the monument.

78. LANJI FORT, LANJI, DISTRICT BALAGHAT

The fort wall has been strengthened by doing underpinning and pointing which was damaged at several places.

79. ATER FORT, ATER, DISTRICT BHIND

The settled debris in the palace complex has been removed to bring back the aesthetic look of the fort. Besides, restoration of the fort wall in random rubble masonry has been carried out. To strengthen the structure, recess pointing and underpinning works have been carried out in various structures located within the fort. Lime concrete flooring with brick jelly aggregate has

been provided at Rani Mahal and Raja Mahal. Apart from it, recently unearthed structures near Ranivas *chowk* have been conserved.

80. PALACE COMPLEX, BURHANPUR, DISTRICT BURHANPUR

Restoration of arches, re-erection of columns, flooring and restoration of various dilapidated structures with random rubble and brick masonry has been provided. Lime concrete roof was provided to six rooms. Scientific clearance around the water tank has revealed a *charbagh* pattern garden alongside many water fountains. All the water fountains have been revived to its originality including the tank and a garden has been developed to enhance the beauty of the palace complex.

81. RAJA-KI-CHHATRI, BURHANPUR, DISTRICT BURHANPUR

Eight domes excluding the central one of Raja-ki-chhatri have been restored with brick masonry. Missing veneering stones have also been replaced during the course of restoration.

82. ASIRGARH FORT, ASIRGARH, DISTRICT BURHANPUR

Lime concrete has been provided over the platform and the roof of the Idgah. Besides, grill fencing around the monument has been provided for its safety and security.

83. TOMB OF SHAH SHUJA, BURHANPUR, DISTRICT BURHANPUR

To strengthen the dome portion underpinning was undertaken. Restoration of stone structures has also been carried out.

84. AHUKHANA, BURHANPUR, DISTRICT BURHANPUR

In continuation of previous year's work, excavation of the water channel which was con-

necting the pleasure pavilion and the tomb of Mumtaz Mahal has been completed. Conservation of the unearthed tank is in progress. A gate has been installed at the entrance to the protected complex.

85. TOMB OF NADIR SHAH, BURHANPUR, DISTRICT BURHANPUR

The tomb and the compound wall of the monument have been restored with stone and brick masonry to make it more presentable.

86. SHAH NAWAZ KHAN'S TOMB, BURHANPUR, DISTRICT BURHANPUR

For the safety and security of the monument, its compound wall has been repaired and fixed with grill fencing.

87. GOND FORT, DEOGARH, DISTRICT CHHINDWARA

The decayed and pulverized lime plaster measuring between 20 and 40mm. in thickness has been removed from the wall surface and in its place a new layer of plaster has been provided. Random rubble masonry works along with pointing at Hammam Ghar, Kachhari, Badal Mahal, Hati kham and at various locations of the fort were undertaken. Simultaneously, grouting and underpinning were also carried out to fill up the voids and cracks to strengthen the structures.

88. WESTERN GROUP OF TEMPLES, KHAJURAHO, DISTRICT CHHATARPUR

To check the ingress of rain water into the temple structures of Western Group, watertightening and pointing works have been carried out. Approach pathways leading to all shrines have been repaired. Cleaning of Chopra tank and Shiv Sagar lake has been carried out. Besides, a compound wall has been under construction around the newly acquired land.

89. PARSVANATHA TEMPLE, KHAJURAHO, DISTRICT CHHATARPUR

Resetting of the platform of Parsvanatha temple with ashlar block masonry and plain flag stone was undertaken. The approach path from the entrance has been paved with stone flooring.

90. JAL MAHAL, MANDU, DISTRICT DHAR

Random rubble masonry work has been carried out at the northern side of the outer wall of Munj talab and simultaneously debris has also been cleared from the surroundings.

91. DAI-KA-MAHAL, MANDU, DISTRICT DHAR

Random rubble masonry work including debris clearance was carried out at various location of the monument.

92. HOSHANG SHAH'S TOMB, MANDU, DISTRICT DHAR

Scientific clearance was carried out to unearth buried structures and enhance the aesthetic look of the monument.

93. MALIK MUGHITH'S MOSQUE, MANDU, DISTRICT DHAR

Random rubble masonry with recess pointing was done to the outer walls and plinth of the mosque, and lime concrete was provided on the northern and southern side of the verandah.

94. PANCHMATA TEMPLE, GOPALPUR, DISTRICT JABALPUR

Under the civil deposit work, restoration of Panchmata temple was taken up. As part of this work, excavation was carried out below the masonry wall for providing ashlar stone masonry foundation. Besides, the floor of the platform has been filled up with hard *murrum* and boulders, and the flooring top is

done with 10cm thick chisel dressed stone. All broken *chhajja*, merlon and parapet stones from the outer wall of verandah roof were taken out and new architectural members were fixed in place of the missing and broken members. Besides, the dwarf compound wall has been mounted with MS grill railings. In addition, landscaping of the area has been done.

95. VISHNU VARAHA TEMPLE, PANAGAR, DISTRICT JABALPUR

The work of chiseling and dressing of ashlar stones were undertaken for the restoration of the temple platform.

96. CHOUBIS AVATAR TEMPLE, MANDHATA, DISTRICT KHANDWA

Under the Narmada Sagar parijojana, the transplantation of Choubis Avatar temple at Mandhata was taken up. Complete drawing and photo documentation work was carried out before initiating the transplantation work of this temple that consists of a square *garbhagriha* and a pillared *mandapa*. In continuation of the previous year's work, dismantling block by block and re-construction of the temple on a raft foundation at the new site which is 5km away from its original place has been completed (Pls. 124-127).

97. CHOUBARA DERA, UN, DISTRICT KHARGONE

Structural repairs were undertaken both at Choubara Dera 1 and 2. At Choubara Dera 2, the worn out and uneven platform has been repaired and reset as per original. Besides, matching stones were procured from the nearby quarry and the work of dressing stones, carving and designing were also carried out at the site that were meant for subsequent structural repair work.

98. GROUP OF TEMPLES, BATESHWAR, DISTRICT MORENA

In continuation of previous year's work debris clearance in between the two stepped tank has revealed remains of ten *mandapika* temples. Six temples out of ten, numbered as Temple 12, 13, 14, 15, 16 and 17 located on the south of Tank-2 were documented and lowered down after detailed documentation. Platform portion of all the temples were provided with ashlar masonry work. Broken architectural members were mended with stainless steel rod diameter of 10mm. During the restoration work almost 20% new architectural members have been utilized at missing places or in place of broken architectural members. Stone slabs of 4 to 6 inches thick were provided over the platform of Temple 3, 4, 5, 6 and 7. Restoration of stepped Tank-2 located on east of the *garhi* was also completed (Pls.128-129). New architectural members such as pillars, beams, roof slabs have been prepared to fix these at the places where these are missing.

Temple 110 located on the east of stepped Tank-1 was completely entangled by a banyan tree. The whole temple was in a ruined state of preservation. Roots had penetrated deeply into the structure. Initially, the tree was removed and the entire complex was cleared from debris. After detailed documentation the temple was lowered down. The structure was then re-erected after providing a sound base (Pls. 130-133).

Works at the *mandapa* and *garbhagriha* portion of Dhonda math have been undertaken. Based on evidences stone pavement was provided to the existing pathway between the pillar gate and Temple 7. In addition to this, for the safety and security of the monument complex a dwarf boundary wall

mounted with mild steel grill has been provided to a height of about 5ft from the ground level around the monument.

99. SIVA TEMPLE, BHOJPUR, DISTRICT RAISEN

The construction of 11th century temple of Raja Bhoja's time was incomplete as noticed from the remnants of a ramp on its eastern side. Perhaps, the ceiling of the temple was open to sky resulting percolation of water into the structure which might have been responsible for the structural weakness of the temple. The missing veneering stones on the exterior of walls had exposed the core that has contributed largely for the structural deterioration. Keeping this in view missing veneering stones of varying sizes i.e. 0.55-0.80x0.40x0.35-0.55m with matching stones have been provided on the exterior wall surfaces of northern, southern and western side of the temple. Broken members were mended with steel rods of 2 inches in diameter with epoxy, lead and adhesive.

The open ceiling has been covered with a fibre moulded architectural member, matching with the designs of the original ceiling member (Pls. 134-135). This has not only stopped water percolation into the temple but also reduced the unnecessary weight on the top of the temple, which could have damaged the entire structure. The gap portion between the wall and the temple superstructure through which rainwater was pouring inside was covered by placing slanting stone slabs according to the available evidences (Pls. 136-137). Apart from this on the right side (north) of the temple entrance a large monolith of 3.52x1.40x0.80m in size and weighing about 15 tons has been placed at the missing place. The huge monolith with the help of chain pulley was raised to a height of about 6m from the platform level of the temple and was placed within the given space (Pls. 138-139).



122



123

Shahjadi-ka-Roja, Chanderi: 122, before; 123, after restoration of chhajja of ground floor and first floor. See p. 195



124



125

Choubis Avatar temple, Mandhata: 124, before; 125, during shifting to the new site. See p. 197



126



127

Choubis Avatar temple, Mandhata: 126, during; 127, after completion of the transplantation work. See p. 197



128



129

Group of Temples, Bateshwar: 128, view of the temple complex; 129, before restoration of Tank-2, See p. 198



130



131

Group of Temples, Bateshwar: 130, after restoration of Tank-2; 131, Temple 110, before conservation. See p.198



132



133

Group of Temple 110, Bateshwar: ==132, during and 133, after conservation. See p. 198



134



135

Siva Temple, Bhojpur: 134, general view showing the dilapidated condition and 135, open ceiling of the temple. See p. 198



136



137

Siva Temple, Bhojpur: 136, before restoration of slanting slabs at the top of the temple and 137, after providing fibre moulded ceiling. See p. 198

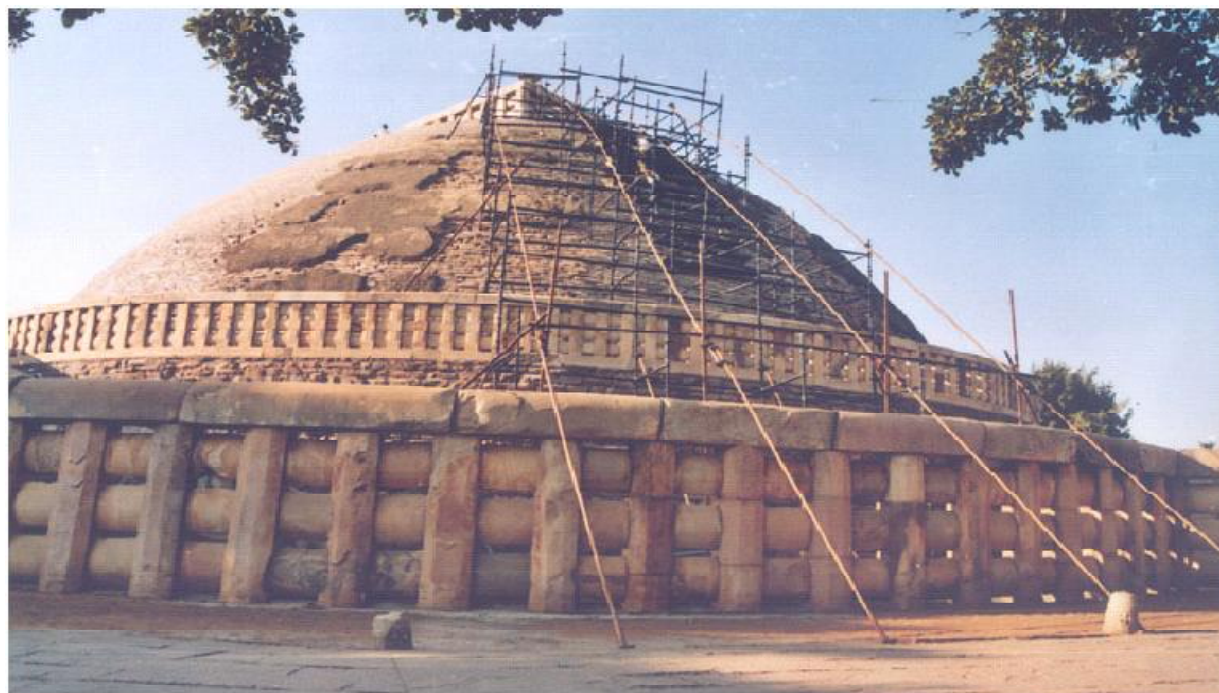


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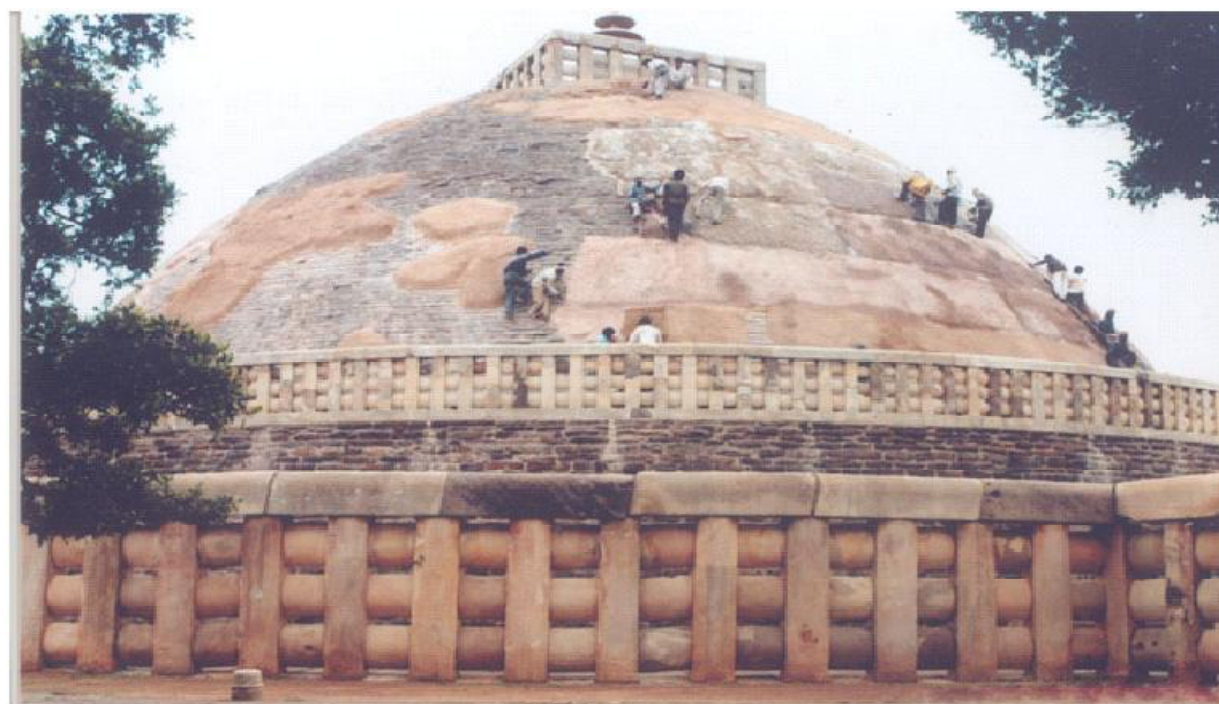


139

Siva temple, Bhojpur: 138, view showing the missing member on the right side (north) of temple entrance and 139, after restoration of slanting slabs at the top of the temple. See p.198



140



141

Stupa, Sanchi: 140, during; 141, after recess pointing and grouting work. See p. 209

100. GROUP OF BUDDHIST MONUMENTS, SANCHI, DISTRICT RAISEN

Tree trunk and roots had got into the crevices of the middle part of the *harmika* portion of stupa and also the binding material has become dead. Therefore recess pointing along with grouting was carried out to conceal the gaps. Following the traditional method, the lime concrete mixture that was prepared by adding *bel*, *gur*, *menthi* and *urad dal*, etc. was applied for conservation. All those pockets where water stagnation was noticed during the rainy season have been sealed with specially prepared mortar. All the weep-holes have been cleaned properly to drain out the percolated water. The cement mortar used for mending the railings of the *pradakshinapatha* has been removed and now mended with epoxy and stone dust (Pls. 140-141). Simultaneously, structural restoration was carried out at Stupa 2 and 3 to check the ingress of rain water into the structure. Apart from it, a lush green garden has been developed around the great Stupa.

101. RAISEN FORT, RAISEN, DISTRICT RAISEN

Resetting of stone beams, pillars, replacement of missing roof slabs in addition to other random rubble masonry works and recess pointing were carried out at the Badal Mahal. Simultaneously random rubble masonry works with recess pointing was also carried out at the Purani Kachari.

102. FORT, DHAMONI, DISTRICT SAGAR

Structural repair in the form of random rubble masonry and pointing work has been carried out at the main gate of the fort. At Rani Mahal after removal of the dead and decayed lime plaster, its wall surfaces were re-plastered with traditionally prepared lime mortar. Besides, 10mm thick lime concrete roof has been provided to the structure. To retain the remnants

of original plaster, edging work was carried out. In addition to this, coping was done over the ruined walls of Rani Mahal to prevent it from further damages.

103. GARHPEHRA FORT, GARHPEHRA, DISTRICT SAGAR

Restoration work at Shish Mahal and Dangi Mahal has been carried out. At Shish Mahal on the ground and first floor the dead lime concrete flooring of 10cm thick was removed and re-laid with new flooring of lime concrete comprising of lime, *surkhi*, sand and brick metal. Over lime concrete base four inches thick flag stone flooring has been provided. Besides, various walls of Shish Mahal were re-plastered and the compound wall was restored. An iron gate has been installed at the entrance to have better control over the monument area.

104. SIVA TEMPLE, BHUMRA, DISTRICT SATNA

A dwarf compound wall mounted with MS grill fencing has been provided around the monument for its safety and security.

105. SIVA TEMPLE AND MONASTERY, CHANDREH, DISTRICT SIDHI

A dwarf wall mounted with MS grill fencing has been provided around the monument for its safety and security.

BHUBANESWAR CIRCLE

ODISHA

106. BHRINGESVARA TEMPLE, BAJRAKOT, DISTRICT ANGUL

The dilapidated pillared *mandapa* has been taken up for repair. The out of plumb pillars were removed and replaced again as per the original. The damaged floors were repaired and roof of *mandapa* was provided with

asbestos sheet over wooden frame for the convenient of the devotees. The restorations of the *prakara* wall and sub-shrines have also been taken up by utilising the available original stones laying within the complex. The work is in progress.

107. CHAUSATH YOGINI TEMPLE, RANIPUR-JHARIAL, DISTRICT BOLANGIR

There were several cracks on the circular wall and the joints were open at various places and also seepage of rain water noticed which resulted rusting of iron dowels and led to exfoliation of stones. The old iron grills affixed to prevent damage of the statues has also become rusted. The open cracks were sealed by way of pointing, sealing the joints, grouting and rusted iron grills have been repaired and replaced to protect from theft and human vandalism. Besides, three miniature shrines near the main temple were also repaired.

108. NILAMADHAVA AND SIDDHESVARA TEMPLES, GANDHARADI, DISTRICT BOUDH

The fallen architectural members of first floor of both the temples have been re-fixed with combined lime mortars as per the original. The works have been completed. The water tightening to the main structures has also been taken up by way of pointing, sealing the joints, grouting and replacing the damaged stones with new ones as per the original. The restoration of missing and damaged platform and the steps of the main entrance have been attended by the way of replacing the damaged stone blocks with original fallen stones available at the site (Pls. 142-143).

109. MAHIMAMANI TEMPLE, RAGADI, DISTRICT CUTTACK

The re-plastering work of boundary wall has been completed after restoring the missing portion. Sandstone flooring in side *antarala* and

jagamohana has been attended. To prevent the entry of the bats/birds expanded wire mesh with wooden frame has been provided in the *jagamohana*.

110. KEDARESVARA MAHADEVA TEMPLE, CHOUDWAR FORT, DISTRICT CUTTACK

In continuation of previous year's work, the restoration work of the *jagamohana* has been undertaken initially. The original architectural members were placed layer by layer as per the original over the original available wall of *jagamohana* in *pidha* form, six layers of *pidha* stone have been provided and the remaining are to be provided during the conservation of the main temple. The repair work of the main temple was also taken up by way of removing the huge laterite stone blocks placed over the broken architectural members and replaced the broken members with the new ones. All the huge stone blocks have been taken out to ground very carefully through a ramp and the work of replacement of the broken beams are in progress. On completion of this, stone blocks will be placed back in their original places. The work is in progress. Besides, the main entrance of top portion of the *prakara* wall was also repaired during the period under review (Pls. 144-147).

111. EXCAVATED REMAINS, BODHI, CHOUDWAR FORT, DISTRICT CUTTACK

In continuation of previous year's work the excavated remains at Badhi were repaired by way of pointing, sealing the joints, resetting the architectural members on their original places with traditional lime mortar. During the course of conservation, remains of a temple datable to c. 14th century CE and contemporary to Kedareswar Temple have been brought to light (Pls. 148-149).

112. BARABATI FORT, CUTTACK, DISTRICT CUTTACK

In continuation with the previous year's work, the work of providing stone paved approach pathway has been taken up by way of laying dressed khondalite sandstone blocks matching with the structure. The work is in progress. The repairing of the excavated remains has also been taken up by way of sealing the joints, refixing the loose architectural members in their original places. The work has been completed. The roof of the main gate of the fort has been watertightened by way of pointing, joint sealing and grouting with traditional combined lime mortar as per the original. The monument has also been provided with limited illumination. A parking area has also been developed in front of the *dargha*. The work of construction of toilet block for convenience of the visitors has been taken up through CPWD and the work is nearing completion.

113. EXCAVATED BUDDHIST SITE, LALITAGIRI, DISTRICT CUTTACK

The area completely covered with unwanted vegetation was cleaned near the *chaityagriha* and repairing of the structures has also been taken up in a phased manner by using the available bricks at the site, traditional lime mortar and *surkhi* as per the original.

114. CHANDRASEKHARA JEW TEMPLE, KAPILAS, DISTRICT DHENKANAL

Retaining walls have been repaired by way of pointing, sealing the joints, and replacing the damaged stones. Restoration of ancient steps leading to hill top has also been taken up by way of replacing the damaged stones by new ones. Besides, pointing of main temple and repair to the apron around it has also been attended.

115. KANAKESVARA MAHADEVA TEMPLE, KUALO, DISTRICT DHENKANAL

The restoration work of the sunken floor was taken up by way of relaying the old stone blocks available at the site on a sand cushion with traditional lime mortar. Besides, the work of construction of boundary wall within the protected area has also been taken up by way of providing dwarf wall with iron grill. The work is also in progress.

116. ANNAKOTISVARA MAHADEVA TEMPLE, LATADEIPUR, DISTRICT DHENKANAL

The rusted iron beam has been replaced, open joints of main temple have been sealed and approach pathway have been provided and undulated surface within the temple complex has also been made uniform and presentable.

117. ASOKAN ROCK EDICT, JAUGADA, DISTRICT GANJAM

In continuation with the previous year's work the fencing work of the protected limit has been completed.

118. MINOR SHRINES OF TRILOCHANESVARA TEMPLE COMPLEX, DISTRICT JAJPUR

Restoration work of the minor shrine near to the main entrance was taken up. The temple full of vegetation, most of the architectural members were out of plumb and few of them fell down. The vegetation was removed first; all architectural members were documented and taken out very carefully. The resetting of architectural members was attended and all stone blocks were placed again at their original locations/positions and the work has been successfully completed.

119. EXCAVATED BUDDHIST SITE, RATNAGIRI, DISTRICT JAJPUR

The cells of Monastery 1 were repaired by using the available bricks with traditional lime mortar (**Pls.150-151**). Top of the wall was made watertightening by way of pointing,

sealing the joints with the traditional lime mortar. The work of providing approach path way around the protected limit for smooth movement of visitors is completed. The work of providing approach pathway connecting individual monument within the protected area has also been resumed. The work is in progress. Monastery 2 was also attended and all cells were conserved by way of pointing, sealing the joints, replacing the decayed bricks with traditional lime mortar as per the original and top of wall was made watertightened (Pls. 152-153).

120. EXCAVATED SITE, UDAYAGIRI 2, DISTRICT JAJPUR

In continuation of previous year's work the restoration of the enclosure wall was taken up to prevent further erosion of the soil. The wall collapsed at several places was restored by the available brick in traditional lime mortar. Simultaneously, the excavated remains within the enclosure were also repaired (Pls. 154-155).

121. JAGANNATHA TEMPLE, JAJPUR, DISTRICT JAJPUR

Water seepage of the main temple was attended first by grouting and sealing the joints with traditional lime mortar. The damaged wooden doors have been repaired. The boundary wall has also been conserved. Being the temple is under worship, the interior was originally lime washed. Therefore, on demand of the local people, lime coating was provided to make it a presentable condition.

122. VARAHANATHA TEMPLE, JAJPUR, DISTRICT JAJPUR

The conservation work of the temple complex has been taken up by way of uprooting the vegetations from the structure, removing the unwanted silt deposit accumulated by the

flood. The damaged wooden doors have got repaired. The renovation work of *rosaghara* was taken up by way of replacing the decayed stone. The work is in progress.

123. ASURGARH FORT, ASURGARH, DISTRICT KALAHANDI

The work of providing retaining wall has been taken up to prevent the erosion due to flood water and the work is in progress.

124. KHANDAGIRI AND UDAYAGIRI CAVES, BHUBANESWAR, DISTRICT KHORDHA

In continuation with the previous year's work the steps leading to Caves at Khandagiri have been repaired by way of replacing the damaged ones with new ones, pointing and sealing the joints in traditional lime mortar. The entrances of the caves have been provided with acrylic sheets in stainless steel frame. The stone floor in front of the Hathi Gumpha Cave has been repaired. The work of mounting light and sound at Rani Gumpha Cave being executed presently by India Tourism Development Corporation is in final stage of completion and will be inaugurated shortly, the show will be managed and maintained by ITDC.

125. LINGARAJA TEMPLE, BHUBANESWAR, DISTRICT KHORDHA

In continuation of previous year's work, the repair work was initiated on the main *deul*. The open joints were sealed and made watertightened, by way of pointing and grouting and simultaneously scaffolding provided in the past was removed. The *natamandapa* and *bhogamandapa* were also attended by way removing the dead lime concrete plaster and relayed with traditional compact lime mortar with *surkhi* as per the original and the work has been completed. Interior of the temple was also in shabby condition. Expanded nets provided on the ceiling to prevent bats was also

repaired, wooden doors were repaired and painted and proper lighting arrangements were made. The partially buried miniature shrine on the right of Parvati Temple was exposed completely and all the structures built within that particular area were repaired and made presentable. Another temple just right of the north gate was also in dilapidated condition and most of the stone members of *amalaka* fell down. There were several cracks on the body of this temple and some stone members were out of plumb. The *amalaka* was repaired and its missing stones were replaced with lime mortar matching to the original. Out of plumb stone members taken out and were re-set again as per the original, the temple was made completely water-tightened by way of pointing, sealing the joints and grouting. Besides, some other shrines were also repaired. The work of laying stone flooring in front of the *rosaghara* was also attended and the work is in progress (Pls. 156-159).

126. RAMESVARA TEMPLE, BHUBANESWAR, DISTRICT KHORDHA

The repair and restoration work of this holy tank was taken up. There is always soil erosion from all around which ultimately settled on the bottom of the tank. Therefore, it has become necessary to provide the retaining wall all around to prevent further erosion. The work for providing retaining wall already taken up and most of work has been completed. Besides, missing and eroded landings of the tank have also been repaired as per the original. The repair to the steps is still in progress (Pls. 160-161).

127. SAHASRALINGA TANK, BHUBANESWAR, DISTRICT KHORDHA

The repair work of Sahasralinga Tank was taken up by way of removing the vegetation growth from the entire area. Some additional

construction which came up in recent times has been removed. The wall of the tank and shrines was stabilized by way of sealing the joints and pointing with traditional mortar. The coping stones wherever missing, were also restored and provided as per original (Pls. 162-163).

128. PAPANASINI TANK COMPLEX, BHUBANESWAR, DISTRICT KHORDHA

The damaged floor to the north of the Papanasini tank around the Makaresvara Temple was taken for restoration by way of providing new dressed stone blocks matching the original with a recess, pointing. The repairing of steps and walls have also been taken up and all works are in progress. The restoration work of the compound wall was taken up; missing portions were recreated with new one as per original. The damaged and sunken floor of the temple was also repaired and the surrounding was made presentable.

129. BHASKARESVARA TEMPLE, BHUBANESWAR, DISTRICT KHORDHA

In continuation of previous year's work, the repair of the stone paved floor around the temple has been completed. The incomplete fencing work has also been completed and the work of providing approach pathway is in progress.

130. MUKTESVARA TEMPLE, BHUBANESWAR, DISTRICT KHORDHA

In continuation of previous year's work the temple has been provided with minimum interior and exterior illumination for easy access to visitors.

131. SIDDHESVARA TEMPLE, BHUBANESWAR DISTRICT KHORDHA

In order to restrict the entry of the bats and pigeons inside the temple, expanded metal net has been provided in the *jagamohana* and

main *deul*. Besides, some light arrangement has also been made in the interior of the temple.

132. RAJARANI TEMPLE, BHUBANESWAR, DISTRICT KHORDHA

Minimum illumination both interior and exterior of the temple has been provided. Besides the work of renovation and up-gradation of existing toilet blocks has been taken up and the work is in progress.

133. ASOKAN ROCK EDICT, DHAULI, DISTRICT KHORDHA

The entrance of the area has been face lifted by way of replacing the damaged laterite stone blocks and lying out with the dressed sand stone blocks for the easy movement of the visitors. Old signage removed and new ones are being provided. The work is in progress.

134. JAMBESVARA TEMPLE, BHUBANESWAR, DISTRICT KHORDHA

Repair to the *sikhara* has been taken up by way of pointing, sealing the joints, grouting with traditional combined lime mortar. The dislodged members have been taken out and re-fixed again as per the original. The work is in progress.

135. ANCIENT SITE, SISUPALGARH, BHUBANESWAR, DISTRICT KHORDHA

Repairs to the excavated structure was taken up by way of uprooting the vegetation, removing the debris, pointing, sealing the joints with traditional lime mortar. The decayed stones have also been replaced. The work is still in progress.

136. ANCIENT SITE, HARIPURGARH, DISTRICT MAYURBHANJ

The repair work of Rasikarai Temple was resumed by way of restoring the missing part with the dressed bricks and traditional lime

mortar as per the original. Pointing and joint sealing of the entire brick structure was also completed. The platform on which the temple stands was also repaired by way of pointing and sealing the joints. Repair to Jagannatha temple was also attended. All vegetations were removed. The missing portion has been repaired up to the *chala* portion and above and the work is in progress.

137. SRI JAGANNATHA TEMPLE, PURI, DISTRICT PURI

In continuation of previous year's work, repair to *garbhagriha* was taken up during *Rathayatra* from 28th June to 9th July, 2006, when the presiding deities were shifted to Sri Gundicha temple. The damaged stone slabs of three steps leading to *garbhagriha* were replaced with new ones. Besides, minor repairs were also attended as suggested by the technical committee. The rusted iron beams of Lakshmi Temple have been replaced. The roof of the temple has also been consolidated with traditional combined lime concrete to protect seepage of rain water. Repair to the floor inside the temple complex has been taken up by way of laying dressed new khondalite stone blocks with lime mortar matching with the original. Repair of Meghanada *prachira* was taken up by way of pointing, sealing the joint, grouting with the traditional lime mortar. The decayed stones have also been replaced with new ones as per the original. Repair to the western side of *kurmibedha* has also been taken up by way of pointing, sealing the joint and grouting with traditional lime mortar. The damaged and decayed stones have also been replaced. As per the advice of the Technical Committee, the repair work of *khapuri* and *amalaka* were attended. Besides, several other shrines within the temple complex have also been attended for their conservation.

138. SUN TEMPLE, KONARK, DISTRICT PURI



142



143

Nilamadhava and Siddhesvara temples, Gandharradi: 142, before; 143, after conservation. See p. 210



144



145

Kedareshvara Mahadeva temple, Choudwar fort: 144, before and 145, after conservation of Jagamohana. See p. 210



146



147

Kedaresvara Mahadeva temple, Choudwar fort: 146, before and 147, after conservation of Jagamohana. See p.210



148



149

Excavated remains, Bodhi, Choudwar fort: 148, during and 149, after conservation. See p. 210



150



151

Excavated Buddhist site, Ratnagiri: 150, during and 151, after conservation of Monastery 1. See p. 221



152



153

Excavated Buddhist site, Ratnagiri: 152, before and 153, after conservation of Monastery 2, See p. 221



154



155

Excavated site, Udayagiri 2: 154, before and 155, after conservation. See p. 221



156



157

Lingaraj Temple, Bhubaneswar: 156, during and 157, after conservation. See p. 213



158



159

*Lingaraj Temple complex, Bhubaneswar: 158, during and 159, after conservation of sub-shrines.
See p. 213*



160



161

Ancient tank, Ramesvara Temple complex, Bhubaneswar: 160, before and 161, after conservation of tank. See p. 213



162



163

Sahashralinga tank, Bhubaneswar: 162, before and 163, after conservation. See p. 213



164



165

Sun Temple, Konark: 164, before and 165, after laying sandstone flooring. See p. 228



166



167

Sun Temple complex, Konark: 166, before and 167, after conservation of Vaishnavite brick temple. See p. 228

In continuation of previous year's work, repair to the floor of the temple was continued on the southern side of the main temple. The architectural members fallen from the main temple were shifted to the platform after repaired. Brass railings have been provided around the main temple to protect it from vandalism (Pls. 164-165). The Vaishnavite brick temple on the rear side of the main temple has been restored by way of pointing, sealing the joints with traditional mortar and replacing the decayed bricks. Besides, pointing of the main temple has also been taken up (Pls. 166-167). Hitherto, the unattended kitchen area was taken up for conservation and all unwanted debris has been removed. While attending the above work, the series of hearths made of laterite stone blocks have been brought to light, which further threw new light and enhanced through sand clearance, the importance of history of Konark. The conservation work of this area is in progress. The illumination of the pathway in outer and also inner side of *prakara* wall has been provided for easy access to the temple.

139. VARAHI TEMPLE, CHAURASI, DISTRICT PURI

The main temple was watertightened by way of pointing, sealing the joints and grouting with the traditional combined lime mortar. The work has been completed.

CHANDIGARH CIRCLE

HARYANA

140. SURAJ KUND, LEKAR PUR, DISTRICT FARIDABAD

Taking out of damaged, dislodged stone work and resetting of the same has been completed.

141. BAOLI GHAS ALI SHAH, FARRUKHNAGAR, DISTRICT GURGAON

The wall inside has been exposed. The lime concreting in floors has been completed alongwith the work of plastering of cells. Grill fencing over dwarf wall has been completed.

142. ANCIENT SITE, AGROHA, DISTRICT HISSAR

An apron in lime *surkhi* mortar around exposed structures has been provided besides pointing and resetting of special brick masonry. This work has been completed while the earth work for pathway is in progress.

143. PRITHVIRAJ CHAUHAN'S FORT, HANSI, DISTRICT HISSAR

The stitching of cracks, grouting and water tightening and tile brick masonry work of drain and wall has been completed. The work of fortification wall for removal of debris is in progress.

144. GUJRI MAHAL, HISSAR, DISTRICT HISSAR

The random rubble stone masonry for dwarf wall has been done. The mild steel grill has been provided. The galvanised iron pipe railing has been fixed and work completed.

145. FEROSHSHAH PALACE, HISSAR, DISTRICT HISSAR

The lime concreting is in progress in the cells and random rubble stone masonry completed, pointing of random rubble stone masonry in the ratio of 1:1:2 is in progress. The grill gates are being fixed in position. Exposing of structures of fort wall is in progress.

146. BRICK TEMPLE, KALAYAT, DISTRICT KAITHAL

The western wall has been raised with lime *surkhi* mortar. The east side *ghat* was exposed by way of removal of debris, earth, etc. reinforced cement concrete was provided in the foundation of plinth of the wall and

lakhauri brick work provided in lime *surkhi* mortar in the ratio of 1:1:3. The work is in progress. The removal of deposit in the pond is also in progress.

147. GATEWAY OF GHARAUNDA SARAI (OLD MUGHAL), GHARAUNDA, DISTRICT KARNAL

The restoration work of flooring have been taken up and completed. Tile brick masonry for boundary wall, fixing of grill has been done. *Lakhauri* bricks of missing patches, arches and concreting and tile brick terracing over roof has been done. Lime and *surkhi* plaster on ceiling and arches has been done. The restoration work, brick masonry, plastering on ceiling, concreting and tile brick terracing is in progress.

148. HARSH-KA-TILA, THANESAR, DISTRICT KURUKSHETRA

Earth work in excavation, dwarf wall and brick on edge on pathway has been done. The concreting brick masonry of dwarf wall is in progress.

149. KARAN-KA-TILA, THANESAR, DISTRICT KURUKSHETRA

Clearance of earth on boundary wall, for concreting work has been completed. Grill fencing over boundary wall has been done. Brick masonry and fencing work is in progress.

150. SHEIKH CHILLI'S TOMB, THANESAR, DISTRICT KURUKSHETRA

Red sandstone, *dasa* flooring and restoration work has been completed. The underpinning work with brick masonry and pointing has been completed.

151. JAL MAHAL, NARNAUL, DISTRICT MAHENDRAGARH

Restoration work with lime cement mortar, pointing and concreting has been completed.

152. KABULI BAGH MOSQUE, PANIPAT, DISTRICT PANIPAT

Restoration work with lime cement mortar, pointing and concreting is in progress. The *lakhauri* brick masonry work has been taken up and work is in progress.

153. KALA AMB, PANIPAT, DISTRICT PANIPAT

Concreting work of pathway is in progress.

154. KHWAJA KHIZIR'S TOMB, SONEPAT, DISTRICT SONEPAT

Restoration work on boundary wall and courtyard with tile brick masonry is in progress.

PUNJAB

155. RAM BAGH GATE, AMRITSAR, DISTRICT AMRITSAR

Dismantling of marble chips flooring and skirting, concreting and fixing of red sand slab flooring has been completed.

156. BHATINDA FORT, BHATINDA, DISTRICT BHATINDA

The work of underpinning, restoration of missing / damaged / disturbed brick masonry of ancient structure, pointing, concreting and tile brick terracing has been completed. The work of providing of support pillars and fixing of grill gate are in progress. Taking out of loose and decayed brick masonry of fort wall concreting, tile brick on edge is in progress.

157. ANCIENT SITE, SANGHOL, DISTRICT FATEHGARH SAHEB

Removal of old sunken floor and taking out of damaged / cracked *lakhauri* brick masonry and underpinning and restoration of *lakhauri* / tile brick masonry has been taken up and is in progress.

158. ANARKALI BARADARI, BATALA, DISTRICT GURDASPUR

Restoration / underpinning of steps of tank, pointing of the steps concreting, tile bricks terracing has been taken up and is in progress. Taking out and removal of old sunken floor, damaged cracked /*lakhauri* brick masonry work has been taken up and is in progress.

159. NURMAHAL SARAI, NURMAHAL, DISTRICT JALANDHAR

Underpinning and restoration of damaged, dislodged and missing brick masonry of structure, providing concreting, tile brick terracing has been completed. Removal and scraping of cement plaster taking out and removal of sunken floor *lakhauri* /country brick masonry work has been taken up and is in progress.

160. DAKHNI SARAI, DAKHNI, DISTRICT JALANDHAR

Removal of old sunken flooring, taking out of damaged /cracked *lakhauri* brick masonry and underpinning and restoration of *lakhauri* /tile brick masonry has been taken up and is in progress.

161. NALAGARH KOTHI, ROPAR, DISTRICT ROPAR

The concreting and brick masonry work is in progress.

162. JAHAJ KOTFAI, HISSAR, DISTRICT HISSAR

The underpinning of *lakhauri* tiles/brick work in patches has been done. The plaster work of museum hall has been completed. The earthen ware tiles for *varandah* has been partly done. The restoration of tile brick masonry to the rooms has been completed. Stitching of cracks has been

completed. Fixing of earthen ware tile is in progress. The lime *surkhi* plaster 25m and laying of floor is also in progress. This work was undertaken under Civil Deposit work.

163. CHOR GUMBAD, NARNAUL, DISTRICT NARNAUL

The dwarf wall all around the Gumbad has been completed besides railing. Flooring in the passage and dismantling of dislodged out of plumb RR stone masonry on eastern side has been completed. The work is in progress. The work was attended under Civil Deposit Work.

CHENNAI CIRCLE

TAMILNADU

164. ST. MARY'S CHURCH, FORT ST. GEORGE, CHENNAI

The damaged stained glass panels were strengthened and a few of the missing ones were replaced as per the original. The work of removing dead plasters of inner walls and re-plastering the same was completed.

165. CLIVE BUILDING, FORT ST. GEORGE, CHENNAI

The damaged *Madras* terrace roof and the floor of Temple Survey office and that of deep shed and store room was conserved.

166. RAMPART WALL, FORT ST. GEORGE, CHENNAI

The work of water tightening the terrace of northern side of rampart wall and Wallaja gate was completed. The fallen portions of rampart wall were conserved as per old clues.

167. FORT MUSEUM, FORT ST. GEORGE, CHENNAI

The work of removing the damaged plastering and re-plastering the 10th gallery was completed.

168. DHENUPURISVARA TEMPLE, MADAMBAKKAM, CHENNAI

The sunken stone flooring of the *mandapa* and area near *dwajasthamba* was removed and re-laid.

169. SUGRISVARA TEMPLE, SIRCARPERIYAPALAYAM, DISTRICT ERODE

The work of constructing a brick *prakara* wall as per old available clues was carried out after strengthening the existing stone base wall. The conservation work at *nandimandapa* was also completed.

170. GROUP OF MONUMENTS, MAMALLAPURAM, DISTRICT KANCHIPURAM

Fencing of the hillock monuments was continued near the Pidari and Valayankuttai *rathas* to prevent encroachments.

171. SHORE TEMPLE, MAMALLAPURAM, DISTRICT KACHIPURAM

The fencing around the shore temple was completed on the southern side.

172. VAIKUNTAPERUMAL TEMPLE, KANCHIPURAM, DISTRICT KANCHIPURAM

The outer periphery of the temple was landscaped and an approach pathway was provided.

173. NARASMIHASWAMY TEMPLE, NAMAKKAL, DISTRICT NAMAKKAL

The accretionary building in the front of the temple was removed. Visitor's amenities shed in the south west corner has been provided.

174. HILL FORT AT NAMAKKAL, DISTRICT NAMAKKAL

The work of water tightening the roof of the *mukhamandapa* of Varadarajaswamy temple (inside the fort) was completed. The damaged outer veneer stone wall of the temple was removed and conserved as per original. Hand railing over the rock surface was provided.

175. BRIHADISVARA TEMPLE, GANGAIKONDACHOLA PURAM, DISTRICT PERAMBALUR

Watertightening of the terrace of the cloister *prakara* and the flooring of the corridor was completed. The *prakara* wall on the north western side was conserved.

176. SIKKANATHASWAMY TEMPLE, KUDUMIYANMALAI, DISTRICT PUDUKKOTTAI

Watertightening of one thousand pillared *mandapa* on southern side was undertaken and is in progress.

177. ROCK-CUT SIVA TEMPLE, NARTHAMALAI, DISTRICT PUDUKKOTTAI

The damaged *prakara* wall on the western and southern sides was conserved as per original. Watertightening of the terrace of *ardhamandapa*, front pillared *mandapa* and northwest sub shrines and re-erection of the pillars of open pillared *mandapa* were completed.

178. BHUMISVARA TEMPLE, SEVALUR, DISTRICT PUDUKKOTTAI

The leaky terrace was conserved by watertightening the same. Conservation of *mukhamandapa* and front open pillared *mandapa* was completed.

179. AGATHISVARA TEMPLE, VELLANUR, DISTRICT PUDUKOTTAI

The work of conserving the walls of *garbhagriha*, *ardhamandapa* and

mukhamandapa on the northern side is in progress. The leaky roof of front pillared, *ardhamandapa* and *madapali* (kitchen) are in the process of being conserved.

180. FORT TIRUMAYAM, TIRUMAYAM, DISTRICT PUDUKKOTTAI

The damaged and fallen fort wall was conserved with available old clues.

181. FORT AND TEMPLE ON THE HILL, CHINNAKAVANDANUR, DISTRICT SALEM

The work of dismantling the damaged bastion wall and reconstruction of the same with available old stones was completed. The work of removing damaged revetment wall and reconstructing the same in the eastern side of the lower temple tank was completed. The work of laying stone pathway between bastion wall and first gate and the work of providing chain fencing in front of the fort entrance over the dwarf wall was completed.

182. FORT, ATTUR, DISTRICT SALEM

The core of the bastion on northern side was strengthened and conserved earth work was carried out around the *mahal* building to expose the original level of the structure. Construction of RR revetment wall on the southern side of the inner fort near by *mahal* building to avoid the sledging of earth was completed.

183. SRI BRIHADISVARA TEMPLE, THANJAVUR, DISTRICT THANJAVUR

The damaged terrace of Keralanthakan *gopura* was water tightened after strengthening the stucco figures. The old accretionary temple car shed inside the temple was dismantled and a temporary car shed is being constructed outside the premises of the temple.

184. AIRAVATESVARA TEMPLE, DARASURAM, DISTRICT THANJAVUR

The damaged cloister *mandapa* in the northwest corner was conserved as per original. While strengthening the foundation fourteen bronzes of late Chola period were found. The work of conserving the sunken veneer stone wall of cloister *prakara* on the northern side is in progress.

185. FORT AND RAMPART, VELLORE, DISTRICT VELLORE

The rampart wall was watertightened on the northern and western sides. The damaged moat wall on northern side of the fort was taken up for conservation after proper documentation. Where as the moat wall on the southern side and eastern sides were watertightened. In Badhusha Mahal and Begum Mahal brick pedestal were made for rearranging the sculptures.

186. BRAHMAPURISWARA TEMPLE, BRAHMADESAM, DISTRICT VILLUPURAM

The leaky roofs of the *natya mandapa* and the *mukhamandapa* were watertightened. Earth work was carried out in front of main *gopura* to expose the original plinth level. The sunken veneers of the *prakara* wall on the northern side and outer sub shrines were conserved as per the original.

187. PATALESWARA TEMPLE, BRAHMADESAM, DISTRICT VILLUPURAM

The damaged weathering course, sunken ceilings slabs, beams, pillar capitals, pillars and veneers of the *madapalli* (kitchen) are being conserved after proper documentation.

188. FORT GINGEE, GINGEE, DISTRICT VILLUPURAM

The breached fort walls on the eastern side of Rajagiri, western side of Krishnagiri and near Vellore gate was conserved. The bastion wall on the eastern side of the Rajagiri fort was

also conserved. Watertightening of the *vimana* of the Siva and Amman shrines and structural repairs to the *mandapas* of the same were carried out.

189. PONDICHERRY GATE, GINGEE, DISTRICT VILLUPURAM

The damaged parapet wall was properly conserved and the broken ceiling slabs, beams, pillars capitals, pillars, *chhajja* portions were mended. The accretionary stone masonry wall was dismantled to expose the original gateway on the northern side of the entrance.

190. APATHSAHAYESWARA TEMPLE, SENDAMANGALAM, DISTRICT VILLUPURAM

The cloister *mandapa* in the north east and south east and *adhistana* mouldings which had fallen were conserved.

PONDICHERRY

191. VARADHARAJAPERUMAL TEMPLE, THIRUBHUVANAI, PONDICHERRY

Watertightening the terrace of main shrine *vimana*, Amman shrine *vimana*, Andal shrine *vimana* and Alwar shrine *vimana* were carried out.

192. NITISVARASWAMY TEMPLE, SRIMUSHNAM, PONDICHERRY

Conservation of the inner *prakara* wall on the northern side along with cloister *mandapa*; exposing the original plinth of the *prakara* wall on the southern and western sides and removal of accretionary wall in *madapalli* (kitchen) were completed.

DEHRADUN CIRCLE

UTTARAKHAND

193. JAGESHWAR TEMPLE (PHULAI GUNTH), DISTRICT ALMORA

The dislodged and badly weathered eleven miniature shrines were dismantled and reset as per the original with the help of combination materials. Cast iron gate of double leaf in ornamented design with gate along with pillars has been provided. Ramp with comfortable steps of staircase for wheel chairs has been provided for differently able and old persons after dismantling the old staircase of the main entrance. The restoration work of Bhairava temple is in progress.

194. SUN TEMPLE, KATARMAL, DISTRICT ALMORA

The weathered and out of plumb four miniature shrines of the complex were dismantled and reset as per the original with the help of old and new stones after strengthening the foundation. The veneering stone of *mandapa* of the Sun Temple was dismantled and fresh stones were provided wherever necessary in lime mortar. The resetting work of ashlar stone masonry of southeast corner of the main shrine has been completed up to the missing *griva* while the covered part of the *jagati* has been exposed. The dismantling work of *sukanasika* is in progress (Pls. 168-169).

195. MRITUNJAYA TEMPLE, DWARAHAT, DISTRICT ALMORA

Dismantling and resetting of Bhairava temple and providing of veneer stones to the small shrine of Mritunjaya group is in progress. Laying of patal flooring in front of *mandapa* is also in progress.

196. MANIYAN GROUP OF TEMPLES, DWARAHAT, DISTRICT ALMORA

Providing of dwarf wall with mild steel railing around the protected area is in progress.

197. GUJARDEO TEMPLE, DWARAHAT, DISTRICT ALMORA

Providing of dwarf wall with mild steel railing around the protected area and laying of patal stone pathway from main entrance to the shrine is in progress.

198. GROUP OF TEMPLES, BALJNATH, DISTRICT BAGESHWAR

Random rubble stone masonry wall and mild steel railing towards riverside near the bridge has been completed. Random rubble stone masonry of side wall, staircase and ramp for wheel chairs including mild steel pipe fixed with stone pillars has been provided after demolishing the badly damaged staircase. Temporary tin shed of *deodar* wood frame, with plywood sheet for store has been completed. Coarse rubble stone masonry wall of low height were constructed around the newly constructed shed with patal flooring around temporary store has been completed beside electrification work of the store.

199. BALESHWAR GROUP OF TEMPLES, CHAMPAWAT, DISTRICT CHAMPAWAT

Searching and collecting of ornamental members which are buried near Baleshwar temple and placing them to their original position are in progress. The out of plumb southern part of Baleshwar temple has been dismantled and re-setting work with ashlar stone masonry is in progress. Wire mesh painted *jali* has been provided to the wooden canopy of Naula.

200. KOTWALI CHABUTRA, CHAMPAWAT, DISTRICT CHAMPAWAT

Ashlar stone masonry work of mouldings of the platform has been dismantled and reset as per the original, with the help of combination materials. The apron around the platform has been restored and slightly widened.

201. ANCIENT GROUP OF TEMPLES, ADIBADRI, DISTRICT CHAMOLI

The unauthorized reinforced cement concrete gate constructed by the army authorities was demolished and a new ornamented cast iron railing has been provided. Patal roof of *char-chala* style has been provided to the temple committee room.

202. CHANDPUR GARHI, CHAMOLI, DISTRICT CHAMOLI

In continuation of previous year's work, exposing of buried structures and simultaneously conservation works were carried out with the help of combination materials as per the original. During this year, clearance work resumed to right side of the second enclosure wall towards eastern slope and found a series of cells in a row. The exposed structures of the previous year were restored. A small portion of the outer enclosure wall towards modern pathways was also restored with combination materials. Wooden door of traditional style with channel gate was provided to the main entrance of the Kali temple of the fort.

203. RUDRANATH TEMPLE, GOPESHWAR, DISTRICT CHAMOLI

The conservation work of Rawal niwas has been completed beside the provision of wooden railing to the inner verandah of the upper storey as per the original. Random rubble stone masonry work of dwarf wall, mild steel railing work, renovation of existing *bhogshala*, coarse rubble stone masonry work with slate stone on the back side of courtyard,

fixing of double leaf mild steel gate at the courtyard and flooring of courtyard with slate stone of Rawal Niwas have been completed.

204. KALINGA MONUMENT, KARANPUR, DISTRICT DEHRADUN

Cast iron railing of period design has been provided towards northern side of the compound along with dwarf wall with mild steel railing at the back side of the terrace garden (lower compound). Iron gate and the front railing has been replaced by period design gate and railing. The entrance of the memorial compound has been widened to get the better view of the monument. A small store room has been constructed just below the newly constructed staircase with mild steel railing for the support of steps. Mild steel railing has been provided to the sub-circle office verandah in view of better security.

205. ROCK EDICT OF ASOKA, KALSİ, DISTRICT DEHRADUN

Mild steel gate in the pattern of Buddhist *suchi* with fine dressed stone pillars with lion capital designs has been fixed. Steps and ramp have been provided at the main entrance of the compound in place of old stair case for the differently able persons. Coarse rubble stone masonry boundary wall with mild steel railing towards Amla road is in progress. Cabin for wheel chair has been constructed near toilet block for differently able and old persons.

206. TEMPLE AND IMAGES IN ITS VICINITY AT LAKHAMANDAL, DISTRICT DEHRADUN

The damaged and decayed wooden members of both temples of the compound including planks and rafters were dismantled and replaced with new one as per the original. The broken and damaged slates of the roof were also replaced with new ones. Buried structures of temple complex under accumulated debris

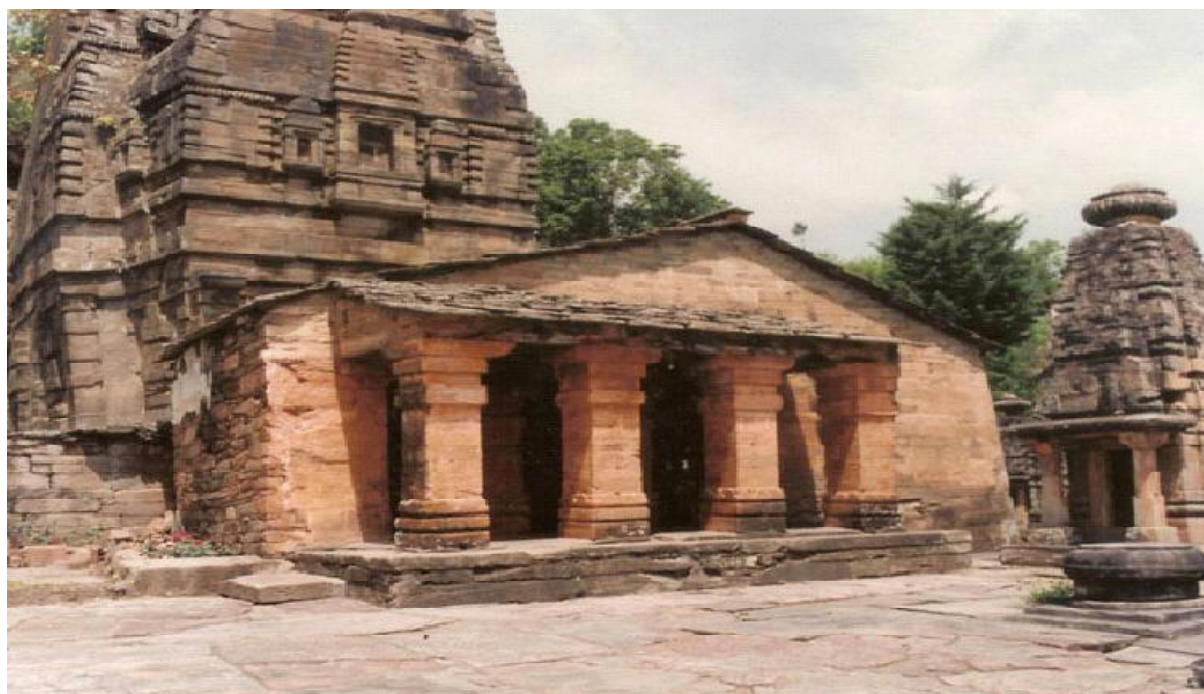
have been exposed and remains of old shrines and also plan of the most ancient shrine have been located. The badly damaged structure of *bhogshala* has been totally renovated and converted into a sculpture shed. A few masterpieces of the sculptures were also displayed on wooden pedestal. Channel gates have been provided to the eastern temple and newly constructed sculpture shed (Pls. 170-171).

207. TEMPLE SACRED TO MAHASU, HANOL, DISTRICT DEHRADUN

In continuation of previous year's work, the construction of dwarf wall with mild steel railing around the protected area and also the inner enclosure wall of the main temple have been completed. The repairing work of *bhogshala* has been completed by dismantling all the partition walls of the upper storey and provided laminated wooden flooring to the hall. All the selected sculptures with wooden pedestals were displayed in the hall and mild steel grill were also provided to the front and side verandah of the structure for better security. Channel gate has been provided to the main entrance of the newly constructed sculpture shed.

208. OLD CEMETERY, SHEKHPURI AND GANESHPUR, DISTRICT HARIDWAR

Brick work in composite mortar was carried out on the damaged part of the boundary wall, graves and obelisk inside the cemetery. Salt affected damaged part of graves and obelisk was raked out and repaired by brickwork and plastering. The badly damaged partition wall between living and dead area was completely demolished and a new dwarf wall with cast iron railing of period design was constructed in view of security. Cast iron gate has been provided at the entrance of the living grave yard. Designed wall has been constructed at the right side of



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169

Sun temple at Katarmal: 168, before and 169, during conservation. See p.233



170



171

Siva temple, Lakhamandal: 170, before and 171, after exposing Miniature shrines. See p. 235



172



173

Excavated site, Govishana: 172, before and 173, after conservation. See p. 239

the cemetery to demarcate the staff quarter and store etc. Chain fencing has been provided to the front lawn of the monument.

209. REMAINS OF A FEW OLD TEMPLES AND AN INSCRIBED MASONRY WELL, GANGOLIHAT, DISTRICT PITHORAGARH

Random rubble stone masonry wall along with mild steel railing has been provided with double leaf mild steel gate at the entrance of the Naula. The work of watertightening and plastering of the floor to the roof of Naula complex has been completed.

210. EXCAVATED SITE, DRONASAGAR GOVISHANA, DISTRICT UDHAM SINGH NAGAR

The remaining brick on edge pathway from the main entrance to the Gupta temple complex has been completed. The work of underpinning, pointing and water tightening were undertaken to the badly damaged portion of the excavated structure particularly western and north-western side that belongs to Gupta period. While removing the baulk and accumulated debris from the existing structure, a few antiquities and pottery, etc. were recovered (Pls. 172-173).

DHARWAD CIRCLE

KARNATAKA

211. AMBIGER GUDI, AIHOLE, DISTRICT BAGALKOT

The sub-shrine dismantled earlier is reconstructed using original members and new dressed lintels were provided wherever required as per original.

212. BASAVANNA ARAI BASAPPA TEMPLE, AIHOLE, DISTRICT BAGALKOT

The sub-shrine dismantled earlier is reconstructed using new stone members as per

original. Random rubble masonry compound wall is raised and veneered with dressed sandstone blocks and core is filled in lime mortar. The dislodged and out of plumb ancient southwestern gateway of the fort including the pillars, lintels and capitals are dismantled for resetting.

213. DURGA TEMPLE COMPLEX, AIHOLE, DISTRICT BAGALKOT

The pathways leading to the Durga and Ladkhan temples are provided with dressed sandstone paving (Pls. 174-175). The plinth protection course of sandstone slabs is provided around the temple. Solar street lights are provided along the periphery of the area around Durga temple as an additional security measure.

214. FORTIFICATION AROUND DURGA TEMPLE, AIHOLE, DISTRICT BAGALKOT

A portion of the damaged and dislodged fortification wall dismantled earlier is reset using original stone blocks and providing new dressed ones wherever necessary. The core is filled with boulders and gravel.

215. GALAGANATHA GROUP OF TEMPLES, AIHOLE, DISTRICT BAGALKOT

The missing architectural members like lintels and doorjambs were prepared and provided to complete the elevation of the shrine. Dressed sandstone paving is provided around the temple to avoid stagnation of rain water.

216. HUCCHIMALLI TEMPLE, AIHOLE, DISTRICT BAGALKOT

Dressed sandstone slab paving over a cement concrete bed is laid around the monument and ancient well. The parapet of the ancient well is dismantled and reconstructed as per original. The dry stone rubble masonry wall on the western periphery of the temple is

dismantled, reconstructed and veneered with stone slabs to match with the ancient ambience (Pls. 178-179).

217. HUCHAPPAYYA TEMPLE, AIHOLE, DISTRICT BAGALKOT

The temple is provided with lightning conductor.

218. JYOTIRLINGA GROUP OF TEMPLES, AIHOLE, DISTRICT BAGALKOT

Vegetation growth in the ancient stepped well in the complex is cleared and desilting work is taken up. The fallen debris and the architectural members of the out of plumb inner veneering of the tank, which had caved in, are carefully removed and stacked for reuse (Pls. 180-181). The work of restoration using available architectural members and dressing of new members for replacing the damaged ones is in progress.

219. MALLIKARJUNA GROUP OF TEMPLES, AIHOLE, DISTRICT BAGALKOT

The wall along the entrance and on southern side is reconstructed using dressed sandstone blocks after laying proper foundation and cement concrete bed. Stone apron is provided over cement concrete bed in between the monument and the ancient *mandapa*. The undulated dry rubble-stone wall of the ancient drainage is dismantled for reconstruction.

220. RAMALINGA TEMPLE, AIHOLE, DISTRICT BAGALKOT

The missing stone members of the *sikhara* are provided with new ones following the original designs. Dressed sandstone slabs are paved over a bed of cement concrete around the temple.

221. TARABASAPPA TEMPLE, AIHOLE, DISTRICT BAGALKOT

The undulated area around the temple is leveled by filling earth. Missing members of the ancient tank are provided with new dressed ones (Pls. 182-183).

222. VENIARGUDI COMPLEX, AIHOLE, DISTRICT BAGALKOT

The out of plumb sub-shrine in the complex is dismantled and reset by providing new stone beams with necessary carvings and mouldings. Rubble masonry compound wall veneered with dressed sandstone blocks is constructed. The ancient well is provided with a low parapet wall.

223. YOGI NARAYANA TEMPLE AND SUBSIDIARY SHRINES, AIHOLE, DISTRICT BAGALKOT

The earlier dismantled *mandapa* of the sub-shrine in the complex is reset by supplying missing architectural members like dressed lintels, pillar bases and other units (Pls. 184-185).

224. FORT WALL AND TEMPLES, BADAMI, DISTRICT BAGALKOT

The breached and missing portion of the wall of the northern fort is reconstructed using available members and supplying new dressed sandstone blocks. The undulated pathway is rendered even and paved with sandstone slabs.

225. GROUP OF TEMPLES ON THE NORTHERN SIDE OF LAKE, BADAMI, DISTRICT BAGALKOT

The dislodged and damaged flight of steps of the lake are removed and reset as per original. The area between the lake and garden is paved with dressed sandstone slabs over a plain cement concrete bed. Crimped wire mesh fencing is provided over the dwarf compound wall for additional safety and to avoid entry of cattle.

226. MALEGITTI SIVALAYA AND KAPPE ARABHATTA INSCRIPTION, BADAMI, DISTRICT BAGALKOT

Rubble masonry compound wall veneered with dressed sandstones is constructed all along the periphery of the protected premises. Crimped wire mesh is provided over it to avoid encroachments and misuse of the area.

227. PALLAVA INSCRIPTION, BADAMI, DISTRICT BAGALKOT

Breached and missing portion of the fortification wall near the inscription is reconstructed using new dressed stone blocks. The uneven steps are dismantled and reset as per original.

228. RAMESHWARA TEMPLE, BEVOOR, DISTRICT BAGALKOT

The dismantled portion of the temple is reconstructed after consolidating the foundation by providing cement concrete bed.

229. TANK WITH COLONNADES AT BANASHANKARI TEMPLE, CHOLACHAGUDDA, DISTRICT BAGALKOT

The out of plumb wall towards the northern side of the sub-shrine is dismantled and reconstructed.

230. JAINA TEMPLE (MELAGUDI), HALLUR, DISTRICT BAGALKOT

The compound wall is provided with dressed sandstone coping.

231. JAINA TEMPLE, PATTADAKAL, DISTRICT BAGALKOT

The roof of the reconstructed temple is duly watertightened with lime *coba*. To avoid stagnation of rainwater around the temple, an apron is provided using sandstone slabs over a concrete-bed.

232. MALLIKARJUNA TEMPLE, PATTADAKAL, DISTRICT BAGALKOT

Missing portion of *mukha-mandapa* on the southern side of the temple is reconstructed by adding new sandstone members like *adishithana* mouldings, pillars, beams and *chhajjas* prepared as per the original.

233. KAMALA BASTI, BELGAUM, DISTRICT BELGAUM

A dwarf-veneering wall is constructed in sandstone slabs along the periphery of the protected premises.

234. SUVARNESWARA TEMPLE, HALSHI, DISTRICT BELGAUM

The missing roof slabs of the *sabha-mandapa* are provided afresh and joints are pointed. The front *mandapa* is reconstructed by erecting pillars, beams, capitals and lintels and the core is filled using rubble and gravel.

235. CHIKKALESHWARA TEMPLE, KONNUR, DISTRICT BELGAUM

The dismantled portion of the temple is reconstructed and the roof is duly watertightened.

236. GROUP OF DOLMENS, KONNUR, DISTRICT BELGAUM

The protected area is fenced by rising random rubble stone dwarf-wall and fixing mild steel grill over it.

237. HAZARAT KHALILULLA SHAH'S TOMB, ASHTUR, DISTRICT BIDAR

The work of de-plastering and re-plastering of the entire wall surface of the monument with lime mortar is completed. Trap-stone merlon is constructed over the compound wall.

238. NIZAM ADALAT, AVVAL TALUK, DISTRICT BIDAR

The dead lime plaster on the roof of monument is removed and re-plastered after providing asbestos cement sheet.

239. GAGAN MAHAL, BIDAR, DISTRICT BIDAR

A parapet wall is constructed in trap stone masonry. The interior and exterior surfaces of the monument are re-plastered.

240. RANGIN MAHAL, BIDAR, DISTRICT BIDAR

The dead lime plaster is raked out and re-plastered including redoing of the stucco carvings to a height of more than 15m. The roof is watertightened using *coba*.

241. ROYAL HAMAM, BIDAR, DISTRICT BIDAR

The interior surface is applied with oil bound distemper and the dome windows are applied with enamel paints. The wooden ceiling is varnished to avoid further decay.

242. SOLA KHAMBA MOSQUE, BIDAR, DISTRICT BIDAR

The dead lime plasters of the domes are re-plastered on the exterior surface. The flooring is re-laid and finished with lime mortar. The walls are replastered and applied with oil bound distemper (Pls. 186-187).

243. TARKASH MAHAL, BIDAR, DISTRICT BIDAR

The decayed and dead plaster on the walls is removed and re-plastered with lime mortar. The roof is watertightened. Fallen arches and parapet wall are reconstructed using trap-stone, and the interior and exterior portion of monument is re-plastered.

244. AIN-UL-MULK'S TOMB, AINAPUR, DISTRICT BIJAPUR

The missing portion of the ancient dilapidated platform is reconstructed using new trap-stone blocks with four line dressing (Pls. 188-189).

245. ALI-KI-ROUZA, BIJAPUR, DISTRICT BIJAPUR

The compound wall along periphery is provided with mild steel grills after plastering. The missing peripheral stones are re-fixed with new ones matching to the existing parapet.

246. ASAR MAHAL, BIJAPUR, DISTRICT BIJAPUR

The debris inside the water tank in front of Mahal is cleared.

247. GAGAN MAHAL, BIJAPUR, DISTRICT BIJAPUR

The interior surface of the massive walls of the Mahal is plastered retaining the original stucco ornamentation. The cracks developed over the wall are grouted. The exterior joints are pointed and plastered with lime mortar. The damaged flooring is re-laid in lime concrete.

248. GOL GUMBAZ, BIJAPUR, DISTRICT BIJAPUR

The height of the existing compound wall on the eastern side is raised in uncoursed rubble masonry and mild steel grill is fixed over it to avoid trespassing. The breached portion of fortification wall is reconstructed in coarse rubble masonry. The old and damaged plaster of *dalans* is de-plastered and re-plastered in lime mortar and applied with distemper. Electrification and wood works like fixing door, arch and window etc. are done for re-using the *dalans*. Running masonry pedestal is constructed for display of architectural members. Flight of steps is provided to the platform in front of the museum entrance. Concrete flooring is laid for parking area. Tree guards are constructed around the trees in uncoursed rubble stone masonry and mild steel grill is fixed around the picnic spot. Regular water supply is ensured by constructing water tank, providing taps and motor.

249. MALIK-E-MAIDAN CANNON, BIJAPUR, DISTRICT BIJAPUR

Stone masonry compound wall is constructed and mild steel grills are fixed over it. The fallen and out of plumb fortification wall is dismantled and reconstructed using trap-stone blocks including core filling.

250. SANGEET AND NARI MAHAL, BIJAPUR, DISTRICT BIJAPUR

The fallen and breached fort wall is reconstructed and plastered in fresh lime mortar. The inner fort wall is plastered with lime mortar and the height of the enclosure wall of the Nari Mahal is raised.

251. WATER PAVILLION, KUMATGI, DISTRICT BIJAPUR

The dead lime plaster of exterior walls of the water pavilion is removed and re-plastered with lime mortar and coated with weather proof emulsion.

252. SHANKARA-LINGA TEMPLE, NIMBAL, DISTRICT BIJAPUR

The area in front and around the monument is laid with stone pavement over cement concrete bed with sufficient gradient for free flow of rain water.

253. MUSKIN BHAVI, LAKKUNDI, DISTRICT GADAG

The undulated area around the monument is leveled and green lawn is developed.

254. GREAT MOSQUE, GULBARGA, DISTRICT GULBARGA

The decayed and dead plaster over the roof surface and domes of the monument are raked out and re-plastered in lime mortar as per original. The stucco work on the dome and

mihrab are re-done following the original and coated with enamel paint (Pls. 190-191).

255. HAFTH GUMBAZ, GULBARGA, DISTRICT GULBARGA

The decayed and dead plaster on the exterior surface of the tombs of Firozshah and Ghiyasuddin in the complex is removed and re-plastered in fresh lime mortar including mending of stucco works on the eastern wall. The damaged architectural members, ornamental merlons, *kanguras* and friezes are mended and re-plastered as per original. A new mild steel grill gate is provided to avoid trespassing.

256. KALMESHWARA TEMPLE, BALAMBID, DISTRICT HAVERI

Dwarf compound wall is raised in rubble masonry over a cement concrete bed and veneered with dressed schist stone slabs and mild steel grill is fixed over it. Dressed stone apron is laid around the temple over a cement concrete bed.

257. TARAKESWARA TEMPLE, HANGAL, DISTRICT HAVERI

The leaky roof is rendered watertight by applying lime mortar.

258. SOMESHWARA TEMPLE, HARLAHALLI, DISTRICT HAVERI

Dressed schist-stone apron is laid over a concrete base on the western side of the temple. The undulated area is leveled and mild steel angle and barbed wire fencing is fixed along the approach road.

259. SIDDHESWARA TEMPLE, HAVERI, DISTRICT HAVERI

The moss and lichen grown over the wall and super structure are cleaned. The height of the existing compound wall is raised and



174



175

Durga Temple, Aihole: 174, before and 175, after providing dressed sandstone pathway. See p. 239



176



177

Ladkhan Temple, Aihole: 176, before and 177, after providing dressed sand stone pathway. See p.



178



179

Huchchimalli Temple, Aihole: 178, before and 179, after conservation. See p. 240



180



181

Jyotirlinga group of Temples, Aihole: 180, before and 181, after cleaning and de-silting of Tank. See p. 240



182



183

Tarabasappa Temple, Aihole: 182, before and 183, after restoration of the ancient Tank. See p. 240

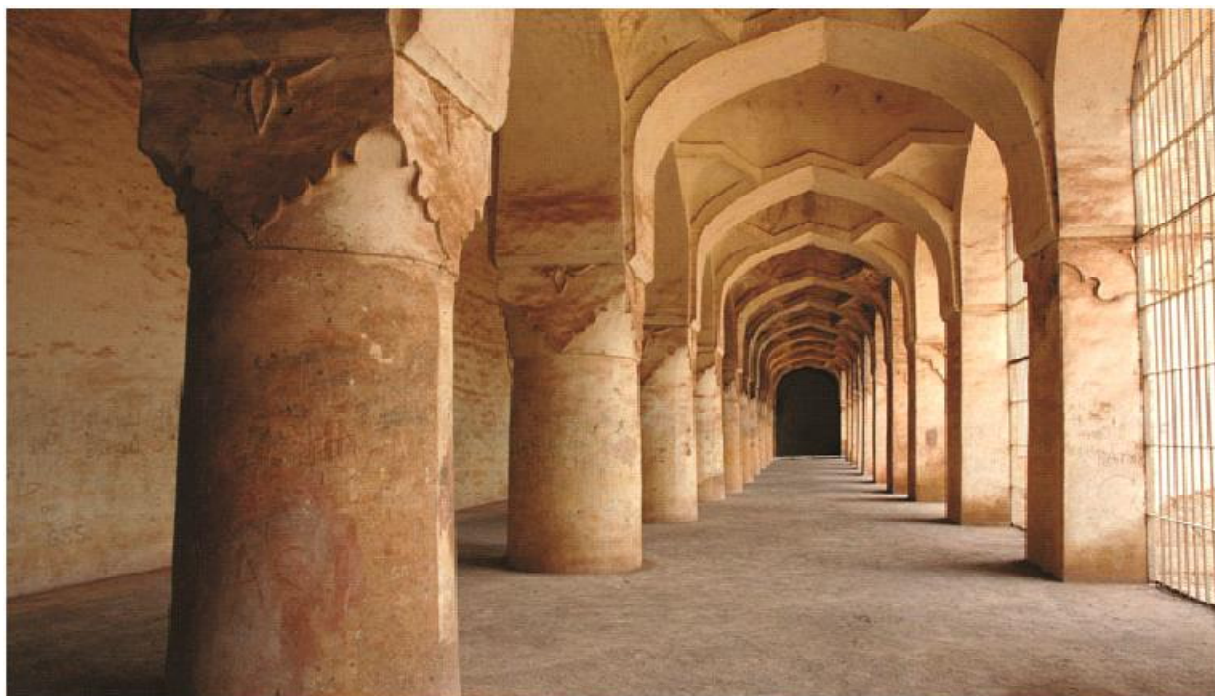


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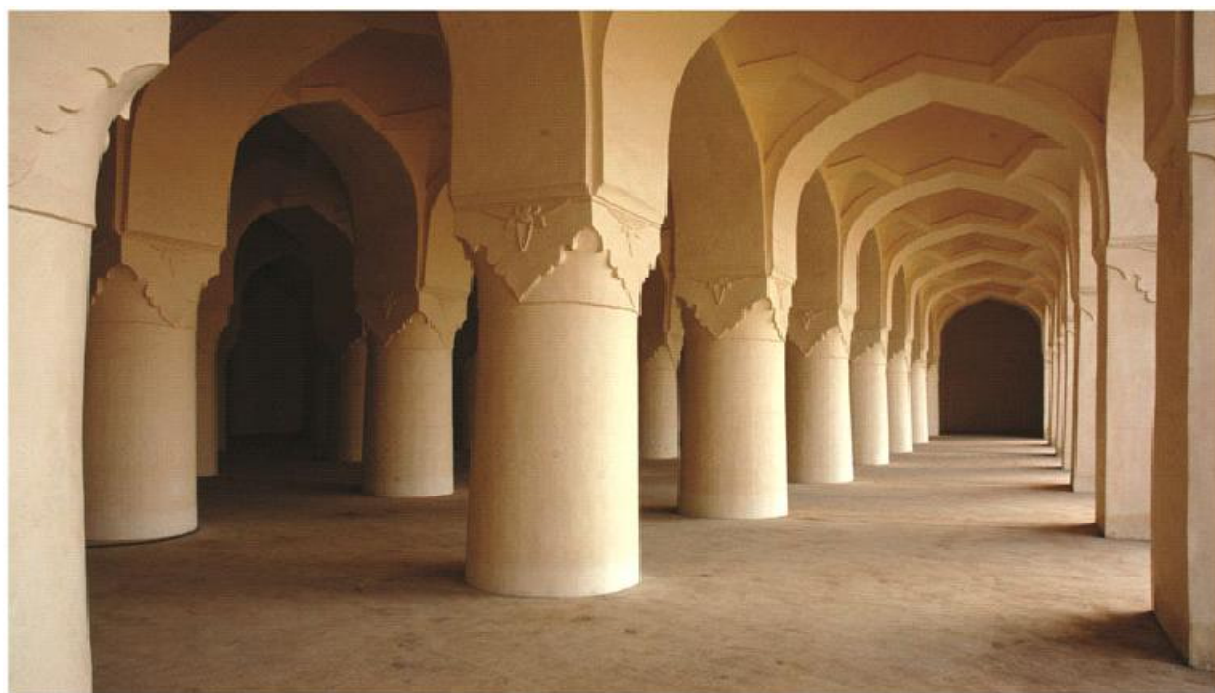


185

Yogi Narayana Temple and subsidiary shrines, Aihole: 184, before and 185 after re-setting of architectural members. See p. 242



186



187

Sola khambha mosque, Bidar: 186, before and 187, after replastering. See p. 242



188



189

Ain-ul-Mulk's tomb, Aina Mahal: 188, before and 189, after reconstruction of ancient platform. See p. 242



190

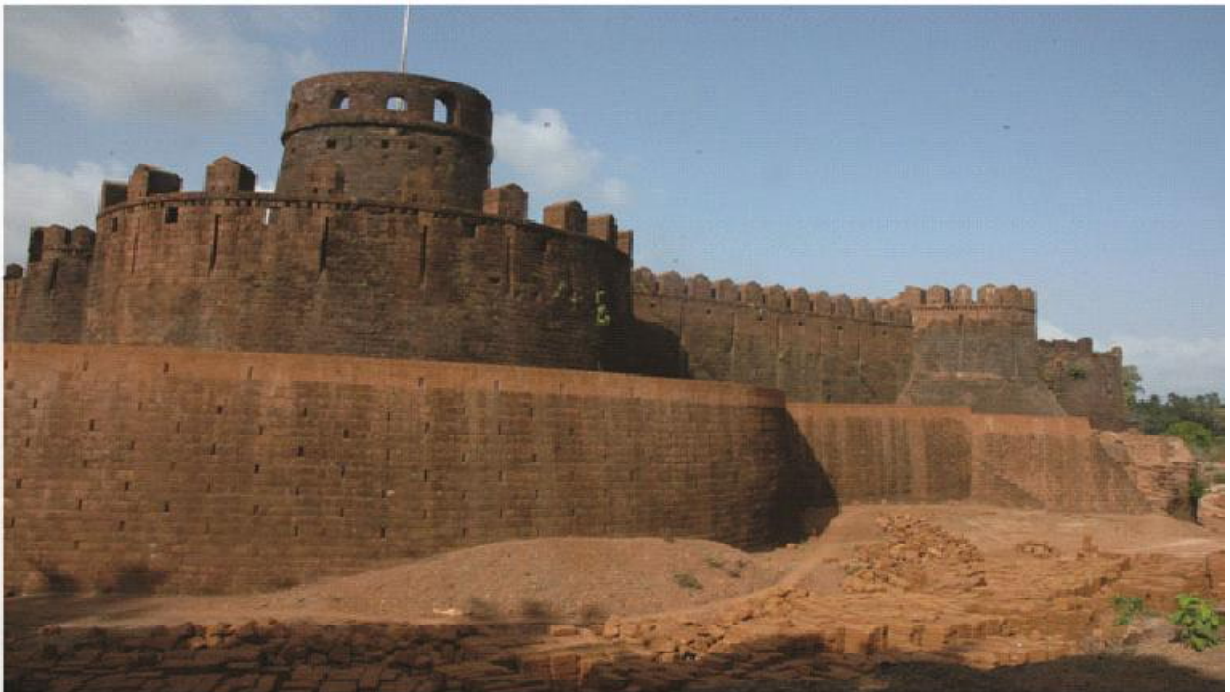


191

Great mosque, Gulbarga: 190, before and 191, after the repairing of stucco work. See p. 243



192



193

Fort, Mirjan: 192, before and 193, after reconstruction of the northern side fort wall. See p. 254

veneered with schist stone slabs on the western side and an mild steel grill gate is fixed.

260. SARVESWARA TEMPLE, NAREGAL, DISTRICT HAVERI

Dressed schist stone slab apron is laid around the temple and a dwarf compound wall is raised in random rubble masonry.

261. MADHUKESHWARA TEMPLE, BANAVALI, DISTRICT UTTARA KANNADA

Dressed granite stone flooring over a concrete bed is laid on the west, east and north-east sides of the monument. The sunken and undulated steps on the east of Mahadeva temple are dismantled and reset. The dead plaster over the stone masonry of the sculpture gallery is removed and re-plastered. The damaged mild steel grills are replaced by new ones.

262. NARASIMHA TEMPLE, BHATKAL, DISTRICT UTTARA KANNADA

Dressed schist stone apron is provided around the temple.

263. PARSVANATHA BASTI, BHATKAL, DISTRICT UTTARA KANNADA

Dressed schist stone apron is provided around the *basti*.

264. GROUP OF MONUMENTS, BILGI, DISTRICT UTTARA KANNADA

The existing mild steel grill over the compound is removed and re-fixed after raising the height of the compound wall using schist stone slabs. Synthetic enamel paint was applied to the grill and mild steel angles to avoid rusting.

265. RATNATRAYA BASTI, BILGI, DISTRICT UTTARA KANNADA

Dressed schist stone slab apron is provided over a concrete bed around the *basti*.

266. VIRUPAKSHA TEMPLE, BILGI, DISTRICT UTTARA KANNADA

Dressed schist stone slab apron is provided over a concrete bed around the temple.

267. CHANDRANATHA BASADI, HADUVALLI, DISTRICT UTTARA KANNADA

The laterite masonry compound wall is provided with a concrete coping. Chain link mesh welded to mild steel angle is fixed over it and painted neatly to prevent rusting. Dressed schist stone flooring and curbing stones are provided around the monument.

268. FORT, MIRJAN, DISTRICT UTTARA KANNADA

The debris accumulated outside the fort wall is cleared to expose the working level and buried portion of the structure. The out of plumb and dislodged portion of the northern fort is dismantled and reconstructed as per original (Pls. 192-193).

269. LAXMI NARASIMHA TEMPLE, MOOD-BHATKAL, DISTRICT UTTARA KANNADA

Schist stone apron is provided around the temple over a concrete base.

270. SHANTAPPA NAIKA TIRUMALA NARAYANA TEMPLE, MOOD BHATKAL, DISTRICT UTTARA KANNADA

Schist stone apron is provided around the temple over a concrete base to avoid seepage of rain water.

GOA CIRCLE

GOA

271. SAFA MASJID, PONDA, GOA

To enhance the ambience of the site the *nala* that dissected the site was lined with laterite block and covered with concrete slabs

and camouflaged by filling the earth and laying grass.

272. CHURCH OF ST. CAJETAN, OLD GOA, DISTRICT NORTH GOA

Based on old photographic records the missing balustrades (railings) between the two bell towers of the monument were provided to match the original and restore the balance of the front facade. New iron-gate with cattle trap was also fixed at the entrance near the compound wall (Pls. 194-195).

273. CHURCH OF ST. FRANCIS OF ASSISI, OLD GOA, DISTRICT NORTH GOA

Adopting the concept of preventive maintenance to stop the wear and tear due to constant trampling of the tombstone on the floor of the church, wooden ramps of marine ply have been provided. This also facilitated easy movement of the visitor. The sacristy which was under the custody of the church authorities was replastered as the plaster had completely peeled off due to seepage of water and capillary action. The roof above the sacristy was relaid with galvanised iron sheets, wooden rafters and Mangalore tiles to prevent ingress of water during the monsoon. The whole area was colour washed matching to original.

274. CHURCH OF OUR LADY OF ROSARY, OLD GOA, DISTRICT NORTH GOA

To prevent ingress of water during monsoon the roof of the church was laid with GI sheets and broken Mangalore tiles were replaced. For the easy movement of visitors, pathway was laid with laterite along with edge stone and portion of the old pathway that was traced got cleared and consolidated.

275. CHURCH OF ST. AUGUSTINE, OLD GOA, DISTRICT NORTH GOA

In continuation of *in situ* conservation adopted at the site, watertightening and filling up of joints was done and the 1/3rd free standing bell tower was further consolidated by adopting a laterite pack technique i.e. laterite nodules were ground, mixed with red/black oxide and lime and the paste was superimposed on the exfoliated surface maintaining the eroded profile. This has resulted in preventing further disintegration of the exposed laterite. This technique has been perfected after trial testing at the site and subsequently the whole tower will be suitably treated on the external surface.

276. BASILICA OF BOM JESUS, OLD GOA, DISTRICT NORTH GOA

The false ceiling in the church had rotten in several places and damaged. Therefore, it was removed and refixed, and painted as per the existing evidence. The quadrangle was white washed as per routine.

277. SE' CATHEDRAL, OLD GOA, DISTRICT NORTH GOA

Conservation was under taken at the Cathedral by replacing the old electric fixtures, rewiring and partially illuminating the interior vault. The damaged windows were repaired and some were replaced as per the existing design. The floor of the platform in front was strengthened by pointing of the joints and the exterior was colour washed. The damaged and dead plaster of the bell tower was removed and replastered.

278. CHURCH OF ST. CATHERINE, OLD GOA, DISTRICT NORTH GOA

The out of plumb compound wall was dismantled and reconstructed, and the roots of the vegetation were removed.

279. UPPER FORT, AGUADA, CANDOLIM, DISTRICT NORTH GOA



194



195

Church of St. Cajetan, Old Goa: 194, before and 195, after providing of balustrades. See p. 255

The chapel within the fortress was further consolidated by resetting of the laterite floor and repaired the doors and windows. A pathway was laid that was strengthened with chequered tiles and side retaining wall constructed for easy and safe access of the visitor to the toilet outside the fortress.

GUWAHATI CIRCLE

ASSAM

280. ANCIENT ROCK-CUT CAVES, JOGIGHOPA, DISTRICT BONGAIGAON

Construction of approach pathway from Cave 1 to 5 including surface drainage facility and construction of low height stone masonry wall on both sides of the pathway to prevent soil erosion are in progress.

281. CACHARI RUINS, KHASPUR, DISTRICT CACHAR

The ancient enclosure wall has been restored with special size bricks and lime mortar and construction of a dwarf wall with mild steel railing over it in order to keep the protected areas free from encroachment is in progress.

282. REMAINS AT BHISMAKNAGAR, BHISMAKNAGAR, DISTRICT DEBANG VALLEY

Thick vegetation inside the monument has been removed and the ancient wall has been restored with special size bricks and combination mortar.

283. MONOLITHS, KASOMARI PATHAR, DISTRICT GOLAGHAT

Vegetation clearance at the site has been carried out and painting of the mild steel grill over the dwarf wall has been completed.

284. SIVADOL, NEGHERITING, DISTRICT GOLAGHAT

Damaged portion of the drain leading from *garbhagriha* to outside the temple has been repaired and the cracks on the *garbhagriha* have been stitched and consolidated by pressure grouting.

285. KAMESWAR TEMPLE, HAJO, DISTRICT KAMRUP

Brick-on-edge apron around the temple has been provided and construction of dwarf wall with chain link fencing is in progress.

286. KEDAR TEMPLE, HAJO, DISTRICT KAMRUP

Pointing to the main *vimana* of the temple after raking out the decayed pointing has been completed. Re-flooring of the damaged floors of *ardhamandapa* and *mahamandapa* with *kota* stones and watertightening of the *ardhamandapa* and plastering of the outer surface as per original has been completed (Pls. 196-197).

287. HAYAGRIVA MADHAVA TEMPLE, HAJO, DISTRICT KAMRUP

The leaky terrace and roofs of *mandapa*, *ardhamandapa* and *antarala* of the temple have been watertightened and consolidated by pressure grouting. The external and internal wall surfaces have been cleaned and joints of the stone masonry walls are neatly pointed and voids of the walls are properly filled and consolidated by pressure grouting. The vertical cracks of the entrance doorway to the *mandapa* are also consolidated by applying the combination mortar. The eastern gateway of the temple has also been attended. Restoration of ancient and undulated stone steps leading to the temple and first phase of the construction of ramp for disable persons has been completed.

Construction of toilet block for the visitors has also been completed.

288. DEVIDOL, GAURISAGAR, DISTRICT SIVASAGAR

The decayed joints of the stone masonry of the main temple have been raked out and pointing of the same is in progress. Removal of damaged apron and relaying of new apron around the monument is also in progress.

289. GROUP OF FOUR MAIDAMS, CHARAIDEO, DISTRICT SIVASAGAR

Earth cutting for construction of guard wall on both sides of the excavated *maidam* to check soil erosion is in progress and construction of compound wall in the front side of the protected area of the *maidam* has been completed.

290. GHANASHYAM'S HOUSE, JOYSAGAR, DISTRICT SIVASAGAR

The vegetation growth inside the monument has been removed. The exterior surface of the monument has been made moss and lichen free.

291. KARENGHAR (TALATALGHAR) OF THE AHOM KINGS, JOYSAGAR, DISTRICT SIVASAGAR

Moss and lichen have been removed from the surface of the monument. Restoration of the damaged ancient compound wall around the palace is in progress. Construction of the toilet block and drinking water facility for the tourists has been completed.

292. RANGHAR PAVILION, JOYSAGAR, DISTRICT SIVASAGAR

The vegetation growth and moss and lichen have been removed from the monument.

293. SIVADOL, SIVASAGAR, DISTRICT SIVASAGAR

Raking out the decayed joints of the stone masonry and pointing of the same with lime mortar is in progress.

294. VISNUDOL, JOYSAGAR, DISTRICT SIVASAGAR

Vegetation clearance inside the monument has been carried out and the monument is made moss and lichen free.

295. AHOM RAJA'S PALACE, GARHGAON, DISTRICT SIVASAGAR

Vegetation growth inside the monument has been removed and the monument has become moss and lichen free.

296. THE MOUND AND RUINS OF THE STONE TEMPLE, DAHAPARBATIA, DISTRICT SONITPUR

The vegetation growth inside the monument has been removed.

297. MASONRY REMAINS OF BAMUNI HILLS, TEZPUR, DISTRICT SONITPUR

The vegetation and scientific clearance in the site has been undertaken. Brick-on-edge approach pathway has been provided in the front side of the monument and the damaged portions of the approach pathway have been repaired. The unfinished building for Sub Circle office has been renovated with new verandah covered with mild steel grill, water tank and the damaged doors are replaced with new one.

MANIPUR

298. TEMPLE OF BISHNU, BISHNUPUR, DISTRICT BISHNUPUR

Vegetation clearance of the monument has been carried out and the mild steel grill over the dwarf wall painted. Plastering of inner side of the boundary wall is in progress.

299. SHRI RADHA DAMUDOR TEMPLE AT WANGKHEI ANGON LEIKAI, DISTRICT IMPHAL-EAST

The work of providing steel clamps in three tiers all around the temple to prevent further movement of the structure was taken up by State Archaeology, Govt. of Manipur.

300. KRISHNA TEMPLE, BRAHAMAPUR GURU ARIBAM LEIKAI, DISTRICT IMPHAL EAST

State Archaeology, Govt. of Manipur removed decayed lime-concrete from the chala-roof of the temple and repaired the damaged portion with fresh lime concrete and water-tightening was also done.

MEGHALAYA

301. STONE MEMORIAL OF U-MAW-THODUR-BREW, NARTIANG, DISTRICT JAINTIA HILL

Construction of random rubble stone masonry boundary wall with mild steel grill fencing over it is in progress.

NAGALAND

302. REMAINS OF A FORT (DIMAPUR RUINS), DIMAPUR, DISTRICT DIMAPUR

Thick vegetation growth inside the monument has been removed.

TRIPURA

303. SCULPTURES AND ROCK-CUT RELIEFS OF THE UNAKOTI TIRTHA, DISTRICT NORTH TRIPURA

In order to reduce soil erosion, construction of stone masonry retaining wall and providing of reinforced cement concrete

hand railing for easy approach to visitors are in progress. Work for drinking water facility for the tourists is also in progress.

304. ANCIENT MOUND CALLED SHYAM SUNDAR TILA, JOLAIBARI, DISTRICT SOUTH TRIPURA

Brick-on-edge apron around the excavated structure has been provided and brick paved flooring in the missing and damaged areas with the help of combination mortar have been completed. Fixation of mild steel grill over the dwarf wall has also been completed.

305. BHUBANESWARI TEMPLE, RAJNAGAR, DISTRICT SOUTH TRIPURA

Painting of the mild steel grill over the dwarf wall has been completed.

306. TEMPLE OF CHATURDASA DEVATA, RADHAKISHORPUR, DISTRICT SOUTH TRIPURA

The vegetation growth inside the monument has been removed.

307. ANCIENT REMAINS, BOXANAGAR, DISTRICT WEST TRIPURA

Conservation of the excavated stupa including raking out the joints and pointing of the same neatly, setting of missing bricks with combination mortar and watertightening have been completed. Construction of boundary wall with pillars including construction of dwarf wall and fixing of mild steel grill over it have been completed. The undulated and lowland areas have also been leveled (Pls. 198-199).

HYDERABAD CIRCLE

ANDHRA PRADESH

308. HILL FORT AT RAYADURG, DISTRICT ANANTAPUR

Pointing was done to the walls, roof of the horse stable and walls of the Madhavaraya Swamy temple and Rama temple. Desilting has



196



197

Kedar temple, Hajo: 196, during and 197, after watertightening and plastering of ardhamandapa. See p.257



198



199

Ancient remains, Boxanagar: 198, before and 199, after conservation. See p.259

been done to the big tank. Besides, the affected roof slabs and capitals, beams and bulged walls of horse stable was removed and strengthened (Pls. 200-201).

309. LOWER FORT, CHANDRAGIRI, DISTRICT CHITTOOR

Reconstructed the fallen portion of Bastion 4 and 8 by using cyclopean stones in the same manner as existing surrounding of fort wall and refilled the washed out rampart using gravel and boulders layer by layer. Reconstructed the fallen portions of adjoining fort walls to third gate *mandapa* using cyclopean stones in the same manner as existing surrounding fort wall and refilled the washed out rampart using gravel and boulders layer by layer. Mended main structural beam and column capital of third gate *mandapa* that were cracked (Pls. 202-203).

310. VENKATESWARA VISNU TEMPLE, SRINIVASA MANGAPURAM, DISTRICT CHITTOOR

The damaged leak roof of the main temple is treated with lime brick jelly concrete and also got watertightened.

311. SUBRAMANYA TEMPLE, VISNU TEMPLE AND SIVA TEMPLE AT LOWER FORT, CHANDRAGIRI, DISTRICT CHITTOOR

Dwarf wall with diamond fencing was done to Subramanya temple, Visnu temple and Siva temple.

312. LOWER FORT, GURRAMKONDA, DISTRICT CHITTOOR

The fallen portion of Bastion 1 and 8 was reconstructed using cyclopean masonry in the same manner as existing surrounding fort wall and the washed out rampart was refilled with gravel layer by layer.

313. SRI BHIMESWARA SWAMY TEMPLE AT DRAKSHARAMA, DISTRICT EAST GODAVARI

The stone veneering of walls of first floor of *garbhagriha* and flooring was laid with dressed khondalite stones. After removal of cement flooring and plaster from the walls of the outer side of *garbhagriha*, recess pointing was done. The damaged cement flooring mixed with pebbles of cloister *mandapa* and *kalyanamandapa* was replaced with dressed khondalite stones over cement concrete bed and further in the joints recess pointing was done. The damaged Madras terrace roof of *gudamandapam* of Sri Kasi Visweswara Temple was removed and re-laid with new teak wood rafters, terrace bricks on edge and covered by pressed tiles over brick jelly concrete on top. The damaged stucco plaster over the brick *sikharas* of Sri Kasi Visweswara Temple was removed and suitably replastered. The *Somavarapu mandapam*, eastern and western *gopurams*, entrance *mandapas* were laid with pressed tiles and watertightened (Pls. 204-205).

314. SRI KUMARA RAMA BHIMESWARA TEMPLE AT SAMALKOT, DISTRICT EAST GODAVARI

The dead lime concrete over the roof of 100 pillared *mandapa* was removed and provided with two layers of country make flat tiles and pointed. The random rubble wall of the eastern side platform (bathing *ghat*) was raised. The dead lime brick jelly concrete over the terrace of the cloister *mandapa* was removed, the original roof stone slabs are thoroughly cleaned, joints filled and brick jelly lime concrete was laid.

315. MAHASTUPA AT AMARAVATI, DISTRICT GUNTUR

Laying of *pradakshinapatha* with ancient size bricks around the stupa is completed.

316. AMPHI THEATRE AT ANUPU, DISTRICT GUNTUR

The fallen dry stone masonry wall was removed, fallen breach of stone masonry was reconstructed, the missing steps around the stadium were restored with suitable *cudduppah* stone slabs and restoration was done by means of filling the pockets wherever the bricks were missing with special size bricks in lime mortar. Stone revetment was provided on southern side of the Hariti temple.

317. SRI KAPOTESWARA SWAMY TEMPLE, CHEJERLA, DISTRICT GUNTUR

The deteriorated lime plaster was removed and relaid with a uniform thickness. This plaster was prepared with grinded lime and sand, and adding gallnut, jaggery and toning the shade by mixing required colour pigment to match the original. Besides, pointing to the dwarf wall around the ancient Koneru was carried out.

318. SRI RAMALINGESWARA SWAMY TEMPLE AT PONDUGULA, DISTRICT GUNTUR

As part of the restoration of the damaged temple, rank vegetation is removed and documentation of the temple was completed.

319. STUPA AT BHATTIPROLU, DISTRICT GUNTUR

320. GOLCONDA FORT, GOLCONDA, DISTRICT HYDERABAD

The fallen and accumulated debris around Bhagmati palace in Rani Mahal complex is cleared resulting in exposing the walls, steps and platforms.

321. FORT AND BUILDINGS AT SIDDAVATAM FORT, SIDDAVATAM, DISTRICT KADAPA

The breaches at west and north side of the fort were reconstructed with available

stones and the core in between walls was filled with brick bats.

322. SRI KODANDARAMA SWAMY TEMPLE AT VONTIMITTA, DISTRICT KADAPA

The bulged out walls on either sides of eastern *gopura* steps were removed after documentation and then reconstructed. The beams, capitals, roof slabs of kitchen room, were dressed where ever necessary and recess pointing to the stone joints was done in lime mortar with matching colour. The kitchen rooms and outer core of the walls reconstructed with available stones. Either side of walls and steps were conserved.

323. ARMOURY HALL OF BANDAR FORT AT MACHILIPATNAM, DISTRICT KRISHNA

Damaged and collapsed ceiling of armoury hall was restored by providing best Madras terrace roof with brick on edge in lime over wooden rafters in two rows, over which two courses of flat tiles were provided and pointing was done to prevent any water percolation.

324. RUINED MAHASTUPA AT GHANTASALA, DISTRICT KRISHNA

The accumulated debris on top of the mound was removed. The brick structures such as brick spokes and the *pradakshinapatha* were exposed and thus relief is given to the structure.

325. SRI UMAMAHESWARA SWAMY TEMPLE, YAGANTI, DISTRICT KURNOOL

The missing wooden rafters were provided in fallen IV *the tala* at the main entrance to *gopuram* and provided with brick-jelly concrete in lime mortar. *Cudduppah* slab flooring and pointing was done in front of the *gopuram*. The inner faces of *rajagopura* was conserved by removing loose and dead lime mortar from the joints of inner face brick

masonry and pointing was carried out in lime mortar. The dead and pulverized lime plaster from the outer surfaces like off-sets/ miniatures/ designs was removed and conserved the missing portions of loose pockets in lime mortar by using special size bricks.

326. SRI SUBRAHMANYA SWAMY TEMPLE, NANDAVARAM, DISTRICT KURNOOL

Watertightening was done to the roofs of shrines by providing brick jelly concrete in lime mortar and clay pressed tiles on the top. The base of the temples was conserved by filling the loose pockets with underpinning.

327. ADONI FORT, ADONI, DISTRICT KURNOOL

The debris in and around the thirty pillared *mandapa* was removed and the hidden basal mouldings were exposed. The roof of *mandapa* was watertightened and fallen parapet wall around *mandapa* was reconstructed. Reconstruction of fallen breach of masonry wall (*prakara*) was done by retrieving old stones from the debris and by providing brick core in lime mortar. The missing granite stone slabs of the floor of *mandapa* were restored and pointing was done.

328. ABDUL WAHAB KHAN TOMB AT KURNOOL, DISTRICT KURNOOL

The accumulated debris on the southern side of the complex from the cellars at the river bed below Hawa Mahal was removed and made the cellars visible.

329. NAVABRAHMA GROUP OF TEMPLES, ALAMPUR, DISTRICT MAHABUBNAGAR

The damaged roofs of temples of Arka Brahma, Kumara Brahma, Bala Brahma, main *mandapa*, Garuda and Swarga Brahma temples were watertightened by providing brick jelly concrete in lime mortar and clay pressed tiles.

Pointing to the *sikharas*, outer faces, inside walls of *garbhagriha* and inner side wall faces of temples was attended. Temple type doors were provided to Nava Brahma group of temples except Taraka Brahma temple.

330. SRI VEERABHADRA SWAMY TEMPLE AT MOTUPALLI, DISTRICT PRAKASAM

Reconstruction of dismantled front *mandapa* has been taken up after detail documentation and the work is in progress.

331. RAMALINGESWARA GROUP OF TEMPLES, SATYAVOLU, DISTRICT PRAKASAM

The damaged stone flooring in front *mandapa* has been removed and re-laid with suitable stone slabs (Pls. 208-209).

332. KRISHNA TEMPLE AT UDAYAGIRI, DISTRICT PSR NELLORE

The accumulated silt mixed with big size boulders in the tank has been removed and desilted. The disturbed and sunken stone steps around the tank has been removed and reset after strengthening the same as per the original.

333. THOUSAND PILLARED TEMPLE AT HANAMKONDA, DISTRICT WARANGAL

As part of conservation of *kalyanamandapam* project, after documentation of all components, the architectural members of *kalyanamandapam* were removed and stocked near Padmakshi Temple.

334. SRI RAMAPPA TEMPLE AT PALAMPET, DISTRICT WARANGAL

The damaged stone *pakasala* (temple kitchen) was dismantled and reconstructed with available old stones to maximum extent after strengthening the foundation. Resetting of *pakasala* was done as per original after strengthening the foundation and the broken beams were mended with epoxy



200



201

Hill fort, Rayadurg: 200, before and 201, after conservation of Rama Temple. See p. 262



202



203

Lower fort, Chandragiri: 202, before and 203, after conservation of bastion 8. See p. 262



204



205

Sri Kasi Visweswara temple, Draksharama: 204. before and 205, after conservation. See p. 262



206



207

Stupa at Bhattiprolu: 206, before and 207, after reconstruction of drum wall. See p. 263



208



209

Sri Ramalingeswaraswamy Temple, Sathyavolu: 208, before and 209, after flooring conservation of mahamandapa. See p. 264

JAIPUR CIRCLE

RAJASTHAN

335. SIVA TEMPLE, NEELKANTH, DISTRICT ALWAR

Compound wall of Navgaza Temple is constructed in random rubble stone masonry and fixing of grill over it is completed.

336. ANCIENT SITE AT BHANGARH, DISTRICT ALWAR

Removal of fallen debris from Mahal complex near fortification wall is completed.

337. SIVA TEMPLE AND RUINS AT ARTHUNA, DISTRICT BANSWARA

Restoration of *garbhagriha*, *sikhara*, exterior part and flooring of the Chaushath Yogini Temple is completed. Restoration work of platform of Jaina Temple and pathway work is also completed (Pls. 210-211).

338. CHAURASI KHAMBA TEMPLE AT KAMAN, DISTRICT BHARATPUR

Resetting of corner *chhajja* is done and provided with new one wherever missing. Construction of a sculpture shed in random rubble stone masonry was completed.

339. CHITTAURGARH FORT, DISTRICT CHITTAURGARH

Restoration work of fortification wall, Hathiya *baori* and ruined structures is completed. Random rubble stone masonry work is done at Suraj pole gate and Gora Badal Mahal.

340. HARSHATMATA TEMPLE, ABHANERI, DISTRICT DAUSA

Strengthening of foundation in cement concrete and RR masonry is completed.

340. BHATNER FORT, BHATNER, DISTRICT HANUMANGARH

Restoration work of bastions has been done.

341. JAISALMER FORT, DISTRICT JAISALMER

Dismantled the out of plumb wall and restoration of the same as per original is completed (Pls. 212-213).

342. LAXMI-NARAYAN TEMPLE, AMBER, DISTRICT JAIPUR

The restoration work of broken *chhajjas* is done and provided with new ones wherever missing.

343. ANCIENT TEMPLE, CHANDRABHAGA, JHALARAPATAN, DISTRICT JHALAWAR

Work of recess pointing of the *baori* has been done.

344. BUDDHIST CAVES AT HATHIAGOR, DISTRICT JHALAWAR

Restoration work of steps is done and laying of pathway over a concrete bed is completed.

345. RANTHAMBHOR FORT, DISTRICT SAWAI MADHOPUR

Restoration work of fortification wall between Badal Mahal and Delhi gate and dismantling and reconstruction of Hamir Palace is completed.

346. GHATS WITH INSCRIPTIONS, PAVILIONS AND TORANAS AT NAVCHOWKI, DISTRICT RAJSAMAND



210

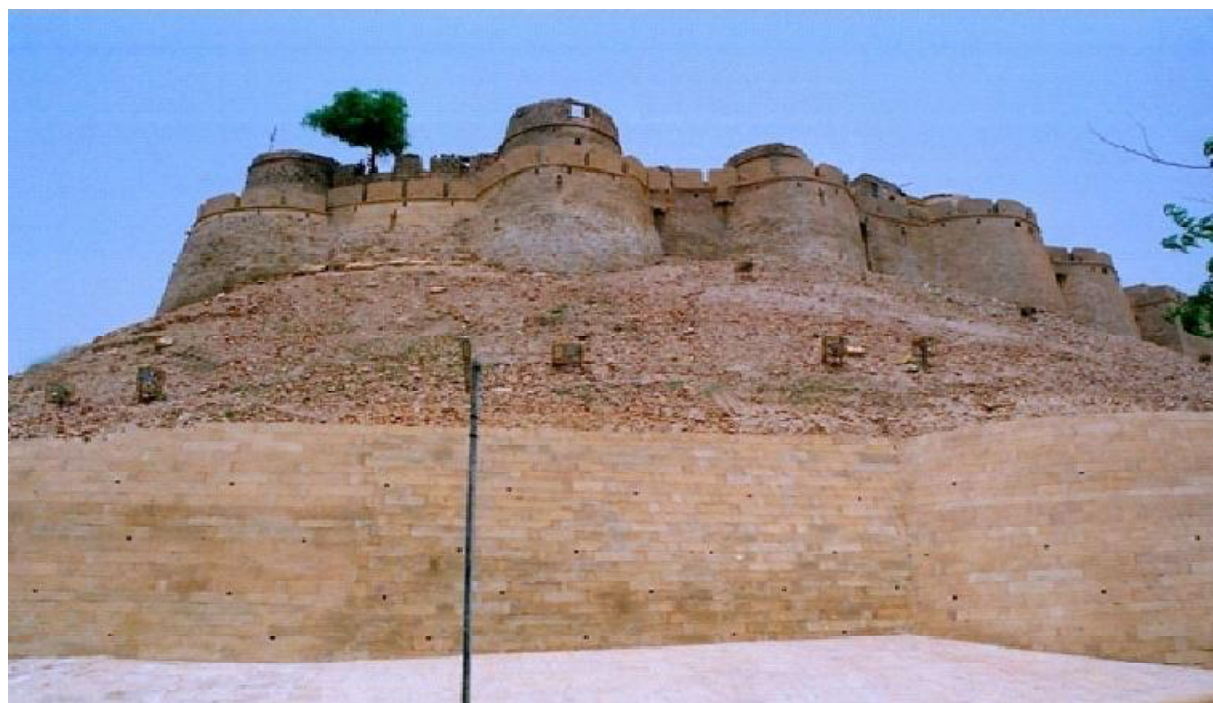


211

Arthuna Siva temple and ruins (Chausath Yogini temple), Arthuna: 210, before and 211, after conservation. See p. 270

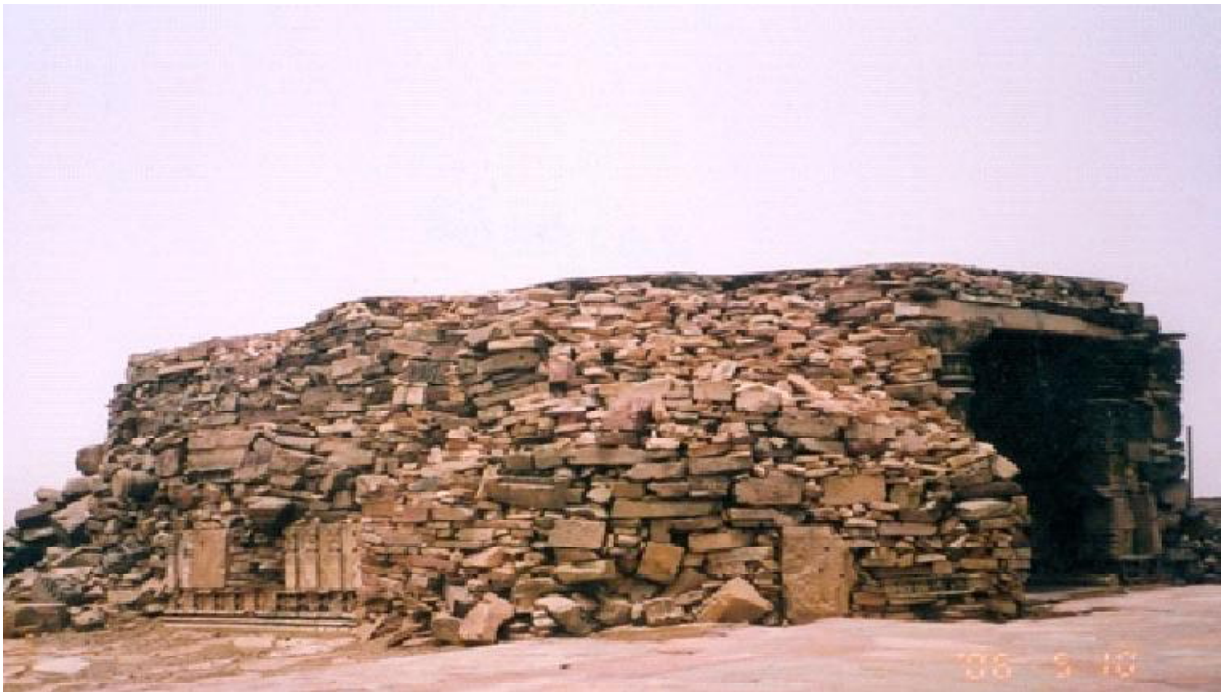


212



213

Jaisalmer Fort: 212, before and 213, after conservation of pitching wall. See p. 270



214



215

Harshnath temple, Sikar: 214, before and 215, after conservation. See p. 275

Restoration work of *ghats*, pavilions and adjoining structures is completed and mild steel grill is provided wherever required.

347. KUMBHALGARH FORT, DISTRICT RAJASAMAND

Pathway between water bodies, Mamadev Temple and Bawan Deori was provided.

348. HARSHNATH TEMPLE, SIKAR, DISTRICT SIKAR

Dismantled the damaged wall of sanctum and *mandapa* was restored as per original (Pls. 214-215).

349. KALA PAHAR TEMPLE AT TODA RAISINGH, DISTRICT TONK

Restoration of fortification wall and *burj* is completed.

KOLKATA CIRCLE

WEST BENGAL

350. ANCIENT MOUND, BHARATPUR, DISTRICT BARDDHAMAN

Fencing the protected area by constructing dwarf brick-masonry wall all around and fixing mild steel grill atop the wall to prevent entry of unwanted elements to the mound have been completed.

351. MURALI MOHAN TEMPLE, BISHNUPUR, DISTRICT BANKURA

Repairs to barbed wire fencing, fixing a cattle proof gate at entrance and arrangement of drinking water facility at the site have been completed.

352. MINAR, PANDUA, DISTRICT HUGLI

Pointing to brick joints of walls of mosque, providing apron, painting to fencing

posts and repairs to wooden door at the entrance to the *minar* have been completed.

353. SHRINE AND MOSQUE KNOWN AS DARGAH OF ZAFAR KHAN GAZI, TRIBENI, DISTRICT HUGLI

Pointing to brick joints of walls, removal of damaged floor and relaying in fresh lime concrete have been undertaken.

354. GROUP OF TEMPLES KNOWN AS BRINDABAN CHANDRA'S MATH, GUPTIPARA, DISTRICT HUGLI

Pointing to open brick joints of walls has been carried out.

355. HANSESVARI AND VASUDEV TEMPLES, BANSBERIA, DISTRICT HUGLI

Carefully taking out damaged old plaster and replastering in lime mortar followed by lime wash as per original has been completed.

356. KOCH BIHAR PALACE, KOCH BIHAR, DISTRICT KOCH BIHAR

Raking out brick joints of parapet walls, removing old cement mortar and repointing to the joints in lime mortar to improve breathability of the structure and also to bring it back to its original texture, removal of old pulverised plaster and replastering in lime sand mortar as per original, carefully taking out damaged lime concrete from the roof and relaying fresh lime concrete matching with the adjoining roof surface, repairs to doors and windows fitted to the wall gaps around the central dome with due replacement of damaged wooden members, broken glass panes, rusted nets, etc have been undertaken.

357. OLD BUILDING OF THE ASIATIC SOCIETY, PARK STREET, KOLKATA

Upgrading the old pathways within the premises and repairs to damaged part of roof

by removing later additions and relaying in fresh lime concrete as per original have been undertaken.

358. CURRENCY BUILDING, DALHOUSIE SQUARE, KOLKATA

Uprooting trees from walls and roof, clearing rubbish from the premises to improve accessibility to all corners of the building for taking up major conservation works have been completed.

359. VICTORIA MEMORIAL HALL, KOLKATA

Stripping off pulverized old plaster and replastering in composite lime mortar to interior wall surfaces, removal of decayed lime concrete from roof and resurfacing with fresh lime concrete, pointing to open stone joints of walls and renewing stone lining to interior wall surfaces after carefully taking out the damaged stones and strengthening to cores of walls in appropriate lime mortar to parapet walls, corner tower and roof of northern wing of Victoria Memorial Hall have been undertaken was under Civil Deposit Scheme.

360. ADINA MASJID, PANDUA, DISTRICT MALDAH

Repairs to brick masonry wall and pillars on southern side by underpinning brick work with special size bricks in composite lime mortar as per original, pointing to open stone joints of southern walls and pillars, laying an apron along the outer periphery of the southern wall to prevent dampness have been completed (Pls. 216-217).

361. BARADUARI MASJID OR THE GREAT GOLDEN MOSQUE, GAUR, DISTRICT MALDAH

Repairs and restoration to badly damaged portions of ornamental brick-masonry at both outer and inner surfaces of main entrance gate, improving the existing apron all

around the outer periphery of main mosque walls, repairs to damaged floor by removing old damaged lime concrete and relaying fresh lime concrete mixed with traditional adhesives, anti-corrosive painting to cattle proof gates and fencing posts have been carried out.

362. CHAMKATTI MASJID, GAUR, DISTRICT MALDAH

Restoration of missing and badly damaged portions of brick masonry in lime *surkhi* mortar to front wall, roof cornice and inner wall surfaces, pointing to brick joints of front wall surface after removal of loose old mortar and cleaning, raking, and applying anti-corrosive painting to grills, gates and fencing posts, etc. have been completed.

363. EXCAVATED SITE NEAR BAISGAZI WALL, GAUR, DISTRICT MALDAH

Cleaning, levelling and dressing the site and its surroundings for better stability, restoration of missing portions of ancient brick walls have been undertaken.

364. LOTTAN MASJID, GAUR, DISTRICT MALDAH

Underpinning brick work to decayed interior wall surfaces, repairs to the exterior wall surfaces by restoring ornamental brickwork in lime *surkhi* mortar as per original, pointing to open brick joints of walls, painting to grills, gates and fencing posts have been completed.

365. TANTIPARA MASJID, GAUR, DISTRICT MALDAH

Underpinning brick work to decayed portions of walls, restoration of missing portions of ornamental brick-masonry of exterior wall surfaces, stitching cracks to brick-masonry walls and arches have been completed.

366. HAZARDUARI PALACE AND IMAMBARA TOGETHER WITH ADJACENT AREA, KILLA NIZAMAT, DISTRICT MURSHIDABAD

Repairs to roof by careful removal of damaged lime concrete and relaying fresh lime concrete as per original, replacement of damaged wooden beams and *bargahs* by new ones, renewing clay burnt tiles in traditional lime *surkhi* mortar and pointing to open tile joints, careful removal of pulverised old plaster from walls, replastering in composite lime mortar and finishing the internal wall surfaces by lime punning as per original, renewing existing old and damaged electrical wirings, carefully taking out damaged lime concrete floor, relaying in new lime concrete and finishing top as per original, repairs to old and damaged doors and windows with necessary replacement of parts by new ones wherever necessary, upgradation and improving the existing old toilet blocks to international standard, erecting grill fencing around the gardens of palace area as per existing old pattern have been completed.

367. IMAMBARA, KILLA NIZAMAT, DISTRICT MURSHIDABAD

Relaying of collapsed and badly damaged portions of roof on the west wing followed by necessary replacement of damaged wooden members by new ones, renewing two layers clay burnt tiles in lime *surkhi* mortar and relaying lime concrete as per original, underpinning brick work to walls, careful removal of old pulverised plaster, re-plastering in lime sand mortar, exposing and preserving the old plastered surface by edging, filleting, grouting etc, removal of damaged floor concrete, relaying in lime concrete and resurfacing with marble slabs as per original and exactly matching with the adjoining existing floors have been completed.

Relaying of damaged roof with necessary repair and replacement of damaged wooden members and renewing clay burnt tiles in lime *surkhi* mortar on the east wing as per original, removal of damaged old plaster from walls and replastering in lime sand mortar as per original, carefully taking out damaged old lime concrete of floor, relaying the same in fresh lime concrete and finishing top as per original, repairs to damaged doors and windows by necessary replacement of parts with new ones and painting as per original have been completed (Pls. 218-221).

368. SOUTH GATE, KILLA NIZAMAT, DISTRICT MURSHIDABAD

Repairs to brick masonry walls by necessary underpinning brick work in lime *surkhi* mortar, renewal of damaged plaster and resurfacing the interior wall surfaces by traditional lime punning as per original have been completed.

369. TOMB OF AZIM-UN-NISA BEGUM, DAUGHTER OF MURSHID KULI KHAN, AZIM NAGAR, DISTRICT MURSHIDABAD

Underpinning brick work to missing portions of walls, pointing to open brick joints, restoration of lime *surkhi* plaster at missing portions, removing damaged lime concrete from floors and relaying in fresh lime concrete, providing apron along outer walls have been done.

370. TRIPOLIA GATE, KUMARAPUR, DISTRICT MURSHIDABAD

Repairs to exterior wall surfaces by replastering and lime punning, restoring all decorative details as per original and matching with the adjoining existing wall surfaces have been completed.



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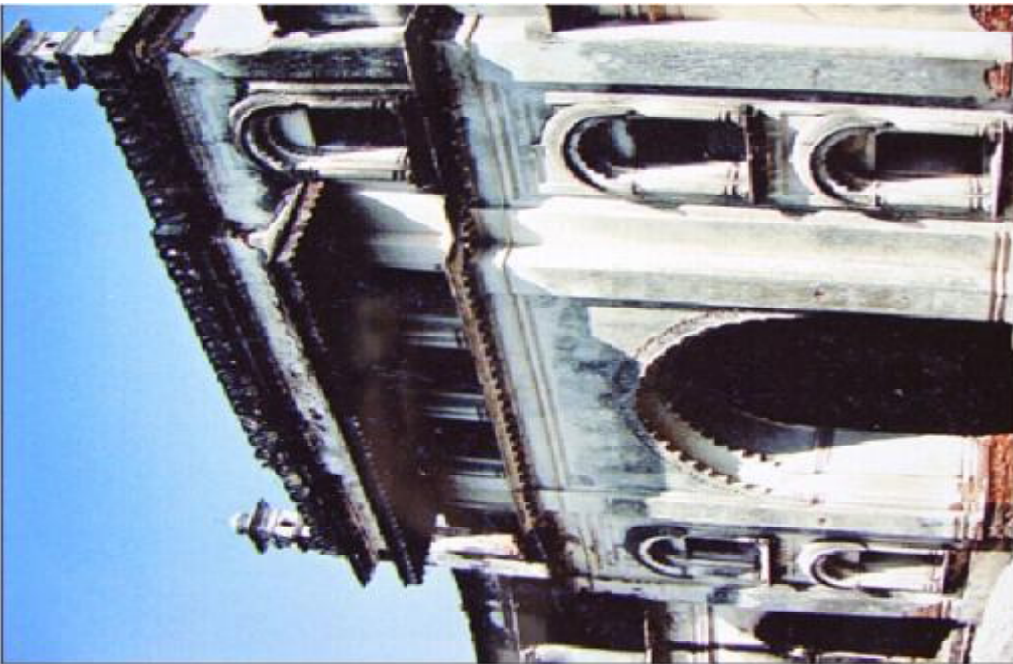
217

Adina Masjid, Pandua: 216, before and 217, after repair of brick masonry. See p. 275



219

Imambara, Killa Nizamati: 218, before and 219, after plastering of wall. See p. 276



218



220

Imambara, Killa Nizam: 220, before and 221, after relaying of collapsed and badly damaged roof. See p. 276



221

371. WARREN HASTING'S HOUSE, BARASAT, DISTRICT NORTH 24 PARGANAS

Carefully taking out the bulged portions of brick walls after detailed documentation and reconstruction of these portions exactly matching with the adjoining existing walls, replacing the damaged and worn out wooden members of roof by new ones of similar size and texture, renewing clay burnt roof tiles in lime *surkhi* mortar have been undertaken.

372. SIVA TEMPLE, KHARDAHA, DISTRICT NORTH 24 PARGANAS

Repairs to the roof of ancient priest's quarters within the complex by careful removal of damaged old concrete and relaying fresh lime concrete in position has been completed.

373. CLIVE'S HOUSE, DUM DUM, DISTRICT NORTH 24 PARGANAS

Repairs to dilapidated portions of brick walls and restoration of the missing parts, relaying damaged roof of ground floor rooms, repairs to doors and windows with necessary replacement of damaged parts have been undertaken.

374. KURUMBERA FORT, GAGANESWAR, DISTRICT PASCHIM MEDINIPUR

Repairs to stone masonry walls, removal of damaged lime concrete at floor and roof and relaying fresh lime concrete have been undertaken.

374. TEMPLES OF BANDYOPADHYAY FAMILY, PATHRA, DISTRICT PASCHIM MEDINIPUR

Restoration of missing portions of brick masonry walls, sealing of cracks on walls and *sikhara* of the main temple, replastering to walls in traditional lime mortar as per original have been undertaken

375. JATAR DEUL, JATA, DISTRICT SOUTH 24 PARGANAS

Pointing to brick joints of walls after removing the old and decayed mortar from the joints and cleaning, etc., laying apron along the outer periphery of the *deul* have been completed.

LUCKNOW CIRCLE

UTTAR PRADESH

375. TOMB OF ABHIMAN, MEHNAGAR, DISTRICT AZAMGARH

Dome and walls of the mosque were consolidated by way of plastering work. The floor was repaired with lime concreting as per original.

376. EXCAVATED REMAINS, BHITRI, DISTRICT GHAZIPUR

Out of plumb portion was underpinned and reset in brick masonry with lime-*surkhi* mortar. Watertightening was done to save it from rain water.

377. SHAHI FORT, JAUNPUR, DISTRICT JAUNPUR

Collapsed portion of the fortification wall was reset and missing parts were restored as per original. Watertightening and pointing work were also attended to the wall for making it strengthened. Plain cement concrete pathway has also been provided within the protected area for easy movement of visitors.

378. TOMB OF FIROZ SHAH, JAUNPUR, DISTRICT JAUNPUR

Consolidation of the dome has been undertaken by way of lime concreting on its exterior surface to make it strengthened and checking the percolation of rain water.

379. JHANJHIRI MOSQUE, JAUNPUR, DISTRICT JAUNPUR

Construction of dwarf wall in brick masonry with mild steel grill over it was constructed to prevent the trespassing and encroachment.

380. EXCAVATED REMAINS, KUSHINAGAR, DISTRICT KUSHINAGAR

The inner side of the Nirvana Temple was strengthened and watertightening has been undertaken to prevent the seepage of rain water. The deteriorated doors and windows were repaired wherever necessary. The bulged and out of plumb portion of the Ramabhar Stupa was consolidated and for the disposal of stagnated rain water construction of a drain has been made. The votive stupas were repaired by way of resetting and watertightening to protect it from further decay.

381. EXCAVATED REMAINS, FAZIL NAGAR, DISTRICT KUSHINAGAR

Fixing of mild steel grill over the existing dwarf wall has been done as a measure of security of the monument. An entrance gate has also been provided at the appropriate point of the boundary wall.

382. EXCAVATED REMAINS, SARNATH, DISTRICT VARANASI

Pointing has been done to the drum of the Dhamekh Stupa to check the growth of vegetation, percolation of rain water, and further deterioration of the structure. A preservative coat has also been provided by using the appropriate chemicals. The Monastery 5 is provided with a concrete pathway for easy movement of visitors. Keeping in view the security of the site height of the existing boundary wall has been raised and re-fixing of the grill has been done over it.

383. JAI SINGH'S OBSERVATORY AT MAN MAHAL, VARANASI, DISTRICT VARANASI

The old and decayed plaster was removed wherever necessary and replastered in lime *surkhi* mortar matching to the original.

384. EXCAVATED REMAINS, RAJGHAT, DISTRICT VARANASI

Keeping in view the security measure of the site southern site of the boundary wall has been raised and provided with mild steel grill over it.

MUMBAI CIRCLE

MAHARASHTRA

385. KOPESHWAR MAHADEV, KHINDRAPUR, DISTRICT KOLHAPUR

The old dislocated damaged and out of plumb southern side compound wall was dismantled and re-constructed as per the original and the wall top was watertightened in lime concrete. The debris accumulated in the open courtyard was also removed and the ground was leveled.

386. PANHALA FORT, PANHALA, DISTRICT KOLHAPUR

The parapet over the fort wall was re-constructed as per the original.

387. ROCK-CUT CAVES, JOGESHWARI, DISTRICT MUMBAI

The huge debris over the roof of the cave accumulated over a period of two to three decades and which was affecting the rock-cut cave with seepage of rain and sewerage water was removed. The openings around the interior *prakara* of the caves were provided with bat proof mesh and cave was freed from bat menace. The pathway leading to the western entrance from the road side was paved with dressed stone slabs (Pls. 222-223).

388. LENYADRI, JUNNAR, DISTRICT PUNE

In continuation of previous year's work, existing approach steps leading to the caves were widened and construction of parapet wall on either side of the pathway has been attended. Widening of retaining wall and parapet wall in front of the Ganesa caves has also been under taken for safety and easy movement of the pilgrims/visitors and the work is in progress (Pls. 224-225).

389. ROCK-CUT CAVES, KARLA, DISTRICT PUNE

In continuation of previous year's work, the façade of the Caves 8, 5 and 10 was provided with a bat proof mesh in teakwood frame. Besides this the pathway leading to Cave 10, 11 and 12 were paved with stone slabs.

390. SHANIWARWADA, PUNE, DISTRICT PUNE

The central bastion on the southern side of Shanivarwada, which had fallen due to heavy rain was restored as per the original besides strengthening the adjoin wall by recess pointing and under pinning (Pls. 226-227).

391. SHIVNERI FORT, SIVANERI, DISTRICT PUNE

Under the civil deposit work funded by Government of Maharashtra, various conservation and environmental development works like improving the pathway leading to the Hathi gate, restoration of the fallen portion of fortification wall in between Pir gate and Hathi gate, watertightening of the roof of Ganesa gate, Maha *darwaja* and Pir gate, improving the steps and pathways leading to the Kulup gate and Ambar *khana*, restoration of fallen bastion and repairs of arched structure (gate) at Kadelot point, restoration of missing portion of the wall of the Badami tank were taken up and completed (Pls. 228-229). Stone flooring in the courtyard of structure known as birth place of Sivaji Maharaja and pointing of

adjacent ancient structure has also been attended. The re-construction of the fallen *minars* and the arch of Kamani Masjid have been taken up and the work is in progress.

392. BUDDHIST CAVES, PALE, DISTRICT RAIGAD

In continuation of three previous year's work, providing and laying pathway from the foot of the Pale hill up to the caves has been completed and construction of parapet wall alongside the pathway is in progress.

393. ELEPHANTA CAVES, GHARAPURI, DISTRICT RAIGAD

The work of providing and laying dressed stone approach pathway to Cave 2 to 5 has been taken-up and the work is in progress. Besides this, the work of providing drains alongside the pathway in uncoursed rubble masonry covered stone block was also attended.

394. JANJIRA FORT, MURUD, DISTRICT RAIGAD

Removal of dense vegetation from King palace, de-watering the ancient tank and removing silt/slushy earth, boulders, etc. has been completed.

395. JIJAMATA SAMADHI, PACHAD, DISTRICT RAIGAD

Providing and laying rough dressed stone pathway and stone steps from main gate to Jijamata *samadhi* has been taken up and the work is in progress.

396. JIJAMATA WADA, PACHAD, DISTRICT RAIGAD

The work of removal and resetting of the bulged out and out of plumb portions of the structures situated near the ancient well was taken up.

397. RAIGAD FORT, RAIGAD, DISTRICT RAIGAD

The fallen portion of the northwestern side wall of Bazarpeth portion was reconstructed as per original. Watertightening and pointing of the structures in Bazarpeth, Ashtapradhanwada and pointing of southern part of Rajwada has also been attended (Pls. 230-231).

398. SINDHUDURG FORT, MALVAN, DISTRICT SINDHUDURG

The work of filling-up of undercut cavities of the fort wall and watertightening the top of the rampart was continued during the current year.

399. OLD TEMPLE IN SARKARWADA LOCALLY KNOWN AS PARSANATH TEMPLE, VELAPUR, DISTRICT SOLAPUR

The work of watertightening of the *sikhara*, restoration of plinth and lower moulding on the eastern side was carried out as per the original.

400. OLD DOUBLE SHRINED TEMPLE ON THE FAR SIDE OF A TANK, LOCALLY KNOWN AS NACHNIACHA MAHAL, VELAPUR, DISTRICT SOLAPUR

The chain link fencing over dwarf wall has been provided on the southern and eastern side of the ancient tank and temple.

401. TEMPLE OF HARANARESWAR OR ARDHANARI-NATESHWAR, ONE HEMADPANTHI TANK AND VIRAGAL STONE, VELAPUR, DISTRICT SOLAPUR

The *vimana* portion was watertightened and the open courtyard was provided with a stone pavement on the front and southern side of the stepped tank. The undulated steps of the tank were repaired by removing and resetting them as per original. The main entrance was provided with a grilled gate.

402. STEPPED WELL PANTACHA KOT, SATARA, DISTRICT SOLAPUR

Reconstruction of the fallen portion of northern and western side walls of the stepped well in cut stone masonry along with veneering as per original has been attended. A chain link fencing with mild steel grill has been provided on the east and west side of the stepped well (Pls. 232-233).

403. OLD FORT, SOLAPUR, DISTRICT SOLAPUR

The work of reconstruction of fallen portions of inner fort wall on the southern side and bastion on the western side and watertightening on top of the wall as per the original was taken up. Resetting of undulated roof and fixing of pipe railing along the steps of the bastion on which the flag post is erected was also attended.

404. FORT AND OLD PORTUGUESE REMAINS, BASSIEN (VASAI), DISTRICT THANE

In continuation of earlier work of structural repairs to the Gonsalo Garcia church at Bassein fort, removal of dead lime concrete and re-laying of fresh lime concrete in brick-bats over the roof of the main altar, removal of dead lime mortar from the walls and re-plastering the same as per the original, re-filling the wall cracks, replacing of Mangalore tiles and damaged wooden rafters in the roof etc were taken up. The work of relaying of floor slabs in stone is in progress (Pls. 234-235).

405. SIVA TEMPLE, AMBARNATH, DISTRICT THANE

The work of providing grill fencing over dwarf wall in stone masonry by replacing the existing damaged barbed wire fencing and extending the laying of stone pavement in the outer courtyard of the temple on the northern, eastern and southern sides has been taken up



222



223

Jogeshwari caves, Jogeshwari: 222, before and 223, after conservation of pathway. See p. 282



224



225

Group of caves, Lenyadri: 224, before and 225, after conservation. See p. 282



226



227

Shaniwarwada, Pune: 226, before and 227, after conservation. See p. 282



228



229

Shivneri fort: 228, before and 229, after conservation of Kadelot point. See p. 282



230



231

Raigad fort, Raigad: 230, before and 231, after conservation of Bazarpeth. See p. 283



232



233

Pantacha Kot, Satara: 232, before and 233, after conservation. See p. 283



234



235

Bassein fort, Vasai: 234, before and 235, after conservation of Gonsalo Garcia church. See p. 283



236



237

Siva temple, Ambarnath: 236, before and 237, after conservation. See p.292

and the work is in progress. The existing dilapidated store room in the south-western corner was removed and the work of re-erecting a shed to house the loose sculptures is under progress (Pls. 236-237).

PATNA CIRCLE

BIHAR

406. TOMB OF SHAMSHER KHAN, SHAMSHER NAGAR, DISTRICT AURANGABAD

The tomb was consolidated by way of undertaking lime concreting and watertightening to prevent further decay.

407. EXCAVATED REMAINS, ANTICHAK (VIKRAMSHILA), DISTRICT BHAGALPUR

Decayed and weak portion of the cells of eastern wing of the monastery has been strengthened by way of underpinning, resetting, lime concreting and pointing in lime-*surkhi* mortar. Structural repairs at the north-eastern corner of the monastery have also been undertaken and floor was repaired with laying of lime concreting. *Pradakshinapatha* of the stupa has been strengthened by resetting of bricks, lime concreting and watertightening as per original. A brick-on-edge pathway by laying of modern bricks has also been constructed for easy movement of the visitors.

408. BUDDHIST STUPA, KESARIYA, DISTRICT EAST CHAMPARAN

At the western side of the stupa restoration of bulged and broken parts were carried out by using bricks bonded in lime-*surkhi* mortar. The restoration work includes underpinning, resetting and watertightening matching to the original.

409. SUJATAGARH STUPA, BAKRAUR, DISTRICT GAYA

Conservation of the stupa was attended by underpinning, lime concreting, resetting in lime-*surkhi* mortar to make it strengthened.

410. RAJA BALI-KA-GARH, BALIRAJGARH, DISTRICT MADHUBANI

The mound was partly fenced by providing chain link fencing over the dwarf wall to check the encroachment and trespassers.

411. STUPA, RAJGIR, DISTRICT NALANDA

To check the encroachment and unauthorised entry of the general public, construction of dwarf wall in brick with mild steel grill fencing has been done at the site.

412. EXCAVATED REMAINS, NALANDA, DISTRICT NALANDA

Floor of the courtyard of Monastery 9 was paved by using special size bricks in lime mortar after removing the old one.

413. EXCAVATED REMAINS, KUMRAHAR, DISTRICT PATNA

The old and damaged brick on edge pathway was dismantled and repaired by raising its height for easy movement of visitors.

414. TANK, MANER, DISTRICT PATNA

The decayed and damaged portion of kiosk at the tank was reset by using *lakhauri* bricks in lime-*surkhi* mortar as per original.

415. TOMB OF MAKHDUM SHAH DAULAT AND IBRAHIM KHAN, MANER, DISTRICT PATNA

Old and deteriorated beam of the mosque was replaced and reset in its original place. Restoration of bulged and broken part of the enclosure wall was carried out by using *lakhauri* bricks in lime-*surkhi* mortar.

416. MIR ASHRAF'S MOSQUE CHOWK, SHIKARPUR, DISTRICT PATNA

Dismantling of deteriorated portion of ancient fountain was carried out wherever necessary and conserved as per original. Damaged floor tiles were also replaced by fresh one.

417. TOMB OF SHER SHAH SURI, SASARAM, DISTRICT ROHTAS

The choked inlet and outlet channel of ancient tank have been cleaned and repaired by using proper ingredients. Dismantling of dilapidated portion of the pathway has been undertaken and reset in brick masonry by raising its height. Delhi gate and causeway leading from main entrance to the tomb have been repaired by replacing the old stone masonry and laying of fresh one as per original. Dwarf wall with mild steel grill fencing around the protected area has been constructed to check the encroachment and unauthorized entry of general public.

418. ROHTAS FORT, ROHTAS, DISTRICT ROHTAS

Growth of vegetation on the structure has been uprooted and relevant portions were repaired by filling of cracks and crevices with proper ingredients. The floor has been paved with flag stones and bonded in lime-surkhi mortar.

419. ANCESTRAL HOUSE OF DR. RAJENDRA PRASAD, THE FIRST PRESIDENT OF INDIA, JIRADEI, DISTRICT SIWAN

Deteriorated portion of the roof was repaired to check the seepage of rain water. The old and damaged doors and windows were also replaced by fresh ones.

420. RAJA VISHAL-KA-GARH, VAISHALI, DISTRICT VAISHALI

The site is provided with construction of dwarf wall and fenced in mild steel grill over it in view of its overall security.

421. RELIC STUPA, VAISHALI, DISTRICT VAISHALI

The bulged and dislocated bricks of the remains of stupa were repaired and all around the protected area dwarf wall with mild steel grill fencing has been provided.

422. ASOKAN COLUMNS, RAMPURVA, DISTRICT WEST CHAMPARAN

As a measure of security of the Asokan pillar a dwarf wall has been constructed and provided with mild steel grill fencing over it.

RAIPUR CIRCLE

CHHATTISGARH

423. MAHADEV TEMPLE, BASTAR, DISTRICT BASTAR

In continuation of previous year's works, after removal of damaged apron it has been re-laid with new stones all around the temple. Besides an approach path leading to the temple has been provided for better movement of visitors.

424. NARAYAN TEMPLE, NARAYANPAL, DISTRICT BASTAR

Work of providing approach path leading to the temple is in progress.

425. KANTHI DEUL, RATANPUR, DISTRICT BILASPUR

In continuation of previous year's works, flag stone flooring has been provided around the monument for easy movement of visitors.

426. RATANPUR FORT, RATANPUR, DISTRICT BILASPUR

Pointing to excavated brick structure and providing lime concrete over it was carried out during the period under report.

427. BHIMAKICHAK TEMPLE, MALHAR, DISTRICT BILASPUR

In continuation of previous year's works, resetting of heavy sculptural panels at its original position is in progress. Besides work of the approach path leading to the temple is in progress.

428. PATALESWAR TEMPLE, MALHAR, DISTRICT BILASPUR

In continuation of previous year's works, after dismantling the original platform it is being reset to avoid water stagnation. Besides work of the approach path leading to the temple is in progress.

429. SIVA TEMPLE, GATORA, DISTRICT BILASPUR

In continuation of previous year's works during the period under report re-plastering and underpinning of brick walls after removal of the dead and pulverized lime plaster, watertightening of the ceiling, re-erection of fallen pillars and restoration of broken arches etc. are in progress.

430. DANTESWARI TEMPLE, DANTEWADA, DISTRICT DANTEWADA

In continuation of previous year's works, laying of lime concrete over the roof of *mukhmandapa* and *antarala*, resetting of the damaged roof of *simhadwara*, re-plastering of side walls after removal of dead lime plaster etc. were carried out. A compound wall have been provided for the safety and security of the monument.

431. BHAI RAMDEV TEMPLE, DANTEWADA, DISTRICT DANTEWADA

In continuation of previous year's works, providing and fixing of mild steel grill over the existing compound wall is in progress.

432. CHANDRADITYA TEMPLE, BARSOOR, DISTRICT DANTEWADA

In continuation of previous year's works, structural restoration including watertightening of the *mandapa* of the temple were carried out. Besides, resetting work of the damaged apron all around the temple was completed. Drinking water facilities have been provided to visitors. In addition to this for the environmental development garden work has been taken up.

433. MAMA BHANJA TEMPLE, BARSOOR, DISTRICT DANTEWADA

In continuation of previous year's works, resetting of the damaged apron all around the temple was completed and environmental development work has been taken up within the monument complex by laying garden.

434. GANESA STATUE, BARSOOR, DISTRICT DANTEWADA

The damaged shed provided earlier over the Ganesa statue was dismantled and a new larger size shed is being provided.

435. KAMA MEMORIAL, DHILMILI, DISTRICT DANTEWADA

In continuation of previous year's works, construction of a shed over the memorial pillar is in progress. For the safety and security of the monument galvanised iron chain link fencing has been provided around the protected limit. Besides an approach path leading to the temple has been provided for better movement of visitors.

436. SIVA TEMPLE, DEOBOLODA, DISTRICT DURG

PRESERVATION OF MONUMENTS

In continuation of previous year's works, apron all around the tank have been provided and damaged steps leading to the ancient tank located on the north side have been restored. Fixing of galvanised iron pipe railing around the tank has been provided to avoid any mishap as well as to keep the tank water neat and clean.

437. SITA DEVI AND SATI PILLAR, DEORBIJA, DISTRICT DURG

Retaining wall has been provided along the edge of the pond to avoid any mishap as well as to develop monument premises.

438. LARGE VISHNU TEMPLE, JANJGIR, DISTRICT JANJGIR-CHAMPA

For the safety and security of the monument a dwarf wall mounted with mild steel grill has been provided around the protected limit.

439. BRICK MOUND 2, GARH DHANORA, DISTRICT KANKER

For the protection and safety of the monument a dwarf wall has been provided and fixing of mild steel grill over the wall is in progress.

440. PALI INSCRIPTION, SAMARSAL, DISTRICT KORBA

For the safety and security of the monument a dwarf wall mounted with mild steel grill has been provided around the protected limit.

441. MAHADEV TEMPLE, PALI, DISTRICT KORBA

Drinking water facilities have been provided to visitors. In addition to this for the environmental development, garden work has been taken up.

442. DURGA TEMPLE, CHAITURGARH FORT, DISTRICT KORBA

Structural restoration of the *mandapa* is in progress.

443. RAMA TEMPLE, SIRPUR, DISTRICT MAHASAMUND

In continuation of previous year's works, resetting, brick veneering, underpinning and watertightening work was carried out at the plinth and steps parts of the Rama temple. Construction of compound wall is in progress to provide safety and security at the monument area.

444. TIVARADEV VIHAR, SIRPUR, DISTRICT MAHASAMUND

In continuation of previous year's works, in addition to consolidating the base all around the monastery resetting and watertightening of the shrine chamber and cells on the north side of the monastery, etc. are in progress. During the course of scientific clearance remnants of ancient steps in front of the monastery were exposed.

445. HARSHA GUPTA VIHAR, SIRPUR, DISTRICT MAHASAMUND

In continuation of previous year's works, resetting and watertightening of the shrine chamber, monastery cells of north side, consolidating the base all around the monastery, etc. have been completed. Resetting and watertightening of the monastery wall on the front side of the main entrance is in progress.

446. SHIV GUPTA TEMPLE, SIRPUR, DISTRICT MAHASAMUND

Restoration and resetting of brick walls including the mouldings above the plinth level, laying of apron after consolidation of the base all around the small temple in the complex, etc. have been carried out. The premises is being

developed to restore the by gone beauty of the monument.

447. LAXMAN TEMPLE, SIRPUR, DISTRICT MAHASAMUND

In continuation of previous year's works, resetting, underpinning and pointing to the peripheral wall, providing and laying of approach road from temple to sculpture shed, providing approach pathway for physically challenged persons, installing electronic security system in temple and sculpture shed etc. have been attended. Development of garden in the monument complex is in progress.

448. PADMAPANI VIHAR, SIRPUR, DISTRICT MAHASAMUND

In continuation of previous year's works, restoration and watertightening of the monastery wall is in progress. A garden is being developed in the complex to beautify the premises.

449. SIVA TEMPLE 4, SIRPUR, DISTRICT MAHASAMUND

In continuation of previous year's works, laying of approach path from the main entrance has been taken up. Resetting, watertightening of monastery walls are in progress.

450. EXCAVATED SIVA TEMPLE 6, SIRPUR, DISTRICT MAHASAMUND

A dwarf wall has been provided for safety and security of the monument.

451. EXCAVATED STRUCTURE (SRP-13), SIRPUR, DISTRICT MAHASAMUND

A dwarf wall has been provided for safety and security of the monument.

452. EXCAVATED STRUCTURE (SRP-16), SIRPUR, DISTRICT MAHASAMUND

For the protection and safety of the monument a dwarf wall has been provided.

453. EXCAVATED SIVA TEMPLE 3, SIRPUR, DISTRICT MAHASAMUND

For the safety and security of the monument a dwarf wall mounted with mild steel grill has been provided.

454. SIVA TEMPLE 1, SIRPUR, DISTRICT MAHASAMUND

Digging of bore well for providing drinking water facilities to the visitors has been completed.

455. SURANG TILA, SIRPUR, DISTRICT MAHASAMUND

In continuation of previous year's works, for the safety and security of the monument a dwarf wall mounted with mild steel grill has been provided.

456. SASAI VIHAR, SIRPUR, DISTRICT MAHASAMUND

Restoration of the excavated structures is in progress.

457. EXCAVATED STRUCTURE (SRP-21), SIRPUR, DISTRICT MAHASAMUND

For the safety and security of the monument a dwarf wall has been provided.

458. EXCAVATED STRUCTURE (SRP-22), SIRPUR, DISTRICT MAHASAMUND

For the safety and security of the monument a dwarf wall has been provided.

459. MAHADEV TEMPLE, NARAYANPUR, DISTRICT RAIPUR

In continuation of previous year's works, after dismantling the damaged apron it is being reset to avoid water stagnation around the

monument. Besides an approach path leading to the temple has been provided.

460. SITA BENGRA AND JOGIMARA CAVES, UDAIPUR, DISTRICT SARGUJA

Galvanised iron pipe railing has been provided on the right side of the pathway leading to the caves to avoid any mishap.

RANCHI CIRCLE

JHARKHAND

461. SIVA TEMPLE, KHEKPARTA, DISTRICT LOHARDAGA

The construction of compound wall around the exposed structural remains is in progress.

462. JAMI MOSQUE, HADAF, DISTRICT SAHEBGANJ

The restoration work of the fallen part of northern portion of the mosque, the construction of brick-on-edge pathway around the mosque and the construction of enclosure wall in the back side of the mosque by providing mild steel grill over the dwarf boundary wall have been completed.

463. BARADWARI, ARZIMUKHIMPUR, DISTRICT SAHEBGANJ

The construction of random rubble stone retaining wall towards the river side of the Baradwari is in progress.

464. BENISAGAR, DISTRICT WEST SINGHBHUM

An octagonal visitor shed was constructed in south west corner of the site. Fencing of northern side with barbed wire is in progress.

SHIMLA CIRCLE

HIMACHAL PRADESH

465. SRI BRIJESHWARI DEVI TEMPLE, CHAMBA, DISTRICT CHAMBA

To facilitate the movement of the pilgrims and tourists, a long flight of 76 sandstone steps, secured with low side walls, set in lime-cement mortar, was provided along the hill slope from the metalled road level below to the higher edge of the Sri Brijeshwari Devi temple courtyard. This is the main and original approach to the Sri Brijeshwari Devi temple (Pls. 238-239).

466. SRI LAKSMI NARAYAN TEMPLE, CHAMBA, DISTRICT CHAMBA

The wooden roof of the *mandapa* and the *garbhagriha* of Sri Laksmi Narayan temple, which is main temple amongst a group of six temples had accidentally set to fire nearly fifty year ago. While the roof of the *garbhagriha* had been restored, this year the restoration of the roof of the *mandapa* was taken up. Wooden tress comprising rafters and planks of first class *deodar* wood and laying roof stones as per original were provided (Pls. 240-241).

467. KATOCH PALACE, SUJANPUR TIRA, DISTRICT HAMIRPUR

A wooden ceiling was provided to the left side gateway structures, with lime concrete on top finished as per original pattern. The course rubble masonry was provided on the right side of the rear gate of the Katoch palace and fort wall with the dressed sandstones, set in lime mortar, as per the original, after dismantling the cracked stone masonry of the rear gate. The restoration work of structure known as *baradari* of the Katoch palace, which was badly damaged during 1905 earthquake, was taken up. The conservation works included

re-producing the collapsed portions of the *baradari* after constructing a base of hard sandstone masonry, supported with reinforced cement concrete work to reach the plinth level of the *baradari* structure, on the sloppy hill, providing and laying lime concrete in the floor of *baradari* and *lakhauri* brick masonry of side walls of the structure was taken up. The work of restoration of front and side retaining walls of the *baradari* structure set in lime mortar. The front and side retaining walls of the *baradari* structure were restored with coarse rubble dressed sandstone masonry in lime mortar (Pls. 242-243).

468. SIVA TEMPLE, BAIJNATH, DISTRICT KANGRA

A retaining wall of coarse rubble masonry with hard sandstone was constructed alongside the hilly slope, on the left of the river to check erosion of the table land.

469. RUINED FORT, KANGRA, DISTRICT KANGRA

The ongoing work of dismantling and restoration of the bulged and missing walls of Sukha Talab has been completed. The cells near the Laxmi Narayana temple were restored as per original with coarse rubble masonry of dressed sandstone in lime mortar. The inner surface of the cells walls was lime-plastered. Dressed sandstones were provided in the flooring of the cells. Two of the cells were provided with wooden roof, having lime concrete on the top. The other two cells, located on the right side of Darshani darwaza, which originally had stone roof and collapsed in the earthquake of 1905, were provided with the stone roof set exclusively in lime mortar as per original pattern. The top surface of the roof was provided with lime concrete finished fine matching with original design and pattern. All the four restored cells were provided with wooden doors and win-

dows, along with *chowkhats*. The part of the fortification wall, running in between the Ahini gate and the Amiri gate, was restored maintaining its original curves, gun slits and other architecture features, matching with the original character of the fort architecture (Pls. 244-247).

470. RUINED FORT, NURPUR, DISTRICT KANGRA

The ongoing work of course rubble masonry with dressed sandstone in lime mortar of the fort walls, located on the left side of Rani Mahal complex and the palace was completed.

The scientific clearance of the Rang Mahal complex, which was taken up last year to expose the structures buried in 1905 earthquake has interestingly revealed a circular well having an unusual star-shaped rim along with the other associated structures.

471. BUDDHIST MONASTERY, TABO, DISTRICT LAHAUL AND SPITI

In continuation of previous year's works, dismantling of the remaining rubble stone pitched pathways and restoring the same with dressed sandstone over base concrete in lime cement mortar was taken up and completed. The restoration work of stupas was taken up by providing local mud brick masonry in mud mortar to their platforms, after dismantling the existing random rubble masonry of stones set in incompatible material. Complete mud plastering of these stupas was done in order to maintain the original look and ambience of the ancient Buddhist monastic complex.

472. MIRKULA DEVI TEMPLE, UDAIPUR, DISTRICT LAHAUL AND SPITI

The Mirkula devi temple had developed some settlement problems mainly owing to moisture reaching into its foundations. Wooden sleepers were procured for restoration work of the



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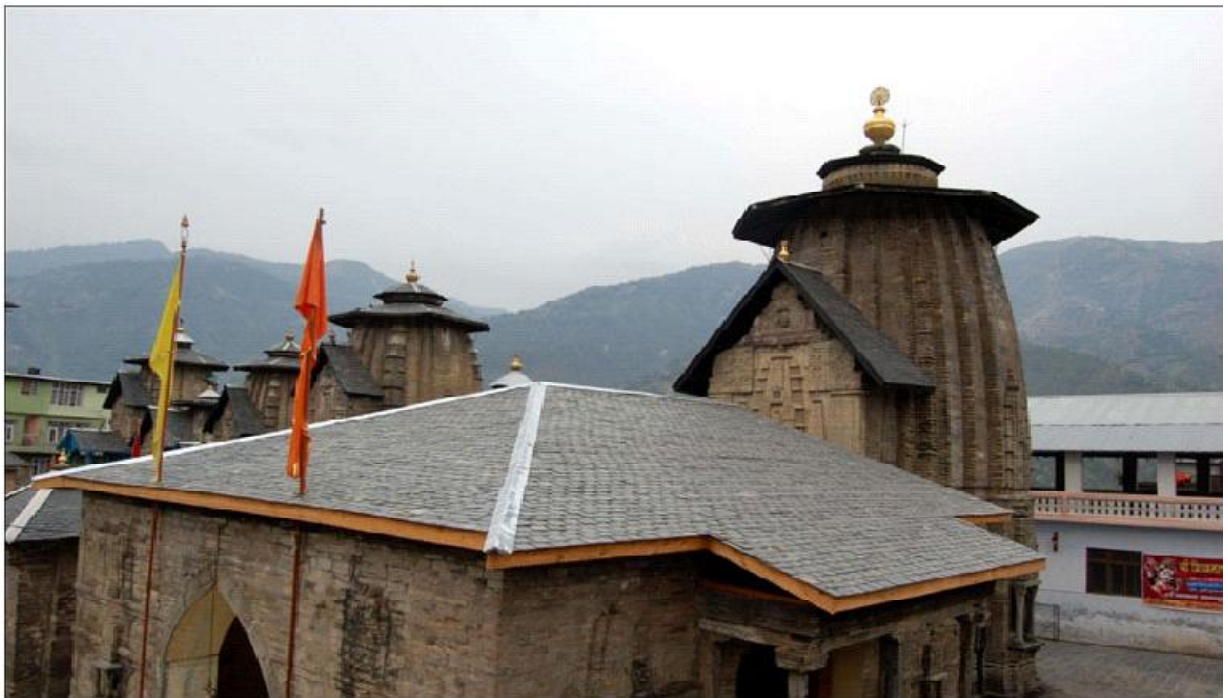


238

Sri Bajreshwari Devi Temple, Chamba: 238, before and 239, after conservation of steps. See p.297

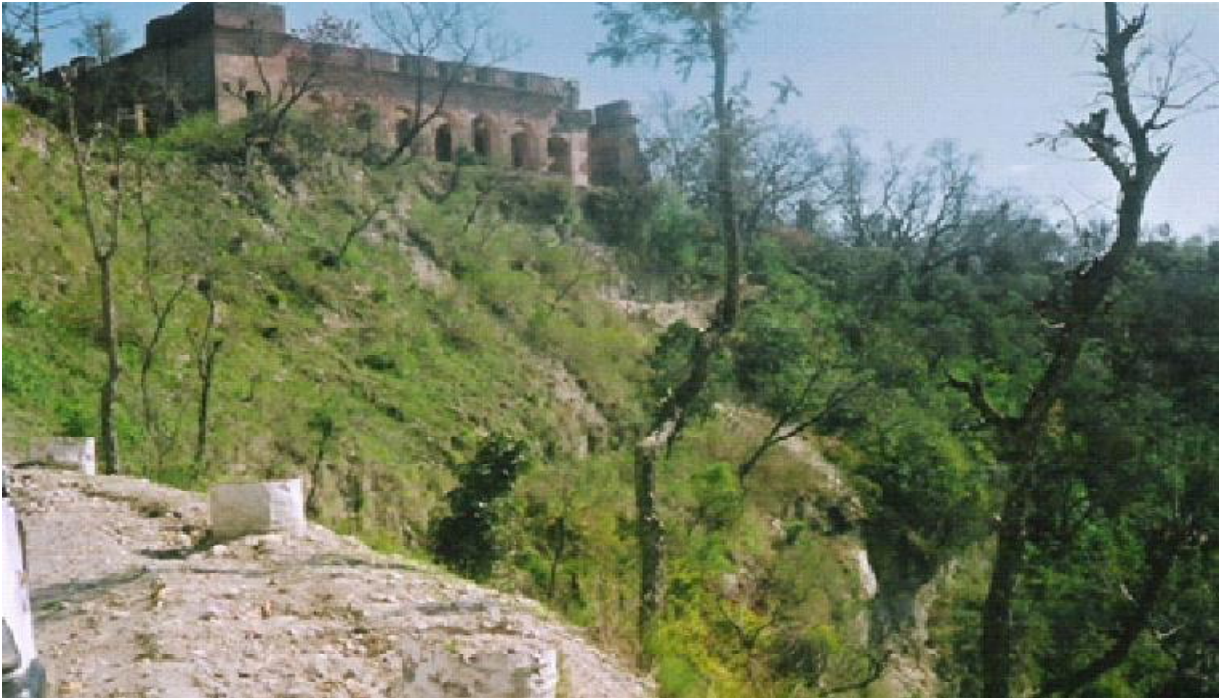


240



241

Sri Lakshmi-Narayana Temple, Chamba: 240, before and 241, after replacing of roof. See p.297



242



243

Katoch palace, Sujampur Tira: 242, before and 243, after restoration of retaining walls. See p. 298



244



245

Ruined fort, Kangra: 244, before and 245, after restoration of roof. See p. 298



246



247

Ruined fort, Kangra: 246, before and 247, during restoration of fortification wall. See p. 298

temple. Till such time as a full-fledged restoration work is taken up, eight wooden load sharing prop-ups, seemingly at the problematic zones were provided as precautionary measures.

473. SIVA TEMPLE, MANGARH, DISTRICT SIRMOUR

A retaining wall of coarse rubble masonry with dressed sandstone was constructed alongside the *nalla* that flow close by the subsidiary temple in order to prevent the water from entering the temple premises. This subsidiary temple, which was in a very bad shape and had developed cracks and vegetational growth, was re-set as per original.

THRISSUR CIRCLE

KERALA

474. TELlicherry FORT, TELlicherry, DISTRICT KANNUR

The damaged roof and walls of unit-I building inside the fort was taken up for conservation. The rotten rafters, wall plates, ridges, creepers, etc. were replaced with new ones wherever required. Anti termite treatment was also given. The outer face of the fort wall on the southern side was pointed.

475. ST. ANGELO FORT, KANNUR, DISTRICT KANNUR

The bastions of the fort were watertightened. The dilapidated and eroded drain on the northern side of the fort wall was properly conserved.

476. BEKAL FORT, PALLIKARE, DISTRICT KASARGOD

The damaged laterite stone pavement between bastions five and nine and was restored.

477. SIVA TEMPLE, NETRIMANGALAM,

PATTAMBI, DISTRICT PALAKKAD

The open courtyard of the temple was leveled up and proper drainage provided.

478. TENKAILASANATHA TEMPLE (VADAKKUMNATHA), THRISSUR, DISTRICT THRISSUR

The dilapidated first and second tier wooden members of the southern *gopuram* were dismantled and reset as per original after replacing the damaged members with new teakwood runners window jalis, planks, etc. The outer walls all around were strengthening and re-plastered after removing the dead plaster. The entire structure was subjected to the anti-termite treatment.

The lower portion roof of the western *gopuram* has been dismantled after proper documentation. The damaged roof members are replaced with new teakwood members wherever required as per original design. Paint over the old wooden carvings is removed and wood preservative oil coat is applied over all roof members. Removal the dead lime plasters from the walls of the upper tala carefully and re-plastered with specially machine grained lime mortar.

The southeastern part of the Thidappally (kitchen) was properly conserved.

479. SIVA TEMPLE, CHEMMANTHITTA, DISTRICT THRISSUR

The out of plump laterite *prakara* wall on eastern side was dismantled after proper documentation and reset as per the original. The conservation of the damaged laterite eastern *gopura* (south wing) was also and carried out by replacing damaged laterite stone with new ones as per the original design. The dilapidated wall of Vilakkumadam was also conserved.

VADODARA CIRCLE

DAMAN AND DIU

480. FORT WALLS, NANI DAMAN, DAMAN

The work of providing new *sal* wood beams and teak wood planks in the aisle of the fort wall, after removing the old decayed beams and underpinning and plastering of the walls and relaying of open terrace with lime concrete mortar has been completed.

481. HOLY JESUS CHURCH, MOTI DAMAN, DAMAN

The work of applying snowcem over the outer walls of the church and repairing of bells and wooden doors has been completed.

482. CHURCH OF OUR LADY ROSARIO, MOTI DAMAN, DAMAN

The work of distempering the inner walls and snowcem on the outer wall and oil paint on doors and windows has been completed.

483. ST. TIAGO BASTION AND RUINED CHAPEL INSIDE THE FORT, DIU, DIU

The work of reconstruction of *bela* stone masonry wall of the bastion and chapel with duly dressed new *bela* stones and reconstruction of arch supported floor of chapel reconstruction of sanctum rows, flooring and lime plastering of chapel has been carried out. The work of stucco plastering of St. Tiago facade, pulpit and vaulted roof of altar has been completed. Consolidating base to support cracked rock below is in progress.

484. CAVALIEO BASTION (LIGHT HOUSE BASTION), FORT DIU, DIU

The work of dismantling bed rock detached from the lower portion of the bastion

and providing support of *bela* stone masonry work to the bastion has been completed.

485. FORT (JETTY), DIU, DIU

The work of dismantling the damaged flooring in *bela* stone masonry and stone masonry parapet wall and steps completed.

486. ARMOUR HOUSE, DIU, DIU

The work of dismantling the cracked and bulged out *bela* stone masonry of armour house is in progress. The dismantling of badly damaged pathway with stone edging and relaying of lime concrete pathway with newly dressed stone edging have been completed.

GUJARAT

487. BHADRA TOWER, AHMEDABAD, DISTRICT AHMEDABAD

The collapsed portion of Bhadra tower (due to the earthquake of 2001) has been restored as per original. Decayed and dead lime plaster over the structure has been removed and fresh lime plaster provided.

488. SAIYED USMAN'S TOMB, AHMEDABAD, DISTRICT AHMEDABAD

The work of providing and reconstructing collapsed inner chamber of the tomb consisting of *kumbhis*, columns, capitals, lintels, etc. duly carved as per original and resetting of the dismantled architectural member using *dhrangdhara* stones had been carried out. The work is in progress.

489. SMALL STONE MOSQUE, ISANPUR, DISTRICT AHMEDABAD

The work of dismantling the badly damaged architectural members such as *kumbhis*, pillars, lintels, stone wall, etc. and reconstruction of the same as per original has

been carried out. The missing ashlar stone masonry wall of southern side *mihrab* and arches has also been reconstructed as per original also providing and fixing highly ornamented *minar* of the mosque with available original stone members.

490. GREAT MOSQUE, SARKHEJ, DISTRICT AHMEDABAD

The old decayed and damaged flooring of the corridor, courtyard and mosque at Sarkhej has been removed and reset with new dressed *dhrangadhara* stones as per original. The work is in progress.

491. MALAV TANK, DHOLKA, DISTRICT AHMEDABAD

The missing stones of railing of the *kakshasana* and base pillars of the bridge leading to central pavilion after dressing and moulding of stones have been provided as per original. The work is in progress.

492. BABA LAULI'S MOSQUE, AHMEDABAD, DISTRICT AHMEDABAD

The work of dismantling and reconstruction of badly damaged architectural members, the central corbelled dome, lintel, capital, columns, *chhajjas*, *kangoora*, etc. has been carried out as per original. The removal of dead lime concrete and roof concrete including pointing, dressing, moulding, etc. as per original.

493. TOMB OF SHAIKH AHMED KHATTU GANJ BAKSH, SARKHEJ, DISTRICT AHMEDABAD

The work of removal of dead lime concrete and providing lime concrete and *dhrangadhara* stone along with stone lining had been carried out.

494. KABUTAR KHANA PAVILION, CHAMPANER-PAVAGADH, DISTRICT GODHRA

Restoration of old brick wall in lime mortar has been carried out and lime plaster has been provided on the front side wall and ceiling. Providing ashlar stone masonry in Khajuri Masjid is in progress.

495. KEVADA MASJID, CHAMPANER-PAVAGADH, DISTRICT GODHRA

The works of providing *chhajja* stones on cenotaph and apron around cenotaph and in front of mosque have been carried out. Dressed *dhrangadhara* stone pathway has also been provided. Excavation of foundation trench for brick masonry platform around the mosque is in progress.

496. EK MINAR-KI-MASJID, CHAMPANER-PAVAGADH, DISTRICT GODHRA

The work of providing chain link fencing over brick masonry dwarf wall and mild steel grill is completed.

497. HELICAL STEP WELL, CHAMPANER-PAVAGADH, DISTRICT GODHRA

The work of providing *dhrangadhara* stone apron around the well on lime concrete base is completed. De-silting of the well has been taken up and fifteen steps have been exposed and pointing has been attended to wherever necessary.

498. LILA GUMBAJ-KI-MASJID, CHAMPANER-PAVAGADH, DISTRICT GODHRA

The work of providing and fixing ashlar stone masonry wall of the courtyard has been carried out and work of providing chain link fencing over brick masonry dwarf wall is in progress.

499. SOUTH-EAST BHADRA GATE, CHAMPANER-PAVAGADH, DISTRICT GODHRA

The work of pointing the old brick masonry wall, *kangura* with lime mortar and

dismantling old flaked lime concrete. Relaying of fresh lime concrete over balcony and platform. Providing old type brick masonry in lime mortar over gate and providing wall near Gate 1 and preparing of *kangura* at missing places in lime mortar. Filling random rubble masonry in lime mortar in corner bastions. Providing finely dressed ashlar stone masonry in bastion, fixing it with lime mortar. Providing ashlar stone masonry in *jarokha* above Gate 2 and platform near the gate providing chain link fencing over brick masonry dwarf wall. The work is completed.

500. ATAK GATE, CHAMPANER-PAVAGADH, DISTRICT GODHRA

The works of dismantling of bulged and dislodged masonry wall and reconstructing in lime mortar the back side of Gate 1, 2 and also front of Gate 1 have been carried out. Watertightening of the rubble masonry wall with the lime mortar was attended to.

501. JAMI MASJID, CHAMPANER-PAVAGADH, DISTRICT GODHRA

The works of providing *chhajja* stones, repairing damaged ashlar stone masonry of corridor, watertightening of corridor and reconstruction of fallen and damaged porch towards northern side of Jami Masjid with old available stones have been carried out. A paved pathway of *dhrangadhara* stone over lime concrete bed has also been provided. The work of constructing toilet blocks and ramp for physically challenged persons is completed. The work of providing apron around the mosque has been completed.

502. NAGINA MASJID, CHAMPANER-PAVAGADH, DISTRICT GODHRA

The work of dressing of *chhajja* stone for fixing in mosque and cenotaph is in progress.

503. VENI MADHAV TEMPLE, DWARKA, DISTRICT JAMNAGAR

The work of dismantling the *sikhara* over *garbhagriha* and resetting the same as per original is completed.

504. DWARAKADHISH TEMPLE, DWARKA, DISTRICT JAMNAGAR

The work of erection of mild steel grill over dwarf masonry wall and fixing of entry gate is completed.

505. BABA PYARE CAVES, JUNAGARH, DISTRICT JUNAGARH

The work of dismantling random rubble masonry wall without damaging the lower portion and stacking useful stones for reuse, disposal of debris, enclosing of area by mild steel grill over dwarf wall is completed.

506. BUDDHIST CAVE, JUNAGARH, DISTRICT JUNAGARH

The work of removing the debris and providing base with concrete, galvanised iron pipe and iron angle bar grills for safety of visitors, besides minor works such as repairs of pillars and flooring, plastering all around the monument is completed.

507. RAO LAKHA CHHATRI, BHUJ, DISTRICT KACHCHH

Reconstruction of pillars of collapsed main *chhatri* as per original by using available and new stones dressed and carved as per original and also provided with capitals over pillars. The work of providing chain link fencing on dwarf masonry wall is in progress.

508. EXCAVATED SITE, DHOLAVIRA, DISTRICT KACHCHH

The work of removal of earth which was dumped during excavation at south east corner

of eastern reservoir and between areas of other excavated remains has been carried out. Construction of culvert over Manhar river for approach road and vehicle parking area have also been provided.

509. RANI-KI-VAV, PATAN, DISTRICT PATAN

The work of providing and fixing of Dholpur stone pathway over concrete bedding and brick layers with stone edges in acquired area and providing concrete in parking area has been completed.

510. SAHASRALINGA TALAV, PATAN, DISTRICT PATAN

The work of providing and fixing chain link fencing over brick masonry wall is completed.

511. TORANA, VADNAGAR, DISTRICT PATAN

The work of repair of *torana* and providing and fixing chain link fencing over brick masonry dwarf wall has been carried out and re-erection of dismantled *torana*, capitals and lintels has also been completed.

512. KHWAJA SAFAR SULEIMANI TOMB, SURAT, DISTRICT SURAT

Wooden frame with mild steel grill has been provided around the corridors.

513. OLD ENGLISH TOMBS, SURAT, DISTRICT SURAT

The works of repairing damaged decorative columns as per original and under pinning the damaged wall, providing and fixing galvanised iron pipe, wire net have been carried out and completed.

514. OLD DUTCH TOMBS, SURAT, DISTRICT SURAT

The work of applying lime *surkhi* plaster reproducing floral grouting of cracks on walls,

arches, columns and repair of broken original. The work is in progress.

515. HIRA GATE, DABHOI, DISTRICT VADODARA

The fallen architectural members have been carefully retrieved from the debris and stacked for reuse after proper documentation. The work is in progress.

516. BHAU TAMBekarwada Haveli, VADODARA, DISTRICT VADODARA

Dismantling rotten wooden beams from the roof of second and third floors, chiseling the wooden members from old teak wood as per the existing style and erecting the same has been taken up. After providing the wooden members anti termite treatment was given. Relaying the weathered course with brick-bats and pure lime to an average thickness of 100mm well beaten with wooden hammers pouring of nutmeg mixed with jaggery and water and plastering the top with combination mortar 1:1:4 added with water proofing compound, curing, etc. applying French polish for the teakwood members like wooden ceiling, beams, etc. was attended to.

IX. ARCHAEOLOGICAL CHEMISTRY

TREATMENT OF MONUMENTS AND PAINTINGS¹

ANDHRA PRADESH

1. SRI VIRABHADRA SWAMY TEMPLE, LEPAKASHI, DISTRICT ANANTAPUR

In continuation of previous year's work, the conservation and restoration work was taken up on the paintings executed on the ceiling of Visnu shrine and stone surface of pillars. The paintings executed on the lime plaster over granite slabs, ceiling pillars were having accumulation of dust and dirt, soot, cobwebs, insects nests, accretions loss of adhesion of plaster at some places, along with presence of lime deposits, oil stains, greasy matter, superficial dust and dirt on the stone pillars. Superficial accretions were removed mechanically using sable hair brushes. The soot and dust accretions were removed chemically using a mixture of 2-ethoxy ethanol, toluene (sulphur free) and tri-ethanol amine in the ratio of 2:2 and 0.5. The tenacious accretions were further cleaned using a mixture of methanol and Iso-propanol. On account of the tenacious nature of the accretionary deposits, the application of the mixture of solvents had to be resorted to 3-4 times for their complete removal. Further, any remnants left on the surface were removed mechanically with the help of artist brush and cotton swabs. The work is still in progress.

2. SRI VAIDYANATHA SWAMY AND SRI BHEEMALINGESWARA SWAMY TEMPLE, PUSHPAGIRI, DISTRICT CUDDAPAH

In continuation of previous year's work, the conservation treatment and preservation work has been taken up for the removal of micro-vegetational growth, tenacious coats of lime and red ochre and stains of bat's excreta from the exterior and interior surfaces of *chhajja*, pillars, *gopuram* of both the temples. The thick and tenacious coats of lime and red ochre were removed by chemico-mechanical means using 3-5% acetic acid in aqueous medium. Micro-vegetational growth was removed using a mixture of liquid ammonia (3%) and non-ionic detergent in 3:1 ratio, followed by brushing with different type of brushes. A final wash with dilute ammonia solution and then with plain water was given to remove all the residual chemicals. Subsequent to cleaning, the exterior surface was given fungicidal treatment with a coat of 2% sodium penta chlorophenate (SPC) followed by application of a silicone based water repellent Wacker BS-290 in mineral turpentine oil (MTO) (1:15) on the dried surface.

3. SRI BHEEMESVARA SWAMY TEMPLE, DRAKSHARAMA, DISTRICT EAST GODAVARI

In continuation of previous year's work, the conservation treatment and preservation work has been taken up for the removal of micro-vegetational growth from exteriors and lime, soot and oil accretions from interior part of west *gopuram* in which the dressed khondalite has been used as building material. The micro-vegetational growth was removed with the mixture of ammonia and teepol in 3:1 ratio. An aqueous solution of

¹ Information from: Director (Science) of the Chemical Branch of the Survey.

glacial acetic acid was used chemico-mechanically for the removal of lime deposits followed by thorough washing with dilute ammonia solution for neutralization of acid remnants. Subsequently, the surface was subjected to thorough washing with plain water. The preservation part will be taken up in next year.

4. SRI BHAVANARAYANA SWAMY TEMPLE, BAPATLA, DISTRICT GUNTUR

The eastern and western exterior surfaces and open *mandapa* of this temple comprises granite stone, which was taken up for the chemical conservation treatment. The main conservation problem of this temple was micro-vegetational growth along with deposition of dust, dirt, lime coats, oil stains, greasy matter, soot, etc. on the exterior surfaces. For the removal of micro-vegetational growth 3% liquid ammonia and non-ionic detergent in the ratio of 3:1 followed by soft brushing with nylon brushes was carried out. For the removal of accretions from the intricate carvings and designs tooth brushes and cotton swabs were also used. The coats of lime were removed chemico-mechanically using 3-5% solution of glacial acetic acid in aqueous medium. The soot and oil smears were removed using tri-ethanol amine. The greasy matter deposited on the interior surface was removed by using the clay pack technique with Fuller's earth. The western exterior surfaces were given a coat of 2% SPC and a mixture of Wacker SMK-1311 in water as a protective coat.

5. GOLCONDA FORT, GOLCONDA, DISTRICT HYDERABAD

In continuation of previous year's work, the conservation work was taken up on the curtain wall, Selai khana (Aslah khana), exterior of Rani Mahal and side structures made up of

granite stone with lime plaster. The main conservation problems were micro-vegetational growth and lime coats on exteriors. The micro-vegetational growth was removed chemico-mechanically using a mixture of ammonia and non ionic detergent in 3:1 ratio, by brushing with nylon brushes of different types. The lime coats were also removed chemico-mechanically, using 3% aqueous acetic acid solution followed by thorough washing with dilute ammonia solution for neutralizing the remnants of acids. The treated surface was then thoroughly washed with plain water followed by a fungicidal treatment using 2% aqueous SPC. Finally, the entire cleaned and dried exterior surface was given a water repellent treatment with silicone based water repellent Wacker BS-290 in MTO (1:15). The work is in progress.

6. BEACH GHANTKI, BURUZU, DISTRICT KURNOOL

In continuation of previous year's work, the conservation treatment work was taken up for the removal of micro-vegetational growth, lime wash accretions, bird droppings, scribbling on walls etc. from stucco and brick surfaces, tetrahedral structure at top floor, identical steps wall on north and south side, eastern and western wall, parapet wall, southeast corner wall at first floor, east parapet wall, steps in east wall, steps in south, north and east walls at ground floor. The micro-vegetational growth was removed by using a mixture of ammonia and teepol in 3:1 ratio, followed by thorough washing with distilled water. The lime and red ochre accretions were removed chemico-mechanically using 5% aqueous acetic acid repeatedly until complete removal of accretions followed by thorough washing with plain water. The acid remnants on the wall were neutralized by aqueous solution of dilute ammonia. The entire cleaned exterior surfaces were given a

coat of 2% aqueous SPC as fungicide. Finally, the dried exterior surfaces were given a water repellent treatment using Wacker BS-290 in MTO in 1:15 ratio. The work is still in progress.

7. SWARGABRAHMA AND BALABRAHMAESWARA TEMPLE, ALAMPUR, DISTRICT MEHBOOBNAGAR

In continuation of previous year's work, the work was taken up for the removal of lime wash coats, marks of cement, micro-vegetational growth from the exterior surface and bat's excreta and lime coats from interior surface of monuments. The bat's excreta and micro-vegetational growth was removed by using a mixture of liquor ammonia and non-ionic detergent in 3:1 ratio and 5% ammonium carbonate and ammonium bicarbonate in 1:1 ratio in aqueous medium. The calcareous and siliceous deposits were removed chemico-mechanically using 3-5% aqueous solution of glacial acetic acid and 2% solution of sodium thiosulphate in distilled water. After thorough washing with plain water, the dried surface was given fungicidal treatment to arrest the recurrence of micro-vegetational growth. A protective coat of silicone based water repellent Wacker BS-290 in MTO (1:15) was given on exterior cleaned surface.

8. PAPANASI GROUP OF TEMPLES, ALAMPUR, DISTRICT MEHBOOBNAGAR

Work was taken up for the removal of micro-vegetational growth, lime coats and bat's excreta from the exteriors and interiors of the temple. The micro-vegetational growth was removed, using a mixture of 3% liquid ammonia and non-ionic detergent in the ratio of 3:1, followed by brushing with nylon brushes of different shapes and sizes. The thick lime coats were removed chemico-mechanically using 3-5% solution of glacial acetic acid in aqueous medium. For the removal of bat's

excreta mixture of liquid ammonia and non-ionic detergent in 3:1 ratio along with 5% ammonium carbonate and ammonium bicarbonate in 1:1 ratio in aqueous medium were used followed by thorough washing with the plain water to ensure elimination of remnants of chemicals from the stone surface. The entire treated and dried surface was given a coat of 2% SPC as fungicide. On the stone surface a preservative coat of repelling super was applied.

9. KUSH MAHAL (SHITAB KHAN PALACE) AND LOOSE SCULPTURE, WARANGAL FORT, DISTRICT WARANGAL

The work was taken up for the removal of micro-vegetational growth, lime and other calcareous deposits from the exterior and interior surfaces of south, east, west sides and loose sculptures in the interior of the fort using aqueous ammonia and non-ionic detergent in 3:1 ratio. The lime and red ochre coats were subjected to the chemico-mechanically cleaning, using 3% glacial acetic acid in aqueous medium. Repeated applications of acetic acid had to be followed for complete removal of remnant coats. The surface was then washed with aqueous ammonia solution for neutralization of acid remnants, followed by thorough washing with plain water. All the treated and dry exterior surfaces were given a coat of 2% aqueous SPC as fungicide followed by application of a silicon based water repellent Wacker BS-290 mixed with MTO in 1:15 ratio. The work is still in progress.

10. BUDDHIST REMAINS, GUNTUPALLI, DISTRICT WEST GODAVARI

In continuation of previous year's works, the conservation treatment has been taken up for the removal of hardened lime accretions and micro-vegetational growth on

certain part of exterior surface of Dharmalingeswara Cave and large monastery. The thick and tenacious coats of lime were subjected to mechanical treatment using needles and nylon brushes, so as to reduce their thickness. The micro-vegetational growth was removed using a mixture of aqueous ammonia and teepol in 3:1 ratio, followed by brushing with different types of brushes with soft bristles. Solution of 3% glacial acetic acid was applied chemico-mechanically for the removal of remnants of lime deposits. Brushing in between with nylon brushes helped in dislodging the lime deposits from the surface. A final wash with dilute ammonia solution was carried out for the removal of acid remnants, if any. All the treated exterior surfaces were given a coat of 2% aqueous SPC as fungicide followed by application of silicone based water repellent Wacker BS-290 with MTO in 1:15 ratio as a protective coat.

ASSAM

11. SIVADOL, NEGHRITING, DISTRICT GOLAGHAT

In continuation of previous year's work, the remaining 40% work has been completed. The main temple comprises of four subsidiary shrines having lime plastered surface beautifully decorated with the stone sculptures at lower level. These were subjected to chemical conservation treatment work to remove accretionary deposits, bird droppings and micro-vegetational growth using aqueous ammonia solution and teepol in 3:1 ratio followed by thorough washing with plain water. The cleaned surface was given a fungicidal treatment with 5% aqueous solution of santobrite to arrest the re-growth of micro-vegetation. Finally, the dried surface was given water repellent treatment using Wacker BS-290 in MTO in 1:10 ratio.

12. JOYSAGAR GROUP OF MONUMENTS INCLUDES SIVADOL, DEVIDOL, VISHNUDOL AND GHANSHYAM'S HOUSE, JOYSAGAR, DISTRICT SIBSAGAR

The conservation and preservation of Joysagar group of monuments brick construction, Vishnudol temple that has stone sculptures and carvings at Joysagar were taken up to clean accretionary deposits like moss and lichens, dust, dirt and birds excreta using a mixture of aqueous ammonia and non-ionic detergent. After washing, the dried surface was given fungicidal treatment with 5% aqueous solution of santobrite followed by application of preservative coating of Wacker BS-290 in MTO 1:10 ratio. Some part of Devidol temple was strengthened by an ethyl silicate based stone strengthener Wacker OH-100.

13. TALATAL GHAR, JOYSAGAR, DISTRICT SIBSAGAR

In continuation of previous year's work, the chemical conservation treatment work was taken up for remaining 50% area on this brick temple which is lime plastered in order to remove heavy microbiological growth and other accretionary deposits using aqueous mixture of ammonia and teepol in 3:1 ratio followed by thorough washing with plain water. The cleaned surface was then given fungicidal treatment with 5% aqueous solution of SPC to arrest the re-growth of micro-vegetation. Finally, the dried surface was given a water repellent treatment using silicone based Wacker BS-290 in MTO in 1:9 ratio.

BIHAR

14. MUNDESHWARI TEMPLE, RAMGARH, DISTRICT BHABHUA

The sandstone temple without *sikhara* was subjected to the chemical treatment work

in order to remove accretionary deposits like micro-biological growth, dust, dirt and bird excreta from exterior surface of the shrine. The surface was cleaned using a mixture of aqueous ammonia solution and teepol in 3:1 ratio followed by thorough washing with plain water. The cleaned surface was then given a fungicidal treatment with 5% aqueous solution of santobrite followed by application of Wacker BS-290 in MTO in 1:9 ratio (single coat) as water repellent.

15. ANCIENT SITE, VIKRAMSHILA UNIVERSITY, ANTICHAK, DISTRICT BHAGALPUR

The brick structured ancient remains of Vikramshila excavated site such as ruined entrance gate, monks' room, adjoining structures were subjected to chemical conservation treatment in order to eradicate micro-vegetational growth, superficial accretionary deposits, bird's droppings, etc. using aqueous ammonia solution and teepol in 3:1 ratio followed by thorough washing with the plain water. The cleaned surface was then given a fungicidal treatment with 5% aqueous solution of santobrite to arrest the re-growth of micro-vegetation. Finally, the dried surface was given a water repellent treatment using Wacker BS-290 in MTO 1:9 ratio. The weak and fragile brick structures were strengthened using a stone strengthener Wacker OH-100.

16. MONASTERY COMPLEX 8, NALANDA, DISTRICT NALANDA

The ruined brick structure of Monastery 8 was subjected to a cleaning treatment by carefully removing biological accretions and growth using chemicals and soft brushes. At some places consolidation treatment was also given to impart strength to deteriorated brick structure using an ethyl silicate based stone strengthener Wacker OH-100. Finally, a fungicidal treatment using SPC of 5% followed

by preservative coat of Wacker BS-290 in MTO was given to reduce ingress of moisture as well as recurrence of biological growth.

17. EXCAVATED AND TRENCHES, KULHUA, DISTRICT VAISHALI

Brick structural remains adjoining big Stupa was subjected to the chemical treatment for the removal of micro-biological growth, dust, dirt and other deposits using a mixture of ammonia and teepol aqueous ammonia solution and teepol in 3:1 ratio followed by thorough washing with plain water. The cleaned surface was then given a fungicidal treatment with 5% aqueous solution of santobrite followed by application of Wacker BS-290 in MTO 1:10 ratio (single coat) as water repellent.

CHHATTISGARH

18. RATANPUR FORT, RATANPUR, DISTRICT BILASPUR

The monument's exterior walls built up of soft sandstone shows signs of erosion due to vagaries of wind and weather. The work was taken up for the removal of micro-vegetational growth, dust, dirt, soot deposits, stains of acrylic paint and lime wash coat. The cleaning of the surface was carried out by using liquid ammonia solution 4% and non-ionic detergent with the aid of soft nylon brushes. The removal of thick layer of lime from the surface was carried out using very dilute acetic acid solution followed by complete neutralization by ammonia solution. For biocidal treatment, 2% solution of SPC in de-ionized water was applied with spray pump over the cleaned surface. Finally, hydrophobic treatment was given to the treated surface by applying a silicone based water repellent Wacker BS-290 solution in MTO solvent of 1:15 ratio.

19. HARSH GUPTA VIHAR, SIRPUR, DISTRICT MAHASAMUND

The work was taken up on the remains of dilapidated wall of main shrine and cell wall built up of soft bricks for the removal of micro-vegetational growth along with cleaning, mending to sculptures of monument and their consolidation. The cleaning of the surface was carried out by using liquid ammonia solution 4% and non-ionic detergent with the aid of soft nylon brushes. For biocidal treatment, 2% solution of SPC in de-ionized water was applied with spray pump over the cleaned surface. The weathered sculptures were consolidated by using an ethyl silicate based stone strengthener Wacker OH-100. Finally, hydrophobic treatment was given to the treated surface by applying a silicone based water repellent Wacker BS-290 solution in MTO. solvent of 1:15 ratio.

DELHI/NEW DELHI

20. FEORZSHAH TOMB, HAUZ KHAS, DELHI

The work was taken up on the lime plaster surface of the tomb including drum and dome, marble grave inside the tomb, stone surface that is fragile in condition having brown iron stains. Besides, efforts were made for the removal of enormous growth of micro vegetation along with thick layer of dust, dirt, soot and tarry matter. The superficial deposits were removed from stone, lime plaster and marble surface, by using 2-5% aqueous ammonia and teepol solution. Clay pack treatment using Fuller's earth along with 2-5% sodium carbonate was given on marble surface to remove hard accretions. Lime plaster surface was subjected to bleaching powder treatment. SPC was applied as fungicide on the chemically treated area followed by a water repellent

treatment using Wacker BS-290 in MTO. The work is still in progress.

21. RAMPART WALL, RED FORT, DELHI

In order to improve its aesthetic appearance, chemical conservation treatment of rampart wall under flag mast facing Chandni Chowk is taken up every year as a regular conservation measure before 15th August. For the removal of superficial accretion of dust, dirt, micro-vegetational growth and particulate matters etc., 2-5% aqueous ammonia and teepol solution was used. The calcareous deposits were removed chemico-mechanically by using dilute acetic acid followed by thorough washing with plain water. Nine numbers of metallic pinnacles situated at Lahori gate were chemically treated in the laboratory for the removal of superficial accretionary deposits and retouched by using golden powder in varnish. Two standing elephants of Hathi gate were cleaned by aqueous ammonia and teepol solution to remove dust, dirt and stains of birds' excreta. Cracks in their teeth were treated and filled, followed by the application of a fine coating of colour in varnish and thinner on the surface of elephant figures. The huge brass gate at the entrance of the Meena Bazaar was chemically treated using 3-5% alkaline solution of sodium potassium tartarate (Rochell's salt) and preserved by using dilute solution of lacquer varnish in turpentine oil. Brass gate situated in Meena Bazaar was also chemically treated for the removal of surface accretions, dust, dirt, rust, birds' excreta and coating of old varnish.

22. IMAM ZAMIN TOMB, QUTUB COMPLEX, NEW DELHI

The work was taken up on the lime plaster and sandstone surface for the removal of superficial accretionary deposits, dust, dirt,

smoke, soot pollutants, micro-vegetational growth and bird excreta. The chemical treatment of sandstone, lime plaster and marble surface was carried out using a mixture of 5% ammonia solution and 2-5% non-ionic detergent. Lime plaster surface of dome was subjected to bleaching powder treatment. Iron stain marks were removed by dilute solution of oxalic acid. Clay pack treatment using Fuller's earth along with 2-5% sodium carbonate was given on marble/sandstone surface to remove hard accretions. The weak and fragile stone surface was strengthened using a stone strengthener Wacker OH-100. After chemical treatment, fungicide SPC was applied all over the surface except marble surface and finally preserved by applying Wacker BS-290 diluted in MTO of 1:12 ratio as water repellent on lime plaster and stone surface.

23. MODEL SCULPTURES, ASI HEAD QUARTERS, NEW DELHI

The chemical treatment and preservation of four model structures built up of lime plaster, mortar and sandstone have been carried out for the removal of dust, dirt, soot, tarry matter, calcareous and other pollutant. The chemical treatment of sandstone and masonry structure was carried out using a mixture of 5% ammonia solution and 2-5% teepol. The lime plaster surface was subjected to bleaching powder treatment. The weak and fragile stone surface was strengthened using a stone strengthener Wacker OH-100. After chemical treatment, fungicide SPC was applied all over the surface except marble surface and finally preserved by applying Wacker BS-290 diluted in MTO of 1:12 ratio as water repellent on the lime plaster and stone surface.

24. CHOTE KHAN TOMB, SOUTH EXTENSION, NEW DELHI

The entire surface of monument is affected with thick growth of micro-vegetation and other accretionary deposits like dust, dirt, soot, bird excreta and other atmospheric pollutants. The chemical treatment of sandstone and lime plaster surface was carried out with a mixture of 5% ammonia solution and 2-5% teepol (non ionic detergent). Lime plaster surface was subjected to bleaching powder treatment. Sandstone surface was consolidated with a stone strengthener Wacker OH-100. After chemical treatment, fungicide SPC was applied all over the surface and finally preserved with a coating of Wacker BS-290 diluted in MTO of 1:11 ratio as water repellent on lime plaster and stone surface.

25. BHURE KHAN TOMB, SOUTH EXTENSION, NEW DELHI

The entire exterior surface of monument is affected with thick growth of micro-vegetation and other accretionary deposits like dust, dirt, soot, bird excreta and other atmospheric pollutants which were chemically treated and preserved. The quartzite stone surface was badly affected with iron stains due to rusting of iron dwells. Lime plaster surface was subjected to bleaching powder treatment. The fragile sandstone surface was consolidated with a stone strengthener Wacker OH-100. After chemical treatment fungicide SPC was applied all over the surface and finally preserved with a coating of Wacker BS-290 diluted in MTO of 1:11 ratio as water repellent on lime plaster and stone surface. The work is still in progress.

26. PURANA QUILA, NEW DELHI

The chemical treatment to the exterior of Qal'a-i-a-Kuhna Mosque was carried out for the removal of superficial accretionary deposits, cobwebs, soot and tarry matter, marks of ink, paint, coaltar, etc. from stone, marble and lime

plaster surface of *kanguras* and top most portions of oriel windows, by using 5% aqueous ammonia and 2-5% teepol solution. Lime plaster surface of dome was subjected to bleaching powder treatment. Iron stains were removed by dilute oxalic acid. After chemical treatment fungicide SPC was applied all over the surface except marble surface and finally preserved by applying Wacker BS-290 diluted in MTO of 1:12 ratio as water repellent on lime plaster and stone surface.

27. ISA KHAN TOMB, HUMAYUN'S TOMB COMPLEX, NEW DELHI

The lime plaster and stone/tiled surface area of the main dome including dome of eight *chhatris* was subjected to chemical conservation treatment for the removal of micro-vegetational growth along with removal of thick layers of dust, dirt, soot and iron stains by using 5% aqueous ammonia and teepol solution. Lime plaster surface was subjected to bleaching powder treatment. SPC was applied on treated surface. Finally the entire stone surface was preserved by applying Wacker BS-290 diluted in MTO of 1:11 ratio as water repellent. The work is still in progress.

GOA

28. BASILICA OF BOM JESUS, OLD GOA

The chemical conservation treatment was taken up for the removal of micro-vegetational growth and salt deposition on the exterior walls of Basilica built up of laterite stone blocks. The surface accretions such as dust, dirt, birds' excreta and micro-vegetational growth were removed chemico-mechanically using 2-3% aqueous solution of ammonia and non ionic detergent and gentle brushing with nylon brushes followed by through washing with plenty of water. Paper pulp treatment was

given to the infested areas in order to extract soluble salts from the stone fabric. The surface was then washed with de-mineralized water for the removal of bits of paper pulp sticking to the surface. A 2% solution of SPC in distilled water was applied on the cleaned surface as fungicide. After consolidation of extensively deteriorated portion using an ethyl silicate based stone strengthener Wacker OH-100, Wacker BS-290 diluted in MTO in 1:13 ratio was applied on the entire cleaned and dried surface as a water repellent.

29. SE' CATHEDRAL, OLD GOA

Work in Cathedral was carried out of gilded wooden figures on the main altar of the church. First all the dust and dirt superficially deposited was removed by gentle brushing. Subsequently, adherent accretionary deposits were removed using organic solvents like cellosolve, carbon tetra chloride, methanol, acetone, toluene in different combinations as per the response of accretionary deposits.

30. ST. FRANCIS OF ASSISI CHURCH, OLD GOA

The wooden artefacts, murals, paintings on canvas were in a very bad condition especially due to insect activity at many places. The entire church was fumigated as murals are depicted all over. Fumigation of the church has been carried out with etoxide gas as a fumigant to control the insect and pest activities. The fumigant was allowed in the air tight condition in the church for about 36 hours. The gas detectors were used to trace out leakage of gas, if any.

GUJARAT

31. SIDI SAIYED MOSQUE, AHMEDABAD, DISTRICT AHMEDABAD

This mosque which is of sandstone construction having unique semi circular *jalis* that were subjected to chemical treatment for

the removal of dust, dirt, bird droppings and other micro-vegetational growth using a mixture of dilute ammonia and non-ionic solution. The consolidations of pulverized jalis were carried out by spraying an ethyl silicate based stone strengthener, Wacker OH-100. Application of 2% solution of SPC as fungicidal treatment was given to entire cleaned area. Finally, the cleaned and dried surface was preserved with a silicone based water repellent Wacker BS-290, diluted in MTO in 1:13 ratio (Pls. 248-249).

32. RAO LAKHA CHHATRI, BHUJ, DISTRICT BHUJ

The monument having sandstone surface was covered with dust, dirt, bird droppings and other micro-vegetational growth which were removed by using 2-3% solution of ammonia and teepol. Entire cleaned area was treated with fungicide using 2% of aqueous solution of SPC followed by a protective coat of water repellent using Wacker BS-290 MTO in 1:9 ratio.

33. SIKANDAR SHAH TOMB, HALOL, DISTRICT HALOL

The monument is built up of sandstone with fine plastered domes and the central chamber and entrance porches with fluted domes. The work was taken up for the removal of dust, dirt, bird's droppings, micro-vegetational growth and other accretionary deposits. These accretionary deposits were removed by using 2-3% solution of ammonia and non ionic detergent. The cleaned surface was given fungicidal treatment with 2% aqueous solution of SPC. Finally the dried surface was given water repellent treatment with Wacker BS-290 and MTO in the ratio 1:9.

34. CITADEL WALL OF FORT, PAVAGADH, DISTRICT GODHRA

The chemical treatment for the removal of micro-vegetational growth dust, dirt and bird

droppings on the citadel walls of the monuments was carried out. The micro-vegetational growth and other accretions were removed using 3% aqueous solution of ammonia and teepol. The entire cleaned surface was given fungicidal treatment using 2% aqueous solution of SPC followed by a protective coat of water repellent using Wacker BS-290 in MTO in the ratio of 1:9.

35. BABAMAN MOSQUE, PAVAGADH, DISTRICT GODHRA

This monument is built up of sandstone and was infested with dust, dirt and micro-vegetational growth. These superficial accretionary deposits were removed by using 2-3% aqueous solution of ammonia and non-ionic detergent. The clean and dried surface was subjected to fungicidal treatment by using 2% aqueous solution of SPC. The entire dried surface was preserved by application of a water repellent Wacker BS-290 in MTO in 1:9 ratio.

36. SATKAMAN, PAVAGADH, DISTRICT GODHRA

The Satkaman situated at the end of the Sadan Shah fort and right side of the Budhiya *darwaja* is constructed of sandstone. The stone surface was covered with dust, dirt, micro and macro-vegetational growth and trees. For the removal of plants and trees paraquat dichloride, a contact herbicide, mixed with distilled water in appropriate ratio was sprayed and injected as per requirement. After fifteen days the dry plants and trees were removed mechanically. The infested surface was treated with 2-3% aqueous solution of ammonia and non-ionic detergent. The cleaned surface was then subjected to fungicidal treatment by using 2% solution of SPC. The cleaned surface was preserved with Wacker BS-290 in MTO in 1:9 ratio. The work is in progress.

37. GALTESHWAR MAHADEV TEMPLE, SUNAK, DISTRICT SUNAK

Work was under taken for the removal of dust, dirt, bird's droppings, thick micro-vegetational growth, superficial accretionary deposits and consolidation of pulverized sandstone which was noticed at the plinth portion of the temple. The consolidation of pulverized stones surface was carried out by spraying an ethyl silicate based stone strengthener, Wacker OH-100. The chemical cleaning was carried out using 3% aqueous solution of ammonia and teepol (non-ionic detergent). The cleaned and dried surface was given fungicidal treatment with 2% aqueous solution of SPC. The treated surface was finally given a water repellent treatment using Wacker BS-290 in MTO in 1:9 ratio.

38. MANSAR TALAB SHRINE, VIRAMGAM, DISTRICT VIRAMGAM

The Mansar *talab* having 357 numbers of small Vaisnava and Siva shrines built up of sandstone. These shrines were covered with dust, dirt, bird's droppings and micro-vegetational growth. The chemical treatment work was carried out for the removal of accretionary deposits using a mixture of dilute ammonia and non-ionic solution. Application of 2% solution of SPC as fungicidal treatment was given to entire cleaned area. Finally, the cleaned and dried surface was preserved with a silicone based water repellent Wacker BS-290, diluted in MTO in 1:13 ratio.

HARYANA

39. LAT-KI-MASJID, HISAR, DISTRICT HISAR

The work was carried out to remove the surface accretions, soot, smoke, stains of rust on iron rod and pinnacle of the Lat and micro-vegetational growth, by using chemicals viz., 2-ethoxy ethanol, triethanolamine, oxalic acid, aqueous ammonia solution and non ionic detergent in

proper ratio with the help of soft nylon brushes. The weak, weathered, pulverized portion of the stone structures was consolidated with an ethyl silicate based stone strengthener Wacker OH-100. The entire cleaned surface was given fungicidal treatment using 3% solution of SPC in distilled water followed by water repellent treatment with Wacker BS-290 in MTO in the ratio of 1:14.

40. KHWAZA KHIZR'S TOMB, SONEPAT, DISTRICT SONEPAT

In continuation of previous year's work, the chemical conservation was carried out on red sandstone surface and wooden structure of the monument. The red sandstone portion and wooden structure were badly covered with dust, dirt, grease, soot and micro-vegetation. The superficial accretions were chemically cleaned by using a mixture of suitable chemicals and solvents. The weak and fragile stone portion was consolidated with stone strengthener Wacker OH-100. Subsequently cleaned and dried stone surface was given fungicidal treatment with 3% aq. solution of SPC. A silicone based water repellent Wacker BS-290 mixed with MTO in the ratio of 1:14 was applied on the stone surface.

HIMACHAL PRADESH

41. ROCK-CUT TEMPLE, MASRUR, DISTRICT KANGRA

In continuation of previous year's works, the remaining chemical conservation and consolidation work of rock cut monolithic temple was taken up. The consolidation work was carried out on the weak, fragile and pulverized stone surface of rock cut figures with an ethyl silicate based stone strengthener Wacker OH-100 solution. The cleaning treatment was carried out using an aqueous

mixture of ammonia and non ionic detergent solution with very soft nylon brushes. The cleaned, consolidated and dried rock surface was then given fungicidal treatment followed by application of two coats of water repellent Wacker BS-290 in MTO in the ratio of 1:14.

42. RUINED FORT, NURPUR, DISTRICT KANGRA

The conservation treatment work on *darbar* hall and west side fortification wall which is of sandstone was taken up for the removal of plants, micro-vegetational growth and other superficial accretions by the chemico-mechanically using aqueous solution of ammonia and non-ionic detergent in a suitable ratio followed by spraying of 3% solution of SPC as fungicide over the completely cleaned and dried surface of the stone. The consolidation work was carried out on the weak, fragile and pulverized stone surface with an ethyl silicate based stone strengthener Wacker OH-100 solution. The water repellent treatment was given with Wacker BS-290 solution in MTO in 1:14 ratio.

43. GAURI SANKAR TEMPLE, DASAL, DISTRICT KULLU

The conservation work was taken up on the exterior and interior stone surfaces of this monument by removal of micro-vegetational growth, smearing of colours deposition of soot, smoke, grease, etc. Suitable organic solvents and aqueous solution of ammonia and non-ionic detergent was used with mild brushing to facilitate the removal of biological growth as well as greasy and oily matter from the surface. Fragile, weak, weathered portion was consolidated with an ethyl silicate based stone strengthener Wacker OH-100 solution. The clean surface was given fungicidal treatment with 3% solution of SPC to reduce the reappearance of biological growth. Finally, the water repellent treatment was given with Wacker BS-290

solution in MTO in 1:14 ratio in two wet-on-wet coats.

44. PHOO GOMPHA, TABO, DISTRICT LAHAUL AND SPITI

Work was carried out on the painted surface of the wall paintings. Paintings were covered with mud streaks, dust, dirt smoke and soot. The problem of cracks and bulging were also observed on the murals of this *gompha*. In order to strengthen the painted plaster, the cracks on the paintings were filled up and repaired with suitable and compatible materials. After the process of strengthening and repair, chemical cleaning was carried out using mixture of organic solvents like alcohols, 2-ethoxy ethanol, tri-ethanolamine, etc. The colour matching of the repaired and filleted area was carried out as per requirement and 1-2% solution of poly vinyl acetate solution in toluene was applied as preservative. A total area of 26sqm area of wall painting was completed.

45. BUDDHIST MONASTERY, TABO, DISTRICT LAHAUL AND SPITI

The chemical conservation and consolidation work was carried out for the wall paintings and stucco figures in the ante-room of Duwang *gompha*. In order to strengthen the painted plaster as well as the stucco figures, the crack on the paintings were filled up and missing portion of the stucco figures were repaired by suitable and compatible materials. After the process of strengthening and repair, chemical cleaning was carried out using mixture of organic solvents like alcohols, 2-ethoxy ethanol, triethanolamine, etc. The colour matching of the repaired and filleted area was carried out as per requirement and 1-2% solution of PVA solution in toluene was applied as preservative.

KARNATAKA

46. HUCHAPPAYYA MUTT COMPLEX, AIHOLE, DISTRICT BAGALKOT

Huchappayya Temple (Mutt complex), comprises of two temples which are built up of sandstone were subjected to chemical conservation treatment for the removal of superficial accretionary deposits, micro-vegetational using ammonia and non-ionic detergent in the ratio 3:1 aqueous acetic acid of 2-3% was used for the removal of lime wash/lime accretions. The fragile stone surface was strengthened using Wacker OH-100 (Ethyl Silicate). The exterior areas were given fungicidal treatment of 2% aqueous SPC followed by water repellent treatment using Wacker BS-290 in MTO in 1:14 ratio.

47. BHUVARAHU TEMPLE, HALSI, DISTRICT BELGAUM

The granite stone temple was taken up for conservation treatment and preservation of the exterior portion of *vimana*, *arthamanatapa*, common *navaranga* and two *garbhagriha* walls. General cleaning and removal of micro-vegetational growth, lime deposits/ coats and red ochre coats was done using aqueous ammonia and non ionic detergent of 3-5% solution. Removal of lime wash/coats was carried out using aqueous solution of acetic acid of 2-3%, the deteriorated stones were strengthened using Wacker OH-100 (ethyl silicate). Fungicidal treatment was given using 2% aqueous SPC solution followed by water repellent treatment using Wacker BS-290 (silane-siloxane mixture) and MTO in 1:14 ratio. The work is still in progress.

48. AHMED SHAH WALI TOMB, ASTHUR, DISTRICT BIDAR

In continuation of the previous year's work, the conservation treatment was continued on this massive square shaped structure with interior paintings of floral designs over lime plaster. The painted surfaces of east and south walls were subjected to conservation treatment for the removal of surface accretions such as old varnish, soot, dust, dirt and birds' droppings which were removed by using 2-ethoxy ethanol and turpentine oil and other suitable solvents like tri-ethanol-amine, methanol, n-butanol, acetone. Filleting and colour integration was also done wherever required using plaster of paris and earth colours. The treated area was preserved with 1% solution of PVA in toluene (sulphur free) (Pls. 250-251).

49. ASAR MAHAL, BIJAPUR, DISTRICT BIJAPUR

In continuation of the previous year's work, the conservation treatment was continued in three rooms on the first floor of the mahal, having beautiful paintings over lime plastered walls and ceilings on the lintels. The conservation treatment was carried out for the removal of superficial accretions, soot, dust, dirt, and old preservative coatings using a mixture of suitable organic solvents. Consolidation work was also carried out for filling and filleting on the north and west wall of the first room. The colour integration work was also attended using earth colours. The cleaned area of the west wall was given a single coat preservative coating using 1% PVA in toluene (sulphur free). The work is still in progress.

50. GOMATESWARA STATUE, SRAVANABELAGOLA, DISTRICT HASSAN

The colossal statue of Gomateswara on granite stone was chemically treated and conserved. The general cleaning of the removal of superficial accretionary deposits like ghee, milk, curd, herbal juices and red stains was carried out using ammonia and non-ionic

detergent in 3:1 ratio. The red ochre stains were cleaned using organic solvents viz., morpholine, chloramine-T and toluene in different ratios. The fragile and deteriorated portions of statue were strengthened using Wacker OH-100 (ethyl silicate). The monolithic statue up to the knee portion was treated with 2% aqueous SPC as a fungicidal treatment and finally a water repellent treatment was given using Wacker BS-290 (silane-siloxane mixture) in MTO (Pls. 252-253).

51. RAMESWARA TEMPLE, KUDLI, DISTRICT SHIMOGA

In continuation of the previous year's work, the work was carried out on exterior south wall and interior portion of *sabha mandapa*, *sukanasi* and *garbhagriha* which is of chloritic schist for the removal of superficial accretions, micro-vegetational growth, lime patches and red ochre stains. The general cleaning and the removal of micro-vegetational growth were carried out using ammonia and non-ionic detergent solution in the ratio of 3:1. The lime patches and red ochre deposits on the exterior and interior surfaces were cleaned using 2-3% solution of aqueous acetic acid. In the interior portion, removal of thick oily accretions was carried out using Fuller's earth, sodium carbonate and sodium bicarbonate. The deteriorated stones were strengthened using ethyl silicate based stone strengthener Wacker OH-100. The exterior cleaned portions were given a fungicidal treatment using 2% aqueous SPC followed by a water repellent treatment using a silicone based micro emulsion Wacker SMK 1311.

52. KEDARESWARA TEMPLE COMPLEX, BALLIGAVI, DISTRICT SHIMOGA

The Kedaresewara temple is built up of schist stone is having three *vimanas* dedicated to Brahma, Visnu and Mahesvara. The general

cleaning was carried out for the removal of micro-vegetational growth from the exterior surface and accretions like soot, oil and grease on the interior surfaces, using aqueous ammonia and non ionic detergent 3-5% solution. The lime patches were cleaned using 2-3% solution of aqueous acetic acid. The deteriorated stones were strengthened using ethyl silicate based stone strengthener Wacker OH-100. The exterior cleaned portions were given a fungicidal treatment using 2% aqueous SPC followed by a water repellent treatment using a silicone based micro emulsion Wacker SMK-1311 (Pls. 254-255).

53. PRANAVESWARA TEMPLE AND INSCRIBED PILLAR, TALAGUNDA, DISTRICT SHIMOGA

The temple is of chloritic schist stone with *garbhagriha*, *navaranga* and inscribed pillar situated in front of the temple, was treated and conserved for removal of micro vegetational growth and thick lime coats. The general cleaning and eradication of micro-vegetational growth was carried out using aqueous ammonia and non ionic detergent solution in 3:1 ratio. The thick lime coats were removed by using an aqueous acetic acid solution of 2-3%. Wacker OH-100 (ethyl silicate) was used for consolidation of deteriorated stones. Finally, a fungicidal treatment using 2% aqueous SPC was given followed by water repellent treatment using Wacker SMK-1311 (silane siloxane mixture) in aqueous medium in 1:14 ratio.

54. TRIMURTHYNARAYANA TEMPLE, BANDALKE, DISTRICT SHIMOGA

The entire temple both on exterior and interior sides contains ornamental carvings. The western *vimana* was collapsed and subsequently conserved. The other two existing *vimanas* are in good state of conservation. The general cleaning was carried out for the removal of the

superficial accretions like dust, dirt, micro-vegetational growth, soot and oily accretions using ammonia and non ionic detergent (3-5% in water). Both lime and red ochre patches were removed by using 2-3% of aqueous acetic acid solution. The fragile stone portions consolidated using Wacker OH-100 (ethyl silicate). The cleaned exterior surface was given fungicidal treatment with 2% aqueous SPC solution followed by water repellent treatment using Wacker SMK-1311 (silane siloxane mixture) in aqueous medium in 1:14 ratio.

55. SOMESWARA TEMPLE, BANDALKE, DISTRICT SHIMOGA

The schist stone temple was taken up for the removal of lime accretions and superficial accretionary deposits. The general cleaning was carried out using ammonia and non-ionic detergent mixture in the ratio of 3:1. The lime patches were cleaned using 2-3% aqueous acetic acid solution and oxalic acid solution. The highly deteriorated portions were strengthened by using an ethyl silicate based stone strengthener Wacker OH-100. Fungicidal treatment was given to entire cleaned and dried surface with 3% solution of SPC to check micro-vegetational growth. Finally, Wacker SMK-1311 a silicon based micro emulsion as water repellent was applied over the entire exterior treated surface.

KERALA

56. ST. ANGELO FORT, KANNUR, DISTRICT KANNUR

The chemical treatment of stable having lime plaster ceiling and arches was taken up for the removal of micro-vegetational growth by using dilute solution of non-ionic detergent and ammonia. After removal of accretions and thorough washing with plenty of water, fungicidal treatment was given using 2% solution of SPC. Finally,

Wacker BS-290 in MTO in 1:14 ratio was applied as water repellent on the cleaned and dried surface.

57. SRI SIVA TEMPLE, SETHUR, DISTRICT KARAİKAL

The chemical treatment and preservation work was taken up for the removal of dust, dirt, oily accretions and micro-vegetational growth from the granite stone sculptures of Sri Siva temple and stucco in *gopuram*. The work is still in progress.

58. BEKAL FORT, PALLIKARA, DISTRICT KASARGOD

In continuation of the previous year's work, the removal of dried thick micro-vegetational growth was taken up. To arrest it, 2% aqueous solution of SPC was sprayed on fort walls followed by dry brushing with nylon brushes. Teepol and ammonia solution was used to clean the traces of micro-vegetational growth. Dried stone surface was once again given a fungicidal treatment with 3% solution of SPC to check micro vegetational growth. Finally, on dried surface Wacker BS-290 in MTO in 1:14 ratio was applied as water repellent treatment.

59. SRI VADAKKUNATHAN TEMPLE, TRICHUR, DISTRICT TRICHUR

In continuation of previous year's work, the chemical treatment work was carried out for the removal of superficial accretions and old preservatives on the paintings of Sri Sankaranarayana shrine. For general cleaning, organic solvents *viz.*, sulphur free toluene, ethoxy ethanol and little amount of butyl amine and turpentine oil in different ratio was used as per requirement. The colour re-integration work was also attended were ever required. Finally, 1% solution of PVA in toluene was applied as preservative on the entire treated surface (Pls. 256-257).

MADHYA PRADESH

60. JAMA MASJID, CHANDERI, DISTRICT ASHOK NAGAR

Jama Masjid which is built of sandstone showed blackening due to the micro-biological growth all over the exposed surface. Outer walls, ceiling and pillars showed accumulation of dust, dirt, dried micro-biological growth, etc. The removal of thick layer of lime from the stone surface of prayer verandah was carried out by using very dilute formic acid solution followed by complete neutralization by ammonia solution. The removal of unwanted accretion from the stone surface exposed after lime removal was carried out using ammonical solution mixed with non-ionic detergent. Entire cleaned area was given fungicidal treatment with SPC solution in de-ionized water. The cleaned interior surface was finally preserved with polymethyl methacrylate, while the surface exposed was preserved with Wacker BS-290 (water repellent) in dilution of 1:15 with MTO solvent.

61. KOSHAK MAHAL, CHANDERI, DISTRICT ASHOK NAGAR

The walls, ceiling, arches of the Koshak Mahal, which is of sandstone were covered with thick micro-biological growth, dust, dirt, bird's droppings, etc. The cleaning of the surface was carried out by using ammonia solution 4% and non-ionic detergent with the aid of soft nylon brushes. For biocidal treatment, SPC of 2% solution in de-ionized water was applied with spray pump over the cleaned surface. The weathered stone surface was consolidated by using an ethyl silicate based stone strengthener Wacker OH-100. Finally, hydrophobic treatment was given to the treated surface by applying Wacker BS-290 solution in MTO solvent of 1:15 ratio.

62. JARDINE MUSEUM, KHAJURAHO, DISTRICT CHHATTARPUR

The museum has large collection of sculptures and architectural fragments around 1583 in number, which had been covered with deposition of dust, dirt, dried micro-biological growth, soil and lime, etc. Scientific conservation for the eradication of these accretions initiated by using dilute ammonical solvent mixed with non-ionic detergent. Dilute acetic acid solution was used for the removal of lime deposits followed by complete neutralization with ammonia solution. The entire cleaned surface was given a fungicidal treatment using SPC and preserved with a protective coating of polymethyl methacrylate of 2% solution in toluene.

63. VAMAN TEMPLE, KHAJURAHO, DISTRICT CHHATTARPUR

In continuation of the previous year's work, on sandstone surface of *maha mandapa* portion from south side and the upper portion of north face were given chemical treatment for the removal of micro-vegetational growth and unwanted superficial accretions, using ammonical solution mixed with non-ionic detergent. A very dilute acetic acid solution was used for the removal of lime accretion followed by complete neutralization with ammonia solution. The cleaned surface was subjected to the fungicidal treatment with SPC in de-ionized water. The cleaned surface was finally preserved with water based silicone resin (water repellent) Wacker SMK-1311 in ratio of 1:10 dilution.

64. KANDARIYA MAHADEV TEMPLE, KHAJURAHO, DISTRICT CHHATTARPUR

In continuation of the previous year's work, the exterior of the north-west face of *sikhara*, *mahamandapa*, *mandapa* and *ardhamandapa* and platform wall of the

temple was taken up for chemical treatment for eradication of micro-biological growth, dust and dirt using ammonical solution mixed with non-ionic detergent. The cleaned and dried surface was given fungicidal treatment with 2% solution of SPC. Finally, hydrophobic treatment was given to the treated surface by applying two coats of a silicone based water repellent Wacker BS-290 solution in MTO solvent of 1:15 ratio wet on wet.

65. JAMI MASJID, MANDU, DISTRICT DHAR

The limestone blocks of the wall and the lime plaster of the domes of Jami Masjid shows surface erosion, scaling, flaking and blackening due to the growth of micro-flora along with dust and dirt. The cleaning and preservation work has been undertaken which is in continuation of previous year's work of the exterior surface of southern and eastern wall, and domes. The cleaning of the surface was carried out by using ammonia solution 4% and non-ionic detergent with the aid of soft nylon brushes. For biocidal treatment, 2% solution of SPC in de-ionized water was applied with spray pump over the cleaned surface. Finally, hydrophobic treatment was given to the treated surface by applying Wacker BS-290 solution in MTO solvent of 1:15 ratio.

66. HINDOLA MAHAL, MANDU, DISTRICT DHAR

In continuation of previous year's work, has been carried out on the interior wall of northern portion of Hindola Mahal by using non-ionic detergent mixed with ammonical water. The deposits of dried micro-vegetational growth were eradicated by cleaning with 3% aqueous solution of ammonia and non-ionic detergent using soft nylon brushes. Fungicidal treatment was given to the cleaned surface by applying 2% solution of SPC in de-mineralized water. Finally, the cleaned and restored stone

surface was given a coat of hydrophobic silicon resin, Wacker BS-290.

67. HOSHANG SHAH'S TOMB, MANDU, DISTRICT DHAR

Composite polishing of the marble surfaces of Hoshang Shah tomb was continued. The work was executed over the exterior portion of northern, southern and western walls along with main dome, using equi-mixture of lead oxide, tin oxide and oxalic acid with the help of polishing stone.

68. BAHU TEMPLE, GWALIOR FORT, DISTRICT GWALIOR

The Bahu temple which is built with sandstone is decorated with beautiful carvings both on exterior and interior walls. The temple appears black due to the deposition of dried micro-vegetational growth, dust and dirt, etc. Besides, micro-cracks and powdering of sandstone blocks of the architectural members were observed at number of places. Therefore in continuation to previous year, the exterior of *mandapa* wall of the temple was taken up for the chemical conservation. The cleaning of the surface was carried out by the brushes. For biocidal treatment, SPC 2% solution in de-ionized water was applied with spray pump over the cleaned surface. The weathered stone surface of temple was consolidated by an ethyl silicate based stone strengthener Wacker OH-100. Finally, hydrophobic treatment was given to the treated surface by applying a silicone based water repellent Wacker BS-290 solution in MTO solvent of 1:15 ratio.

69. MOHAMMED GHAS TOMB, GWALIOR, DISTRICT GWALIOR

This monument is decorated with beautiful paintings executed in geometrical and floral pattern on lime plaster. The chemical cleaning and preservation including fixing,

filleting and color re-integration of paintings on ceiling of entrance porch, verandah and doorjamb of Mohammed Ghaus tomb, Gwalior was taken up. The cleaning of the surface was carried out by using various solvents with absorbent cotton swabs over the restored and consolidated painted plaster. Fixing, filleting and edging of loose and fragile plaster of the ceiling was done wherever necessary using plaster of paris mixed with adhesive (Fevicol) suitably tinted with earth colors.

70. GREAT STUPA, SANCHI, DISTRICT RAISEN

Remaining work from last year, cleaning and preservation of *toranadwara* and sandstone railing on the top of the *anda* continued using ammonical solution mixed with non-ionic detergent with aid of soft nylon brushes. A 2-3% aqueous solution of SPC was applied as a fungicide. Finally, two coats of silicone based water repellent Wacker BS-290 in MTO, wet-on-wet were applied.

71. RAISEN FORT, RAISEN, DISTRICT RAISEN

The work was taken up on the exterior surface of the Raisen fort, which is of sandstone/plaster. The removal of surface accretions such as dust, dirt and micro-vegetational growth was carried out by using 4% solution of ammonia and non-ionic detergent with the aid of soft nylon brushes. The removal of thick layer of lime from the stone and plaster surface was carried out using very dilute formic acid solution followed by complete neutralization by ammonia solution. For biocidal treatment 2% solution of SPC in de-ionized water was applied with spray pump over the cleaned surface. Finally, hydrophobic treatment was given to the treated surface by applying Wacker BS-290 solution in MTO solvent of 1:15 ratio.

72. SIVA TEMPLE, BHOJPUR, DISTRICT RAISEN

The temple which is of sandstone became blackish on its exterior surface and the platform wall due to the deposition of dried micro-vegetational growth. All over the interior surface of the sanctum a thick deposit of calcareous accretions were left behind by water seepage along with the dust, dirt, etc. The chemical treatment for the removal of the deposits left behind by the water seepage along with the dust, dirt, etc. was carried out by chemico-mechanical means by using ammonia solution and non-ionic detergent with aid of soft nylon brushes. For biocidal treatment, SPC of 2% solution in de-ionized water was applied with spray pump over the cleaned surface. Finally, hydrophobic treatment was given to the treated surface by applying a silicone based water repellent Wacker BS-290 solution in MTO solvent of 1:15 ratio in two coats wet-on-wet. Over the interior surface of the monument a 2% solution of poly methyl methacrylate in toluene was applied as a preservative coating.

73. BALJATI SHAH'S MOSQUE AND TOMB, DHAMONI, DISTRICT SAGAR

Beside, the accumulation of dust, dirt, bird's droppings and blackening due to micro-biological growth, the main problem was the thick lime wash coating all over the surface of both the structures except the platform and the three walls of the tomb. Thick lime deposits from the sandstone surface were removed chemico-mechanically by using dilute organic acids and soft nylon brushes, followed by treatment with ammonia solution to neutralize the effect of acids left behind on the surface. For the elimination of dead and living micro-biological growth and other extraneous deposits a mixture of ammonia and non-ionic detergent was used with the aid of soft brushes. For biocidal treatment, SPC 2% solution in de-ionized water was applied with spray pump

over the cleaned surface. Finally, hydrophobic treatment was given to the treated surface by applying a silicone based water repellent Wacker BS-290 solution in MTO solvent of 1:15 ratio.

MAHARASHTRA

74. AJANTA CAVES, AJANTA, DISTRICT AURANGABAD

Removal of dust and dirt from paintings and sculptures of different caves using soft brushes, temperature and relative humidity were maintained regularly at Cave 1, 2, 16 and 17. Insecticidal treatment was also given regularly on fortnight basis of the unpainted surface using 2% pyrethrum extract in solvent as a preventive measure. In continuation of previous year's work, the paintings on ceiling of the Cave 2 and 16 were subjected to chemical treatment for the removal of dust, dirt, soot accretions and old preservative coating from Cave 17 using mixture of suitable organic solvents in different proportions. The loose grains of white pigments on the surface were consolidated and gaps/lacunae were filled with suitable materials. After drying, the surface was scientifically cleaned with a mixture of suitable an organic solvent followed by preservative treatment was given using 0.5-1.0% solution of PVA in toluene.

In order to consolidate the sculptures of Cave 1,4, 5,9,19,26 and 27 an ethyl silicate based consolidant was percolated inside the cracks, exfoliated and damaged portion by saline method in which the flow of consolidant was regulated as per the requirement. Besides, the painted area in various Cave 2, 6, 9,10,11,15 and 16 were consolidated using lime plaster and mud plaster. The basalt stone surface at the façade of Cave 4,13,26 and 27 were subjected to conservation treatment for the removal of white depositions of salts, bat's

excreta, dust, dirt and thick layer of micro-vegetational growth using paper pulp and clay pack methods followed by thorough washing with distilled water to make it salt free. For the removal of micro-vegetational growth aqueous solution of ammonia and non-ionic detergent with few drops of hydrogen peroxide was used. The entire cleaned and dried surface was then given a silicon based water repellent treatment using Wacker BS-290 solution in MTO.

75. AURANGABAD CAVES, DISTRICT AURANGABAD

The rock cut sculptures and stone surface of Cave 6 and 7 of were subjected to the stone conservation treatment involving removal of superficial dust, dirt, bird's excreta and other surface accretions in the interiors and thick growth of micro-vegetation in exterior of caves. A mixture of 2-3% aqueous solution of ammonia and 1% non-ionic detergent was used for cleaning followed by thorough washing with clean water. Calcareous depositions were removed with the help of 1-3% aqueous solution of acetic acid by chemico-mechanical means followed by thorough washing with clean water to neutralize acid effect. To eradicate the stains of bat's excreta, mixture of 5% solution of EDTA, 3% solution of ammonium carbonate, 5% solution of ammonia and few drops of tri-ethanolamine was used. The fragile portion and cracks were consolidated using an ethyl silicate based stone strengthener, Wacker OH-100 and rock powder. A fungicidal treatment using 2% aqueous solution of SPC was given to the cleaned surface followed by application of a silicon resin based water repellent Wacker BS-290 diluted in MTO in 1:13 ratio on the dried surface.

The insecticidal treatment to arrest the insect activity was carried out at these rock cut caves having interior mural paintings executed on mud plaster. These caves were properly

sealed with the use of plywood and wooden rafters to make them air tight. Subsequently, after the fumigation process was over with etoxide gas for 36 hours, sealing was removed slowly and the remaining gas was removed by exhaust fan.

76. ELLORA CAVES, ELLORA, DISTRICT AURANGABAD

Work was taken up in Cave 10 for the removal of thick layer of dust, dirt, bird's excreta using aqueous mixture of ammonia and non-ionic detergent. Besides chemical cleaning, filling of cracks and reconstruction minor missing parts of sculptures were also attended using rock powder of similar origin and Wacker OH-100 an ethyl silicate based stone strengthener. Hardened accretionary deposits were removed with the help of 1-3% aqueous solution of acetic acid +1% non ionic detergent with gentle brushing using nylon brushes followed by thorough washing with water. Finally, fungicidal and preservative treatment was given using 2% SPC solution in water and Wacker BS-290 diluted in MTO in 1:13 ratio.

The conservation treatment on Cave 15 was carried out on basalt rock having mural paintings on mud plaster and lime plaster surface. The mud plaster and lime plaster surface was bulged out at many places. Fixing and filleting of bulged out and damaged mud plaster and lime plaster was carried out, wherever required with matching retouching material.

The conservation of stone sculpture and surface of *vimana*, terrace of main temple, *sabha mandapa* in the Lankeshwar Cave 16 was carried out to remove the cemented dust, dirt, bird's excreta using 2-3% aqueous solution of ammonia and non-ionic detergent by gentle brushing with nylon brushes followed

by thorough washing with clean water. Calcareous deposits from rock surface were removed with the help of 1-3% aqueous solution of acetic acid and 1% non ionic detergent with gentle brushing using nylon brushes followed by thorough washing with clean water. Removal of dust, dirt and soot from mural paintings was carried out using suitable organic solvents like methanol, ethyl methyl ketone, butanol and butylamine mixture in suitable proportions. In order to stabilize the painted surface, consolidation, fixing/filleting work of loose painted plasters, cracks, holes, etc. has been carried out using appropriate compatible materials and an ethyl silicate based consolidant Wacker OH-100. The cleaned stone surface was given fungicidal treatment using 2% aqueous solution of SPC. On the stone/sculpture surface in dry state water repellent treatment was given using Wacker BS-290 diluted in MTO in 1:13 ratio as preservative. The restoration work of the mural paintings is still in progress.

77. DAULATABAD FORT, DAULATABAD, DISTRICT AURANGABAD

The wooden doors of the Daulatabad fort were cleaned by removing surface dirt and accretions using the mixture of toluene, isopropyl alcohol, acetone and acetic acid in appropriate proportions. The cleaned wooden surface was then subjected to fungicidal and insecticidal treatments using aqueous solution of SPC and beach wood, creosote oil in isopropyl alcohol respectively. Finally, application of polyurethane in turpentine oil was carried out on the entire dried wooden surface as a preservative treatment.

78. MARKHAND DEV TEMPLE, MARKHAND, DISTRICT CHANDRAPUR

The exterior carvings of this temple which is of basalt stone were cleaned and

conserved with the removal of thick layers of micro vegetation, dust, dirt, bird's excreta and other surface accretion by chemico-mechanical means using 2-3% aqueous solution of ammonia and 1% non-ionic detergent with gentle brushing by soft nylon brushes followed by thorough washing with clean water. Calcareous depositions were removed with the help of 1-3% aqueous solution of acetic acid followed by thorough washing by cleaned water. The nandi image in front of temple was in two pieces having the weight of 5 tons each was joined using stainless steel pins and epoxy resin. The exterior part of this figure was consolidated and re-integrated with stone powder and Wacker OH-100 (ethyl silicate). For fungicidal treatment 2% aqueous solution of SPC was applied on cleaned area. Finally, entire cleaned and dried surface was given a preservative coat using Wacker BS-290 in MTO in 1-13 ratio.

79. SANGMESHWAR TEMPLE, JALGAON, DISTRICT JALGAON

This temple which is of basalt rock having many big holes, cracks and fragile surface on exterior side with weathered stone sculptures. The consolidation and mending work was carried out with an ethyl silicate based stone strengthener Wacker OH-100 and lime with aggregates. A mild cleaning of the stone surface was carried out as per normal cleaning process where ever required. After drying, the cleaned surface was given silicon based water repellent treatment using Wacker BS-290 solution in MTO in proper dilution.

80. KANHERI CAVES, BORIVALI, DISTRICT MUMBAI

The exterior carved stone of basalt was cleaned and conserved after the removal of thick layers of micro-vegetation, dust, dirt,

bird's excreta and other surface accretion by chemico-mechanical means using 2-3% aqueous solution of ammonia and 1% non-ionic detergent with gentle brushing by soft nylon brushes followed by thorough washing with clean water. Calcareous depositions were removed with the help of 1-3% aqueous solution of acetic acid followed by thorough washing by clean water. The fragile stone portions were consolidated by using an ethyl silicate based stone strengthener Wacker OH-100. The cleaned area was then given a fungicidal treatment using 2% aqueous solution of SPC followed by application of a silicon based water repellent Wacker BS-290 diluted in MTO in 1:13 ratio on treated and dried surface.

ODISHA

81. BARABATI FORT, CUTTACK, DISTRICT CUTTACK

The main portion of the fort, built up of sandstone and some portion of the western side is of laterite and sand stone were subjected to treatment for the removal of surface accretion such as dust, dirt and micro-vegetational growth by using 2% aqueous ammonia solution and non-ionic detergent mixture. On the dried surface fungicidal treatment was given by spraying 2% aqueous SPC solution. Finally, the dried stone surface was given a protective coat of silicone resin based water repellent Wacker BS-290 diluted with MTO in 1:12 ratio.

82. JAGANNATHA TEMPLE, JAIPUR, DISTRICT JAIPUR

The *vimana*, *jagamohana* and *bhogamandapa* of this temple which is of khondalite and sandstone are fully lime plastered while the platform of the temple is not plastered. The conservation work was carried out for the removal of micro-

vegetational growth and superficial accretionary deposits by using 2% aqueous ammonia and non-ionic detergent. Fungicidal treatment was given by spraying 2% aqueous SPC solution on the entire cleaned surface. Plaster surface was preserved by applying single coat of Wacker SMK-1311 water based water repellent, diluted with water in the ratio of 1:12. Single coat of Wacker BS-290 diluted with MTO in 1:12 ratio on the total stone surface, was applied as preservative.

83. JAMBESWAR TEMPLE, BHUBANESWAR, DISTRICT KHURDHA

The chemical treatment was taken up on the exterior walls of *vimana*, *jagamohana*, Aruna pillar and side temples, that are of sand stone of various shades like red, yellow, grey etc. The removal of surface accretions such as dust, dirt and micro-vegetational growth was carried out by using 2% aqueous ammonia and non-ionic detergent mixture. The weak stone surfaces, except sub-shrine temples, were consolidated by using an ethyl silicate based stone strengthener Wacker OH-100 followed by giving a fungicidal treatment using 2% aqueous SPC solution on the cleaned and consolidated surface. Finally, silicon based water repellent Wacker BS-290 diluted with MTO in 1:9 ratio was applied on the treated and dried surface as protective coat. The work is in progress.

84. LINGARAJA TEMPLE COMPLEX, BHUBANESWAR, DISTRICT KHURDHA

In continuation of previous year's work, conservation treatment on the exterior sand stone surface of *jagamohana*, *bhogamandapa* and *natamandapa* of the Lingaraja Temple along with sub-shrines namely Biswanath Temple, Gouri Sankara Temple, Amaleswara Temple, etc. and plastered surface of *kalasa* of

jagamohana and roof of *bhogamandapa* and *natamandapa* were taken up for the removal of dry accretion and deposits of dust, dirt, red ochre patches and micro vegetational growth by using a mixture of 2% aqueous ammonia and non-ionic detergent in a chemico-mechanical way. The cleaned area was then given a fungicidal treatment using 2% aqueous solution of SPC. The deteriorated stone portions were strengthened by using an ethyl silicate based stone strengthener Wacker OH-100. A silicone based micro emulsion of Wacker SMK-1311 in distilled water was applied on the plastered surface as a water repellent treatment whereas the entire treated and dried stone surface was given a single coat of silicone based water repellent Wacker BS-290 diluted with MTO in 1:12 ratio as protective coat.

85. SUN TEMPLE COMPLEX, KONARK, DISTRICT PURI

In continuation of previous year, the conservation work was taken up in the intricately carved pillared *natamandapa* within temple complex which is of khondalite stone in ashlar masonry. First there was the removal of vegetational growth as well as surface accretionary deposits using 2% aqueous ammonia solution mixed with non-ionic detergent. The deposition of salts within the fabric of the stone was removed by repeated paper pulp treatment. Surface consolidation was carried out by using Wacker OH-100 (ethyl silicate) where ever required. The cleaned surface was given fungicidal treatment using 2% aqueous solution of SPC to arrest the further micro-vegetational growth. Finally, single coat of Wacker BS-290 as water repellent diluted with MTO in 1:9 ratio was applied as preservative. The work is still in progress.

86. SRI JAGANNATHA TEMPLE COMPLEX, PURI, DISTRICT PURI

Vimana of Sri Jagannatha Temple, which is of khondalite stone was subjected to treatment for the removal of surface accretions such as dust, dirt, micro-vegetational growth, deposition of soluble salts by using 2% liquid ammonia and non-ionic detergent solution. The stone surface of *vimana* was cleaned by repeated paper pulp treatment for the removal of soluble salts. The fragile stone portions of the wall of *vimana* were strengthened by an ethyl silicate based stone strengthener Wacker OH-100. A fungicidal treatment was given with 2% SPC on the entire cleaned surface.

Finally, the plastered surface from *beki* level to top of *vimana* was preserved by applying a coat of silicone micro-emulsion of Wacker SMK-1311 in distilled water in the ratio of 1:12 and the dried stone surface was then given a protective coat of silicone resin based water repellent Wacker BS-290 diluted with MTO in 1:12 ratio as a preservative.

PUNJAB

87. OLD SARAI AMANAT KHAN, AMRITSAR, DISTRICT AMRITSAR

The work was executed on the gateway of this monument which is built of bricks and lime plaster, decorated with glazed tiles, floral designs and inscriptions, etc. At few places, remnants of paintings were also visible on the lime plaster surface. The work was carried out using the mixture of aqueous solution of ammonia and non-ionic detergent for the removal of micro-vegetational growth and other accretionary deposits. The entire treated and non painted area was given fungicidal treatment with 3% aqueous solution of SPC. The weak and fragile portions were consolidated using an ethyl silicate based stone strengthener Wacker OH-100. Finally, two coats of silicon based water repellent Wacker

BS-290 in MTO in wet on wet was applied as a protective coat over the entire treated and dried surface. Painted area was cleaned with suitable organic solvents like ethanol, methanol, turpentine oil and 2-ethoxyethanol, etc. followed by a preservative coat with 1% PVA solution in toluene which is sulphur free.

88. HAJI JAMAL TOMB, NAKODAR, DISTRICT JALANDHAR

This tomb which is of bricks, covered with lime plaster and decorated with mosaic work was taken up for the removal of superficial dust, dirt and other accretionary deposits along with micro-vegetational growth using suitable mixture of liquid ammonia and non-ionic detergent with soft nylon brushes. The 2-3% aqueous solution of SPC was sprayed as fungicidal treatment over treated and dried surface of the monument. The deteriorated and weak portion of the monument was consolidated using an ethyl silicate based stone strengthener Wacker OH-100. The treated surface was given water repellent treatment with two coats of Wacker BS-290 solution in MTO.

89. SARAI COMPLEX, NUR MAHAL, DISTRICT JALANDHAR

The cells of inner *sarai* complex of brick construction were subjected to treatment for removal of superficial accretions and micro-vegetational growth using 2% aqueous mixture of ammonia and non-ionic detergent with the help of soft nylon brushes. The cleaned surface was given fungicidal treatment using 3% aqueous solution of SPC. The weak and fragile portions of the wall were consolidated using ethyl silicate based stone strengthener Wacker OH-100. Finally, silicon based water repellent Wacker BS-290 in MTO was applied as a protective coat over the entire treated and dried surface.

RAJASTHAN**90. MANDLESHWAR MAHADEV TEMPLE, ARTHUNA, DISTRICT BANSWARA**

In continuation of previous year's work, the interior and exterior surface of this temple was taken up for the removal of micro-vegetational growth and other surface accretions using 2-3% liquid ammonia solution with non-ionic detergent. The *sikhara* portion was also cleaned gently followed by application of aqueous SPC as fungicidal treatment on the entire cleaned surface. Finally, silicon based water repellent Wacker BS-290 in MTO was applied as protective coat over the entire treated and dried stone surface.

91. FORT CHITTAURGARH, CHITTAURGARH, DISTRICT CHITTAURGARH

In continuation of previous year's work was taken up on the gate of Ratan Singh palace and sub-shrines of Choth Mata temple, Visnu temple and Laxmi temple. Choth Mata temple, Visnu temple, Laxmi temple and inside wall and rooms of Ratan Singh palace around garden are constructed of sandstones where as gate of Ratan Singh palace is lime plastered from exterior side. Work was carried out to eradicate depositions of dried micro-vegetational growth, dust and dirt with the help of 2-3% liquid ammonia solution and non-ionic detergent. The lime depositions were removed chemico-mechanically by using 1% dilute acetic acid solution followed by thorough washing with clean water. The cleaned surface was then subjected to fungicidal and water repellent treatments.

The outer *sikhara* portion including *mandapa* of the southern and western side of Kalika Mata Temple was taken up for removal of micro-vegetational growth and other surface accretions by using 2-3% aqueous ammonia

solution and non-ionic detergent. The cleaned and dried surface was giving a fungicidal treatment with 2% aqueous solution of SPC and was finally preserved using a silicone based water repellent Wacker BS-290 in MTO. The work was still in progress.

92. MAHANALA TEMPLE COMPLEX, MENAL, DISTRICT CHITTAURGARH

In continuation of the previous year's work, the hard lime deposition on the interior portion of the *mandapa* of Jaleshwar Mahadev temple was removed with the help of 1-2% aqueous solution of glacial acetic acid by gentle brushing. After thorough washing and drying, the micro-vegetational growth was removed using 2-3% liquid ammonia with non-ionic detergent in aqueous media with the help of soft nylon brushes. The cleaned and dried surface was then subjected to a fungicidal treatment using SPC to arrest further micro-biological growth. Finally, a water repellent treatment was given by applying a coat of Wacker BS-290 in MTO.

93. KUMBHALGARH FORT, KUMBHALGARH, DISTRICT RAJSAMAND

Conservation work on Gole Rao Temple 1, 2 and 3 was taken up for the removal of micro-vegetational growth, dust, dirt, etc. by using 2-3% aqueous solution of liquid ammonia mixed with non-ionic detergent, followed by a thorough wash with clean water. The cleaned and dried surface was then given a fungicidal treatment with 2% aqueous solution of SPC. Finally, the cleaned and dried stone surface was preserved using Wacker BS-290 in MTO as water repellent treatment. Work on Jain Temple 2 and 3, Parshavnath temple at Kumbhalgarh fort including boundary wall of Vedi Temple was taken up for the removal of superficial deposits and micro-vegetational growth, dust and dirt, etc. by using 2-3%

aqueous solution of liquid ammonia mixed with non-ionic detergent, followed by thorough wash with clean water. The cleaned and dried surface was then given a fungicidal treatment by spraying 2% aqueous solution of SPC. Finally, the cleaned and dried stone surface was preserved by using Wacker BS-290 in MTO as water repellent treatment. In continuation of the previous year's work was taken up on the interior face of Rampole with adjacent fort walls for the removal of dirt, dust and micro-biological growth. 2-3% ammonia solution mixed with non-ionic detergents was used to facilitate the removal of accretionary deposits. The cleaned and dried surface was then given a fungicidal treatment with 2% aqueous solution of SPC. Finally, the entire cleaned and dried surface was preserved with a silicone based water repellent Wacker BS-290 in MTO.

94. BISALDEV TEMPLE, BISALPUR, TODA RAI SINGH, DISTRICT TONK

In continuation of the previous year's work, has been taken up for the removal of surface accretions such as dirt, dust and micro-vegetational growth using 2-3% aqueous solution of ammonia and non-ionic detergent. The cleaned surface was then given a fungicidal treatment using aqueous solution of 2% SPC followed by application of a preservative coat of a water based emulsion Wacker SMK-1311 as water repellent.

95. KALYAN RAI TEMPLE, TODA RAI SINGH, DISTRICT TONK

In continuation of the previous year's work, was carried out to eradicate micro-biological growth with the help of 2-3% ammonia solution mixed with non-ionic detergent by gentle brushing with soft nylon brushes. The cleaned surface was then given a fungicidal treatment with 2% aqueous solution of SPC as a fungicide to arrest further micro-biological growth. The cleaned and dried surface

was preserved with a silicone based water repellent Wacker BS-290 in MTO (Pls. 258-259).

96. PIPAJI TEMPLE, TODA RAI SINGH, DISTRICT TONK

In continuation of the previous year's work, was taken up for the removal of surface accretions such as dirt, dust and micro-vegetational growth by using 2-3% aqueous solution of ammonia with non-ionic detergent. The cleaned surface was then given a fungicidal treatment using aqueous solution of 2% SPC followed by application of a preservative coat of Wacker SMK-1311 in water.

TAMILNADU

97. GROUP OF MONUMENTS, MAHABALIPURAM, DISTRICT KANCHIPURAM

The rock cut structures and sculptures of Arjuna's penance, Krishna *mandapa*, Varahmandapa, Ganesa ratha, Pandava cave, Trimurthi cave and Rayar *gopuram* on granite were chemically treated for the removal of dust, dirt and micro-vegetational growth by using ammonia and non-ionic detergent solution. After removing the accretions completely the area was washed with plenty of water and then 2% solution of SPC was applied as fungicide on dried surface. Finally, cleaned and dried surface was preserved with a silicone based water repellent Wacker BS-290 in MTO.

98. ROCK-CUT JAINA TEMPLE, SITTANAVASAL, DISTRICT PUDUKKOTTAI

In continuation of the previous year's work of paintings and Jaina beds of rock cut Jaina temple, Sittanavasal was taken up. The paintings were treated with organic solvents like sulphur free toluene, ethoxy ethanol and turpentine oil for the removal of dust and old preservative. Finally, fresh 1% solution of PVA

in toluene was applied as preservative. Jaina beds were also treated with non-ionic detergent and ammonia solution for the removal of vegetational growth, dust and dirt. Finally, fungicide and preservative coating were applied.

99. SRI VARADARAJA SWAMY TEMPLE ON HILL, SANKAGIRI, DISTRICT SALEM

In continuation of previous year's work, the work of remaining *mandapas* was taken up for the removal of lime wash accretions with dilute acetic acid solution and for the removal of dust, dirt and micro-vegetational growth mixture of aqueous ammonia and non-ionic detergent was used. Application of 2% aqueous solution of SPC as a fungicide was given on the exterior portions. Finally, over exterior surface a water repellent treatment was given using a silicone based Wacker BS-290, diluted with MTO in 1:14 ratio.

100. SRI BRIHADESVARA TEMPLE, THANJAVUR, DISTRICT THANJAVUR

In continuation of the previous year's work of the main *vimana nayaka* was taken up for the removal of surface accretions viz., micro-vegetational growth, dust, dirt, bird's excreta, etc. For the removal of surface accretions mixture of non-ionic detergent and ammonia solution in 1:3 ratio was used. After removing the accretions completely the area was washed with plenty of water and then 2% solution of SPC was applied as fungicide and finally, cleaned and dried surface was preserved with a silicone based water repellent Wacker BS-290 in MTO. One panel of *nayaka* painting which was superimposing the painting of Chola period was also stripped out and mounted on epoxy panel.

To prevent the growth of micro-organisms over this stucco Keralantaka

gopuram, 2% solution of SPC followed by Wacker SMK-1311 in water in 1:14 ratio was applied on chemically treated surface. Stone sculptures like walls and doorjambs below stucco *vimana* were covered with dust, dirt and other accretions. For this the area was chemically treated with non-ionic detergent and ammonia solutions in 1:3 ratio. After cleaning, the surface was washed with plenty of water and 2% solution of SPC was applied as fungicide and finally on dry surface Wacker BS-290 in MTO in 1:14 ratio was applied as preservative. Vandalism marks over the Maratha paintings in the open *mandapa* of west side were also chemically cleaned.

101. SRI JALAKANTESWARA TEMPLE, VELLORE, DISTRICT VELLORE

In continuation of the previous year's work, for the remaining portions of this temple which is of granite stone was taken up for the removal of dust, dirt and micro-vegetational growth. Aqueous ammonia and non-ionic detergent solution was used for cleaning, followed by application of 2% aqueous SPC as fungicidal treatment on the exterior portions. The fragile stone portions were strengthened by applying an ethyl silicate based stone strengthener Wacker OH-100. Finally, a water repellent treatment was given to the dried surface using a silicone based water repellent Wacker BS-290, diluted with MTO in 1:14 ratio.

102. SRI SUBRAMANYASWAMY TEMPLE AND JAINA CAVE, VALLIMALAI, DISTRICT VELLORE

The granite stone sculptures, walls and pillars of Sri Subramanyaswamy temple and Jaina cave of Vallimalai were taken up for the removal of dust, dirt, lime wash and micro-vegetational growth. Dilute acetic acid solution was used for the removal of lime wash accretions. Non-ionic detergent and ammonia

solution was used in general for the removal of dust, dirt and micro-vegetational growth followed by application of 2% solution of SPC as a fungicidal treatment on the exterior portions. Over exterior surface a water repellent treatment was given by using a silicone based Wacker BS-290, diluted with MTO in 1:14 ratio.

UTTARAKHAND

103. SUN TEMPLE, KATARMAL, DISTRICT ALMORA

The group of 46 temples including one huge temple of lord Surya that are built of sand stones were taken up for the removal of thick micro-vegetational growth, loose dust and dirt etc. The micro-vegetational accretions were eradicated by treating with 2-5% aqueous ammonia solution and a little non-ionic detergent. The entire treated surface was given a coat of 2% solution of SPC as fungicidal treatment. Finally, over exterior surface a water repellent treatment was given using a silicone based Wacker BS-290, diluted with MTO in 1:11 ratio.

104. MRITYUNJAY GROUP OF TEMPLES, DWARAHAT, DISTRICT ALMORA

The Mrityunjay group of Temples comprises of Mrityunjay temple, Bharionath temple and an open courtyard that are built of gray sandstone were taken up for the removal of micro-biological growth dust, dirt and other superficial accretions on the interior surface. The loose dust and dirt was brushed off using soft nylon brushes. The micro-vegetational growth alongwith grime was eradicated by treating with 2-5% aqueous ammonia solution and a little non-ionic detergent. The interior portions were treated by applying the paste of Fuller's earth containing traces of cellosolve and some organic solvents in suitable

proportion in order to loosen the greasy and tough accretions. The paste so applied was covered with polythene sheets. After drying, the paste was removed.

105. GROUP OF TEMPLES, GOPINATH, GOPESHWAR, DISTRICT CHAMOLI

The exterior surface of the Gopinath group of Temples became black due to the deposition of dust, dirt and dried micro-vegetational growth. The interior surface was imparting a black appearance due to the deposition of soot and greasy matters owing to the practice of lighting oil lamps. The loose dust and dirt was brushed off using soft nylon brushes. The micro-vegetational growth alongwith grime was eradicated by treating with 2-5% aqueous ammonia solution and a little non-ionic detergent. The interior portions were treated by applying the paste of Fuller's earth containing traces of cellosolve and some organic solvents in suitable proportion in order to loosen the greasy and tough accretions. The paste so applied was covered with polythene sheets. After drying the paste was removed.

106. GROUP OF TEMPLES, ADI BADRI, DISTRICT CHAMOLI

The Group of Temples known as Adi Badri that comprises fourteen temples are constructed with sand stone. There was heavy deposition of dust, dirt and dried micro-vegetational growth on the exterior surface while the interior surface of the temple became black due to the deposition of soot and smoke. To remove the micro-vegetational growth and other accretions 2-5% aqueous ammonia solution containing the little liquid, non-ionic detergent was used. The interior portions were treated by using Fuller's earth containing traces of cellosolve and some organic solvents in suitable proportion in order to loosen the greasy and tough accretions. The paste so

applied was covered with polythene sheets. After drying, the paste was removed with soft nylon brushes. Some weak portions of stone were consolidated using an ethyl silicate based stone strengthener Wacker OH-100. The treated surface was given fungicidal treatment using 2% SPC. Finally, the cleaned and dried surface was preserved with a silicone resin Wacker BS-290 in MTO in the ratio of 1:11.

107. MAHASU TEMPLE, HANOL, DISTRICT DEHRADUN

The work was taken up for the removal of thick deposition of micro-biological growth, dust and dirt from the exterior surface, deposition of soot, smoke, sticky oily and greasy matter from the interior surface and the gates of main sanctorum and *grabhagriha* which is of silver metal turned black due to deposition of above mentioned accretions. The exterior surface of the temple was treated with 2% aqueous ammonia containing a little non-ionic detergent. Tough and sticky accretions were removed by applying ammonia solution and non-ionic detergent mixed with the traces of hydrogen peroxide and tri-ethanolamine. The lime wash, coat was removed by the solution of dilute acetic acid. The black accretions of interior surface were cleaned with clay pack technique. The paste was applied homogenously by using Fuller's earth in distilled water containing sodium carbonate and cellosolve. The silver surface was cleaned scientifically using mild solutions of oxalic acid, tartaric acid and ammonia. Scientifically treated exterior surface was subjected to biocidal treatment. Two coats of 2-3% SPC was applied on the dried surface. Finally, the dried surface was preserved with a silicone based water repellent Wacker BS-290 diluted in MTO in the ratio of 1:11.

UTTAR PRADESH

108. AKBAR'S MAUSOLEUM, SIKANDRA, DISTRICT AGRA

In continuation of previous year's work for the removal of dirt, dust, smoke, tarry matters and micro-biological accretions was continue by using clay pack method by applying a paste of Fuller's earth containing traces of cellosolve and some other organic solvents in suitable proportions. The paste of Fuller's earth was applied over the marble surface and then covered with polythene sheets. The surface was made free of this paste and thoroughly washed. Finally, the cleaned surface was treated with a paste mixture of lead oxide and tin oxide to retain its original lusture.

109. AGRA FORT, AGRA, DISTRICT AGRA

In continuation of previous year's work was taken up for the removal of dust, dirt, smoke, tarry matters and micro-vegetational growth from the marble surface of the Moti Masjid because the exterior marble surface of this mosque had turned pale and dark brown in appearance, which was cleaned by clay pack method by applying a paste of Fuller's earth containing traces of cellosolve and some suitable organic solvents in appropriate proportion in order to loosen the greasy and hard accretions. The paste of fuller's earth was applied over the marble surface and then covered with polythene sheets. It was left for a day allowing the proper adsorption to take place. The surface was made free of this paste and thoroughly washed. The cleaned surface was treated with the mixture of lead oxide and tin oxide to retain its lusture.

110. GROUP OF MONUMENTS, FATEHPUR SIKRI, DISTRICT AGRA

In continuation of previous year's work was taken up on the red sandstone and lime plastered surface of this Hiran Minar for the removal of micro-biological growth and other accretionary deposits using 2-3% solution of aqueous ammonia and non-ionic detergent. The lime depositions were removed by chemico-physical methods. After chemical cleaning fungicidal treatment was given with 2% solution of SPC on the exterior surface followed by preservative treatment with the application of two coats of a silicone based water repellent Wacker BS-290 diluted in MTO in the ratio of 1:10 wet-on-wet basis.

In continuation of previous year's work was taken up on the sand stone surface of Hathi Pole Gate and Water Tank for the removal of micro-vegetational growth, dust, dirt and other superficial accretionary deposits using 2% aqueous ammonia solution and little non-ionic detergent. The cleaned exterior surface was then subjected to a fungicidal treatment by applying 2-3% aqueous solution of SPC followed by preservation with a silicone based water repellent Wacker BS-290 diluted in MTO in the ratio of 1:11.

The interior of Hakim hamam was beautifully painted by geometrical designs. Fixing and filleting work was also attended. After retouching and colour reintegration, a coat of PVA in toluene was applied as a preservative.

111. ROMAN CATHOLIC CEMETERY, AGRA, DISTRICT AGRA

The work was taken up for the tomb of Col. Hastings and other small tombs for the removal of micro-vegetational growth, dust, dirt and other terry matters. Due to thick deposition of micro-vegetational growth the tomb has become blackish in appearance. The

loose dust and dirt was brushed off using soft nylon brushes from the exterior surface of the monument. The micro-vegetational accretions were eradicated by treating with 2% aqueous ammonia solution containing a little non-ionic detergent. The cleaned surface was given a coat of 2% SPC as a fungicidal treatment. The surface so prepared was preserved with a silicone based water repellent Wacker BS-290 diluted in MTO in the ratio of 1:11.

112. KHUSROO BAGH TOMBS, DISTRICT ALLAHABAD

In continuation of previous year's work was taken up for the dome and *burjis* of the tombs situated in the Khusrroo Bagh complex for the removal of micro-vegetational growth, lime patches and lime coatings, dust and dirt. The loose dust and dirt was brushed off using soft brushes. The micro-biological accretions was eradicated using 3-5% aqueous ammonia solution adding a little of liquid non-ionic detergent from the sandstone and plastered surface. The lime plaster surface was treated with bleaching powder. The treated sandstone and lime plastered surface was given biocidal treatment by applying 2-3% solution of SPC in water. Lime coating was removed by using 1% of acetic acid solution. The weak stone surface was consolidated using an ethyl silicate based stone strengthener Wacker OH-100. Finally, the above treated dried sandstone surface was preserved with a silicone based water repellent the Wacker BS-290 diluted in MTO in the ratio of 1:11.

113. MAKHDOOM JAHANIA, KANNAUJ, DISTRICT KANNAUJ

The three tombs and one mosque were taken up for the removal of micro-vegetational growth, dust, dirt and other accretionary deposits. The micro-vegetational growth was eradicated by treating with 2% aqueous

ammonia solution containing a little liquid non-ionic detergent. The treated surface was given a coat of 2% SPC. The weak stone surface was consolidated using an ethyl silicate based stone strengthener Wacker OH-100. Finally, the above treated dried sandstone surface was preserved with a silicone based water repellent Wacker BS-290 diluted in MTO in the ratio of 1:11.

114. JAINA TEMPLE, DEOGARH, DISTRICT LALITPUR

The chemical treatment work was taken up for the exterior surfaces of the temple which have become black due to the deposition of dust, dirt and dried micro-biological growth. The black depositions were very thick and badly affected the beauty of carvings and images. There is a deposition of lime beneath the black depositions. The dried vegetation growth and other black accretions were removed using 3-5% aqueous ammonia solution adding a little of liquid non-ionic detergent with the help of soft nylon/coir brushes. The work is still in progress.

115. SADAT ALI TOMBS AND MURSHID JADI, LUCKNOW, DISTRICT LUCKNOW

The tomb is built of *lakhauri* bricks using lime plaster as mortar. The chemical conservation work was taken up for the removal of thick growth of micro-vegetation, dust, dirt and other accretionary deposits over the sandstone and plastered surface. The loose dust and dirt was brushed off using soft brushes. The spores of deep-rooted micro-organism were killed by applied a coat of calcium hypochlorite paste on the lime plastered surface. The paste was allowed to remain on the surface for at least 6-8 hours. The harmful, biological and micro-biological accretions were eradicated using 3-5% aqueous ammonia solution adding a little of liquid non-ionic detergent with the

help of soft nylon/coir brushes from plastered surface. The treated sandstone and lime plastered surface was then given biocidal treatment, by applying 2-3% solution of SPC in water. Finally, the above treated surface, on being completely dry, was preserved with the Wacker BS-290 diluted in MTO in the ratio of 1:11.

116. ROMAN CATHOLIC CHURCH, SARDHANA, DISTRICT MEERUT

The exterior surface of both the towers of Roman Catholic Church became black at many places due to the deposition of dust, dirt and dried biological growth. These accretions on the surface were imparting a very shabby and unpleasant look. The loose dust and dirt was brushed-off using soft brushes. The spores of deep rooted micro-organism were killed by applying a coat of calcium hypochlorite paste on the plastered surface. The paste was allowed to remain on the surface for at least 6-8 hours. The micro-vegetational growth was removed by using 3-5% aqueous ammonia solution adding a little of liquid non-ionic detergent with the help of soft nylon/coir brushes from plastered surface. The treated plastered surface was given biocidal treatment, by applying 2-3% solution of SPC in water. The weak stone surface was consolidated using an ethyl silicate based stone strengthener Wacker OH-100. Finally, the above treated dried sandstone surface was preserved with a silicone based water repellent the Wacker BS-290 diluted in MTO in the ratio of 1:11. The metallic portion was cleaned using mild solution of oxalic acid, tartaric acid and preserved with solution of PVA in toluene.

117. LAL KHAN TOMB, VARANASI, DISTRICT VARANASI

This tomb, having lime plastered domes and coloured tiles was subjected to chemical treatment for the removal of thick

micro-vegetational growth, dust, dirt, smoke and bird's excreta by using 3% solution of ammonia and teepol. The cleaned surface was then given fungicidal treatment followed by application of silicone based water repellent Wacker BS-290 diluted in MTO in the ratio of 1:11.

118. PANCHAYATANA TEMPLE ADJOINING VOTIVE STUPAS AND OTHER ANCIENT REMAINS, SARNATH, DISTRICT VARANASI

Mostly brick structure and partially lime plastered Panchayatana temple and other shrines of Sarnath excavated site were subjected to removal of micro-vegetational growth, bird's excreta and other accretionary deposits by using 5% solution of ammonia and non-ionic detergent. After cleaning the complete dried surface was given fungicidal treatment with 5% solution of SPC to arrest the vegetational growth. Finally, the above treated and dried surface was preserved with a silicone based water repellent Wacker BS-290 diluted in MTO in the ratio of 1:11. The work is still in progress.

WEST BENGAL

119. BEGUNIA GROUP OF TEMPLE, BARALAR, DISTRICT VARDHMAN

The Group of four temples (Kali, Ganesa, Siva and Durga) built of sandstone was subjected to chemical treatment in order to remove micro-vegetational growth, dust, dirt and bird's excreta including strengthening of fragile and powdery carvings and sculptures. The surface was cleaned with the help of 5% aqueous ammonia solution and non-ionic detergent by gentle brushing with suitable nylon

brushes. The weak stone surface was consolidated using an ethyl silicate based stone strengthener Wacker OH-100. The cleaned area was then subjected to fungicidal treatment followed by application of Wacker BS-290 in MTO in the ratio of 1:10 as preservative. The work is in progress.

TREATMENT OF EXCAVATED OBJECTS AND MUSEUM EXHIBITS²

120. Ancient metallic coins and an image from Ahichhatra excavation site, received from Agra Circle have been chemically treated and preserved.
121. Antiquities of copper, silver, iron and lead coins from Daultabad fort, Daultabad have been chemically treated and preserved.
122. Wooden doors from Daultabad fort were chemically treated and preserved.
123. One hundred fifty antiquities received from Aurangabad Circle have been chemically treated and preserved.
124. Fortythree antiquities of iron, brass and silver received from Excavation Branch-IV, Bhubaneswar have been chemically treated and preserved.
125. A terracotta monastic sealing, received from Excavation Branch-IV, Bhubaneswar has been chemically treated and preserved.
126. Fifteen numbers of antiquities mainly of terracotta and potteries received from Archaeological museum, Ropar have been chemically treated and preserved.

². Chemical treatment carried out by 120, Zonal Laboratory, Agra; 121-123, Zonal Laboratory, Aurangabad; 124-125, Regional Laboratory, Bhubaneswar; 126, Zonal Laboratory, Chandigarh; 127-135, Laboratory, Science Branch, Dehradun; 136-137, Zonal Laboratory, Delhi and 138, Zonal Laboratory, Mysore of the Survey.

127. Seventeen archival art materials received from the Taj Museum, Taj Mahal, Agra have been chemically treated and preserved.
128. Lime mortar samples from stupa collected from the excavated site at Kanganahalli near Sannati in Chitapur taluk of district Gulbarga, Karnataka received from Director (Conservation) was analyzed to determine its chemical composition.
129. Eleven mortar samples collected from Mahabodhi Temple, Bodhgaya have been analysed to determine their chemical composition.
130. Six samples of mortar/mud plaster from *Chauburji*, Itimad-ud-Daula, Agra being analyzed for determining their chemical composition.
131. Seven mud plaster samples from Ellora Cave nos. 5 and 6 have been analyzed for determining their chemical composition.
132. Two metal samples (brass) from main Mausolium door, Bibi-ka-*maqbara*, Aurangabad have been analyzed for determining their chemical composition.
133. A Japanese painting received from Swami Rama centre, Jolly Grant, Dehradun has been restored.
134. Four lime plaster samples from Bharat Mata temple, Daulatabad fort, Aurangabad have been analyzed for determining their chemical composition.
135. Scientific and analytical studies of samples (what sort of samples) collected from Red fort, Delhi with regard to preparation of comprehensive conservation management plan of Red fort, Delhi is in progress.
136. Chemical cleaning and analysis of metal antiquities received from excavation at Siswania, District Basti were carried out.
137. Marble sculptures in the marble hall collection of President's Secretariat were chemically treated and preserved.
138. Twenty four lead coins received from the excavated site at Sannati Buddhist site in Chitapur taluk, District Gulbarga, Karnataka are being chemically treated and preserved.
139. The colour of marble surface of Victoria Memorial Hall has changed its appearance along with its deterioration due to effects of various pollutants like smoke, dust, dirt and greasy matter. In continuation of previous year's work has been taken up on the south and north side of the exterior surface which is of rough coarse marble and interior surface of the north-west restoration room of marble and sandstone materials along with metal structures. The clay pack method was used for cleaning of marble surface by applying the paste of Fuller's earth containing traces of sodium carbonate, sodium bicarbonate and hydrogen peroxide in order to loosen the greasy and hard accretions. The sandstone surface was cleaned using a mixture of aqueous ammonia solution and non-ionic detergent followed by thorough washing with clean water. The work is still in progress.
140. Cleaning, consolidation and preservation work was carried out on the mural paintings of Shri Guru Ram Rai Durbar, Dehradun. The work is still in progress.
141. The Ambient Air Quality Monitoring Station (AAQMS) at Taj Mahal, Agra has been monitoring and analyzing the presence of air pollutants such as sulphur

dioxide (SO_2), oxides of nitrogen (NO_x) and suspended particulate matter (SPM) in the ambience of Taj Mahal. Besides these pollutants, some environmental chemical activities such as dust fall rate and sulphation rate were also calculated in this laboratory in respect to Taj Mahal and Agra fort. Meteorological parameters which may affect the activity of the above cited pollutants *viz.*, temperature, relative humidity, wind speed/wind direction, solar radiations and rain fall were also monitored.

A. Chemical parameters

- i. Sulphur dioxide: The maximum concentration of SO_2 was recorded as $15.75 \mu\text{g}/\text{M}^3$ in the month of January 2007, whereas the maximum monthly average concentration was recorded as $05.18 \mu\text{g}/\text{M}^3$ in the month of January 2007. The monthly annual concentration of SO_2 for the period between April, 2006 and March, 2007 was measured as $3.49 \mu\text{g}/\text{M}^3$.
- ii. Nitrogen dioxide: The maximum concentration of NO_2 was recorded as $23.44 \mu\text{g}/\text{M}^3$ in the month of May 2006, whereas maximum monthly average concentration was recorded as $13.19 \mu\text{g}/\text{M}^3$ in the month of December, 2006. The annual concentration of NO_2 for the period between April, 2006 and March, 2007 was calculated as $7.02 \mu\text{g}/\text{M}^3$.
- iii. Sulphation rate: Sulphation rate is an important factor and is described as the rate at which SO_2 in the atmosphere gets converted into SO_3 . This SO_3 in turn transforms into sulphuric acid, which, if comes in contact with the marble may cause its dissolution. The maximum sulphation rate was calculated as 0.0288

gm $\text{SO}_3/\text{m}^2/\text{day}$ in the month of April, 2006 at Taj Mahal.

B. Physical parameters

- i. Dust fall rate: Dust is a carrier of various pollutants present in the atmosphere. These particles can cause abrasion to the marble surface if strike with momentum. The maximum dust fall rate was recorded $5.24 \text{ MT}/\text{Km}^2/\text{month}$ in the month of May, 2006 at Taj Mahal, Agra. Volatile matter of dust fall has also been estimated during the period.
- ii. Suspended Particulate Matter: The tolerable limit for SPM has been fixed as $100 \mu\text{g}/\text{M}^3$ for the sensitive zone of the monument. The maximum monthly average concentration of SPM was recorded in month of May, 2006 as $681.67 \mu\text{g}/\text{M}^3$. The monthly annual average concentration of SPM for the period between April, 2006 and March, 2007 was calculated as $253.819 \mu\text{g}/\text{M}^3$.

C. Meteorological parameters

- i. Wind speed and wind direction: Wind speed and wind direction have been monitored with the help of wind monitor (WM-200). During the period under review, light air ($1\text{-}5\text{km/hr}$) was recorded. In the months of April to June, 2006, light to strong wind was recorded. The direction of wind flow remained variable.
- ii. Temperature and Relative Humidity: The maximum temperature was recorded 43°C in the month of May, 2006, while the minimum temperature was recorded as 4.4°C in the month of December, 2006. The relative humidity varied from 15% and 99% during the period under review.
- iii. Rainfall: The total rainfall was recorded 459.5mm during the period under review.

The maximum rain fall was recorded as 251.5mm in the month of July, 2006.

- 142.** To study the levels of suspended particulate matter and important gaseous pollutant in the ambient air in and around Charminar and their impact on the stability of structures are being carried out.

RESEARCH AND ANALYSIS³

- 143.** Petrological studies of stone samples received from different archaeological monuments situated at Hyderabad, Gopeshwar, Adibadri, Khajuraho, Gwalior with the view to have complete information about the action of deteriorating agencies have been completed. A comparative study of weathered stone samples of Red fort, Delhi under the “Comprehensive Conservation Management Plan, Red Fort” was carried out in the laboratory.

- 144.** Physico-chemical studies on polymers in conservation of stone- efficacy of synthetic polymers Topcoat and Wacker as consolidants for red sandstone was carried out. Samples were artificially weathered and physico-chemical properties *e.g.*, water-absorption by

capillary, immersion, rate of water evaporation and surface roughness were also studied.

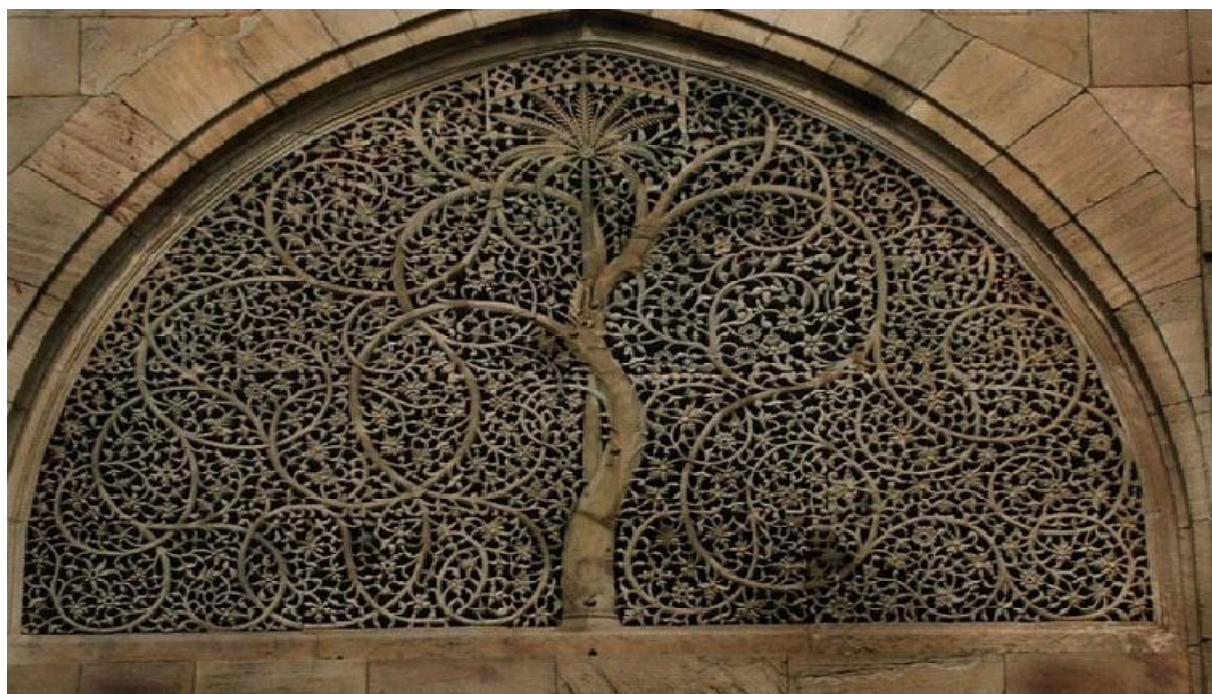
- 145.** Bio-deterioration studies of monuments and museums of Rajasthan was conducted. Walls of Amber Fort, Jaipur were treated with different homoeopathic drugs (Petroleum-30, Rumex-200, Arsenicum-30, Sulphur-1M and biocide Naphthaquinine). No effective results were found.

- 146.** The Laboratory is presently engaged in the conservation of maps and drawings of World Heritage Site, CST, Mumbai. Another main project in hand is the conservation of manuscripts belonging to Rashtriya Sanskrit Sansthan, Allahabad.

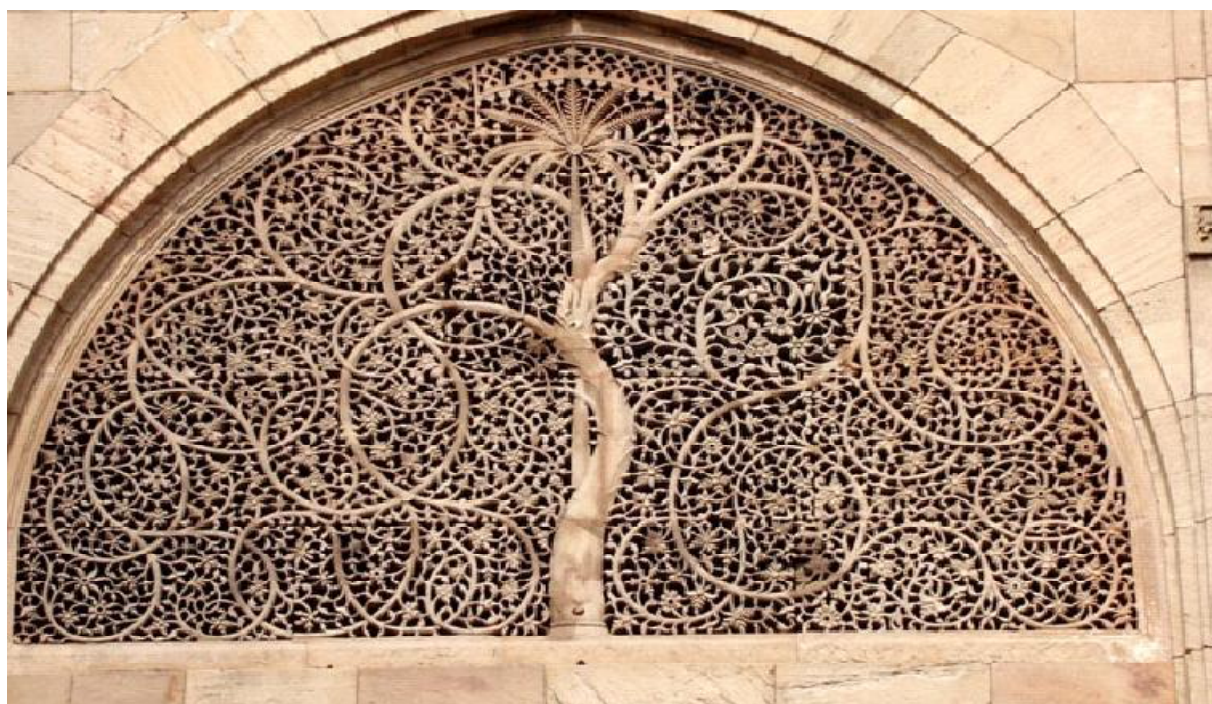
- 147.** The Regional Conservation Laboratory, Mysore was designated as a research centre of the National Manuscripts Mission. The Laboratory will carry out research in the field of lamination, mass de-acidification, adhesives for palm-leaf and traditional methods of conservation under this project.

- 148.** A 3-week training in the conservation of art objects was organized for the Asstt. Archaeological Chemists from different branches of the Survey from 9-28th April, 2007. 15 persons attended and successfully completed the training.

³ Information from: 143, Stone Conservation Laboratory, Agra of the Survey; 144-148, National Research Laboratory for Conservation of Cultural Property, Lucknow.



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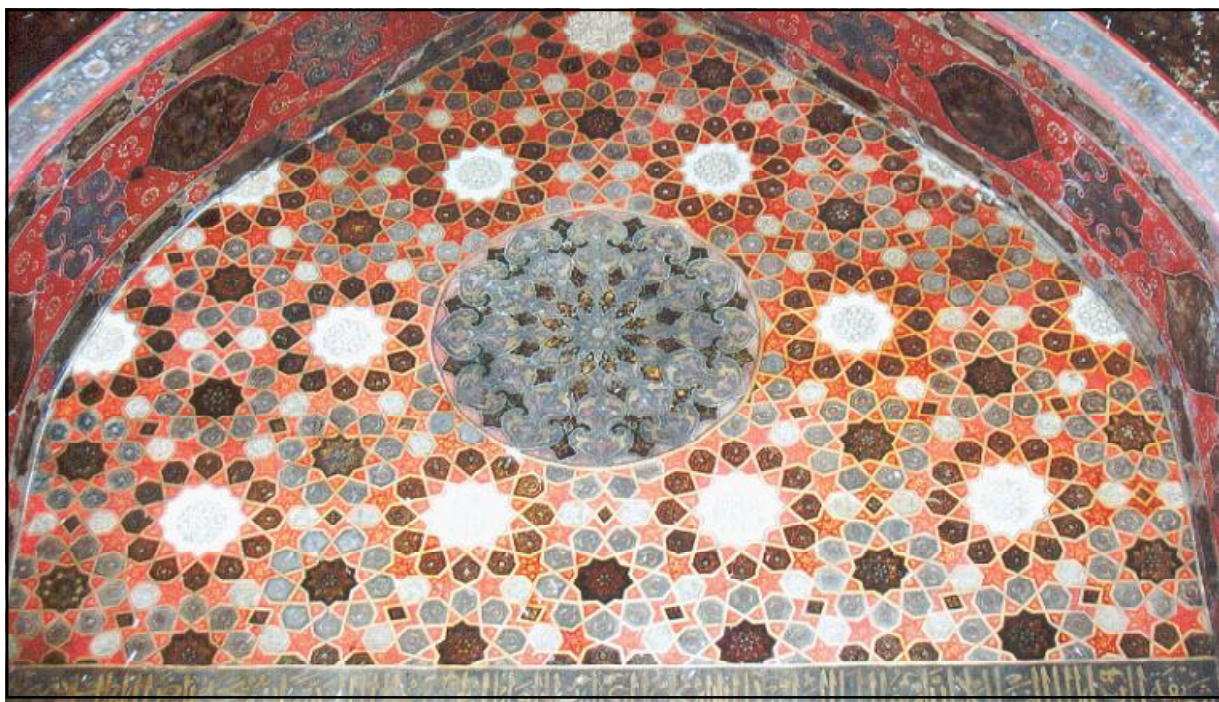


249

Siddi Sayed mosque, Ahmedabad: 248, before and 249, after chemical conservation. See p. 317



250



251

Ahmed Shah Wali Tomb, Asthur: 250, before and 251, after chemical conservation. See p. 320



253

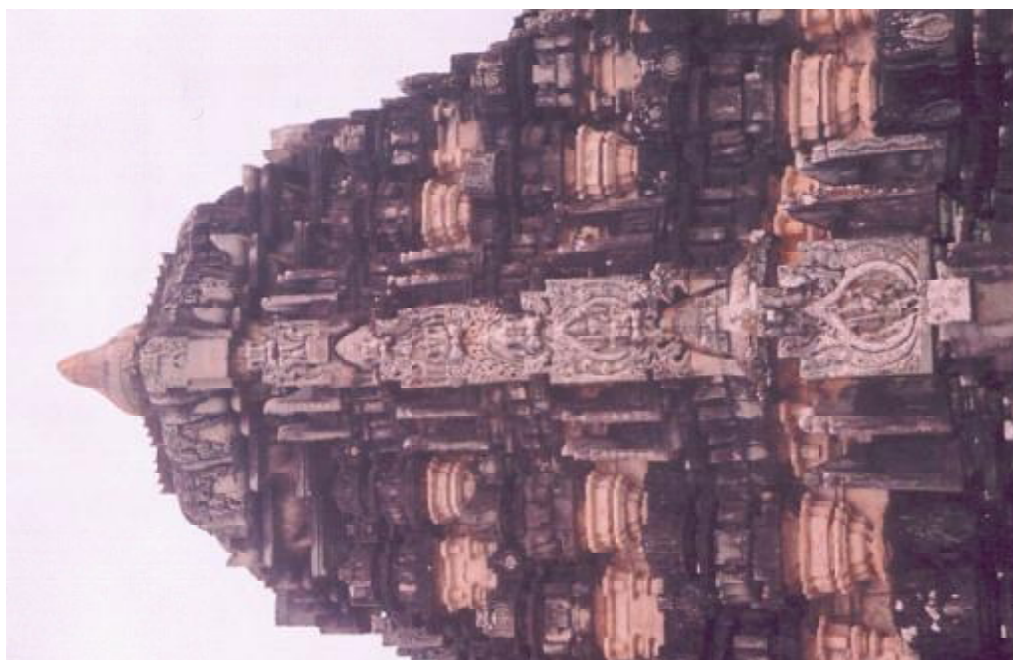


252

Gomeateswara statue, Sravanabelagola: 252, before and 253, after chemical conservation. See p.321



255



254

Kadareswara temple complex, Belligavi: 254, before and 255, after chemical conservation. See p.321



257

Sri Vadakkunathan temple: 256, before and 257, after chemical conservation. See p. 322



256



258



259

Kalyan Rai Temple, Toda Rai Singh: 258, before and 259, after chemical conservation. See p. 332

X. ARCHAEOLOGICAL GARDENS

DELHI

1. RED FORT, DELHI

The area on south western side of Dewan-i-Am is landscaped. A pump is installed in ancient well for irrigation of this area. After trenching the area backside of barrack was given shape to suit to the surrounding and grassed.

2. MANDI MOSQUE, DELHI

There is small area around the mosque with no water supply arrangement. The Mandi mosque is in ridge area of southern Delhi. The front area was full with stones and *malba*, it was removed to the depth of 20cm and compensated with good earth, to develop lawn. The garden development including plantation is completed.

GUJARAT

3. CITADEL WALL, PAVAGADH, DISTRICT GODHRA

The outer area on south western side along citadel wall facing the main road from Vadodara to Pavagadh is taken up for development. The area was full with wild vegetation and stones including wall members. All the wall member stones and other stones are stacked separately at suitable place and the area was dug after clearing the wild vegetation. The good earth was added to compensate the *malba* and stone and manure was added to increase fertility of soil and grassing and plantation is done after dressing of the area. The water supply arrangement is made from bore well at *Shahar-ki-masjid* (Pls. 260-261).

4. ANCIENT SITE, LOTHAL, AHMEDABAD

The whole region at Lothal is badly effected with salinity and soil is clay in nature. The drinking water is brought from far distance. It was essential to take up environmental development to make the place tourist friendly. In first phase on experimental basis the front area of museum with some plantation in adjoining ancient site area is taken up. After clearing, the wild vegetation. The pits are dug for plantation and area in front of the museum has been grassed. The lawn and plants are in good condition.

5. NAGINA MASJID, PAVAGADH, DISTRICT GODHRA

The Nagina *masjid* is located in isolated place is scrub forest. The area was full with wild vegetation and thorny bushes and even trees and bushes grown on the ancient channel from *masjid* to well. The wild vegetation was uprooted. The area was given the shape while digging. The area is grassed and plantation work will be taken up as soon as conservation work will be over (Pls. 262-263).

HARYANA

6. RUINED QILLA (PRITHVI RAJ CHAUHAN'S FORT), HANSI, DISTRICT HISSAR

The fort of famous emperor Prithvi Raj Chauhan at Hansi occupies a large area, which is divided in two parts.

The outer area is a moat except in front of entrance to the fort. The fort wall is of mud and there is regular erosion of mud losing the glory. The outer area has only one structure

known as 'ghoda-ghar' (stable) and remains of brick structure. The moat area was undulated and full wild vegetation and thorny bushes of *Prosopis* (*Vilayati babul*), which made the area in accessible to visitors and it was being misused by local residents. The earth from the area was also being dug for their use. The inner vast area is undulated, and the excavations are also carried out in this area. There was no water supply arrangement and ground water is saline in nature. As the area is quit vast therefore in the first phase, the garden development in area in front of entrance is taken up to improve the environment.

To make water supply arrangement, a shallow bore well to the depth of 115' is sunk. In view of brick structural remains in the area trenching is not proposed, only good earth to the thickness of 15cm will be spread to develop lawns. A brick pathway is laid by the Chandigarh Circle. The work of development of garden is in final stage of completion and the lower moat area will be provided with plantation.

HIMACHAL PRADESH

7. HIDIMBA DEVI TEMPLE, MANALI, DISTRICT KULLU

The ancient temple of Hidimba devi is made of wood and the area is full with big trees of deodar. The area is irregular in shape with slope from south western side to north eastern side. The northern side has steep slope. The ground receive sparse sun light. Due to regular erosion the ground was undulated and having wild growth. The monument is in centre of city and being visited by domestic and foreign tourist. The landscaping of archaeological area around temple is taken up to arrest erosion and to make well maintained tourist friendly complex. The beautiful valley of snow and trees is attracting tourist from all over the world.

While trenching the area, it was shaped to restore original topography. The shrub plants are planted in the open area, which receives sunlight. The area is grassed and shade loving ground covers and bulbs are planted.

JAMMU AND KASHMIR

8. ANCIENT PALACE OF RAJA SUCHET SINGH, RAM NAGAR, DISTRICT UDHAMPUR

The place is located on hill slope. The existing garden was in front area but rear area was full wild vegetation. The lawn of existing garden were badly infested with weeds. Therefore landscaping of rear portion and regrassing of existing lawn is taken up to make whole area presentable. The irrigation pipe line is extended in rear portion, while trenching the area is shaped without disturbing topography of area. The grassing is done to arrest erosion from slopes. The creepers are also planted on slopes (Pls. 264-265).

9. SAMADHI OF QUEEN OF RAJA SUCHET SINGH, RAMNAGAR, DISTRICT UDHAMPUR

The *samadhi* is on north and western side of Ramnagar fort. The garden was maintained in the inner court yard of *samadhi*. The outer area was full with wild grasses. The garden is laid in outer area. The grassing was done after trenching and plantation is done along periphery. The shrubs are planted in group at suitable places.

10. SARAI INCLUDING GATEWAY, NURMAHAL, DISTRICT JALANDHAR

The *sarai* consist of vast courtyard and cells in the ancient wall of *sarai* and *masjid* in north western portion with two big gateways. The 8" dia. bore-well is sunk for irrigation. The some areas were full with *malba* and also having tar roads, these areas are to be dug to

the depth of 30cm and unserviceable material is to be removed to initiate the horticultural works. The level of area around *masjid* is higher than pathway, therefore it need to be cut to the level of pathway.

11. SARAI INCLUDING GATEWAY, DAKHNI, DISTRICT JALANDHAR

There is linear strip of land on all sides of monument. The area is almost leveled but full with wild grasses, which is cleared by digging to the depth of 45cm. The soil was good therefore only manure is added to improve fertility. The 8" *dia.* bore-well is sunk to depth of 100m and a submersible pump-set is installed for irrigation. The pits have been dug at periphery and at other places as per plan for plantation of trees and shrubs. After trenching and fine dressing of the area, grassing is done (Pls. 266-267).

RAJASTHAN

12. HATHI KHANA, BAYANA FORT, BAYANA, DISTRICT BHARATPUR

Bayana fort is situated on high hill and covering vast area of whole rocky hill. It is accessible from the west through steps up to top of hill. At foot of hill there is enclosure known as Hathi *bara*. It is little away from main road and one has to pass through village to reach Hathi Khana. In first phase woodland development is taken up to initiate development work along with water supply arrangement to convert this dreary starch of land in to green tourist friendly spot. The 8" *dia.* bore well to the depth of 105m is sunk. The pipe line is laid. The work of digging of pits for plantation of trees is in progress and further work will be taken up as soon as power supply is received.

13. ANCIENT SITE, SAMBHAR, DISTRICT JAIPUR

The ancient site Sambhar is close to famous largest salt lake Sambhar in Jaipur district. It is located on main road from Dudu to Phulera. The ancient site is spread over a large area with ancient remain at five places which are well conserved. The vegetation is scanty. There are thorny bushes of *prosopis juliflora* and xerophatic plants. The area receive poor rain fall. The ground water is saline and poor, therefore in first phase the work of water supply arrangement and environment development of area on both the sides of approach path from main road to site is taken up. The successful 12" *dia.* dug well to the depth of 62' is constructed. The Rajasthan State Electricity Board is requested for power supply. The wild grasses are uprooted by trenching.

14. MENAL TEMPLE, MENAL, CHITTAURGARH, DISTRICT CHITTAURGARH

The area is being visited by large number of tourists regularly. The loose stones are spread over the whole archaeological area and giving dreary and shabby looks. The water fall receives the water from seasonal river. In first phase, the area on both sides of approach path from road to temple is taken up and for water supply, 8" *dia.* bore well is sunk to the depth of 95m.

15. ANCIENT SITE, NAGRI, DISTRICT CHITTAURGARH

It is a mound having remains of ancient Siva temple and citadel wall of huge dry stone blocks. The area was full with wild vegetation and thorny bushes, which was destroying the archaeological remains. The area also become centre of anti-social activities. Therefore, it was essential to take-up environmental development of this site to make it tourist friendly. The 8" *dia.* bore well was sunk for irrigation. The wild vegetation was uprooted.



260



261

Citadel wall, Pavagarh: 260, before and 261, after landscaping. See p. 348



262



263

Nagina masjid, Pavagarh: 262, before and 263, after landscaping. See p. 348



264



265

Ancient Palace, Ramnagar: 264, front area and 265, after development. See p. 349



266



267

Dakhani Sarai, Dakhani: 266, before and 267, after development. See p. 350



268



269

Ancient site, Nagri: 268, before and 269, area after clearance. See p. 357



270



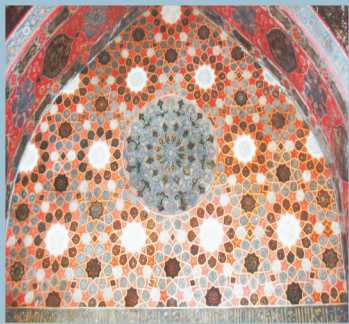
271

Kumbhalgarh fort, Kumbhalgarh: 270, before and 271, after landscaping. See p.357

The self-grown trees were trimmed and pruned to give natural shape, which was destroyed by local residents, by regular cutting of trees and bushes for their use. The natural *doob* grass is allowed to grow and shallow rooted shrubs are planted (Pls. 268-269).

16. PARSWANATH AND SIVA TEMPLE, KUMBHALGARH FORT, DISTRICT RAJSAMAND

After augmentation of water supply by desilting of Mammadev Bavdi, the garden development is taken up. Both the temples are located on hill. The area is landscaped. The small patch of lawn are developed with plantation of dwarf shrubs in spaces between rocks. The trees like *champa*, *khajur*, *harsingar*, *molsari* are planted at places having soil of good depth. The sweet scented creepers and bulbous plants are also planted (Pls. 270-271).



Archaeological Survey Of India

Post Script

Some material has been received after compilation of Review, hence, being included as Post Script material as under:

UTTAR PRADESH

1. EXCAVATION AT INDOR KHERA, DISTRICT BULANDSHAHR

In continuation of the previous season's work, Jaya Menon of Aligarh Muslim University, Supriya Varma of Jawaharlal Nehru University, New Delhi, Paru Bal Sidhu and Suchi Dayal of Punjab University, Chandigarh undertook excavation at the site of Indor Khera.

The site of Indor Khera (28°14'57"N, 78°12'48"E) is located in Tehsil Debai, District Bulandshahr, on the Chhoiya Nadi, also called Nim Nadi. Indor Khera lies between the rivers Kali Nadi and Ganges. The village of Indor is located 0.5 km off the Aligarh-Anupshahr Road and is about 10 km from the Ganges River (**fig. 1**). The objective of the excavations was to reopen one (A3) of the trial soundings taken in the previous season as well as undertake more extensive work in the northwestern part of Indor Khera. One of the reasons why the northwestern area was chosen for excavation was to map activity areas within and outside houses in this small ancient urban centre.

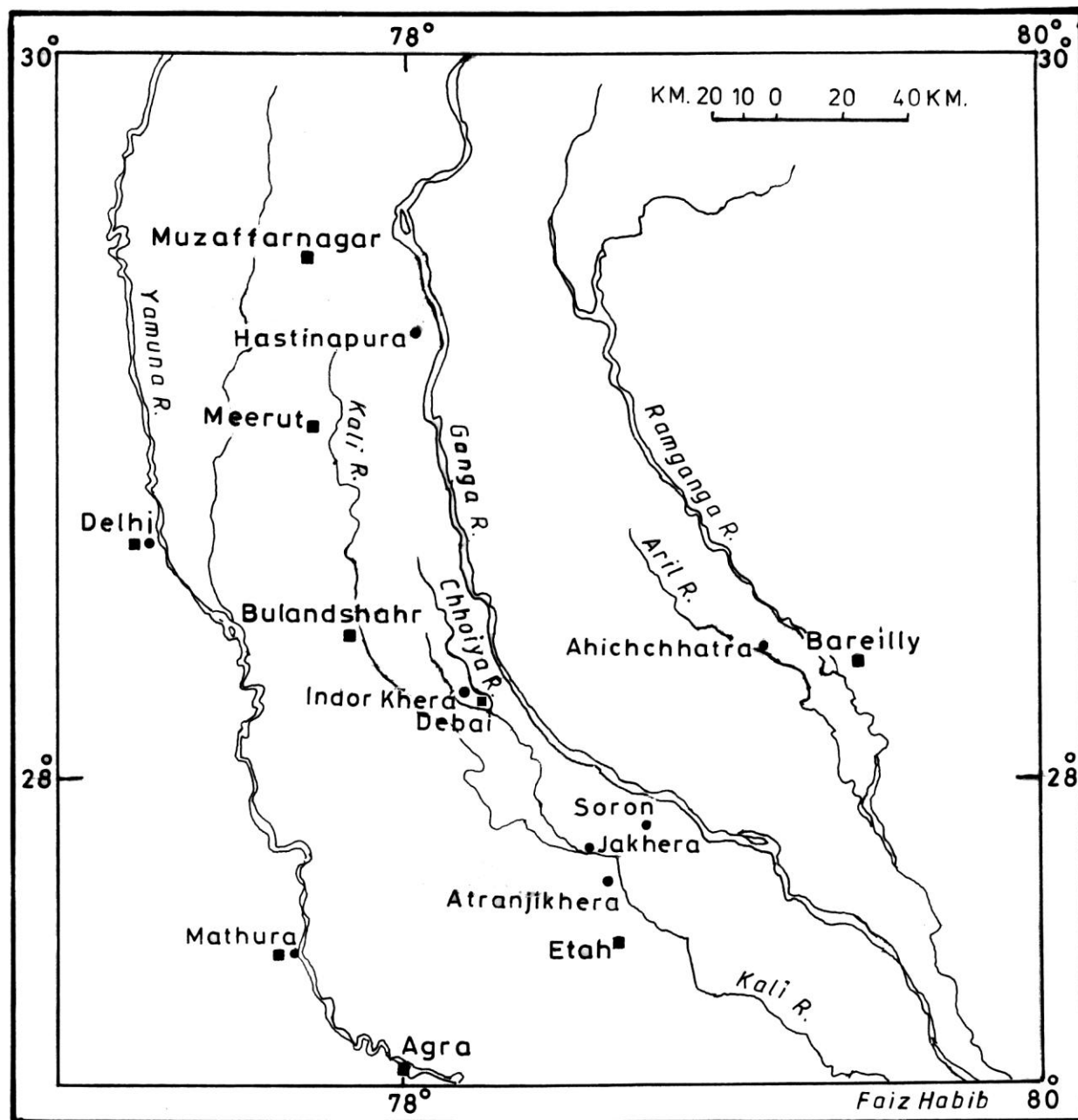
The trial cutting A3, which in the previous season had a cutting area of 4 x 2 m, was in this season extended into a 4 x 4 m trench. In the previous season A3 had been dug till 4.26 m and in this season it was

dug up to natural soil at 5.86 m. In the northwestern quadrant 28 layers were identified: layers 11-28 (3.11 – 5.86 m) belonged to Period I; layers 3 to 10 to Period II (0.70 – 3.11 m); and layers 1 and 2 to Period III (surface to 0.70 m) (**fig. 2**).

Period I is represented by Black Slipped Ware, Fine Grey Ware, Painted Grey Ware, Black-and-Red Ware. As Painted Grey Ware dates are well established, this period can be dated between 1000 and 700/600 BCE. The small finds included terracotta beads, bangles, marbles, discs, wheels, gamesman, ring and animal figurine; bone points; copper bangle; silver sheet; glass bead; carnelian bead; shell beads; and mica fragments.

Period II is characterized by Northern Black Polished Ware. Two terracotta sealings (see the upper two in **Pl. 1**) were found in excavated deposits. Neither was inscribed but both have symbols on the basis of which they have been identified to the Mauryan period. The small finds included terracotta beads, bangles, marbles, discs, wheels, gamesmen, animal and bird figurines; glass beads; bone points, combs; beads of quartz, garnet, carnelian, moss agate, black agate and jasper; shell beads, bangles and cowries; ivory object; copper coins, ring and rod; iron nail, axe, hook and rod. Further, five successive roads (Features 2, 3, 4, 5 and 6) were identified, of which the earliest (Feature 6) was unpaved while the

Fig. 1



Indor Khera: Location Map.



Indor Khera: Terracotta sealings from A3.

remaining four were paved (**fig. 2**). These successive roads in Period II were probably originating from a gateway perhaps at the gully near A3.

Period III has been dated from 200 BCE-100 CE as indicated by the ceramic assemblage, which is marked by Red Wares, an absence of NBPW, and an inscribed sealing with Brahmi characters of the early 1st century CE, inscribed in circular fashion and deciphered as *Bhagvatasya* (pl. 1 bottom). The small finds included terracotta beads, marbles, gamesmen, button, reel, pendant and animal figurine; bone pendant; copper bangle; iron axe head, hook and knife; sandstone pestle; and glass pendant and bead.

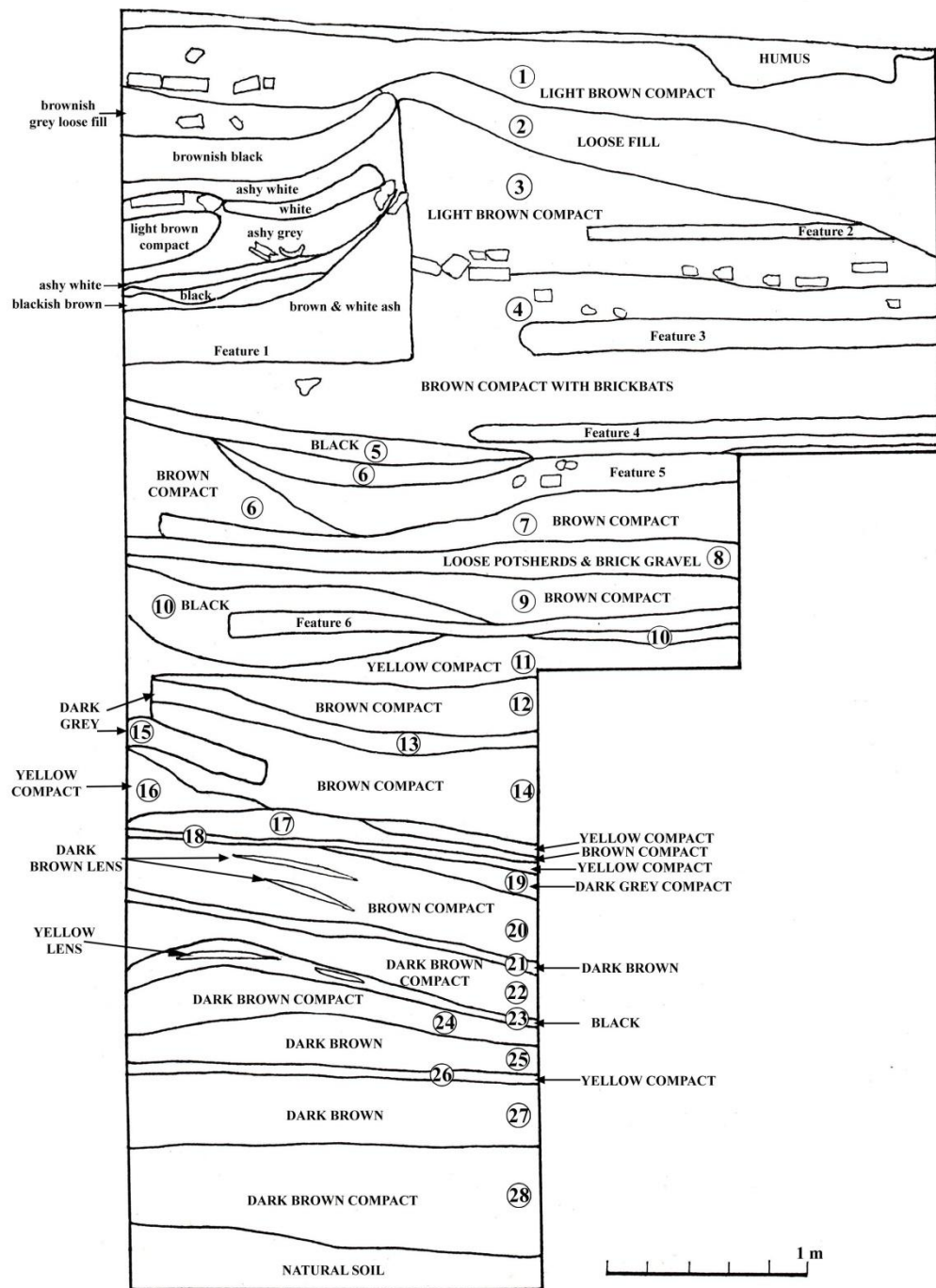
The gridding of the site was undertaken to facilitate the laying out of trenches for full-fledged excavations. The following trenches and parts of trenches were excavated in the northwestern area: A1d, B1a, B1b, B1c, B1d, B2b, B2c, B4b, C1a, C2a and C2b (**fig. 3**). The reason why parts of trenches were opened was due to the encircling ridge or the edge of the mound. Hence, the cutting areas of A1d, B1b, B1c, B2b, and B2c were 4 x 2 m, while the rest of the trenches had a cutting area of 4 x 4 m. Trenches were dug to varying depths: A1d to 40 cm; B1a, B1c and B1d to 176 cm; B1b to 115 cm; B2b to 52 cm; B2c to 60 cm; B4b to 67 cm; C1a to 60 cm; C2a to 50 cm; and C2b to 60 cm.

The deposits in these trenches were dated on the basis of pottery and coins. Stamped potsherds were found from the B1a-c-d trench. Also found from this

combined trench were two terracotta stamps used for decorating pottery (**fig. 4 & Pl. 2**) and tiny sherds of wares with a black slip or polish and a red core. Sherds of fine grey ware were largely found from the B1c-d trenches. The bulk of the pottery comprised red wares, including sprinklers from the upper levels. Out of a total of seven copper coins recovered, three coins are clearly datable to the Kushana period, three are entirely unreadable while the last is a square punch marked coin. From trench B1b was recovered a coin of Huvishka. From the same trench was found a coin with part of the dotted flan still visible but the rest was unclear. From trench C2a were found three coins stuck together out of which only one was well-preserved. This is a coin of Vima Kadphises, showing the king on the obverse standing with his head turned to his right, offering with his right hand to an altar and on the reverse is a figure of a bull. From the same trench was found another Kushana coin with part of a Greek legend still visible. The reverse is completely mineralized. The copper punch marked coin was found in trench B1c. While the Kushana copper coins were found from the upper deposits the few sherds with black slip or polish and the copper punch marked coin were found from the lower levels. Thus, on the basis of all the evidence taken together, the deposits in this excavated northwestern area of Indor Khera have been dated from about 200 BCE to 300 CE.

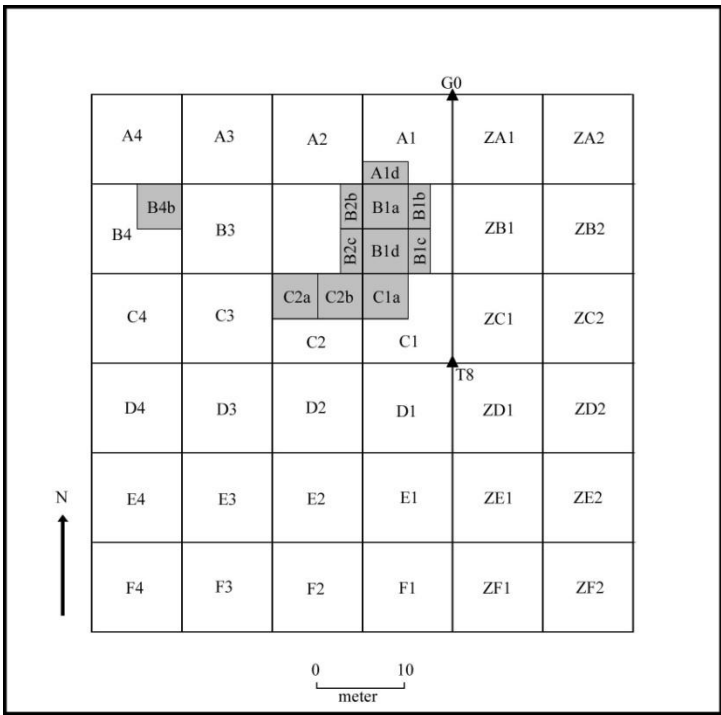
Structures were traced in trenches B1a, B1b, B1c, B1d, C1a, A1d, B2b and B2c. Walls in all cases were oriented in the cardinal directions. These were constructed

Fig. 2

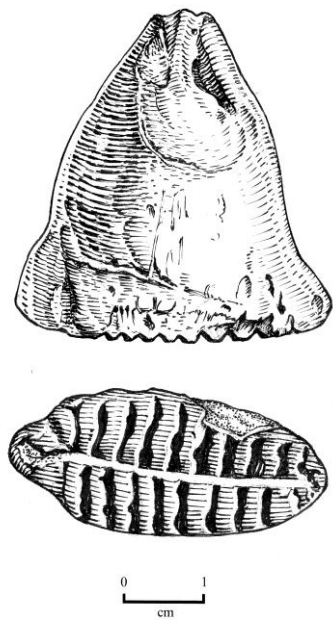


Indor Khera: South facing section of A3.

Figs. 3-4



Indor Khera: Layout of trenches in the northwestern part.



Indor Khera: Pottery stamp.



0 1 2
cm

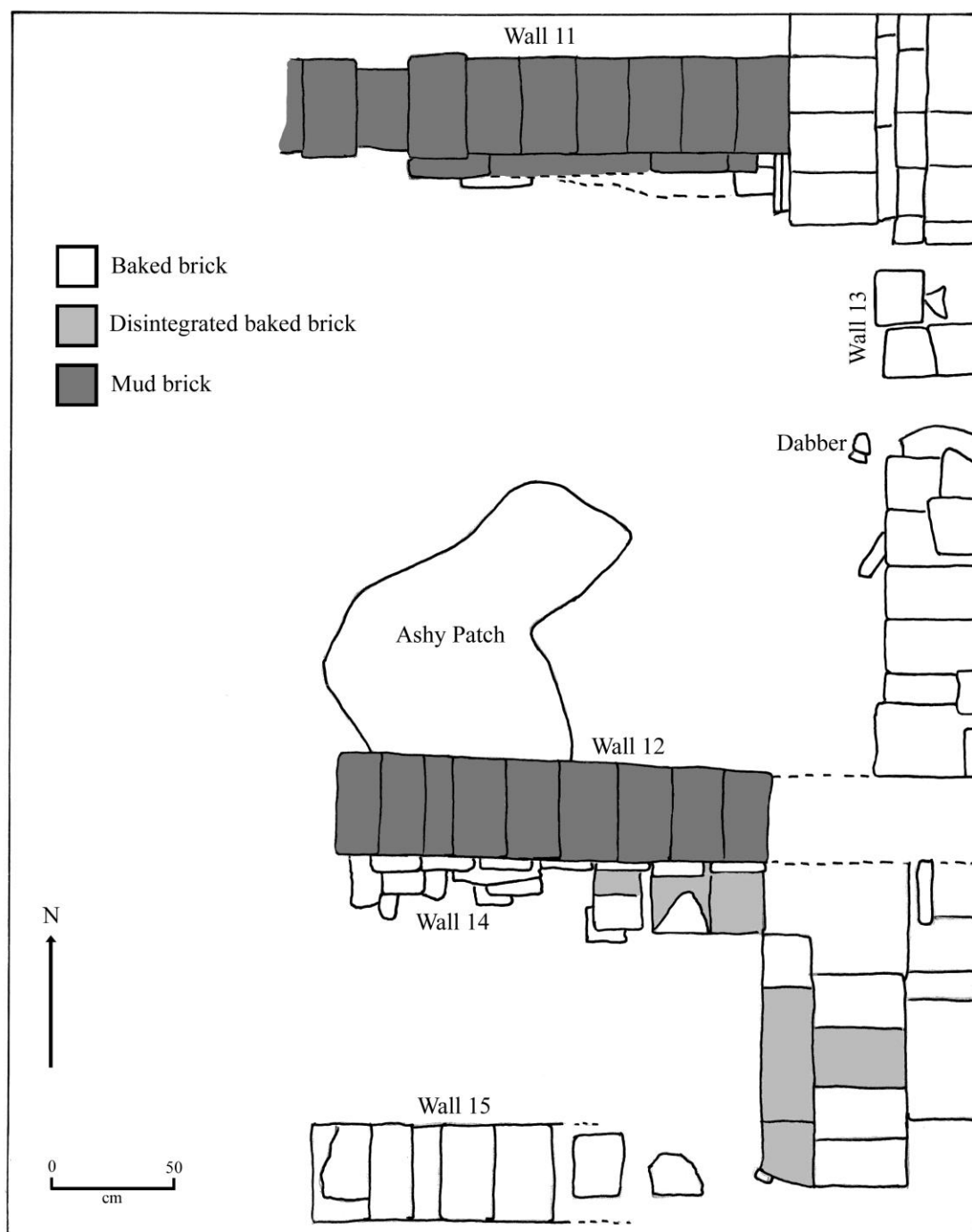
Indor Khera: Pottery stamp.

both of mud-bricks as well as burnt bricks. Walls/structures of two phases were found in trench B1a. Belonging to a later phase (Phase II) were two east-west oriented walls, 242 cm apart, composed of mud-bricks (Walls 11 and 12). The well preserved mud-bricks varied in size from 38-42 cm and 22-24 cm in width and 5-6 cm in thickness. The extant length of Wall 11 was 200 cm while that of Wall 12 was 176 cm. Wall 11 is better preserved and comprised of eight courses, while in the case of Wall 12 only the topmost course was clearly discernible. Walls were raised with courses of header bricks, making the width of Wall 12 about 38-42 cm. Under the mud-brick courses of Wall 11, is a facing of mud-bricks, below which are two courses of baked bricks. Between these two walls was detected a paved platform (105 cm EW x 110 cm NS) on a mud-brick base. On excavating further down between Walls 11 and 12 was found an ashy patch that can be seen in figure 5. Both Walls 11 and 12 meet up in the east with a north-south oriented baked brick wall (Wall 13). This latter wall appears to have been built in an earlier phase (Phase I) which continued in use in the later phase. The width of Wall 13 is unknown as it goes into the west-facing section of the trench. However, the excavated remains show a double row of stretcher bricks making the extant width at least 80 cm. Wall 13 runs through the entire length of the trench and extends into the baulk between trenches B1a and B1d. The sizes of the baked bricks vary from 36-44 cm in length, 22-24 cm in width and 5-6 cm in thickness. The bricks in the northeastern part of the trench abutting Wall 11 also reveal remains of a mud plaster.

Four courses below Wall 12 were recovered projecting courses of baked bricks of the same size going down about 70 cm (Wall 14). These appear to be part of a structure of Phase I which extends southwards into the baulk between trenches B1a and B1d. Hence, the baulk between these two trenches was removed. About 70 cm south of these projecting courses of baked bricks is another baked brick alignment of header bricks (Wall 15) extending eastwards into Wall 13 found in trench B1a. These bricks had dimensions of 40 x 22-24 x 5-6 cm (**fig. 5**). Nine courses of bricks were recovered with headers and stretchers in alternate courses. The area of 70 cm between Walls 14 and 15 was filled with a packing of mud and brickbats. In the northern part of trench B1b, burnt brickbats laid flat were recovered covering an area of about 120 x 180 cm. These appear like a brick paved area or platform belonging to Phase I.

In the centre of trench B1d was excavated a paved platform (measuring 118 cm NS x 70 cm EW) of Phase II with thick mortar underneath which there were mud-bricks. To its north was an ashy patch measuring 118 cm NS x 170 cm EW. Almost the entire area of the rest of trench comprised of a loose grey deposit. In trenches B1c and B1d were recovered walls of several phases. Belonging to Phase III was an east-west oriented wall (Wall 10) of header baked bricks, with dimensions of 42 x 24 x 5-6 cm. Wall 10 extended 538 cm in length with a width of 42 cm. In some places two courses were recovered, while in others, three courses of bricks could be discerned. Of the following Phase IV, was found an

Fig. 5



Indor Khera: Plan of B1a and part of B1d.

east-west oriented wall (Wall 7) of baked bricks. It is conjectured that Wall 7 of four courses of header bricks may have had a length of 534 cm and a width of 22 cm. One intact brick in the western end of the trench was noted to have dimensions of 38 x 22 x 5-6 cm. Two parallel north-south walls (Walls 8 and 9), 300 cm apart, extended southwards from this east-west wall, perhaps forming a room. Of these, the western wall, Wall 8, 224 cm in length, extended south to the end of the trench, while of the eastern wall (Wall 9), only three bricks were extant. The end of Wall 9 was not discernible as it was cut by a later period (Phase V) east-west wall (Wall 1) in trench B1c. Of the three bricks, one was marked by four grooves in an arc formed perhaps by the fingers.

Wall 1 measured 230 x 40-42 cm. Of this wall seventeen courses were extant. The wall was constructed with header bricks with dimensions of 38-42 x 22-24 x 5-6 cm. In trench C1a were excavated two baked brick walls (Walls 2 and 3), one oriented north-south and the other oriented east-west, with the two meeting at right angles, perhaps comprising part of a room. The width of the walls is about 40 cm. The length of Wall 3 in the trench is 200 cm while that of Wall 2 extended over the length of the trench. The brick sizes varied from 38-40 cm in length and 22-24 cm in width and 5-6 cm in thickness. Six courses of header bricks in Wall 2 were recovered below which was a light brown compact deposit. Five courses of header bricks were recovered of Wall 3. To the east of Wall 2 was excavated a baked brick and brickbat platform that extended the length of the trench and had an extant

width of 164 cm. The walls in this trench belonged to Phase V.

In trench A1d, an east-west wall (Wall 4), made of yellow-coloured mud-bricks was found at 20 cm, of which only a few bricks were clearly visible but traces of the wall were found both west and east through the entire length of the trench of 4 m. Wall 4, belonging to Phase V, was raised of header bricks with dimensions of 36 x 24 x 5-6 cm. Abutting Wall 4 towards the southwest were traces of a yellowish compact deposit perhaps representing a paved platform, of which the surviving portion measured 90 x 48 x 5-6 cm of now disintegrated mud-bricks.

Trench B2b was opened up to investigate whether the walls recovered in trench B1a extended westwards. The same burning activity that was visible in the northwestern corner of B1a with alternate lenses of grey ash and black charcoal was seen to continue in the southeastern corner of B2b. A baked brick alignment of 90 x 24 cm of five courses (Wall 5), belonging to Phase V and oriented in an east-west direction, was found in the northeastern corner. Several fallen bricks were found to the south of this structure. A north-south oriented brick bat alignment (Wall 6), belonging to Phase V, of 30 x 70 cm, was found in the northern part of trench B2c.

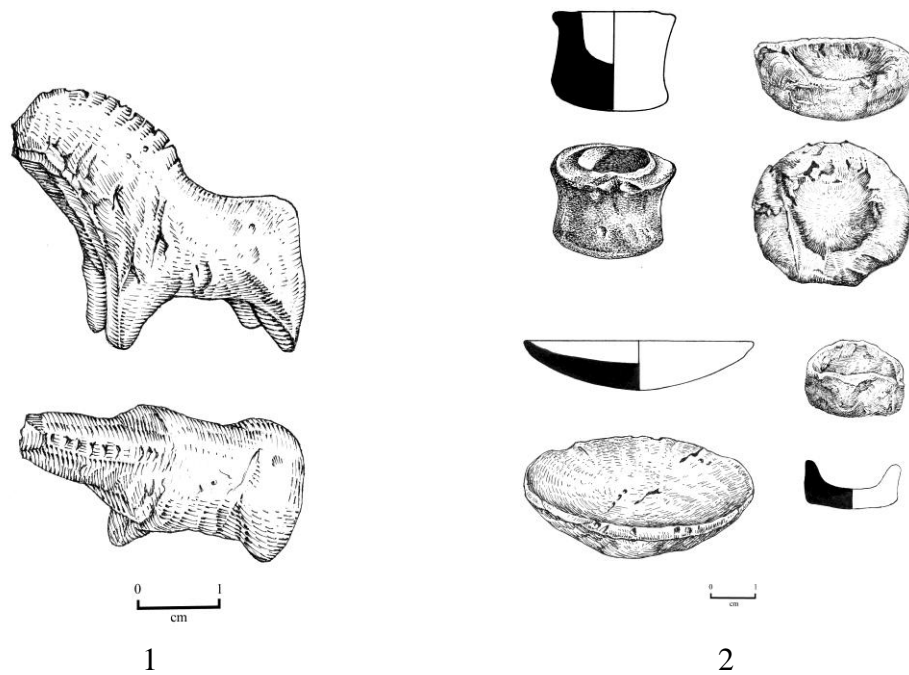
Thus five phases of structural activities were discerned in this area. To the first phase, Phase I, belonged Walls 13, 14 and 15. Perhaps Wall 13, with a width of at least 80 cm, is part of the remains of a

fortification wall. Walls 14 and 15 with their brickbat and mud packing appear to be cross-walls abutting Wall 13. What have been excavated are the upper levels of the fortifications. The fortification wall and cross-walls were probably built before 200 BCE. The deposits that have been excavated probably date to a phase when expansion led to occupations just outside the fortification walls. This explains the construction of mud-brick walls 11 and 12 of Phase II which were built against Wall 13. These two walls represent part of a house (House 1), probably a room, with dimensions of 240 x 200 cm. Wall 10 belonged to Phase III. To the next Phase IV belonged Walls 7, 8 and 9, which again form a room of a house (House 2). This room measured 300 cm and at least 240 cm. A compact yellow deposit probably represents traces of a mud floor. To the last Phase V belong Walls 1, 2, 3, 4, 5 and 6. Of these, Walls 2 and 3 are part of a room of a house (House 3), with dimensions of at least 276 x 200 cm.

A number of artefacts of a variety of materials and types were recovered. These included terracotta beads, bangles, button, discs, plaque, reel, shuttle, pottery stamps, dabbers, marbles, wheels, toy cart, perforated objects, finished and unfinished handmade miniature vessels, human and animal figurines; glass bangles and beads; iron knife, hook, nail and sheets; copper coins, antimony rods and strip; beads of quartz, steatite, agate, carnelian and amethyst; shell beads, bangles and cowries; bone beads, ring and points. The excavation in the northwestern area also revealed evidence for the production of objects of

terracotta and bone. In the case of terracotta objects and pottery, the evidence of production consists of tools such as dabbers and stamps, unfinished objects such as beads, miniature vessels and unfired clay objects as well as debitage including vitrified lumps and coils of clay. Several terracotta animal figurines were found in this area. These are made by the same technique of hand modeling. The bull figurines were fired in reducing conditions while the others such as the horse were oxidized (**fig. 6**). The finds of numerous animal figurines suggests that these were being made here. While the animal and human figurines were hand modeled (**Pl.3**), the terracotta plaque, on the other hand, was moulded (**Pl. 4**). This represents the face of a woman with part of an elaborate headdress also visible. Among the handmade objects are also miniature objects, including vessels that appear to have been made by children (**figs. 7-8**). Bone tool production is attested to by finds of bone splinters, burnt bones, along with finished and unfinished bone points (**Pl. 5**). The unfinished bone points show marks of fabrication and are unpolished. A bone working area was also identified in the B1c-B1d area. There is a possibility that terracotta and pottery production as well as bone tool making may have been practiced in the same area. It appears then that there are craft quarters, with multiple crafts, on the edge or periphery of the settlement, something that is not known from other sites of this period. However, this aspect needs further investigation. A more extensive excavation in this area in the next season would help to address this issue.

Figs. 6-8



Indor Khera: 1; Terracotta horse figurine and 2; Miniature vessels.



Indor Khera: Miniature vessels.



1



2



3

Indor Khera: 1; Terracotta human figurine, 2; Terracotta plaque and 3; Finished and unfinished bone points

UTTARAKHAND

2. ROCK PAINTINGS FROM HUDOLI, DISTRICT UTTARKASHI

During the course of exploration in the Hudoli area (District Uttarkashi) in the Kamal Valley, a tributary of the Yamuna, Prof. Dr. Maheshwar P. Joshi, Joshi (Doon Library & Research Centre, Dehradun), Dr. Vijay Bahuguna (Govt. College, Barkot, District Uttarkashi), Dr. D.N. Dimri, Dr. K.C. Nauriyal and Dr. Piyush Bhatt (all, Archaeological Survey of India), noticed the following antiquities:

1. Some curious motifs of oblivious antiquity painted in steel-grey colour on a rock about 20 kms away from the famous Asvamedha site at Purola. The motifs show enigmatic bird-like figures, creeper-like curvilinear lines in combination with insect-like characters arranged perpendicularly, as if representing some pictographic script. Close by another set of painted motifs was noticed, in this case with scroll-like characters (**Pl. 6**).

Rock paintings in different hues of red, black and white, mostly depicting

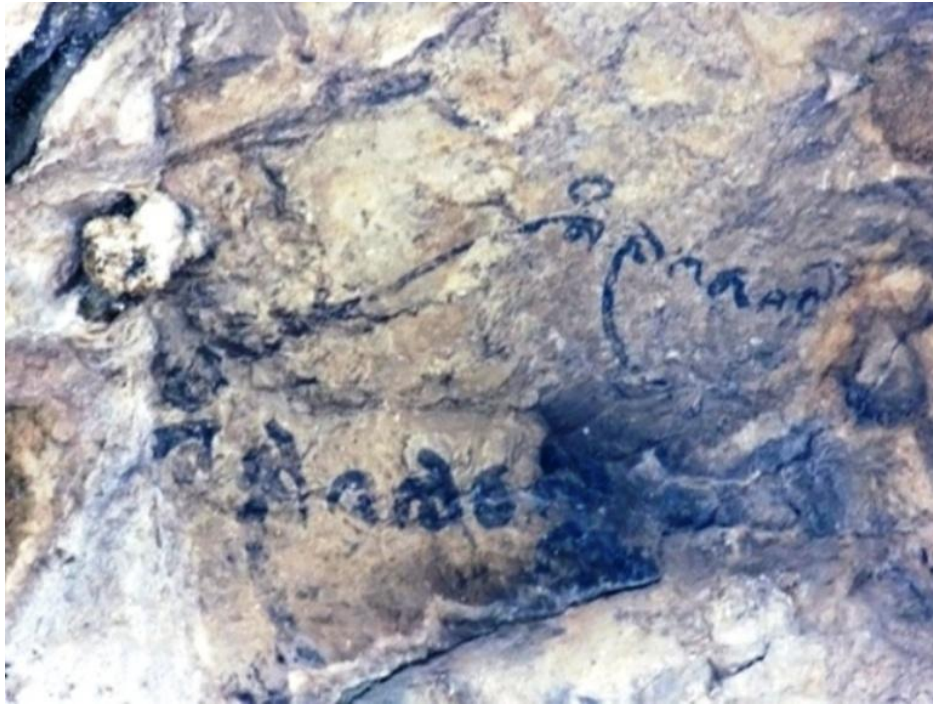
stylized anthropomorphic and zoomorphic figures along with few floral and geometrical patterns have been reported from Almora and Chamoli Districts (eastern Uttarakhand). However, these paintings are depicted with a horizontal orientation. In this respect the perpendicular arrangement of motifs in the Hudoli rock paintings appears to be singularly interesting.

2. About a kilometer away from the above-mentioned paintings, there is a cliff near Village Thadung. It bears two epigraphs painted in steel-grey pigment. The upper one runs in one line and, among others, reads '*k(o) ga t(o) śa (kha)*' in *circa* first century AD characters. The lower one runs in two lines of which the upper line reads, '*(bhe) śi kha śi (vo bha)*', and the next below the last two characters, *e (cha)* in the Brahmi characters of *circa* first century BC (**Pl. 7**). These are the earliest known painted epigraphs found in Uttarakhand.

3. On the summit of a hillock about a kilometer away from the cliff under reference there are few cup marks of different shapes and sizes scooped in the rocky surface (**Pl. 8**).



Hudoli: 1; Painted motifs.



1



2

Thadung, Hudoli: 1; Painted epigraphs and 2; Cup marks in different shapes and sizes.