CHAPTER-IV
POTTERY

Potter's craft is believed to be one of the oldest and most important traditional crafts of India. It has come down to our times from pre-historic age. Indian pottery is said to be "the truest to nature, in the directness and simplicity of its forms, their adoption to use, and purest in art, of all its homely and sumptuary handicrafts". Indeed, no feature of Indian art has such a long tradition of artistic achievements as the pottery. It is a marked fact that through a continuous process of development in techniques and artistic expressions, the pottery craft in India achieved an appreciable degree of perfection e.g. pottery industry in different periods brought about some improvements in innovative techniques and creative quality of the fine output upon the previous period. Either it added some new features to the existing forms and designs or perfected them in order to make more sparkling, delightful and useable as is evident from the scholarly study done by N. Dahiya. The period from 200 B.C. to c.300 A.D., marks a landmark in the history of ceramic industry in India. Literary and archaeological sources alike give interesting information about the various industries existing in contemporary period in India.

The rich literature of the period contains numerous references to potteries. References to potters (Kuṃbhatāras, Bhandāra, kulā), their workshops, wheels (Kajmsala, Čakka-čakṣa), etc. often occur in ancient contemporary literature. Informations about types of earthen wares used during the period are also furnished in literature. Following are some of the varieties of pots referred to in contemporary literature.

I. Water Pots - kuṃbha, kuṃbhi, big and small jars, ghata, kalsā, gāgrī, maḍakā or present matkā.

II. Domestic Utensils (Parināhyā) - sthālī (cooking vessel like modern batlōi), ukha (frying pan), maṅsapačānī (a vessel for cooking meat, but its shape is unknown to us), karpara-odana (a vessel to keep rice), sarva (Various types of dishes used for various purposes), taviya-tapika or avāvākka (a toasting pan).
III. Wine-pots - jumbula, paraya, bhumbhala and sandiya-saundika were the types of jars to store the wine and uvachiia, karia and katlanka were the pots to serve the wine.

IV. Storage Jars - bhānda or kostha besides kals, kumbha and ghata were also mentioned to be used as storing vessels.

V. Measuring Pots - adhka, kamsa, khari (used for measuring large heaps of corn), kuḍava, prastha, etc.

VI. Pots for religious use - kamaṇḍalu, patigha (for monastic use), tapparagu and tappara. Their exact shapes are unknown to us. Manu forbade the ascetics to use metallic and lustrous pots.

VII. Flower Pots - pindalaga and fuppachhajjia and singia (denotes a syringe with which water was sprinkled on flower plants).

Only scanty references pertaining to pot decoration and surface treatment have been recovered in literature. Jātaka's and Jain literature mentioned about pot colouring and decoration with many colours and motifs. Rubbing, polishing and oil coating on the pots is also mentioned in literature.

References regarding potters' guilds, however, found in contemporary inscriptions, e.g. the Nāsik inscription of Mādhariputra, Iśvarasena refers to a guild of potters (Kulārikās), functioning in the district. Mathurā inscription of the time of Huviṣka have mentioned drinking vessels.

Thus literary and epigraphical evidences present a widely flourishing state of ceramic pottery in contemporary India.

Several excavation reports bring to light a wide range of pottery belonging to the period under study. A close survey of them brings to light various facts about the time, space, shape,
fabric texture, techniques and various other aspects of inter-cultural contacts in India and the west world. And also the socio-economic condition of the potter and the people as well. Various ceramic industries noticed during c.200 B.C. - c.300 A.D. are as follows -

(A) BLACK AND RED WARE INDUSTRY

The period ranging between c.200 B.C. - c.100 B.C. shows predominancy of black and red wares in the region of central Ganges Basin at Patna (pd. c.150 B.C.), in Rajasthan at Ahar and in Western Central India in Saurashtra (upto pd. c.100 B.C.), at Maheshvara (pd. B.C. 200 - c.100) and continuation of the wares at Bahal during the whole period under Satvahanas.

Several regional variations both in typology (shape) and fabric are available in this ware. For example, at Patna the texture vary from coarse to medium, while at Udaipur and Ahar it is found in coarse to fine fabric and the specimens from Maheshvara, Bahal and Saurastra present exclusively medium texture. At all contemporary sites, black and red ware was made with clay of secondary nature as the ceramic fabric shows that the clay was generally mixed with digressed material like fine sand, hay and possibly ash too. Majority of pots collected from Ahar were made with clay prepared in this fashion.

The typological differences are also noticed, as at Patna the main type of black and red ware is found with its characteristic features of collared rim, inturned thickened rim, while at Udaipur and Ahar the main types include bowls with incurved or straight sides, a shallow dish on stand and globular jar with high narrow neck.

Differences in decorations, painting and surface treatment are also noticed. The specimens from Patna are essentially treated with red slip and smeared with coarse sand on both sides and fired on high temperature which presents gritty core. Specimens from other sites as mentioned above are painted with simple dots and lines in white; a noted peculiarity of the specimens of the sites.
Notwithstanding these local differences, some common trades such as sameness in firing technique and utility of the pots are clearly discernible in all black and red wares. The pots were such, as could be used only for drinking, eating and cooking purposes and not for storing.

It is examined that the pots were shaped by the combination of hands and wheel technique e.g. rimless bowls, globular pots with sloping shoulders, basins and dish on stands.

Black and red wares at all sites were generally of coarse fabrics as at Patnā, Maheśvara and also at Ahar. They looked porous. In order to check seepage and fill up grass marks appearing on the surface thick slip was applied. Surprisingly the black and red ware potteries were well versed in the art of burnishing as burnished pots too are collected from Sauraṣṭra. Though the pots from Ahar found in the lower level associated with Śuṅga period are not as such lustrous like earlier pots found from the same region. It seems a devolution in regard to surface treatment gets set at Ahar during this age.

The designs on black and red wares (B.C. 200 - 100) are chiefly confined to the group of lines and dots which produce variegated designs in combination with different geometrical forms, painted in white pigment on both exterior and interior sides. The designs show that the potter had a great control over the brush.

The potter might have employed either double firing technique which entails first making the pot red or black and then making them black or red at the edges by the application of charcoal or inverted firing technique.

A marked devolution is noticed in the black and red ware industry during this period as specimens exhibit ill firing at Sauraṣṭra and pots are not made with well levigated clay and turned on slow wheel and also not fired skillfully and uniformly at Ahar.

(B) MEGALITHIC - BLACK AND RED WARE INDUSTRY

Contemporary to the black and red ware is the megalithic black and red ware. The ware is found at the sites, including Brāhamagiri (c.200 B.C. - c.50 A.D.), Arikāmedu, Chandravalli and Śīsupālgārh (c.200 B.C. - 300 A.D.).
The ware is a fine product as it has a uniform thin side and is wheel made and polished. In spite of having thin sides, the ware is brittle and seems to have been fired at a low temperature. The black and red effect is due to the process of inverted firing, and as a result it turns black at the places of direct contact with fire, viz. the inner surface and the exterior edge round the rim, while the rest of exterior surface turns red.

The ware varies from coarse to medium in fabric and is treated with a slip. It is also sometimes salt glazed to present a shining through crackled appearance.

The types and paintings in white pigment is similar to those black and red ware found in northern sites related to the period under study. Post firing scratching known as graffiti is a common feature in these wares.

Thus the megalithic black and red ware enveloped practically the whole of South India which continued up to the Āndhrā period. But the occurrence of black and red ware has to be related with the North. The characteristic feature of the South Indian black and red ware is its cracked surface unlike the North one, which was perhaps due to the clay and the salt glazing which was intentionally done to hide it.

(C) RED WARE INDUSTRY

The dominant Red ware industry occurred in abundance in India covering a wide range both in time and space i.e. Śaka, Śuṅga (Pl.X, Figs.1,2) and Kuṣāna (Pl.X, Figs.3,4) periods.

At Rupar (c.200 B.C. - c.600 A.D.), Hastināpur (c.200 B.C. - c.400 A.D.) and Patnā (c.200 B.C. - c.400 A.D.), there was exclusively a Red ware industry covering the whole wide range of Śuṅga Kuṣāna rulers in the North, while at Dwārikā54 it is noticed in Śaka Kuṣāna period (c.200 B.C. - c.400 A.D). Besides, Red ware industry was exclusively and popularly show its appearance during the Kuṣānas from various sites belonging to them e.g. in Pākistān the town sites were Taxilā, Sirkāp, Bhirmound, Saikhandheri and Charsada, in India the principal sites were Puṣkālavaṭī, Kurukṣhetra, Puranā Quila, Noh, Bairāt, Hastināpur, Mathurā, Śrīvāasti,
Kausāmbī, Rājghāt, Chairand, Sonpur, Buxer, Vaisālī, Kamrāhar, Bikaner, Udaipur and recently discovered site Mandoli (near Ghaziabad. See Pl.X, Fig.5) has yielded Red ware in abundance, the time period covering approximately (A.D. 100-300).

Red wares were also discovered at Arikamedu (B.C. 200 - 100) and Śiśupālgarh (A.D. 100 - 200).

The Red wares are entirely monochrome turned on wheel. They are not made in fully levigated clay as earlier specimens. The fabric ranges from coarse to fine e.g. at Patnā it is mostly coarse, while at Hastināpur, Ropar and Udaipur it consists of medium texture. The recently excavated site Mandoli exhibits the fabric thin to very thick.

Red wares are fired in general at a medium temperature and often show unoxidised smoky core. But the pots from Hastināpur, Patnā, Bikaner, Rupar and Dwārka were fired to a high temperature as they give ringing sound when dropped on hard surface.

The general repertory of shapes in Gangetic valley sites belonging to Kuśānas is marked by monotonous conservatism with few types adopted for specific use. These include - the widely distributed bowls, basins, button knobbed lids, ink-pots bottle, necked sprinklers and Handa shaped miniatures. Vessels with pointed bottom are also recovered (See Pl.XI, Figs.6a-6i). These pots were evidently intended to serve the needs of the general masses for use in kitchen. There were no deluxe table wares as were seen in early period.

In early centuries of Christian Era, at Begrām and various parts of India, hundreds of pots and potsherds bearing various human figures have been found. Human heads, busts or full human figures have also been recovered from Ujjain (M.P.), Haryana, Rājghāt and various other contemporary places. Spouts bearing human faces, Yakṣī or Kinnaris are also recovered from Sāmbhar and Begrām (See Pl.XI, Figs.7a-7d).

The Red Ware pottery found in North West site like Saikhān Dheri, Sirkāp and Bhirmoud of Kuśāna time is highly sophisticated and represented in red and gray colours. These include dishes, lids, basins, pedestalled chalices, large water pots, strap-handled vases,
narrow-necked flasks, water bottles, spouted-pots, handled-jug, drinking cup, bonds and saucers, frying pan, lamps which are similar to those discovered from the Gangetic sites. The majority of them exhibit foreign influence and seem to have evolved from the Scytho - Parthian tradition. Sirkāp has yielded typical Greek type two handled glazed Amphorae, standard beakers, goblets and small handled censers.

Most of the pottery types noticed at Taxilā recur in Punjab and the Gangetic valley, but some of them are conspicuously absent in these areas. Thus, the Roman amphora is not to be found in the Gangetic valley. At the same time, new shapes in pottery, influenced by the Saka, Parthian and Kuśāna traditions, unnoticed earlier at Taxilā, are found here.

The Saka-Kuśāna pottery of the same type has been reported from Rupar, Hastināpur, Ahichchhatra and Kauśāmbī. Carinated waisted vessels and beakers are found at Vaiśālī in period II (c.150 B.C. - 100 A.D.), Kumrāhar period II-III, (c.150 B.C. - c.300 A.D.), Bhītā and possibly Rājghāṭ. Another typical Kuśāna pottery is the sprinkler, reported from a number of sites like Taxilā, (Sirkāp), Purāna Quila, Hastināpur, Manvan, Mason, Kauśāmbī, Akhnur, Sonpur, Buxer, Chiraṇḍ, Saradkef, and Kumrāhar.

The Kuśāna Red ware industry exhibit its most significant characteristic feature, that the pots were found to be stamped. Various Kuśāna Urban sites yielded various stamped specimens and stamps, which suggest the local manufacture of pottery in Kuśāna towns.

Red ware pottery varies in respects of its surface treatment also, e.g. The Red ware from Patna sometimes slipped or coarse, while the pots from Hastināpur, Bikāner, Udaipur were found sometimes slipped, burnished and then decorated. Dwārika specimens (B.C. 200 - 100) are slipped, burnished and then painted in black paints but specimens from the same site (dt. c.100 B.C. - c.300 A.D.) were not found to be painted but decorated in various techniques such as incision, impression, scratching, rouletting and stamping too. The pottery related to Kuśāna period belonging to Gangetic valley is essentially unpainted but decorated by using similar techniques as noticed at Dwarkā. These designs are geometrical types, such as opposed triangles, alternately filled in horizontal lines, wedge pattern opposed triangles arranged in such a way as to form
rhombus, triangles with wavy lines, loops and spirals, parallel wavy lines in a single or double row. It may be noted here that some of these designs have survived from very early times in India. Religious motifs like Ṣaṃdipada, swāstika, fish, triratna, taurine, nāga symbol, chaitya, sun and dharma chakras noticed on the contemporary coins are also found on these pots. Naturalistic patterns generally mould made or stamped mainly consisting of lotuses, rosettes, leaves, conventionalised petals, couch shells, branches of trees etc. are seen on these pottery. Besides, human, animal and birds motifs such as horses, lion, elephant, parrot, squirrel, are also noticed on these pots. Similar designs were also noticed on the pottery of Ferghanā and Khwārizm.

Even then, it remained popular for longer time in the wide region because of its utilitarian new shapes and decoration with auspicious designs.

Thus red ware industry during the Śunga, Kuśāna and Śaka period was quite in flourishing state. Though, the pottery belonging to Gangetic valley was not so impressive and durable as other, perhaps due to use of under levigated clay and ill-firing and thus, devoid of metallic sound.

Red ware Industry in North-West and Gujrat regions maintained its artistic and utilitarian merits as well. But in South, specimens at Arikāmedu and Śiśupālgarh reveal that a process of devolution sets in and red wares subsequently became cruder due to ill firing and lack of decorations on the one hand and the introduction of various new Indo Roman Industries and Andhra Wares on other hand.

(D) BLACK WARE INDUSTRY

This ware has a fine surface fully blackened with polish and this section is comparable with the Northern Black Polished Ware (N.B.P.W.). It belongs to the same date as that of black and red ware group.

These wares appeared exclusively at Dwārikā during Śaka Kuśāna periods. But a few specimens are also recovered from Bṛahamāpuri along with other prominent red wares (c.200 B.C. - c.300 A.D.) and red polished wares (c.100 B.C. - c.300 A.D.).
These pots are uniformly black in sections. The clay used is coarse but firing was done at high temperature, as they give ringing sound when dropped on hard surface.

The pottery is mostly wheel turned. The pots with bulbous body or carinated body were first turned on the wheel and after some drying, the body was beated to a required shape without touching the rim and the neck.

Main shapes recovered are - square rims, cooking pots with carinated neck, ledged shoulders and lids with knobs. The pots are decorated with incised or impressed designs such as oblique lines between group of double lines and wavy lines, a row of pricked depressions and circles above the carinated portions. Angular strokes and triangles were also noticed.

The black ware industry seems to still hold good position in Saurastra. But it is in devolution state in South and other parts of India.

(E) PAINTED GRAY WARE INDUSTRY

Few specimens of painted gray wares have been recovered from the sites in Yamunā basin and Rājputāna only along with N.B.P.W. and Ochre Coloured Plain Wares. These appear to be ill-fired and are in common shapes and belong to pre-Kuśana's time. Findings of limited pieces of this type suggest that this industry must have ceased or was in process of dying and exact dating of these pieces could not be clearly made.

(F) GRAY WARE INDUSTRY

Gray Wares belonging to the period under study were found mainly from Ahichchhatra (c.200 B.C. - c.300 A.D.), Kauśāmbī (c.200 B.C. - c.100 A.D.), Bairāt (A.D. 100 - 300), and Arikāmedu (B.C. 200 - 100).

The pots are dressed with thin slip, which under reducing condition of the klin has burnt to ash. Though the clay is finely levigated, the fabric varies from site to site. For example, at Ahichchhatra it is thin to medium while at other places, it is generally coarse. The shapes are
however common and utilitarian type similar to red ware of Gangetic valley. The decoration was also done in same general patterns, sometimes with certain innovations added from time to time. Reed impressed designs of Ahichchhatra and Arikamedu is a good example in this regard.

The Gray Ware Industry was in its full bloom at Ahichchhatra and Bairat during whole period under study with certain new innovations in shapes and patterns. But at Kausambi and Arikamedu, it seems to be in ceasing state as other new industries were introduced at these places. No specimen has to be recovered from Gujrät and Bengäl side.

(G) NORTHERN BLACK POLISHED WARE INDUSTRY (N.B.P.W.)

Though the precise date for the N.B.P.W. has been fixed in between B.C. 600 - 200, this fixation of date to this commodity industry is not convincing on the basis of findings from different strata during excavation.

The central zone i.e. Gangā Basin was the primary home of N.B.P.W. Industry. The common pottery here, from (c.500 B.C. - c.500 A.D.), have enough correspondences to Northern Western, central Eastern and Southern sites indicating an intimate reciprocal contacts and a largely common ceramic tradition. For example at Taxilā (Bhirmound) N.B.P.W. were recovered throughout the period under study and Marshall designated them as Greek black ware. Rupar (B.C. 200 - 100), Sārnāth, Rājgīr, Basārāha, Kauśāmbi, Kāsā & Rājghāt (B.C. 200 - 100) show N.B.P.W. in association with other ceramic objects. A few sherds of N.B.P.W. riveted with copper pins have been recovered in Bairat. At Tāmluk and Bāngra N.B.P.W. are also found of pre Kuśāna’s times while Maheśvara, Nāsik, Tātāpurī, Sānchī and Brāhmaṇpurī exhibits N.B.P.W. belonging from early centuries of Christian era to the period of Sātvāhanas. Strikingly enough, a few sherds of N.B.P.W. have also occurred at Śiśupālgarh (c.200 B.C. - c.100 A.D.) and a single sherd at Amravati (A.D. 100 - 300).

Although N.B.P.W. Industry was unanimously related to Gangetic Valley, occurrence of N.B.P.W. along with other regional local potteries from North West Punjāb and Southern sites of India suggest that N.B.P.W. was an item of commodity and was imported to these sites from Gangetic Valley.
N.B.P.W. are made of a well levigated and fine clay, which is generally gray but sometimes reddish in section. The core, however, varies in colour as was fired to a very high temperature. The clay used for this class of pottery appears to have been taken from the silt of the Gangetic Basin. The fabric varies from thin to thick and the shapes are limited to small vessels like bowls, dishes, hândis and jugs. The pottery also shows the painting tradition of painted Gray Wares which is found in Yellowish and light Vermillion colours into steely blue or golden surface. N.B.P.W. were made on fast turned wheel\(^93\).

N.B.P.W. are unique in having distinctive lustrous polish for which these are highly praised and named as "DELUXE" wares which also fully justifies its higher place in the society. It was obviously not a common man's pottery and was mainly used by the aristocrates and members of rich and royal families. Besides this, the pottery must have been very costly as sherds of N.B.P.W. riveted with copper pins have been recovered from various places such as Bairāt, Rupār, Sonpur and Kumrāhar\(^94\) and its availability in small quantity than its associate wares\(^95\).

No specific change in its artistic merit has been marked during this period.

**(H) ĀNDHRA WARE (See Pl.XII, Fig.9iii)**

This sophisticated type of pottery dating back from the middle of the first cent. A.D. has been found in a few Āndhra sites including Brahmāgiṇī and Chaṇḍrāvalli during the rule of Sātvāhana kings\(^96\).

This is one of the most interesting variety of pottery of South India which bears Kaolin paintings on the red-ochre washed surface. After the pot was made and dried leather hard, the russet-coating or ochre wash was given\(^97\). Then they were dyed and the painting in Kaolin was made in various designs. These painted design are in the form of horizontal and vertical bands, wavy lines, arches and curves, concentric circles, oblique lines, criss cross and lattice patterns and chevron. Dots in various forms also occurred on the various sherds\(^98\).

For making this type of pot, the pot was fired in a klin evenly and a high polished, shining and glazed effect after firing was obtained. The red pigment shows a network of cracks under the
microscope. This crackle or crazing indicates that pots were probably salt glazed. When the fuel has nearly burnt out and the pots are red hot, common salt is thrown into the klin. In the intense heat the salt volatilizes and by chemically reacting on the surface of the pots produces the glaze. The glazing effect is, therefore, superficial. With the exception of iron, no other colouring material was present.

The various shapes in this ware are bowls with different kinds of rims such as beaked, rounded, levelled or featureless ones. Other objects are the high-necked convex bowls with narrow mouths, globular pots, flat and shallow dishes with slightly incurved or vertical sides sometimes with a carination on the profile.

Thus, Andhra pottery is distinct in its technique of firing which gives glass like shining and glazing surface and painting in Kaolin.

(I) IMPORTED WARES

During the beginning of the Christian era, India developed extensive trade contact with the Western World. The result of these are reflected in Pottery also. The excavations at Arikamedu and other sites brought to light these distinct wares -

(i) Arretine ware
(ii) Reuletted Ware
(iii) Amphorae
(iv) Red Polished Ware.

(I) Arretine Ware (See Pl.XII, Fig.9iiA)

It is a soft and delicate red-glazed ware with shades varying from red to yellow-red with the lustre rivalling that of 'sealing wax'. The ware was current from the last quarter of the first cent. B.C. to the first half of the First cent. A.D. and is named after the place of its manufacture "Arretium" (mode Arezzo) in Italy. It was also manufactured at other centres in Italy, viz. Puteoli Modena and Rimini. The term 'Terra Sigillatta', which means pottery with stamped designs,
also covers Arretine Ware as it is also decorated by being pressed into a stamped mould. The stamped pottery belongs in origin to the eastern mediterranean area especially to the environs of the Aegean sea.

The production technique of the Arretine ware inherits the ancient technique practised from the Mycenaean period through the Hellenistic period of decorating the pot in relief by means of a mould. The Megarian bowls of Greece and Asia Minor also inspired the production of decorated hemispherical vessels of Arretium.

The process consisted of preparing a mould by means of a stamp, which is fixed in the centre of the potter's wheel and the wet clay is thrown inside the mould with the tip added free-hand. The pot shrinks in size as it get dry, facilitating its removal from the mould.

In the Indian context, Arretine ware was first noticed at Arikamedu. The arretine shreds found from Arikamedu (20-50 A.D.) represent undecorated cups and dishes, in some cases even without normal rouletting. The Sigillatta ware along with stamped sherds of bowl like dish and a carinated cup rouletted on rim portion dt. (A.D. 41-54) and one fragmentary sherd, yellow with red veins described as marble vase were probably produced by Arretine potter as early as 1st cent. A.D. A sherd of an invitation and provincial Terra-Sigillatta of reddish grey fabric with light red glaze and rough external rouletting has been found at the same site which belongs to 1st cent. A.D.

(II) Rouletted Ware (Pl.XII, Fig.9iic)

The technique of impressed decoration practised during the Hellenistic period gave rise to rouletted decoration which consists of revolving a toothed wheel on the wet surface of the pot and producing symmetrical pricked decoration. The rouletting designs consist of minute triangles; diamonds or parallelograms, wedge or upright crescents, ovals or dots; or an eye shaped device which is like attenuated diamond. The design with triangle is very commonly found in all strata.

Rouletted sherds were found at Arikamedu (c.100 B.C. - 100 A.D) Chaṇḍrāvalī and Bṛhamāgiri (A.D. 14-37) Śiśupālgarh and also from various other following places in India.
After a careful study of the ware, it is found that the ware is made of fine well levigated clay which is carefully potted on a quick wheel. On firing, it produces grey, or more often, greyish pink colour alone. The grey colour is due to the reducing condition under which the pot is fired. Before firing, it was usually treated from inside and outside with a slip which, on being subjected to an inverted firing, turned black from inside and showed variegated shades of gray, black, yellow or brown inside. Occasionally both faces are covered with black slip and rarely with brown. The interior surface was burnished and in some cases it approximated to the lustre of the N.B.P.W., though it was decidedly inferior.

The objects are usually confined to flat dishes with incurved rim, the beak or the pronounced nature of inward project on them, accounting for different types. Besides the dishes, there are shallow bowls, some without the internal rouletting.

The value attached to this ware can be adjudged from the sherds found from various places attached to Andhra Pradesh, Uttar Pradesh, Madras and West Bengal. In fact, the 'rouletting' attracted the potters so much that they readily adopted this Hellenistic technique for decoration.

(III) Amphorae (See Pl.XII, Fig.9iiB)

The amphora is a high two handled pot with a neck, a standard vessel for transport of oil and wine during the Roman period. Instead of footed variety of classical period, pear shaped and conical type in coarse fabric predominated the Roman period. The Amphora has usually a long cylindrical body with a pointed base, a long narrow neck and two straight handles. The amphorae pitched internally to preserve the wine. After a careful chemical inspection of various sherds found from Arikamedu, Neväsa, Dwärikä and Devenimmore, it is found that they
show black incrustation on the inner surface which is caused by an ingredient (resin) used in the preparation of Roman wine. The Periplus also contains quite a number of references to the import of wine in India from the Mediterranean world.\textsuperscript{119}

In the Indian context Amphorae sherds are found at Arikamedu,\textsuperscript{120} Kāṇchīpuram,\textsuperscript{121} Kolhāpur,\textsuperscript{122} Nevāsa,\textsuperscript{123} Ujjain, Ter, Junnar,\textsuperscript{124} Dwārikā, Devnimore,\textsuperscript{125} and Taxila.\textsuperscript{126}

The Taxila examples must have travelled by the land route, while the South Indian specimens were travelled by sea route with Roman traders.

\textbf{(IV) Red Polished Ware (See Pl.XII, Fig.8)}

A beautiful sophisticated pottery either imitated or imported has been found at several stages in Saurashtra and Gujrat viz. Vadnagar, Barodā, Amreli, Devinimore, Somnāth,\textsuperscript{127} Dwārikā and Dhank caves\textsuperscript{129} (Dist. Junāgarh), Eran, Ujjain, Vidiśā, Mahēśwar (Madhya Pradesh) and Tripuri,\textsuperscript{130} Nāsik,\textsuperscript{131} Bāhal,\textsuperscript{132} Ter,\textsuperscript{133} Bṛahamāgiri\textsuperscript{134} and Śīsupāl-garh\textsuperscript{135} (South East Peninsula).

The important quality of this ware is its fine texture because of the use of well-levigated clay. It has polished red surface reflecting light. It is fired in high temperature and oxidized completely as the section shows uniform red colour.

Main pots are bowls, dishes and sprinklers with different types of rims. Since its surface treatment and firing techniques shows marked differences and also, it was initially restricted to few shapes and areas, it was probably an imported item from Roman world. Unfortunately, no direct proof is available to accept, this view point, as the shapes found in India are obscure in Italy or in Roman’s African and Asian colonies.

A close inspection of the shapes found from Vidiśā and Ujjain, which were similar to Northern Indian types, shows that these shapes were popular in India even before the advent of Romans. So far as the sprinkler is concerned, it was the most popular shape of this ware in various parts of India, particularly in the Buddhist community. Many sherds of this type have been found from the Western India caves like Pitā Khora Junnar which were copied later on by others.
Most of the historians\textsuperscript{136} namely M.N., Pandy, S.P. Gupta, S.R. Rao had a discussion on this type of pottery and decidedly accepted this pottery as a local one which was made under the influence of the Romans who settled down at coastal and inland emporia and wanted this ware for their use. Local inhabitants also evinced interest in these new sophisticated ceramics and the village potters produced such imitation wares for the consumption of this sophisticated class and also for local use.

The pot making industry was the most common and popular industry because this industry satisfied the needs of rich and poor people, particularly the poor who entirely depended on earthen pots for their domestic use. The potters used to make different kinds of earthen pots on the potters wheel and to make it stronger they were burnt in the klin. These pots were made attractive by decoration for a better market. Thus during the period under study decorated pottery played an important role in the ceramic industry of India. It helped in establishing the cultural sequence of a number of Ancient sites particularly of North India.

Though the decorated pottery existed in Śuṅga period it played an important role in the technology of pottery craft in India during Kuśāna period. With the increase in demands of the society, the rate of productivity was inconsistent. Professional attitude must have encouraged the potters with a competitive spirit. They had to search for new methods and patterns to decorate the objects like stamping, making incision, roulette and applique etc. They also used to prepare their own recognizing stamp having different motifs. Besides this, Indo-Roman wares were also made which prove India’s relation with the outside world.

**TECHNIQUES**

Though the art of pottery making is very senile with its field limitless and interminable, very scanty references in regard to the technique of making pots and surface treatment occurred in contemporary literature. The description of the technique of manufacture of the pots occurs in the Jātakas. They show that the lumps of clay (maṭṭika) were kneaded with water and then mixed
with ashes and dung (go-māya). This mixture was then rotated on the wheel (cakka) which was constantly turned (avithi) and various vessels were shaped. The wet vessels were then dried and baked, (sukkhapetvapačītva) and made ready for consumption.

Patañjali in his Mahābhāṣya refers to the moulded pottery. The Athārvaveda speaks of baked pottery which turned to blue and red (Neel-Lohita), which probably refers to the technique of inverted firing. The Jain literature copiously refers to the paintings on pottery. The colour for decoration on pottery was generally kept in a pot called Kalada. In Jātakas the skill of the potter was exhibited in the preparation of the pots which were coloured and decorated with motifs (Nanarpāpai Samatthapeśi). While studying the excavated specimens, various technical aspects of pottery came into light which can be studied in the following main subdivisions:

(I) Fabric   (II) Surface Treatment
(III) Firing   (IV) Decoration
(V) Forms

<table>
<thead>
<tr>
<th>(I) Fabric</th>
<th>(II) Surface Treatment</th>
<th>(III) Firing</th>
<th>(IV) Decoration</th>
<th>(V) Forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Clay</td>
<td>1) Slip</td>
<td>1) Open Klin</td>
<td>1) Incised</td>
<td>1) Rim</td>
</tr>
<tr>
<td>2) Preparation of Paste</td>
<td>2) Burnishing</td>
<td>a) Oxidizing</td>
<td>2) Applique</td>
<td>2) Neck</td>
</tr>
<tr>
<td>3) Tempering material</td>
<td>3) Wash</td>
<td>b) Reducing</td>
<td>3) Stamped</td>
<td>3) Shoulder</td>
</tr>
<tr>
<td>4) Turning or Throwing</td>
<td>4) Glaze</td>
<td>c) Inverted firing</td>
<td>4) Moulded</td>
<td>4) Body of profile</td>
</tr>
<tr>
<td>5) Moulded</td>
<td>5) Salt glaze</td>
<td>d) Straight firing</td>
<td>5) Painting</td>
<td>5) Base</td>
</tr>
</tbody>
</table>

(I) Fabric
1) Clay - It is known as ‘mṛd’ or mṛṭikā in literature which means clay, and the pots made of clay are known as mṛhmayipātra or mṛṭpātra.
Broadly speaking, the clays are of two kinds namely primary clay and secondary clay. The clay that remains in contact with the igneous rock is known as primary clay. The secondary clay is the resultant of having been carried by agencies such as water farther from its source and carries impurities. Almost all the clay of the ancient pottery was out of secondary clay and the Gangetic Basin has been one of the fertile sources for such clay.

Selection of the Clay - the potter’s prime need is good clay. So he is cautious in the selection of the clay. He brings it from the particular place, studies the substance and its organism and uses it. He confines himself to only such clay with which he is well versed.

2) Preparation of the Paste - The Potter’s clay is bettered by ageing or ‘weathering’. The clay is spread and exposed to sun, rain, wind and frost. The sun and wind dries and soaks through. This process is called as the degeneration process and allowed for a few months. When the clay is devoid of impurity, it is moistened with lime water and mixed by hand or foot to the right consistency of throwing. This stage of clay is known to be ‘leather hard stage’. It is the stage of the clay body or paste when it becomes firm but not dry. A vessel in the leather hard state can be handled without risk of deformation carved or incised without clipping.

3) Tempering Material - They mix ingredients such as silica, sand grit, husk mica and lime to the clay to bring it to the leather hard stage, the stage when the clay is fit for throwing on the wheel.

The fabric of the clay varies from fine to coarse or coarser. If the ingredients are used sparingly in the clay, the fabric is fine. In this case the section would be normally thin and the clay would be uniformly distributed. In the case of the usage of the moderate ingredients the fabric will be medium. If the tempering material is profusely used, the fabric will be coarse or coarser. However, it may be remembered that the quality of the fabric depends not only on the quality of the clay and other ingredients of the raw paste but also in the firing process.

4) Throwing or Turning - The ‘throwing’ method comprises of shaping the form in the desired manner.
Hand made Pottery: The pottery made by means of entirely using hands is called handmade pottery which in its appearance is not even due to thumb impressions, irregular sections and shape.

Wheel made pottery: As regard the process of turning the pottery by means of wheel, the potter places a lump of plastic clay on the wheel head (See Pl.XIII, Fig.10) and then sets the head in motion. Then he gradually works the soft clay between his fingers, thumbs and palm to form the desired shapes of the objects (See Pl.XIII, Figs.11-14). The wheel is rotated on a hub by means of a rod swiftly or slowly as he desires. In case of wheel made pottery the stains are visible. In the case of fast wheel, strain marks are parallel, uniform, horizontal unlike the slow wheel, where it is irregular. See Pl.XIII, Figs.16,17 for equipments used in making wheel turned pottery.

5) Moulded Pottery - The mould of a required design is prepared and then the pottery is shaped as desired. At times the body of the vessel is wheel turned, while its base or its accessories such as spout and handles are fashioned in mould and luted. The moulds are generally wooden. After the Śuṅga period majority of the pottery was made out of mould. It is true in regard to Kuśāna, Andhrā and Indo - Roman Potteries.

(II) Surface Treatment

The surface treatment of the pot is made in the leather hard stage. Various techniques of surface treatment are as follows -

1) Slip - Slip is a liquid made by mixing dry clay and water in equal proportions to the consistency of cream. It is applied to the surface of the pot when it is on the wheel. Slip gets into the core of the pot and forms almost a sort of layer which could easily be perceived in the section. Extra portion of the slip on the pot is removed by means of a bamboo slit or reed while rotating on the wheel it is called reserved slip.
2) **Burnishing Slip** - The process is done with a smooth surfaced wooden object. It is rubbed on the pot while rotating on the wheel as a result of which a burnishing smooth surface over the pot is formed. At times the burnishing strokes of the wooden surface are also seen vividly on the exterior portion of the pot. Then the slip is applied to make it a burnishing slip.

3) **Wash** - It is applied with a hand or brush. It never conceals the body of the pot or gets into the core of the pot as in case of slip. It is almost transparent and can be differentiated by its irregular movement when it is made by a brush particularly.

4) **Glaze** - Glazes are vitreous coatings used to conceal the ceramic body. It is composed of certain colour agents (zinc, lead, chrome, iron, dissolved in the glaze) and fluxing agents as salt, manganese and when they are fired in the klin they give glaze appearance. As such glaze forms a separate thin layer over the pot. When the glaze becomes soft in the glossy fire they combine with the body material with which they are in contact. The glaze and the body are to be matched and cooled. It can be achieved with the glaze which have similar composition to that of the body. It may follow that the hard glazes (glazes having a high softening temperature) are as rule, fit better to the body than soft glazes\(^{148}\) and give extremely good glaze.

Coloured glaze are generally applied by dipping, pouring, splashing, trailing and painting. There are two kinds of glazes, viz. under glaze colour and on glaze colour. In the case of under glaze colour decoration, the colours and the glazes are fired together and in the case of on glaze decoration, they are fired together with the aid of a softy flux. The under glaze colours are applied to the ‘bisque’ (Ware which had already gone under firing) and the glaze is applied subsequently by dipping.

5) **Salt Glaze**\(^{149}\) - It is produced by throwing salt into the fire mouth in the latter stages of firing. The salt melts in the klin and produces crazy appearances. But not as a rule, all the crazy appearance on the pots are salt glazed. Sometimes due to thermal expansion of the body of the pot the slip gives crazy or crackling appearance.

Megalithic ware and Andhra ware are found to be salt glazed.
Wet Smoothing\textsuperscript{150} - When the pot is on the wheel this wet smoothing is given.

(iii) Firing\textsuperscript{151}

Firing of the pots is done in two ways either in open klin or in closed klin.

1) Open Klin - In the open klin pots meant for firing are piled one upon another covering them with combustible materials like husk, straw and dung cakes. They are set fire and the flames are allowed to come into contact with the pots directly. In the open klin firing should have been affected under oxidizing, reducing or under inverted or straight firing technique. The techniques are found to be used in firing the various potteries in the period under consideration can be enumerated as follows -

(a) *Oxidizing condition of the Klin:* In oxidizing conditions the excess of oxygen is allowed into the klin. The oxygen comes into contact with the pots and such pots turned red. All the ancient red ware ceramic industry was subjected to this technique of firing. At times, some dark patches are seen on the sherd. These are due to indifferent firing. The ill firing must have been due to uneven distribution of flames. The rate of oxidation depends on the proportion of oxygen, temperature, humidity of the day and the properties of the material oxidized\textsuperscript{152}.

(b) *Reducing Condition of the Klin:* In this process pots are fired in such a way that they do not come into contact with the flames directly. In the klin no oxygen is allowed. In this case pots turn either black or grey depending upon the temperature controlled.

All the black slipped ware, black ware and grey ware of the ancient times were the resultants of this kind of firing.

(c) *Inverted Firing:* This kind of firing was used in Black and Red ware industry. This process of firing could have been affected under the oxidizing condition of the klin.

In this process there would have been an open platform with slots provided at equal distances. The number and rows of slots or grooves depend upon the area of the platform. Beneath entrances are furnished through which flames are fed. The pots are kept inserted in these grooves upside down, in such a way that the rim goes into the groove with the rest of the portion exposed.
The flames are fed out, inside and around. The interior portion of the pot is always filled or pasted with combustible material. When these pots come into contact with the flames, the exterior portion of the pot namely neck, shoulder, profile and base which is exposed turns red, and the rim portion, since it is concealed in the groove, turns black due to its indirect contact with the flames. As such, certain portion of the pots become red and the remaining black. Hence they are called red and black wares.

Since the pots are kept topsy turvey or upside down and then fired, the technique of firing is termed as inverted firing technique.

(d) Straight Firing: Black and Red ware industry has also under gone this kind of firing. In this, the pots are kept straight, as such the base portion gets inserted in the slot while the rest of the pot is exposed. As usual the interior portion is filled with combustible material. When they are fired, the base portion turns black since it is concealed and the rest turns red while the interior portion is always black. Here also black and red effect is given as formed in the inverted firing technique.

2) Saggar Firing - This appears to have been executed in a closed Klin. The pots are placed in rectangular wooden boxes and kept in different levels untouched or detached. The klin is closed on all sides except one side by which the heat is sent beneath the wooden boxes. The heat is uniform and in all probability fuel appears to have not been used in this case. As such the pots that undergo this technique of saggar firing are uniformly burnt and absolutely there are no indifferent firing. It is presumed that the modern crockery and such pottery which has uniform firing is subjected to this saggar firing.

In all probability the N.B.P.W. and Red polished wares were seemed to have undergone this technique.

(IV) Decoration

The main decorating techniques noted in the period under study are incision, applique, stamping, moulding, painting, and rouletting. The process can be enumerated as follows -
1) **Incision**\(^{153}\) - Incisions on the pots are done by means of a pointed pin or rod either before or after firing. If the incision is made pre-firing or at the stage when the clay is plastic, a slightly raised edge or buried edge can be perceived. On the other hand, if the incision is done post firing, the distinct disturbance of the slip on the surface is visible.

2) **Applique**\(^{154}\) - It is affected at the leather hard stage. A separate band or slip of clay is applied around the body or neck or shoulder of the pot. And on it, finger tipped or nail-tipped impression is caused. Since the clay is applied separately to the pot it is termed as applique.

3) **Stamping**\(^{155}\) - Stamping technique was the most significant technique introduced in the period under consideration which was done pre-firing. The stamps are imprinted into the body of the pot and the designs could be seen in relief.

4) **Moulding**\(^{156}\) - Decorations caused by means of moulds can be seen on the relief unlike the stamped one. The luting of the moulded designs to the body of the pots are often affected. Decoration by moulding techniques was certainly the innovation introduced during the period under consideration, though precise date is yet to be settled.

5) **Painting**\(^{157}\) - The painter used the brushes and applied the ceramic colour to this ware which required great skill and practice. The paints had the tendency to change their colour during the firing and hence the painter should have in view this point also. Lines or bands (thick lines) in painting were made by means of a brush held at a slightly oblique angle to the article while it is revolving on the wheel. Its multibands or lines of painting are to be caused by number of brushes held together affected the designs. To give multibands or wavy lines this multibrush technique appears to have been used. See Pl.XIII, Fig.15 showing making alternate thick bands of painting the pot.

(V) **Forms**\(^{158}\)

Different minor techniques were employed to bring variation in the form of the pottery on the rim, neck, shoulder, body or profile and base portions which is directly related to its use.
Rim Portion - (i) Inverted rim - here the pinching is very little. (ii) Out curved rim or incurved rim - In this case the curvature of the rims is apparent. (iii) Out turned rim or inturned rim - Here the angle formation of the rims is vivid. Besides these, other variations are also noted such as - bevelled rim, beaked rim, collared rim, oval and featureless rim, sharpened rim, flaring rim and cordoned rim.

Neck - Convex, carinated vertical and short and high necks are reported.

Shoulder - Oblique, high, concave or convex, corrugated, square shoulders are reported.

Body or Profile - Round, globular, oval, cylindrical, pear shaped, carinated and conical body are reported.

Base - Flat, round, disc, ring, rim, pedestal, pointed, foot, button, convex and saggar base are reported.

Thus the technical aspect gives large in sight in construing the contemporary technique of pottery preparation.

The Indian pottery of historic period was mainly utilitarian with little artistic merit. With the influx of the foreigners during the period, some significant changes in technology, in fabrics, in shapes and decorative designs of pottery could be noticed, which initially started at Taxilā and later continued in Punjab and other regions. The potters of the Gangetic Valley seem under great influence of Scytho-Parthian pottery as is evident from the creation of sophisticated pottery with red and gray colour slip. These potteries were made of fine fabric and had uniform texture. The treatment of clay leading to high firing gives the products the metallic effect. Some pots discovered from Mathurā and Dwārikā are thin - walled, even more thinner than those of N.B.P.W., which reflect highly developed skill and technology being adopted by the potter.

Likewise Greeks introduced the art of impressing designs on the wet clay with the help of moulds and stamps which was later on adopted by local potters. Further, Newer methods and patterns to decorate the objects were introduced during Kuṣāna period. Rouletting, stamping, moulding, and grifting techniques of decorations were introduced by Indo-Roman potters.
Foreign influence is quite vivid in the shape and structures of the pottery specimens. Two handled Amphorae, water bottles, beakers and goblets seem to be in Greek shape. Some undecorated wares like pear-shaped flasks with flat bottom, the handled jugs, the beakers and bowls with beak flared mouth were introduced by Greeks and became popular under the Sakas and Parthians. Some pottery types of Hellenistic origin found in Gandhāra region are bowls, saucer, wine cups, goblets, amphorae and spouted vessels. Similar shapes have also been recovered from Farganā and Khwārism (central Asia).

Besides decorated potteries, we come across rouletted and Arretine wares mainly from Southern India which convincingly prove India's extensive trade relations with outside world, particularly western world.

Thus the traditional Potter's crafts continued in flourishing state presenting certain evolutions in terms of pot making techniques and decorations. Besides being the introduction of various new industries perhaps under the patronage of foreign rulers, various predominant industries were also continuing and exhibiting certain changes in their artistic merits on the one hand and innovations in regard to adoption of various utilitarian shapes and techniques of decoration to beautify the wares on the other. The technological advancement attained by the potters of the age must have improved their socio-economic conditions. To improve potters economic status, there were well developed potters guilds patronizing the pottery crafts as referred in contemporary inscriptions and literature.

Besides, Indian pottery was not an item for foreign trade, though local internal trade in regard to N.B.P.W. had been ascertained.
REFERENCES

2. See Dahiya, N., Arts and Crafts in Northern India, (from the earliest times to c.200 B.C.), Ch.II for detailed study.
5. Astadhyayi, 4.3.118.
7. Deo., S.B., op.cit, p.34.
9. Manu., 2.182.
10. ibid, 8.319.
11. Aṣṭādhyāyī, 4.3.56.
13. ibid.
15. Aṣṭādhyāyī, 3.2.17.
16. ibid, 3.2.17.
17. ibid, 6.1.63 and Mahābhāṣya, p.68.
18. Agarwala, V.S., India as known to Panini, p.144; Mahābhāṣya, p.447.
19. Aś., B.II, Ch.14; Manu., 6.56.
23. Mahābhāṣya, p.507.
24. Aṣṭādhyāyī, 5.1.53; As., B.IV, Ch.II, pp.2.19.
25. Aṣṭādhyāyī, 5.2.73.
26. As., B.II, Ch.XIX.
27. ibid.
28. ibid, Asṭadhyāyī, 5.2.48.
30. ibid, "Taijasani Pāṭrahi".
31. ibid.
33. Deo., S.B., op.cit, p.38.
34. ibid.
36. Luder's list No. 1137.
39. Sharma, Y.D., op.cit, AI, No.9, 1953, p.158.
40. AI, No. 10, p.185, (figs.7.9 & 9.2).
41. Sharma, Y.D., op.cit, AI, No. 9, 1953, p.158.
42. Sinha, B.P., op.cit, p.30.
43. Sharma, Y.D., op.cit, AI, No. 9, 1953, p.147-159 & 161.
44. Sinha, B.P., op.cit, p.30.
48. Sharma, Y.D., op.cit, p.158.
50. Sharma, Y.D., AI, No.9, 1953, p.146-158-161.

52. ibid.

53. Sharma, Y.D., op.cit, AI, No. 9, 1953, p.125, 140-141 & 147.


55. Sharma, Y.D., op.cit, AI, No. 9, 1953, p.116-159.


58. Sharma, Y.D., op.cit, AI, No. 9, 1953, for Dawārika see Ansari, Z.D., op.cit, p.59-60.


60. Agarwal, R.C., ‘Yakṣi or Kinrii Pot from Begrām & allied Problems’ in Sinha, B.P., (ed.) op.cit, p.161-166.


63. Sharma, Y.D., op.cit, AI, No.9, 1953, p.116-167; also see CAKP, pp.30-33.


65. IAR, 1969-70, p.5.

66. AI, No. 10-11, pp.31-63.

67. IAR, 1969-70, p.44.


69. MASI, 74, p.127.


72. IAR, 1965-66, p.11.

73. Sinha, B.P., (ed.) op.cit, p.196.
75. IAR, 1960-61, p.39.
76. Potter's, dabbers and stamps have been reported from Taxilā (Marshall, J., Taxila, Vol. II, p.424; stamps for stamping potteries, ibid, p.437); Kurukshetra (IAR, 1970-71, p.31); Noh (IAR, 1971-72, p.42); Mason (IAR, 1967-68, p.52); Hastināpur (AI, No. 10-11, p.87); Rājghat (IAR, 1960-61, p.39); Kauśāmbī (MASI, 74, p.74); Kumrāhar (Altekar, A.S., & Mishra, V.K., Excavation at Kumrāhar, 1951-55, p.129.
77. Sinha, B.P., Pātilputra Excavation, p.30.
79. CAKP, pp.30-33, Also See MASI, No.74, pp.XVII-XVIII.
81. ibid, p.59.
82. ibid, p.67.
83. AI, No.9, p.136-137.
84. AI, No.9, p.163, also see AI, No.1, Jan.1946, p.45-49.
87. AI, No. 9, 1953, p.136-137.
88. ibid, p.142-153.
89. ibid.
90. ibid, p.155.
91. ibid, p.116-159; also see Sankalia, H.D., Ancient and Pre-historic Mahārastra, JBRAS, XXVII, 1951, pp.99ff.
92. AI, No. 9, 1953, p.116-159.
97. Potteries in Ancient India, ed. Sinha, B.P., (Mahalingham, T.V., ‘Ceramic Industries in South India’), p.225, fig.4.
98. ibid.
99. ibid.
100. AI, No. 4, July 1947; January 1948, p.236ff.
101. ibid.
104. ibid, p.275.
105. ibid, p.276.
107. The stamps of potter’s mark reported are - ‘VIBII’, ‘ITTA’ and ‘CAMURI’.
108. AI, No. 9, 1953, p.765.
110. AI, No. 9, 1953, also see Wheeler, R.E.M., Brāhamagiri and Chaṇḍravalli, 1947; AI, No. 4, p.236tt.
111. Lal, B.B., AI, No.4, pp.237-278.
112. Potteries in Ancient India. ed. Sinha, B.P., p.282 (Panday, M.N., op.cit.).

114. Sinha, B.P., op.cit, p.277.

115. Wheeler, R.E.M., op.cit, p.35; AI, No.2.35.


117. ibid.

118. Lal, B.B., Excavation at Devnimore, p.77.


120. Wheeler, R.E.M., AI, No.2, pp.41-45.


123. Sankalia and others, From History to Prehistory at Nevāsa, pp.280-81.


127. Sharma, Y.D., op.cit, AI, No.9, 1953, pp.68-158.


129. Potteries in Ancient India, ed. Sinha, B.P., p.282.

130. ibid, also see AI, No.9, 1953, p.161-162.

131. ibid.

132. ibid.

133. Sinha, B.P., op.cit, p.282.

134. AI, No.9, 1953, p.166.

135. ibid, p.168-169.


137. Jāt., V.291.

138. Mahābhaṣya, p.164
139. Atharvaveda, 14, 1, 2, 17.
140. Deo, S.B., op.cit, p.37.
143. Krishnamurthy, K., Social and Cultural Life in India, Ch.13, p.110-111.
144. ibid.
145. Mainly based on personal observation also see Krishnamurthy, K., p.111-112.
146. Mainly based on personal observation, also see Krishnamurthy, K., op.cit, p.112-114.
147. Mainly based on personal observation also see Krishnamurthy, K., op.cit, p.114.
149. ibid.
151. Mainly based on personal observation, also see Krishnamurthy, K., op.cit, p.116-119.
152. ibid.
153. Krishnamurthy, K., op.cit, p.119.
154. ibid, p.119.
155. ibid, p.120.
156. ibid, p.120.
157. ibid, p.120.
158. Krishnamurthy, K., op.cit, p.121, 122, figs.1-22.