The potters craft was one of man's earliest discoveries. It enabled him to store grains and provided him with the means of cooking food. But it is not known how or when it was first discovered. Scholars seem to attribute the discovery of pot making to women on the basis of their observation in Africa, but it is probable that it might not represent the oldest phenomenon.

Potters craft seems to have started before the application of rotary motion to its production, because hand-made pottery is found in periods before the existence of wheel-turned pottery. After the introduction of potters' wheel as a tool for pot-making, large scale production could be undertaken as an independent craft, sometimes between three and four millenium B.C.

In Gujarat, the evidence of pottery making is found right from the microlithic - chalcolithic period. The pottery of this period, especially on sites like Langhnaj, is called Microlithic pottery. Parts of Microlithic period seem to belong chronologically to the chalcolithic period in this area. The period could be divided into several phases. The evidence of pre-Harappan phase is scanty. So, the first well-established period in Gujarat is Harappan. In Gujarat excavations of Rangpur, Lothal, Surkotada, Lakhabawal, Prabhas, etc., show that Chalcolithic people were living in many parts of Gujarat. 2

In the three districts under the study, evidence of Chalcolithic pottery has not been traced from Panchmahals and Baroda. But Broach district shows the evidence of this tradition right from the Harappan period, as it is revealed by various sites of Broach, which are Hasanpur, Mehgam, Telod etc. On the basis of Harappan pottery tradition in adjoining areas like Kaira, Ahmedabad, Broach, possibility 2

For references on the sites mentioned here, please see Appendix 6.1 and Appendix 6.2 at the end of Chapter VI.
of Harappan pottery in Panchmahals and Baroda can not be ruled out. Thus, the tradition of this craft in these districts can be assumed to be existing right from the Harappan period. The ceramic tradition seems to have been continuing through all the periods of history and it still continues with some changes in the techniques, fabrics, shapes and decorations.

2. **RAW MATERIALS**

(A) **Different types of Raw-Materials**

The nature and the quality of a craft depends very much on the quality and the quantity of raw materials available and the tools used in the production process. Raw-materials for the potters' craft are clay, tempering materials and colouring and decorating materials.

The most important raw-material for a potters' craft is clay. It is a natural product just as it matures on the earth.

The local clay, in the districts under study, is divided into two main types of according to its properties.
The first type is the porous clay which is locally known as 'gorali mati' or 'lal mati'. It is light yellow or red in colour. The second type is the sticky clay, locally known as 'kali mati' or 'chikas wali mati'. It is black in colour.

The porous clay requires less of tempering. Certain types of smaller objects can be prepared with porous clay even without tempering. The black clay ('kali mati') is a very fine type of clay, but it is too plastic and sticky for working. Therefore it has to be tempered with non-plastic materials such as ass-dung, ashes, chopped grass, straw and rice-husk. Tempering improves the porosity of the clay, reduces its stickiness, and therefore, reduces its tendency to warp and crack in the process of drying and subsequent firing. The amount of tempering required varies according to the properties of the clay in different localities.

Ass-dung, as a tempering material, is used only in some parts of these districts. Locally, ass-dung is known as 'ladi'. It is collected, dried, crumbled, filtered through a sieve and finally added to the clay in the required proportion.
Another tempering material is ash, locally known as 'rakhodi'. Generally it is collected from fire-places where cow-dung, wood, straw or charcoal are burnt. Besides being used as a tempering material, ashes are also used as a powder to be spread over the floor of the workshop to reduce the stickiness of the floor, and also to be dusted over the vessels when they are beaten to give them desirable shapes.

Yet another tempering material is sand or 'reti'. Sand is added to the clay to increase its porosity. Sand is particularly used in clay for preparing cooking vessels, such as 'handli', 'tavadi', etc. Due to sand particles, the clay is supposed to retain more heat for a longer time and prevent the pots from cracking.

Potters in Godhra are particularly known for manufacturing good cooking vessels. The clay around Godhra is sandy, and the potters mix still more sand with the clay.

Cowdung, goat-droppings and chaff are also used as tempering materials.

Ochre ('geru'), chalk ('khadi') and mica ('abrak') are
the materials used for colouring and decorating the pots. Ochre is used by mixing in water as a pigment to colour the vessels. It is a good and cheap colouring material. It contains iron oxide, and when the pots are painted with it and fired, they turn red. The brightness of the colour depends on the quality of the ochre used. Higher the content of iron oxide in ochre, more is the redness it gives to the pots. At a number of places, such as Kalol in Panchmahals, Ankleshwar in Broach and Dhoral village in Baroda district, natural ochre is available locally. However, Ankleshwar ochre is not of a good quality.

Chalk or 'khadi' (CaCO$_3$) is also used as a colouring material to give white colour. At some places, it is available from natural sources, but generally it is purchased from the market. It is also one of the cheap colouring materials.

Mica or 'abrak' is another media for decorating the pots. It is used for giving silver lustre to the pots. Generally potters collect it from natural sources. At some places like Devagadh Baria town of Panchmahals, it is found in the clay. Usually, mica is dusted on the pots before they dry up. Such pots are usually baked in closed
furnaces to give them a black colour, so that the silvery mica particles shine more prominently. It is a very old tradition. We get micaceous wares right from the early historic period. In Dhoral village of Dabhoi taluka of Baroda district, potters collect a special type of mica which has a greenish lustre. Mixing it with water, they prepare a paste out of it which they apply on the neck of the pots, and after baking, it gives a very beautiful shining of greenish-white.

Water may also be considered to be another important requirement of this craft. It is used right from the initial process of preparing the clay to the stage of building the kiln. It is for this reason that potters' habitations are usually located near a tank, pond or a river.

Fuel for baking the pots is another essential requirement. Chaff, cowdung, goat-droppings, wood and coal are used as fuels. Chaff of different grains, specially of paddy, are used to fire the kiln. Cowdung ('chhan') is also used as one of the main fuels. It gives steady heat and helps in maintaining the temperature of the furnace for a longer period. Sometimes wood and coal are also used for
baking, but the turn out to be costlier fuels. Shrubs and dry leaves, where available, are also used.

In order to produce smoke in inverted firing technique, dry goat-droppings are used in the furnace. It helps in maintaining the temperature of the furnace at the required level for a longer time.

(B) Process of preparing the clay

Following are the processes for preparing the clay:

i) Bringing the clay from the field, or buying it;
ii) Breaking up clods of clay into pieces;
iii) Pouring water over the clay;
iv) Crumbling the clay (Pl. 2a);
v) Preparing the body clay or clay mixture;
vi) Kneading the clay (Pl. 2b);
vii) Preparing the lumps of clay (Pl. 2c).

For collecting the clay, the potter goes to the field with his donkeys, digs the clay and brings it home. But at some places this work is done by some hired labourers. In the cities and big towns where fields for taking the clay are not available, potters purchase the clay from some
persons who sell it as a profession.

In the villages, usually the potters collect the clay from uncultivated land, pond or tank etc. While taking the clay, generally the potter discards the first layer and collects the second layer. For still better quality of clay, the potter collects it from the third or the fourth layer.

We know very little about the process of preparation of clay into plastic form employed during early times, because no systematic analysis of sherds from excavations has been made from this point of view. The report of Tek Biet Mirsim excavation^3 (late second and early first millennium B.C.) in Palestine contained the first detailed technical analysis of the pottery methods used on any ancient site. From there, we know that the preparation of clay was usually done by washing and silting in a chain of vats dug on a slope. The lowest vat would contain the finest clay which might be further refined by straining through cloth.

It is surprising to see that centuries-old tradition,

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as noted in Palestine, still exists in some parts of the districts under study. Gurjar potters of Baroda and Momana potters of Surat district still use this method for getting refined clay for good work. They make three pits on a mildly inclined slope (Pl.2d). Area of these pits varies from place to place. The first pit is used for keeping fresh clay. This clay is first soaked with water. Within one or two-days it becomes soft. Thereafter the clay is kneaded and insoluble materials are taken out. After kneading with water, it changes into paste. From the first pit, this paste is transferred to the second pit. In this pit the clay is filtered by sieves and it is transferred to the third pit. From the third pit, this clay is taken out and it is spread for drying. After drying it changes from paste to plastic form. A very fine clay is obtained by this method. This method of preparing the clay is generally used for producing very fine types of pots only, because this process takes a lot of time and labour.

Other potters use very simple processes for preparation of clay. They bring clay, break it into small pieces, mix it with all ingredients and soak it with water. After crumbling it again, they prepare lumps of clay for throwing the pots.
As it is already noted above, various tempering materials are used for making the clay homogenous. The proportion in which these materials are mixed varies from place to place according to the composition of the clay. Various types of clays are also mixed together in certain proportions, besides the other ingredients, to achieve the desirable properties. Technically, this clay is known as "body clay". The data about the proportions in which various types of clays and other ingredients are mixed in different parts of the three districts under study, as collected from potters, are presented in Table 5.1.
Table 5.1: Proportions in Which Various Types of Clays and Other Ingredients are Mixed to Prepare 'Body Clay'.

<table>
<thead>
<tr>
<th>Place</th>
<th>Use</th>
<th>Ingredients</th>
<th>Units (Tagara)</th>
<th>Proportion (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Village: Kurali Taluka: Karjan Distt.: Baroda</td>
<td>General</td>
<td>Black clay</td>
<td>4</td>
<td>44.44</td>
</tr>
<tr>
<td></td>
<td></td>
<td>White clay</td>
<td>2</td>
<td>22.22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dry Assdung</td>
<td>1</td>
<td>11.12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Furnace Ash</td>
<td>2</td>
<td>22.22</td>
</tr>
<tr>
<td>2. Village: Muwal Taluka: Padra Distt.: Baroda</td>
<td>General</td>
<td>Black clay</td>
<td>1</td>
<td>50.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>White clay</td>
<td>1</td>
<td>50.00</td>
</tr>
<tr>
<td>3. Village: Vadu Taluka: Padra Distt.: Baroda</td>
<td>General</td>
<td>Black clay</td>
<td>1</td>
<td>50.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>White clay</td>
<td>1</td>
<td>50.00</td>
</tr>
<tr>
<td>4. Village: Chandod Taluka: Dabhoi Distt.: Baroda</td>
<td>a) For 'Matla' (Water pot)</td>
<td>Black clay</td>
<td>2</td>
<td>50.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assdung</td>
<td>1</td>
<td>25.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sand</td>
<td>1</td>
<td>25.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) For 'Batak' (water bag)</td>
<td>Black clay</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assdung</td>
<td>1</td>
<td>20.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ash</td>
<td>1</td>
<td>20.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sand</td>
<td>1</td>
<td>20.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c) For 'Kothi' (Big Jars for water or grains)</td>
<td>Black clay</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assdung</td>
<td>1</td>
<td>25.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sand</td>
<td>1</td>
<td>25.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d) For 'Mond', 'Handli', 'Ghada', and 'Gagar'</td>
<td>Black clay</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>White clay or red clay</td>
<td>1</td>
<td>25.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) For cooking vessels</td>
<td>Black clay</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sand</td>
<td>1</td>
<td>11.11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c) For small pots</td>
<td>Black clay</td>
<td>1</td>
</tr>
<tr>
<td>5. Town: Limkheda Distt.: Panchmahals</td>
<td>General</td>
<td>Sticky clay</td>
<td>1</td>
<td>50.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Campwali clay</td>
<td>1</td>
<td>50.00</td>
</tr>
</tbody>
</table>

cont...
<table>
<thead>
<tr>
<th>Place</th>
<th>Use</th>
<th>Ingredients</th>
<th>Unit (Tagaras)</th>
<th>Proportion (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Village: Burkal Taluka: Sinor Distt.: Baroda</td>
<td>General</td>
<td>Black clay 8</td>
<td>47.06</td>
<td></td>
</tr>
<tr>
<td>Taluka: Sinor Distt.: Baroda</td>
<td>Red clay 4</td>
<td>23.52</td>
<td></td>
<td></td>
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<tr>
<td>Taluka: Sinor Distt.: Baroda</td>
<td>Sand 3</td>
<td>17.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taluka: Sinor Distt.: Baroda</td>
<td>Ass dung 2</td>
<td>11.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Village: Gangedi Taluka: Lunawada Distt.: Panchmahals</td>
<td>(Doni') (Water pots)</td>
<td>Black clay 2</td>
<td>15.40</td>
<td></td>
</tr>
<tr>
<td>Taluka: Lunawada Distt.: Panchmahals</td>
<td>White clay</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taluka: Lunawada Distt.: Panchmahals</td>
<td>Grey clay 8</td>
<td>61.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taluka: Lunawada Distt.: Panchmahals</td>
<td>Sticky clay 3</td>
<td>25.10</td>
<td></td>
<td></td>
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<tr>
<td>Taluka: Kalol Distt.: Panchmahals</td>
<td>White clay 5</td>
<td>71.40</td>
<td></td>
<td></td>
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<tr>
<td>Taluka: Kalol Distt.: Panchmahals</td>
<td>Ash 1</td>
<td>14.30</td>
<td></td>
<td></td>
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<tr>
<td>10. Taluka: Halol Distt.: Panchmahals</td>
<td>General</td>
<td>Slicky clay, (Chikani Mati') 2</td>
<td>40.00</td>
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<tr>
<td>Taluka: Halol Distt.: Panchmahals</td>
<td>Brown clay ('Gorali Mati') 2</td>
<td>40.00</td>
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<tr>
<td>Taluka: Halol Distt.: Panchmahals</td>
<td>Sand ('Reti') 1</td>
<td>20.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Village: Pharoda Taluka: Devagadh Barida Distt.: Panchmahals</td>
<td>a) 'Matla' (big water jar)</td>
<td>Black clay 2</td>
<td>40.00</td>
<td></td>
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<tr>
<td>Taluka: Devagadh Barida Distt.: Panchmahals</td>
<td>White clay which contains sand 3</td>
<td>60.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taluka: Devagadh Barida Distt.: Panchmahals</td>
<td>b) 'Handli', 'Cheelam', 'Vadhi' and 'Batak'.</td>
<td>Black clay, (Kali mati') 1</td>
<td>9.00</td>
<td></td>
</tr>
<tr>
<td>Taluka: Devagadh Barida Distt.: Panchmahals</td>
<td>White clay 10</td>
<td>91.00</td>
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<tr>
<td>Taluka: Devagadh Barida Distt.: Panchmahals</td>
<td>c) Rooftiles</td>
<td>Sand clay 20</td>
<td>95.20</td>
<td></td>
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<tr>
<td>Taluka: Devagadh Barida Distt.: Panchmahals</td>
<td>Black clay 1</td>
<td>4.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Town: Shivrajpur 'Matla' and other pots Taluka: Halol Distt.: Panchmahals</td>
<td>Black clay 1</td>
<td>20.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taluka: Halol Distt.: Panchmahals</td>
<td>Red clay 4</td>
<td>80.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place</td>
<td>Use</td>
<td>Ingredients</td>
<td>Unit (Tagaras)</td>
<td>Proportion (%)</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------</td>
<td>------------------------------</td>
<td>----------------</td>
<td>----------------</td>
</tr>
<tr>
<td>13. Town: Jhalod, Taluka: Jhalod, Distt.: Panchmahals</td>
<td>'Gori' (Pot for storing water and keeping 'chhach')</td>
<td>Black clay</td>
<td>2</td>
<td>66.60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>White clay</td>
<td>1</td>
<td>33.40</td>
</tr>
<tr>
<td>14. Town: Naswadi, Taluka: Naswadi, Distt.: Baroda</td>
<td>a) General</td>
<td>Black clay</td>
<td>12</td>
<td>54.54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Red clay</td>
<td>8</td>
<td>36.36</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sand</td>
<td>1</td>
<td>4.55</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ash</td>
<td>1</td>
<td>4.55</td>
</tr>
<tr>
<td></td>
<td>b) Small pots</td>
<td>Black clay</td>
<td>7</td>
<td>43.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Red clay</td>
<td>7</td>
<td>43.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sand</td>
<td>1</td>
<td>6.25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ash</td>
<td>1</td>
<td>6.25</td>
</tr>
<tr>
<td>15. Town: Chhotaudaipur, Taluka: -do-, Distt.: Baroda</td>
<td>General</td>
<td>Black clay</td>
<td>12</td>
<td>85.72</td>
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<tr>
<td></td>
<td></td>
<td>Ash</td>
<td>1</td>
<td>7.14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sand</td>
<td>1</td>
<td>7.14</td>
</tr>
<tr>
<td>16. Town: Sinor, Taluka: Sinor, Distt.: Baroda</td>
<td>General ('Kali Mati')</td>
<td>Black clay</td>
<td>2</td>
<td>50.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ass dung</td>
<td>1</td>
<td>25.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sand</td>
<td>1</td>
<td>25.00</td>
</tr>
<tr>
<td>17. Town: Jabugam, Taluka: Jabugam (Jetpur), Distt.: Baroda</td>
<td>General</td>
<td>Black clay</td>
<td>5</td>
<td>62.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Red clay</td>
<td>1</td>
<td>12.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ash</td>
<td>2</td>
<td>25.00</td>
</tr>
<tr>
<td>18. Village: Dhavat, Taluka: Karjan, Distt.: Baroda</td>
<td>General, 'Degado', 'Maia', 'Dhochki' and other small objects</td>
<td>Sticky Black clay</td>
<td>2</td>
<td>50.00</td>
</tr>
</tbody>
</table>
Thus, on the basis of the information noted above, we can observe that the black clay is the most commonly used ingredient in the body clay, perhaps because it is most commonly available also. A much higher proportion of black clay is needed for preparing cooking vessels (as much as 90% of the body clay), and the only other ingredient in this case is sand. For reducing the sticky quality of the clay, they mix ashes, assdung and sand. Proportions of various ingredients in the mixture of the body clay vary according to the place as well as the type of clay objects to be prepared.

3. POTTERS' TOOLS

The tools or implements used by the potters in manufacturing the pots are quite simple, and for the most part very traditional. There have not been much improvements in these tools. Right from the stage of digging of the clay to the firing stage, different tools are used by the potters. Shapes of the tools and materials depend on the function of the tools.

The types of tools which are generally used by the
potters of the districts under study are described below. But all the tools are not kept by all the potters. They keep the tools according to their need.

(A) Tools for Digging the Clay

Broad Hoe or 'Pavda': It is a very simple and a traditional tool for the potters. It is made of a broad iron scoop fitted to a straight handle by means of a hole at one end. It is used for cutting and digging the clay.

Narrow Hoe or 'Kudali': It has a narrow trapezoid scoop having a hole at one end in which a wooden handle is fitted. It is also used for digging the clay.

Pick or 'Teekam': The iron pick has a pointed and a broad end. A stout straight wooden handle is fixed to the centre of the iron. It is a very good tool for digging hard clay.

Saddle bag: This is made from strings of coconut fibre or some other fibres. The saddle bag is roughly triangular in shape and is laid across the back of the donkey. It is used for hauling the clay. Potters buy this bag from the market. It is generally prepared by the tribal
people and its manufacture is very common in Panchmahals district. There is another type of bag which is used for carrying the pots, which is locally known as 'lagado'. It is a pair of basket frames joined with bamboo poles in such a way that the two baskets, knitted with ropes, hang on either side of the donkey's back (Pl.3a).

(B) Tools for preparing the clay:

'Tagara': It is made of iron and it looks like a big shallow dish. It is used for measuring the clay and other ingredients while preparing the clay mixture.

Basket or 'Tokari' or 'Dalia': The big hemispherical basket is made of bamboo strips running parallel to the rim. Small baskets are used for shifting the clay from one place to another. The baskets are also used for keeping the freshly thrown pots for drying, where the ash-beds are not used for keeping the unfinished pots. For example, the baskets are used for this purpose in Tilakwada of Baroda district. When used in this way, it is known a 'Chalu'.

'Seive or 'Chalana': A piece of wire-netting is stitched across a large rectangular frame to make a sieve.
Another type of sieve consists of a fine wire-netting, fitted into a circular wooden frame, and nailed down under an iron hoop. Yet another type is made of a tin base with holes fitted in a frame. The sieve is used for filtering the levigated clay. It is also used for sieving the small grains of sand which is sometimes mixed with the clay.

Stone-slab or 'Pathro' : A smooth stone slab, roughly rectangular in shape, is used as a base for rolling the lump of clay. It is specially used in hand-made pottery.

(C) Tools for Throwing the Pots

Potter's Wheel or 'Chakdo' : The wheel as used by potters ranks among the earliest mechanical contrivances. The Egyptians classed it among the inventions of the gods and claimed that Mum, the creator, fashioned man upon it. A similar type of belief is prevalent among the potters of this region. They believe that their working equipment is given by one of the deities, Shanker or Siva. Shanker gave the tools to Brahma, and he gave it to the potters. The tradition has it that when Brahma first gave this tool to the

potters, the wheel used to turn automatically. They had to use the hand to stop its turning. But one day a potter, being mad, wanted to stop the turning wheel without using his hand and instead, he gave the wheel a kick with his feet. After that the wheel stopped for ever, and since that day they have to turn the wheel with a stick. This also explains the taboo among the potters about touching the wheel by feet, referred to in Chapter III.

A relatively close association of pottery with religious beliefs is that when the lump of clay is kept on the centre of the wheel, it is known as 'Shanker-nu-ling' which in reality resembles a 'Siva Ling'. The potter, thus, draws analogy between himself and the creative deity, the Prajapati.6

There is another interesting story about potters' wheel. In the 'Krit Yuga' the Maheshwar, 'Siva' intended to marry the daughter of Hemvant. Then the Devas and the Asuras (i.e., the Gods and the Evils) assembled at Kailas (the heaven). Then a question arose as to who should furnish the vessels required for the ceremony, and one 'Kulalaka', a Brahman, 6

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6 And hence, potters' organisations are invariably named as 'Prajapati Samaj' as noted earlier in Chapter III.
was ordered to make them. Then 'Kalalaka' stood before the assembly with folded hands and prayed that materials be given to him for making the pots. So Vishnu gave his 'Sudarsana Chakra' (i.e., the discus) to be used as a wheel, and the mountain of Mandara was fixed as a pivot beneath it to hold it up. The scraper was 'Adi Kurma' the tortoise, and a rain cloud was used for the water tub. So Kulalaka made the pots and gave them to Maheswar for his marriage. 7

Evidences of the use of wheel in the manufacture of pots are found right from the late stone-age at Langhnaj in Gujarat. It was widely used during the Harappan period, and has continued to be used through all the successive periods till now. 8

In the process of manufacturing the pots, the function of the wheel is to supply centrifugal force to a lump of plastic clay accurately thrown out of the centre. Such a well centred lump, when spinning fast, needs only light guiding pressure from the potter's hand to rise and to change into the desired shape.

There are five parts of the wheel, i.e., (a) the central disc ('thala' or 'tharu'), (b) the spokes ('ara'), (c) the bearing ('adi'), (d) the apperture in felloe ('khado') and (e) the pivot ('chopti'), (Pl.3b).

The wheel is usually made of wood, though, at some places cement wheels or stone wheels are also used, as for example, at Dahod in Panchmahals. The wooden wheel is covered with coir and sheep or goat hair and is plastered with clay so as to make it heavy for gaining and retaining a good momentum and giving a steady motion. The wheel resembles a cart wheel, consisting of a broad curved felloe, composed of several pieces tenoned together. The felloe is connected with the central hub or disc by means of six or eight spokes which are also tenoned. The flat upper surface is used to throw the earthen vessels. A small, slightly concave, piece of white flint stone socket enclosed in a frame of metal strip is nailed to the centre on the underside of the wheel. It serves as a bearing for the rotation of the wheel. An apperture is cut on the side of the wheel to admit the stick with which the wheel is made to turn.
A rectangular piece of wood is fitted into the centre of an irregularly shaped stone slab and wedged firmly in by means of a chip of wood and rags of cloth. This rectangular wooden pin ('pivot') which is fashioned from wood, is a spherical point well lubricated with oil, so that it helps the movement of the wheel.

The size of the wheel differs from place to place and it also depends on the type of pots to be manufactured. Those potters who manufacture big water pots, cooking vessels etc., use a bigger wheel which gives more rotation in a single move. Those potters who manufacture small pots, use small wheels. The biggest size of wheels having a diameter of one meter, are found in Tilakwada, Vadu and Muwal of Baroda district. Generally the potters use wheels having a diameter of 85 cms. to 90 cms. Smallest wheels, having a diameter of 76 cms. are used by Momana potters of Broach district. These wheels are very light, and women also operate them. Momana potters of Surat also operate with small wheels.

Stick or 'Lakadi': A straight wooden stick which is about one meter in length, is used to drive the wheel into motion.
Cloth: Sometimes potters use some rough pieces of cloth to smoothen the rims of the vessels.

Cord or 'dori'. A thread is used for cutting the vessels from the wheel after throwing.

(D) Tools for Expanding the Pots

Paddle, i.e., 'Tapala' or 'Phalada': This term is generally used for all wooden mallets, employed to chase vessels into shape. It is a wooden tool made by carpenters. It has two sides, one side is plain and the other side has a depression. Various types of paddles are found at different places which differ in size and weight. Mostly, there are two types of paddles in use in this region: (a) paddles used for enlarging the vessels, and (b) paddles used for smoothening the surface of the vessels. But there are no separate names for these.

A heavy paddle with plain surface is generally employed for enlarging the pot, while a light paddle with a depression is used for smoothening the surface. A paddle with a narrow oblong striking surface is employed to shape the

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9 Eberhard Fisher and Haku Shah: Rural Craftsmen and Their Work, op.cit., p.127.
shoulder or vessels. In some other places like Goa, Mysore, Andhra Pradesh, Northern parts of Kerala, Madras and in West Bengal, a heavy paddle which has engraved lines, is used. These types of paddles with linear incision are used to render decorative impressions on earthenware. This type of paddle is not used in this region.

In this region paddles are generally made from mango, acacia (‘babul’) or neem wood. The length of the paddle varies from 20 cms to 35 cms. Potters use different sizes of paddles at different stages of operations on the same pot.

In shape, only two types of paddles have been noticed in this region: (a) round shape and (b) trowel shape. Potters generally keep both the types.

Dabber or Anvil or 'Filla': A smooth pebble stone cut in a special shape, is used for giving support to the pots from inside while beating with 'tapla'.

(E) Tools for Painting, Burnishing and Engraving

Brush or 'Kuchi': A brush (known as 'kuchi') made of

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women's hair is used for colouring and designing the pots. Ochre and chalk are liquified in an earthen pot, and used as paints. Some of the potters add some oil to the paint, which gives more shining to the pots. Generally, groundnut oil is used for this purpose. For painting the black pots specially, oil is used with black clay and soot. The mixture is applied with brush made of hair.

**String of Beads and Stone Pieces**: A string of stone-beads, generally made of quartz, is used for burnishing and polishing. It is known as 'manka' or 'mala'. Sometimes a few smooth stones without a string are also used for this purpose.

**Needle or wire**: An iron needle or a piece of hard iron wire is generally used for engraving.

(F) **Tools for Firing**

**Axe or 'Kuado'**: A common iron axe with a socket and with straight handle, is used to chop the wood. Besides it, other instruments are occasionally used to chop the wood.

**Tongs or 'Chipio'**: Two flexible flat iron rods are revetted together at one end to make the tong which is used to handle hot objects.
Poker or 'Lakado': A wooden or bamboo stick is used to poke the fire in the kiln.

Pot-sherds or 'mikrob' or 'Kundo': The rim portion of broken earthen ware is used to form the ventilation holes in the kiln. Sometimes a bowl-shaped pot without a base and with a hole inside, is used to form the ventilation holes. At places like Vadu and Muwal in Baroda district they use bowl-shaped pots. At other places, only rim portions of pots are used for this purpose. Broken earthen pots are also used for covering the kiln at the time of baking the pots (Pl. 3c).

4. METHODS OF MAKING THE POTS

Three methods are used for making the pots and other clay objects in the districts under study. These methods are:

(a) Hand modelling;

(b) Moulding; and

(c) Wheel turning.

(A) Hand Modelling

Hand modelling is not very common in this region.
Big water jars ('kothi'), pedestals ('tharu'), and hearths ('sagari') are the only objects which are made by hand. Of these, pedestals and hearths are usually prepared by women. Big water jars are prepared both by men and women.

For manufacturing these objects, usually, the clay is prepared in the same way as in the case of wheel-thrown pottery. But for preparing large jars the clay has to be tempered with fibrous materials like chaff or dung, and if the clay is sticky, ash is also added. At Darapura in Padra taluka of Baroda district, the clay used in the manufacture of big jars ('kothi') by hand modelling is tempered with chaff and allowed to ferment for about twenty days. After the clay is fermented, it is thoroughly kneaded by feet and hands till it attains the required consistency.

The method of modelling the pot is the same at all the places like, Darapura and Chandod in Baroda, Lunawada and Santrampur in Panchmahals and Ankleshwar and Jambusar in Broach, where big jars are produced.

For manufacturing big jars, each circuit of the pot is formed by separate layers of clay ranged one upon the other and pressed into one.
First of all the potter flattens a disc from the clay. The disc serves as the base upon which walls are constructed. A lump of clay is rolled out on a wooden board and added around the rim of the base. Then more clay is added and pressed with fingers. The work thus proceeds by ranging the layers one after another. The potter walks around the pot for affixing the clay fillets. The walls of the pot are beaten with 'pilla' and 'tapala', when they are a little dry. During the process of beating, the 'tapala' and 'pilla' are moistened frequently. After building the walls the pot is finally beaten to the required thinness. Jars are made in different shapes. Some of the jars are without necks while others have it. For making the neck of the jar, a small clay fillet is attached to the top of the body of the pot. The neck is finally shaped by hand and with the help of 'tapala' and 'pilla'. Sometimes designs are engraved on the shoulder and on the rim of the pot before they are dried in the sun.

The same method is used for manufacturing 'tharu' (pedestal) as well. First of all, a flattened dish is made, on which a small wall is raised with clay fillets, and three legs are attached to the disc with a lump of clay. A portion
on the wall of the pedestal is cut before it is dried. The same method is used for making hearths also.

(B) Moulding

In this method, the objects are made with the help of a mould. In these districts only terracottas and some idols and bricks are moulded by this process.

It is an easy method. A lump of clay is placed and pressed in a wooden mould. Before the clay is placed, ash is sprinkled on the board to prevent sticking. Then the object, which takes the shape of the mould, is taken out. This type of mould is generally used by the Ajmeri potters for moulding terracottas and by Dalwadi potters for moulding bricks.

Among other groups of potters also this method is sometimes used, but it is rare.

(C) Wheel Turning

This is the most common method of making the pots. For throwing the pots on the wheel, the potter sits facing the wheel. Then he holds the spokes of the wheel with his right hand and sets the wheel in motion. A lump of clay is placed on the wheel. About a dozen of stages are gone through
before the clay lump turns into a desired shape. In
general, almost all the pots are thrown in the following
successive stages:

(i) **Preparation**: First the potter takes a lump of clay
formed into the shape of a cylinder. The size of cylinder
varies according to the object to be prepared. But generally
he makes two or more than two objects from a single lump of
clay.

(ii) **Centering**: The clay cylinder is placed in the centre
of the wheel which is already spinning slowly. The potter
presses his left hand against the clay cylinder to settle
it compactly, symmetrically and centrally.

(iii) **Coning**: The potter moistens the lump of clay with
his wet palms and clasps the clay cylinder firmly with both
the hands while the wheel is in motion. The palms nearer the
wrists are pressed against the front of the clay cylinder
and fingers of both the hands join on the other side.
Pressure of the palm and fingers induces the clay cylinder
to rise up, (Pl.3d).

(iv) **Plunging**: The dome formed by coning is slowly pressed
down by driving vertically the finger of the two hands on the top of the dome. The finger and thumbs of both the hands maintain perfect harmony so that the dome may not be torn.

(v) Drawing up : Plunging reduces the original size of the clay cylinder. The clay is again drawn up by giving a gentle pressure on the walls by the medial edge of the palms and the direction of the fingers held closely. When it rises to the upper limit, the two thumbs are placed inside, and the fingers hold the outer wall to prevent the open top from flaring.

(vi) Thinning the wall : The wall of the cylinder requires thinning according to shape. The potter inserts his left hand into the clay cylinder and supports the outer wall with his right hand. The two hands move simultaneously and work smoothly in such a balanced manner that the wall of the cylinder receives an even thickness throughout.

(vii) Forming : At this stage, the method differs from pot to pot. In this process the position of the hand is the same as in thinning process, but the potter moulds the rim portion of the pot and narrows the mouth of the cylinder or makes it broad according to the shape of the pot.
Different types of 'kunda' (flower pots) which are not subsequently chased with paddle and 'pilla', and therefore have to bottom, very often, are given double rims. For this purpose, after throwing the full shape, the potter stops the wheel and proceeds to revolve it backwards, at the same time pressing the lower rim against the upper one at equal intervals with thumb, the forefinger resting on the upper rim. The lower rim is then formed into a wavy shape.

A border of parallel grooves is sometimes scratched around the neck of a 'gori', 'ghada', 'matla' and other water vessels. For this purpose, the potter uses one of his finger nails, whichever happens to be the longest.

(viii) Smoothening: After the pot has received the desired shape and the wall has been made steady, the next task of the potter is to smoothen the rim and the surface of the pot with a wet mop which may be a piece of cloth.

(ix) Cutting off: When the pot is ready, he cuts it from the base with the help of a thread.

(x) Removal: While removing the pot, the wheel is slowed down and the pot is lifted with both the lower arms or in a
hollow, formed by cupping the two hands. All the vessels are turned in more or less the same way. The small flat 'kadio' (earthen-ware lamp) and the 'dhakni' (lids) are not cut with the cord, but are twisted off the wheel. The potter accomplishes this by slowly squeezing together his thumb and forefinger under the object and jerking it upwards, as a result of which the object falls into his hands. Its symmetrical shape is generally preserved because it is comparatively thick.

(xi) Expanding the vessels: After the pot is thrown by wheel and dried leather-hard, potter starts the beating process for expanding the pot. Among the local potters this process is known as 'garhna'. In literature, this process is termed variously as enlarging the pots, 'chasing the pots', 'shaping the pots, and beating the pots', etc. Indian potters believe that the technique of beating gives more cohesion to the clay of the pots thrown on the wheel. Except the small cups, earthen lamps and toys, all other vessels receive the treatment of beating. The method and the extent of beating depends on the type of objects to be made, the clay

11 Eberhard Fisher and Hakku Shah, Rural Craftsmen and Their Work, op. cit.
12 Baidyanath: Pottery Technique in Peasant India, op. cit., p. 55.
used for preparing the ware, and the season in which the pots are made. Before beating the pots, the potter tests the degree of hardness of the clay by pressing his forefinger on the pot.

Generally, potters avoid keeping the pots in the sun for drying. They keep the pots in an ash-bed specially made in a corner of the outer part of the house. Then the pots are covered with a blanket so that the drying process is slow. This is the most common method of drying the pots. However, in Tilakwada taluka of Baroda district, instead of using an ash-bed, the potters keep the pot in a small basket full of scraps of wood or river-weed which absorb all the moisture of the pot (Pl. 4a). The pot is covered with similar scraps. The potters claim that this method keeps the pots tidy (as the ashes make them dirty), and it gives the convenience of shifting the pots from one place to another for the expanding process. Yet another advantage is that by keeping the pots in baskets, they can economise on floor space, and space is generally short in potters' houses.

The interval between throwing and expanding depends on the weather. In dry weather it takes only four or five hours in the shade whereas in humid weather it takes more time.
In this region, generally the potters throw the pots early in the morning and start the work of expanding in the afternoon.

When the pot is leather-hard, it is taken out for beating. While being beaten, the pot is kept on ashes contained in an earthen pot, covered with a thick jute bag. Sometimes it is also beaten while keeping it on an ash-bed. It mostly depends on the size of the pot. Potters take the 'pilla' and 'tapala' and start the process of beating and expanding. While shaping the pots, the potters use water for moistening and ashes for removing the stickness of the pots. Shaping starts from the lower part of the pot and proceeds towards the upper part. This process is divided at least in four parts, separated with long intervals. In the first round, potters give the shape to the vessel by beating extra clay attached with it. Sometimes while cutting the pots, the potter cuts the bottom of the pot also, for instance, in the case of 'tavadi'. For this pot, in the first round, the potter closes the bottom by covering it from the sides by beating process. In the first round potters usually use the thick and heavy 'tapala'. In the second round mostly the upper parts of the pots are beaten, and in the third round, the pots are fully
expanded to the desired shape. In the fourth round, generally the potters use a light type of 'tapala'. In this stage, pots attain the smoothness and symmetry which are essential for a well-shaped pot, (Pl. 4b).

Large vessels with carinated shoulder are shaped on a ring support, over which a gunny bag, strewn with ash, is laid.

Shaping of pot depends on the clay. If the clay is good and levigated, then more strokes can be given at one place and it taken less time, but if the clay is of inferior quality then care has to be taken while giving the strokes, otherwise it would break. In this case it takes more time to give proper shape to the pot.

5. METHODS OF DECORATING THE POTS

After the pots are thrown, expanded, shaped and dried, they are subjected to various types of decorations. The process of decoration involves (a) polishing or burnishing, (b) painting, and (c) engraving.

(A) Polishing or Burnishing

The process between coating the first slip on the pots and painting of the pots, is known as burnishing or
polishing in which the pots are given shining by friction. This process is locally known as 'ghutno'. The technique of polishing is known among the potters all over the country, and it is quite an old tradition. Pot-sherds found even on the late stone-age site, Langhanaj, bear the evidence of burnishing. The purpose of polishing is to brighten the surface of the pots. It is done for red pottery as well as for black pottery. In these districts burnishing is done by three methods, i.e., (i) burnishing with a small piece of smooth stone, (ii) burnishing with a chain of beads of stone, and (iii) burnishing with the help of a chain of beads and wheel.

When the pot is completely dried, it is rubbed with a piece of stone. This method of burnishing is used only for smaller pots. But the pots are not fully burnished by this method. However, it is a simple method, and is usually practised by women.

Burnishing the pots with a chain of beads of stone: In this method, one big chain of beads, known as 'manka' or 'mala' is employed. The pot is kept on the ground and the potter bends over the pot, encircles it with the chain and starts

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rubbing the pot. While rubbing, the potter gives a circular motion to the pot so that the whole area of the pot is covered (Pl. 4c).

It is one of the better techniques of polishing. Generally, the bigger pots are polished by this method.

**Burnishing the pots with the help of a chain of beads and the wheel:** This method is very effective and very common for burnishing all types of pots, whether small or big. In this method, the rim portion of a broken pot (handli) is tied to the centre of the wheel. Then the pot which is to be burnished is kept in the centre with the support of the rim of the broken handli. The potter holds the chain of beads in his hand and places it on the neck of the pot. Then he gives motion to the wheel. When the wheel rotates, the beads rub the pot all around uniformly, and a complete burnishing is achieved in a short time. This is one of the best methods of polishing.

(B) **Painting and Engraving**

Painting is an important part of decoration which is done only by women in this region. This work is locally known as 'Chitra Padana'. Painted pots are in great demand,
First of all, the pots are coated with a slip. The slip is generally light-red or red ochre, and when applied, it gives bright and dark red colour to the pot after firing.

There are different varieties of ochre. Some are light red and some are a dark red. For giving the slip on the pots they prepare ochre solution by mixing it with water. At some places they also mix some groundnut oil in this solution which gives bright lustre after firing. The solution for about hundred big pots would contain the following ingredients:

- Ochre: 5 Kgs
- Groundnut oil: 1/2 Kg
- Water: Half of a medium size bucket.

The slip of ochre is given when the pots are fully dried. Sometimes a second coating is also given. Then the pots are allowed to dry. In Dahod taluka of Panchmahals district, the first slip is given with a solution of chalk, and the red slip of ochre is used for painting the pots on the white background (Pl. 4d).

At Dhoral village of Dabhoi taluka of Baroda district,
the potters use a mica slip on the shoulder of the pot. Mica of a green colour is available from the river-bed locally, and it gives a beautiful luster after firing. At some places, like Devagadh Barida in Panchmahals, mica is dusted on the pot just for giving a lustre. This is done for red as well as black pots.

After the pots have been given a red (ochre) slip, a chalk or lime solution is used to paint various motifs on the pot, and the painting remains white even after baking. Sometimes, the colour scheme is reversed. For example, in Dahod, a lime solution is used to give the first slip and then an ochre solution is used to paint motifs on the pot. But this scheme of colours, i.e., red motifs on white background, is not very common.

Ceremonial pots, such as 'garbi', 'gotri', etc. are painted after firing. Generally a chalk (CaCO₃) solution is used for painting motifs. As this type of painting is not durable, potters, at some places, have started painting the fired pots with oil paint which looks very charming. Potters at Shivarajpur in Panchmahals have even started painting big (non-ceremonial) pots like 'matla' and 'ghada' with oil paint. But oil-painted pots loose their porosity, and hence their water-cooling quality is reduced.
Jars which are used for keeping pickles (i.e., 'burni') are given a slip of lac after being fired. The pot is heated first, and then a slip of lac is given both on outside and inside walls, and then the pot is allowed to cool-down. This way, the pots acquire a gloss. This technique of lackquering on fired pots is prevalent in Baroda city, Vadu village in taluka Padra of Baroda and at some other places in Panchmahals where lac is available from natural sources.

**Engraving:** Engraving is done on the pots with a pointed iron needle when the pot is dried leather-hard. This too is usually done by women. Generally, the bigger pots, such as 'gori', 'matla' etc., are engraved on the shoulder. In this region, wave-bands and check motifs are common for engraving (Pl.5a).

6. **TECHNIQUE OF FIRING THE POTS**

Firing is the last, but a very essential process for giving durability to the pots. Method of firing differs from place to place and it also depends on the types of pots.

(A) **Types of Kilns**

In potters' language, the firing kiln is known as 'Limbada' or 'Niwada' or 'Bhatti'. In Panchmahals district
it is generally known as 'Limbada' and in Baroda and Broach districts it is known as 'Niwada'. 'Bhatti' is a common word used by common people everywhere in these districts.

The following types of kilns are found in these districts:

(a) Common types of kilns:
   i) kiln on a flat ground,
   ii) kiln on a hollow ground, and
   iii) kiln on a raised platform;

(b) Kiln with circular brick walls with many windows ('baris'); and

(c) Kiln having one window and a dome type of shape.

Common type kilns: There are local variations in the size and the style of the kilns ('niwada'), though the basic principle is the same. At most of the places it is made on a flat ground but at some places it is made on a raised platform, for example, at Jambusar in Broach district. At some places it is made on hollow ground, for example at Kurali village of Karjan taluka of Baroda district. But the method of arranging the pots is the same at all places. For this purpose first a circular bed consisting of dried bushes,
strips of wood etc. is prepared on the ground. At some places the platform is also made of dried 'babul' thorn, for example, at Vadu village of Baroda district. Advantage of this thorn is that it takes more time to be completely burnt and gives more heat to the pots, (Pl. 5b).

At some places the platform is made of cakes of cow-dung and other bushy material, for example, in Chandod and Kurali villages in Baroda district. But a more common practice is not to use cow-dung for making the platform, but to use it afterwards for filling the gaps between the pots in the kiln.

Pots are piled up on this bed in a circular manner with their mouths inverted (Pl. 5c). The bigger pots are kept first, and then the smaller ones. Around the 'nivada' broken pots with their rims, known as 'bhangar', are kept which work as a window ('bari') for the kiln. Many such types of windows are made around the kiln. Number of the windows depends on the size of the kiln. But generally fifteen to twenty windows are found in one kiln. At some places two cylindrical types of 'mobhia' (country roof tiles) are kept around the furnace in a vertical position, and those are covered with another 'mobhia' in horizontal position. Then
the rim of a big pot is placed under the 'mobhia' and this is how the window is made. This practice is found in Dabhoi taluka of Baroda district. Sometimes a special type of pot (known as 'kunda') is prepared for making the windows. Its shape is like a deep bowl with a big hole in the base. This type of 'kunda', which is specially made for this purpose, is found in Vadu and Muwal villages of Baroda district.

Pots are piled in various layers. After arranging each layer, gaps are filled in with dried pieces of cow-dung known as 'Ghana'. The pile generally takes the shape of a dome.

When all the pots are arranged the kiln is covered with 'tavadi' or pans. Only the upper portion of the kiln is not so covered. Dry leaves and grasses are spread over the kiln, and it is plastered with clay. Then the fire is kindled through all the windows simultaneously by one or two persons.

The fire, which is initially slow, gradually develops and spreads inside the kiln. Sometimes a stick is used as a poker to stir the fire. Feeding of the kiln is done through the windows and the smoke comes out from above. The fire with a bright flame goes on for about an hour or two, and then slow firing continues for another three to four hours depending on the type of pots and the fuel. Usually feeding is stopped
when the colour of the pots becomes very bright. Generally, in this region, firing is done in the evening at about 4 p.m., and the pots are taken out from the kiln the next morning.

**Kiln made of Circular brick-walls**: This type of kiln is made on a flat surface by bricks in a circular form. Its size varies from place to place. But generally it has a radius of 1.5 meters to 2 meters, and a height of about one meter, and the width of the wall is between 25 cms. to 40 cms. It has many windows on the lower part of the circular wall. Number of the windows depends on the size of the kiln. But generally it has something between 14 and 20 windows (Fig. 15d). This type of Kiln is not very common. It has been found only at a few places. In Baroda town, potters use this type of kiln, for which they have to pay Rs. 5/- per year as a corporation tax.

In this type of kiln also, first of all, a platform with dried grass is made. Then the pots are arranged in the usual manner. After arranging the pots and filling the kiln with fuel, it is plastered with clay. The upper portion of the kiln is kept open. Feeding is done through the windows.
**Kiln having one window and dome type of shape or oven type of kiln**: This type of kiln has a round dome type of shape with one window. The upper portion is open. In this kiln, pots are not kept in direct contact with the fire, but they are kept on an iron net which is kept inside the oven. Feeding is done through the window. This type of kiln is used for baking small pots and terracotta objects. This type of kiln is also quite rare. It has been found only at Devagadh Barid taluka of Panchmahals.

The last two types of kilns (i.e., type (b) and (c)) are not very common in these districts, though, there are many advantages of these types of kilns, as they require less fuel and temperature is well controlled. In open firing, there is no control over temperature, and its efficiency depends more on experience.

But these brick-wall or oven type of kilns require a permanent space which the potters generally do not have. Open firing can be done anywhere and at any time. Therefore, mostly the potters prefer open firing.
(B) Reduction Firing and Open Firing:

When the firing is done in such a manner that the combustion is complete, and in consequence, the burning gases are amply supplied with oxygen, it causes metals in the clay to give their oxide colours. This is known as open firing. Under this type of firing, the colour of the pot depends upon the type of slip used before firing.

There is another method of firing in which pots become black. This method is known as reduction method, which is opposite to the oxidation method. A kiln in which combustion is incomplete or smoky, the carbon present inside has the effect of reducing the oxides to their respective chemicals. No separate kiln is needed for this type of firing. The pots are arranged in the same style as in the case of open firing. But unlike oxidation firing, after the fire has burnt for certain period, the upper portion of the kiln is closed with a thick layer of clay and the smoke is retained inside. Sometimes after the pots are red in the kiln, potters throw husk, cattle-dung or any other material which may produce more smoke inside the pile. Then all the windows and outlets are sealed properly and the smoke is choked inside. The pots turn black.
This method is widely prevalent among all potters of these districts for manufacturing black pots. Specially tribal people prefer black pots. Therefore, this technique is very common in tribal regions of these districts. But this type of firing takes more time, more labour and more fuel than oxidising method.

(C) Fuels and Temperature

For firing purposes, generally such types of fuels are used which can rapidly burn, e.g., cattle-dung cakes, straw, husks, dry leaves, etc. Charcoal or coke is rarely used. Usually in all cases of open firing the pile is required to be covered with pot-sherds, mud-paste or any other material which may prevent the draught of cold air inside the kiln, and thus help conserve the heat.

The temperature obtained under open firing varies from 400°C to 1000°C. Potters give the required temperature on the basis of their experiences. Variations in temperature are needed according to the quality of the clay, which varies from place to place. For example the clay of Vankad Kamam area in Baroda district can bear higher temperature while at other places the clay cannot bear that much temperature.

Duration of firing also depends on the season and the climate.