A Cybernetic Study on the Andro Ceramic Ecology

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I

Ceramics, one of the most tangible products of man’s culture, are a highly specialized part of the techno-economic sub-system that adapts to and modifies the environment for socio-cultural ends (Arnold, 1988: 16). Moreover, as an integral part of the larger culture-environment system, ceramics are also systematically tied to the environment.

Earlier studies on ceramics (Gifford, 1960; Rouse, 1960; Whallon, 1972 and Smith et al., 1960) placed emphasis on classification taking potsherds as basic units of study. Such studies were based on the atomistic paradigm that has its roots in Newtonian Physics. It did not take environment into its account on the ground that environment is a neutral variable which plays no appreciable role in the similarities and differences in ceramics. Another paradigmatic notion that affects ceramic studies is mentalism that dominated anthropological thought in the late nineteenth and early twentieth centuries. This perspective is clearly reflected in the ceramic studies of Bunzel (1929), Gifford (1960) and Deetz (1967). Among archaeologists the environment was thus viewed as having no impact on ceramics except as providing the necessary raw material (Arnold, 1988:9).

Maison (1965), relating Steward’s (1955) cultural ecological approach to ceramic studies, first emphasised the relationship of the ceramics with the environment and cultural patterns behind them. He refers to his perspective as ‘ceramic ecology’ in order to show its difference from the traditional ceramic studies a well as to call academic attention to this approach. In his ceramic ecological approach, he further emphasises the need to relate ceramics to human choices and cultural patterns. This theoretical approach was later employed by Arnold (1975, 1978 a, b), Kolb (1976), Van der Leeuw (1976) and Rice (1981) in their pursuit of ceramic studies.

The systematic relationship between ceramics on the one hand, and environment and culture on the other can exhaustively be discussed in terms of cybernetics rooted in systems paradigm because ceramics, as one kind of material culture and a part of the exploitative or productive technology, are tied closely to the environment forming a complex whole – a dynamic system. ‘Cybernetics is attractive ... because it removes the distinction between living and non-living system and concentrates on the similar properties of both’ (Arnold, 1988: 17). These similar properties, from the perspective of cybernetics, consist of goal-seeking behaviour and the processes of control and communication that permit the system to achieve that goal (Boulanger, 1969). These processes of control and communication always work to reduce the difference between the goal and the actual performance of the system by way of collective information about the difference (Miller et al., 1960). These processes, referred to as feedback mechanisms, display mutual causal relationships in which the output (the actions of the system upon its environment) of the system affects the input (the varying external conditions acting upon the systems).

Feedback mechanisms are of two types: negative feedback (regulatory or deviation counteracting feedback) and positive feedback (deviation amplifying feedback). Negative feedback promotes equilibrium of the system counteracting deviations from the stable situation over long periods of time and maintaining simultaneously a prescribed set of boundaries. When a system cannot regulate the external input acting upon it the feedback process promote or amplify deviations: this is positive feedback. It consequently results in the expansion of system and gives rise to the stability of the system at new, more complex levels (Maruyama, 1963). These external inputs, called kicks, redefine the thresholds of the system forcing the inputs of the system through the threshold of the regulatory feedback. Positive feedback thus bring about dis-equilibrium and change within the system. Moreover,
the system can gain information and change by means of the process of this feedback. 'Both kinds of feedback are important in their respective capacities for bringing systems up, or away from states of equilibrium or stability' (Clark, 1978: 47).

The processes that relate ceramics to the environment and culture can be viewed as a set of some of the feedback processes that stimulate or limit ceramic production and can aid in interpreting the role of ceramics in ancient society.

The present study endeavours, on the one hand, to explain the relationship of the Andro potters with their environment and culture as a series of feedback mechanisms in the light of cybernetic model and to draw an ethnographic generalization of the relationship that can be applied to the past on the other.

II

Inhabiting the village bearing the same name on the down slopes of the eastern foothills of the Nongmaiching hills in the Imphal East District, Manipur, the Andros is one of the important constituent groups of the 'loii' community of the State. Though listed as a Scheduled Caste (along with their other counterparts - Phayeng, Sekmai, Leimaram, etc.) under the Government of India's Scheduled Castes and Scheduled Tribes Amendment Act (No. 108 of 1956), the patri-oriented agrarian Andros do not necessarily agree with the configurational hierarchy system of a caste society. However, the people possess the tribal characters at least in the concept of territorial and cultural boundary (Majumdar, 1961: 367; Beteille, 1977: 10). The people of the region are acclaimed as wet-cultivators; nevertheless pottery is also practiced as a main economic pursuit by the Andro womenfolk - as favourite bit of household chores. Thus, pottery, by and large, remains as a part-time occupation of Andro women whereas men share none with their opposites. Continuity, development and seasonality of the women - specialized Andro pottery result from both the negative and positive feedback mechanisms induced by some contemporaneous environmental factors such as, original properties of the raw materials, local climatic conditions, availability of resources, scheduling conflict, cultural norms and behaviour resulting in exploitation of resources etc.

One of the primary environmental factors responsible for the development of pottery in Andro is the suitability and easy availability of the necessary resources. The raw material of the Andro pottery consists of leitan (clay class) co-mingled with leichreng at a given proportion just to manufacture a tempered produce. The addition of finely pounded leichreng to the paste of leitan is effected for the sole effect of achieving workability, counteracting the ill effects of shrinkage and facilitating drying process of the finished product. Rock group of both leitan and leichreng are of argillaceous variety. The variety of leitan, the milky pale lacustrine clay, used in pottery - making is of good and favourable quality for potting and it comes within the halloysite group which does not absorb much water and takes lesser time to dry (Grim, 1968: 235). These fine-grained and natural biscuit clays sometimes have reddish-brown tinge owing to the least proportion of ferric oxide in it. The tempering materials (leichreng) are the Dishang shale of Tertiary (Miocene) origin. These are reddish black in colour with carbon and iron coating and split easily along the bedding planes.

The Andro-potters gain enough benefit of collecting the resources from places in the vicinity of their dwelling sites. It turns out to be an added advantage to the people when they are in the thin of the profession. The resource site, located in the north-western boundary of the village and on the western side of the inter-village road, further enhanced the job prospects of the regional artisans. This more or less irregularly triangular plain of about half a square kilometer area lies on the south-eastern downslope of the three interlocking hill ranges - Eraoching, Seloliangmaiching and Heinoupokpi. However, the first and third hill ranges are the outgrowths of the main Seloliangmaiching. The descending ridges running parallel to the Seloliangmaii hill range are aligned roughly with each other in the south-west north-east direction and incised by the elongated shallow gorges. The slopes that over look the valley are dissected by perennial streams drained into a common rivulet down the delta. Consolidated argillaceous sediments are
thus deposited at this deltoid area of leitan pekpham (the collecting site of clay), giving a rich deposit of potting clay to this whole drainage area. At present, a weir (seemingly of recent artificial origin) of about 18 meters length is seen just at the foothill, resisting the perennial water current that flows down the delta, that is, the leitan pekpham, to make into an artificial lake (which the people call laipat) of about 22×37 square meters in area. This weir, which serves as a footway, stretches north-south, bridging the gorge between the Eraoching and the south-western extension of the Heinoupokpi hill ranges.

The tempering materials (leichrenge) of Andro pottery are only collected from a particular site popularly known as leichrenge khappham/loupham. It is situated in the Chamba Leikai of the village, at a distance of about 50 meters to the south-west of the leitan pekpham. The welded shales are lying exposed on the western downslope of a small shrubbery hillock separated by a small stream from the larger Selolangmai hill range.

As the village settlement is of nucleated pattern and resource areas are located in one corner of the village, potters naturally have varied geodesic and pheric distances to the ceramic resources. For instance, a potter who lives near to the sources of clay and temper shall have a lesser distance (both geodesic and pheric) than those who reside farthest from these two sources. Moreover, a reciprocity in distance variation is also apparent between those potters who settle near the clay source and the others who are near the temper source. Taking the center of the village as a central point, the geodesic distance to the clay source measures 1.281062 km (that is, ≤ 1.5 km) and the pheric distance3 33 min. In case of the temper source, they are 0.87 km (that is 1 km) and 28 minutes, respectively.

III

Other than the suitable clay and temper, other equally important ceramic resources are fuel, water and colours and other items used in the work. The nucleated settlement village area is almost surrounded by agricultural lands. The potters use straw and dried cow dung for firing the green potteries. These are found easily within the reasonable distance from the potter’s house.

Water, though equally important, is not a problem as well. The only liquid colouring material used just after firing of the pots is made through prolonged dipping of kahi (Quercus sp.) tree’s bark into water. These is an abundant supply of this variety of tree in the locality, for the downslopes of the nearby hills abound with the same. Thus, the use of local subsistence by-products as fuel, and locally available plants for making colouring item suggests a similar threshold distance as that of the clay and temper.

Other, more or less consumable items of resources in Andro pottery, include: (a) ukoo, an elongated mortar – like piece dug out from a big tree trunk (the size ranges from 0.65 to 1.5 m); (b) shuk a wooden pestle; (c) a flattish or rounded fine grained pebble (about 17 to 25 cm in diameter); (d) a half piece of the bivalve shell of the Kong-georg (mussel); (e) tetap, a rectangular thick bifaced mallet – one face of which is plain and the other opposite side incised with geometric forms of decoration (size of about 7 cm × 15 cm); (f) a piece of wooden plant of about 1.5 cm × 2.8 cm. In size; (g) a split bamboo piece of about the size of 2.5 cm × 17.7 cm (h) one kang (Diptera carpus tuberculatex); (i) a piece of rough cloth used for rubbing the outer surface of the green pot before being dried; (j) a long bamboo pole of about 1.5 - 2 m in length (known as phurok chei); (k) a broom made temporarily from straws - used for sprinkling the colour of kahi liquid; and (l) bark of kahi tree (Quercus sp.).

IV

Weather and climate (as the environmental variables of humidity and temperature) also have exerted a profound effect on the consummate success of Andro pottery production. The seasonality of the craft is seemingly an outcome of both the cumulative adverse effects of the economic and socio-cultural regulations and weather and climate that constitute an important feedback mechanism on this craft specialization are two-fold. First, Andro women are debarred from continuing the craft during the hectar season of agriculture, which normally falls within the wet season. Second, the leitan and leichrenge can hardly be collected by any enthusiastic Andro women on the onset of the Andro new
year without prescribed ceremonial observances. Here, it can be asserted that the fulfillment of these economical and cultural norms have the deviation countering feedback in the ceramic production – partly debarring the Andro women from becoming a full-time specialist in the craft. The two factors are also reciprocal in nature, and this reciprocity partly fulfils the favourable steps in pottery production, such as, the collection of raw materials, drying of clay for enabling to pound into powdery state before mixing with the fully pounded leichreng, the drying of pottery and other subsequent activities. Rate of drying of green pottery is affected not only by the permeability, mineralogy, and size and shape of the clay body, but also by temperature, wind velocity and relative humidity in the environment. (Shepard, 1956: 74; Grim, 1962: 75). Moreover, drying of the green potteries is not done all too quickly under the direct sunshine just to avoid the chance of cracking of the finished stuff. Such undesirable damages are easily avoided by drying these objects in the shade. Drying is normally carried out in the shade for a couple of days or so or even longer in case of big sized pots. They are then dried in the sunshine for one or two days. Before the stage of drying proper in the shade and sunshine, an initial stage of drying is made during the dabbing stage of pottery, which starts after about one hour of molding. Beating with the help of a mallet (tetap) on the outer surface by holding a flattish pebble anvil oppositely from inside to absorb shock is normally done after two hours if it is a foggy, rainy day. Beating is done every one hour of regular interval till the sutures left on the outer wall by the cooling method is obliterated.

"Pottery making is ideally a dry weather craft; cold and damp (wet) weather and climate provide significant limiting factor for pottery production" (Arnold, 1988: 71). Manipur belongs to the humid tropics ... where the dry season is less than four months (Ramakrishna, 1985) and has an annual average rainfall of about 146.75 cm. (Statistical Abstract of Manipur 1989). Andro, the village in the Imphal East District, Manipur, enjoys a climatic condition characterized by marked wet and dry seasons. The wet season extends from May to September, or sometimes October, with the greatest amount of rainfall occurring between June and August. The heavy rains of these period are generally accompanied with high humidity, persistent heavy cloud cover and hence little sunshine. Dry season generally commences from October or November and lasts up to April with February, March and April generally being the driest month. The rainy season, thus, provides partial negative feedback, regulating Andro pottery making to a seasonal pattern and limiting it to the dry months of the year.

The craft of part-time, seasonal Andro pottery is entirely in the hands of the womenfolk. Female predominance in pottery making has been reported from many societies, which excel in the trade. For instance, 84% of 37 societies from South Mexico, and Central and South America, and 9 out of 10 societies from tropical forest of South America have female potters (Murdock, 1967: 116). In such agricultural societies, men are exempted from pottery making enabling them to pursue their necessary agricultural activities and paving the way for avoiding scheduling conflict with subsistence activities. Dean Arnold (1988:99) also asserts that "the transition of a population to pottery making depends on the successful solution of two inter-related problems: (1) scheduling pottery making so that it does not interfere with subsistence activities, and (2) if it does, solving this problem by allocating the craft to one sex or the other (or both) without creating conflicts with other responsibilities". Hammond (1966) and Longacre (1974) on the basis of their studies on pottery making among the Mossi and the Kalinga respectively, have arrived at a conclusion that seasonality in pottery making can be explained by scheduling conflicts with subsistence activities. These ethnographic evidences throw light on the explanation of the seasonality of Andro pottery making, for potting is a seasonal occupation of Andro women who engage themselves in various agricultural activities, particularly in the transplantation of paddy seedlings, through an organized, reciprocal labour units as done by their neighbouring Meitei counterparts (Manibabu, 1991, 1992). No one has the time to
work with the clay because of the agricultural responsibilities in the wet season.

Though scheduling conflict as a regulatory feedback mechanism explains the seasonalities of potting among the Andros, it falls short to give a theoretical explanation of the Andro women's monopoly over the specialized craft of pottery making. A wider theoretical speculations is found needed to account for the genesis of pottery as a women monopoly among the Andros. The Andro men do not engage themselves in the work of pottery making though they have enough time of doing it when they are free from their agricultural activities during the slack season. Contrary to our finding, among the Noctes of Dadam, Tirap District, Arunachal Pradesh, as reported by Shyamachoudhuri and Biswas (1963: 64), only men make pots during November and December when they are free from their activities of shifting cultivation and men are forbidden to touch pottery clay. The occupational restriction of pottery to women among the agrarian Andros can be explained in the light of the role expectation of Andro women deeply rooted in the cultural value system of the society.

A brief ethnographic explanation will make the above argument more sound. Women among the Andros, are the custodian of all household activities as well as responsibilities. The role expectation of Andro women has a wide spectrum by virtue of their substantial economic contribution to the family coffers. An ideal man in the society is never expected to take part in any female oriented role. Ceramic production, among the Andros, is a household production. Since females are tied to the household by reasons of culturally accepted value system ceramic production, a household craft is found to be culturally restricted to the females. Sexual scheduling of Andro ceramic production can thus, be explained in the light of role expectation of Andro women.

VI

The collection of the chief raw materials - leitan and leichreng - of Andro pottery is never done at random but always regulated by culturally prescribed rituals. The conventional rituals, dully performed by clan head (Piba)\(^6\) on particular days of particular months, mark the approval of resource collection. As stated earlier, clay and temper are collected from the particular site locally known as leitan - pekpham and leichreng khap-pham respectively. The performance of the ritual complex of leitan leipak hangba comprising two consecutive ritual acts, namely, lei-yengba and leiphu phatpa on the morning of the fifth day of phairel (January - February) under the ritual supervision of the Pibas of the three Andro lineages, viz. Phanjoubam, Ningthoujam and Khunungmayum, marks the general approval of the collection of clay for the coming potting season. This ritual, performed under the ritual headship of the Piba of Phanjoubam, is also customarily joined by the khullakpa (village chief) and other official of the village council\(^7\). The significance of the ritual act of lei-yengba is the propitiation of the custodial goddess of the site, offering wine or rice-beer and a pure red or pure black live cock locally termed as sapang along with other items, such as, an even numbered bunch of bananas, a long complete sugarcane, kaboknachal taret\(^8\), seven varieties of locally available flowers and fruits, and shingji\(^9\). It is followed by the performance of the second and concluding ritual, named leiphu - phatpa. It is marked by a nominal spade - depth digging at the site only once each by the three pibas with a spade. It heralds symbolically the beginning of the collection of clay for the current season.

The first seasonal collection of tempering material is also always preceded by the ritual, leichreng leithong hangba (literal meaning: opening of leichreng site), celebrated on the morning of the fifth day (or the first day as reported by some local informants) of Mera, the seventh month of the local calendar year, under the ritual guidance of the three pibas mentioned above or any one of them at leichreng khap-pham. It is characterized by a cock - oblation rite locally called yeilhing thaiba performed in honour of the custodial goddess of the site. An egg may also serve the purpose, and the piba(s) concerned has (have) to bear the same in either case. Other essential items of the rite include a handful of husked rice, even varieties of flow- ers and fruits, a little quantity of waiju (rice beer) and kalei (local wine) and kabok nachal taret
that are kept spread categorically on a yangkok\textsuperscript{12} brought by the wife (ves) of the pibas(s). The piba(s) who acts (ac) as priest(s) then offers (offer) the materials to the guardian goddess letting the cock free to eat the spread husked rice on the yangkok. It is also an omen seeking oblation. If the freed cock, after taking the rice, flew away happily the potters, as believed by the people, will have good fortune on their side. After the offering is over the wife (ves) of the piba(s) takes (take) some leichreng on the yangkok, fans (fan) them and then returns (return) home bringing seven handfuls of leichreng. It marks the end of the ritual as well as approval of the collection of the tempering material for the current season.

The pibas of three Andro lineages, by virtue of their being members of mangang clan to which Kings of the State belong, have the prerogative of patronizing the exploitative rituals. These rituals restrictions in resource collection – in conjunction with scheduling conflict act as one of the major adverse mechanisms of regulatory or deviation counteracting feedback in Andro ceramic production thereby preventing Andro women from becoming full time craft specialists.

VII

The foregoing analytical description on the ethnohistory of the Andro pottery reveals how it articulates with the environment and the culture. It has also offered a multicausal explanation of the development of pottery at Andro and its subsequent development into a part-time, women-oriented craft. Ready availability of suitable necessary ceramic resources provide deviation amplifying feedback for the origin of the craft at Andro. However, local climatic condition characterized by a long spell of rainy season with heavy rains, high relative humidity, cloud cover and cool temperature results in partial negative feedback limiting Andro pottery making to dry season of a year as well as making it a seasonal craft. Here enters another negative feedback – scheduling conflict, resulting from the conflict of pottery making with the subsistence activities – that partly explains the seasonality of Andro pottery. Andro pottery, inspite of its favourable potential for develop-

ment into a full-time specialty, thus remains as a part-time craft because of the deviation counteracting feedback resulting partly from local climatic condition and partly from the scheduling conflict. This environmentally determined negative feedback has been channelised by culturally programmed ways of behaviour expressed in the form of cyclic rituals that have restricted the craft to a seasonal, part-time specialty. The restriction of the craft to female only can be explained in terms of the culturally determined value system of the Andro society.

It is possible to develop a micro-level generalization about ceramic-environment-culture relationship on the basis of the material drawn from Andro ethnography in the theoretical perspective of systems paradigm, for cultures, as they possess the characteristics of systems, bear certain isomorphic relationship. The application of such a generalization to the past will make archaeologists possible to develop a precise interpretation of how archaeological ceramics relate to ancient environment and culture.

NOTES

1. The lois who, “very closely resemble the Meiteis” (Hodson, 1908: 3) are ‘not recognized as Pure Manipuri’ (Brown, 1874: 14), and the people prefer to call themselves as chakpa. G.H. Damant (1880) refers to the term ‘lo’ as ‘slave or dependent’. Of the three categorical classification of the lois, namely lai-ngam-loi (conquered one), lamhs loi (Captured one from war and rehabilitated by the King) and leithaba (who were sent into exile as a punishment), - the people of Andro as well as Sekmai, Phayeng, etc. are not the loi of the second and third types (Devi, 1988:89). The places inhabited by these people are not the places for sending the offenders. Most of the earlier worker described them as lai-ngam-loi, and the people of Andro and Phayeng even claimed as being driven by Pakhangba, the suzerain ruler of the Meitei in 33 A.D. (Hodson, 1908). Some scholars are of the opinion that Lois had migrated to the Manipur valley from the Chin Hills in Burma (and) According to the Mizoram tradition and history, the lois are not the only sub-clan of the Chins, known to them as Poi, but a few of their own clans are also of the same extraction” (Shymachandhuri and Biswas, 1963: 61). According to B.S. Carey and H.N. Tuck (1866) ‘the pot-making trait was carried into Manipur and Mizo districts from Burma by the Poi (loi) sub-clan and some other such clans as Fansai, Huha and Hialum in the Mizo district.

2. Part-time potters are those who made pottery for only part of the year (usually seasonally), whereas full-time potters are those who practice their craft during the entire year (Arnold, 1988: 18).
3. In the Andro pottery, raw materials of leitan and leichegré are mixed in the ratio of 1:1.25.

4. A preliminary account on the mineral and element compositional analysis through XRF and XRO of the Andro ceramic materials (clay and temper) has been discussed in an article (Manibabu, M. Ethnominology of Andro pottery: Etics and Emics, Ms).

5. At present, new transportation technology and innovations do not bring about any deviation amplifying feedback mechanisms of the pheretic distance. The wide notion among the people that those raw/spotting made materials should only be transported by head load and not by other means such as cart, vehicles, etc., seems to be the underlying potent factor.

6. The people adopt the lunar year of twelve months starting with Sajibhu (March-April) and ending with Landa (February-March).

7. Such methods of making hand-shaped wares were first invented in the region of southeast Asia, and also in North America (Sper, 1956: 225).

8. The ulitagimit is a male issue of a lineage/clan.

9. The Andro village council comprises seven nos-hereditary dignitaries, such as - Khullakpa, Lulakpa, Khunjanah, Khabamakpa, Yupanba, Pakhangiakpa and Nahaarkpa. They are appointed from amongst the two age-set units, that is, halting (ant/college of elders)-shallup) and hanchok (unit/college of youngsters-Naharup). For instance, the Khullakpa, Khunjanah, Yupanba and Pakhangiakpa are appointed from the halting unit; whereas Lulakpa, Nahaarkpa etc. from the hanchok unit.

10. Khaokat (baked/steamed rice), nachal (=hard/fail) tarat (=seven) literally mean a little quantity of baked/steamed rice collected from different seven trays of the same, usually sold in the market.

11. An usually edible concoct of tender vegetable leaves/ tendon-flavoured with chilly, salt and roasted agari (fermented fish usually taken by the local people).

12. Yangkot is a household item, flat and oval in shape. It is made of plaited bamboo strips and a rounded rim of bamboo piece used as frame of the flat plaited bamboo strips. This item is used for fanning the pounded rice so that the husks are separated out/wrapped out from the unpounded ones.

KEY WORDS Andro Pottery, Ceramic Ecology, Cybernetics, Paradigm, Manipur.

ABSTRACT The present study, employing the cybernetic model of systems paradigm as a theoretical frame for analyses, has attempted to formulate an ethnographic generalization about the relationship of ceramics to environment and culture in the context of a scheduled caste community of Manipur – the Andros, who inhabit a village of the same name situated on the downstreams of the eastern foothills of the Nongmahching hill, Imphal East District, Manipur, and among whom pottery is a part-time, women-oriented occupation.

REFERENCES


