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CENSUS OF INDIA 1961

VOLUME X

MAHARASHTRA

PART VII-A (6-7)

HANDICRAFTS IN MAHARASHTRA

SILVERSMITHY AT HUPARI
AND
GLASS BANGLES AT TARAPUR

Prepared by

THE MAHARASHTRA CENSUS OFFICE, BOMBAY

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CENSUS OF INDIA 1961

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II-B (ii)	..	General Economic Tables—Occupational Classification
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FOREWORD

ONE OF THE FIRST STEPS to be taken in the First Five-Year Plan was the establishment of six Boards for the promotion of handicrafts, village and small industries : (1) The Khadi and Village Industries Board ; (2) The All India Handicrafts Board ; (3) The All India Handloom Board ; (4) The Central Silk Board ; (5) The Coir Board ; and (6) The Small Industries Board.

The rapid expansion of the activities of these Boards which concentrated not only on production and techniques, but also on organisation, extension, credit, marketing and export, consolidated and enlarged the position that the household industries sector had so long enjoyed in the nation's economic life. It was this fact that forced itself upon the preparations for the 1961 Census and demanded that household industry should be separately investigated for a proper accounting of the nation's manpower, resources and its specific contribution to the national income. The 1961 Census therefore asked a special series of questions on household industry, input of family and hired labour, and the periods over which household industry is conducted. It was felt, however, that an enumeration of the total number of establishments and their industrial classification would be incomplete without a proper description of what they produce and how they produce. It was important to make an assessment of the limits of rigidity within which traditional skill operates. This could be obtained by studying the caste, occupational, social and economic stratifications, the limitations of credit and marketing facilities, the dominance of custom over contract, the persistence of traditional tools and design forms, the physical limitations of transport, communication and mobility, the inability to adopt new lines or adapt to changing circumstances. It was important also to make an assessment of the limits of flexibility that traditional skill is capable of, because the transformation of traditional skills to modern skills is easier said than done and a thorough study may well reveal that it is perhaps cheaper from the social point of view to develop industrial skills from scratch than to try to graft traditional skill on alien soil. A rather tragic case of failure to make what would on the face of it seem a minor adjustment cast its heavy shadow on the nation when it was discovered that goldsmiths used to working on 22-carat gold all their lives felt sadly helpless when asked to work on 14-carat, so narrow and unadaptable were the limits of their skill and proficiency and so rudimentary the tools and equipment with which they and their forefathers had worked. This fiscal accident revealed that tools are even more important than skills.

An early opportunity was therefore taken in February 1960 to suggest to State Census Superintendents, that the Census provided a unique opportunity for conducting and documenting a survey of this kind. As such a survey was quite outside the usual terms of reference of Census work it was thought prudent cautiously to feel one's way with the thin end of the wedge of what would, it was hoped, prove to be an exciting pursuit. It was therefore considered the wiser course to wait until the State Census Offices felt so interested that they would no longer take the inquiry as an imposition but rather want to do it on their own and ask for the necessary staff and equipment. This office, too, in its turn, could make use of the interval to organise and elaborate the design of inquiry in order to feed the appetite that work in progress would serve to whet. Because it was a labour of love, sought to be unobtrusively thrust on one's colleagues and because the inquiry itself was so vast that normally it would demand in any country as big a set-up, if separately established, as the Census organisation itself and that over a much longer period, and because it was almost a pioneer venture, nothing like it having been undertaken since the 1880's, it was decided to move towards a build-up by stages, to let the inquiry unfold itself only as fast as my colleagues chose to ask for more.

Thus, in the first circular of 18th February 1960, it was suggested that the inquiry might be conducted through the agency of the Development Department, the State Director of Industries, the Director of Tribal Welfare, the Registrar of Co-operative Societies and other organisations concerned with the promotion of household industry. A draft questionnaire containing 30 questions in three parts was recommended for canvassing. It was suggested that information on this questionnaire, village by village and area by area might either be obtained through the regular departmental channels of the State Government, or through the newly set up Census organisation, or through the hierarchy of the newly created Panchayats. Stress was laid on the need of photographic documentation and illustration of designs, shapes and forms not only by photographs but with the help of line drawings or sketches together with a full description of the materials used.

Almost the whole of 1960 and the first half of 1961 were spent in organising and taking the Census count, although several States even during this period had not allowed the grass to grow under their feet but made exploratory studies and decided in their minds how the inquiry should be organised. A series of regional conferences held in Trivandrum, Darjeeling and Srinagar in May and June 1961 revealed much enthusiasm among State Superintendents to proceed with the survey, but the need of separate staff and equipment was felt at the same time as the realization dawned that this was much too serious an enquiry to be treated casually and left to be achieved through the usual administrative channels and State Census Superintendents proceeded to augment their staff with qualified research and investigating officers, technical persons, photographers, artists, draughtsmen and other trained personnel.

This was followed by rapid progress in co-ordination between the Central and State Census offices in the matter of exchange and processing of information, documentation and investigation, of assisting each other with trained investigators and in editing and finalizing drafts, layouts, presentations.

Mention has been made of a questionnaire in three parts and thirty questions. The idea was to make a beginning with empirical, analytical studies based on a structured questionnaire which would replace general descriptive accounts that had obtained so far. The primary aim was to obtain a picture as much of the artisan himself as of his craft, to obtain a perspective of the artisan and his craft in his social and economic setting, the extent to which tradition bound him and the winds of change ruffled him, the extent of his mobility and immobility, the conditions of market, credit new contacts and designs in which he operated, the frame of new as well as traditional producer-customer relationships, in which he still worked, and how far he was ready to pierce his own caste-tribe socio-economic cocoon and make a break through to new opportunities promised by the Five-Year Plans. The aim was to hold up the mirror to hereditary skills struggling with the dialectics of tradition and change.

Thus the first part of the questionnaire, purporting to be a village schedule, sought to take account of the size and population of the village, its remoteness from or proximity to centres of trade and commerce, in short, the degree of isolation in which the artisan worked, and the relative strengths of various communities, in the village which would afford clues to social interdependence and the prevalence of the JAJMANI system. The second part was devoted to artisan communities in the village ; the several castes of artisans, the number of families in each, the total number of workers, males and females, the extent of co-operative activity among them, the extent of dependence upon employers and of wage or contract labour. There were questions on the raw materials used, the means of their procurement, the possible extent of dependence on others for raw materials, the extent of the material that artisans can handle within the limits of their skill. There were other questions on the exchange and flow of designs, the use of colours, the ancientness of the craft and legends associated, the colonization of the craftsman on patrons and customers and on social and economic contact with the world inside and outside the village. There were specific questions on the work-shop itself and particularly the tools and the source of supply of these tools, because it was felt that tools decide everything and are the surest index of inertness or flexibility. Separate blocks of questions were designed to bring out the ramifications of artisan castes throughout the country and the ways they sustained themselves, the type of clientele they catered for, the extent to which they operated on money or barter or service, how specialized their craft was, how wide the market, how dependent they were on their socially preordained clientele and how restricted the latter was by the seemingly unalterable laws of social custom ; the extent to which they could operate in the open market, the range of their wares and the sizes to which these were ordinarily restricted either by the limits of their own skill or the length of their customers' pursestrings. Inquiries were to be made about the operation of middlemen and of co-operative societies, the people who gave new designs and demanded new products. Finally, the several stages of production of the articles themselves were to be fully described including the final and finishing stage and a list of very skilled crafts-men of each community was to be furnished. The third part was devoted specially to tribal communities and designed to find out how self-sufficient or dependent they were on the production and supply of manufactured goods, the extent to which they produced themselves or depended on others, their contacts with other communities and the specific forms of production and commerce through which these contacts were maintained.

Particular emphasis was laid on the need of obtaining as full an account as possible of unique regional design differentiations as they reflect not only the very culture patterns of the country but the persistent inventive faculties of the craftsmen. The importance was emphasised of giving full attention to articles of domestic use as it is in their shapes, designs and forms that the culture patterns and traditional skills persist most tenaciously.

Simultaneously with the investigation of specific crafts, State Superintendents proceeded to compile a comprehensive list of all types of handicrafts obtaining in their State. As for the specific crafts to be investigated several tables were devised from the structured questionnaire in order to guide investigators toward pointed observation and analysis, to enable them to write, not just general descriptions, but with their eye on the object and on facts.

Investigations conducted between September 1961 and May 1962, including a study group of all States and the Social Studies Division in December 1961 at Delhi, stimulated many of the States into going in for a much enlarged schedule. The revised village schedule itself, the counterpart of the first part of the February 1960 schedule, contained 19 large sections containing elaborate and probing questions. The Family Schedule for practising artisan families similarly contained 19 main questions each sub-divided into many questions. The Family Schedule for non-practising artisan families contained 21 questions. There were schedules for the study of co-operative societies, of production-*cum*-training centres, and of consumer's preference. This enlarged schedule of investigation, in the formulation of which the States themselves actively assisted, was greatly welcomed. The surveys that will appear in this series will therefore consist of two main types : (*a*) those based on the original short schedule and (*b*) those based on the much enlarged schedule. In some cases Census Superintendents felt enthused enough to scrap the work based on the original short schedule and do it over again on the enlarged schedule. In the meantime much experience was gained on the analysis of facts and figures to clothe each observation with plenty of authentic information so that the reader could make his own judgment instead of being expected to see all the time through another pair of eyes.

This programme of survey of handicrafts and household industries has been fortified by several ancillary surveys, each one of which would deserve major attention. Along with the survey a compilation has been made of all handicraft centres in each State and an inventory prepared of skilled craftsmen. Photographic and other documentation has been built up to constitute what may now be regarded as the most considerable repository in the country. Elaborate and accurate maps of craft centres in talukas, tehsils and districts are either ready or under preparation. A full census of all fairs and festivals, weekly *hats* and markets, throughout India, has been taken and is being published for the 1st time. Andhra Pradesh has embarked upon a project of chronicling the social and religious antiquity and uniqueness of every fair and festival. A separte volume will be devoted to each district which promises to be of the utmost value to sociologists and orientalists. A full and complete inventory, replete with sketches and measurements of every object, has been prepared of exhibits in museums of tribal crafts in India. There has been a fairly satisfactory survey of houses and buildings, indigenous architectural designs and use of local building material of the whole country. All this has been entirely a labour of love, patiently organized and executed under great strain and in desregard of health and comfort, for which I take this opportunity of expressing my appreciation and grateful thanks to my colleagues.

NEW DELHI,
July 30, 1964

ASOK MITRA,
Registrar-General, India.

PREFACE

This part of the Census Report presents monographs on the " Silversmithy of Hupari " and " Glass Bangles of Tarapur " two of the following seven handicrafts selected for detailed study in Maharashtra :—

(1) Himroo Weaving at Aurangabad, district Aurangabad.

(2) Clay Images of Ganapati and Images of Plaster of Paris at Pen, district Kolaba.

(3) Wooden Toys at Savantvadi, district Ratnagiri.

(4) Coir Ropes at Achare, district Ratnagiri.

(5) Glass Bangles at Tarapur, district Thana.

(6) Silver Ornaments at Hupari, district Kolhapur.

(7) Kosa Silk at Ganeshpur, district Bhandara.

For various reasons it has not been possible for the Maharashtra Census Office to strictly follow the scheme referred to by the Registrar General, India, in his " foreword ". The prescribed village schedules could not be canvassed and, therefore, statistical tables based on the villagewise statistical survey covering all household industries with special emphasis on rural arts and crafts were not prepared. The scope of the study was restricted to (*i*) collection of data on important aspects of crafts, viz., sources of raw material, fuel, service condition, wages, processes involved in manufacture, market for finished products, etc., at the selected centres only from the manufacturing establishments and households connected with the selected crafts and (*ii*) tabulation of data regarding household industries including arts and crafts from columns 4 to 8 of the Census Houselists according to a codified list of common Household Industries prepared by the Registrar General's Office on the basis of the Indian Standard Industrial Classification. The data collected under the former formed the basis of the monographs on seven selected crafts and the tables prepared from the Census Houselists showing for each village, taluka and district, the distribution of establishments and workers of different household industries classified upto minor group codes of the Indian Standard Industrial Classification are published in Part II of the District Census Handbooks.

We are very much grateful to Shri Asok Mitra, Registrar General, India, for his encouragement and inspiring guidance to us in various Census assignments including the Rural Crafts Studies. Our thanks are due to Dr. Roy Burman, Officer on Special Duty and the late Mrs. Ruth Reeves of Handicrafts Section of the Registrar General's Office for their valuable suggestions to improve the monograph.

The survey was conducted by Shri V. B. Aradhye, Statistical Assistant under the supervision of Shri V. B. Sawant, Deputy Superintendent of Census Operations. The office bearers of the Chandi Audyogik Sahakari Sangh Ltd., Hupari and Chandi Mal Utpadak Sahakari Sangh Ltd., Hupari, rendered valuable assistance during the survey of Silversmithy at Hupari and those of the Tarapur Bangdi Utpadak Sahakari Sangh Ltd., Tarapur, during the survey of Glass Bangles at Tarapur. We are grateful to them for this help.

Sarvashri N. Y. Gore, Tabulation Officer and K. K. Akolkar, Investigator rendered valuable assistance in drafting of this monograph. The maps and line drawings appearing in this monograph are prepared by Shri S. Y. Pradhan, Draughtsman.

Sarvashri N. B. Thakur and S. V. Deorukhkar, looked after the proof reading and printing of this volume.

We are grateful to Shri S. A. Sapre, Manager and the staff of the Government Central Press, Bombay, for excellent printing and in bringing out this monograph in reasonable time in spite of various commitments.

BOMBAY,
1st January 1968.

D. V. RANGNEKAR

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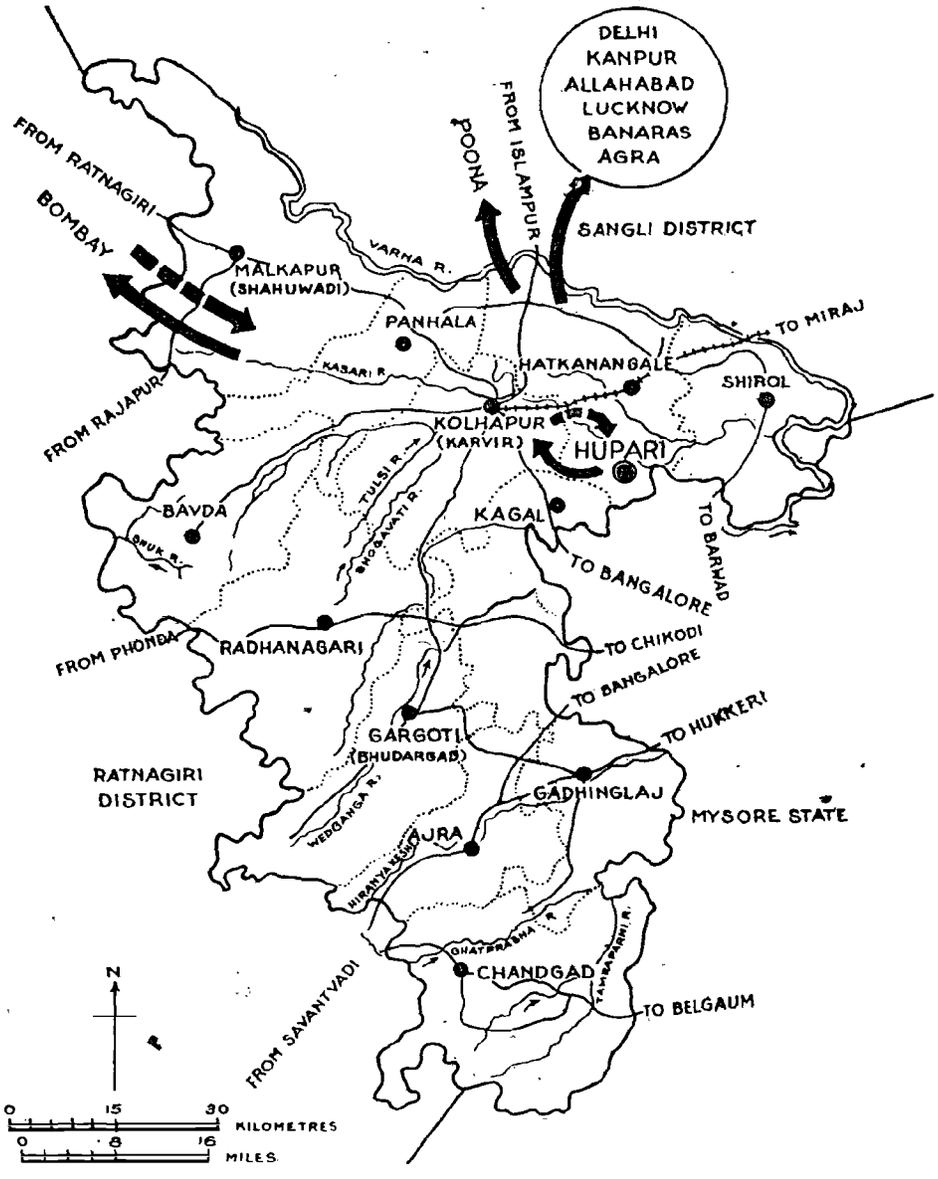
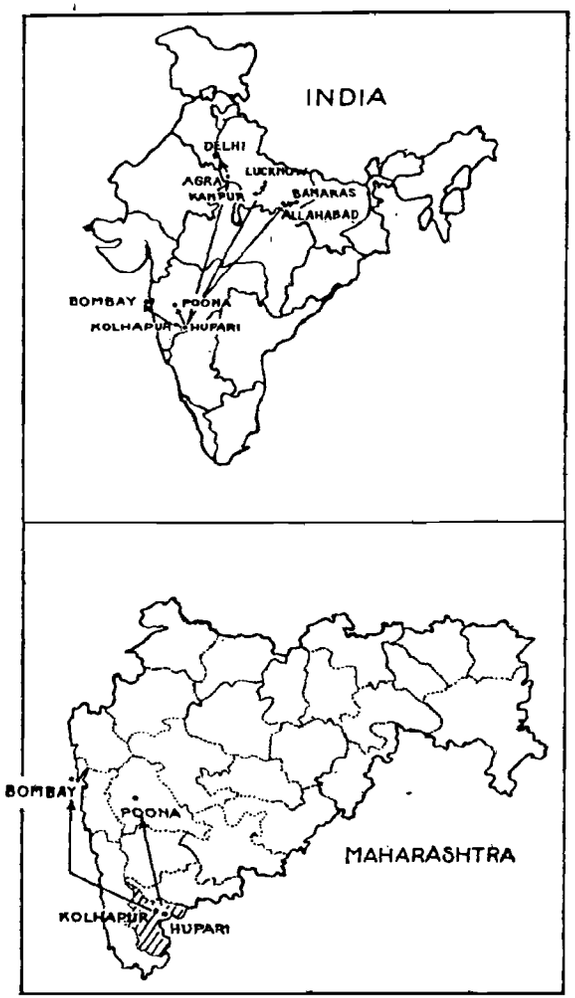
SILVERSMITHY OF HUPARI

HUPARI: CENTRE OF SILVER ORNAMENTS





RAW MATERIAL
FINISHED PRODUCTS

DISTRICT BOUNDARY

TALUKA BOUNDARY

CHAPTER I

INTRODUCTION

Ornaments, it may be recalled, are in existence in this land since time immemorial, though perhaps their form and shape and the materials out of which they are manufactured, might have undergone many changes from time to time. There are references in *Rig Veda* to many types of ornaments. "....It tells of the Maruts decorating themselves with various ornaments and 'shining necklaces are pendent on their breasts'. The Sage Kakshivat, the author of many of the hymns of the *Rig Veda*, prays for a son 'decorated with golden ear-rings, and a jewelled necklace".[1] Ornaments are mentioned quite prominently in *Ramayana* and *Mahabharat*, the two great epics of India. We are told that Laxman, brother of Lord Rama, the hero of Ramayana, could recognise his sister-in-law, Sita, Lord Rama's wife, by a glance at the ornaments worn on her feet, especially toe etc., since he never, it is said, used to look at her face out of complete obedience and modesty. So also Hanuman, or Maruti, the monkey god, was once given a necklace of precious gems by Lord Rama as a reward for the services rendered but Hanuman, we are informed, chewed every gem of the necklace and threw it away since he could not find image of Lord Rama in any one of them. Again, when Hanuman went to Lanka, where Sita was in captivity of Ravana, the king of Lanka, he carried with him a ring of Lord Rama as his credentials. Similar references to ornaments are found in Mahabharat also. It is said that the illustrious Saint of Maharashtra, Tukaram spurned the *Nazarana* of costly jewellery offered by Shivaji Maharaj as it symbolised perpetual attachment to wordly existence. All these stories go to show that people in those days used to wear ornaments and though the material out of which these ornaments are manufactured has been changed, through passage of time, yet their basic form remains, more or less, the same.

The materials like bones and ivory which were used extensively in the manufacturing of ornaments were soon replaced by such metals as copper and brass, gold and silver and now by synthetic materials like plastics etc.

The love for ornaments and their lure for women have not diminished a whit with the passage of time. In fact, with the introduction of new designs, it has increased and not waned. Ornaments are worn by persons primarily for three different reasons. Firstly, they are preferred to enhance the personal beauty of the wearer and to decorate one's body so as to look attractive. When ornaments began to be manufactured in precious metals like gold and silver, they were looked upon as a means for safe investment to be utilized in times of want. This motive is so dominant in underdeveloped countries and specially in India that, " a man will hang his earnings round his wife's neck, and arms and anklets ". It is, perhaps, of this motive that the ornaments of earlier times were rough in shape and wanting in intricate designs. Importance was given to value rather than to decorative part of the ornament and thus, a gold rod was given a circular shape and was worn as a bangle or a bracelet. Ornaments are also worn as a means to ward off evil spirit and to protect the wearer from effects of an evil spirit. " The character of the articles used as hair ornaments suggests that hair ornaments were originally substances which were esteemed as spirit-scarers. The moon, the sun, the sweet pandanus, the cobra, and the tortoise are all guardians. A comparison of the shapes and an enquiry into the names of the metal and gem-studded ornaments worn by high class Hindus suggests that they have their origin in the grass ornaments and in the holy fruit or holy flower ornaments of the early Hindu tribes, and as is shown by the position which the *durva* and, other grasses hold in the Brahman ritual, that the origin of wearing the holy grasses, fruits, and leaves, like the origin of the practice of wearing teeth and other parts of holy animals, was to keep off evil spirits. The places chosen for protection were at the chief openings by which spirits were believed to enter the body, the suture in the skull, the ears, nose and mouth, the throat which the movements of the uvula seem to have suggested as the abode of one of the body's vital spirits, at the wrists and ankles where the pulse beats, and at the fingers and toes through which the spirit passed in and out.

One of the plants of spirit scaring power, which is worn by Hindus both in its natural state and in the form of metal ornaments, is the *tulsi* or the sacred basil Ocymum sanctum. This *tulsi*, chiefly apparently

[1] Handicrafts and Industrial Arts of India, Rustam J. Mehta, D. B. Taraporevala Sons and Co., Pvt. Ltd, Bombay, 1960, page 15.

for its value in hysteric complaints, is with many Hindus the great guardian. A pot of *tulsi* is thus grown close to the house to keep evil from the doors. Every November the *tulsi* is married to Vishnu the Preserver, and a *tulsi* wood necklace is worn by *Varkaris* and other devotees of Vishnu.

Besides in its natural form, the *tulsi* is worn in gold by Hindu women in the ornaments known as *tulsipatti* or *thushi*. Of all grasses the *darbha* and *durva*, worn as rings and in other ways, have a high place as evil-scarer in many Brahman rites, and rings of these grasses are known as *pavitris* or purifiers, that is sin or evil-spirit scarers. In the Konkan, rice is the staple grain, the chief scarer of the fiend hunger. To keep off spirits heads of rice called *bugdi* were worn and are the origin of the present ear ornaments of that name. The Malhar-Kolis of Thana, as a cure for pimples, scratches and other skin diseases, which, they believe to be spirit caused, wear a necklace of *gulvel* Menispermum glabrum. They also wear an armlet of the creeper called *bhutamalli* or spirit-wrestler to keep away evil and their children wear a necklace of *bajarbattu* beads to keep off the evil eye.

..... Of guardian or spirit-scaring animals a trace of the holiness of the cow remains in the Hindu women's ornaments *patli* literally pale red or cow-coloured. A tiger claw enclosed in gold or silver is tied round the neck of some Hindu children to guard them against spirit attacks and the ivory *patalis* or bracelets worn by Hindu women are held to be luckier or more spirit-scaring than any metal or gem-studded ornaments. Other things which early men supposed to be lucky and have lasted into modern Hindu metal ornaments are the knot and black bead. So among the modern metal jewellery of low class Hindus is the ganthale or knotted necklace and the gantha or knotted ear-ring. Beads especially black beads are worn as spirit-scarers by the early tribes, and the regular marriage necklace of all Hindus, the *mangalsutra* or lucky-thread, is of black beads..... It was not only, perhaps not at all, their greater beauty that made metal and gems take place of old spirit-scaring grass, fruit and teeth. So also and still more were iron, silver, and gold spirit-scaring ; and most of all had the precious stones virtues, that is spirit-scaring powers, a belief which was once universal in England and was strong at the time of Butler (1640), who made pearl-wearing a cure for one form of melancholy or bad spirits or blue devils, and still lives in the belief in the virtues of the bishop's sapphire and the baby's coral. Hindus use precious stones to scare fiends when they bury them to scare the place-spirit, or dig them in round a *ling* to keep spirits from worrying the *ling*. On several occasions Hindus wear ornaments to keep off evil rather than for show, illustrating the rule that fear is an older passion than vanity, that most things now done for show or *shobhesathi* have their root in the wish to scare evil-spirits or *bhutasathi*."[1] We thus find that the ornaments as means to keep off evil spirits had a great sway over peoples' mind in the past, though few would be konwing the origin of ornaments in this land in present day.

The development of any craft presupposes a reasonably long spell of peace and prosperity for no craft can survive and thrive in a period of conflict and without the partonage of the people and rulers of the land and this support or patronage is generally forthcoming in times of over-all prosperity. The intricate designs in the ornaments, therefore, must have been introduced when there was a demand for such costly pieces by the rulers and sophisticated noble gentry of the land. This is reflected in the fact that most intricately designed ornaments were costly and worn by members of the noble family and these ornaments were made out of gold which is costlier than silver. The common people (and especially the rural masses), therefore, are attracted to silver rather than to gold since they can afford to have an ornament of silver in place of gold because of the relative cheapness of the former.

Hupari, a village in Hatkanangale taluka of Kolhapur district, is famous for silver ornaments not only in Maharashtra but throughout India. It is situated to the south-east of Kolhapur at 16° 35′ North and 74° 20′ East and is at a distance of only 16 miles from Kolhapur. It is well connected to all the important places in Kolhapur District by bus-routes and as many as 52 buses ply regularly to and from Hupari to various places of the district. It has a Post and Telegraph Office as also a Telephone exchange. Tap water supply is also provided. It has an area of 6·6 square miles and as per 1961 Census, has a population of 10,001 persons as against 7,039 of 1951 Census. In other words the decade increase in population of the village is 42·08 per cent as against 33·50 per cent of Hatkanangale taluka and 22·05 per cent of the District. The 1961 population of the village is shown in the table on page 3 with sex and industrial categories.

[1] District Gazetteer, Volume XVIII, Part I, Poona 1885, Appendix D, pages 548, 549, 550.

Distribution of population by nine broad industrial categories and sex

Industrial category	Description	Population			Column 3 expressed as a percentage of total population	Percentage of workers in each category to total workers
		Persons	Males	Females		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
I	As Cultivator	1,180	731	449	11·80	26·47
II	As Agricultural Labourer	660	422	238	6·60	14·80
III	In Mining, Quarrying, Livestock, Forestry, Fishing, Hunting, Plantation, etc.	16	15	1	0·16	0·36
IV	At Household Industry	2,100	1,471	629	21·00	47·11
V	In Manufacturing other than Household Industry ..	108	106	2	1·08	2·42
VI	In Construction	15	14	1	0·15	0·34
VII	In Trade and Commerce	170	158	12	1·70	3·81
VIII	In Transport, Storage and Communications ..	8	8	....	0·08	0·18
IX	In Other Services	201	163	38	2·01	4·51
	Total workers	4,458	3,088	1,370	44·58	100·00
	Non-workers	5,543	2,263	3,280	55·42	
	Total ..	10,001	5,351	4,650	100·00	

The predominance of workers in Household Industry can be gauged from the fact that 21 per cent of the total population of the village or 47·11 per cent of the total workers of the village are engaged in the Household Industry which is, in its turn, predominated by silversmithy since as many as 1,547 or 34·70 per cent of the total workers are engaged in one way or the other in this craft.

The craft of manufacturing silver ornaments at Hupari seems to be of recent origin since the District Gazetteer of 1884 does not make any mention of the existence of this craft in the village in 1881. Its population as per 1881 Census was 3,335 and no industry worth the name was mentioned in course of description of Hupari village. The origin of the present craft seems, therefore, to be in the present century. Hupari must have had usual number of traditional goldsmiths as are found in any other village of India. However, the craft of silversmithy to-day is not confined to traditional caste i.e., *Sonar* but almost all major castes i.e., Brahmin, Maratha, Kumbhar, Mahar, etc., among Hindus and other religionists like Muslims, Jains etc., are also engaged in this craft. It is rather curious to see that this craft should be located at Hupari which has neither the advantage of availability of raw material (e.g. silver, copper, zinc, etc.) nearby nor are the market centres for silver ornaments near Hupari. The markets for ornaments of Hupari are as far away as Delhi, Agra, Poona, etc. The origin of this craft as understood from craftsmen is given in the following paragraph.

The village Hupari had sometime in 1912, five or seven goldsmiths, as are usually found in other villages, and amongst them, the late Shri Krishnaji Ramchandra Potdar was a man of foresight, conviction and integrity. He not only imparted necessary skill required for manufacture of ornaments to others but sometimes even advanced money to them as capital and encouraged them to establish their own workshops. Due to family disputes over property Shri Krishnaji Ramchandra Potdar and two of his nephews were murdered in the village round about 1914. However, the son of Shri Krishnaji Ramchandra Potdar, named Shri Waman Krishnaji Potdar was saved and once again he

continued the family profession after his father's death. He not only followed the worthy traditions of his father but being a man with broad vision, deeply interested in the prosperity of the craft as also of the craftsmen, introduced lot of improvements. When he saw that the time wages paid to the craftsmen did not serve as an incentive to workers to give more output, he did not hesitate to introduce the " piece-wages " for many operations involved in the craft. It is he, it is stated, who again thought of introducing such machinery as " hand press ", " wire and strip drawing machine ", etc., into the craft which revolutionised the scope and working of the craft altogether. Formerly, only skilled and semi-skilled persons could be employed. With the introduction of machinery, however, even unskilled persons were able to carry out various operations. It also helped to lower the cost of production. He, however, left the village round about 1926 and settled down at Kolhapur. At that time, there were about 40 craftsmen working in his workshop, who commenced their own establishments after Shri Waman Krishnaji Potdar's departure from the village. These 40 persons were drawn from various castes and thus, the caste barrier was broken once for all and the silversmithy craft of Hupari is not now confined to one particular caste. The prominent persons who were engaged in this craft were Sarvashri R. G. Kulkarni, D. A. Kolhapure, S. D. Nakil, S. M. Nawale, etc. It was Shri H. G. Kulkarni who revolutionised the craft by introducing the present chain and " Gujrav " balls. The chain forms, in most ornaments, their base and as such its introduction has helped to diversify the types of production at Hupari. Soon afterwards modern machinery was available and introduced in this craft by the Chandi Audyogik Sahakari Sangh Ltd., Hupari, followed by other organizations like, " Sanmitra Sangh Company " ," Sudarshan Company ", " N. A. Patil Company ", " Ashok Company ", " Kajave Company", etc.

After Second World War, this craft expanded further and many new designs were introduced by craftsmen, the prominent among them being :

(1) Shri Bhojemali
(2) Shri P. B. Ingrole
(3) Shri D. B. Kajave
(4) Shri B. J. Kajave
(5) Shri J. B. Patil
(6) Shri D. V. Waigade
(7) Shri S. N. Vibhute

This craft is, since then, progressing year after year mainly because its craftsmen are ever willing to introduce new indeas into the craft and cater to the changing needs of the customers. The following chart shows the number of establishments in existence from 1944 to 1962 :—

Year	No. of establishments
1944	116
1945	137
1946	169
1947	176
1948	179
1949	193
1950	212
1951	204
1952	254
1953	175
1954	195
1955	190
1956	223
1957	220
1958	194
1959	222
1960	283
1961	283
1962	315

These figures, which include establishments that are working in neighbouring villages but are affiliated to the Chandi Karkhandar Association, Hupari, speak of the progress of the craft themselves. Of the 315 establishments in existence in 1962, 235 were from Hupari and the rest, i.e., 80 from neighbouring villages like Pattan-Kodoli etc. The reduction in the number of establishments noticed in the year 1951, 1953, 1955 and 1958 was due to amalgamation of two of three establishments into one.

The proprietors of the various establishments at Hupari mainly manufacture ornaments on behalf of their customers and as such they are not affected by the rise or fall in prices of silver. Secondly, the main raw material i.e., silver is made available to the proprietors by the merchants or traders and hence craftsmen of Hupari are not generally required to make an initial investment for the supply of silver. While this system has one advantage viz., less capital for a proprietor and secured return for the work done, yet it follows that the maximum benefit goes to the pocket of the merchant or trader who ultimately sells the ornaments to the customers. The business that is transacted between the trader and proprietor at Hupari is as follows :

If, A, the trader places an order for a specific type of ornament of given purity (say 70/100) of 1 Kg., the trader will give the proprietor pure silver

of 700 grammes plus the wages for manufacturing the ornaments of 1 Kg. These wages vary from ornament to ornament and design to design and usually range from Rs. 25 to 35 per Kg. The proprietor has thus, to meet all the expenses that are incurred by way of supplying, in this particular case, 300 grammes of other alloy to be mixed with silver, charges for *Atni* section, i.e. melting unit, wire and strip drawing section etc., wages of craftsman who assembles the pieces, polishing, etc., as also other material as borax, sulphuric acid, kerosene oil, etc. It is reported to us that on an average the proprietor gets, after meeting all the expenses, about Rs. 10 to Rs. 15 per Kg., of silver ornaments, manufactured by him. The trader on the other hand will sell the ornaments (1 Kg.) at the current market price of silver (and not for 700 grammes only) plus service charges fixed by him for various ornaments. He, therefore, usually pockets the maximum profit.

As already stated earlier, there are craftsmen belonging to various castes engaged in manufacturing silver ornaments and as such we did not find any established myths and legends connected with craftsmen communities at Hupari. Since there is a great deal of mechanization in the manufacturing of ornaments, there are no age-old customs, traditions, etc., which are usually associated with handicrafts. Magic and superstituious belief do not hold paramount place in the life of the craftsmen. So also there are no specific myths and legends in connection with the particular ornament and this seems natural because the craft came into prominence only after the First World War and since modern machinery is used in various processes, there are no rituals connected with the ornaments which are manufactured in accordance with the specifications received from the customers/traders. In fact, one of the workshops in existence at Hupari, i.e., of M/s. Ingrole Brothers, is working with most modern and up-to-date machinery, many of which are power operated. On the whole, the craft at Hupari has progressed because it could successfully make use of modern machinery and its consequent advantages of division of labour on the one hand and a great deal of co-operative spirit and team-work displayed by the leading craftsmen on the other. These two elements together with the integrity and honesty of the workers and proprietors have helped to the speedy growth of the craft at Hupari.

CHAPTER II

TECHNIQUE OF PRODUCTION

The craft of silversmithy at Hupari is so much mechanised today that there is a near complete division of labour. There are, for example, those who will melt raw silver day in and day out while the entire female labour force that is engaged in this craft will either prepare chains from the rings or prepare what is called *bittis* which are subsequently converted into hollow round balls by skilled male craftsmen at other workshops. There is thus, a complete dependency of one unit on the other and it is a very rare occasion that we see a craftsman carrying out all the processes by himself.

This chapter is divided into two parts. The first one describes the tools, implements, machinery, raw material and other auxiliary material required by different sections of the craft while the second one describes the actual processes carried out by each section in respect of work done in that section.

On the basis of the broad division of work, we have the following sections in the silversmithy craft at Hupari :—

(*i*) Silver melting or *Atni* section.

(*ii*) Silver strip and wire drawing or *Pashta* and *Sut* section.

(*iii*) Press machine section.

(*iv*) Assembling section.

Besides these broad groups, there are those female workers who prepare *bittis* (which are afterwards converted in round hollow balls), those who prepare chain (un-soldered) from loose rings, those who give polish to the finished products etc. The tools and implements and machinery used by these sections are described below along with the raw and auxiliary material required by them.

(i) Melting of Silver

This section is called *Atni* section in local language. The main function of it is to melt silver brought to it by customers who are the entrepreneurs of the craft. The silver brought for melting is in various forms and shapes and of different degrees of purity. The customers specify the purity of silver required by them and in that proportion, the craftsmen of the *Atni* section mix certain alloy like zinc, etc. Thus, if one wants silver of 70/100 purity it means that the melted silver will contain pure silver upto 70 per cent and the remaining 30 per cent will be other alloy like zinc, etc.

The following machinery, tools and implements are used by one *Atni* section at Hupari :—

Serial No.	Name of tools, implements etc.	Local name	No.	Value at the time of purchase	Value at present
				Rs.	Rs.
(1)	Electric Motor ¼ H.P.	Motor ..	1	350	200
(2)	Bellows ..	Bhata ..	1	100	75
(3)	Furnace ..	Bhatti ..	2	40	30
(4)	Matrix ..	Pagha ..	12	30	20
(5)	Crucibles ..	Mus ..	60	40	10
(6)	Anvil ..	Airan ..	1	7	4
(7)	Hammer ..	Hatoda	2	20	5
(8)	Hammer ..	Motha Hatoda.	2	30	15
(9)	Scissors ..	Katri ..	1	30	20
(10)	A pair of tongs ..	Chimta or Gavi.	6	50	30
(11)	Wooden Pots ..	Kund ..	2	2	1
(12)	A set of weights and balances.	Vajne ..	One set.	175	160

All the tools and implements are brought from Kolhapur except the following which are purchased locally or prepared by the workers themselves:—

(*a*) *Bhatti.*—This is prepared by the workers with the help of empty barrels and fire-clay bricks.

(*b*) *Hammer.*—It is purchased from local blacksmiths.

(*c*) *Tongs.*—These are supplied by the local blacksmiths.

(*d*) *Wooden pots.*—These are prepared by local carpenters.

Besides the tools mentioned above a few minor implements are also used in this section, viz. :

(1) A long iron rod slightly bent at one end called *Sali* to stir the melted silver in a crucible while it is in the furnace.

(2) A blow pipe.

(3) A ladle to pour the small particles of silver etc., into the crucible while it is in the furnace.

(4) A *Pahar* or crowbar to stir the coal pieces of the furnace.

Pashta and Sut Section

The function of this section is to draw silver strips or wires out of silver ingots (in the shape of bars of about 1′ to 1½′ in length) obtained from the *Atni*

section. The following tools and implements are used by one such section at Hupari :—

Serial No.	Name of tools, implements etc.	Local name	No.	Value at the time of purchase	Value at present
				Rs.	Rs.
(1)	Electric Motor 3 H. P.	Motor ..	2	1,800	1,600
(2)	Strip drawing machine.	Pashta machine.	3	9,000	8,000
(3)	Wire drawing machine.	Sut machine.	3	9,000	8,000
(4)	A set of weights and balances.	Vajane ..	1	175	160
(5)	Scissors ..	Katri ..	2	18	12
(6)	Hammer ..	Hatoda	2	4	3
(7)	Wrench Set ..	Panha set.	1	10	5
(8)	Furnace ..	Bhatti ..	1	10	5
(9)	Iron rod ..	Sali ..	2	3	2

All the tools and implements and the machinery are purchased from Kolhapur except the following :—

(*a*) Hammers and scissors are supplied by local shop-keepers.

(*b*) The furnace is locally constructed. It is a very simple thing and in fact there is no skill required at all because the ground is prepared smooth and charcoal is spread over it. A few pieces of tin sheet are erected sideways to keep the coal within bounds.

(*c*) Strip drawing machine and wire drawing machine are mostly manufactured at Ahmedabad in Gujarat State.

Press Machine Section

In this section the various designs and other parts which are ultimately assembled in different ornaments are 'cut' from the silver strip. The following tools and implements are in use in one such establishment at Hupari :—

Serial No.	Name of tools, implements etc.	Local name	No.	Value at the time of purchase	Value at present
				Rs.	Rs.
(1)	Fly Press.machine.	Press machine.	9	4,409·18	4,188·26
(2)	Dies ..	Dies ...	85	2,315·00	1,949·00
(3)	Electric grinder ..	Drill machine.	1	518·00	492·00
(4)	Scissors Big ..	Mothi Katri	2	20·00	15·00
(5)	Scissors Small ..	Chhoti Katri	8	20·00	16·00
(6)	Vice ..	Chimta ..	1	30·00	20·00
(7)	File ..	Kanas ..	15	55·00	45·00
(8)	Hammer ..	Hatoda ..	4	20·00	16·00

All the tools and implements are purchased from Kolhapur except the following :—

(*a*) A few designs of dies supplied by local craftsmen.

(*b*) Hammer supplied by local shop-keepers.

Karkhana or Assembly Unit

This is the last section of the silversmithy craft. In fact it is the proprietors of these units who receive orders from the traders and businessmen and deliver the manufactured silver ornaments to them as per specifications. They receive silver from the customers or purchase it on behalf of them and send it to *Atni* section for obtaining silver ingots or bars which in its turn are sent to *Pashta* and *Sut* section for forming into strips and wire. The former are sent to "Press section" for obtaining the various designs and on receipt of them the ornaments are prepared by workers of this section. It is again, this section which provides work to the bulk of the women-workers of this craft. The silver wire of different gauges is rolled in a spiral manner to form a "rope" and is "cut" into circular pieces "rings" or "*matya*", and these rings are given to women-workers who prepare a chain out of these rings. The following tools and implements are used by one *Karkhana* of Hupari :—

Serial No.	Name of tools, implements etc.	Local name	No.	Value at the time of purchase	Value at present
				Rs.	Rs.
(1)	Hand Drill machine	Drill machine.		0·00	7·00
(2)	A pair of tongs ..	Chimta ..	8	10·75	5·00
(3)	Big Scissors ...	Mothi Katri	2	22·00	12·00
(4)	Small Scissors ..	Chhoti Katri	3	4·00	2·00
(5)	Hand-stove ..	Stove ..	2	50·00	25·00
(6)	Hammer ..	Hatoda	2	2·00	1·00
(7)	Writing slate ..	Pati ..	4	5·00	2·00
(8)	Iron pot ..	Bhande ..	5	31·00	15·00
(9)	A set of weights and balances.	Vajne ..	1	90·00	60·00
(10)	Vase ..	Barni ..	4	10·00	6·00

All the tools and implements are purchased locally except the following which are brought from Kolhapur :—

(*a*) Hand Drill machine.

(*b*) Big Scissors.

(*c*) Hand-stove.

Besides the above tools and implements certain minor implements are also required which are listed below :—

(*a*) A mud slate board called *veet* to keep the unsoldered chain in a straight line for soldering.

(*b*) An iron thin rod (like an umbrella rib) to be used at the time of soldering.

(*c*) An iron flat rectangular pan called *Tad* wherein the coal ash is spread and on its smooth surface various parts of the ornaments are arranged and then soldered.

All these accessories are available at the local shops.

Raw Material and Auxiliary Material

The main raw material required for this craft is, of course, silver which is purchased at Kolhapur but, in most cases, is supplied by the customer who places the orders for the silver ornaments to the *Karkhana*-owners, i.e., the owners of assembling units. It is a peculiar tradition of Hupari that there exists a great deal of confidence in the integrity of various persons engaged in this craft. Thus, the trader who hands over a given quantity of silver to the *Karkhandar* of Hupari often settles his accounts at the time of Diwali festival (October-November) when all the processes of manufacturing silver ornaments are suspended for a period of about 15-20 days, partly due to holidays but mainly to settle last year's accounts not only between trader and *Karkhandar* but between employer and employees also. Very few *Karkhandars* are required to purchase silver. They receive it from the customers who specify the purity of the ornaments to be made out of it. It is called " Tanch " of ornaments. In order to obtain the given purity of silver, certain alloys, especially zinc, are mixed with silver while it is melted. These alloys, however, are purchased by the *Karkhandars*.

The list of raw material and auxiliary material as also other items required by various sections of this craft is given below :—

(*i*) *Silver melting or Atni section.*—The materials required by this section are :

(*a*) Hard coke.

(*b*) Navasagar (Sal ammoniac).

(*c*) Charcoal powder (to be mixed with navasagar).

(*d*) Charcoal for heating furnace.

(*e*) Mobil oil as a lubricant for the matrix in which molten silver is poured.

All these items are obtained from the Chandi Audyogik Sahakari Sangh Ltd., Hupari.

The motive power used is electricity.

(*ii*) *Silver strip and wire drawing section or Pashta and Sut section.*—Since this section is a service-rendering one, it does not require any raw material as such. The motive power is electricity. Charcoal is required to heat the silver bars received from the *Atni* section. Mobil oil is required to lubricate the wheels and other parts of the *Pashta* and *Sut* machines. This section transforms silver bars into strips and wire of definite breadth and gauge, for which it charges a commission.

(*iii*) *Press machine section.*—This section, too, like the one described just now, renders services to the customers and requires no raw material as such. It 'cuts' various designs on the silver strips received from the customers and charges a commission for the services rendered. However, it requires the following items:—

(*a*) Charcoal or cow-dung cake to heat the silver strips before designs can be cut out of them.

(*b*) Mobil oil or coconut oil to be smeared on the strips before designs can be 'cut' out of them. The strips are smeared with coconut oil or mobil oil so that the strip becomes " smooth " as the craftsmen describe it.

(*iv*) *Complete Karkhana or Assembling Units.*—These sections require the following items either as raw material, auxiliary material or fuel and lubricants:—

(*a*) Zinc, (*b*) Brass — To be mixed with silver for obtaining the required fineness.

(*c*) Borax, (*d*) Solder pieces — for soldering the ornaments.

(*e*) Kerosene oil — for heating the stove.

(*f*) Sulphuric acid, (*g*) Nitric acid, (*h*) Sodium cyanide (*Potash*), (*i*) Silver powder, (*j*) *Ritha* or Soap-nut — for polishing the ornaments as also to remove blackish colour of the silver ornaments.

(*k*) Ash — To be spread over the pan, 'Tad', on which the various components of the ornaments are placed and then soldered.

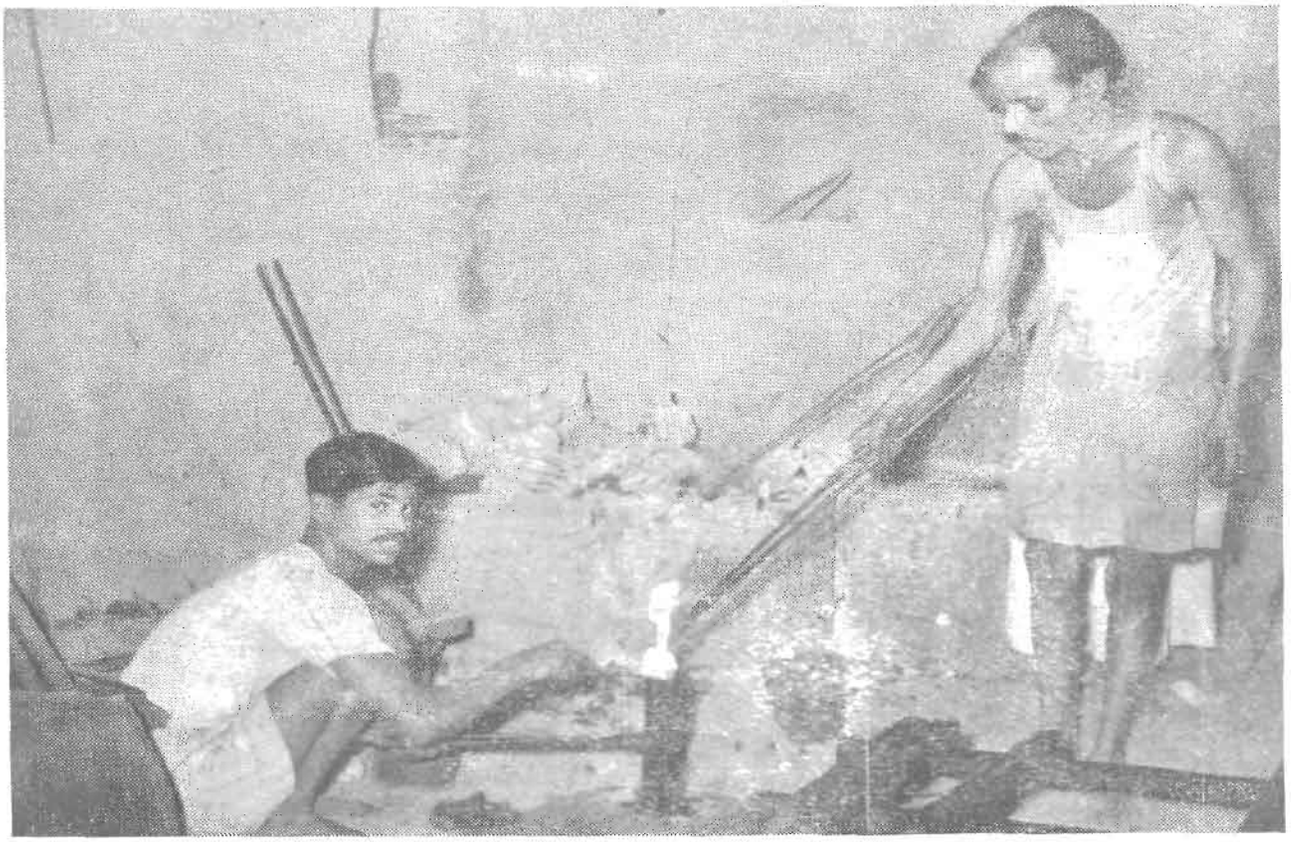
(*l*) Dung-cake and fire-wood — To be used as a fuel for heating water at the time of polishing.



Photograph No. 1
A view of Hupari village as seen from the top of the water reservoir in the village.

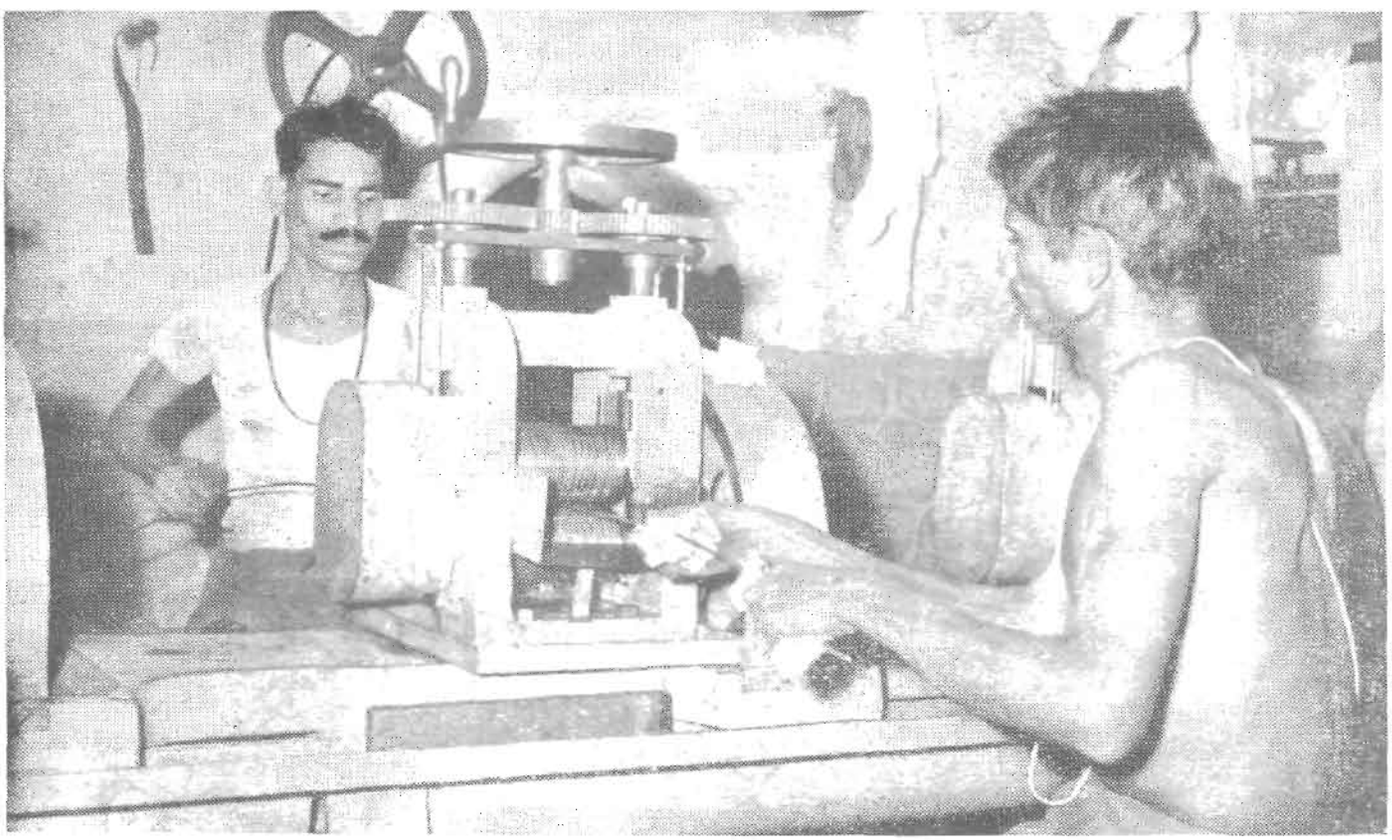


Photograph No. 2
Melting of silver in a crucible.



Photograph No. 3

The melted silver is poured into a "Pagha" (Matrix) to form an ingot.



Photograph No. 4

The silver rod is passed through the "Sut" machine (wire drawing machine) in order to form a square wire of required gauge.

Workshop

The requirements and types of workshops in which various processes of silversmithy are carried out at Hupari depend upon the nature of section and work done in it. Thus, for *Atni* section and *Pashta* and *Sut* section much space is required than for the other two sections. In case of the former however there should be ample provision of water since the furnace is always burning and precaution has to be taken against the outbreak of fire. The minimum space required for *Atni* section is 25′×20′ so that the furnace and the electric motor could be installed on one side of the workshop while at the other side the weighing scales to weigh the silver and other pieces brought for melting and also the silver bars obtained from the matrix. There must be some open space to keep the crucibles, charcoal, coke, water-pot, etc. which are required for the section. The furnace is constructed out of fire-clay bricks and barrels. There is an opening at the middle of the barrel which is connected to the fan run by the electric motor by means of a big size hose. The drum is embedded into the ground upto the hole of drum (barrel) which is usually in the centre of the drum (barrel).

The workshop of a *Sut* and *Pashta* section is like that of a modern factory with overhead wheels with "V" belts etc. erected on raised columns of steel. The electric motor is installed at the corner of the big hall and the *Sut* and *Pashta* machines are erected in a row with some space on all the four sides of a machine to allow the workers to work and for movement also. A portion of the hall usually the corner of it is reserved for the furnace where the annealing of the silver bars is done. Another corner of the hall is occupied by the weighing scales, and the owner of the workshop who maintains an account in a very rough manner about the weight of silver bars brought in by the customers and the weight of silver strips and wires given to them when work is completed. The minimum space required by this section is 30′×30′.

The workshop of a Press section is anything from a small room to a big hall, depending upon the number of workers engaged in the section. Since the work is done by workers by squatting on the ground, no special pains are taken for the installation of the machines, *i.e.*, press machines. They are portable and can be worked upon in any place where a shelter is provided. The minimum space required to set up a workshop of press section is a small room measuring 10′×10′,

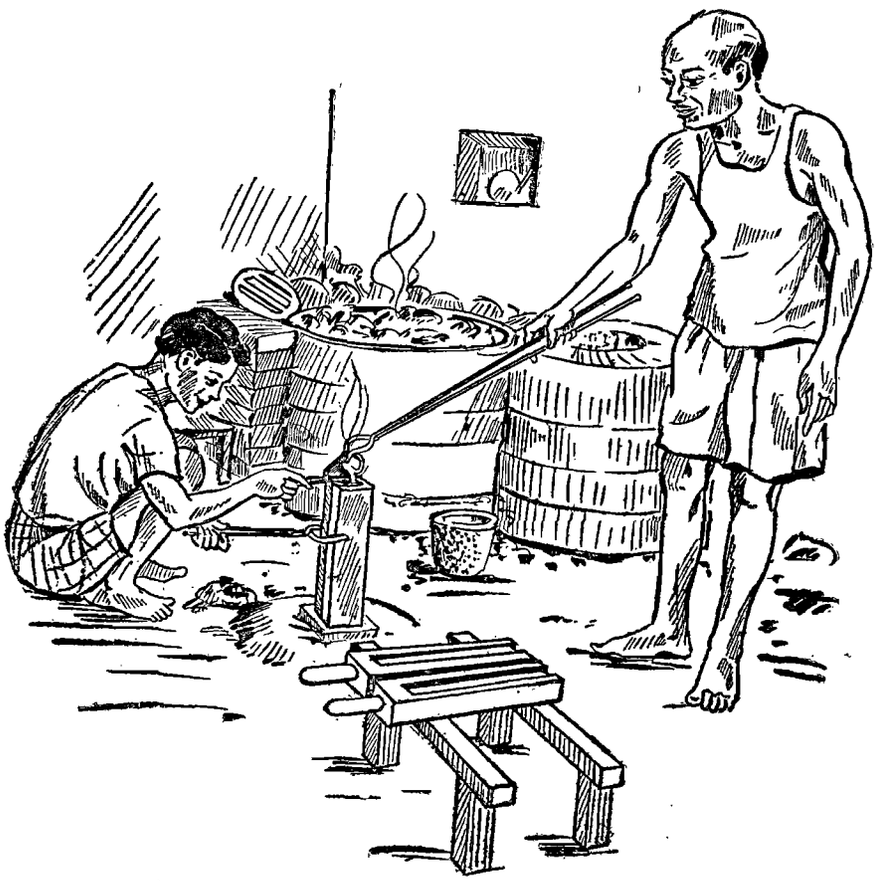
Since the workers engaged in a *Karkhana*, *i.e.*, where assembling of all parts of an ornament is done, are required to assemble small parts of an ornament by squatting on the ground, they need sufficient natural or artificial light. Hence, generally, the front portion of the building with ample air and open doors is used as a workshop for *Karkhana*. The workers squat on the ground and keep the *veet* or the *Tad* on a low rectangular table.

There is very little space between two workers and it is their general complaint that their back and feet are strained due to constant sitting in a particular posture. A corner of the room or hall is occupied by two or three vases which contain sulphuric acid, nitric acid, water etc. At the other end of the room or hall, and away from the main entrance, to avoid the street dust, sits the owner/proprietor of the workshop with the weighing scales and gives final touches to the polished ornaments meant for delivery to the merchants/traders. Sometimes the owner/proprietor also sits along with the workers either to cut the solder pieces or to assemble the various components of the ornaments. He keeps a close supervision over the workers which is possible since all of them sit in the same hall or room.

It is observed that all the sections of the craft are located on the ground floor of the building in Hupari. This should be so because the buildings of Hupari are mostly residential buildings which are used for the various sections of the craft except the *Pashta* and *Sut* section for which special structures are essential because of the machinery installed in it. Whereas electricity is used for operating *Atni* section and *Pashta* and *Sut* section, no power-operated machines are required in case of press section and *Karkhana*.

Manufacturing Process

Stage I.—The melting of silver pieces and transforming them into bars of required size is the first stage involved in manufacturing silver ornaments. This process is done in *Atni* establishments which charge a service charge of Re. 0·50 per kg. of silver melted by it. The customers bring their silver pieces to the *Atni* establishment and specify the purity required by them. The customer supplies the alloy to be mixed with silver. Since the silver brought to *Atni* for melting is not always pure silver, *i.e.*, silver as such but is also the waste silver strips obtained from Press machine section etc., there is always a difference between the two weights, *i.e.*, silver (with alloy to be mixed) weighed before melting and the silver ingots or bars obtained after melting. If the difference is within the permissible



The melted silver is poured into a " pagha " (Matrix) to form an ingot.

margin, there is no dispute. If it exceeds the limit, an investigation of the furnace etc., is carried out. Generally, however, there are no disputes about the weight. This difference is called *Toot* in the local parlance.

When the silver is brought to the *Atni* section for melting, it is weighed and a receipt is handed over to the person who brings it for melting. The silver along with the alloy is then deposited in a crucible called *Mus*, which in its turn is deposited in the furnace. The air is blown into the furnace by means of a fan which is run on the electric motor. In case of break-down in the supply of electricity a hand operated fan is kept nearby so that there is no stoppage of work. After about 20 minutes, the contents of the crucible are stirred by means of an iron rod called *Sali*. This stirring is essential in order to mix throughly silver and the alloy. Every now and then a handful of the powder of sal-ammoniac locally called '*navasagar*' mixed with charcoal powder (in proportion of 50 : 50) is poured into the crucible. This expidites melting of silver, it is reported. It also helps the molten silver to pour down smoothly when taken in a small crucible. When the worker is satisfied that the silver is melted completely and the mixture i.e., silver and alloy is thorough it is poured over the matrix. There are two types of matrix, locally called *Pagha*, in which the molten silver is poured. In case silver bars are to be used for purposes of soldering then a vertical matrix is used whereas if it is to be used for drawing strips or wire then a horizontal matrix is selected which is placed on two wooden stands which are firmly embedded into the earth like the foot-ball goal poles. The photo-graph No. 2 shows the worker (who is sitting) holding a vertical matrix while in photograph No. 3, the horizon-tally placed matrixes are seen at the right side of the worker.

In both the cases, the inner portion of the matrix is smeared with mobil oil as a non adhesive agent before molten silver is poured over it. It is applied by means of a hand made brush prepared out of waste cotton cloth. The molten silver is taken in a small crucible which is heated previously so that silver may not stick to it and poured into the matrix through an opening at the top in case of a vertical matrix and at the centre in case of a horizontal matrix.

The weights shown in the table on page 10 were taken before and after melting of silver in respect of 3 items which were melted by one *Atni* section at Hupari.

Type of ingots to be had (1)	Nature of material handed over for melting (2)	Total weight before melting (3)	Crucible No. used for melting (4)	Weight after melting		Difference (*i.e.*, col 13-col. (5+6) *i.e.* (*Toot*) (7)	Time required for melting (8)
				Weight of Bars (5)	Weight of Waste (6)		
		Kg.		Kg.	Kg.	Kg.	H. M.
For *Sut*, *i.e.*, wire ..	Waste matter of strips and miscellaneous pieces of silver and alloy.	4·678	5	4·550	0·065	0·063	1 15
For *Sut* and *Pashta i.e.*, wire and strip.	Silver bars, old coins and miscellaneous and alloy.	3·902	5	3·898	0·004	*Nil*	1 0
For *Pashta* and for solder, *i.e.*, strip for solder.	Silver bars ..	1·285	2	1·245	0·030	0·010	0 45

Once the molten silver is poured into the horizontal matrix, it obtains a shape of a bar and the bar is removed from it and is dipped in a very mild solution of water and sulphuric acid. In case of vertical matrix, however, the strips so obtained from it are allowed to cool in air and are not dipped in a solution of water and sulphuric acid. It is reported by the workers that the strip will be hard if it is dipped in a solution of sulphuric acid and water. The vertical matrix is used only when the strips for soldering are to be obtained.

The silver bars obtained from the *Atni* section are given different names, depending upon the use to which they are put subsequently. The following table shows the local names of such bars, their approximate length, the use to which they are put etc. :—

Local name of the bar (1)	Shape of the bar (2)	Approximate length (3)	Average weight of a bar (4)	Use to which it is put (5)
Die ..	Round but not exactly so.	1 to 1½ feet.	250 to 300 in grammes	For obtaining strips.
Koylee Pagha ..	Do. ..	1 to 1½ feet.	250 to 300 in grammes.	For obtaining thin strips.
Mani Pagha ..	Do. ..	1 to 1½ feet.	250 to 300 in grammes.	Do.
Sut Pagha ..	Do. ..	1 to 1½ feet.	250 to 300 in grammes.	For obtaining square and round wire.
Dag Pagha ..	The shape is that of a foot rule.	6 inches ..	120 to 130 in grammes.	For obtaining solder pieces.

The type of solder used at Hupari is of the following 4 types and the proportion of different alloys mixed in it are given below :—

Local name of the solder	Approximate percentage content of		
	Silver	Brass	Zinc
10 " anne Dag " ..	62	25	13
8 " anne Dag " ..	50	25	25
6 " anne Dag " ..	37	40	23
5 " anne Dag " ..	31	39	30

The coal used for the furnace is called " Beehive hard coke coal No. 2 " and is obtained from, the Chandi Audyogik Sahakari Sangh Ltd., Hupari. The crucibles that are used in melting silver bear different numbers from 1 to 50 and these numbers indicate the capacity of the crucible. Thus a crucible bearing No. 1 is used for melting one Kg. of silver ; No. 2 for 2 Kg. of silver and so on.

When the bars are obtained, the function of *Atni* section ends. These bars are then sent to *Pashta* and *Sut* section for obtaining strips or wire from the bars.

Stage II—Manufacture of strips and wire from silver bars.—The bars which are obtained from the *Atni* section by the customers are first weighed. They are then placed in the furnance for heating, the furnace being a charcoal fuelled. Once the bars are sufficiently hot they are taken out and allowed to cool in the air. This process which is technically called " annealing ", is essential in this craft so that the metal is tempered by heating.

The bars are then sent either to *Sut* machine (if wire is to be obtained), or to *Pashta* machine (if strip is to be obtained). The customer specifies the gauge of the strip and wire required by him. The two machines—*Sut* and *Pashta*—are power operated. Two workers are required while the bars are passed through the two cylinders of the machines. The person who inserts the bar is called *Lavnara* or *Mal ghalnara* while the one who receives it from the other side is known as *Kadhnara* or *Dharnara*. Since the bars are passed

through the machine a number of times, they get heated and as such the two workers are required to hold them (bars) in cotton rags. One bar is passed through the machine for 40 to 50 times before the strip or wire of required gauge is obtained. The cylinders of the machine have to be oiled frequently for smooth working of the machine. The owners of this section charge a commission of Re. 0·50 per Kg. for drawing wire or strip. However, in case of *Dag* strip the charges are Rs. 0·75 per Kg. Photograph No. 4 shows the working of a *Sut* machine while photograph No. 5 shows the two workers engaged in drawing the strip from the *Pashta* machine. Once the job of drawing wire or strip is completed, the wire or strip is coiled and weighed and handed over to the customer. The strip obtained from the *Pashta* machine is of different gauges and of breadth. The breadth varies from 0·3 inches to 0·8 inches. The wire which is obtained from the *Sut* machine varies from 28 gauge to 36 gauge. However, the wire is not exactly round in shape and smooth. It is, therefore, sent to another section where round-shape wire is drawn, with the help of a machine which is also called *Sut* machine and is power operated. The wire is passed through a gauge scale called *Jantar patti.* While the coiled wire passes through the holes of the gauge scale it is dipped in a solution of water and mobil oil. The photograph No. 6 shows the worker drawing a round wire from the gauge scale which is held by him in his right hand. The gauge scale, however, is not visible in the photograph since it is hidden behind a part of the machine.

The wire obtained from the *Sut* machine described earlier is deposited on the conical shaped portion of the machine, shown at the right side in photograph No. 6. Before one end of the wire is fixed into the slot of the circular wheel, shown to the left, it is passed through the required hole of the gauge scale. The end of the wire is rubbed by means of a file and it is inserted into the hole of gauge scale and is pulled from other side by means of a pincer. The pulled end is fixed into the slot of the round wheel. Once the machine starts working, the round wheel rorates and the wire passing through the gauge scale is deposited on the round wheel. This wire is then again passed through a smaller hole and the entire process is repeated till the wire of required gauge is obtained.

Stage III.—The next stage consists of sending the strips to Press machine section by the customers to cut them into specific designs by means of dies fixed into a fly press which is hand operated. The design is selected by the customer and he has to pay a fixed amount of charges for the cutting of strips into designs. When the strips are sent to Press machine section they are first weighed and then heated in a cow dung cake fire to dull red and allowed to cool in air. The strips are then straightened and coconut oil is applied to them by means of cotton rags. The strip is then passed through a slot of the fly press by the worker who operates the press machine with his right hand. The design is impressed on the strip and is cut and is collected in an iron pan placed below the press machine. On an average a worker can produce such designs weighing about 200-300 grammes a day. There are a variety of designs such as diamond, spade, club circular pieces, etc. The charges for impressing the designs on strips are Rupees 4 per Kg. The customer then collects the designs and cut out strips. The photograph No. 7 shows the worker working at a Press machine.

The round wire is used for making chain which invariably forms the base of silver ornaments manufactured at Hupari. The wire is coiled over a steel rod (of the size of an umbrella rib) by mans of wooden planks. The photograph No. 8 shows the worker coiling the wire around the steel rod. One end of the longer wooden plank is placed on the raised portion of any wooden slab or a door step. The other end is held firmly by the left foot. A small length of wire is first coiled around the rod by hand and then the rod is placed horizontally on the wooden plank. The smaller wooden plank is then moved (from bottom to top direction) briskly so that the wire is deposited over the rod. Once the entire rod is coiled by the wire around it, the coiled portion of the wire is pulled out and the process is continued till we get a coiled wire like a spring. The coiled wire is then cut by means of a big scissors called *Matyachi Katri,* so that we get circular rings with an opening as follows :

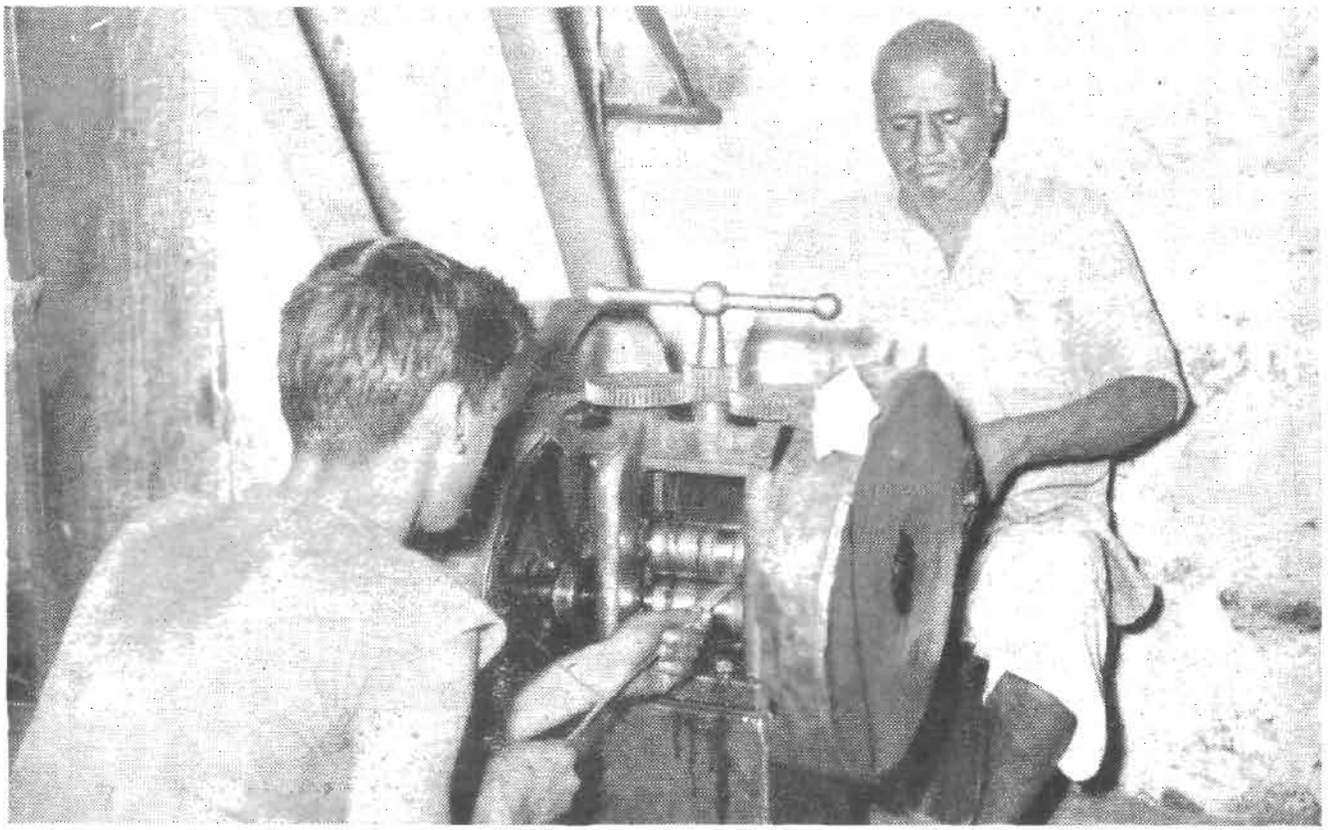


"MATYAS"- RINGS WITH AN OPEN MOUTH



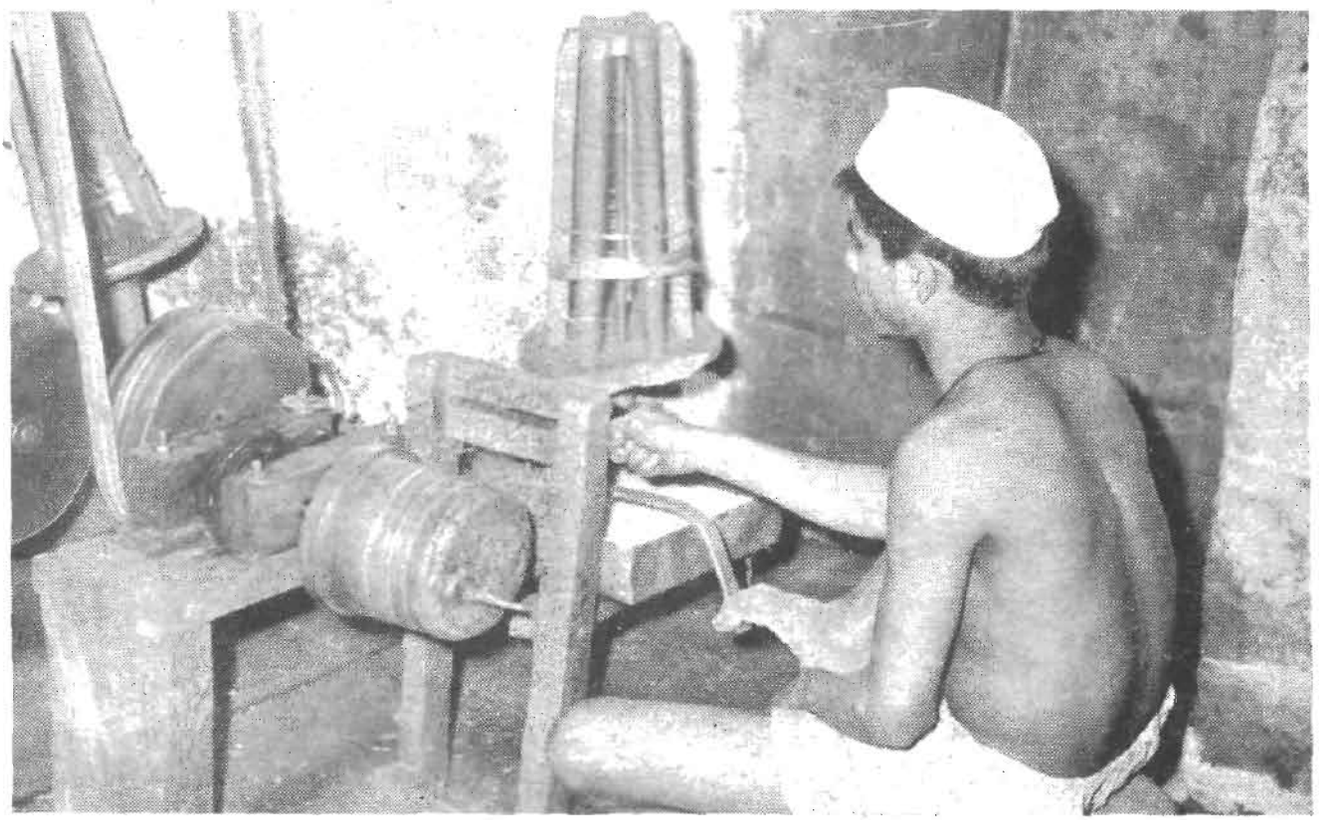
A CHAIN IS FORMED BY INSERTING 'MATYAS' INTO ONE ANOTHER

The circular ring is called *Mati.* These rings are then given to women workers of the village who prepare a half finished chain out of these rings. The women take the rings by weight to their homes where even small girls of the age group 6 to 10 assist their mothers and elder sisters in chain making. The worker picks up one ring, closes its mouth and then inserts another ring in it, closes its mounth also and then inserts the



Photograph No. 5

The silver rod is passed through the " Pashta " machine (strip drawing machine) in order to form a strip of required gauge.



Photograph No. 6

The wire drawn through the " Sut " machine is further processed in this " Sut " machine to obtain round shaped wire of required gauge.



Photograph No. 7

The strips obtained from 'Pashta' machine are passed through the press machine to obtain the design with the help of a die.



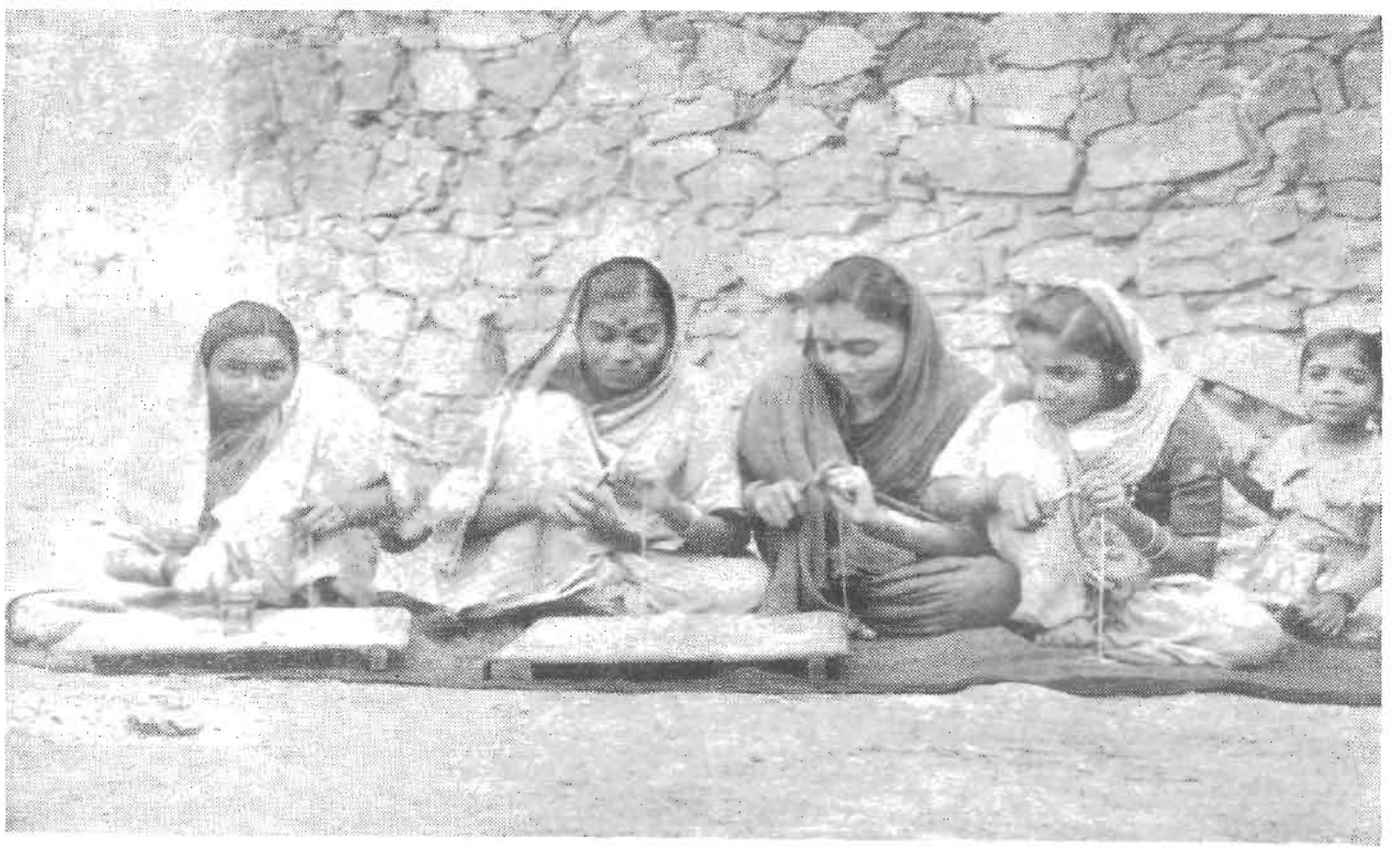
Photograph No. 8

The wire drawn through "Sut" machine (Photograph No. 6) is rolled over a steel rod and a 'spring' is formed.



Photograph No. 9

The "Spring" is cut into small pieces to get small circular rings with opening.



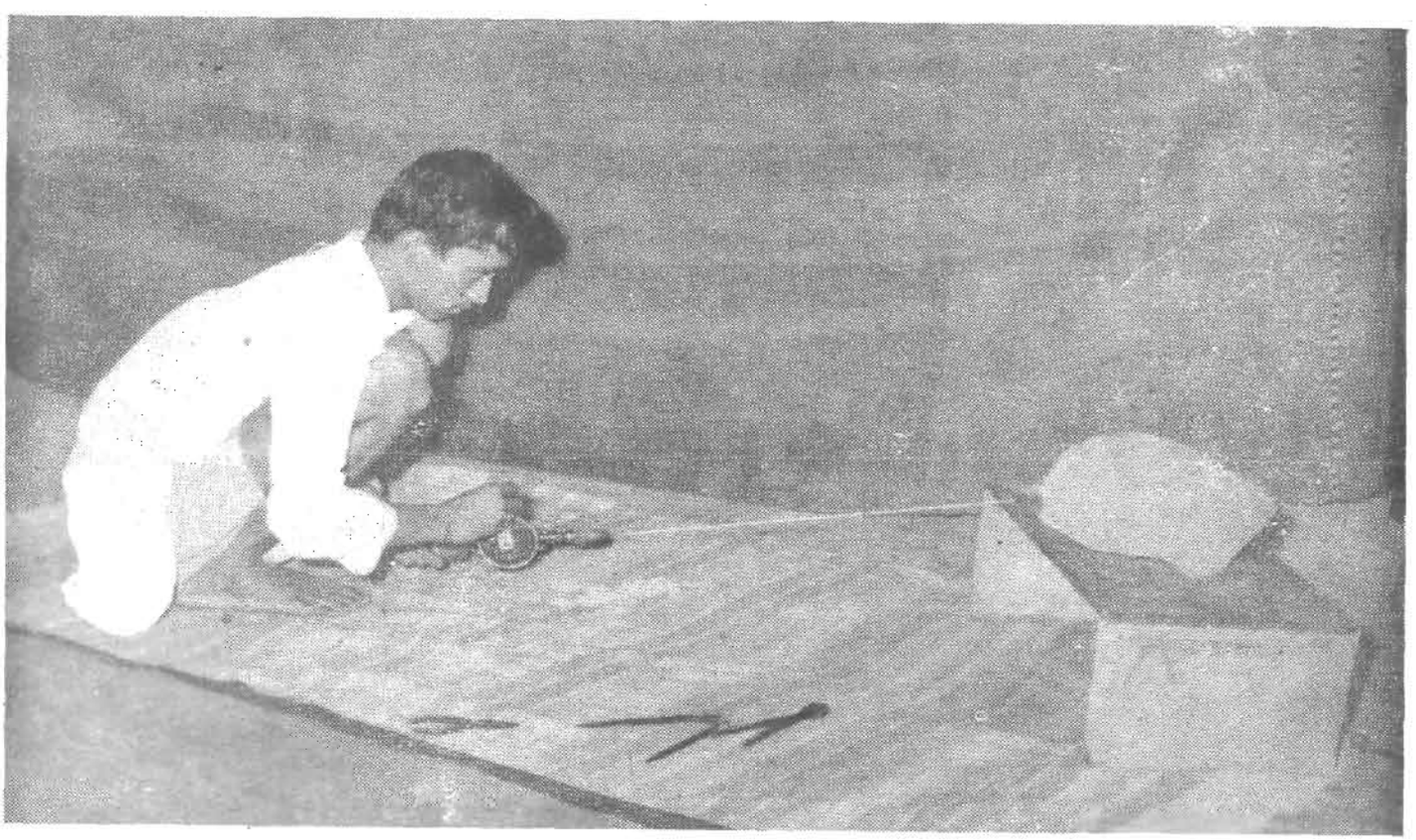
Photograph No. 10

The small rings are linked together to form a chain. This work is invariably done by females.



Photograph No. 11

The chain is being soldered with a hand-stove.



Photograph No. 12

The completed chain is given a slight twist with the help of a drill machine in order to get a design.

3rd ring closes its mouth and so on. For this purpose they take the help of a *Chimta* or pincer to close the mouth. In this way, they prepare a long chain about 20 to 30 feet long and send the chain to the *Karkhandar* from whom they had brought the loose rings. The wages for chain making are Rs. 4·50 per Kg. In a day a woman can prepare a chain weighing about 200-300 grammes. The photograph No. 10 shows a group of women workers at chain making.

This chain has to be soldered, *i.e.* the mouth of each ring is to be closed by means of a solder which, when heated melts, and closes the opening. The chain is first arranged properly on a mud plank called *veet* in local language. The small pieces of solders smeared in a solution of borax and water are placed one each on the opening of each ring. Brute borax, called *Takankhar* in its raw form is not used. It is mixed with water and a small quantity of *navasagar* (Sal-ammoniac) and heated on a fire. When it starts boiling, it is poured over a piece of cloth and a lump of it is prepared by tying a knot. It is allowed to cool. Once it is cool it takes the shape of a solid ball. It is then rubbed on a writing slate with a small quantity of water and a paste is prepared. Small pieces of solder are then mixed in the paste and these pieces are used for soldering. Once all the openings of the rings are closed by placing one solder piece each, a hand-stove is heated. Its flame is moved, first from a distance, and then brought close to the chain slowly, so that the solder-piece melts and closes the opening completely. When this is done, the stove is kept aside and the chain is allowed to cool. The chain is then examined to see if all the rings are properly soldered and in case there are any defects, the chain is cut at that point and again soldered a fresh by inserting a fresh ring. The soldered chain is then given a twist by means of a hand-drill. The twist gives a sort of design and then the chain is given a soft beating by means of a mallet. The photograph No. 11 shows the worker busy in soldering the chain while photograph No. 12 shows the worker giving a twist to the soldered chain by means of a hand drill. One end of the chain is firmly attached to a nail fixed into a box while the other end is fixed firmly into the mouth of the hand drill and the drill's handle is gently rotated so that the chain is twisted. Only a slight twist is given or else the chain will break away.

Stage IV—Assembling of designs and formation of an ornament.—The ornaments of Hupari are not manufactured by one craftsman alone but are a product of many workers' labour. Different workers carry out different items of work and finally the various parts of an ornament are assembled together, preferably with a chain as a base, and soldered. Thus at this stage, the worker is given by the *Karkhandar* a definite length of chain, definite pieces of designs to be attached to the chain and other decorative pieces for the chain. The final get up of the ornament is decided by the *Karkhandar* (who in his turn fulfils the wishes of the traders from whom he has received the orders) and the worker carries out the instructions faithfully. The chain and the other pieces are washed in a solution of water and sulphuric acid called *ukada* (before they are soldered together) so that the blackish coating on them is removed. This is called pickling in a technician's language. The worker takes a rectangular steel plate, called *tad* in which he deposits coal ash and it is levelled by means of the smooth portion of a small tin box or anything with a smooth surface. The ash is pressed gently and then the base of the ornament, usually the chain, is placed on the smooth portion of the ash. The other decorative pieces are then placed at their proper position, one by one with the help of a *chimta*. Once the arrangement of the ornament is completed, the solder pieces are placed at proper places. The last operation is that of soldering. The process of soldering is already described earlier. After soldering the ornament is sent for polishing which is the final stage in manufacturing of silver ornaments at Hupari. The photograph No. 13 shows the worker arranging the small pieces of design in proper order. The arrangement of different designs and pieces of an ornament is a tedious and time consuming process. It puts a great strain on the back of the worker who has to work cross-ledgged and in a bent position all the time.

Polishing

The polishing of silver ornaments which happens to be the last operation as far as manufacturing processes are concerned, requires sufficient supply of fresh and pure water. Hence this work is mostly done near 4 or 5 wells which are located in the fields of Hupari village or near the canal which irrigates the near-by sugarcane fields. The quantity of ornaments carried to the well or the canal is usually a substantial one *i.e.*, 20, 30, 40 or 50 Kgs. of ornaments. The work of polishing the ornaments is done by a group of about 4 or 6 people. Two of them are solely utilized to fetch fresh water and are called *Panke* while the rest, known as *Zilaiwale*, do the skilled work. The ornaments are carried in a steel frying vessel called *kadhai* and before the party leaves the workshop with ornaments for polishing, they (ornaments) are once dipped in a solution of water and sulphuric acid called *ukada* and are dried. At the well or canal side, the ornaments are kept in a peice of cloth measuring about 6′ × 3′, called *zolana* and water is poured over them. At a time about 10 Kg. of ornaments are kept in a *zolana* whose four ends are held by two *Zilaiwale*, two

ends by each. They swing the *zolana* to and fro with the result that the ornaments inside are rubbed against each other. After sometime water again is poured over the ornaments. While this is in progress, the two *Panke* prepare a fire and keep over it a metal pot called *ghamela*. 2 balls of *Potash* (Sodium Cyanide) a deadly poison each weighing about 2·5 Tolas, are kept in the *ghamela* in which water is now poured. The balls dissolve into it. As the solution boils, one tola of silver powder is added to the solution. When the solution is at boiling temperature, one ornament is dipped into the solution for 5 minutes or so and taken out and is examined to see if it gets the coating of silver correctly. If not, a little more of silver powder is added. When the worker is satisfied about the evenness of the polish on the ornament dipped in the solution, he deposits all the ornaments of *zolana* (*i.e.*, usually 10 Kg.) into the *ghamela*. They are then taken out after half an hour or so. The fire below the *ghamela* is then extinguished. Afterwards the ornaments are again taken into the *zolana*, water is poured over them (ornaments) and the *zolana* is swung to and fro by the two *Zilaiwale*. Water is poured intermittantly over the ornaments. Then a handful of ornaments are taken by each *Zilaiwala* and rubbed between palms with the foam of *ritha* (soapnut). All the ornaments are thus cleaned by means of foam of *ritha*. They are once again washed in a mild solution of water and sulphuric acid and finally washed in clean water and allowed to dry. The protograph No. 15 shows the process of polishing in progress.

If the quantity of ornaments is less say 3 or 4 Kgs., they are not polished in a *zolana* but in cotton bags though all other processes are the same. The photograph No. 14 shows the workers polishing the ornaments in small cotton bags.

If the ornaments are of delicate and sharp designs which might be spoiled if rubbed in a *zolana* or a bag, then they are rubbed by means of a metal wire brush as is shown in photograph No. 16. All other processes, however, remain unchanged.

Sorting and Packing—

The ornaments after polishing are brought to the workshop where they are sorted out as per design specifications (as shown in photograph No. 17) and finally packed in wooden boxes for delivery to the customers (photograph No. 18). They are, of course, weighed before sending them to traders. In some cases, few links of ornaments get twisted in the process of polishing. The defects are rectified while the ornaments are being sorted out by the workers.

It has been noticed that the silversmithy craft of Hupari makes extensive use of two items, *viz.*, chain and hollow or solid balls. We have already described earlier how the chain is prepared (*vide* photographs Nos. 8, 9, 10, 11 and 12). The process of manufacturing balls at Hupari will be described in the following paragraphs :—

There are 3 types of balls which are manufactured at Hupari. They are :—

(*a*) Solid balls called *Rawyache* balls.

(*b*) Hollow balls (but with a joint) called *Tapliche* balls, and.

(*c*) Hollow balls (but without any joint) called *Gujrav* balls.

(a) Solid balls

These balls are manufactured with the help of a power operated machine which has two circular discs, one over the other. The upper disc rotates when the machine is set in motion. The lower disc has a number of slots but not very deep in depth and not very wide in breadth and long in length. The size of the balls depends upon the gauge of wire selected for the purpose which is square in shape. It is obtained by sending silver bars to the *Sut* machine. This wire is cut into very small pieces by means of a scissors and the size of the pieces is as follows :—

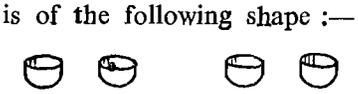


SQUARE PIECES OF WIRE BEFORE THEY ARE TRANSFORMED INTO SOLID BALLS

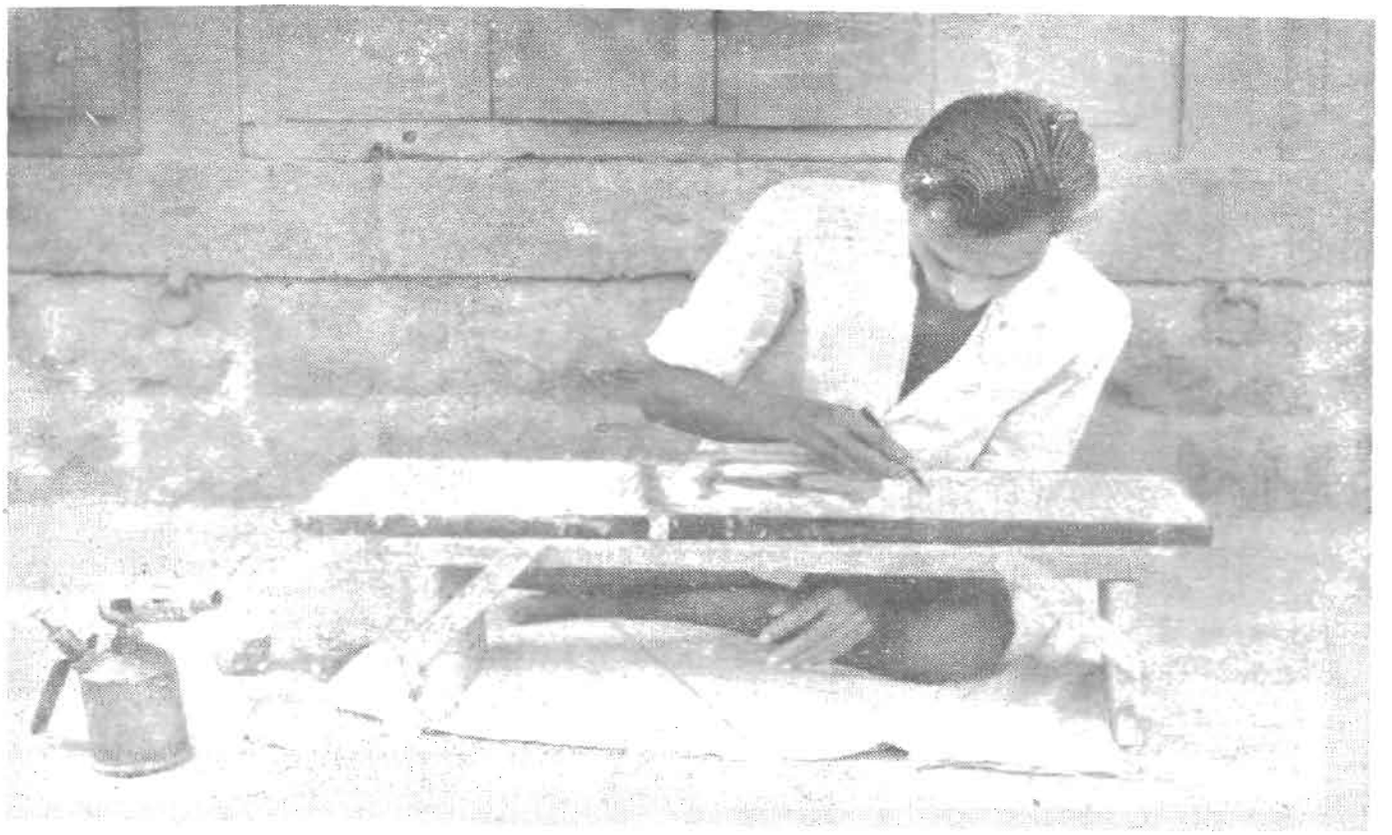
These pieces are then spread over the lower disc of the drilling machine evenly and afterwards the upper disc is adjusted over the pieces by lowering the disc. In other words the small square pieces of silver are caught in between two discs. When the drilling machine is set in motion, the upper disc rotates with a great speed and with it, the small silver pieces, too, get a motion which 'cuts' the edges of the pieces and finally a round shape is obtained by them. These round shaped silver pieces are called *Rawyache* balls.

(b) Hollow balls or Tapliche balls

These balls are prepared out of silver strips which are obtained by sending silver bars to *Pashta* machine section. The strips of silver are sent to Press machine section where hemispherical shaped designs are cut out from these strips and the cut out portion is called *Topan*. It is of the following shape :—



4 PIECES OF TOPAN USED IN MANUFACTURING HOLLOW BALLS



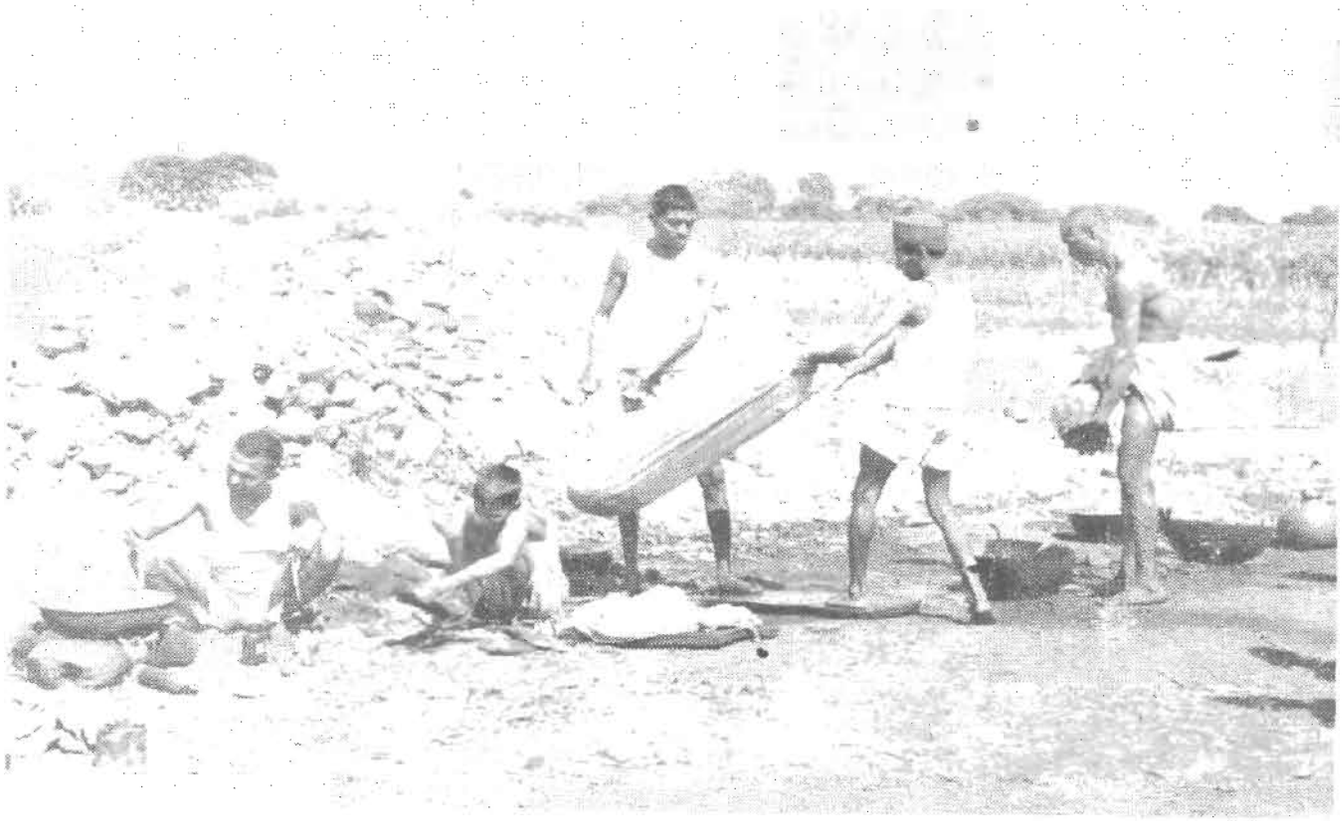
Photograph No. 13

The small pieces of design as obtained through the press machine (photograph No. 7) are arranged together and then the entire ornament is soldered with a hand-stove.



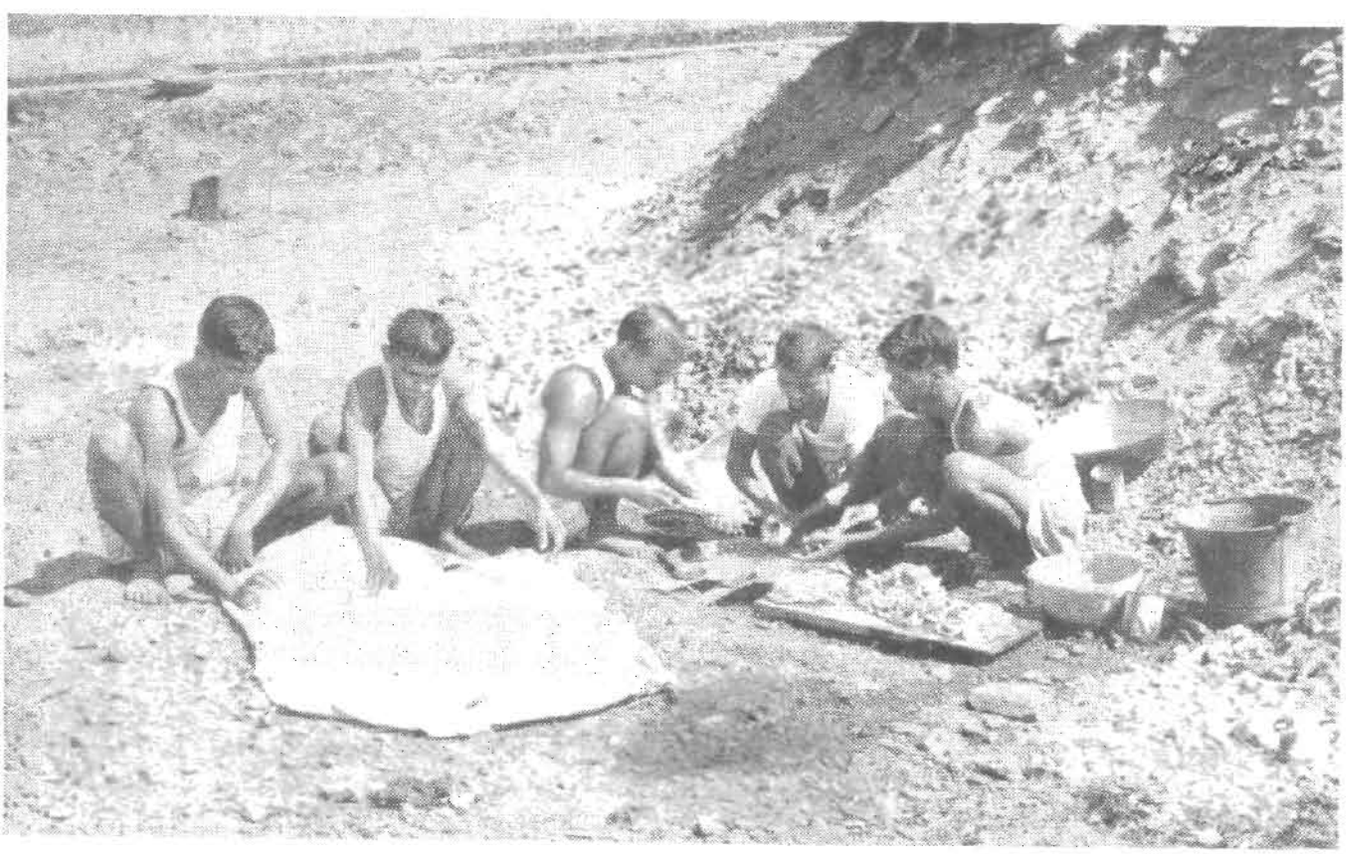
Photograph No. 14

Polishing of ornaments by putting them in small bags of 2-3 kilograms each.



Photograph No. 15

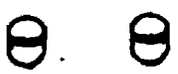
Polishing of ornaments is done in a "Zolana" containing 10 to 15 kg. ornaments.



Photograph No. 16

Polishing of ornaments with a brush in respect of some special ornaments involving intricate designs.

The opening of the *Topan* is then rubbed on a writing slate on which the solution of water and borax (*takan-khar*) (in the form of a thin paste) is spread over and the *topans* are then assembled in the rectangular steel pan called *Tad* which contains a thick layer of ash, the top of which is made very smooth by means of a smooth portion of a box. These hemispherical pieces are arranged in the following manner:—



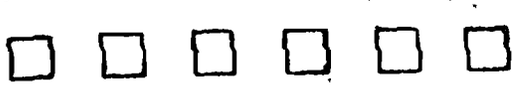
ONE "TOPAN" PLACED OVER THE OTHER FOR MANUFACTURING HOLLOW BALLS

A piece of solder is then kept over each and the two sides are soldered by means of a hand-stove. These balls are soldered generally at the time of assembling the ornaments as described in stage IV earlier.

(c) Hollow balls or Gujrav balls

These balls, it is reported by the workers, are manufactured at Hupari only and at no other place in India. The speciality of these balls is that they are jointless and are manufactured by a very handful of skilled craftsmen who belong to Mahar caste. These balls are prepared out of *bittis* which are prepared by women. *Bittis* are nothing but two small square pieces of silver sheet, interlocked in each other by keeping one over the other, one of which is in an inverted position.

The strips of silver are cut into small pieces by means of a scissors. These small pieces are of the following shape:—



SQUARE PIECES OF STRIP USED FOR BITTIES

All the pieces need not be of exactly the same size but more or less they are so. Any slight difference does not matter much. A wooden block is then kept on the ground and on the top surface of the block a small hollow portion is scooped out. A metal sheet, hollow in shape, is firmly fixed into this 'slot'. This 'metal-filled-slot' is called *gaddi* and costs about Re. 0·75 to Re. 1. It is manufactured by local blacksmiths. Then 5 or 6 or even more number of silver pieces are deposited in the *gaddi* and a small pestle-like instrument called *mola* or *khulnicha mola* is taken and the pieces are given a sort of hollow shape by placing one smooth end of the *mola* over them and the other end being knocked often by means of a small iron plate called *patti*. After 8 to 10 beatings the pieces take an hollow shape and are removed from the slot. Then two such pieces are taken in hand by the worker and kept one over the other in the following way:—



SHAPE GIVEN TO THE SQUARE PIECES, WITH THE HELP OF AN IRON PLATE



A "BITTI" IS FORMED BY PLACING 2 CURVED PIECES ONE OVER THE OTHER

When this is done the two-pieces are held in a *chimta*, a 'U' shaped instrument, and are rubbed in the groove of a small stone slab, three or four times. The ends of the pieces are bent due to the rubbings and a *bitti* is formed. This work is entirely done by females and even by small girls of the age-group 6 to 14. The wages received by workers are piece wages *i.e.*, Re. 0·56 per 200 grammes of *bittis*.

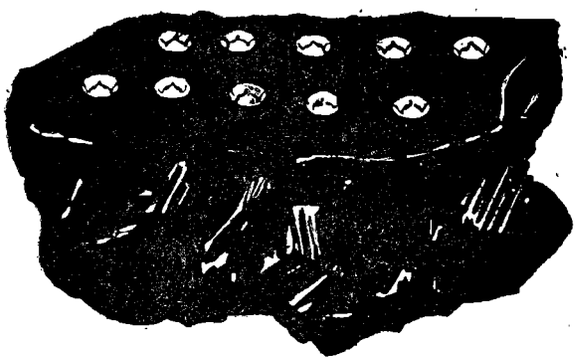
These *bittis* are then sent to skilled craftsmen of the *karkhandars*, to be formed into hollow jointless balls. The instruments used by them are very simple.

(*a*) A charcoal fuelled oven.

(*b*) A *chimta* (pincer).

(*c*) A *funkani* (blow-pipe).

The oven or *bhatti* is prepared out of tin sheets and is a portable one. It is like a chafing dish or portable grate. The centre portion is occupied by a block of charcoal (rectangular shaped one) which has 10 holes in 2 rows as follows:—



A CHARCOAL PIECE WITH 10 BITTIES PLACED ON 10 HOLES

The sides of this block of charcoal are covered by pieces of charcoal. A special type of charcoal called *Hirdicha Kolsa* is selected for this oven. When the oven is fired the rectangular shaped block of charcoal also is burned red hot. The *bittis* are smeared in powder of *takankhar* (borax). The worker then places one *bitti* on each of the 10 holes and the *bitti* gets a circular shape, it is reported, because the air inside the *bitti* expands because of heat and due to thin sheet of the silver it automatically obtains a round shape. As soon as the *bitti* gets a round shape, the worker drops 2 or 3 drops of water over each and every *bitti* one after the other with the help of the *chimta* by dipping it in a vessel containing water. All the while the worker is blowing air into the oven by the blow-pipe to keep the charcoal burning. Because of this process, it is said, the worker's chest is spoiled permanently. Once the water drops are dropped on the round shaped *bitti* (now in the shape of a ball) it is cooled and is picked up by the *chimta* and deposited in a separate pan. The photographs Nos. 19 and 20 show the work of manufacturing hollow balls, *gujrav*, in progress.

The wages paid to the worker are at the rate of Rs. 3·50 to Rs. 4·00 per 200 grammes of hollow balls prepared by him. In a day a worker manufactures about 250 grammes of balls.

As already stated the manufacturing of silver ornaments at Hupari is nothing but the assembling of various parts of it and these parts are prepared by different persons and not necessarily by the person who assembles them and solders together all the pieces. The polishing of the ornaments is also done by a different class of workers. There is thus a great extent of division of labour in this craft.

An ancilliary industry which thrives at Hupari, as in all towns and villages where gold and silversmiths are to be found in predominent numbers, is the collection of ashes from the furnaces of *Atni* section, as also the rubbish, dust, etc., of other three sections of silversmithy and after washing it, the fine dust at the bottom is melted so as to obtain pure silver. There are five households which are engaged in this process of obtaining valuable silver from the dust. They purchase the ashes and dust etc. from the establishments, the amount of money paid to the owners of establishments being determined on the basis of quantity of ash, dust, etc. which is produced every month, the purity of the silver ornaments usually undertaken by the establishments etc. Thus if the quantity of ash etc., "produced" is large a higher price is paid for it. Similarly if the establishment usually manufactures silver ornaments of higher purity, then also a higher price is paid than that to another establishment which usually manufactures silver ornaments or silver work of less purity. About 30 workers are engaged in this work and each household on an average gets about 2-3 Kgs. of silver per month from the waste collected by them. The work is carried out in most unhealthy surroundings because the dust and rubbish is first washed in a pond of water. The fine earth is collected at the end of each washing in a *ghamela* and this fine earth is melted by mixing lead into it in a regular crucible or in a *bhatti* prepared out of 'ash'.



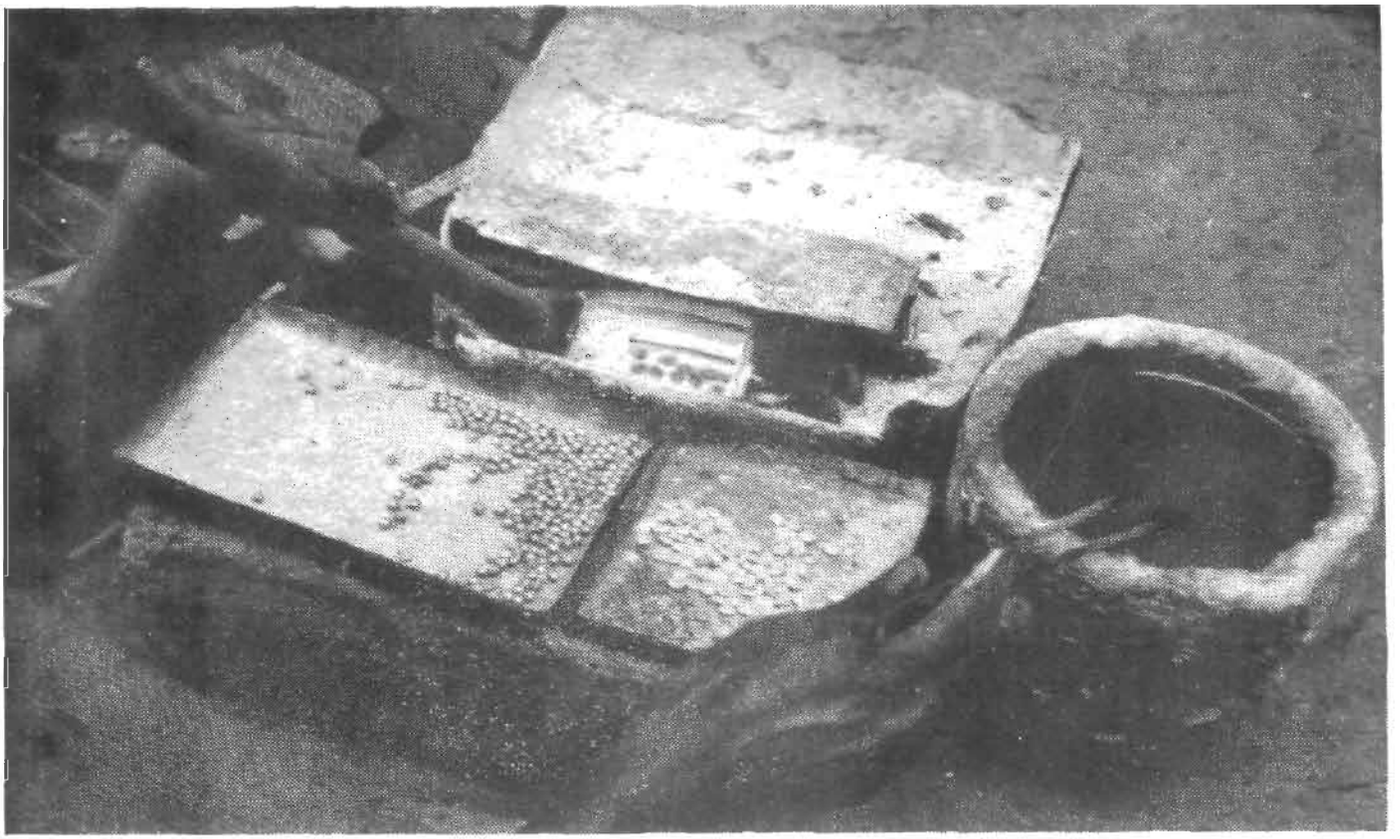
Photograph No. 17

Sorting of ornaments.



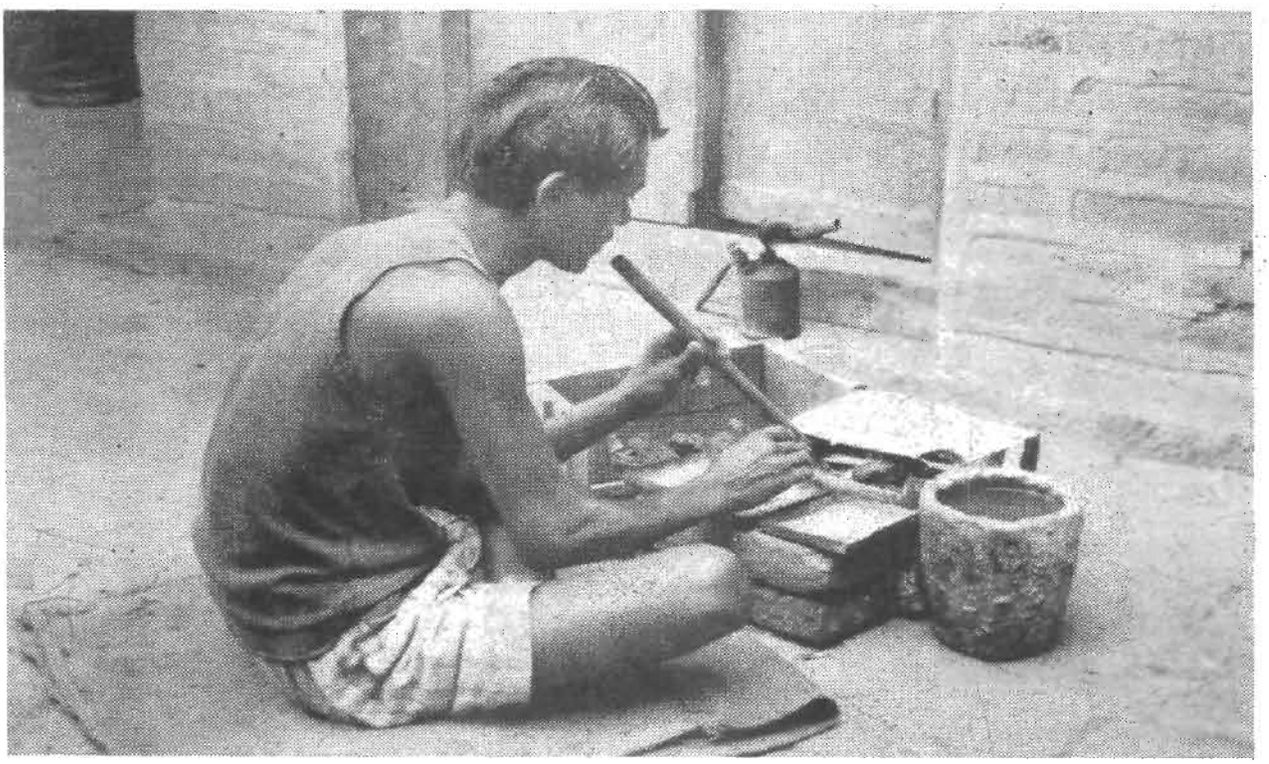
Photograph No. 18

Packing of ornaments for export.



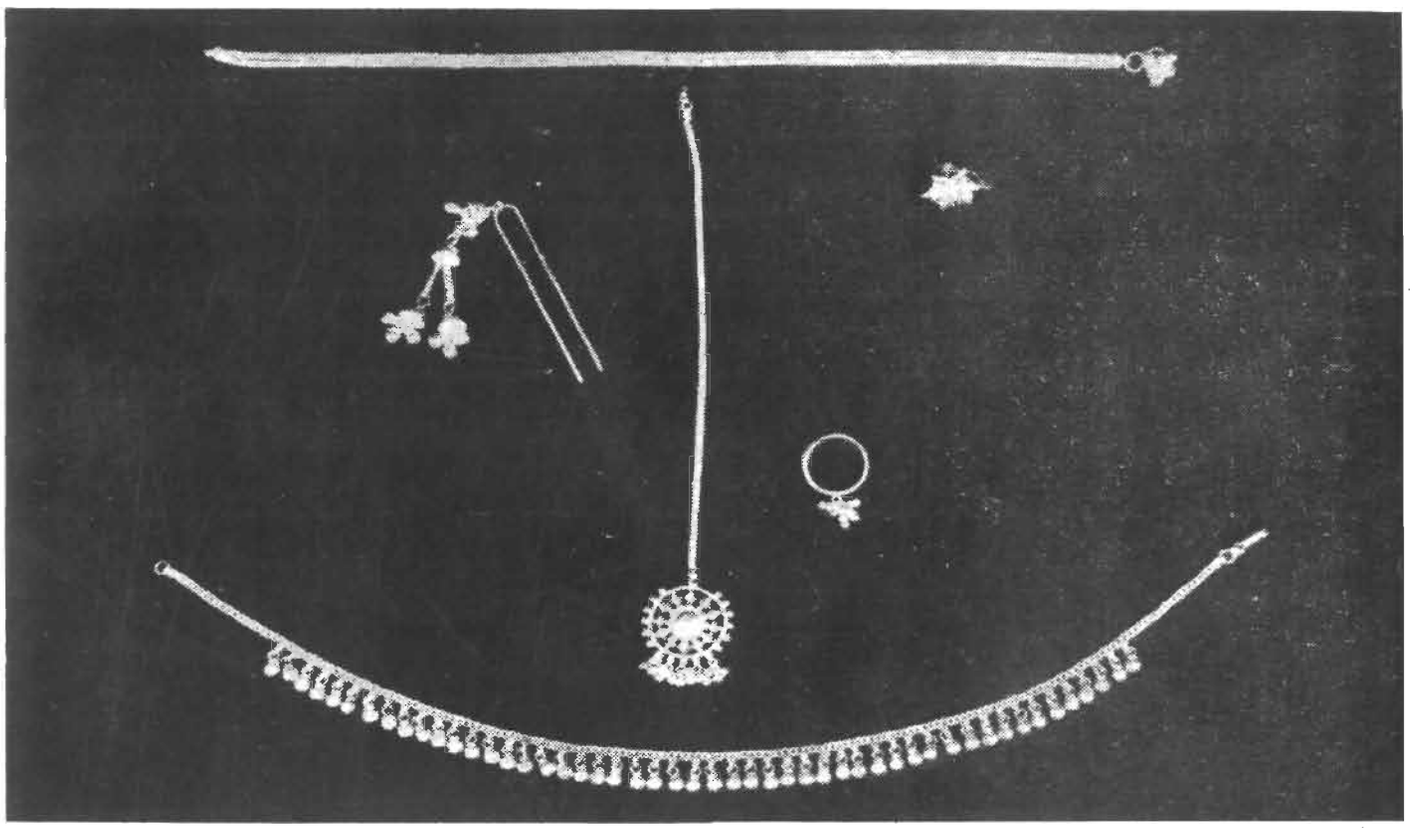
Photograph No. 19

The manufacture of hollow round balls is a speciality of Hupari. The finished products are seen at the left while at the right are seen "bittyas" from which they are made.



Photograph No. 20

The worker engaged in manufacturing hollow balls.



Photograph No. 21

A few specimen of silver ornaments.

Articles and Designs

The articles which are manufactured at Hupari are of various degrees of fineness and are in great demand particularly in Northern and Southern India. The ornaments can be divided into the following groups:—

(*i*) Ornaments for the head.

(*ii*) Ornaments for the fore-head.

(*iii*) Ornaments for the ear.

(*iv*) Ornaments for the neck.

(*v*) Ornaments for the arm.

(*vi*) Ornaments for the ankle.

(*vii*) Ornaments for the waist.

(*viii*) Miscellaneous ornaments like key-holder etc.

It is observed that in case of anklets, head and ear ornaments small silver balls are extensively used. The names which are given to the designs are the names given by the producers for their convenience and cannot be taken as standard names conveying identical meaning of ornament.

Type of Ornament	Local Names
Head ornament.	Hair pin, *Akda, Bindya, Veni, Gajra.*
Ear ornament ..	*Chawkadiya, Chawphuli, Bugadi, Kudak, and Kudya.*
Neck ornament.	*Bormal, Mangalsutra, Eksar, Sari, Har, Chandra Har,* etc.
Arm ornament..	Bracelet, *Patlya, Poche, Bilwar, Waki, Bajuband, Kankan, Kade, Tode.*
Anklets ..	*Painjan, Chal, Tordi, Koylee, Spring-Tordi, Payache Wale, Sankhali,* etc.
Waist ornament.	*Kardoda, Kamar Patta, Killi Akade, Katiband-Kardodi, Judi,* etc.
Finger ornament.	*Angathi.*
Toe ornament ..	*Masolya, Kandephul, Vedhan, Jodvi.*

A few manufacturers especially Ingrole & Bros. take keen interest in introducing new designs. They have brought out a good catalogue of the designs prepared by them. The workshop of this concern is run with most modern equipments and is a class by itself.

The articles produced at Hupari are not embellished by enamel work. As already pointed out, the craftsmen engaged in the final stage of production simply assemble together all the different parts of the ornament and solder them together. As far as our study goes, there is no symbolic significance to the various designs produced at Hupari.

CHAPTER III

STRUCTURE OF SILVERSMITHY CRAFT

There were 235 establishments at Hupari that were engaged in manufacturing silver ornaments in one way or the other when the present study was undertaken. Since a considerable division of labour is employed in this craft, the functional distribution of these 235 establishments can be done in the following manner.

The division of the establishments into the 4 types mentioned earlier is not always a water tight compartment division because some establishments undertake two or more functions. Thus there are certain units which cut various designs with the help of Fly Press and also assemble the parts of ornaments and sell them to customers/traders. In some cases, there are a few private melting units that assemble the parts of ornaments also. Such units are of course very few. In respect of two establishments *viz.* Ingrole Bros. and Bhoje Mali and Co., they have practically all the units within their premises and managed by the same owners. They are not required to go out of their workshops for any work *e.g.*, for melting, for wire-drawing etc. These two establishments, however, have been shown against serial No. 4, *i.e.*, *Karkhandar*.

The functions of these 4 different types of establishments have been described elsewhere in this report in brief they are :—

(*a*) *Atni Section.*—These units melt silver brought to them by the customers for which they charge a commission.

(*b*) *Strip and Wire-drawing Section.*—These units convert the silver bars into strips or wires of required gauge as per specifications of the customers. They charge a commission for this piece of work.

(*c*) *Press Section.*—These units 'cut' the design out of the strips with the help of "Fly Press" and different dies. They charge a commission for this piece of work.

(*d*) *Karkhana.*—These units assemble the different parts of ornaments, solder them and polish the finished ornaments and sell them to their customers. A sizeable number of females, who get work from these units, prepare chain out of rings supplied to them by *Karkhandars.*

The following table shows the distribution of 235 units according to above mentioned classification :—

Serial No.	Type of Establishment	Number	Number of workers			
			Total	Adult Males	Adult Females	Children
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Establishments engaged in melting of silver (*Atni* Section).	12	36	33	....	3
2	Establishments engaged in drawing strip and wire ...	19	108	105	....	3
3	Establishments engaged in cutting different designs out of strips (Press Section).	11	31	28	1	2
4	*Karkhana i.e.*, those who assemble the different parts of an ornament and those who make chain.	193	1,601	913	473	215
	Total ..	235	1,776*	1,079	474	223

*The number of workers engaged in this craft is given elsewhere as 1,547 whereas in this table it is 1,776. The difference is due to the fact that the figure in this table refers to December 1962 while in Chapter IV it is as on 1st March 1961. Secondly, the workers who pursue the craft in a secondary capacity are included in this table, while they are excluded in Chapter IV.

The Co-operative Societies have played a vital role in helping this craft to attain the present status. In this respect the following societies have done special efforts to bring prosperity to the craft and the village.

(*i*) *Chandi Karkhandar Association, Hupari.*—This association of *Karkhandars* started functioning in 1944 and was registered in 1948 under the Companies Act of 1860. The main object of the association was to protect the interests of the proprietors and those who work in this craft. It has made certain rules and regulations to see that unhealthy practices do not spoil the working of the craft. Thus no new establishment could be opened at Hupari, without the sanction or permission of the association. It has laid down that each member shall pay Rs. 18 per year to the association by way of annual fee. So also an admission fee of Rs. 5 is to be paid by a new entrant in this craft at the time of his application for starting new establishment. The number of members of the association was 116 in 1944-45 as against 315 in 1961-62.

The association did a commendable work in post-war period when there was general scarcity of many things like kerosene oil, sugar, etc. It tried its best to obtain kerosene oil which is essential in this craft for soldering and through its efforts it got a permit for 500 tins of kerosene oil per month for distribution. In post-war periods transport facilities were not so adequate as they are to-day. Hence it undertook the bus-service from Hupari to Kolhapur and other places in 1948 and continued till 1953 when the State Road Transport Corporation took over the routes operated by the association.

(*ii*) *Chandi Audyogik Sahakari Sangh Ltd.*—This co-operative society was registered on 4th April 1956. This society has done much useful work for the craft. It is the only society through which the proprietors of establishments can get such raw material as zinc, auxiliary materials like sodium nitrate, sulphuric acid, potassium nitrate, etc. It also sells some of the tools and implements, *viz.*, scissors, slate-boards, etc. required by the craftsmen. It also supplies bee-hive hard coke required for the *Atni* section. Thus the society practically purchases on behalf of proprietors all that is required by the craftsmen and sells these articles to them at competitive rates. It has also opened a Press section for cutting various designs out of the strips as per specifications of the customers. The table in the next column shows the progress of the society from 1957 to 1962.

Year	No. of members	Share capital	Reserve Fund	Other Funds	Investments	Profit
		Rs.	Rs.	Rs.	Rs.	Rs.
1957 ..	86	4,080	930	..	..	2,227
1958 ..	99	5,070	1,846	370	155	1,680
1959 ..	117	10,050	3,065	670	455	3,005
1960 ..	130	11,020	4,545	1,539	705	4,100
1961 ..	149	12,740	6,725	2,623	905	3,862
1962 ..	174	15,180	8,085	3,320	2,955	3,984

(*iii*) *Chandi Mal-Utpadak Sahakari Sangh Ltd.*—This society which mainly runs the melting section came into existence on 1st October 1960 and is registered under section 10 of Bombay Co-operative Societies Act of 1925 (Act VII of 1925). The society has 42 share-holders and shares of the value of Rs. 1,925 have been sold so far. The Government has given Rs. 1,000 by way of subsidy to the society on 3rd April 1962. So also cash credit worth Rs. 5,600 has been sanctioned by the District Central Co-operative Bank, Kolhapur, on 30th October 1961. The society employees 7 craftsmen and has also manufactured ornaments worth Rs. 20,040 during the period July 1961 to June 1962.

(*iv*) *The Paisa Fund Shetki Sahakari Bank Ltd.*—Hupari, though not directly connected with this craft, has done the pioneer work in establishing sound traditions in co-operative field. It is, perhaps, because of the persons who handled the affairs of the bank since its inception that other co-operative societies have done excellent work by following the example laid down by this bank which was established in January 1950. It has entered many activities like oil crushing, fertilizer production, agricultural implement manufacture, Bidi making, warehousing, maternity home, etc. This bank advances loans to craftsmen to start a new establishment on certain conditions, *e.g.* :

(*a*) The maximum amount of loan granted is Rs. 2,000 in case no valuable articles (like gold, silver) are kept with the bank.

(*b*) The maximum amount of loan is Rs. 5,000 in case valuable articles are deposited with the bank.

(*c*) The rate of interest varies from 9 per cent to 11 per cent per annum.

(*d*) Two respectable persons should stand as sureties.

Most of the establishments engaged in silversmithy at Hupari are, what can be appropriately termed as household establishments that employ mainly the members of the household. The entire unit is a small compact one, though they also engage outside labour.

The classification of establishments by number of workers employed is given in the following table:

Average No. of workers	No. of establishments
1 to 6	113
7 to 9	53
10 to 15	65
15 and above ..	4
Total ..	235

The dominance of small establishments shows the dispersal of this craft in many households.

Capital Investment

The fixed capital of the craft comprises tools and implements, land, buildings, etc. The fixed capital required for this craft differs from section to section. While it will be highest for *Pashta* and *Sut* section because of the heavy expenditure on machinery, it will be lowest for a *Karkhana* and Press section. Here also, the investment depends upon the number of machines employed in the section. The table in the next column shows the minimum fixed capital required for different sections. This, however, does not take into account investment in land and buildings :

Name of section	Approximate amount of fixed capital required
	Rs.
Atni	1,000
Pashta and *Sut* ..	5,000
Press	600
Karkhana	500

In the District Gazetteer of Kolhapur District (1960) the total capital investment in an establishment with four or five artisans working therein is estimated at Rs. 5,000.

The capital required for setting up an unit is generally obtained by the entrepreneur from the past savings or loans taken from friends, relations, banks or co-operative societies. The circulating capital required is less because most of the workers in an establishment are unpaid household workers and the main raw material, *i.e.*, silver is supplied by the trader/merchant. Since the craft is generally located in the house of the craftsman, there is no special investment in land and buildings to be incurred by the craftsman.

CHAPTER IV

CRAFTSMEN FAMILIES

The silversmithy craft at Hupari is not confined to one caste only, *i.e.*, *Sonar*, the traditional caste persons who manufacture gold and silver ornaments. In the early days of the craft, no doubt, it was the sole monopoly of members of *Sonar* caste. However, with the introduction of machinery into the manufacturing processes at Hupari other persons, not belonging to *Sonar* caste, were attracted to the craft. Today, we find that as many as 16 different caste-members among Hindus besides Jains, Christians and Muslims are working in this craft. These 16 castes are :—

(1) Maratha, (2) Mali, (3) Sali, (4) Koli, (5) Mahar, (6) Sonar, (7) Korvi, (8) Shimpi, (9) Dhangar, (10) Kumbhar, (11) Sutar, (12) Mang, (13) Jangam, (14) Nhavi, (15) Lingayat, and (16) Brahmin. There are craftsmen from Muslim, Christian and Jain religions also.

The use of machinery has broken the caste barrier and this development has been advantageous to the growth of the craft. However caste nexus exists only in manufacture of one particular type of balls which are extensively used in the ultimate production of ornaments *viz.*, *gujrav* balls *i.e.*, hollow jointless balls. These balls are manufactured by members of Mahar community ever since they were developed at Hupari. No person belonging to other caste has ever tried to manufacture these balls which may, perhaps, be due to the fact that the process entails a heavy strain on the chest and heart of the worker and it is claimed by the craftsmen that those who manufacture them are generally unfit for any physical work after the age of 40.

Since the volume of workers engaged in this craft was great, it was thought proper to sort out Census slips from category IV (At Household Industry) pertaining to village Hupari and carry out an analysis of the data available through the slips of workers engaged in silversmithy. This, of course, means a limited approach to the atributes of workers engaged in the craft because we are not including those workers who are pursuing this craft in a subsidiary capacity. However it is felt that their number would be considerably less because the analysis of slips of category IV for the village reveals that as many as 1,547 persons of the village 1,115 males and 432 females are engaged in this craft as per 1961 Census. In other words 15·47 per cent of the total population or 34·70 per cent of total workers of the village are engaged in this craft.

The distribution of 1,547 workers by religion is shown in the following table :—

Name of religion	No. of workers			Percentage
	Persons	Males	Females	
Hindu ..	1,141	806	335	73·76
Jain ..	268	208	60	17·32
Muslim ..	136	101	35	8·79
Christian ..	2	..	2	0·13
Total ..	1,547	1,115	432	100·00

It is rather curious that no member of Buddhist religion is engaged in this craft. 73·76 per cent workers are Hindus while 17·32 per cent and 8·79 per cent belong to Jain and Muslim religion, respectively.

The distribution of the workers by broad age-groups is shown in the following table :—

Age-Group	No. of workers			Percentage
	Persons	Males	Females	
0—14 ..	187	90	97	12·09
15—34 ..	1,023	751	272	66·13
35—59 ..	333	270	63	21·52
60+ ..	4	4	..	0·26
Total ..	1,547	1,115	432	100.00

We thus find that two-thirds of the workers belong to age-group 15—34. The employment of children *i.e.*, in age-group 0—14 is also considerable because as many as 12.09 per cent (or roughly one-eighth) workers belong to this age-group. Here again, the boys and girls are almost equally represented. Boys are employed especially in the Press Section and in polishing process as *Panke* while girls are invariably engaged in preparing chain out of rings and in making *bitts* which are ultimately converted into hollow balls.

Literacy

Since the craftsmen working in this craft are drawn from various castes, the number of literate workers is as high as 808 or 52·23 per cent of total workers. However, persons holding technical degrees, etc., are not at all working in this craft. The percentage of literate females is very low for only 15·04 per cent female workers are literate while 66·64 per cent male workers are literate. The following table shows the distribution of workers by educational level :—

Educational Level	No. of workers		
	Persons	Males	Females
Illiterate	739 (47·77)	372 (33·36)	367 (84·96)
Literate (without educational level)	233 (15·06)	217 (19·46)	16 (3·70)
Primary or Junior Basic	556 (35·94)	507 (45·47)	49 (11·34)
Matriculation and above	19 (1·23)	19 (1·71)	....
Total ...	1,547 (100·00)	1,115 (100·00)	432 (100·00)

(Figures within brackets indicate percentage to total).

The literacy percentage for the district and the village is 26·30 per cent and 27·04 per cent., respectively. However, we cannot compare these figures with that obtained for the workers engaged in silversmithy at Hupari because, the population of the district and the village includes population of age-group 0—4, which by convention, has been treated as illiterate and hence the effective literacy rate will be still higher for the district and the village.

Persons working in the craft who are born outside Hupari i.e., Migrants

The effect of migration on a craft is considerable because new ideas are brought in by the migrants. Since in most cases migrants are young, they help to accelerate the progress of the craft. The data on migration in respect of workers engaged in this craft are presented in the table in next column. A person is considered a migrant if his place of birth is other than Hupari.

Place of Birth	No. of workers			Percentage
	Persons	Males	Females	
At Hupari ..	755	613	142	48·81
In other village/ town but within Kolhapur district.	467	296	171	30·19
Outside Kolhapur district but within Maharashtra.	52	32	20	3·36
In Mysore State ..	272	173	99	17·58
In Madras State ..	1	1	..	0·06
Total ..	1,547	1,115	432	100·00

As per our definition, less than half the number of workers (48.81 per cent) are non-migrants. Amongst males 54.98 per cent are non-migrants while 32.87 per cent females are non-migrants. This sharp difference in non-migratory character between male and female workers is due to migration of females consequent upon marriage.

It is generally believed that migrants to a place are better equipped by skill and craftsmanship and this is reflected, to some extent, in the literacy data. However, the analysis of the literacy data obtained through the Census slips reveals that there is not much of a difference in literacy standards between migrant workers and non-migrant workers. Among migrants, 51·77 per cent are literate while among the non-migrants, the percentage of literate workers is 52·71 per cent. The following table shows the classification of migrant workers by sex and educational level.

Educational level	Migrant workers			Percentage
	Persons	Males	Females	
Illiterate ..	382	137	245	48·23
Literate (without educational level)	114	100	14	14·40
Primary or Junior Basic.	286	255	31	36·11
Matriculation and above.	10	10	..	1·26
Total ..	792	502	290	100·00

It is also believed that among migrants, proportion of young population is more than that among local workers. Though there are differences in the proportion of migrants among various age-groups as compared to that of local population, yet the differences are not too wide. Thus, whereas 69·32 per cent migrants are in age-group 15—34 we find that 62·78 per cent

non-migrants are in this age-group. The following table shows the distribution of migrant workers by broad age-groups and sex:—

Age-group	No. of migrant workers			Percentage
	Persons	Males	Females	
0—14 ..	78	42	36	9·85
15—34 ..	549	343	206	69·32
35—59 ..	162	115	47	20·45
60+ ..	3	2	1	0·38
Total ..	792	502	290	100·00

The religion-wise break-up of migrants engaged in silversmithy at Hupari is given in the following table :—

Religion	No. of migrant workers			Percentage
	Persons	Males	Females	
Hindu ..	579	353	226	73·11
Jain ..	150	110	40	18·94
Muslim ..	61	39	22	7·70
Christian ..	2	..	2	0·25
Total ..	792	502	290	100·00

CHAPTER V

ECONOMICS OF THE CRAFT

The cost of production of an article not only includes cost of raw material and wages of labour but such other items as depreciation of tools and implements, rent of land and buildings, interest on loans, etc. In case of silver ornaments at Hupari, it was found that no regular account books were maintained to show cost of production. Secondly, a particular unit of production *viz.*, an ornament is so small that it was rather difficult to apportion the total costs. The manufacturers, however, informed us that they were merely rendering services to the traders and merchants who bring the silver and pay a fixed amount as wages to proprietors of *Karkhanas*. Thus these wages vary from ornament to ornament and design to design and generally range from Rs. 26 to Rs. 35 per Kg. of ornaments manufactured by the proprietors. Again the traders/merchants do not pay, it is reported, for the amount of alloy mixed with silver to get a certain degree of fineness. Thus if 300 grammes of zinc is mixed with 700 grammes of pure silver, the merchant/trader will pay for 700 grammes of silver only plus the wages of 1 Kg. of silver ornaments i.e., say between Rs. 26 to 35. The proprietor of the *Karkhana* has to meet all expenses from these wages *i.e.*, wages of workers, other raw material like zinc, etc., auxiliary material like *navasagar*, sulphuric acid, etc. It has been reported to us that the proprietors get a margin of about Rs. 10 to Rs. 15 per Kg. of silver ornaments manufactured by them after meeting all the expenses. An attempt was, however, made to obtain exact expenses on raw material, labour charges, etc., on a few selected ornaments and on the basis of information given by the proprietors the results are as under :—

Particulars of expenses	Name of ornament			
	Tordya for ankles	Necklace	Ear-rings	Gattan or knotted necklace
	Weight 18 grams.	Weight 35 grams.	Weight 10 grams.	Weight 10 grams.
	Fineness 70/100	Fineness 70/100	Fineness. 50/100	Fineness. 50/100
	Rs.	Rs.	Rs.	Rs.
Raw material silver	3·90	7·80	1·50	1·50
Auxiliary material	0·50	0·80	0·30	0·30
Labour charges ..	1·00	2·50	0·50	0·75
Others ..	0·10	0·25	0·10	0·20
Total ..	5·50	11·35	2·40	2·75
Sale Price ..	7·00	13·00	3·00	5·00

Total Production

It is rather difficult to mention the total production of silver ornaments at Hupari in a year because of the large number of establishments that manufacture the ornaments. However, from an approximate figure given by the manufacturers it is estimated that ornaments of about 50 lakh tolas are manufactured at Hupari valued at about Rs. 11·37 million in 1961-62.

Market

The ornaments manufactured at Hupari are marketed almost throughout India, but specially in towns and cities of North India, like Delhi, Kanpur, Allahabad, Lucknow, Banaras, Agra, etc. The traders and merchants from these towns place an order with the *Karkhandars* of Hupari who supply the ornaments as per specific design, fineness, etc. There are not much seasonal variations in the demand, though in the summer period, which is usually the marriage season, it goes up while in rainy season there is some slackness. Most popular ornaments are anklets (*Tordi*), necklace and hair-pins etc. Ordinary chains, worn round the waist of babies are also in great demand. A few enterprising manufacturers undertake a study-*cum*-survey tour to explore new markets, introduce new designs, obtain new techniques of production etc. and in this respect the name of M/s. Ingrole Bros., comes foremost. They have also exported these ornaments abroad expecially to U.S.A.

Wages

The craftsmen employed in this craft are paid either on monthly basis, daily basis or on piece wage basis also. However, majority of the workers are paid on daily wage basis and these include those that are employed by the *Atni* section, *Sut* and *Pashta* section and *Karkhana* section. The female workers who prepare the chain and those who prepared the *bittis* are paid on piece wage basis. So also a majority of workers employed in Press section are paid on the basis of output of work given by them in a day. The chart on page 25 shows the range of wages earned by workers belonging to different sections of the craft.

Type of Establishment	Wages per day	
	Skilled worker	Unskilled worker
	Rs.	Rs.
Atni section ..	3·75 to 4·50	1·00 to 2·00
Wire drawing and strip drawing section (*Sut* and *Pashta* section).	2·00 to 3·35	1·00 to 2·00
Press section ..	1·90 to 3·75	0·88 to 1·50
Karkhana or assembly section	2·00 to 3·50	1·00 to 1·25
Chain making ..	Re. 0·88 per 200 grammes of chain	....
Bitti Making ..	Re. 0·56 per 200 grammes of *bittis*.	....

The craft works for about 11 months in a year and on the eve of Diwali (October-November) practically all work is suspended for a period of about one month. This facilitates the proprietors to settle all outstanding accounts with their customers as also with the workers. It is a convention at Hupari that if a worker/proprietor wants to leave his master/worker, he cannot do so in the middle of the year but only on the eve of the Diwali festival. Many workers change their establishments on the eve of Diwali.

There is also a tendency among the proprietors to put an efficient worker on piece wage basis so that the total output is high per day. In such cases the rate of wages is also kept at a higher level.

Generally it is seen that the workers are contended. Every Saturday, which is a weekly market day of the village, is a holiday and all establishments are closed on this day.

CONCLUSION

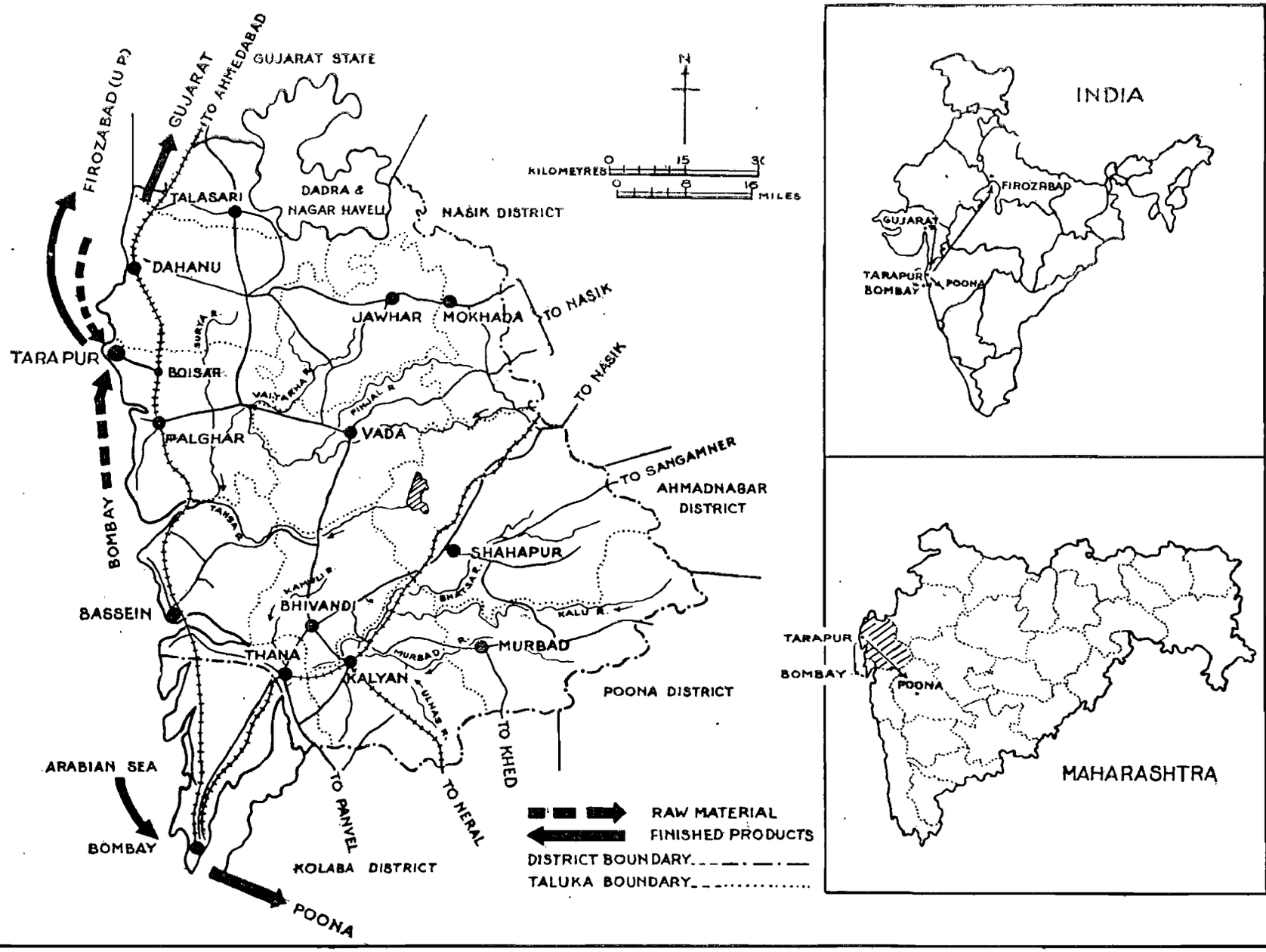
The silversmithy craft at Hupari is at present firmly established and it is hoped it will prosper from year to year. Though, the economic condition of the people all over India may deteriorate in a particular year, yet the lure for ornaments will continue forever. Besides, the ornaments manufactured at Hupari are rather cheap and since it has started manufacturing sophesticated designs like hollow balls etc., the average family can afford to take these ornaments. It has not been possible for us to ascertain how far the Gold Control Order of 1963, which prohibits manufacturing gold ornaments of more than 14 carats, has helped to push up the sales of silver ornaments. None the less, the silver ornaments like necklace, anklets, etc., are becoming popular even amongst the urban educated women who were till recently accustomed to wearing gold ornaments only. Secondly, because of constant changing of designs due to a change in fashion, it is felt that customers want an ornament which is not only attractive but is also considerably cheap in value. In this respect silver ornaments of Hupari can be most popular. Thus the demand for silver ornaments is bound to go up in near future and there is no likelihood of a shrinkage of the market for them. Though the craft has an assured demand for its products, yet it is facing certain difficulties, the biggest amongst them being the shortage of certain raw-materials and auxiliary materials, like sulphuric acid, copper, zinc, etc. The case of sulphuric acid, which is absolutely essential in polishing the finished ornaments, is peculiar. Sulphuric acid was available to the Chandi Audyogic Sahakari Sangh Ltd., Hupari, at about Rs. 300 per metric ton in the past. However, now-a-days it is not available at these official rates and they had to pay a high price for it. Because of this high cost of sulphuric acid the cost of production of silver ornaments goes up.

There is practically no labour trouble because of the sympathetic and accommodating attitude adopted by the proprietors and the workers alike.

The manufacturers of the ornaments at Hupari are making constant efforts to introduce new designs and capture new markets. Handicrafts, unless exported, do not contribute much to economic growth, and can be exported only if the designs are good enough to suit tastes of foreign consumers and if there are also good marketing facilities. In this respect, the proprietors of silversmithy craft at Hupari are to be congratulated for they are making sincere efforts to bring out new designs and at the same time trying to market the goods abroad. This craft has, therefore, a secure future.

GLASS BANGLES OF TARAPUR

TARAPUR: CENTRE OF GLASS BANGLES



CHAPTER I

INTRODUCTION

The origin of glass, a very common thing to day, is, however, quite old. It is difficult to pin-point the exact time when glass was first discovered. However, there are many legends about its accidental discovery. " A ship", according to Pliny, " laden with a cargo of nitre was moored to sandy shores of Phoenicia in Syria and the merchants cooked their food on the sandy shores. They used lumps of nitre to support the cooking vessels. When the fire was lighted they found a stream of molten glass due to the combination of sand and nitre."[1]

As far as India is concerned " the first Indian (Ceylon) references to glass are in the Mahavamsa, the chronicles of the Sinhalese kings (B.C. 306), when glass mirrors were carried in processions. Crude glass-ware and ornaments of glass of about the early Christian era have been found in various parts of India, but there is no evidence for supposing that a flourishing industry existed in India at that time".[2] In the sixteenth century, the progress of the industry was limited and whatever glass that was produced was " utilised almost entirely for the manufacture of bangles and, to a very limited extent, for small bottles to hold perfumes and for flasks in which to store Ganges water."[3]

It was in 1892 that the manufacture of glass and glass articles on modern lines started in India. " Between 1892 and 1900 five modern factories were established, two of which did not long survive. Of the other three, all of which were under European management, assisted by men trained in European glass works, and two of which were equipped with large modern furnaces and plant and were not stinted for capital, one worked from 1892 to 1899, another from 1898 to 1902 and the third from 1900 to 1908 .....between 1906 and 1913, 16 factories were established under Indian management, assisted sometimes by European trained glass workers who stayed on in the country after the earlier ventures had failed, and sometimes by Japanese working under the control of Indians who had been to Japan to learn the business.....The outbreak of the war at once stopped the flow of imports from Germany and Austria. To supply the need thus created new factories came into existence ; and it was estimated that in 1918 about twenty factories were at work, of which seven at Firozabad were engaged entirely in the manufacture of glass for bangles,....."[4]

The bangles made out of glass have been manufactured in India since centuries. Bangles, which are a sort of bracelet worn by women on their wrists since times immemorial, assume special religious and social significance because the absence of bangles on the wrists of women is a sure indication, in many Hindu communities, of widowhood. Bangles are worn by women of almost all religions, though among the Hindus they carry great implications. They are not only a piece of ornament to enhance the beauty of the hands but also a safe investment when the bangles are made either in gold or silver.

Some of the main centres of manufacturing glass bangles in India are Firozabad in Uttar Pradesh and Talegaon in Maharashtra. The bangles were also produced on a large scale at Tarapur in Thana District of Maharashtra but now the craft is slowly vanishing. The importance gained by Tarapur in the manufacture of glass bangles can be realised when we find that the method adopted at Tarapur in manufacturing glass bangles is called as " Puri, Tarapore or twisted" method.

Tarapur is a village in Palghar Taluka of Thana District and is at a distance of 26 and 13 kms., respectively, from Palghar and Boisar railway stations on Bombay-Surat Section of Western Railway. These two railway stations in their turn are 87 and 98 kms. away from Bombay Central. Buses ply regularly between Palghar and Tarapur and Boisar, it may be mentioned incidentally, is on Palghar-Tarapur bus route.

" Tarapur, north latitude 19° 50′ and east longitude 72° 42′ 30″, a port in the Mahim sub-division, ... lies in a low wooded tract on the south bank of the Tarapur creek, sixty miles north of Bombay, fifteen miles north of Mahim and about seven miles north-west of the Boisar station.....

In the 1881 population of 2,939 (of this village) there were 2,124 Hindus, 397 Musalmans, 366 Parsis and 52 Christians. ..... A municipality was sanctioned in 1866 but the sanction was withdrawn in 1869. There is a Government school and a school founded by the Bombay Parsi Panchayat for teaching Zend Avesta (the sacred book of the Parsis). In the Parsi quarter of the town is a fire temple, built about 1820 by the well known Parsi contractor Vikaji Mehrji.....

In 1670 Ogilby mentions it as a coast town and in 1695 Gemelli Careri describes it as inhabited with monasteries of the Dominicans and Franciscans of Recolet school. In 1728 it was said to be of no strength and was garrisoned by sixty soldiers. In

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[1] Hand-book of Glass Technology, by R. Charan, page 1.
[2] "Notes on Glass Manufacture" by Dr. C. S. Fox, Geological Survey of India, quoted in the Report of the Indian Tariff Board on the Glass Industry, 1932, page 1.
[3] *Ibid.*
[4] Report of the Indian Tariff Board on the Glass Industry, 1932, page 2.

1739 the fort was attacked by the Marathas under Chimnaji Apa. Four mines were laid of which two succeeded in making great breaches in a bastion..... Bajiberav, Ramchandra Hari, Yeshvant Pavar and Tukaji Pavar rushed into the breaches with their colours. They were stoutly opposed by the Portuguese and success was doubtful till Ranoji Bhonsle scaled the wall in another part and divided the attention of the garrison. Still, as Chimnaji wrote, they fought with the courage of the Europeans, till, at last overpowered the survivors asked for and were granted quarter. In 1750 Tieffenthaler mentions Tarapur as a place once Portuguese, now Maratha. After the capture the Marathas repaired the sea face of the fort in European style. In 1760 it was in good order and protected by four guns. In 1776 Raghunathrav took shelter in the fort. In 1803 it passed to the British without resistance. In 1818 it was described by Captain Dickinson as one of the largest, best conditioned, and most central of the sea-coast forts in the north Konkan."[1]

The District Gazetteer of Thana District (*Gazetteer of Bombay Presidency*, Vol. XIII, Part 1, Thana, page 354) mentions that the 33 ports of the then district were " for customs purposes grouped into seven divisions, Umbargaon with four ports, Tarapur with seven, Ghodbandar with six, Bassein with three, Trombay with six, Panvel with four and Uran with three ". The port of Tarapur was an important place of business activity and the volume of trade in terms of imports and exports through it was considerable.

There is, however, very little activity at the port nowadays because of the construction of a pucca road between Tarapur and Palghar. Even then bulky articles like salt, etc., are carried by country-crafts from the port of Tarapur.

The present findings at the fort indicate that it must have been once a formidable one. However, the fort is in ruins now and the land inside it is cultivated by the villagers. There is, in addition to the fort, a light house at a distance of about 2½ miles from the village and is managed by the Light House Department of the Government.

The construction of the Atomic Power Station at Tarapur by the Atomic Energy Commission of the Government of India has once again brought the village into great prominence. The work is in progress and it is expected to be completed by 1967.

The 1961 Census of India has recorded the population of the village as 4,932, as against 4,318 in 1951. It means that in the last decade the population of the village increased by 14·22 per cent while the population of the taluka increased by 20·05 per cent. The following table shows the distribution of the population of the village as per 1961 Census by workers and non-workers, the former being further sub-divided into nine broad industrial categories :—

Distribution of the population (1961 Census) of Tarapur by sex and by broad industrial category

	Category of worker/non-worker	Population		
		Total	Males	Females
I	As Cultivator	436	234	202
II	As Agricultural Labourer ..	203	130	73
III	In Mining, Quarrying, Live-stock, Forestry, Fishing, etc.	151	150	1
IV	At Household Industry ..	347	114	233
V	In Manufacturing other than Household Industry.	133	128	5
VI	In Construction	9	9	..
VII	In Trade and Commerce ..	113	87	26
VIII	In Transport, Storage and Communications.	44	44	..
IX	In Other Services ..	281	199	82
	Non-workers	3,215	1,387	1,828
	Total ..	4,932	2,482	2,450

We thus find that 34·81 per cent population is economically active (i.e. workers) while 65·19 per cent are non-workers. Of the total workers, 639 or 37·22 per cent are engaged in agriculture while 347 or 20·21 per cent are employed in household industry. The important household industries carried out in the village besides manufacture of glass bangles, are die-making, flour mill, manufacture of leather goods, production of salt, etc.

The inhabitants of the village belong to almost all religions, *viz.*, Hindus, Muslims, Zoroastrians, Buddhists etc. However, the Zoroastrians, Parsis as they are popularly known in India, were and are even now, most influential community in the village. A part of the village is known as 'Parsi Ali' (i.e., Parsi Lane). In the pre-Independence days, they were Zamindars of the village. Consequent upon implementation of tenancy legislation in 1956, many members of this religion migrated to urban areas of the State but mainly to Bombay which is nearby. Another community, important from the point of view of the craft of bangle-making, is Muslims most of whom speak Gujarati and some speak Kachchhi. The glass bangle industry has always remained in the hands of Muslims and it is rather strange that no other community has ever tried to manufacture glass bangles at Tarapur. This is particularly so since the total capital required to start this craft is not much. There is, however, much manual work involved in the craft which may be the reason why others are not attracted to it.

[1] Gazetteer of the Bombay Presidency, Vol. XIV, Thana, Places of Interest, 1882, pages 343-345.

CHAPTER II

BEGINNING OF THE CRAFT

It is very difficult to trace the history of the craft of glass bangle industry at Tarapur. The main raw material, i.e., sheet glass is not available at the village but has to be imported from Bombay. It is said that Shri Framraj Katrak, a Parsi gentleman, was the pioneer in establishing this craft at Tarapur about a hundred years ago. He went to Firozabad in Uttar Pradesh and after acquainting himself with the technique of glass bangle manufacturing, returned to Tarapur and commenced its production. It seems there was no complete data about the location of the glass bangle factories in India in the past. The following extract taken from the Report of the Indian Tariff Board on the Glass Industry, 1932, shows the conflicting data supplied to the Board:--

" From various sources we have received information of the existence at present of fifty-nine factories, twenty-six of which are engaged entirely in the manufacture of bangles and one in the manufacture of false pearls. The Glass Manufacturers' Association which does not concern itself with the bangle-making part of the industry, has given us a list of twenty-two factories. A list supplied by the Director of Industries, Bombay, omits four of the factories mentioned by the Association, but includes fourteen additional factories, ten of which are bangle factories. The Firozabad Glass and Bangles Industrial Association mention twenty works engaged in the manufacture of bangles at Firozabad ; they omit three mentioned by the Director of Industries, Bombay, but include fifteen works which are not in his list. Dr. Drane has given us a list of sixteen factories, other than bangle factories, which includes two factories in or near Bombay which have not been mentioned by the Bombay Director of Industries. Finally four manufacturers (one at Naini near Allahabad, one at Dacca, one maker of bangles in Calcutta and one maker of false pearls in Bombay) who are mentioned in none of these lists, have made their existence known to us either in person or by letter or by both methods."[1]

At present there are two centres in Maharashtra where the manufacture of glass bangles is undertaken viz., Tarapur in Thana District and Talegaon in Poona District. This craft flourished a good deal during the days of the first and Second World War. During 1938-39, it is learnt, there were about 35 *bhattis* (furnaces) in Tarapur which used to manufacture glass bangles. In those days, the craftsmen of Tarapur, not only used to prepare bangles, but such other items as Pen holder, paper weights, " *Surmeki-sali* ", (a thin glass rod used for inserting an eye-lotion), sticks, etc., out of glass. After the First World War, the boom in the industry ceased and more and more factories which came into existence in 1914-18 period were closed down because the home market was once again flooded with imported bangles.

A representation was made to the Government by the "glass manufacturers' requesting that protection may be extended to the glass industry in India". Accordingly a Tariff Board under the Chairmanship of Dr. J. Matthai was constituted on 20th October 1931 and in its report it recommended that protection be given to glass bangle craft (besides other glass items). The recommendation was : "protective duties in respect of Bangles, beads and pearls—50 per cent. *ad valorem*". It says, "Bangles are at present subject to a revenue duty of 50 per cent. *ad valorem*. The same duty is applicable also to beads and false pearls. If our recommendation to impose a protective duty of 50 per cent on bangles is accepted, we propose that the duty should be applied also to beads and false pearls".

The Second World War again gave a fillip to this industry since the imports from Japan, Austria, etc., were stopped. But the end of the war brought bad days to the craft at Tarapur though the one at Firozabad flourished. In December 1964, when the present study was undertaken there were 3 *bhattis* (furnaces) engaging 20 workers only though in the beginning of the year 1962 there were 4 *bhattis* employing 32 workers. The reasons for the decline of the craft at Tarapur may be stated as :

(*a*) Fall in demand for the bangles manufactured at Tarapur which is again due to :

(*i*) Poor quality of the products, and

(*ii*) Lack of initiative and hesitancy to adopt new designs such as application of liquid gold, etc.

(*b*) Steady switch-over of workers in this craft to other activities, especially at the construction site of the Atomic Power Station at Tarapur.

[1] Page 3 of Report of the Indian Tariff Board on the Glass Industry, 1932.

(*c*) Inability to face the competition from the units manufacturing glass bangles of superior quality at other centres especially Firozabad in Uttar Pradesh and those producing bangles out of plastic, rubber, steel, etc.

A Co-operative Society, called "The Tarapur Bangdi Utpadak Sahakari Sangh Ltd." was established in 1960 with a view to assisting the workers and the employers engaged in manufacture of glass bangles at Tarapur. The aim was to impart training to skilled workers of the craft in manufacturing bangles on modern machinery in place of traditional tools, etc. However, this attempt was not a success and the *bhatti* of the Co-operative Society was closed down in 1965.

The following table shows the value of exports of glass bangles from India to other countries for a few years. There has been practically no imports of glass bangles into India since 1953-54 :—

Year		Exports (Rs.)
January to December (1958)	..	476,228
January to December (1959)	..	379,759
April-March 1961-62	..	245,913
April-March 1962-63	..	176,019
April-March 1963-64	..	111,795
April-March 1964-65		301,208

The aim of the present survey conducted in December 1964 was to study the present position of the craft, its process of manufacturing, reasons for its decay and future prospects, if any. The data was collected by contacting the persons who own the *bhattis*, the workers who were directly engaged in the craft and other prominent and old residents of the village.

CHAPTER III

THE CRAFTSMEN OR THE ARTISANS

The glass bangle craft at Tarapur has since the begin-, ning been monopolised by members of one religion only viz, Muslims. All the workers and proprietors who own the *bhattis* are Muslims and are pursuing the craft since generations. The members of other religions, it appears, never made an attempt to enter into this craft. On the day of survey, 19 households of Tarapur were connected with this craft in one way or the other. From these 19 households, 24 persons are working in the craft either as owners i.e. employers or as employees. All of them belong to Shaikh sect of Muslim religion.

Of the 24 persons 3 are employers while the rest work as employees. Of the 3 *bhattis* two are working with a full complement of 8 workers each, while the third one employed 5 persons only since it could not market its entire production.

The 21 employees who are working in this craft are paid on daily wage basis which in its turn depends upon the daily output. The *Lom Bananewala* has to prepare the molten glass sufficient for manufacturing 5,000 bangles a day in addition to the manufacture of coloured glass sticks. Similarly the *Jodnewala* has to prepare 2,500 bangles a day. The *Tar Khenchnewala* is engaged throughout the day. The work usually commences from 7 a.m. in the morning and lasts upto 4 p.m. with an interval of an hour or so for meals. There is no restriction either in respect of number of hours of work or timing as long as the daily output is ensured.

Of the 19 households, 16 or 84·21 per cent were wholly dependent upon this craft since the earners of these households were all engaged in this craft and they had no other source of income. In respect of 2 households they had some subsidiary occupation, though the principal one was the craft of bangle manufacture. It was only in respect of one household that the present craft was being pursued as a secondary occupation and some other work was the main source of income. The following table sums up the position:—

Description	No. of households	Percentage
(1) Households with glass bangle craft as the only source of income.	16	84·21
(2) Households with glass bangle craft as one of the sources of income but still the principal source of income.	2	10·53
(3) Households with glass bangle craft as a subsidiary source of income with some other occupation as the principal one.	1	5·26
	19	100·00

The subsidiary occupations followed by members of the household are:—

(*i*) Cultivation

(*ii*) Agricultural Labour

(*iii*) Transport by Tonga

(*iv*) Miscellaneous labourer (coolie)

From the above table it is seen that the survival of this craft is a question of life and death in respect of 16 households who will have to seek "fresh woods and pastures new" in case this craft dies out at Tarapur.

It is rather difficult to make a distinction between a skilled and an unskilled worker in this craft since all the 3 operations involve some kind of skill and cannot be undertaken unless one has undergone practical training at the *bhatti* for some time. However, the craftsmen consider the *Lom Bananewala* and *Jodnewala* only to be skilled worker and on that basis we find that 12 out of 21 employees in the craft are skilled.

This craft has given no scope for employment of females. This may be primarily due to the fact that the nature of work is such that the women may not be able to participate actively in this craft. Secondly the craft has remained since generations in the hands of Muslims among whom females observe *purdah*. However, we find that women can do such sundry jobs as counting of bangles, packing, labelling, transport of glass rods from one place to another, cutting of long glass rods into small pieces of required length, etc.

Of the 19 households who are engaged in this craft only 6 households belong to the traditional craftsmen families i.e., the craft is handed down in these households for generations, from father to son. The rest of the households entered this craft during the second world war when it was flourishing due to stoppage of imports from Europe and Japan due to hostilities. The present workers, however, are not inclind to put their sons, etc., in this craft since the wages earned are too low. Secondly, there is no guarantee of continuity of the job in this craft since employment depends upon the work available at the *bhatti*. In addition to this, the construction of the Atomic Energy Power lant near this village has attracted many workers of this craft to it where they get not only higher wages but continuous employment for all the year around except the rainy season. The employers, too, are unwilling to expand the business due to its non-profitable character. They have to face a stiff competition from the manufacturers of Firozabad.

The education, as is understood by the public, does not play an important part in this craft since the skill required for the craft can be acquired independently of general education. In fact the more educated a person the more is his likelihood of getting away from the craft, since most of the work involved in the craft is manual work. Of the 21 employees we find that 7 or 33·33 per cent are illiterate and 14 or 66·67 per cent literate. Among the 14 literates, none has gone beyond the matriculation level.

The number of workers engaged in this craft is so small that it is very difficult to draw any conclusions on the basis of the data obtained by this survey. This is true in respect of age data collected by us. It is given below:—

Age-Group	Number of workers	Percentage
Total	21	100.00
0—14	..	..
15—34	11	52.38
35—59	9	42.86
60+	1	4.76

The data on the number of earners in each household engaged in this craft was collected along with the wages earned by various categories of workers. This has revealed that in most cases there was only one earner per household. The following table gives the said data :—

Households having	Number of Households	Percentage
One earner	15	78.95
Two earners	3	15.79
Three earners	1	5.26
Total	19	100.00

Thus more than three-fourths of the households had only one earner. The average size of these 19 households was observed to be 6·37 persons which is considerably high when compared with the average size of household for the village and taluka which is 5.96 and 5.40, persons respectively. If we link these two factors with the earnings earned by workers of this craft we find that the economic condition of the households engaged in this craft is very distressing. The *Lom Bananewala* gets Rs. 3·00 to Rs. 3·50 per day while the other two workers *viz. Jodnewala* and *Tar Khenchnewala* get Rs. 2·00 to Rs. 2·25 and Rs. 1·75 to Rs. 2·00 per day, respectively.

Thus we find that the main reason for the drifting away of workers engaged in this craft is the low level of wages and unless this level is raised it is doubtful whether the skilled craftsmen will be attracted to this craft.

CHAPTER IV

TOOLS AND IMPLEMENTS AND PROCESS OF MANUFACTURE OF GLASS BANGLES AT TARAPUR

Before we describe the various tools and implements used in the glass bangle manufacture at Tarapur, it is essential to describe the *bhatti* (furnace) around which almost all operations centre. The *bhatti* is located in the workshop which, more often than not, is a temporary wooden structure covering an area of about 20′×20′ . The roof of the workshop is of grass or thatch and the place of walls is taken either by gunny bags or a bamboo matting, locally called *Tatta*. Considering the nature of activity carried out in the workshop, these materials are very dangerous, especially in the summer when fire may break out at any moment due to the *bhatti*. The *bhatti* which is wood fired is located at the centre of the workshop and is circular in shape at the base. It is a dome like structure with an opening at the top, perhaps to work as a chimney. This opening, however, is covered either by tin sheets or mangalore tiles. A pit is dug upto a level of 2½′ and through an opening fire wood is inserted inside the *bhatti*. There are in all 6 openings around the conical walls of the *bhatti*. Of these, 2 which are meant for *Lom Bananewala* (i.e., the person who prepares molten glass mass from sheet glass), are square in shape and of the size of 1′ × 1′ . The other four which are used by *Jodnewala* (i.e., the persons who weld the two ends of the glass rod and give a circular shape of a bangle to the rod) are of circular shape. In front of each opening, apartments are made with low walls, each one made for an individual worker. There is a shelf running all around the inner wall of the *bhatti* which is used by the workers either to keep the pieces of sheet glass, enamel glass or pieces of glass rods for heating. In order to protect the eye-sight of the *Lom Bananewala* who is exposed to the heat of the furnace more intensely than the *Jodnewala*, there is a device to cover the opening used by him. There are four bamboo poles embedded in the ground and above the *bhatti* about 3 to 4 feet in height from the ground. Logs of firewood which are to be used in the *bhatti* are kept on the supports of these bamboo poles so that they (logs of wood) become perfectly dry before they are inserted into the *bhatti*. A sketch of a *bhatti* is given for better understanding.

The following tools and implements are used at Tarapur in manufacturing glass bangles:—

(*i*) *Ghan*.—It is like a hammer and is made of iron. The *Ghan* is used to press the red-hot pieces of sheet glass so as to obtain a conical shape. Since it is made of iron, it lasts for 20 years or so. The cost of a *Ghan* is Rs. 3·00. It is available either at Palghar or at Bombay.

(*ii*) *Chimta*.—It is a pair of tongs and is made of iron. This tool, which is of " U " shape, is used to hold the pieces of sheet glass for keeping them inside the *bhatti*. The pieces of glass rods kept inside the *bhatti* by the *Jodnewala* are also picked up by the *chimta*. The rods kept inside the *bhatti* are picked up by the *chimta* and kept on the *kalabut* which, when rotated, gives a round shape to the glass rod. The price of a *chimta* which is locally available is Rs. 1·75 and it lasts for 10-12 years.

(*iii*) *Salakh*.—It is a long iron bar (about 4 feet long) with a wooden handle fixed at one end. The wooden handle enables the *Lom Bananewala* to hold it in his bare hands. The other end of the *Salakh* is often inside the *bhatti* or carries the red hot semi-fluid mass of sheet glass. The *Salakh* is used to collect the semi-melted pieces of sheet glass earlier kept in the *bhatti* to melt. *Salakh* is manufactured locally and costs about Rs. 2·50, each. Its life is about 10 years.

(*iv*) *Akodi*.—It is just like the *Salakh* with the difference that its length is about 1½′ and its further end is slightly bent. *Akodi* is used to join the two ends of the pieces of glass rod which are kept on the *Kalabut*. By pressing the two ends of the glass rod by the bent end of *Akodi*, they are welded together. The *Jodnewala* does this. *Akodi* is locally manufactured and costs about Rs. 2·00 a piece and lasts for 15 years.

(*v*) *Salai*.—It is a round iron rod about 2 feet in length. One end of the *Salai* is pointed like that of a needle and it is inserted into the hole at the base of the *Kalabut*. It is used by the *Jodnewala* and costs Re. 0·37 a piece. It is available at Tarapur.

(*vi*) *Kalabut*.—It is alike a fire-clay cone with a smooth surface. It comes in different sizes, depending upon the size of the bangle to be manufactured on it. At its base, there is a hole (exactly at the centre) in which the pointed end of the *Salai* is inserted. By keeping the *salai* in left hand, the worker rotates the *Kalabut*. The pieces of red-hot glass rod are kept on the *Kalabut* and when the two ends of the rod are welded with the bent end of the *Akodi* which is held in right hand, the *Jodnewala* twirls the *Kalabut* and

the glass rod gets the shape of a bangle. It is locally manufactured by the workers from local clay and costs Re. 0·06. It has to be replaced after about a month's use or so.

(*vii*) *Kanas.*—It is a simple file which is used to cut the long glass rods into small pieces of definite size. Its cost is about Rs. 2·50 and it lasts for 5 years. It is obtained either from Bombay or Palghar.

Besides these major tools and implements, the craft at Tarapur also requires the following minor tools in its daily working :—

(*a*) *Badana.*—It is a small iron wire (usually an umbrella rib) about 6″ to 9″ in length with a pointed end. It is used for drawings glass rod from the semi-fluid glass mass at the end of the *Salakh.* It is pierced into this mass and pulled out. It is locally prepared by the worker himself.

(*b*) *Patta.*—It is a flat iron plate with a handle and is triangular in shape above the handle. It is used by the *Lom Bananewala* to smoothen the red-hot glass viscous in a round tapering shape. Its life is about 20 years since there is very little wear and tear of the instrument. It costs about Rs. 1·50.

(*c*) *Steel Plate.*—A small rectangular steel plate of $\frac{1}{2}$″ thickness is required in this craft for keeping the red-hot glass viscous which is then pressed with the *ghan.*

Raw Materials

The main raw materials required in the manufacture of glass bangles at Tarapur are :—

(*a*) Pieces of sheet glass of various thickness.

(*b*) Pieces of coloured glass enamel.

The pieces of sheet glass are obtained generally from shops dealing in glass and glasswares, situated at Abdul Rehman Street, Bombay-2. The price of pieces of sheet glass is Rs. 5·00 a maund of 40 seers and the transport charges for one maund of sheet glass from Bombay to Tarapur is Re. 1. The pieces of sheet glass are clear and fully transparent.

The pieces of coloured glass enamel are procured from the traders at Firozabad in Uttar Pradesh. The following six colours are generally used at Tarapur and the prices of each variety are mentioned against it :—

	Name of the colour		Price per maund of 40 seers
1	White	.. ..	Rs. 50·00
2	Green	.. ..	Rs. 50·00
3	Red	.. ..	Rs. 80·90
4	Blue	.. ..	Rs. 50·00
5	Black	.. ..	Rs. 30 to 35·00
6	Yellow	.. ..	Rs. 50·00

There are no other raw materials used in the craft at Tarapur.

Manufacturing Process

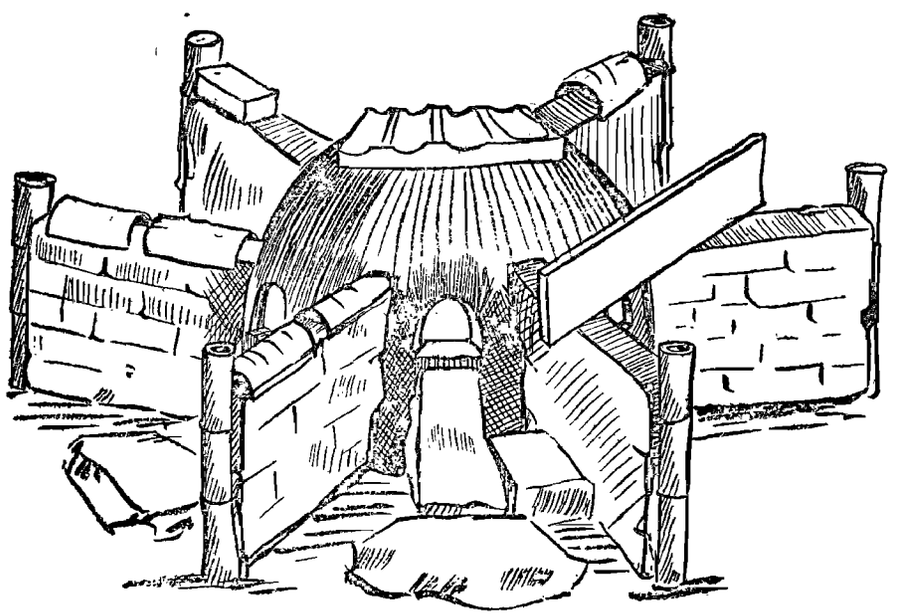
There are various processes in India by which glass bangles are manufactured, viz. (*a*) hand-made jointed bangles, (*b*) roller made jointed bangles, (*c*) hand-made jointless bangles, etc. The craftsmen at Tarapur follow the first method in manufacturing glass bangles. This process is very crude, and so the finished products of Tarapur do not fetch a high price. The last touch given to the bangles is also of a poor quality and in most cases the joint of a glass bangle is visible to the naked eye and can be felt by the hand. The process of manufacturing glass bangles at Tarapur is described in the following paragraphs:—

A *bhatti*, around which almost all the operations are carried out, gives employment to 8 persons if it is worked to its full rated capacity. Of the 8 persons two are called *Utarnewale* or *Lom Bananewale.* These are the skilled craftsmen who melt pieces of sheet glass and unless this is done, further operations cannot be commenced. There are two other workers who are designated as *Tar Khenchnewale* (i.e., persons who draw glass rods with the help of *badana*) and are attached, one each, to the two *Lom Bananewale.* Their duty is to draw the glass rod with the help of a *badana*, cut the long pieces of glass rods into smaller ones of uniform length, supply these pieces to four other persons who are known as *Jodnewale.* The function of a *Jodnewala* is to weld the two ends of a small piece of glass rod and form a bangle. In other words, on a *bhatti* (if it is working with a full complement) there are two teams and the members of each team are:—

(*a*) Lom Bananewala (one)
(*b*) Tar Khenchnewala (one)
(*c*) Jodnewala (two)



CUTTING OF THE LONG GLASS WIRE WITH THE HELP OF A 'KANAS'



BHĂTTI

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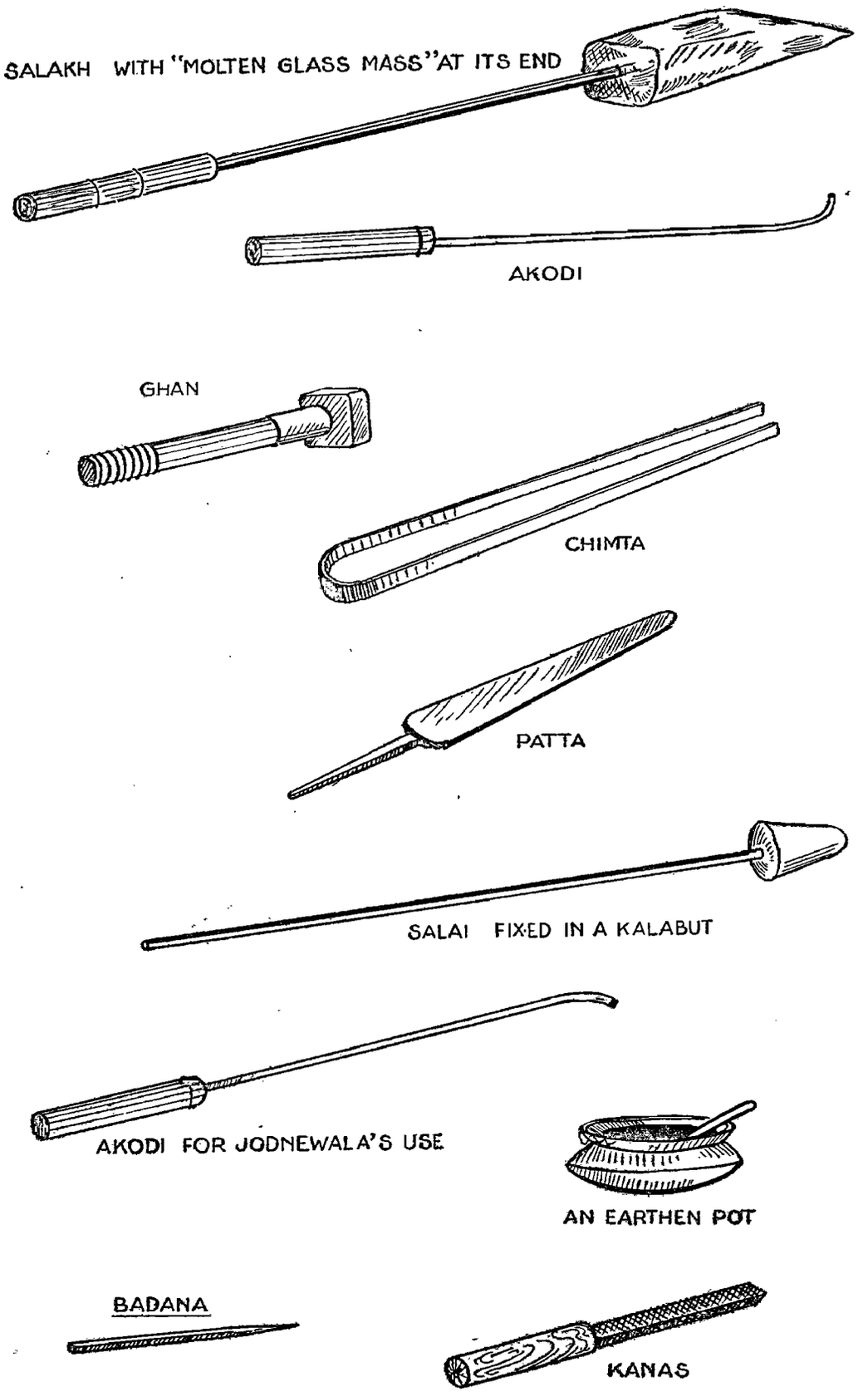
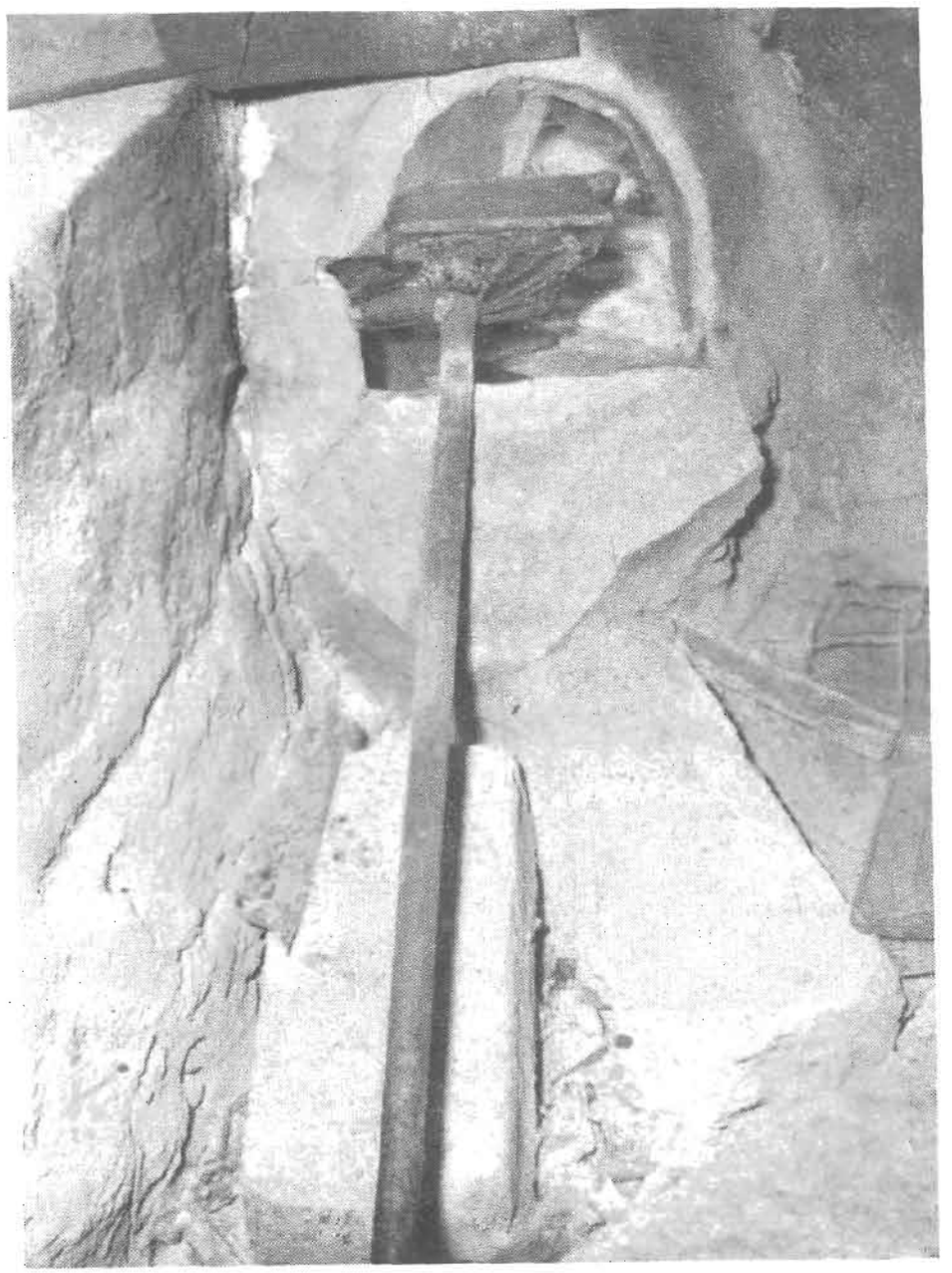
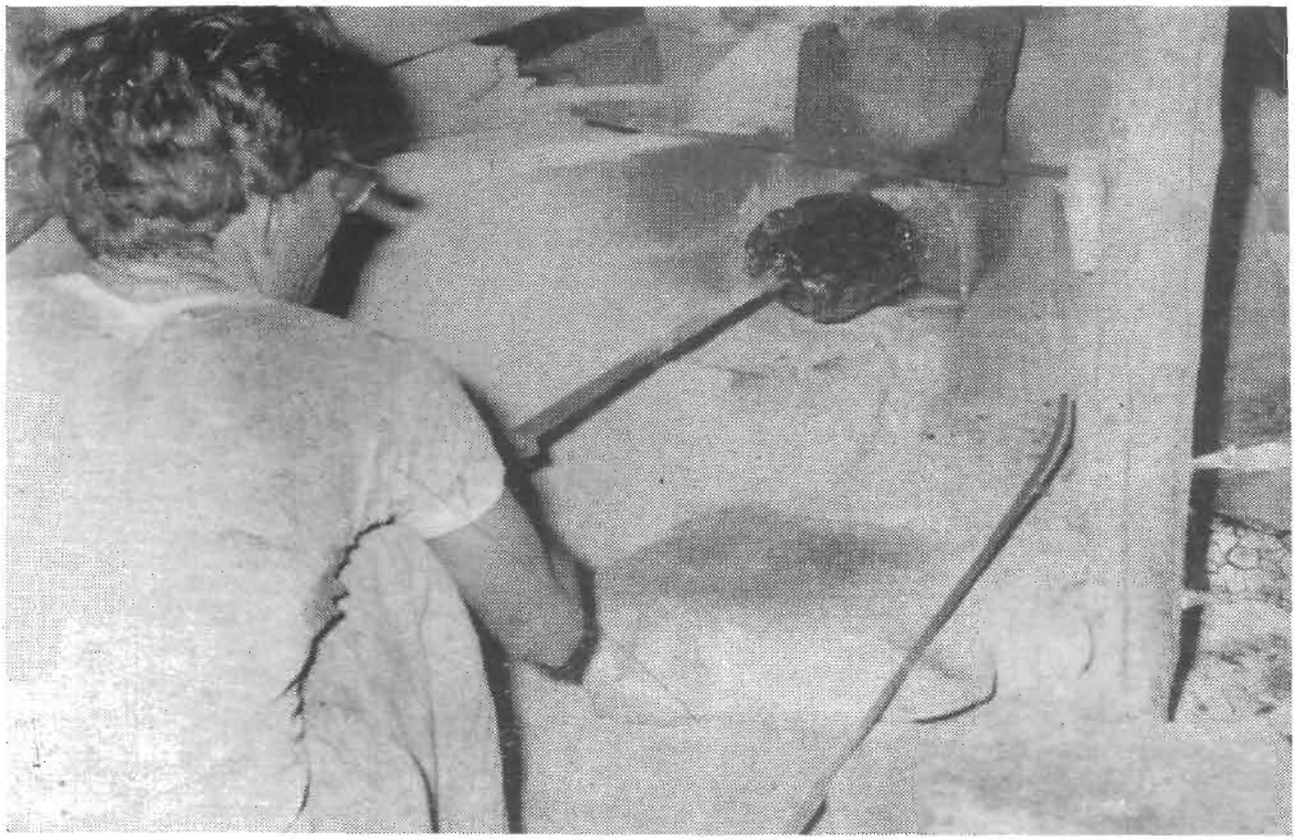


TOOLS & IMPLEMENTS



Photograph No. 1

The transparent glass pieces are heated in *Bhatti* (furnace) by *Lom Bananewala* to prepare the *Lom*, molten glass viscous).



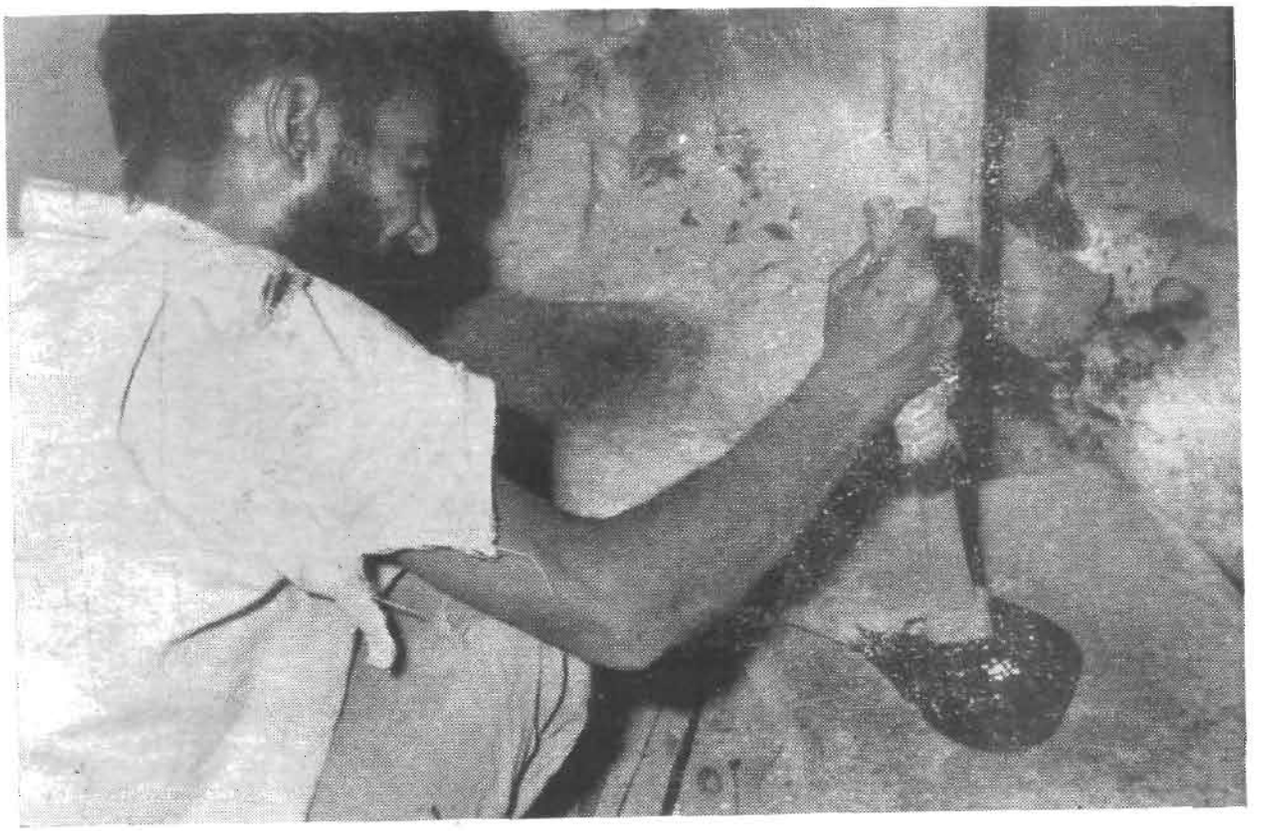
Photograph No. 2

Lom, the molten-glass mass, is taken out of *Bhatti* (furnace) and is pressed with *Ghan* to obtain desired shape and kept inside the furnace again and again till the same is ready.



Photograph No. 3

The hot *Lom* is kept on a stone-slab, lying before the mouth of the furnace, to be pressed by *Ghan* to bring it to the desired shape.



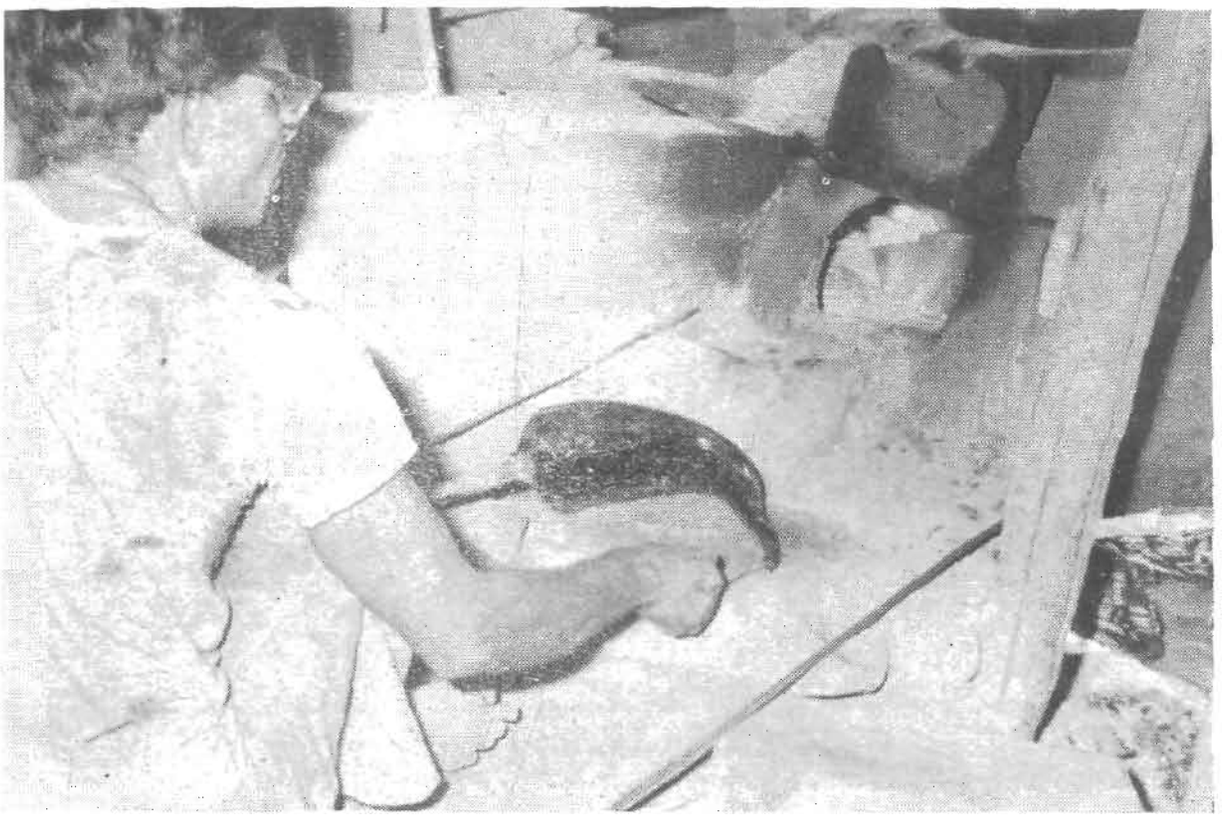
Photograph No. 4

The *Lom* (the molten-glass mass) kept on the stone-slab is being pressed by *Ghan* to bring it to the desired form.



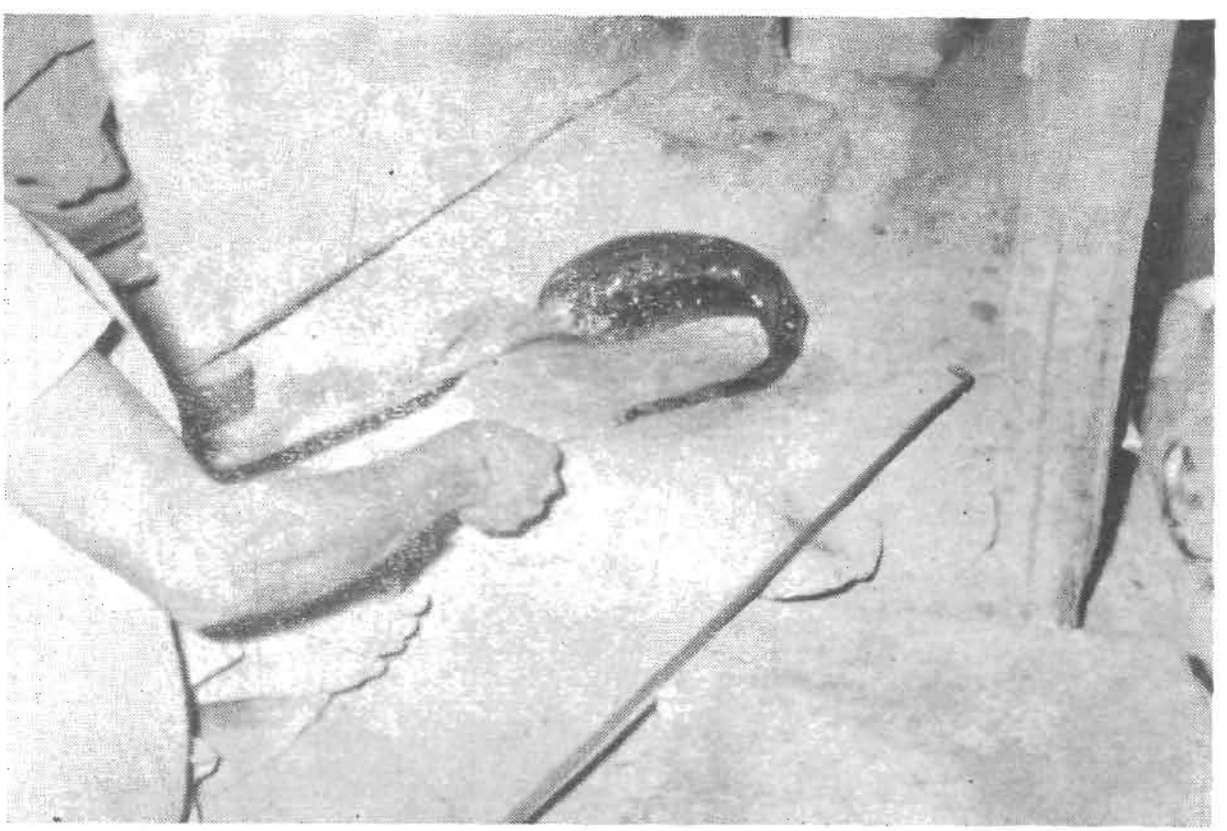
Photograph No. 5

The *Lom* kept on the stone-slab is being pressed by *Ghan*. It may also be noted that the craftsman protects himself from the heat of *bhatti*.



Photograph No. 6

The *Badana* is pierced into the conical point of the *Lom* and will be pulled skilfully to prepare the glass-wire.



Photograph No. 7

The *Badana* is inserted in the conical point of *Lom* and is pulled to make the glass-wire (tar).

In the past, when Tarapur was at the height of its glory in manufacturing glass bangles, there used to be one worker, usually a boy of 10 or 12 years old, per *bhatti*, whose duty used to be to carry out various odd and sundry jobs not necessarily connected with the craft. He used to get Re. 0·12 per day as wages. The duties of this "helper boy" used to be:—

(*a*) To insert fire-wood into the *bhatti* as and when required.

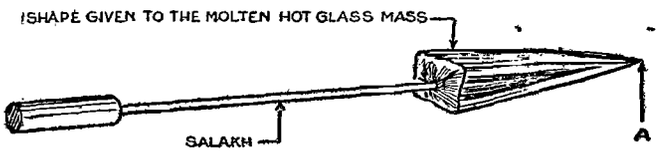
(*b*) To serve drinking water to all the 8 workers of the *bhatti* but specially to *Lom Bananewale* and *Jodnewale* since these are the persons who are directly exposed to the heat of the *bhatti*.

(*c*) To remove the finished bangles from the *Jodnewale*, count them and prepare garlands of 200, 250, 300 bangles, each.

However, with the gradual decline in the prosperity of the craft the employers have abolished this post and the work which was done by this boy is now distributed amongst the two persons *viz.*, *Tar Khenchnewala* and *Jodnewala.*

Before the workers manufacture glass bangles, there is a process which is essential in the craft and that is the manufacture of "coloured glass sticks" which are used as "colouring agents" in the manufacture of glass bangles. These "coloured glass sticks" are manufactured by mixing pieces of sheet glass and coloured glass enamel. This process is described below:—

The *Lom Bananewala* takes the required quantity of pieces of sheet glass and a proportionate quantity of pieces of coloured glass enamel. The craftsmen are unwilling to give out their proportion as they intend to keep it as a trade secret. However, it is seen that the proportion between sheet glass and coloured glass enamel is in the ratio of 5:1 by weight. The *Lom Bananewala* keeps these pieces on the shelf inside the *bhatti* for heating. At the same time he keeps the iron end of the *Salakh* inside the *bhatti* so that it too is heated. When he is sure that the coloured glass enamel stones are heated sufficiently (the craftsmen come to know when the enamels attain the required temperature just by seeing its colour), he picks up these pieces one by one with the help of the *chimta* and dusts them with cotton rags and gathers them at the end of the *Salakh.* Since both, the end of *Salakh* and the coloured glass enamel, are quite hot, the latter sticks up to the end of the *Salakh.* In this manner he gathers all the coloured glass enamel pieces around the end of the *Salakh.* When this is done, he (so to speak) wraps these coloured pieces in the pieces of sheet glass which were so long inside the *bhatti.* Just as he had earlier cleaned the pieces of coloured glass enamel before taking them on to the *Salakh,* he cleans the pieces of glass sheet with cotton rags and then envelopes the coloured pieces with the pieces of the sheet glass. The *Lom Bananewala* then presses the 'mass' with the help of the *ghan* by keeping it on the steel plate. In this process, the mass of coloured glass and sheet glass get cooled a bit and so he once again keeps it inside the *bhatti* for heating. Then, he takes it out and presses it with the *ghan.* In this manner he 'sandwitches' the coloured enamel between the layers of sheet glass. However this is not enough. The aim of the *Lom Bananewala* is to obtain a thorough mixture of the two components. He obtains this thorough mixture in the following manner. When the solid mass is inserted inside the *bhatti* after repeated pressing, he pierces the hot bent end of the *Akoda* into the mass which is red hot and draws a thick rod from it and then wraps this rod around the mass at the end of the *Salakh.* He repeats this process in quick succession, the operation being done inside the *bhatti,* till he is satisfied that the two components are mixed thoroughly. The test of a thorough mixture is the homogeneous mass which is visible to a layman's eye when it is red hot. When his aim is fulfilled, he disconnects the *Akoda,* keeps the mass inside the *bhatti* for a while and then takes it out and gives it a conical shape by repeatedly pressing the molten glass with the help of the *ghan.*



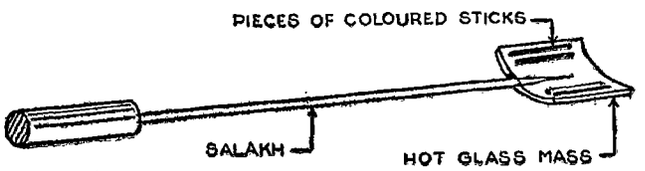
When this shape is obtained he places it inside the *bhatti* for heating and then takes a *badana,* heats its pointed end a bit and pierces it at point 'A' of the mass and draws out a rod of glass by pulling it. He draws the rod for about 3 to 4 feet and then hands over the *badana* to the *Tar Khenchnewala* who, by walking backwards, draws the coloured rod. It is not necessary that the rod should be of uniform breadth or thickness or length since it is to be cut again into small pieces and used as colouring agent. The length of the rod drawn by the *Tar Khenchnewala* is seldom less than 120 feet. By the time the *Tar Khenchnewala* reaches the limit, the rod becomes cool. It is then cut into small pieces of 6" each, by means of a file.

The various stages involved in manufacturing glass bangles are as follows:—

(*i*) Moulding the glass pieces, (*ii*) Preparation of the glass viscous, (*iii*) Drawing the glass wire, (*iv*) Cutting the glass wire, (*v*) Shaping the bangles and (*vi*) Finishing, packing, etc.

These stages are described below:—

If the pieces of coloured glass rods are already prepared, the *Lom Bananewala* proceeds with the manufacture of red hot glass lump which is called in local language as *Lom*, *Ganderi* or *Batti*. For this he selects pieces of sheet glass and determines the required quantity. A proportionate quantity of pieces of coloured glass rods (already prepared) is also selected. Since the craftsman, does not weigh these components it is not possible to state their proportion. He keeps the pieces of sheet glass and the pieces of coloured glass rods (which are kept in a small country tile) on the shelf inside the *bhatti* for heating and once they are sufficiently hot, the pieces of sheet glass are picked up one by one, dusted with the help of cotton rags and gathered at the end of the *Salakh* which is, incidentally it may be mentioned, also hot because the end of it is also kept inside the *bhatti*. Once all the pieces of sheet glass are gathered at the end of the *Salakh*, they are pressed with the help of the *ghan*. The gathered pieces of sheet glass are again and again heated and pressed so that they get, a curved shape as shown below:—



When this type of shape is obtained, he places the coloured glass sticks (which were all along inside the *bhatti*) at the centre of the glass sheet and then keeps the whole thing inside the *bhatti*. The glass sheet is all along now attached to the end of the *Salakh*. When this glass sheet is hot, he takes it out and presses the same with the *ghan* so that the coloured sticks are sandwitched inside. The placing of the coloured sticks is important from the point of view of obtaining a design. The design obtained by placing the sticks in the middle will be different from that obtained by placing the sticks at the corners of the glass sheet. When the coloured sticks are thus enclosed inside the "glass sheet" he presses the whole mass with a *ghan*. By the repeated process of heating and pressing the mass the craftsman gives a conical shape (carrot like shape) to the mass as shown in, the sketch on the previous page.

When this shape is obtained, he takes a *badana*, heats its pointed end in the *bhatti* and pierces the end at point 'A' when it is hot inside the *bhatti* and draws a rod. He twirls the *badana* in his hand and hands it over to the *Tar Khenchnewala* who twirls it (*badana*) by placing it on his left palm and twirling it with his right hand fingers. While performing this process he takes backward steps in a bent position. The glass rod so drawn is about 100 to 120 feet in length. The skill of the *Tar Khenchnewala* lies in the uniform roundness of the rod and that it should not break in the middle. While the glass rod is being drawn by the *Tar Khenchnewala*, the *Lom Bananewala* keeps the end of the *Salakh* inside the *bhatti* and sees that the hot mass is of uniform temperature. If he thinks that the hot mass is not hot enough, he breaks the glass rod at point 'A' as shown in the line drawing, takes out the whole mass, presses it with a *ghan* and obtains a conical shape once again. With a fresh *badana* he draws a fresh glass rod as before and hands over the new *badana* to the *Tar Khenchnewala* as usual. This process is continued till the whole mass is exhausted. In the finished rod, the colour appears in a spiral pattern in the inner portion of the rod and is uniformly spread over.

The next stage is to cut these rods of 120 feet length into small pieces of definite length, depending upon the size of the bangle. The following table gives the sizes of the bangles manufactured at Tarapur and the length of the rods required to obtain them:—

Serial No.	Size of the Bangle (Local term)	Length of the glass rod in inches
(1)	Do anna (Two annas) ..	$4\frac{5}{16}$"
(2)	Char anna (Four annas) ..	$4\frac{7}{16}$"
(3)	Chha anna (Six annas) ..	$4\frac{3}{4}$"
(4)	Ath anna (Eight annas) ..	5"
(5)	Das anna (Ten annas) ..	$5\frac{1}{2}$"
(6)	Bara anna (Twelve annas) ..	$5\frac{11}{16}$"
(7)	Chauda anna (Fourteen annas).	$6\frac{1}{8}$"
(8)	Do inch (Two inches) ..	$6\frac{11}{16}$"
(9)	Do inch Do anna .. (Two inches and two annas)	$6\frac{13}{16}$"
(10)	Do inch Char anna .. (Two inches and four annas)	7"
(11)	Do inch chha anna .. (Two inches and six annas)	$7\frac{7}{16}$"
(12)	Do inch Ath anna .. (Two inches and eight annas)	$7\frac{11}{16}$"

Note.—The size of the bangle mentioned in colomn 2 above is in local terms. In order to get an idea of the shape, the length of the glass rod of each size is given in column 3.

In passing it may be mentioned that the length of all the pieces cut for manufacturing one particular size of a bangle is not always the same since the worker cuts the rods to the required size holding 5 rods together. However, a slight difference in the length does not make any difference in size of the bangle. To cut the



Photograph No. 8

Lom Bananewa'a, one who makes the glass-wire is skilfully drawing the glass-wire with the help of *Badana*. The *Lom* fixed in *sa'akh* is kept inside *Bhatti* which makes the *Tar Bananewa'a* easier to draw the tar. The skill of *Tar Bananewa'a* lies in drawing the glass-wire of even thickness. The length of the glass-wire goes upto 120 feet at a time



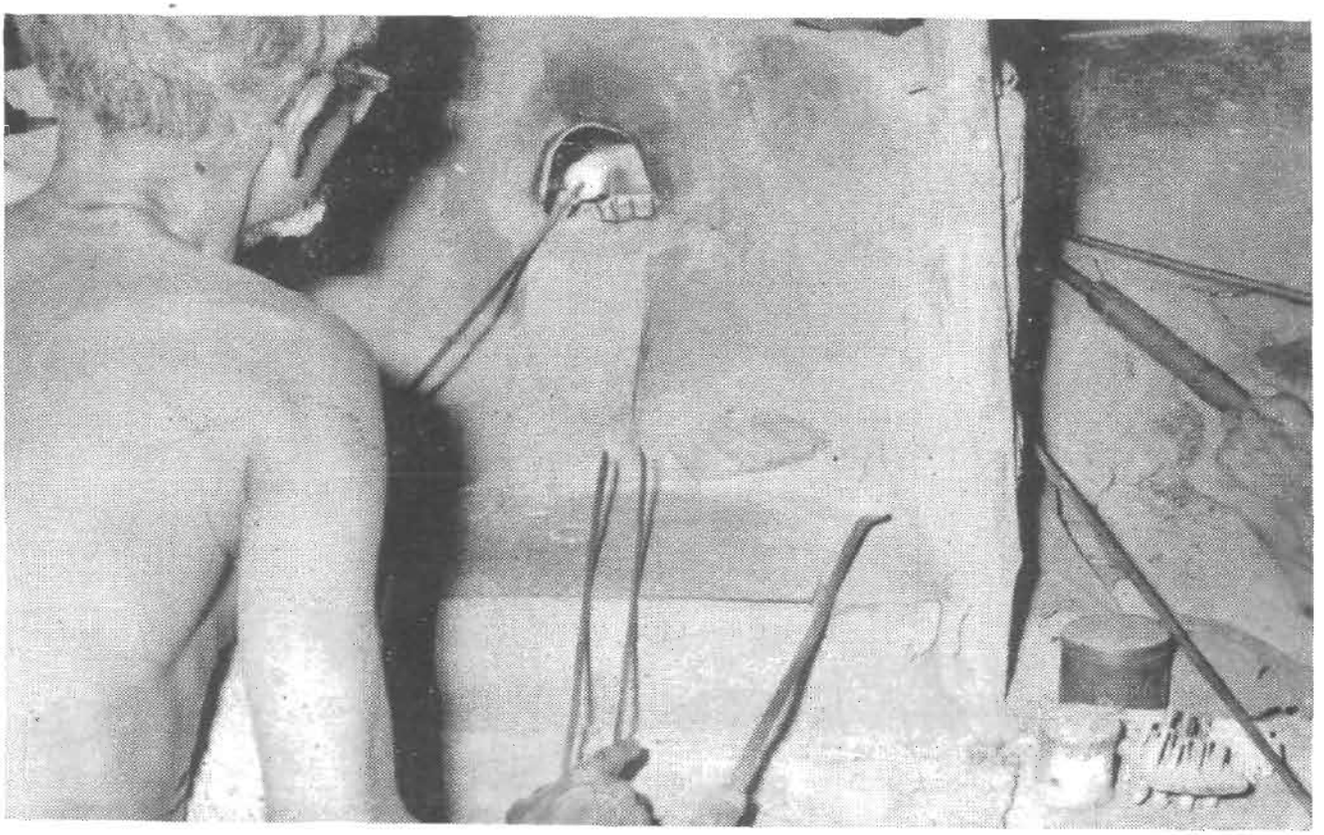
Photograph No. 9

The glass-wire is twirled



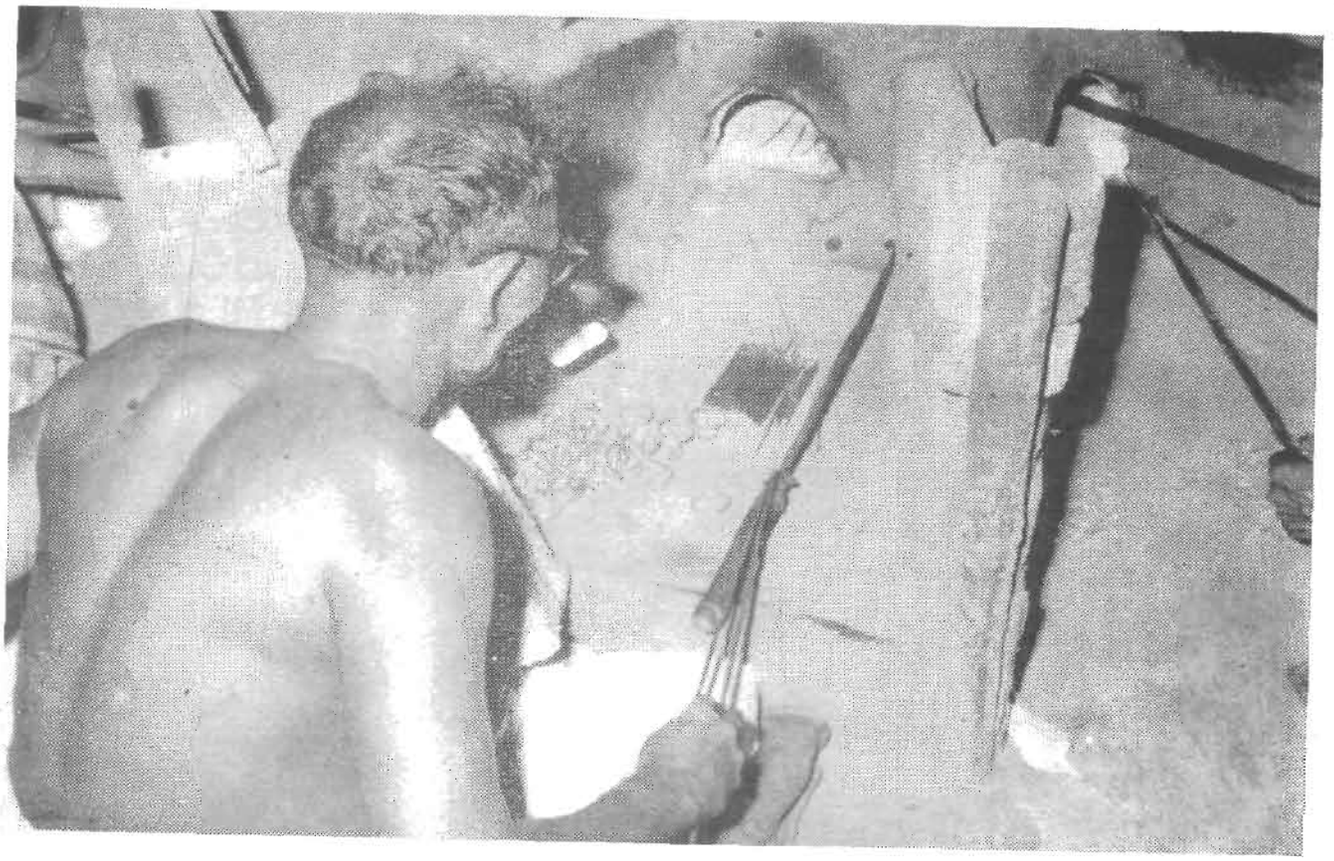
Photograph No. 10

The glass rods are cut into pieces of definite length with the help of a file



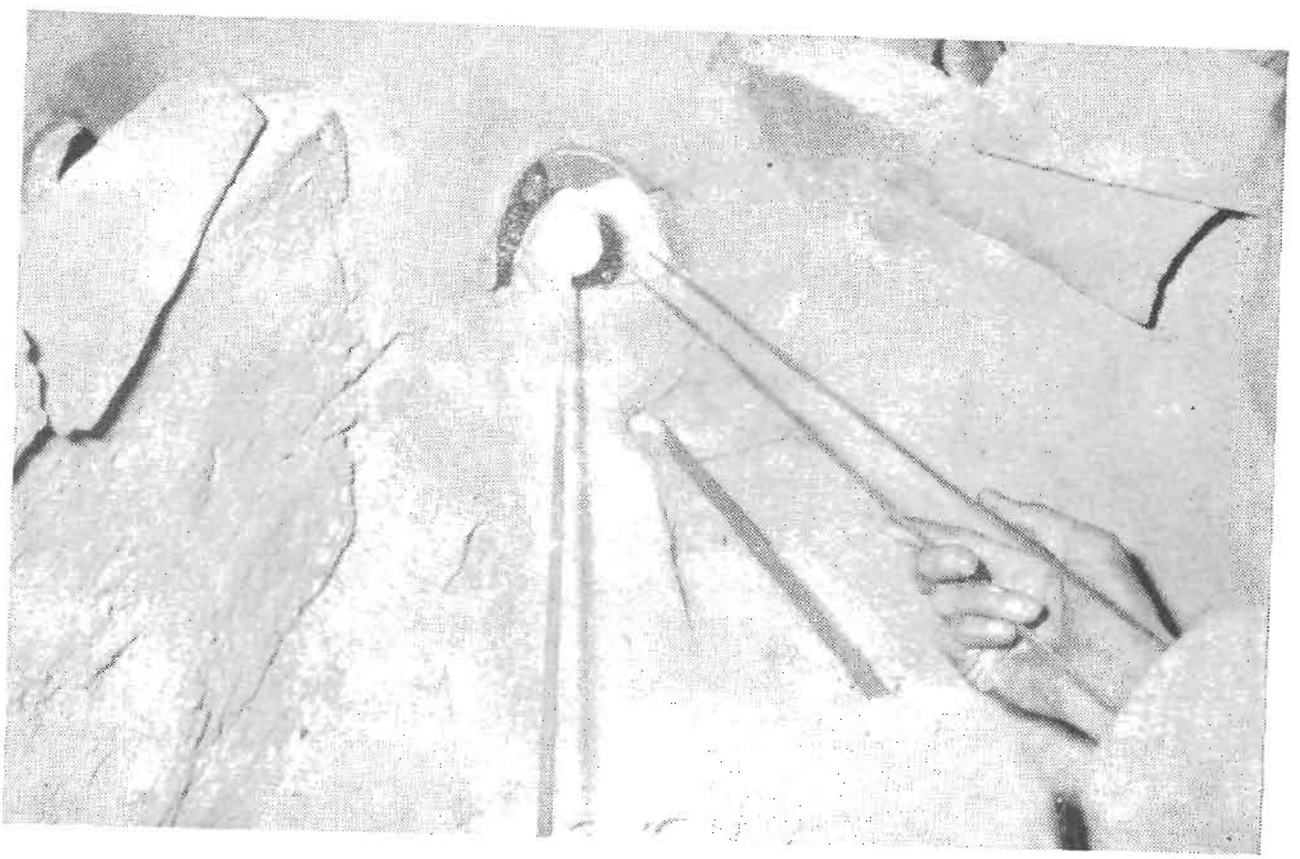
Photograph No. 11

The pieces of glass-wire of required length are kept inside the inner shelf of the *Bhatti* for heating. These pieces will be picked up with *Chimta* (tongs) when they attain the required temperature and will be placed on the *Kalabut* for further processing



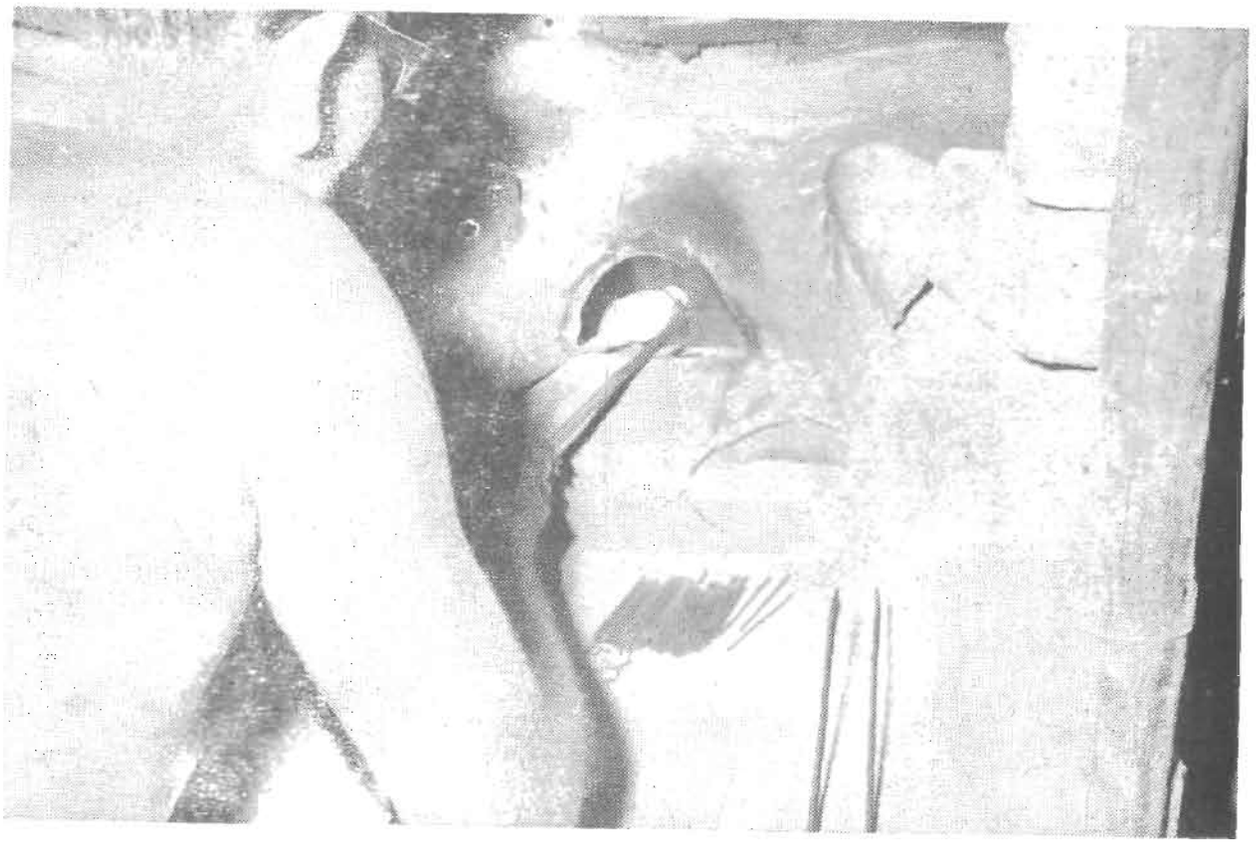
Photograph No. 12 and 13

The red hot glass-wire is placed on *Kalabut* which is inside the Bhatti and is slowly rotated so as to bring the edges of the wire together on *Kalabut* which gives it the round shape. The help of *Chimta* (tongs) is also taken by the craftsman whenever he feels its necessity



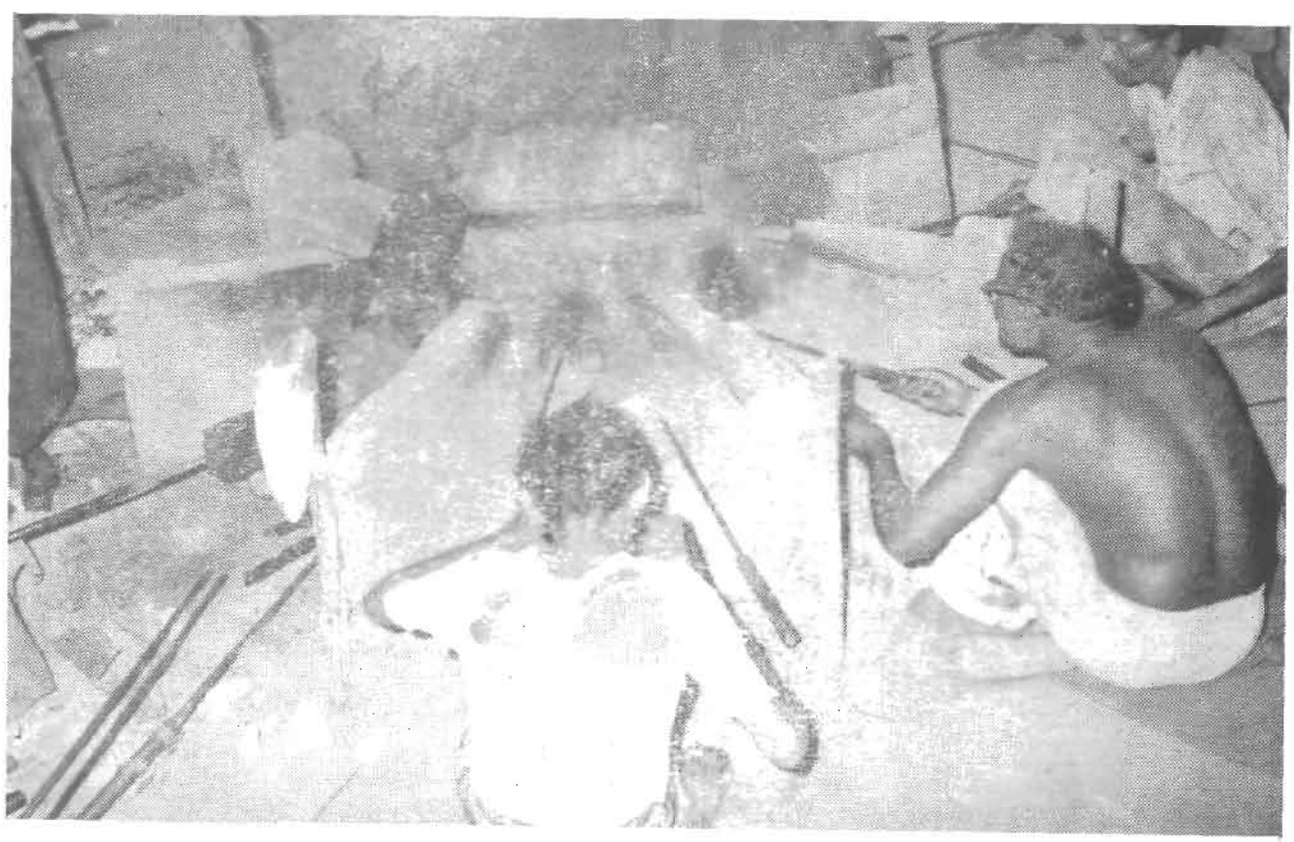
Photograph No. 13

The help of chimta is also taken by the craftsman



Photograph No. 14

The two ends of the glass wire kept on hot *Ka!abat* are joined together by pressing them with the help of *Akodi*, an Iron tool of 1½ feet long, the tip of which is slightly bent



Photograph No. 15

A view of the Craftsmen working around the *Bhatti* at their respective places

rod into pieces a file is firmly held by the worker within the toe and the adjoining finger of his right foot, the edge of the file facing upwards. He then picks up 4-5 glass rods in a bunch and cuts them into pieces of required length by rubbing them against the edge of the file. In case they are not cut he applies a gentle pressure with the thumbs of his hands and the rods give way.

These small glass rods are then passed on to the *Jodnewala.* The job of a *Jodnewala* is to weld the two ends of the small pieces of glass rods by first heating them inside the *bhatti* and then placing them on the *Kalabut.* He keeps 5 to 6 glass rod pieces, one at the side of the other on the shelf inside the *bhatti* with the help of the *chimta.* After they are quite hot, he picks up the first piece of glass rod with the *chimta* and places it on the *Kalabut* which is also inserted earlier into the *bhatti.* Due to heat the glass rod becomes elastic and when the *Kalabut* is rotated it takes a circular shape. However, before the *Kalabut* is rotated while it is inside the *bhatti,* the *Jodnewala* presses the two ends of the glass rod with the flat bent end of the *Akoda.* Since they are hot the two ends are welded together. He then rotates the *Kalabut* with the help of its handle when it is inside the *bhatti* and after a few rounds the bangle takes a round shape. He then places the bangle on the flat iron plate and in case the shape is irregular he gently presses it with the *chimta.* He then takes out the next rod from inside the *bhatti* and repeats the above process.

At Tarapur the *Jodnewala* prepares about 2,500 bagles in a day.

In order to retain the shape of the *Kalabut* the *Jodnewala* every now and then dips it in an earthen pot containing a mixture of lime and water every 10 to 15 minutes. Lime is available in nearby fields of Tarapur and hence no money has to be spent on it.

The prepared bangles are then counted by the *Tar Khechnewala* and they are woven into a cord to make a garland. This garland is called *Mala, Katta* or *Toda* and contains 200, 250 or 300 bangles. These garlands are then wrapped in sheets of wrapping paper, tied and marked properly. They are then packed in wooden cases (usually tea chests) with a padding of straw (usually of paddy). The labels, on the wrappers are generally marked with local signs e.g. if it is written "·II· Do Faki" on the wrapper it means the wrapper contains bangles of 8 anna size of Do Faki design. If the marking on the label is "·III· Do Faki" then it means bangles of twelve anna size of "Do Faki" are wrapped n the paper.

iDesigns

The designs in the bangles as mentioned earlier are obtained by placing the coloured glass sticks at different places on the glass sheet. Different designs can also be obtained by mixing more than one colour or by drawing thick or thin galss rod. The names given to the designs are in local language and the craftsmen could not offer any historical background for the origin of thier names. Again the names of the desings need not be standard ones. The designs .manufactured at Tarapur are :—

(1) Genda
(2) Do Faki—Sadi
(3) Do Faki—Dudhiya
(4) Badrang
(5) Chadi
(6) Karkadiya
(7) Cha Kandi
(8) Glass Feta
(9) Gadheri Feta.

CHAPTER V

STRUCTURE OF GLASS BANGLE CRAFT

The craft of manufacturing glass bangles at Tarapur has been carried on since generations as a cottage industry and it used to give employment to about 8 to 9 persons per *bhatti*, of which half the number used to be from the household itself. However, an attempt was made in 1960 to bring together all these manufacturing units under a Co-operative fold. "The Tarapur Bangdi Utpadak Sahakari Sangh Ltd." was, thus, established and registered on 28th April 1960. The promoters of this Co-operative venture were the traditional craftsmen at Tarapur. It had 56 share-holders who purchased the shares of the society valued at Rs. 2,100. The Government of Maharashtra had also helped the Society to the tune of Rs. 2,000. Almost all the share holders are Muslims of the village. The Thana District Central Co-operative Bank, Thana, had granted credit worth Rs. 5,000 to the society on 1st March 1961. In addition an amount of Rs. 1,000 was sanctioned to the society as subsidy by the District Co-operative Society Thana, on 25th January 1962.

The Society operated one *bhatti* and employed 10 persons on it. The fixed capital invested by the Society in tools and implements was of the value of Rs. 48·66. This amount does not include the value of land and buildings in which the manufacturing activities are undertaken. The 'workshop' was owned by the Chairman of the Society for which he did not charge any rent. The details of tools and implements are given below:—

Serial No.	Name	Number possessed	Value at the time of purchase
			Rs.
(1)	Ghan	2	6·00
(2)	Chimta	6	10·50
(3)	Salakh	2	5·00
(4)	Akodi	6	15·00
(5)	Salai	12	4·44
(6)	Patta	2	3·00
(7)	Kalabut	12	0·72
(8)	File	2	4·00
		Total ..	48·66

The production and sale of glass bangles by the Society during the year 1963-64 were of the order of Rs. 5,535 and Rs. 3,643 respectively.

The Society could not expand the business. It tried to import modern machinery and Technicians from Firozabad in Uttar Pradesh so as to impart necessary training to the local craftsmen but the experiment proved a failure in 1964. It spent Rs. 3,672 in 1964 on machinery alone. This venture was so expensive that the society had to close down its old *bhatti* in 1965, and since then the society is not functioning at all.

Besides the Co-operative Society, the number of independent proprietors is too small. They own two *bhattis* only and give employment to 14 persons. These owners work as proprietory concerns and because of paucity of funds and finance they had to rely on old tools and implements. These two establishments are not covered either by Factories Act, 1948, or Shops and Establishments Act, 1950, since the number of workers at each establishment is less than 10.

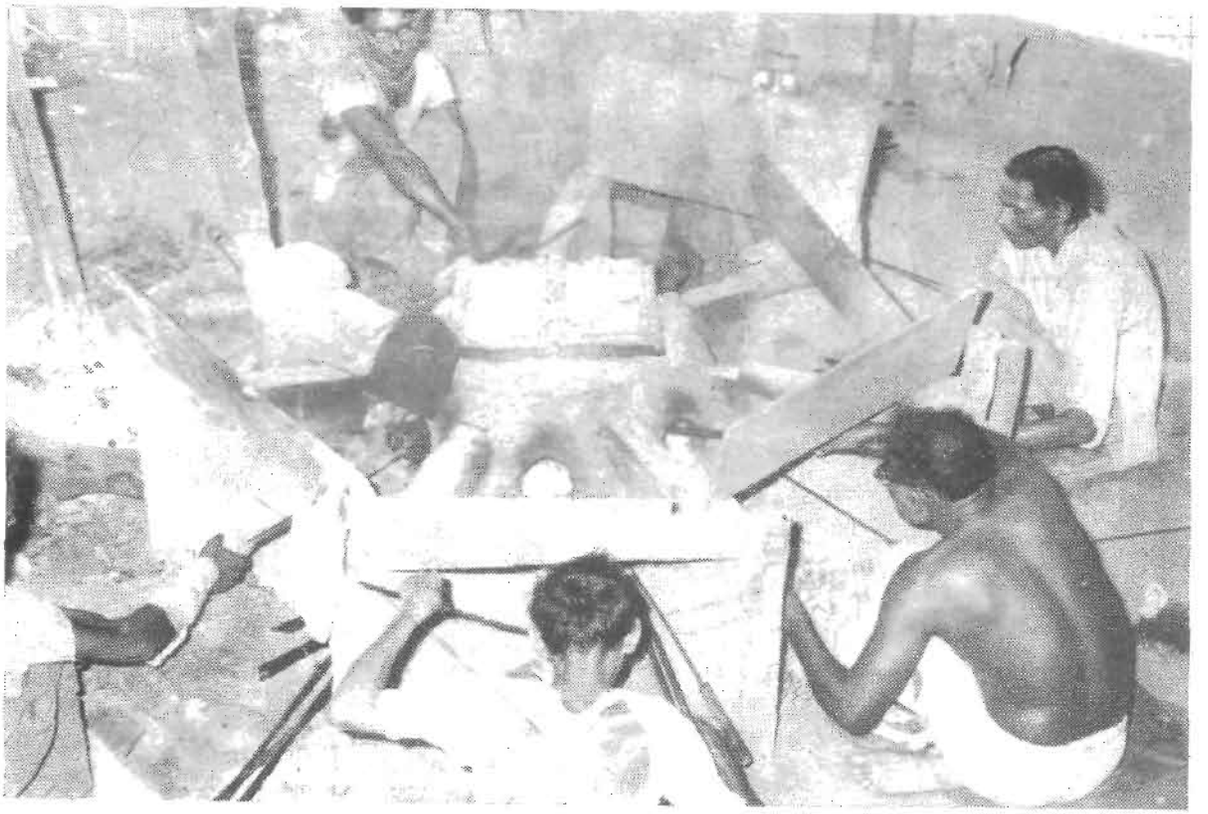
The main problems which face an owner-proprietor of small establishments are of finance and marketing of finished goods. Though the amount required in investing fixed capital is not big, yet the same for circulating one is considerable. The Co-operative Society received substantial assistance from the Government and other financial institutions of the district but no such help was either sought for or received by the proprietory concerns. The details of fixed capital of the craft are given below:—

Nature of establishment	Fixed capital (Rs.)		
	Tools etc.	Land and building	Total
Co-operative Society ..	49	1,200 (imputed)	1,249
Proprietory establishments.	90	1,300	1,390
Total ..	139	2,500	2,639

In other words the investment of fixed capital in the craft is Rs. 880 per establishment and Rs. 110 per worker (if supervisory staff is included) and Rs. 125 per worker (if supervisory staff is excluded).

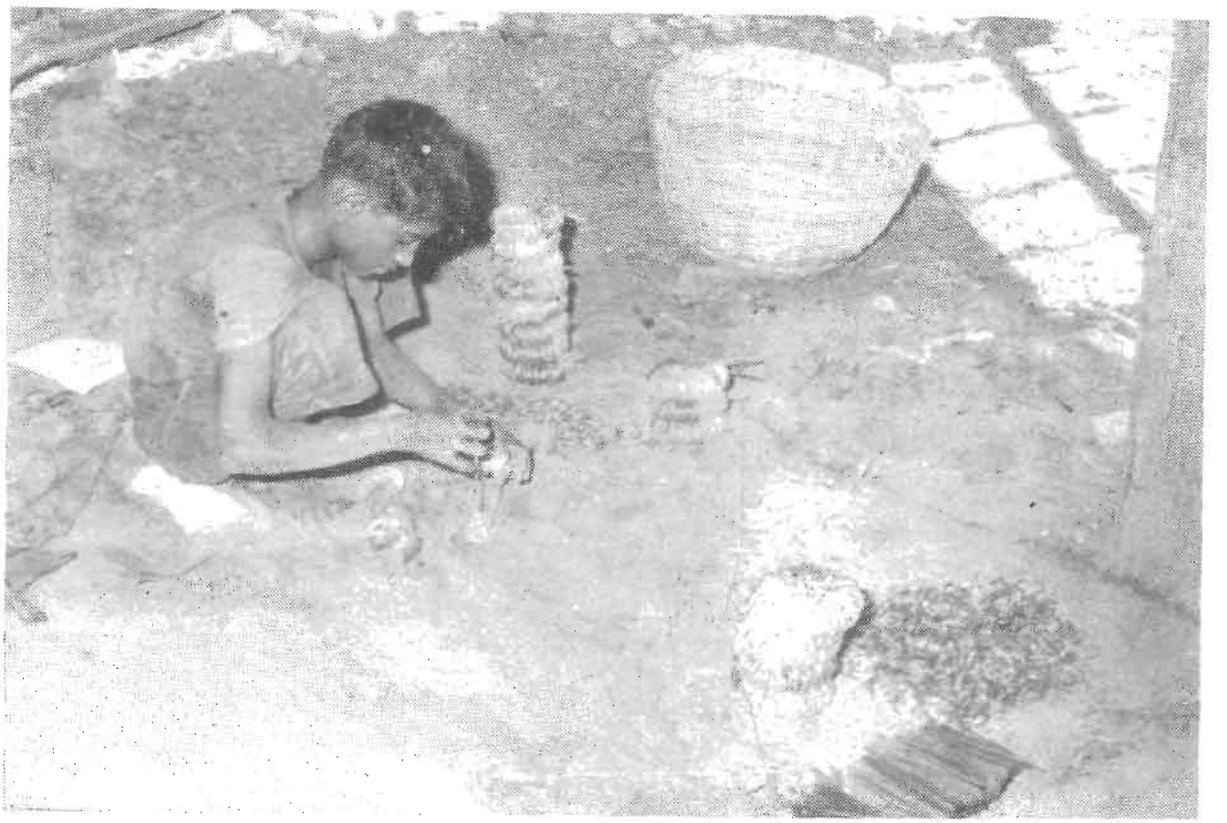
The working capital is required for purchase of raw materials and payment of wages, etc. The total working capital on the day of survey is estimated at Rs. 818. The details are given below:—

Particulars	Working capital (Rs.)		
	Co-operative Society	Proprietory establishments	Total
Total working capital ..	344	474	818
Working capital per worker including supervisory staff.	34	34	34
Working capital per worker, excluding supervisory staff.	38	39	39



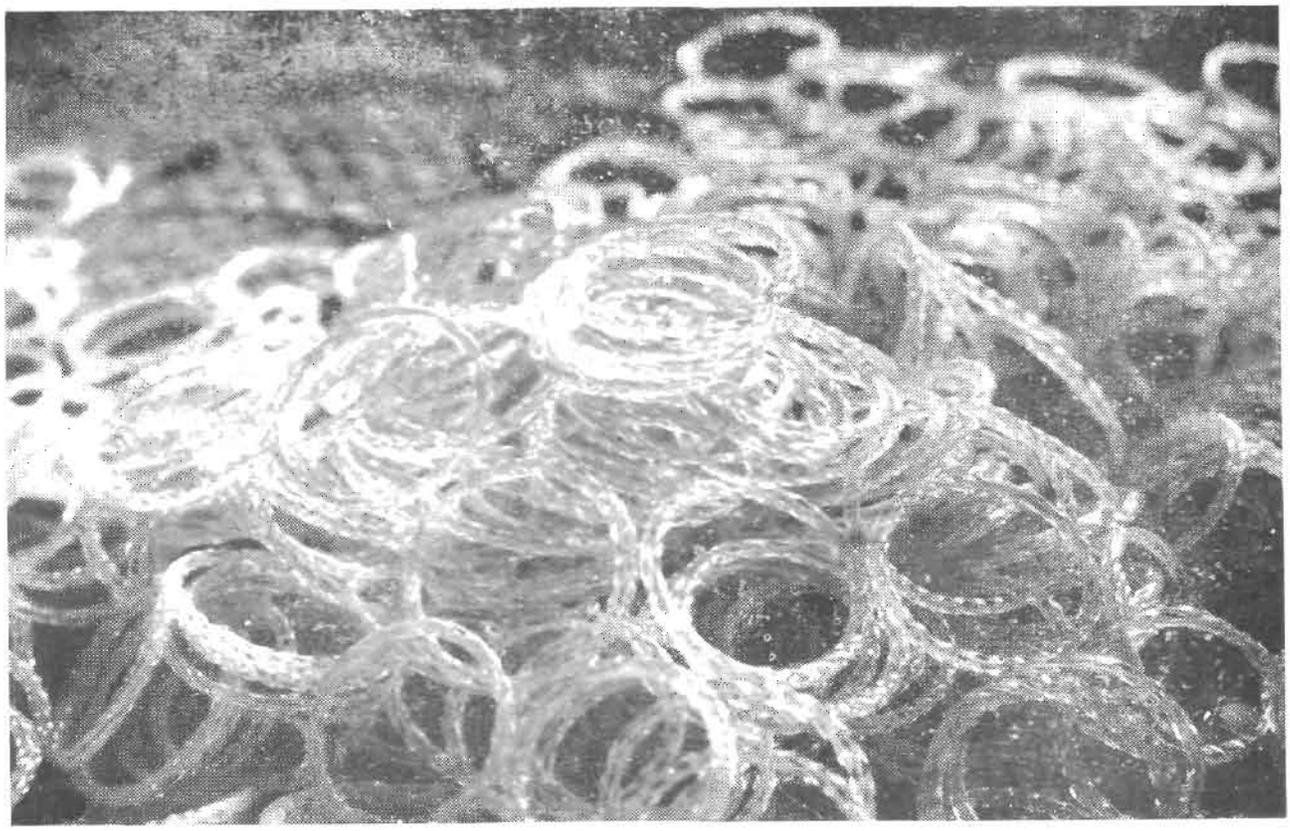
Photograph No. 16

The workers working at a *Bhatti*



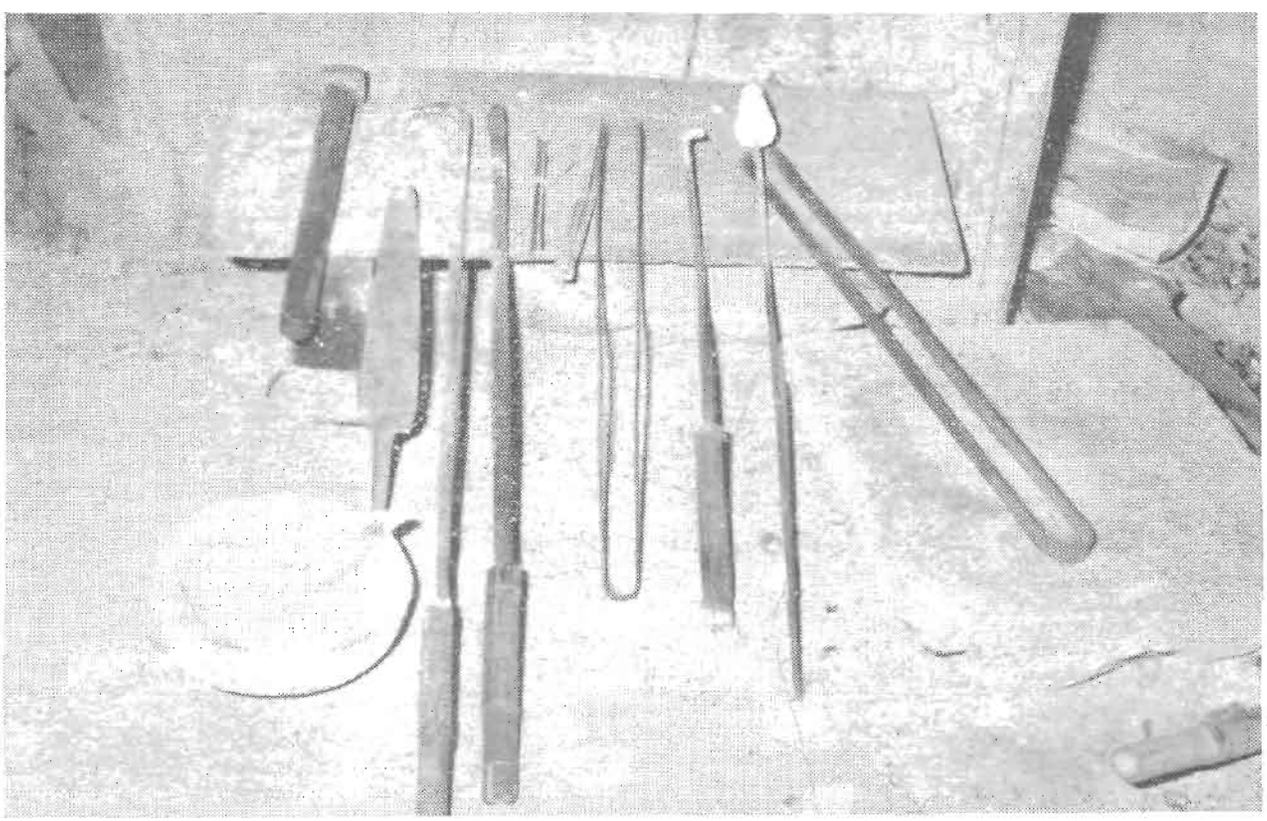
Photograph No. 17

The finished bangles are counted and a garland (called *Toda*) is prepared



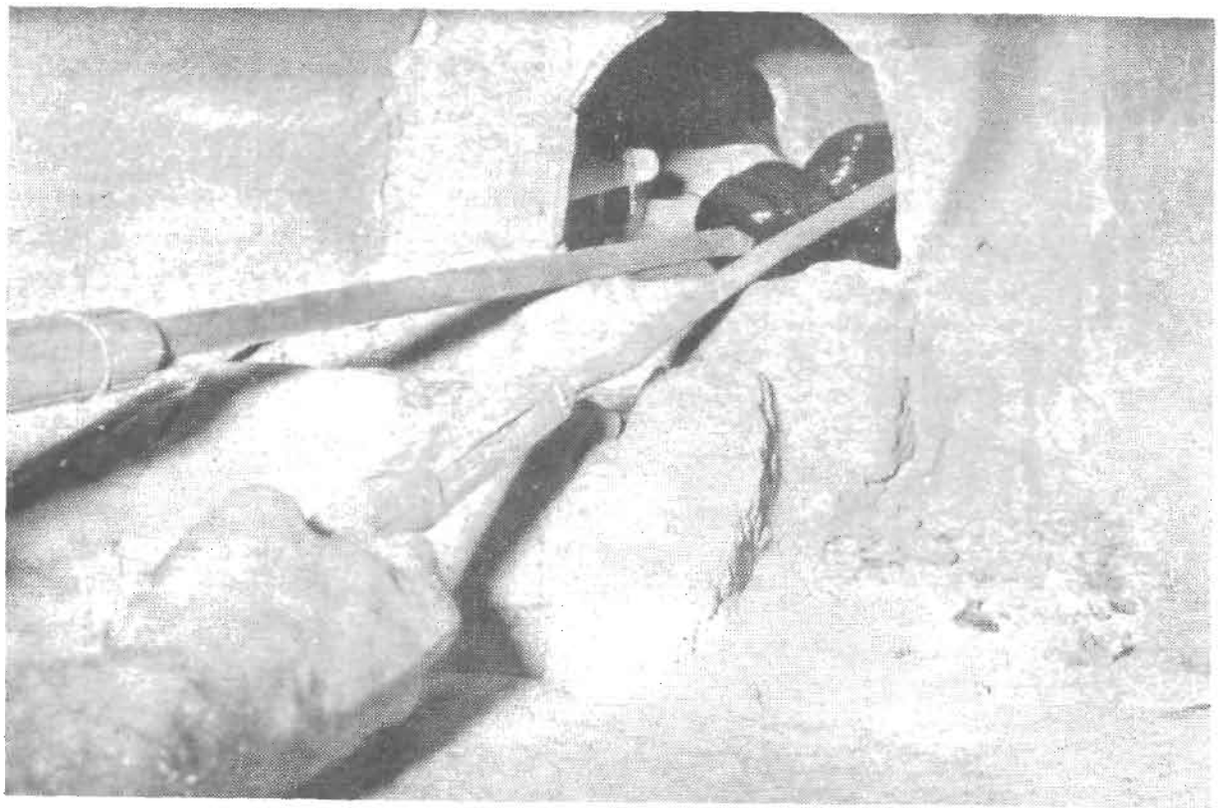
Photograph No. 18

The bangles of Tarapur made from twisted glass-wire



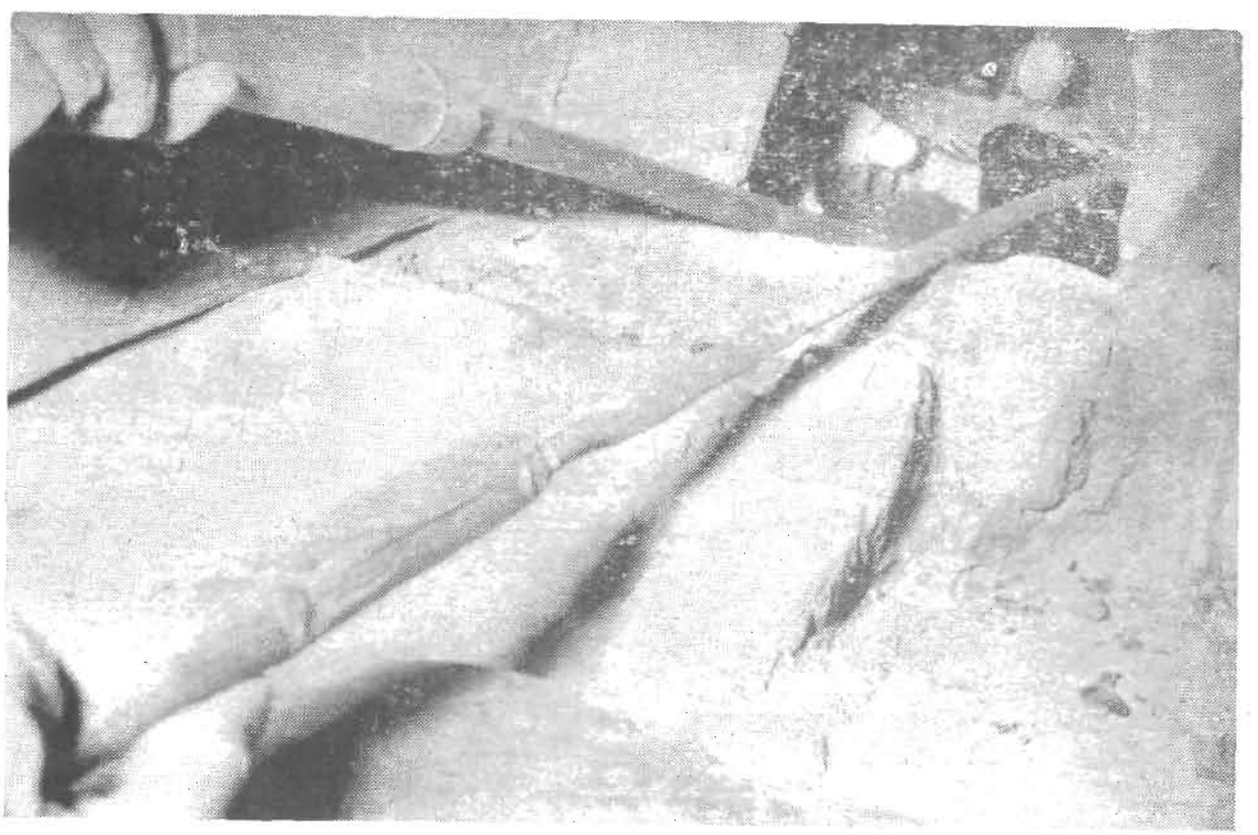
Photograph No. 19

Tools and implements used at Tarapur in manufacturing glass bangles



Photograph Nos. 20 and 21

Coloured sticks are prepared by mixing sheet glass and glass enamel stones. The red hot pieces of sheet glass and glass enamel stones are thoroughly mixed with the help of an *Akodi* and *Salakh*. Note the twists given to the red hot glass mass



Photograph No. 21

The twist is given to the red hot glassmass



Photograph No. 22

The finished bangles are counted and a garland (called *Toda*) is prepared. The way of *Todas* (garland) kept one on the other may also be noted

CHAPTER VI

ECONOMIC ASPECT

The cost of production of an article includes cost of raw material, labour charges, depreciation of tools and implements, interest on loans, rent of land and buildings etc. In case of glass bangle craft the manufacturers have to take into account while fixing the price of bangles, the loss incurred by way of breakages, etc. An attempt is made below to give cost of production of 9,000 glass bangles of " Do Faki " design (size : 12 annas) :—

Name of Item	Quantity	Value (Rs.)
(a) Raw material and fuel—		
(i) Sheet glass and coloured glass sticks.	One maund and 1·16 seers.	7·50
(ii) Firewood	3·6 maund ..	7·50
	Total ..	15·00
(b) Wages—		
(i) 1 Lom Bananewala ..	2 man days ..	7·00
(ii) 2 Jodnewale ..	4 man days ..	8·00
(iii) 1 Tar Khenchnewala ..	2 man days ..	3·46
	Total ..	18·46
(c) Miscellaneous charges e.g. packing the material, breakage, etc.	....	2·29
	Grand Total ..	35·75

These bangles are sold by the producers, it is reported for Rs. 40·50 at the rate of Rs. 4·50 per 1,000.

The total production of glass bangles at Tarapur in the year 1963-64 was estimated at Rs. 15,322 as shown below :—

(i) Co-operative Society ..	Rs.	5,535
(ii) Proprietory establishments ..	Rs.	9,787
Total ..	Rs.	15,322

Total expenditure on raw materials and fuel for the year 1963-64 was as follows :—

(i) Sheet glass and coloured glass enamel.	Rs.	3,914
(ii) Firewood ..	Rs.	2,896
Total ..	Rs.	6,810

The total wage bill for the year 1963-64 is shown below :—

(i) Wages paid by Co-operative Society.	Rs.	3,194
(ii) Wages paid by Proprietory Establishment.	Rs.	4,278
Total ..	Rs.	7,472

Marketing

The glass bangles of Tarapur are sold to wholesale merchants in various parts of India. It is, however, the manufacturers of glass bangles at Firozabad who purchase in bulk the glass bangles of Tarapur and after some processing they sell them in the market. The transport charges are borne by the merchants who place an order for the bangles. The goods are sent by Railway Parcel to all stations. Since the goods are manufactured on a small scale, there is no need of a big godown to store the finished products. These are kept till their despatch in the houses of the proprietors.

CONCLUSION

The craft of glass bangles at Tarapur has lost its original importance and slowly it is losing ground. The prospects of its revival appear to be very poor. This is a real tragedy because if we consider the fragile character of the glass bangles, we will at once realise that this craft should be diffused as widely as possible because by its diffusion we will be saving not only transport charges but the loss in breakages due to transit. At present, the proprietors tell us, the bangles prepared at Tarapur are sent to Firozabad for further processing and then sold in the market. If these "further processes" could be carried out at Tarapur only that will not only result in a big saving on transport charges and reduce the cost of production but will help the revival of this dying craft.

The craftsmen at Tarapur need specialised training in the application of "liquid gold" on bangles, manufacturing glass bangles on modern machinery and evolving new designs, etc. An attempt in this direction was made in 1964-65 by the "Tarapur Bangdi Utpadak Sahakari Society Ltd., Tarapur", by importing machinery and technicians from Firozabad. However, the entire scheme failed and the technicians, it is alleged, did not train the local craftsmen properly with the result that the Society had to incur such a heavy loss that it had to close down its *bhatti* in 1965. It may also be correct to say that the duration of training was not long enough to acquire necessary skill by the craftsmen of Tarapur.

As it is, the bangles manufactured at Tarapur are of inferior quality and are not durable. There is, therefore, very little demand for them. Unless the craftsmen improve the quality of the bangles (especially in regard to its durability) there is very little likelihood of the survival of the craft.

Because the workers are poorly paid as compared to those in other branches of economic activity like plying the Tongas, construction work, etc., the craft does not attract the new entrants capable of delivering the goods. The skilled workers in this craft leave it as soon as they get a job elsewhere where they earn better wages and have better working conditions. Fortunately for them the construction of Atomic Power Station at Tarapur by the Atomic Energy Commission has offered many jobs to these workers and those who have left the craft have, in most cases, joined the Bechtel India, Ltd., construction contractors for the Atomic Energy Commission.

The waste matter of this craft is not utilized by the craftsmen to manufacture any other item of glass such as paper weights, glass toys, etc. The waste, at present, it is reported, is used by some manufacturing units elsewhere to produce glass goods like paper weights, pebbles, beads, etc. If the proprietors at Tarapur undertake this line of manufacture of by-products it will, besides reducing their cost of production, give employment to some more workers.

The producers of glass bangles at Tarapur cannot face the tough competition offered by manufacturers of the same product at Firozabad as also of bangles made out of rubber, plastic, metal, etc., and that is also one of the reasons of the decline of the craft.

In short, the future of this craft is very discouraging.