BRASS AND COPPER ARTWARES OF DELHI

K. C. NAUTIYAL

Under the guidance of Ruth Reeves, (Honorary Adviser, Handicrafts & Social Studies, Office of the Registrar General, India) and Baldev Raj

Editor BALDEV RAJ

Superintendent of Census Operations
Delhi
Photographs: II-4 to II-7D, II-8E (courtesy of M/s. Narula Cooper Bazar, Sunder Nagar New Delhi) and IV-T1 to IV-T21 (courtesy of M/s. Prem Chand Hazari Lal, Phatak Namak, Haus Kazi, Delhi) were taken by Shri Amar Singh under the supervision of Mrs. Ruth Reeves.

Photographs: II-1, IV-12 to IV-14, IV-A1, IV-B to IV-B25, IV-C1 to IV-C21, IV-D1 to IV-D20, IV-F1 to IV-F28, V-A, V-B, V-C (courtesy of M/s. Prem Chand Hazari Lal); II-8, II-10, to II-14, IV-A to VI-11 (courtesy of M/s. Babu Ram Kalayan Dass, Gali Sheesh Mahal, Sita Ram Bazar, Delhi) and II-8A to II-8D and II-9 (courtesy of Md. Moosa, proprietor of M/s. Bhartiya Hastakala Metal Industries, Chawari Bazar, Delhi) were taken by the office photographer. Shri H. P. Sarin.

Layout
B. M. BHANOT
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 18 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 organizing 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 organized. 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 inquiry 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 workshop 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’ purse-strings. Inquiries were to be made about the operations 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 finishing stage and a list of very skilled craftsmen 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 towards 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 counter-part 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 subdivided 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 enthusiastic 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 judgement 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 taluks, 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 first time. Andhra Pradesh has embarked upon a project of chronicling the social and religious antiquity and uniqueness of every fair and festival. A separate 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 organised and executed under great strain and in disregard of health and comfort, for which I take this opportunity of expressing my appreciation and grateful thanks to my colleagues.

New Delhi
30 July 1964

Asok Mitra
Registrar General, India
ACKNOWLEDGMENT

The entire spade-work for this study was done by Shri K.C. Nautiyal in as much as the investigation and the first draft were prepared by him. Mrs. Ruth Reeves, Honorary Adviser of the Handicrafts and Social Studies Section in the Office of the Registrar General, India, was associated with the project from start to finish. The photographing, which was done under her direct supervision, was carried out partly by Shri Amar Singh of the Office of the Registrar General, India, and partly by Shri H.P. Sarin, our office photographer. The Honorary Adviser went through the entire draft report and made helpful suggestions. The final draft as now presented is thus the result of tireless work done and endless efforts spent on it by Mrs. Ruth Reeves and Shri K. C. Nautiyal. Shri Asok Mitra, Registrar General, India, also has constantly been guiding and encouraging us in this important undertaking. Dr. B. K. Roy Burman, Officer on Special Duty in the office of the Registrar General India very kindly prepared a comprehensive set of schedules which were helpful in carrying out the field enquiry along scientific lines. Under the guidance of Mrs. Ruth Reeves, the arduous work of retouching photographs for clearer printed reproduction has been done by Shri T. Kesava Rao, Artist in the Office of the Registrar General of India. Shri Prem Chand, proprietor of Prem Chand Hazari Lal, manufacturer of brass and copper artwares Phatak Namak, Hauz Qazi; Shri Baboo Ram, proprietor of Baboo Ram Kalayan Dass; Gali Sheesh Mahal, Bazar Sita Ram; Gulam Mohammed, a Kashmiri craftsman (Kali Masjid), Mohammed Musa, a Muslim artisan from Jama Masjid area and Shri Krishan of the All-India Handicraft Board’s Design Development Centre at Okhla Industrial Estate, have all been most helpful in furnishing useful information relating to raw materials, tools and appliances, and the techniques of artware production. Finally, I thank Mr. A. N. Chatterjee, Mr. J. S. Virdhi and Mr. David C. Cooke for their unstinting cooperation and valuable technical guidance in the printing of this monograph.

Baldev Raj
Our craft traditions are becoming extinct, sadly comments every scholar seriously concerned with the study of the Indian handicrafts as they reveal the material and non-material culture patterns of this country. For centuries together they have provided us with the ‘glow of local and national pride’ and at the same time have ensured employment opportunities to innumerable persons. In the past, the artisan’s pure love for his work, his righteous devotion to duty, and his belief in the sacred sermon set down in verse 47, Canto II of the Gita:

कर्मचेवाधिकारस्ते मा फलेषु कदाचन। कर्मेवाधिकारस्ते मा फलेषु कदाचन, ।
मा कर्मफलहेतुर्सुमार्मा ते सङ्गोऽस्तवकर्मणि।

“Set thy heart upon thy work, but never on its reward. Work not for a reward: but never cease to do thy work” —

produced for India works of great craftsmanship in various fields ranging from wood and stone work to that of metal, including gold and silver jewellery—all having been recorded in history for their unparalleled craftsmanship and artistry. Unfortunately, foreign rule and its imperialistic policies, the downfall of princely states and their rulers (who were the chief patrons of the crafts) and the coming of the machine age, have combined to bring about an almost complete paralysis of our centuries old craft traditions.

Today, as an independent nation India has to shoulder the heavy responsibility of revising those traditions which formerly gave her such pride of place in the world’s arts and crafts. No less significant is the responsibility of providing social security to craftsmen who, as per tradition, are engaged in these crafts in spite of facing abject poverty,
disgustingly low social status, and a frustrating stage of the craft economy despite the fact that several of these crafts possess rich export potential and have low capital requirements.

The Registrar General India, gauging the usefulness of taking up some analytical studies of special crafts throughout the country, asked the State Census Superintendents to make a start in this direction. Brass and copper artware is one amongst the five crafts finally selected for special study in the Union Territory of Delhi. The other four crafts are blacksmithy, carpentry, pottery and ivory work.

The brass and copper artware craft figures as one of the most traditional crafts of the City and has often been referred to as one of the important “sumptuary arts” of India. Like the city of Delhi, it survived and flourished by fits and starts, reaching the peak of its glory during the Mogul regime. The fall of the Mogul empire and the partition of 1947 led to an almost wholesale out-migration, not only of the metal craftsmen, but of their wealthy customers as well. Yet the craft somehow survived, probably because of the unique position of Delhi as the cosmopolitan capital of India.

The present study seeks to present an analytical picture of the archaeological, historical, social, economic and aesthetic considerations relevant to this craft. It also attempts to assess “the limits of rigidity within which traditional skill operates, as obtainable through a study of the castes; occupational, social and economic stratifications; the limitation of credit and marketing facilities; the dominance of custom over contract; the persistence of traditional tools; production processes and design forms; physical limitations of transport, communication and mobility, and the inability to adopt new lines or adapt to changing circumstances.” The study claims distinction in as much as it attempts to present a pictorial documentation of various craft practices, i.e., tools, manufacturing processes and design motifs. It is hoped that the report will be of interest to the lay reader as well as to research scholars engaged in the study of various problems of social and economic importance.

7 September 1964

Baldev Raj
CONTENTS

7 Foreword
12 Acknowledgment
13 Preface
17 List of Tables
17 List of Maps, Line Drawings & Photo Plates

21 Chapter 1
INTRODUCTION
Pattern of Production Units—27. Number of Persons Employed—28. Craftsmen and
the Nature of Employment—29.

35 Chapter 2
DESIGN AND ARTWARES
Origin & Development of Design—38. Traditional Motifs (Mogul)—39. Traditional

61 Chapter 3
RAW MATERIALS, TOOLS AND APPLIANCES
Raw materials—61. Secondary Raw Materials—64. Ral—64. Polishing Compounds—
64. Fuel—64.
Chisels—70. Auger or Hand Driven Mechanical Drill—70.
Beating & Shaping Appliances—71. Circular Hollow Iron Frames—71. Stakes and
Anvils—71. Ekwaii Maikh (Two nosed Anvil)—73. Sumba (One nosed Anvil)—73.
Kauwa Maikh (Crow’s Beak shaped Stake)—73. Sandan (Planishing Stake)—75. Gole
Maikh (Bright Stake), Gurda Maikh (Nepho Stake)—75. Kharwar—75. Pankha
(Blower)—75. Scraping Tools & Appliances—76. Randa (Scraper)—76. Charakh
(Scrapping Lathe)—76.
Chasing & Perforating Tools—77. Chisel & Impression Pen—78. Chasing & Perforating
Appliances—80.
Pickling and Polishing Appliances—80.
Chapter 4

PRODUCTION TECHNIQUES


Chapter 5

THE STRUCTURE AND ORGANISATION OF THE CRAFT


Chapter 6

INSTITUTIONS AND THE CRAFT


Chapter 7

CONCLUSION


Appendix A

GLOSSARY OF THE NATIVE TERMS

Appendix B

HANDBREAD SCHEDULES

Appendix C

BIBLIOGRAPHY
LIST OF TABLES

1.1 Locality-wise Distribution of Craft units—27
1.2 Number of Persons engaged in the craft in Different Localities—29
1.3 Distribution of Craftsmen according to Religion and Nature of Work—30
3.1 Average Annual Prices of Basic Raw Materials (1962-63)—62
4.1 Distribution of Production Units by Motive Power used—81
5.1 Distribution of Production Units by Nature of Organisation—164
5.2 Distribution of Production Units according to Mode of Work—164
5.3 Distribution of Craftsmen according to Nature of Work—166
5.4 Employment strength of different Production Units classified by the Nature of Work—166
6.1 Distribution of Working Members and paid Officials of the Dhatu Patra Co-operative Society—180
6.3 Final Accounts of the Dhatu Patra Co-operative Industrial Society Ltd., for the year 1962-63—182
6.4 Balance Sheet of the Society for the year ending 30th June, 1963—183

LIST OF MAPS, LINE DRAWINGS, SKETCHES AND PHOTO PLATES

MAPS
1. Union Territory of Delhi, Location of Brass & Copper craft Centres—24
2. Delhi City, Location of Brass & Copper craft Units—26

LINE DRAWINGS AND SKETCHES

II-A A sharply cut mihrab figure—40
II-2 Ganesha, son of Shiva, known for his sagacity and wisdom—41
III-3 Lord Vishnu, the preserver of the Universe reclining on the shayya, bed of Sheshnaga (Shesha Serpent)—42

Fig.1 Heihoras (Hammers)—65
Fig.2 Moongri (Mallet)—66
Fig.3 (a) Parkar (Iron Dividers)
(b) Katiya (Snippers)—67
Fig.4 Sandasi (Pincers): Plos (Pliers)—68
Fig.5 (a) Kaity (Solder Iron)
(b) Salai (Spike)—69
Fig.6 Retis (Files)—69
Fig.7 Burma (Auger)—70
Fig.8 Bangars (Circular hollow iron frames)—71
Fig.9 Ekwail Maikh (Two nosed anvil)—72
Fig.10 Maikhs (Stakes)
(a) Sumba (One nosed anvil)
(b) Kauwa Maikh (Crow's beak shaped stake)—72
Fig.11 (a) Sandan (Planishing stake)
(b) Gole Maikh (Bright stake)
(c) Gurda Maikh (Nephroid stake)74
Fig.12 Kharwar (Stake with upwardly raised noses)—75
Fig. 13  Galaridar Pankha (Mechanical blower)  
Sandookri Pankha (Box type hand blower)—76

Fig. 14  Randa (Scraper):  Charak (Scraping Lathe)—77

Fig. 15  Chisels and Impression Pens—78

Fig. 16  Iron Blocks; Nihai (round block); Chauka (square block)—79

IV-A1  A Chain-hung perforated brass hexagonal hanging lamp-shade, Circa 18th century—97

IV-A2  Globularly-shaped perforated, nickel-plated copper hanging lamp-shade featuring horizontal bands of intertwined floral fret-work.  
Height: 42 cms.—98

IV-A3  A chain-hung, brass hexagonal Mogul lamp-shade. Circa 18th century—99

IV-B1  Illustration: explaining the sequence of chasing process involved in the central frame of the perforated hanging lamp-shade—109

IV-B2  Illustration: showing the process of giving the requisite shape and form to the brass clips—115

IV-C17  Illustration: showing the sequence of chasing process in the hexagonal upper cap of the perforated central frame—124

IV-C18  Illustration: explaining the sequence of operations followed in chasing the floral design on the lid of the perforated hanging lamp-shade—125

PHOTO PLATES

II-1  A pattern of Chinar leaves, a favourite Kashmiri motif, chased on the surface of a round tray. Diameter: 22”—34

II-4  Thal—Detail of an oblong brass tray featuring egg and dart design on the raised rim and the border decorated with chased pattern of elephants trampling one after the another on a base of imbricate floral design in a background symbolising jungle-growth. Diameter: 54”—43

II-5  Brass Tray, a scene from the court of a Mogul Emperor. Diameter: 22”—44

II-6  Perforated all over lotus pattern decorating the surface of brass trays (thals) with raised pie-crust of egg and dart border. Diameter: 36”—45

II-7A  Brass darwala gale (round) lamp, the top part of which is shaped like a minaret. Height: 56 cm.—46

II-7B  Darwala pahaldar (perforated brass hanging lamp-shade) with mihrab shaped openings one above the other either side of which are concave pillars (pahals) perforated in a diamond shaped or leaf pattern called chaukalia jali i.e., four leaves fret-work. Overall length of lamp 50 cm.—46

II-7C  Cylindrical perforated lamp-shade featuring on almost total imbricate design known as mahipushta jaal or net work of fishscale. Height: 48 cm.—47

II-7D  Globularly shaped perforated copper lamp-shade with gole-handi and with round lid. Height: 35 cm.—47

II-8  Wall Plate featuring oxidised brass casting of Kamadeva, the god of passion arm in arm with ‘Rati’ goddess of beauty (wife of Kamadeva) in fleeting pose. Diameter: 10”—48

II-8A  Tibetan collapsable section horn. Height: 48”—49

II-8B  Laharia baja, undulant shaped ceremonial copper horn decorated with chased German-silver superimposed on the copper body. The wide end of the horn represents a famous Chinese motif of furious dragon with wide eyes and frangs coming out from the both nostrils and flame stemming out from the hair and the body of the dragon. Size: 20” long—50

II-8C  Sher baja, a curvilinear copper horn featuring a deeply chased motif of a fierce Chinese dragon. Size: 16” long—50

II-8D  Tibetan boy blowing the folding, collapsable section horn—51

II-8E  Tibetan copper bowl. Height: 5 1/8” Diameter: 9 1/8”—52

II-9  Nepalese tea pot made of copper tinned on the inside. Height: 9”—53

II-10  Ardhanari, Shiva half male and half female posture—55.
II-11 Natraj, Shiva in his cosmic dance—57
II-12 Dancing girl, in a pose somewhat similar to the Natraj Posture—58
II-13 A nayeka (dancing girl) in tribhanga (triple flexural) pose, on around pedestal—59
II-14 Mirror girl, standing on a lotus pedestal—60
IV-A The image of flying Hanumana, after casting, showing him in the finished state following oxidization—83
IV-B Hanumana as view from the back—83
IV-1 The lead pattern of Hanumana in his fleet as the wind pose—84
IV-2 to
IV-11 Pictorial representation of box mould casting and cored casting of icons—85-91
IV-12 Craftsman scraping a copper tray—93
IV-13 A close view of scraping operation—94
IV-14 Hammering on the but end of the impression pen (shappe-ki-kalam) the craftsman is imprinting the design on the surface of copper tray—95
IV-A4 Hexagonal brass darwala (with doors) Jaipuri Lamp-shade—100
IV-B1 to
IV-B25 Plates presenting the still pictorial documentation of the manufacturing process of the hexagonally shaped perforated central frame (darwali patti)—102-115
IV-C1 to
IV-C18 Chasing and perforation work on chappal (cap)—116-124
IV-C19 to
IV-C21 Chasing and perforation work on the lower dhakkan (lid)—125-126
IV-D1 to
IV-D20 Manufacturing process of the perforated gole lattus (round tops)—127-133
IV-F1 to
IV-F21 Craft process of fitting together the different parts of Lamp-shade—134-142
IV-F22 to
IV-F28 Pickling and polishing of the Hexagonal perforated hanging lamp-shades—143-146
IV-T1 to
IV-T28 Still pictorial documentary representation of the manufacturing process of the brass artware trays (thals)—147-162
V-A Leisure and Recreation—Smoking Sulpha provide them good pastime—169
V-B Recess & Relaxation—Craftsmen napping at the work site during lunch hours—172.
V-C Workshop-cum-living Quarter—Means do not permit to avail of separate rental accommodation and also to keep their families alongwith. In a corner of the workshop a craftsman can be seen cooking his meals and being helped by his son—173
History of the Craft

DELHI has long been known as the centre of a number of artistic crafts such as the manufacture of various kinds of artistic metalwares, gold and silver ornaments, ivory articles, zardozi work, etc. Of all these crafts, the manufacture of brass and copper artwares occupies a unique place in the city and ranks as one of its most important traditional crafts. It exists in the heart of the city as a highly flourishing craft which has been perfected by centuries of skill handed down from generation to generation. The many varieties of the brass and copper artwares manufactured here are oriented to meet a large consumer choice and taste. They are manufactured both for interior decoration and for domestic use and bear the stamp of superb craftsmanship. Today, some of the most popular varieties are the perforated hanging lamp-shades; decorative wall plates; trays; table tops; flower vases; fruit and punch bowls; jugs; ash trays; Nepalese type tea-pots; Tibetan type bowls; and long, curved ceremonial horns; goblets; pandans, spice boxes; surahis, globular vessels with long cylindrical neck; hookahs, hubble bubble; toys and images of Radha, Lord Krishna (the tenth incarnation of God); the dancing Shiva (god of destruction); Kamadeva (the god of passion) with his wife Rati, the goddess of beauty; Hanumana, the monkey chief etc.\(^1\) The shapes and design ornamentation of all of these articles are numerous and can be obtained in the specific form desired by the customer.

Oddly enough, no coherent historical account of the growth of the brass and copper artwares craft in the city nor of its inception in Delhi, is available. However, professional opinion has it that it emerged and flourished under the influence of the Moguls, the manufacturing centres being concentrated in and around the Jama Masjid and Kucha Paati Ram (Sita Ram Bazar) areas. It is further asserted that during the Mogul regime Delhi was widely recognized throughout the northern India as the chief centre of the most artistically outstanding brass and copper products. In fact some of the later (16th century and onwards) Mogul rulers took a keen interest in the development of the craft. Abul Fazal, Akbar’s great minister, in his *Ayine Akbari*\(^2\) i.e., ‘Institutes of the Emperor Akbar’ (A.D. 1556—1605) mentions that Akbar had in his service a large number of artists. Once a week he would inspect the work of every artist and in proportion to their individual merits they were honoured with premiums and their regular salaries were increased\(^3\). The artwares produced mainly featured chased (chitai) work and low relief work, called (nakasi). Some of the important articles produced were: jugs; surahis.
(water container); tash (a vessel); tumblers; katoris (bowls) and pandans; husandsans; and khasdans (small boxes for keeping betels etc); trays or thals (large saucer-shaped trays); naimat khanas (tiffin carriers), maratbans (containers with lids); tea-pots; silabchi (a vessel for washing the hands); pava of palang (legs of bed-steads); changer (flower vase); hanging lamp-shades; cupolas and orbs for temples and mosques. Most of these articles were made of copper sheet metal and then nickel plated.

The crafts and the craftsmen of the city enjoyed a wide reputation amongst all the manufacturing centres of metal crafts throughout the country. The Delhi District Gazetteer of 1912 contains the following observations. ‘....most of the smiths from other places admit that they are not so skilful with the hammer and stake (sandan) as those of Delhi.’

“Brass articles are tastefully ornamented by the chiteras with foliage in low relief.... There is a considerable production of....small fantastic toys of brass, roughly made, but often ingenious. The native merry-go-round seen at melas (fairs) furnished in one model, and railway trains, raths (temple cars), grotesque figures and toy vessels of all sorts are also made. Small boxes of brass with lids perforated in foliated patterns and furnished with a false lid in which a small mirror is fixed, are favourite possession of native ladies who use them to keep cardamom (seeds used as a stomachic) or small articles of adornment.

“The local manufacturers do a good business, especially in pure hammer work, i.e., the shaping of vessels from one sheet of copper, without point. The best workmen are living in and about Kucha Paati Ram. Jagan Nath’s rath, or car, in Delhi is a good specimen of large and bold work executed entirely in the city, and large orders are received for cupolas and orbs for the tops of temples and mosques. Toys and ornaments of brass and copper are manufactured in large quantities.... and sold in maunds....”

During the early twenties the export of the brass and copper artwares was also apparently quite noteworthy. Regarding the Export items of artwares, the District Gazetteer of 1912 adds.... “They are made in great numbers and find their way into Rajputana as well as all over the Punjab.”

However, the decline of the Mogul empire in 19th century gave a serious set-back to this centuries old traditional craft, for, the manufacture of brass and copper artwares had flourished in the city under the patronage of the Mogul Rulers and the rich Jagirdars (grantees). Incidentally, after the fall of the Moguls, the city experienced wholesale migration of the talented craftsmen to other rich princely cities and towns, e.g., Lucknow, Muradabad, Jaipur etc., which were formerly (during the Mogul’s rule) subordinate to Delhi. The migration of the talented craftsmen to the other states seriously affected the volume and the quality of products here.

Further, during the subsequent decades of the 20th Century, the competition brought about by the mass production of machine-made, cheap but standard artware metal products, also adversely affected the manufacture of the metal handcrafts, especially the brass and copper artwares made for everyday domestic use, e.g., bowls (katoris), thals (trays), tumblers, tiffin carriers, silabchis (vessel for washing the hands), etc.

Moreover, after the Second World War, the craft was forced to undergo an even worse damaging shock as a result of the partition of the country in 1947. The fall of the Mogul empire, the break-up of the British rule and the

---

1For details of the articles produced in the city see Chapter II ‘Design and Artwares’, the sub-head Artware Products, pp. 43.
2Ayina Akbari, by Abul Fazal, translated in English by H. Blochmann, 1937.
3Industrial Arts of India—Sir G.C.M. Birdwood, London, 1880.
incoming of the machines that put cheap but standard metal products on the market, all combined to seriously affect the traditional standing of the craft. The virtual paralysis of the craft brought about by the partition is still fresh in the memories of the professionals engaged in the craft at that time. The partition led to a steep decline in the volume of employment as well, for the preponderance of the metalsmiths were Muslims, hence many of the talented master craftsmen of the city, willingly or unwillingly, migrated to Pakistan.

It is particularly painful to remember the plight of the craftsmen who were exclusively engaged in the production of copper artwares. The partition led to the virtual end of the manufacture of the copper artwares in the city as much as it resulted in wholesale unemployment of the craftsmen engaged in their fabrication. A large number of wealthy Muslims, these being the main consumers of the copper artware articles of domestic use, migrated to Pakistan and thus the demand for them fell to a very low level. The artisans—Muslims as well as the Hindus engaged in the craft—were suddenly faced with no work.

However, during the fifties, the demand for brass and copper artwares, and particularly for the former, gained impetus. The unique position of Delhi as the cosmopolitan capital of India and, concomitantly, a centre of international trading, plus being the country’s chief commercial and tourist headquarters, led some of the Delhi and New Delhi merchants who owned Curio Shops and Art Palaces (those at any rate who could foresee that the craft possessed tremendous expansion potential) to revive and develop it in the capital. It is mainly because of the pioneering zeal and fostering care of these merchants that the brass and copper artware craft again occupies an unique place of pride amongst other distinguished handicrafts of the state, and contributes a large number of attractive items for export to foreign markets. Some of the most popular of the exported artwares are as follows: the round or oval trays which are also used as table tops on folding wooden brass-tipped legs, the trays generally being made of brass or copper sheet metal with an up-raised rim featuring the egg and dart or pie crust design. The surface of the tray is chased in floral patterns, such as chinor leaf, lotus, creeper with leaves, or popular native motifs such as a folk scene at a village well, the Taj Mahal and portraits of renowned Indian kings, queens or heroes. Other best sellers are the perforated hanging lamp-shades (mainly made of brass but a few of copper sheet metal also) available in both globular and polygonal forms with miharb6 shaped side gates fitted with ground glass, the perforated brass design often being a floral one or of an interlocking creeper pattern with leaves; wall plates, made of brass as well as copper, mainly featuring native patterns chased in low or high relief; Tibetan bowls, Nepalese tea-pots and Tibetan horns—all made of copper sheet metal featuring animal or floral motifs chased in low or high relief work. The Tibetan bowls, horns and tea-pots are decorated with the dragon and other far eastern symbols which are made of chased white metal sheet (coin silver), super-imposed on the plain copper bodies of the bowls or tea-pots.

Location

In all, there are forty-one production units manufacturing brass and copper artwares in the city. All of these units are concentrated in the densely populated areas of old Delhi, viz. Sita Ram Bazar (Gali Sheesh Mahal—Kucha Paati Ram, Gali Bajarang Bali and Mandi Namak, Hauz Kazi); Turkman Gate (Kali Masjid, Asaf Ali Road, Nal Wali Gali, Pahari Bojla, Suwalan); Jama Masjid area (including Matia Mahal, Barsabula, Chitla Darwaza, Churiwalan etc.); Ballimaran; Tiraya Bairam Khan; Bara Hindu Rao (Bagicha Achhajiee and Nai Basti) and Bahadurgarh Road (see location map). It is in these areas that all the production processes, from the shaping of raw material to the finishing of the products, are carried on. In most of the undertakings, (over

6A miharb, to quote the definition of it in Chamber’s Twentieth Century Dictionary, is “a niche or slab in a mosque marking the direction of Mecca”, the outer rectangle or square of the niche being innerly decorated with repeating out and in swelling curves that come to a pointed apex at the top.
90 per cent) the proprietors themselves happen to be very skilled craftsmen who carry their operations in the open yards or verandahs of their dwellings. The craftsmen running small operations of their own normally undertake the supply of finished products on order or on a contract basis.

The basic raw materials, viz., copper, zinc and brass sheets, or ingots required for the manufacture of the artwares, are normally procured from Chawri Bazar and Sadar Bazar at black market prices. Only a few units are able to procure a part of their raw materials supply at controlled rates through the State Trading Corporation and local agents, M/s. Gillinders Arbuthnot and Co.

The following are the main sales centres for the finished metalwork: various so-called art palaces in New Delhi's Connaught Place; Emporia, privately and State owned, such as the Delhi State Industries Emporium and the Central Cottage Industries Emporium, etc., the Red Fort curio shops; Sunder Nagar Market; Jor Bagh Market and the various curio shops in the principal hotels of Old and New Delhi, viz., the Hotel Imperial, Maidens Hotel, Ashoka Hotel, etc. The common practice is for the merchants from the curio shops to visit the manufacturing units and give orders for the manufacture of artwares on arbitrarily stipulated terms. The practice of advance payment for ordered merchandise is also prevalent.

Institutions and the Craft

There are three main institutions which directly or indirectly exercise a dominant influence on the functioning of the craft and are responsible to a great extent for the present state and the future development of the craft. These institutions are:

1. Directorate of Industries, Delhi Administration, Delhi.
2. All-India Handicrafts Board.
3. Dhatu Patra Co-operative Industrial Society Ltd.

The Directorate of Industries is a Department of the Delhi Administration which looks after the over-all functioning and requirements of the craft. The Directorate is housed in the Old Secretariat Building (5.2 kilometres from Jama Masjid). The Inspectors of the Shops and Establishments pay regular visits to the craft units and keep a close watch on their functioning and requirements.

The Delhi State Industries Emporium was set up on 2nd October, 1956 by the Directorate of Industries, with a view to give publicity to the products of handicrafts and small-scale cottage industries of Delhi State. The Emporium is housed in Saraswati Bhawan, E-Block, Connaught Place. It maintains a standing exhibition of Delhi's industrial products and also has a sales counter.

The All India Handicraft Board was set up by the Ministry of Commerce and Industry in 1948 with the purpose of reviewing and promoting the handicrafts of the country in the domestic as well as foreign markets. The head office of the Board is in Military Barracks, Willingdon Crescent, New Delhi. In 1952 the Board also set up a Handicraft Museum in Thapar House, Janpath. In 1957, in pursuance of an all India handicrafts programme, a Regional Design Development Centre was set up by the board at the Okhla Industrial Estate, New Delhi. Its main function is to stimulate the trainee craftsmen to be guided by the best in traditional Indian Handicrafts and from this springboard of technical and aesthetic excellence, to recreate crafts to suit modern taste and requirements. Designs developed at the centre are distributed free of charge to metal craftsmen, the manufacturer, the exporters and the co-operative societies.

Dhatu Patra Co-operative Industrial Society Ltd.

The Dhatu Patra Co-operative Industrial Society Ltd., is a local body of the craftsmen which looks after and promotes their mutual interests. Its main task is to procure work and raw materials for its members and to market their finished products.

For details see Chapter V pp. 175.
The society was registered with the Registrar of Co-operative Societies as a 'C' class Society in September of 1958. The society has its headquarters in Gali Sheesh Mahal, Bazar Sita Ram, Delhi. All the member units which are run by the craftsmen independently, are located in Gali Sheesh Mahal, Gali Bajrang Bali (Sita Ram Bazar), Phatak Namak, Gali Bandook Wali (Hauz Kazi), Sirkiwalan and Churiwalan area. All of these areas fall within a radius of one mile from the headquarters of the society.

The offices of the Registrar of Co-operative Societies and of the Assistant Registrar of Cooperative Societies are located in Old Secretariat Building Delhi and in Asaf Ali Road, New Delhi, respectively.

Concentration Pattern of Production Units
Table No. 1.1 gives a broad idea regarding the pattern of the concentration of the craft units in the city. The table shows that all the production units of the craft are located in the densely populated and famous localities of old Delhi, viz., Sita Ram Bazar, Turkman Gate, Jama Masjid, Ballimaran, Bara Hindu Rao Road, etc. In all of these localities, the production units are housed in the residential quarters of the craftsmen, or in the residential buildings, normally two-storied, of the localities, a major part of the buildings being utilised for living accommodation for local residents. In the majority of cases, the narrow streets of the localities where the craft units are housed lead to blind alleys. Normally, the production units of craftsmen operate on the ground floors—preferably in the open yards or in the verandahs of the residential structures, provided such are available.

All the localities where these production units of the craft are clustered are quite large, each one being composed of a network of several narrow streets. Yet in each locality the production units have clustered together in only a few streets, all of them close to each other. For instance, in Sita Ram Bazar, there are eleven production units of the craft. Of these, seven are in Gali Sheesh Mahal which is a small, narrow blind alley, and all seven are within a diameter of 30 yards. Three units are in another blind alley known as Mandi Namak, Hauz Kazi, about 150 yards away from Gali Sheesh Mahal, and one unit is in Gali Bajrang Bali, about 10 yards from Gali Sheesh Mahal. Similarly, in the Jama Masjid area nearly all the production units are concentrated in the blind alleys of Chitla Darwaza (three units); Barsabula (five units) and Churiwalan (two units) etc. It should be mentioned that all

| TABLE 1.1 Locality-wise Distribution of Craft Units |

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the Locality No.</th>
<th>Number of Establishments engaged in</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Process No. 1 Shaping &amp; Soldering &amp; Cutting work</td>
</tr>
<tr>
<td>1</td>
<td>Bazar Sita Ram Area</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Turkman Gate</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Jama Masjid</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Ballimaran</td>
<td>1</td>
</tr>
</tbody>
</table>
| 5      | Tiraya Bairam Khan (Ghas-
   ki-Mandi)              | 1                                  | 1                                | 1                          | 1                         | 1                 | 1     | 2·4    |
| 6      | Kucha Pandit            | 1                                  | 1                                | 1                          | 1                         | 1                 | 1     | 2·4    |
| 7      | Bara Hindu Rao Road     | 1                                  | 1                                | 1                          | 1                         | 1                 | 1     | 2·4    |
| 8      | Bahadur Garh Road       | 1                                  | 1                                | 1                          | 1                         | 1                 | 1     | 2·4    |
| TOTAL  |                         | 2                                  | 16                               | 5                          | 2                         | 1                 | 41    | 100·00 |

PERCENTAGE OF THE GRAND TOTAL: 4·9 26·8 39·0 2·4 12·2 4·9 7·3 2·4 100·00
these streets are also close to each other and fall within a diameter of 75 yards one from the other.

Table 1.1 shows that the Sita Ram Bazar and Jama Masjid areas, together account for 53.6 per cent of the total production units engaged in manufacture of brass and copper artwares in the city. Turkman Gate area, accounting for 9 craft units i.e., 21.9 per cent, is ranked third if placed in the order of numerical strength of the manufacturing units concentrated in different localities. Next comes the Ballimaran area where five units i.e., 12.5 per cent of the total units mainly engaged in chasing and cutwork on the artwares, are housed.

In Sita Ram Bazar Area and Tiraya Bairam Khan (Ghas ki Mandi), all the production units of the crafts are located in Hindu localities, that is to say, in lanes having an overwhelming majority of Hindus, and all of these units are owned by Hindu owners. In the rest of the localities, viz., the Jama Masjid area, Turkman Gate, etc. in Ballimaran, Kucha Pandit, Bara Hindu Rao Road, etc., all the production units are in the hands of Muslims and are located in lanes occupied mostly by Muslims. Out of the total of forty-one production shops, eighteen (i.e., 43.9 per cent) are owned by the Hindus and the remaining twenty-three (56.1 per cent) by Muslims.

A study of the locality-wise distribution of the production units and the different stages of production in which they are engaged (refer to Table 1.1) highlights the following important facts. Column 4 of the table shows that the number of production units engaged in shaping and soldering work, besides chasing and cut work (fret work or perforated work) of the brass and copper artwares constitute the largest single process of production work in which 39.0 per cent of the total craft units are engaged. It is followed by column 2, i.e., the production units engaged exclusively in chasing and perforation work, accounting for 26.8 per cent of the total craft units.

Sita Ram Bazar area accounts for eleven (26.8 per cent) of the total craft units (41) in the city. Out of the total of eleven production units, ten are exclusively engaged in chasing and cut work, besides the shaping and soldering of the artwares, and thus account for 62.5 per cent of the total production units engaged in similar work in the rest of the localities (refer to Table 1:1 col. 4). The only unit in the city which is engaged in the casting of artwares is also located here.

In the Jama Masjid area, out of the total of eleven units, five are engaged in shaping, scraping and impression work on the copper artwares. The only one composite unit that undertakes all the production operations from the shaping of the artwares to their final finishing, is located in one of the blind alleys of Chita Darwaza.

Turkman Gate area accounts for 21.9 per cent of the total units engaged in the craft. The three units engaged mainly in polishing the brass and copper artwares in the city are also located here. In Ballimaran area, Bara Hindu Rao Road, Bahadur Garh Road, etc. all the production units of the craft are mainly engaged in chasing and cut-work operations on semi-finished artwares.

It is significant to note that in each of the areas where the craft units are located a number of production units of other crafts also are flourishing. However, in no place has it been possible to trace out any kind of casual link between the craft units and the production units of the other crafts which exist in the same street, or even in the same building in the locality.

Number of Persons Employed
During the year 1963, there were in all 167 craftsmen engaged in the manufacture of brass and copper artwares in the city. 89 (53.2 per cent) of these were Muslims and the rest 78 (46.7 per cent) were Hindus. Table No. I.2 below gives locality-wise distribution of the craftsmen.
TABLE 1·1 No. of Persons engaged in the Craft in Different Localities.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the Locality</th>
<th>No. of Production Units</th>
<th>No. of persons engaged.</th>
<th>Total</th>
<th>Percentage of the total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hindus (M F)</td>
<td>Muslims (M F)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Sita Ram Bazar</td>
<td>11</td>
<td>57 (M) 9 (F)</td>
<td>23 (M) 34 (F)</td>
<td>66</td>
</tr>
<tr>
<td>2</td>
<td>Turkman Gate</td>
<td>9</td>
<td>4 (M) 23 (F)</td>
<td>13 (M) 3 (F)</td>
<td>27</td>
</tr>
<tr>
<td>3</td>
<td>Jama Masjid</td>
<td>11</td>
<td>5 (M) 34 (F)</td>
<td>13 (M) 3 (F)</td>
<td>39</td>
</tr>
<tr>
<td>4</td>
<td>Ballimaran</td>
<td>5</td>
<td>2 (M) 13 (F)</td>
<td>15 (M) 3 (F)</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>Tiraya Bairam Khan</td>
<td>1</td>
<td>8 (M) 5 (F)</td>
<td>3 (M) 1 (F)</td>
<td>13</td>
</tr>
<tr>
<td>6</td>
<td>Kucha Pandit</td>
<td>1</td>
<td>... (M) ... (F)</td>
<td>3 (M) 1 (F)</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Bara Hindu Rao Road</td>
<td>2</td>
<td>1 (M) 2 (F)</td>
<td>3 (M) 1 (F)</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>Bahadur Garh Road</td>
<td>1</td>
<td>... (M) ... (F)</td>
<td>1 (M) 1 (F)</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>41</td>
<td>78 (M) ... (F)</td>
<td>89 (M) ... (F)</td>
<td>167</td>
</tr>
</tbody>
</table>

The above table shows that the total working force engaged in the manufacture of brass and copper artwares in the city is constituted of males alone. In a majority of cases the craftsmen work in the production units of the very locality where they live. Sita Ram Bazar and Jama Masjid area, together account for 53·7 per cent of the total production units and employ over three fifths, i.e., 62·8 per cent, of the total craftsmen engaged in the total production units of all the localities. Further, Sita Ram Bazar area claims to be the single largest locality in the city, accounting for 26·8 per cent of the total production units and about two fifths i.e. 39·5 per cent of the total craftsmen employed in the craft.

A religion-wise distribution of the craftsmen in different localities shows that in Sita Ram Bazar area and in Tiraya Bairam Khan, Hindu craftsmen are in the majority, whereas, in the rest of the localities such as Turkman Gate, Jama Masjid, Ballimaran, Kucha Pandit, Bara Hindu Rao Road, etc., the Muslim craftsmen are in an overwhelming majority. For instance, in Jama Masjid area 87·2 per cent craftsmen are Muslims and 12·8 per cent are Hindus; in Ballimaran 86·7 per cent are Muslims and 13·3 per cent are Hindus and in Sita Ram Bazar 13·6 per cent are Muslims and 86·4 per cent are Hindus.

Craftsmen and the Nature of Employment

The employment structure of the craftsmen engaged in the manufacture of brass and copper artwares in the city represents a typical complementary inter-dependence among the Hindu and the Muslim craftsmen. Even today, the Hindu craftsmen maintain their traditional rating of being first in the skilful use of hammer and stake. They are also reputed to be outstanding in their skilful shaping of a metal piece in the precise form required by the customer. The Muslim craftsmen, on the other hand, enjoy a virtual monopoly in carrying out chasing and perforation work of the various designs and motifs on the semi-manufactured brass and copper art pieces. During our enquiry, we found that out of the total of 167 craftsmen engaged in the manufacture of the brass and copper artwares, 78(46·7 per cent) were Hindus and the rest were Muslims. The Muslim craftsmen also include 14 Kashmiri Muslims, primarily engaged in the chitai (chasing) work alone. Table 1·3 gives the distribution of the craftsmen according to their religion and the nature of work they are pursuing in the craft.

The above table shows that among the Hindus 69·3 per cent are thateras, (Hindu metal smiths), 10·8 per cent kaseras (originally the utensil sellers) and the rest 20·5 per cent include mainly sunars (goldsmiths) and Khatri. The Hindus are predominantly engaged in shaping and soldering of the brass and copper artwares and account for 72·0 per cent of the total craftsmen engaged in the shaping and soldering operations of them. Out of the total of 54 Hindu craftsmen engaged in the shaping and soldering operations, 85·2 per cent are
TABLE 1.3 Distribution of Craftsmen according to Religion and Nature of Work.

<table>
<thead>
<tr>
<th>Occupation &amp; Religion</th>
<th>Shaping &amp; Soldering</th>
<th>Chasing &amp; Cut-work</th>
<th>Impression work (copper)</th>
<th>Casting</th>
<th>Scraping (copper alone)</th>
<th>Polishing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HINDUS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thateras</td>
<td>54</td>
<td>11</td>
<td>5</td>
<td>3</td>
<td></td>
<td></td>
<td>78</td>
</tr>
<tr>
<td>Kaseras</td>
<td>46</td>
<td>4</td>
<td>2</td>
<td>8</td>
<td></td>
<td></td>
<td>89</td>
</tr>
<tr>
<td>Others</td>
<td>8</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td></td>
<td>...</td>
<td>8</td>
</tr>
<tr>
<td><strong>MUSLIMS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delhiwala</td>
<td>21</td>
<td>47</td>
<td>4</td>
<td>1</td>
<td>8</td>
<td></td>
<td>89</td>
</tr>
<tr>
<td>Kashmiri</td>
<td>21</td>
<td>33</td>
<td>4</td>
<td>1</td>
<td>8</td>
<td></td>
<td>75</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>75</td>
<td>58</td>
<td>9</td>
<td>6</td>
<td>8</td>
<td></td>
<td>167</td>
</tr>
</tbody>
</table>

Percentage: (44.9) (34.7) (5.4) (3.4) (4.8) (6.6) (100.0)

The Thateras and the remaining 14.8 per cent are Kaseras. The word thatera literally refers to the brass and copper-smiths, and the kasera refers to the craftsmen engaged in the shaping of the kansa (pewter) wares. The Thateras in the city claim to be the hereditary brass and copper workers, but the Kaseras here have reported their traditional occupation as the selling of the brass and copper wares. It is only very recently, during the mid-fifties in fact that a few of Kasera families, finding it remunerative, have taken to manufacturing brass and copper artwares.

The Muslim craftsmen who do the shaping and soldering work are known as ghartias. They account for 28.0 per cent of the total craftsmen engaged in these particular processes of the craft's production, and 23.6 per cent of the total Muslims engaged in all the operations of the crafts.

The chasing and cut work on the brass and copper artwares is known as chitai and jaalikat work respectively. The craftsmen engaged in chasing and cut work (fret-work or perforation work) are known as chiteras (chasers). 81.0 per cent of the total craftsmen engaged in the chasing and cut work are Muslims. 70.2 per cent of the total Muslim chiteras are Delhiwala Muslims and the remaining 29.8 per cent Muslim chiteras are Kashmiri Muslims. 11 Hindu chiteras include 4 Thateras, 2 Khatris and 5 Sunars. The Thateras and the Muslim chasers have recently learnt the craft from the Kashmiris. The Sunars too have recently switched over from carrying the ornamentation work on silver and golden articles to chasing and cut work on brass and copper artwares.

A majority of the Muslim chiteras (chasers). Delhiwalas as well as Kashmiris, have as their traditional occupation the chasing and engraving of the surface pattern designs on the silver and gold ornaments and artwares. The shortage of gold and silver and the decline of the former princely States of the country seriously affected the normal functioning of their trade. Hence, during the fifties, one finds that most of these craftsmen switched over to chasing and fret work.

The table shows that all the Kashmiri craftsmen engaged in the craft are working as chasers mainly on chasing the brass and copper trays. They constitute what might be called "floating" craftsmen, for they come to the city during the winter season of the year, and go back to Kashmir for a short interval of one or two months during the summer. Most of these craftsmen come from Srinagar (Kashmir) proper. Sometimes, if one of these "floating" craftsmen does not feel like coming from Kashmir to work in Delhi but has promised some manufacturer to return within a stipulated period, he sends some other craftsman down as his substitute. Similarly, if a Kashmiri craftsman has good relations with his employer but wishes to enjoy a short (or long) home leave, in consultation with his employer he arranges for some suit-
able Kashmiri craftsman before availing himself of the leave.

The Kashmiri craftsmen are regarded as the pioneers in carrying out the chasing work on the brass and copper artwares. In this particular craft field they possess unparalleled skill and are, therefore, comparatively better paid. It is said that the Kashmiris were first employed in the City by a well-known New Delhi dealer of metal artwares, Shri B. K. Aswani by name, who was the first to revive the manufacture of the brass and copper trays with the traditional raised borders which are referred to in this survey as the pie crust or egg and dart design with the chased and/or engraved surface of the tray featuring typical Kashmiri floral and chinär leaf patterns. The Kashmiri craftsmen were famous in Kashmir for their ornamentation work on silver and copper trays, samovars and other decorative objects and in Delhi they are now famous for similar work on brass and copper trays. The trade in silver artware products being dull in Delhi, the Kashmiri craftsmen accepted the terms and their decorative, finely chased floral designs found a popular market. Consequently, one finds that during 1960, the number of Kashmiri craftsmen in the city figured around forty. Thus, both the 'pull factors', i.e., attractive terms offered by the crafts, and 'push factors', i.e., the low earning permitted by their traditional erstwhile profession of ornamentating copper and silver wares in Kashmir, explain the influx of Kashmiri craftsmen into Delhi during this period.

Till 1959, the Kashmiri craftsmen enjoyed a complete monopoly in carrying out the chasing work on brass and copper artwares. But in early 1959 an unfortunate incident took place. One Delhi dealer in metal artwares received a large order for about two thousand chased trays featuring Kashmiri floral patterns from a firm in the United States. The normal wage rate of the Kashmiri craftsmen which prevailed during this period was Rupees 10/- per day, plus one month's paid leave. The dealer tried to make contracts with some of the Kashmiri craftsmen on a lower rate of pay, viz., Rs. 9 per day plus one month's paid leave, but all in vain. The Kashmiris stuck firmly to their current wage rate. Moreover, they formed a union and decided not to yield under any circumstances. The dealer then showed the sample piece, which had originally been chased by a Kashmiri and approved by the U.S.A. firm to some Muslim Delhiwala craftsmen, engaged in the silver ornamentation work. Some of them undertook to supply the full quota of trays corresponding exactly to the sample piece within the stipulated period at the rate of only Rs. 8/- per day. The order was duly executed. But the Kashmiri craftsmen acted very adroitly. They managed to trace the source of the order and, through letters, convinced the firm in the United States that it had been cheated in so far as the Delhi dealer had not supplied it with trays featuring Kashmiri floral motifs corresponding exactly to the sample piece that originally had been approved by the firm. Consequently, the firm cancelled the order and returned the whole consignment. The dealer incurred heavy losses but the Kashmiri chasers (chiteras) suffered equally, for the Delhi Muslim craftsmen had in the meantime learned the technique of chasing the Kashmiri floral motifs and soon gained great proficiency. The upshot was that a kind of cut-throat competition started between the Delhi Muslim metal artware craftsmen and the Kashmiri Muslim ones. The latter lowered their rates for chasing the floral motifs on trays (thal) from Rs. 10-12 to Rs. 5-6 per tray, with the result that the corresponding rates of the Delhi Muslim craftsmen have also fallen to Rs. 3/- per chased tray. This rates competition resulting in the lowering of rates of the chasing work has very seriously affected the present quality of the craft. Although the rates of the Kashmiri craftsmen have gone down drastically, yet their total earnings have not been so adversely affected. They are still well above the average earnings of the workers engaged in the craft taken as a whole. Formerly, in 1958, the Kashmiri craftsmen used to chase one or one and a half trays in a day, but now they chase two to four trays per day. Before 1958, they used to work with much greater ease and therefore more
carefully, whereas now they work swiftly and mechanically, from early morning till late in the evening.

The imitation of Kashmiri chasing art-techniques by the local craftsmen and the consequent cut-throat competition offered by them have been factors which have very definitely affected the standing of the Kashmiri craftsmen in the city. Apart from the disadvantages resulting from the lowering of rates, the Kashmiri craftsmen also have the disadvantage of weak staying power in the city. All of these craftsmen having left their families in Kashmir, they have to incur huge expenses in coming to Delhi every year and in getting suitable temporary accommodation. This reduces their net earnings considerably. Therefore, it is not very much surprising that the total number of the Kashmiri craftsmen in the city has gone down from 40 in 1960 to 14 in October-November of 1963.

During the last 5 years, the total number of non-Kashmiri Muslim tray chasers has gone up from 5 in 1958 to 33 in 1963. Most of these are of Delhi origin although a few have recently migrated to the city from Meerut, Muradabad, Jaipur, etc. The Muslims engaged in the craft are mostly Sheikhs, Pathans, Khans, Saiyads and Moguls.

Impression work, which is tapping out with a hammer various designs on the copper surface of the finished object by means of iron chisels and impression "pens", in the bases of which various designs have been cut, are locally called thappa ke kaam. This work is mainly done on the copper artwares. Before the impression work is undertaken, the copper artwares are given a brilliant shine by skilfully scraping their surface. This is accomplished by an indigenous technique requiring two craftsmen, one to manoeuvre the scraping of the surface of the copper plate (chhilai operation) and the other to ply the scraping lathe (khichai operation) as seen in plates IV-12 and IV-13 pp. 94. Scraping is done in the city only by the Muslims, whereas 55.5 per cent of the total craftsmen employed in the impression work (thappa ke kaam) are Hindus. The rest 44.5 per cent, are Muslims.

It is an interesting fact that almost all of the Thateras and Kaseras engaged in the craft claim to belong to the Suryavanshi Kshyatriya caste; that is to say, one originally associated with the warrior's caste. Few of the craftsmen questioned about this could even hazard a guess as to how it came about that from warriors they became brass and coppersmiths. However, one of the most commonly accepted explanations substantiating this claim finally came from some of the reputedly more knowledgeable older craftsmen and is given below:

It is said that around 5000 B.C. their forefathers were Kshyatriya kings. But once they became greedy and committed a contemptible act against a generous Brahmin rishi (saint) named Jamdagni. This incurred the displeasure of Jamdagni's son, Parush Ram, who took a vow that he would kill all the Kshyatriyas living on the earth with his parsa (a large axe). One of the Kshyatriya kings failed miserably in facing up to the challenge. His name is not known but the story goes that he took shelter in a temple in order to hide himself. He remained there for a very long time and to while away the tedium of idleness he shaped a metal bell (ghanta) and offered it to the deity of the temple. The king won widespread admiration for his work and soon orders to shape similar metal bells came to him by the hundreds. Later, his sons and relatives followed suit so that after a while the scope of the work was extended from the shaping of metal bells to the manufacture of various puja (votive) utensils i.e., small copper spoons, water containers, arati (votive) lamps and other utensils such as are used in the temples of today. The Thatera and Kasera craftsmen in Delhi claim to be the descendants of this king.

The event which incurred the wrath of Parshu Ram is briefly stated hereunder:

Renuka was Parush Ram's mother. Once she implored her husband, Jamdagni, who was
also the family priest of a King, to take her along with him to the King’s palace on a certain auspicious occasion. Jamdagni tried to persuade her that it would not be in her interests to go to the palace, for the men of the palace had a distinctly different mode of living which he suggested would not meet with her approval. In spite of all his arguments, Renuka insisted upon going. On the scheduled day, she dressed herself in her best, with ornaments and finest muslins, but on the advice of the rishi she also took some every-day clothes along with her.

In the palace, Renuka stayed with the Queens and her dress and ornaments had no equal. The eyes of the guests and others were constantly fixed on her garments and ornaments. The greedy, impatient, young queens plied her with questions about them and in order to cut them short, Renuka generously gave her clothes and ornaments to whoever expressed a desire to possess them. Soon she had given away all that she had taken with her and so had to return to her house in her ordinary clothes.

The rich illustrious ornaments and garments distributed by her gained wide publicity in no time. The men of the palaces finally decided to pay a visit to the ashram (home) of the rishi. They expressed their desire to the rishi who was in a great quandary for, as a matter of fact, he was living a very ordinary life in his simple quarters. However he had an extraordinary cow known as Kamadhenu. Now, Kamadhenu possessed a divine power which provided the rishi with everything he wished for. In the end, the rishi agreed to invite the palace gentlemen to visit him.

He arranged for fine tents for the kings and their families and served them the finest dishes. But the kings were actually only interested to peep into the stores of riches inside the rishi’s ashram, although for obvious reasons they were reluctant to mention this intention openly. Finding no other alternative, they sent their little princesses to play in the ashram. However, the rishi immediately sensed the evil intention behind this move and refused entrance to the children. But the obstinate princesses persisted in entering the store-room of the ashram and in his efforts to prevent them, the rishi unintentionally injured a few of them. Hearing the cries of the children, the kings rushed to the spot and after picking a quarrel with the rishi, they forcibly entered the ashram and took away Kamadhenu.

Parshu Ram was not present in the ashram when the incident took place but later on when he came to know about the unhappy incident he rushed after the Kshyatriya kings with his axe, killed many of them and finally got Kamadhenu back. On his return to the ashram he asked his father to recount the details of the happening. The rishi said that the root cause of all the trouble was his mother, Renuka, and ordered Parshu Ram to kill her. Parshu Ram obeyed his father’s orders, but at the same time he took a vow that he would massacre all the greedy Kshyatriya kings living on the earth. He started on an unending worship of his father. It is said that the rishi, pleased with the devotion of his son, asked him to make a wish and in his wish, Parshu Ram asked that his mother be restored to life. It is also said that the rishi granted the wish and that Renuka came to life once again.
A pattern of chinur leaves, a favourite Kashmiri motif chased on the surface of a round brass tray. Diameter: 22". II-1
DESIGN, which can refer to both the shape and surface ornamentation of art objects, forms one of the most reliable barometers of the richness of social and cultural heritage, and also of the historical character of a country. Indian Handicrafts are well known, recognised and appreciated by art connoisseurs the world over for their exceptionally fine forms and surface decorations, happily wedded together to produce objects of both utility and beauty.

Delhi being centrally placed in India and having occupied a position of more than ordinary importance as India's capital city for several centuries, automatically enjoys the privilege of maintaining close links with the other parts of the country. The city's location and status offer an unprecedented stimulus to the export of a large variety of utility-cum-decorative brass and copper artwares, featuring both religious and secular motifs, to all parts of the country. The heterogeneity of the artwares with respect to their shapes, forms and decorative patterns is wide and embraces the salient features not only of the sumptuous Mogul traditions but of Hindu classical art and of contemporary art the world over.

Designing, i.e., shaping the requisite form and the decorative patterns of the artwares, is not a simple task. It calls for complete concentration in which the hand, the head and the heart of the craftsmen operate in unison. The craftsman has to be extremely careful and highly concentrated while he is at work, not only in order to produce a perfect object, but also to prove worthy of the words: “Nothing gives greater pleasure to one’s inner aesthetic sense than the craft wrought by the cunning hand”. The sensitive hand of the artisan transforms the raw materials into perfectly balanced shapes and surface ornamentation which skillfully combine to produce a work of art.

The designing of these artwares, which is all done by craftsmen who have never had any formal art education, constitutes the life of the article produced. One of the most essential underlying qualities of design is rhythm. It is the rhythm that strikes one's eye first, draws the attention and creates a sense of pleasure and thus determines the innate quality of a designed object. The rhythmic attributes of these metal artwares are part and parcel of their basic forms and surface pattern decorations, although before giving conscious thought to the latter, the artisan's first concern is to give shape to metal objects. For this is his first and foremost problem in the designing of them. Tremendous care is taken by the craftsman to give his work of metal art, the requisite beauty of form, proportion and balance, first in shaping it and then in the surface embellishment of it.
History speaks in glowing terms of the quality and variety of the metal art crafts that flourished in Delhi in the past, for then too, the craftsmen possessed an understanding of the aesthetic values they needed to bring to the artwares they produced. The artwares then produced in the city were known and valued all over India and in foreign countries for just these properties. But perhaps history prefers to be erratic. As has already been mentioned, the first half of the twentieth century released an array of untoward shocks that led to a decline in popularity of the craft and deterioration in its former high standards of production. The traditional brass and copper artwares of the city, which once had occupied an esteemed place among the handicrafts of India, lost much of their vitality and vigour during this short span of time. The political unrest resulting from the fall of the Mogul Empire, the decline of princely states and jagirdars (grantees) who were the chief patrons of the craft, and the partition of 1947 that led to unhealthy wholesale migration of ustads (masters) and talented Muslim craftsmen as well as the wealthy Muslim section of the population who constituted the main admirers and buyers of these utility-cum-decorative artwares, all combined to bring about far-reaching changes in the social and economic outlook of the Indian people. The growing preference for cheap, machine-made, handy articles which followed the dawn of 20th century, have contributed mightily to a slowing down of creative incentive among the craftsmen of today to produce articles of rare beauty and finish.

Although these days one finds a wide range of Delhi artwares with a large choice of make and design, yet the eyes of an art historian or even a keen lay observer would soon discover that neither the technical execution nor the quality of the designs in most of the specimens are as distinguished as those which historical accounts of them describe. They lack that elegance of form harmoniously harnessed to textured surfaces of design which was the hallmark of their fore-fathers. In his ‘Indian Art Exhibition, Delhi, 1902-3’; Sir George Watt remarked that the craftsmen of Delhi being “great bird fanciers, designs featuring birds are often prettily made in brass... Delhi has a speciality of small boxes which were very popular among native ladies. They are oblong or sometimes heart-shaped and the upper lid is perforated and engraved with the patterns of birds and foliage. A second lid discloses a looking glass. Large quantities of these caskets were made.” Nowadays, one rarely finds these boxes with the “prettily designed birds” about which Sir George Watt so enthusiastically wrote at the turn of the nineteenth century. Nor are the delicate Persian motifs which required such thorough calculation and possessed such rare finish any longer produced by Delhi’s contemporary metalsmiths. The enamelling of brass in the production of fine chikan work (engraved metal artware, in the interstices of which a coloured or black lacquer background is given) no longer finds the Delhi craftsmen doing it.

A go-round of Delhi’s currently operating manufacturing units would prima-facie give the impression that the brass and copper artware manufacturers, as well as the craftsmen, lack creative drive and business imagination. As many as 78.1 per cent of the total manufac-

---

1 Religious motifs: appreciated most are images of such deities as Lord Shiva, Parvati, Natraj, Hanuman, Radha and Krishna, etc.

Secular motifs: in vogue are mainly floral patterns; scrolled design of leaves and creepers; leaves and flower of chameli (jasmine); chinar leaves of a tree found only in Kashmir; patterns of the rose, the lotus and a large number of geometric designs resembling squares and parallelograms; shapes of fish scales are also used, particularly in perforated work.

Native motifs: Rich surface decoration of patterns generally elaborated in chased or low relief work featuring Historical monuments such as Taj Mahal, Qutab-Minar, a scene from the caves of Ajanta, Ellora, etc.; hunting scenes—a lion confronting an elephant; a scene at the village well; portraits of historically renowned figures such as Shivaji, Akbar, Maharana Pratap, etc.

2 G. Venkatachalam, “Design in Handicrafts”, an article produced by All India Handicraft Board.
turing units were found to have no show-rooms at all. The variety of artwares in the show-rooms of the others was far below a respectable proportion of the actual production range. It has also been observed that most of the chiteras (the craftsmen exclusively engaged in chasing) have a set of decorative motifs which they transfer indiscriminately on most of the articles, most of the time without any discretion as to their design arrangement, which often results in disproportionate forms with unbalanced ornamentation vis-a-vis the shape of the objects that only succeeds in assaulting the eyes of the beholder. It is true that in a large number of instances the fine traditional shapes and surface design motifs are handed down from father to son, but often the son mechanically copies them without making any individual design contribution of his own, with the result that the standard of craftsmanship deteriorates in this unproductive process of repetition.

Yet, a second prudent look into the problems and handicaps experienced by the craftsmen, and at his manufactured artwares, will reveal that any categorical inference that the brass and copper artware craftsmen and manufacturers of the city lack creative urge and imagination, is a hasty one and probably not even warranted. In spite of their being illiterate, or rather, having low literacy standards, most of the craftsmen interviewed were found keen to try out new designs and even evolve self-created articles. But the means with which to materialize their creative urge and imagination were beyond their reach. The first bottleneck that thwarts their every effort to put new designs on the artware market has its roots in the difficulties and harassments involved in the procurement of the basic raw materials of this craft. It is very common to hear the craftsmen-cum-manufacturers grumbling because they are unable to obtain basic raw material, i.e., brass, copper and zinc even at high black market prices—these being insufficient to meet their orders. Under the circumstances, to conceive of utilising raw materials for purely experimental projection when raw material is not even enough to meet the orders in hand, is to these practical craftsmen, completely unrealistic. Some of the craftsmen, and also the craftsmen-cum-manufacturers, reported that their earnings are hardly enough to meet the bare necessities of life; that this sorry situation does not permit them to risk what residue capital may be left to invest in new ventures, viz., the development of new metal artware designs.

Another kind of cut throat competition exists among the craftsmen, particularly amongst the chasers (chiteras), which is to a significant extent responsible for the deterioration in chased and perforated surface ornamentation patterns. Nowadays, amongst the many surface decorative motifs, the Kashmiri chinar leaf, scroll patterns and the lotus (kamal) motif are the most popular ones. Till 1958 or so, these motifs were mostly chased by the Kashmiri craftsmen, who are actually the best designers and more capable of giving a good decorative finish to their products than are the local craftsmen. But from 1958 onwards, the Delhi craftsmen started imitating them very expertly indeed and at lower rates. Formerly, a Kashmiri used to chase one tary, the average size being 36” to 54” at the rate of Rs. 12 to 18 per tray—taking about one or one and a half days to do it. But today, because of rate competition (now the rates are Rs. 5 to 7 per tray), the same Kashmiri craftsman completes chasing work on two or three trays per day. This has naturally resulted in lowering the standard of the chasing work done by them. There is hardly any doubt about the truth of the old quotation: “Work done least rapidly, Art most cherish’d.”

However, in spite of the general decline in design standards of the craft, the traditional shapes and surface designs have not entirely vanished. There is still a wide range of beauty-cum-utility artware produced in the city which sustains the
rich Mogul metal art traditions and the use of their popular chased design motifs. The popular Hindu art motifs are not completely lacking either. Before furnishing an analytical account of the forms and surface patterns of some of the widely demanded utility-cum-decorative artwares, a few lines regarding the origin and development of designs on brass and copper artwares are added below:

**ORIGIN & DEVELOPMENT OF DESIGNS**

As regards the origin and development of the designs, *i.e.*, shapes and ornamentation, of the brass and copper artwares in the city, an historical record of them presenting a textual and pictorial chronological development of them, has never been gathered under one printed roof, so to speak; such scattered historical accounts as do exist give the rather superficial impression that this craft emerged and flourished in Delhi only under the patronage of the Moguls. Doubtless they were great art connoisseurs, and it is also true that the craft made spectacular strides during the Mogul regimes and reached its highest peak of development under their affluent patronage. Certainly most of the artwares produced today possess the characteristic features of Mogul designs. Even so, to accept as fact that the craft emerged in the city purely under the stimulus of the Moguls side-steps the truth. Hindus too were connoisseurs of metal art; but they adopted art as the handmaiden of religion; sacred icons and temple utensils were produced and used not for man’s glory, but for the glory of God. A careful study of the history of the arts of the country would suggest that those Hindus who lived before and even contemporaneously with the Mogul period, were highly aware of art values. They paid it the highest reverence inasmuch as they utilised it with care and devotion in the service of their spiritual beliefs. As, art historians the world over agree, crafts which were produced in association with religion were most apt to possess the aesthetic stature that places them in the category of moving works of art. The Hindu craftsmen were known for shaping the beautiful and lively caste images of deities; Lord Shiva and his consort, Parvati; Lakshmi, goddess of wealth; Ganesha, god of sagacity; Durga, goddess of rhythm and creative power; Hanumana, the monkey chief. Their masterly shaping and designing of metal votive (arati) utensils and votive lamps featuring sacredly symbolic cast metal forms of the cobra, the fish, the elephant, the swan, the lotus and peepal (sacred fig tree) leaves are equally well known. Some of the Muslim invaders who ruled Delhi from the 11th century till the 17th century, and because of their religion of one God and one Faith (laid down in the holy Quran), were deeply opposed to the very idea of idol worship and the Hindu multiplicity of gods. Consequently they wrought disastrous havoc on the centuries-old Hindu craft traditions and way of life by desecrating many of the Hindu religious institutions and destroying many of the traditional sacred metal temple crafts and icons.  

---

6Gupta period (4th Century A.D. to 6th Century A.D.) was the golden period in the history of Indian Culture and Indian art. Shri Chintamani Kar in his book ‘*Indian Metal Sculptures*’ 1952, writes “The Gupta metal images have great artistic merit: they show high technical skill in casting of large size figures. During this dynasty various classical traditions and foreign influences were completely blended and assimilated into the style of Indian figure art. At this time the religious images became regulated by priestly codes. The style of sculpture formed by the Gupta artists became the ideal art for later centuries and this continued until the advent of Islamic armies (from 15th Century) which were pledged to the destruction of idols.” (p. 3). 

---

4“From the point of view of the Indian Artist too, religious import was every thing; their conscious endeavour was concentrated upon that. Design, colour composition, all the purely aesthetic elements of their work were left to the intuitive activities of mind.” Mukul Dey:—*My pilgrimage to Ajanta and Bagh*, introduction by Laurence Binyon, pp. 19-20.
However, in spite of the atrocious rule of some of the early Muslim invaders, today essentially Hindu designs and motifs on brass and copper artwares are found working harmoniously together with the ancient Mogul’s favourite shapes and design motifs. The erstwhile taboo among the Muslim craftsmen not to chase or engrave human or animal figures on the artwares is no longer adhered to. These days, it is not unusual to see Muslim craftsmen chasing figures of—Akbar, Mumtaz Mahal, Jahangir, Shivajee, Budha, Krishna and Jawahar Lal Nehru, etc., which a hundred years ago would have been absolutely prohibited, due to the Muslim belief that to portray images of man belittles the one God who is to be felt but never seen.

Traditional Motifs (Mogul)

For reasons stated above, the Mogul metalsmiths have concentrated on secular designs, the most commonly featured in their artware being globular, cylindrical, circular, rectangular and oval in form, while surface decoration is geometric with imbricate and ogge patterns combined with floral and leaf motifs which are chased or engraved in low relief or by embossing with special tools, the designs of which are cut into the bases of them. Amongst the floral motifs, branches and bunches and grapes and grape leaves, intertwining creepers with leaves, chinār leaves and jasmine petal and rose motifs arranged in curvifoliate formations are popular with them, chaukālia (four petals), or atha kalia (eight petals), all being patterns which produce the classical rosette are in the greatest demand. A large number of geometric and imbricate or fish scale designs which are used in the production of both chased and perforated objects, are also to be seen in Muslim artwares. Some of the designs carry popular local names suggested by the shapes and forms of actual objects such as sweets, animals or certain creatures which they most resemble. For instance, there is one favourite diamond shaped pattern used in ornamentation work which is called shakkarpara, this being the name of a popular local sweet prepared with fine wheat flour (maida) and sugar and then cut into diamond shapes. Square patterns are also called barfi, a sweet prepared with milk and sugar and cut into squares. Some surface ornamentation work resembles the scales of fish and this is known as mahipusta, which literally interpreted means scales of a fish design. Patterns corresponding to the lovely shapes of the historic curvilinear gates (dars) featuring arch and the doom motif, or smooth flowing curves of arculate forms within a rectilinear frame, which, as mentioned earlier, indicate openings symbolising the direction of Mecca, are known as mihrabs (see Plate II-A). Also pailldar, a concave shaped pillar, constitutes one of the most favoured motifs used to decorate the forms of the polygonal, perforated hanging lampshades (Plate II-7A). The various designs representing such historical buildings as the Taj Mahal, Qutab Minar and Lal Qila (Red Fort), are known by the name of the buildings they resemble.

It is significant to note that with the exception of a special kind of decorative floral motif called guldasta which consists of bunches of different kind of flowers in a vase, the patterns of historical buildings and the mihrab patterns (which are first traced in outline on the surface of the objects), the floral and geometric design motifs are all chased or perforated with suitable tools and appliances purely from the craftsmen’s memory.

possible of the buildings and art work of the Hindu idolators, who had become their subjects. In pursuance of that policy during the course of five centuries (1200-1700), immense areas were absolutely denuded of all Hindu buildings and, of course, at the same time, of all works of art connected with those buildings.

It is true that in the 16th and 17th Centuries some of the Mogul rulers relaxed their restriction on Hindu religious ceremonial functions, and there were instances when metal images were made for temples and homes. But the creative genius of the old sculptures was lost irrevocably during the long suppression and wanton destruction of the art by the iconoclastic fanatics. Only the remote regions where the Islamic army could not penetrate, such as Nepal and Tibet the practice of highly skilled metal statuary remained unhampered. (p. 5).
Mihrab, a sharply-cut figure featuring leisurely flowing curves of the arcuate forms meeting at the apex to form a dome.

The floral motifs and historical building designs are normally chased or worked in low relief or embossed on the surface of artwares, whereas the geometric designs are mostly executed in perforated work.

**Traditional Motifs of the Hindus**

"The Hindu view of art is the Hindu view of life, as interpreted by religion and philosophy."  

The Hindus traditionally utilised brass and copper artwares for votive purposes. Art to them was purely a means to purify and exalt the inner soul (kalanam praware chitam कलानाम प्रवरे जितम / Vishnu Dharmottar Puran). It enabled them to conceive of the visual form of their Almighty Omnipotent yet generous, all-pervasive and omnipresent, who was nevertheless an unseen Ishta (living faith in the form of a deity). They conceive of the God as assuming oneness out of its manyness; unity out of its multiplicity; the infinite out of the finitude. Art to them was purely a means of materialising their religious impulses and imaginations regarding the conception, form and nature of their revered Ishtas (deities). Therefore, as a matter of course, even today one finds amongst the most common Hindu motifs in vogue which are executed in delicate chasing in low relief; or the mould cast images such as the elegantly-stanced and lively figures of Shiva in his cosmic role of Natraj, the king of dancers (nat meaning dancer and raj meaning king); Shiva, the creator and the destroyer; Krishna, an incarnation of the god Vishnu and the preserver of the Universe; Hanumana, the monkey chief who is the son of the wind and thus known as pavan putra—pavan meaning wind and putra meaning son—and also the true sevaka, the servant of Ram; Ganesha (son of Shiva) known for his gentleness and prudence; Lakshmi, goddess of wealth and prosperity. These, then, are the Hindu metalsmith's *dramatis personae*, so to speak—the celestial cast of their cast metal images.

Amongst the firmly established Hindu crafts' motifs of birds and animals, the most favoured ones are the elephant, the bull, the hansa (swan) and the peacock. These are mostly used as symbolic motifs in the chasing of the surfaces of their brass or copper wall plates and trays. The peacock is the vehicle of Kartikeya (Lord Shiva's son), renowned for his might and of a calm and profound nature. The swan (hansa) is the vahana (vehicle) of lord Brahma, the creator of shrīṣṭi (the universe) and is also the vehicle of Saraswati, the goddess of truth and learning. It is a peace-loving bird, reputed for its sagacity and purity and it also signifies atma or the soul. Great saints known for their sanctity are designated by surname of paramhansa, i.e.,

---

"...a life is for them Hindu a sacrament, the same ideal of religion and philosophy, which is the goal of priestly art dominates all other forms of art too."  

"Indian thought does not isolate objects by aesthetic analysis or any other analytical process. The associations of a pie of sculpture or a whole temple and the associations of the person brought into contact with it both contribute to the state of mind from which the sense of values is derived."  
Mr. K. de B. Codrington: *An Introduction to the Study of Medieval Indian Sculpture*, pp. 19-20.

—for details of Natraj see pp. 57-58.
perfection Hansa. The peacock, also the national bird of India, is loved for its beauty.

Among the floral motifs, the kamal (lotus) still enjoys the privilege of being the most frequently used motif for decorating the surfaces of the chased artwares. It is the symbol of generic power, springing from the nabhi (navel) of lord Vishnu, preserver of the shrishti (Universe). It is believed that in the early stages of the development of the universe there was nothing but water everywhere. In due course of time, up from the water sprang a hundred bright lotuses, all from the navel of Lord Vishnu. Later, the land (the earth) emerged. In Vedic literature, the earth is referred to as kamal-rupi, or having a form resembling a lotus, the water symbolising the body of the woman and the lotus the virgin part of her (yoni-vat).

Ganesha, son of Shiva, known for his sagacity and wisdom, is sitting on a padampitha (lotus pedestal). His hands, legs and neck are adorned with ornaments. In his right hands he holds a lotus, while a trident is in the other. His left hand holds a small parasa (axe).

Kashmiri Motifs

Recently, that is to say in the mid-fifties, the Kashmiri craftsmen in Delhi introduced some very distinguished motifs essentially typical of Kashmir, the most popular of which was the leaf of the chinai, a species of tree found only in that State. So it is but natural that these same designs, produced largely from memory by the Kashmiri craftsmen, should have appeared on the Delhi artware market. The lotus motifs inspired by the blooms that abound in the waterways of Srinagar during August, and the chinai leaf patterns, chased on the flat surfaces of copper and brass trays, were, and are now, without peer in Delhi.

Recent Trends

A new trend has been noticed in the design development of brass and copper artwares.
Paradoxically enough, some of the Delhi manufacturers have stepped up the revival and commercial exploitation of the more celebrated of the traditional artware motifs in an attempt to modernise their existing designs. It is also interesting to find artware trays featuring chased patterns depicting scenes from the wall paintings of the Ajanta caves. Wall plates and trays featuring the native scenes of a group of women at a village well, a hunting scene or portraits of historically renowned figures are also enjoying an increased demand.

Possibly taking note of the perennially popular subject matter of the encrusted art metal plates produced at Tanjaur in Madras, and so many of the copper and silver repoussé plaques made in Varanasi, the Delhi artware craftsmen have begun to add to their design repertoire motifs of the Hindu deities and the low relief chased patterns featuring historically famous personalities. These are mainly used to decorate the surfaces of brass and copper wall plates. The outlines of these are first drawn with pencil or ink on paper which is made secure on the surface of artwares and then traced. The paper is removed and the traced design is then chased with tap hammer and fine steel chisels after the metal has been embedded in ral.
ARTWARE PRODUCTS

Both Hindus and Mohammedans regard copper as the purest of metals. Yet it is very common to find that brass is most frequently employed by the Hindus and copper by Mohammedans. By and large, the Hindus traditionally used copper for shaping votive articles whilst the Muslims have traditionally used copper for producing utility-cum-decorative artwares after being tinned. It has been reported by professionals engaged in the craft that before the partition of 1947, the copper artwares were produced in much greater quantity than they are now. Today the metalsmiths in Delhi mainly manufacture brass artwares. The share of copper artwares in the total volume of brass and copper artwares production is even less than one fourth (25%). The explanation for the proportionately higher volume of brass artwares production and this despite the fact that it is technically easier to carry out chasing or perforation (cut work) on copper than on brass, probably lies in the following two factors: (a) the unfortunate shift of talented Muslim craftsmen, and the wealthy section of the Muslim population to Pakistan during the partition of the country in 1947; and (b) the technical and economical supremacy of brass artwares over copper artwares, the former being cheaper and more durable than the latter and also the brass products being less affected by moisture and humidity in a changing climate such as India's, than the copper ones.

The use of copper (metallic) vessels by Muslims is prohibited in their holy Quran; but it is believed that the prohibition of copper is removed by its being tinned.
The following lines give a brief description of some of the widely produced utility-cum-decorative artwares.

**Thals (round or oval Trays)—also used as table tops on folding wooden stands**

The artware trays form one of the most distinguished and widely produced artwares of Delhi. The first of the popular motifs with which they are decorated are secular, that is to say, of Kashmiri origin and are of very recent origin in the city. The most popular shapes of these trays are rectangular, oval or round forms with an upwardly raised rim featuring the egg and dart or pie-crust pattern. The patterns of the surface decorations are usually chased *chinai* leaves and the lotus or the lotus flower combined with *chinai* leaves, (see Plate II-1 and II-6).

Some trays depicting indigenous Indian scenes, portraying famous kings of the past (see Plate II-5) or historical buildings, wild animals in the background of jungle growth (see Plate II-4) are also chased on the top surfaces of wall plates. The chasing work on the trays is mostly perfected either by the Kashmiri Muslim *chiteras* (chasers) or local Muslim *chiteras*. The shaping of trays with the egg and dart rim design, is done by the Hindu craftsmen known as *chiteras*. The trays are generally made of brass sheet metal. The size of trays varies from 22 to 54 inches, those between 48” to 54” being oval in shape with their weight varying from $\frac{1}{4}$ of a kilogram to 14 kilograms. The cost of the trays varies according to their size, shape and ornamentation work. from Rs. 12 to Rs. 140.
Perforated all-over lotus pattern decorating the surface of brass tray (thali) with a raised pie crust or egg and dart design border. Diameter: 36"
Brass Darwala gole (round) lamp, the top part of which is shaped like a minaret, the hexagonally-shaped middle portion features six mihrab-shaped ground glass openings and the base is shaped like an inverted dome. The lamp features flower and leaf motifs in perforation work. Height of lamp: 56 cm. Dhakkan (the lid): 18 cm. each, and the patti (central frame of the lamp-shade): 20 cm.

Perforated Hanging Lamp-shades

Perforated hanging lamp-shades are essentially of Mogul Origin. These are manufactured in a large variety of shapes and in a number of designs, the most common motifs being floral motifs, creeper and leaves (bail-patti) and geometric designs, chaukaliya jal (four petal fret-work); chameli (Jasmine flower); mahipusia (fish scales or the imbricate pattern); shakkarpata or diamond shaped fret-work; barfi or square cut work. Currently produced perforated hanging lamp-shades make provision for the neat fitting
Cylindrical (gole) perforated brass lamp-shade featuring an almost total imbricate design known as mahipusta jaal, or net-work of fish scales. Overall height of lamp-shade 48 cm., tops: 5 cm. each; caps: 12 cm. each; central frame: 24 cm.

Perforated copper globular-shaped lamp-shade with round lid (gole: chakkan). Globular central frame: 30 cm.; round lid: 5 cm. The round lid and the central and lower half of the globular frame of the lamp-shade (marked by arrows) feature chaukalia jaal (four leaf fret-work) design motifs. The adjacent bands i.e. those adjacent to the sides of the central band of the globular frame, feature a floral fret-work. Total height: 35 cm.

of electric bulbs inside their frames although some also provide fittings for candles. Some of the four or six-sided brass lamp-shades feature mihrab-shaped openings, technically referred to as gates which are fitted with ground or blind glass so that more light is possible than that which would come through the solid bank of fret-work. The most common size of the perforated lamp-shades ranges between 20 cm. to 80 cm. The price of the lamp-shades varies from Rs. 35/- to Rs. 90/- according to their size and pattern. These are made of brass sheet metal.
Wall Plates

The decorative wall plates, which are made of brass as well as copper sheet metal are generally characterised by figures of various Hindu deities, historical personalities and indigenous scenes in low relief or high relief work. The wall plates most in demand are circular in shape and range between 16 cms. to 25 cms. in diameter. The cost of them varies according to the size and intricacy of the decorative surface motifs, from Rs. 15/- to Rs. 50/-.  

Ewers and Surahis

Ewers and surahis are very handsomely shaped, the latter being elaborately chased with curvifoliated designs such as creeper patterns with leaves and four petaled flowers, almost invariably worked in an all-over pattern. These water containers are largely made of copper sheet metal, the inside of which is tinned. The spouted water jugs or ewers are usually globular or oblong in form and feature beautiful and often intricately shaped handles. Surahis have more deli-
cate and aesthetically distinguished shapes than those of the ewers. The surahi with its rhythmically proportioned cylindrical neck and globular body, is an object one might well call a museum piece. The size of these water containers ranges between $5'' \times 3''$ and $15'' \times 7''$ and that of the tumblers which fit over the neck between $9''$ to $22''$.

**Tibetan Artwares**

Tibetan artwares have long been famous for their interesting shapes and ornamentation that mirror both the material and non-material culture patterns of the Buddhist people of that country. The production of Tibetan artwares greatly increased during the post independence period, and with the supply of Tibetan made artefacts now cut off they have become so greatly in demand in New Delhi with its large foreign embassy personnel, that they are now being copied by Delhi metalware artisans. The Tibetan *folding baja*, i.e. collapsable section horns; *lahariya baja*, undulant shaped horn and *sher baja*, dragon shaped horns, featuring a cylindrical and copper body are particularly popular with the New Delhi tourist and the embassy clientele. These otherworldly ceremonial objects are made of copper sheet metal encrusted with chased geometric and foliated designs and dragon motifs of German Silver (white silver), see Plate II-8-A; 8B; 8C and 8D. The Size of the Tibetan collapsable section horns generally varies from 2' to 5' long (weighing about 6 kilograms). These are sold in pairs, the price per pair ranging from Rs. 60 to Rs. 120. For a pair of folding horns, each being 5' long, the price per pair is Rs. 120/-; Rs. 90/- per pair for horns 4' long, and Rs. 60/- per pair for horns which are 3' long.

The Tibetan tea bowls are also very popular with tourists. These are made of copper sheet metal, the inside of the bowl being tinned, electroplated, or lined with a sheath of German Silver. The outer copper surface is often ornamented with chased stylized motifs of German silver featuring Tibetan women in flowing garments, alternating with four petaled rosettes of tied folds of the robe, see Plate II-8-A; 8B; 8C and 8D. The Size of the Tibetan collapsable section horns is generally 48''.
Sher Baja, a curvilinear copper horn featuring a form of a fierce Chinese dragon emitting out burning flames from his body all deeply chased in German silver and super-imposed on the copper body. Size: 16" long.  II-8C

Lahariya baja undulant shaped ceremonial copper horn decorated with chased German silver super-imposed on the copper body. The wide end of the horn represents a famous Chinese motif of furious dragon with wide eyes and long fangs coming out from the both nostrils and flame stemming out from the hair and the body. The flattened spherical form features undulating deeply chased work. Size: 20" long. II-8B
springing from a linear stem. At the bottom of the bowl there is a small circular German Silver base chased in the form of a stylized wreath (see Plate II-8E). The sizes in which these small tea bowls come is 3¾" × 2¼" and the large one, 5¼" high with a diameter of 9¼". The price of the bowls ranges between Rs. 8/- to Rs. 50/- according to their size and quality.

The copper Nepalese tea-pots with deeply chased German Silver spouts and handles, often, made in the form of dragons, and domed German Silver lids, topped with bosses, also deeply chased with floral and dragon motifs, are in great demand in the capital, particularly during the many international conventions held here (see Plate II-9). It is to be added that these tea-pots must be credited with more than just decorative or souvenir value, for as they are tinued on the inside they make readily usable as well as extremely handsome coffee pots and tea-pots. Their retail prices range between Rs. 25/- Rs. 45/- and Rs. 75/- according to their size and quality.

It is to be noted that the sizes and ornamental motifs are not very rigidly adhered to in certain artwares. They often vary according to

---

*The Tibetan woman is worshipped in Tibet as the ‘Mother Goddess’ and is known for her fecundity cult. The goddess worshippers offer prayers to her for she is the Mother of the world, the essence of reality and the secret of the cosmos.*
the customer's requirements. Thus, the manufactures of the artwares are dynamic in the sense that they change the shape, size and ornamentation motifs of the artwares according to the specific tastes and prescription of specific consumer. Moreover, many a craftsman-cum-entrepreneur is so adept at his work and in his business dealings that he takes orders for artwares on the basis of photographs of artware objects sent him by both Indian and foreign customers. Some manufacturers have also reported the fostering of links with the New Delhi Design Development Centre of the All India Handicraft Board at Okhla Estate, as many of them have used the designs developed by this centre to definite business advantage.

Tibetan copper bowl. The main body of the bowl consists of copper sheet metal and the inner side is covered with the thin sheet of white metal. The outer side of the copper bowl is decorated with chased white silver Tibetan motifs of the 'Mother Goddess' alternating with four petalled chased white silver linear rosettes springing from a central linear stem. Height: 5½" Diameter: 9¼".
Metal Icons (Murtis)

A large number of cast images are produced in the city and shipped to Bombay and Calcutta, and also sold to the dealers-cum-exporters in Delhi. The casting technique locally prevalent is that of box-moulding. The castings are generally made of brass scrap and given the final finish with polishing buffs followed by oxidation, the latter being done with a view to giving the images the impression of antiques.

The images of the various Hindu deities cast by the local craftsmen represent their traditional forms, gestures and appurtenances which most buyers of them have known from childhood and hold them in great reverence. These are produced with considerable care in order to achieve as exact a replica as possible of the historical figures and gods and goddesses the artisans of ancient India have sought to portray. Unlike

Nepalese Tea-pot made of copper tinned on the inside. The lid, the neck, the handle and the spout of the tea-pot are adorned with white metal (German silver) cut into different shapes and deeply chased into various patterns to represent the popular motifs of the lotus, dragon, etc., and then super-imposed on the copper base. Height: 9".
the metal icon craftsmen of ancient India the metal artisans of today are non-literate and so, know little or nothing about the metal casting techniques and principles laid down in the ancient Shilpa-shastras', i.e., art treatises. They rely more on their own common sense and ability to do an able job as copyists, rather than on those old precise formulae which formerly were so strictly carried out under the influence of religion and philosophy. In the present section an attempt has been made to furnish a detailed account of the myths, legends and descriptions of some of the metal icons most currently produced in Delhi, for even today through these replicas of them, is revealed the public's demand to preserve India's ancient cultural values.

Ardhanari (Shiva in half Male and half Female posture)

Ardhanari, i.e., half male and half female, or, to be more correct, Ardhanarishvara; half male and half female body of the God, the male half representing Shiva and the female half representing Parvati (daughter of the mountain and the wife of Shiva), was held in high reverence by the Hindus of ancient India. Interpreted from the viewpoint of religious philosophy, the Ardhanarishvara form of Shiva signifies the idea of oneness and the indivisible union between the Father God and the Mother God. It bespeaks their likeness and basic unity in the midst of differences. The glory of the Ardhanarishvara, i.e., the concept of the Supreme God as the male-half and female-half combined in one as the indispensable halves of a body, reached its climax during the Puranic Days. In Shiv-Purana there are a number of references to the Ardhanarishvara form of Shiva. The great Hindu poet, Kalidas, opens the first hymn of his immortal work, viz., 'Raghuvansa', by offering a prayer to the Mahesa (another name of Shiva) and Parvati, conceiving them as being united in one body. The prayer salutes Parvati and Shiva who are always and incessantly united like words and their meanings, the wish inherent in the prayer being to


Shilpa-shastras or art treatises on sculptures, metal image casting architecture, and also on painting are the historic documents believed to be written by the rishis (art-experts, or the mythical and half mythical sages) between the 1st century A.D. and the 10th-11th Centuries A.D. These works prescribe a number of 'Do's and Don'ts' expressed in the forms of verses. Kears in Tamil Shilpa-shashtra published in Indian Antiquary, V., 1876, writes: "The Silphin" (craftsmen) "should understand the Athar-veda, the thirty-two Shilpa-shastras and the vedic mantras (hymns) by which the deities are invoked. He should be one who wears a sacred thread, a necklace of holy beads and a ring of kusa grass on his finger; delighted in the worship of God, faithful to his wife, avoiding strange women, piously acquiring a knowledge of the various sciences, such a one is indeed a craftsman".

The laws regarding the making of metal images are scattered in different Silpa-shastras, many as early as the Gupta Period and probably before. Dr. Mulk Raj Anand in his "The Hindu View of Art", Chapter three *Principles of artistic practices*, mentions that the "Six Silpa-shastras, the Brihatashikha, the Sukraniti-sara, the Vishnudharmottaram, the Matsya-puranam the Agni-puranam, the Mayasastra, the Pratima-manalakshanam, lay down, however, more or less comprehensive systems.

In these art treatises a number of laws have been formulated regarding the bodily form; its shape, size and the colour and apparel of each image of the deity. These measurements should vary according to the age, sex and the nature of the image. Sukracharya—the author of the Silpa-shashtra, Sukraniti, suggests that the images are to be made of gold in Satya-yuga, the age of truth; of silver in Treta-yuga, the era when Lord Vishnu incarnated as Rama; of copper in Dvapara-yuga, the age contemporary to the age of Lord Krishna; and of Bronze in Kaliyuga, the age of fear and death, which is the present era. Further, there are images corresponding to the ultimate qualities of reality; the Sattvika (truthful) animage of god seated self-contained, with hands turned in (the abhya pose) as if granting boons and encouragement (to the devotees; the Rajasika (passional) "an image seated on a vahana (vehicle) decked with various ornaments and hand holding weapons; Tamasika (fearful) a terrible armed figure destroying the demons".

Corresponding to the different kinds of images and their nature and qualities, different ideal proportions in terms of the human body are given in many ancient treatises. The basic unit of measurement is tala, the measurement of the face from the hair on the forehead to the chin – 12 angulas; fingers roughly equal 0.172 meters. The most common measurement adopted for the image making was nav-tala, i.e., nine talas—approximately 1.54 meters (see Nava Talam, a drawing originally prepared by Eric Gill and reproduced by Dr. Mulk Raj Anand in "The Hindu View of Art" pp. 79).

19 Period starting from the close of the epic era down to the early mediaeval age of Indian History.
Ardhanari, as the name indicates, describes the form of the image which is half man and half woman. The right half is male Shiva, half of his head bearing the Jata Mukuta, crown of locks while the right side of his head at the top is adorned with a crescent moon. His right arm is held in abhaya, the fearless pose, and the other arm holds his parsa (large axe). Just underneath his right elbow is the expanded hood of a cobra, Shiva’s favourite snake. On the right half of his chest there is the sacred thread (yajnopavita). The right side of his leg is covered up to the knee. The icon stands on a Padampitha (lotus pedestal).
enable Kalidasa to limit himself only to the correct usage of words and their connotations. The prayer goes thus:

बनाथादिव सम्पृक्ति बाण्ये प्राप्ति पन्ये।
जति: विरो लिने पार्वती परमेश्वरी।

Vagarthaviv samprikto vagarthprati patraye,
Jagatah pitaro vande parvati parmeshvaro.

i.e. for the right comprehension of words and their senses, I salute Parvati (the mountain's daughter, wife of Shiva) and Parmeshvara (the Supreme-Shiva) the parents of the Universe, who are perpetually united like words and their meanings.12

There is a prakritik (natural) interpretation of Ardhanarishvara, signifying that the creative man is incomplete without female support. It is both male and female united together, that causes creation and produces creative energy. The union of man and woman is such that one is complimentary to the other, and one is incomplete and imperfect without the other. In their real nature both are undetachable fragments of one piece, and so are the words inseparable from their meanings.

There are a number of stories connected with the Ardhanarishvara form of Shiva. The following two accounts explaining the circumstances that led Shiva to assume the Ardhanarishvara form are taken from the classic work of T. A. Gopinath Rao, Elements of Hindu Iconography, Volume II, Part I, 1916, page 331 onward:

"It is stated in Shiva Purana that the Brahma first begot a number of male beings, the Prajapatis, and commanded them to create various other beings. They were found later on to be unfit for the task for which they were intended and Brahma feeling uneasy at the slow progress of creation, contemplated Mahesvara (Shiva). The latter appeared before him in the composite form of a male-female and asked him to cease feeling distressed. Hitherto it did not occur to Brahma to create a female also, and at the sight of this composite form of Maheswara he realised his error.

The other account of the appearance of Shiva in the Ardhanarishvara pose states that once Shiva was sitting with his consort, Parvati, on the top of the Kailash mountain. The devas and rishis went to pay their homage to him. All except rishi Bringi circumambulated around both Shiva and Parvati and also bowed to both. This rude act of Bringi’s made Parvati angry and in cursing him she said that the flesh and blood of the rishi should disappear from his body, whereupon the rishi was reduced to a skeleton form. Shiva, seeing the rishi unable to support himself, sympathised with him by giving him a third leg. Bringi became pleased and out of joy danced vigorously in praise of Shiva. This annoyed Parvati who turned to penance in order to obtain a boon from Shiva which would at the same time annoy Bringi rishi. Shiva, being pleased with her devotion, granted her wish of being united with his own body. Thus Shiva assumed the form of Ardhanarishvara. Quite naturally this was a heart burning situation as far as Bringi rishi was concerned for he wanted to worship only Shiva; but undaunted by this obstacle, Bringi assumed the form of a beetle, pierced a hole through the composite body of Shiva and thus circumambulated around Shiva alone. Later, Parvati reconciled herself to what had happened and bestowed her grace upon the pious rishi for his steadfastness of purpose and devotion to Shiva.

“The description of the image of Ardhanarishvara is given in the Ainsmadbhedagama, the Kamikagama, the Superabhedagama, the Silparatna, the Kiranagama and a few other works.18

The cast and oxidized image of Ardhanar as shown in Plate II-10, produced in a local manufacturing unit specialising in cast metal artwares, manifests every minute detail of the description of Ardhanarishvara given in the above mentioned historic work. It also closely resembles the

12Rečer M.R. Kale—Racbhavansha of Kalidasa, 1925, pp. 1, Canto I.
Natraja in his mystic dance trampling the asura (demon) lying underneath his feet on a lotus pedestal.
early stone and bronze images of Ardhanarishvara found in several temples in South India.

**Nattraja (Shiva in Cosmic Dance)**

Shri T. A. Gopinath Rao in his Elements of Hindu Iconography, Vol. II, Part I, pp. 221 describes Shiva as “a great master in the art of dancing.” In the Saivagamas it is stated that Shiva danced in hundred and eight modes. Hence he assumes the name of Natraja (king of dancers). A large number of the Delhi-produced icons of Shiva in this well loved form correspond to the sculptural representations of Natraja which are to be seen in several ancient temples: the Bhuvanesvar and Konarak temples in Orissa; in the rock temples at Mahabalipuram in Madras, and in those at Ellora, in the State of Maharashatra. The icon of Natraja shown in Plate II-11 was produced in one of the local manufacturing units and closely follows the popular description of the four armed and four handed dancing Natraja as given in the Ainsumadbhedagama. Here it states that the image of Natraja should be modelled in beeswax according to the uttamta measurement. The front hand should be held in the danda-hasta or gajahasta pose, i.e., the hand hanging down across the body, and at the back the left hand should carry agni (fire), either in a vessel or upon the palm itself. The front right hand should be held in the abhaya pose with the tip of the middle finger just touching the nikha sutra. On the forearm there should be a sarpa-valaya (twisted snake). The back right hand should hold the damaru (hollow-bodied drum). The right leg should be bent and placed upon the back of the Apasmarapurusha (demon), and the knee should reach the nabhi-sutra (navel). The left leg should be lifted up somewhat, turned towards the right leg and kept across it. On the head there should be a jatamukuta (crown made of long locks of hair) adorned with a flower garland; a snake, jewels and ornaments and a grinning human skull should be on the left side. From the jatamukuta should issue on either side five, six, seven, or eleven jatas (locks of hair) that stand either horizontally or are arranged in a circle. The body of Shiva should be

---

Dancing girl, in a pose somewhat similar to the Natraja posture. The crown on the head of the Nayaka symbolises Shiva's favourite crown consisting of a snake's hoods.
A Nayeka (dancing girl) in tribhanga (triple flexural) pose, on a round pedestal.

Adorned with the *yajnopavita* (sacred thread); a *urassura* (chest band); rings on all his fingers except the middle one, and anklets on the ankles. The prostrate *asura*, the Apasmara-purusha (demon) who is being trampled by Shiva’s right foot should have his head on the right side and his leg on the left side of Shiva. Shiva should be dressed in lightly fitting breeches, and a fluttering scarf.

According to Shri T. A. Gopinath Rao, the root idea behind the dance is “the manifestation of primal rhythmic energy.” Dr. Anand Coomarswamy in his “N” Dance of Siva’ published in *Sidhanta Dipika*, Vol. XIII, July 1912, and reproduced by T. A. Gopinath Rao in his Elements of Hindu Iconography, Vol. II Part I, pp. 231 onwards, refers to a number of peculiarities and legends given in ancient Indian literature regarding this bronze image of Natraja. It is mentioned that the dance represents his five activities, viz., creation arising from symbol of *damaru*, i.e., drum; protection or preservation proceeding from his right hand of hope placed in *abhaya mudra*: from fire in his left hand proceeds *samhara*, i.e., destruction; the foot planted on the ground gives abode to the tired souls struggling in the toils of *karma*; and lifted foot grants eternal bliss and salvation to those who approach him. These, separately considered, are the activities of the Brahma, the creator of Universe; Vishnu, the preservor of Universe; Rudra, the god of war; Mahesvara (the Shiva), the god of destruction and Sadasiva.

One legend as related in the Koyal-Purana regarding the incidents that led Shiva to assume the form of Natraj is given below:—

“In the forest of Tarka dwelt multitudes of heretical *rishis*, followers of Mimasa. Thither proceeded Siva to confute them, accompanied by Vishnu disguised as a beautiful woman and Adisesha. The *rishis* were first led into a violent dispute among themselves, but their anger was soon directed to Siva, and they endeavoured to destroy Him by means of incantations. A fierce tiger was created in sacri-
Dancing Girls (Nayekas)

In ancient India, the Nayekas (dancing girls) enjoyed a pride of place in the society. They were held in honour and great sentiment was attached to their day-to-day conduct and dancing performances. They danced on occasions of religious importance and on particular dates to appease their celestial and religious impulses. Their abodes were the sacred temples and the palaces of religious sanctity. A large number of sculptures of dancing girls are found in the famous temples of Kornarak and Bhuvaneshwar in Orissa and Mount Abu, in Rajasthan. Today the metalsmiths in the city produce a large variety of icons of Nayekas resembling in form, shape and ornamental decoration the stone sculptures of the Nayekas found in the ancient temples of Orissa and Rajasthan. In Plate II-12, II-13 and II-14, some of the favourite forms of the dancing girls' icons produced in the city are shown.

Nayeka (dancing girl) also known as the mirror girl (mirror in her left hand) is standing on a lotus pedestal. Similar stone sculptures of dancing girls are found in the temples of Kornarak, Bhuvaneshwar and Mount Abu.

A similar story in elsewhere related about an elephant and these account for the elephant or tiger skin which Shiva wears.
RAW MATERIALS

The basic raw materials required for the manufacture of brass and copper artwares are brass (peetal) and copper (tamba). Brass is not a virgin metal. It is an alloy of copper and zinc obtained by fusing copper and zinc (justa) in the ratio of 60 to 40 approximately. A small quantity of tin (kalai), lead (sikka), borax (suhaga) and ammonium chloride (nausadar) are required during the soldering operations. Sulphuric acid (gandhak-ka-tezab) and hydrochloric acid (namak-ka-tezab) pickles are used to clean the artwares before the soldering and for the final polishing operations. Peerless, Luster bars and Rouge bars are used as polishing materials. As the domestic production of copper, zinc, tin and lead is inadequate to meet the total requirements, a large proportion of these is imported from the United States, Canada, Australia, England, Russia and Germany.

Copper, zinc, tin and lead are pure metals and are available in the form of ingots or bars. The artware manufacturers in the city mainly use sheet metal. Normally, the manufacturers purchase brass or copper sheets directly from the local metal dealers. But in case they procure copper and zinc ingots through the State Trading Corporation of India or other sources (local metal dealers), they take the ingots to Jagadhari (Punjab) or Rewari (Punjab) or Hapur (Uttar Pradesh), where the rolling mills convert them into sheets. The service charges of the rolling works out to Rs. 900 per ton plus Rs. 3 per ton as excise duty. The transportation cost to Jagadhari and Rewari comes to around Rs. 15 to Rs. 20 per ton.

The total consumption of basic raw materials during the year 1962-63 of all the 41 production units manufacturing brass and copper artwares is estimated to be about 300 metric tons (about 240 tons brass and 60 tons copper), as against their yearly requirements amounting to about 370 tons. Most of the manufacturers reported that they would have manufactured more artwares than they actually produced during the year 1962-63, had they procured more of the raw materials. Shortage of basic raw materials forced them to take limited orders in hand.
Procurement of brass and copper sheets or copper and zinc ingots at a fair price poses a special problem to the manufacturers of the artwares. A majority of the production units reported being in a state of distress as far as availability of raw materials was concerned. Out of the total 41 production units, 14 are entirely servicing units, 11 of which are engaged in chasing work alone and 3 in polishing, and, therefore, are free from the headache of the procurement of brass and copper sheets. Out of the total 27 production units, 8 units, which are relatively larger, are in a position to get a part (less than one-fourth) of their annual raw material requirements at a fair price, i.e., at a controlled price. Thus, the residual procurements, i.e., more than three fourths of their total raw materials requirements are met from the black market. The remaining 19 units, mainly running on the basis of family members and paid apprentices meet their entire (100 per cent) raw material requirements from the black market. There is a wide gulf between the controlled price and the prevailing black market prices of the raw materials. The difference in controlled prices and black market prices is, in certain cases, even more than double. The following table No. 3·1 gives average prices (controlled prices as well as black market prices) of the basic raw materials as they were prevailing during the year 1962-63.

The table also gives the percentage deviation between the actual controlled prices and market prices, i.e., black market prices, of the basic raw materials. The deviation in the case of tin is highest. The market price of tin is 129.6 per cent higher than the controlled price. The controlled prices of copper ingots are 94 per cent less than the black market price. Similarly, the market prices of zinc ingots, brass and copper sheets are 92.8 per cent, 35.6 per cent, 26.3 per cent higher than their respective controlled prices. What is even more shocking is that the black market prices are so widely accepted that over 75 per cent of the total dealings among the local metal dealers and the artware manufacturers are settled on the basis of the prevailing black market prices. The local metal dealers refer to the black market price as if it were the market price. It is significant to note that during the year 1962-63, there was a steep rise in black market prices of metal sheets and ingots. Although the controlled prices of the metal sheets and ingots during the period remained constant, the black market prices by the end of the year were 25 per cent higher than they were at the beginning of the year 1962-63.

The Delhi manufacturers of artwares have reported that the principal obstacle in the manufacture of artwares faced by them is the procurement of raw material at fair prices, i.e.,

### TABLE 3·1 Average Annual Prices of Basic Raw Materials (1962-63)

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>Name of the Raw Material</th>
<th>Controlled price per metric ton (in Rs.)</th>
<th>Market Price (Black market price) per metric ton (in Rs.)</th>
<th>Percentage Deviation from controlled price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Copper Ingots</td>
<td>3600.00</td>
<td>7000.00</td>
<td>94.4</td>
</tr>
<tr>
<td>2</td>
<td>Zinc Ingots</td>
<td>1400.00</td>
<td>2700.00</td>
<td>92.8</td>
</tr>
<tr>
<td>3</td>
<td>Lead</td>
<td>1200.00</td>
<td>2000.00</td>
<td>66.6</td>
</tr>
<tr>
<td>4</td>
<td>Tin</td>
<td>13500.00</td>
<td>31000.00</td>
<td>129.6</td>
</tr>
<tr>
<td>5</td>
<td>Brass Sheet (19. S.W.G.)*</td>
<td>4950.00</td>
<td>6250.00</td>
<td>26.3</td>
</tr>
<tr>
<td>6</td>
<td>Copper Sheet (19. S.W.G.)*</td>
<td>5900.00</td>
<td>8000.00</td>
<td>35.6</td>
</tr>
</tbody>
</table>

*S. W. G., refers to Standard Wire Gauge used to measure thickness of sheet metals. One sheet of 19 S. W. G. (the size being 4' x 4') weighs 7.50 kilograms (Approximately).
controlled prices. Only 8 production units reported that they obtain a part (about 1/4th) of their total raw materials requirement at controlled prices, and that only after facing a considerable amount of harassment at the hands of the local metal distributors. The normal procedure for obtaining raw materials at controlled prices is for the artwares manufacturers to secure a Certificate of Production and Consumption from the Directorate of Industries of Delhi. A copy of the certificate entitling the manufacturers to procure raw materials is forwarded to the State Trading Corporation of India Ltd. or to local authorised metal wholesale dealers. Normally, copper or zinc in the form of ingots is procured through the State Trading Corporation. However, in order to obtain brass and copper metal sheets, the manufacturers are directed to M/s. Gillinders Arbuthnot and Co., who are sole distributors of brass, copper, tin and lead in India.

The local manufacturers seem to be very dissatisfied with the working of M/s. Gillinders Arbuthnot and Co. They allege that the company's personnel and local agents unnecessarily harass them and do not supply even one-fifth of the certified quota at controlled rates. The company does not directly supply the raw materials, but directs the manufacturers to obtain raw materials from their local agents and distributors, viz., Rattan Lal Narayan Das and Co., Chawri Bazar, Delhi and Mool Chand Bhooto Mal and Co., Sadar Bazar, Delhi. The local agents in turn reluctantly supply only a fraction of the certified quota. After a lot of cumbersome bargaining, the manufacturers are forced to be satisfied with the fraction. It has been learned that even the authorised metal dealers openly deal in raw materials at black market prices. The most commonly practised black-marketing procedure as reported by the artware manufacturers is that the metal dealers either demand “black money” before supplying raw materials or else they manipulate the bill (qualitatively or quantitatively, or both) by misrepresenting the entries in the bill. Moreover, usually the metal dealers’ palms have to be greased before obtaining raw materials. Many of the artware manufacturers are illiterate and are not capable of taking up the matter at official levels. Furthermore, many of them have expressed their fear that if they do, the metal dealers may get annoyed and stop supplying them raw materials even at black market rates. All the more shocking is the realization coupled with apprehension on the part of the manufacturers that the authorised metal dealers have easy access to Ministers and important government officials; and in case they dare to raise a voice against them, the latter might even harm them physically.

To appreciate how difficult it is to procure raw materials at controlled prices, the following case study of one of the distinguished artware manufacturers is given:

Annual raw materials (brass and copper sheets and scrap) requirements of M/s. Kalyan Dass Baboo Ram, manufacturer of brass and copper artwares and castings at Gali Sheesh Mahal, Bazar Sita Ram, Delhi, are estimated to be about 21 metric tons. The Certificate of Production and Consumption, issued by the Directorate of Industries, Delhi, dated 22.12.62 authorised the manufacturer to obtain 6.5 metric tons of brass sheet (7.18 kilograms per sheet) half yearly from M/s. Gillinders Arbuthnot and Co., New Delhi. This company asked the manufacturer to obtain the brass sheet from their local agents, viz., M/s. Narayan Das Rattan Lal and Co., Chawri Bazar, Delhi and M/s. Mool Chand Bhooto Mal, Sadar Bazar, Delhi. But after a lot of harassment, the manufacturer was able to procure from them only 2759.400 kilograms of brass sheets during the full course of year (1963), (1659.400 kilograms from M/s. Narayan Das Rattan Lal and Co., and 1050 kilograms from M/s. Mool Chand Bhooto Mal and Co.) as against the authorised quantity of 13000 kilograms. Thus during the year, the artware manufacturer could procure only 20.8 per cent of the total brass sheets he was entitled to obtain at the controlled price. As a result, about 80
per cent of his total raw material requirements during the year were procured from the black market.

It is not, therefore, surprising that many of the artware producers manufacturing a large variety of artwares keep a very small sampling of them in their show-rooms. Apart from the financial investment involved in maintaining show-rooms, one of the reasons put forth for the manufacturers not being in a position to display a large variety of produced articles has been the non-availability of raw materials at fair prices and sometimes not even at black market prices.

Secondary Raw Materials

In the preceeding paragraphs, some of the problems connected with the basic raw materials used by the local artware manufacturers have been discussed at length. The following paragraphs will attempt to give a brief account of the secondary raw materials utilised by the artware manufacturers in producing brass and copper artwares.

Some of the artware manufacturers, who produce Tibetan horns, bowls or Nepalese teapots etc., also make use of ‘white metal’ scrap. Its consumption is very little, i.e., about a ton a year, and it is obtained from the local metal dealers at the rate of Rs. 18 to 20 per kilo.

During soldering operations sulphuric acid and hydrochloric acid pickles are used to clean the artwares. These acids in diluted form are obtained from local retail dealers at the rate of Rs. 0·40 to 0·62 per bottle of 26 oz. Borax and ammonium chloride are also obtained from the retail dealers as and when required at the rate of Rs. 1·25 per lb. (borax) and Rs. 2/- per lb. (ammonium chloride). Both of these are used as a flux during the soldering operations.

Rol

Resin, locally known as rol, is prepared with other ingredients and is used to fill into the back or the inside of the articles over which chasing and perforation work is to be carried on. It is made by mixing powdered burnt bricks and a kind of gum called beroja with mustard oil in the ratio of approximately 10:5:3. Beroja is locally bought at the rate of Rs. 35 per canister containing 20 seers.

Polishing Compounds

Polishing compounds, viz., Silica, Peerless, Luster and Rouge brands are amongst the most popular trade-names and are used to give the requisite finish to the artwares produced. All of these are locally procured from Chawri Bazar, Sadar Bazar, etc. Silica, Peerless and Luster brands are available in the form of bricks, whereas Rouge brand is procured in the form of bars. The bricks of Silica, Peerless and Luster brands each weighing 585 grams, 575 grams and 900 grams respectively, are obtained at the rate of Rs. 0·50, Rs. 1·75 and Rs. 3·75 per brick respectively. Silica brand is used while grinding the rough surfaces of the objects smooth; Luster brand is the main polishing compound and Peerless brand is finally used as a finishing compound. In case of the perforated artwares, instead of Peerless, Rouge bars as a finishing compound are more commonly used. A Rouge bar weighs approximately 454 grams and is available in three grades. The first grade, i.e., the superior one, costs Rs. 4 per piece; the B grade, medium one Rs. 3 per piece and the lowest quality Rs. 2·75 per piece.

Fuel

Fuels used during soldering and annealing operations are commonly soft coke bits, pieces of charcoal and firewood. Kerosene oil is used but in very little quantity and that only for operating blow-torches. Soft coke bits, pieces of charcoal and firewood are obtained from local coal merchants, usually at the following rates:

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft Coke Bits</td>
<td>Rs. 5·40 per 100 Kg.</td>
</tr>
<tr>
<td>Charcoal Bits</td>
<td>Rs. 14·50</td>
</tr>
<tr>
<td>Firewood</td>
<td>Rs. 5·00</td>
</tr>
</tbody>
</table>
TOOLS & APPLIANCES

The preponderance of the tools and appliances generally used by the craftsmen of brass and copper artwares are essentially primitive and traditional. Almost all of these are operated by hand and do not involve the use of electric power. They are generally prepared by the craftsmen themselves or by local blacksmiths as per order. Interestingly enough, although most of the tools and appliances now used look very simple, yet each one of them requires a highly specialised skill to handle them properly. Manufacturing the artwares necessitates the procurement of a large variety of tools and appliances required for the various stages of manufacture. Each tool generally has a specific use to which it is put and provides very little margin for further manipulation. The following pages will illustrate and explain the various sets of tools and implements used in the different stages of manufacture of artwares.

Beating and Shaping Tools

During the beating and shaping operations of artwares, a large number of tools, namely, hammers; mallets; dividers; shears; pincers; pliers; files; chisels; spikes; implements such as iron and wooden blocks and iron stakes of various shapes and sizes are needed. None of these tools and appliances involves the use of electric power. Below a brief description of each tool and appliance—its function, the material out of which it is made and the source and price at which it is obtained, is furnished.

Hammers (Hathora): Figure 1—Hammers of various shapes and sizes are used for raising, levelling and planishing operations. Better hammers are generally made of superior quality of iron (locally known as spat—literally interpreted as steel). Blocks of iron are procured from Motia Khan, a specialised market of iron and steel metal—within the price range of Rs. 35 to 40 per maund, (a maund is equivalent
to 37·3240 Kilograms) and then shaped to the required size at the local blacksmith's shops. The size of the hammer's stroking head normally varies between 4" to 8" in length and 1" to 2½" in width. A hammer has a smooth rounded wooden shaft fitted into a circular hole of the stroker. The size of the wooden shaft varies from 10" to 16" with a circumference ranging between 2" to 3". The cost of hammers varies from Rs. 3 to 8 according to their size and quality. A hammer with a square edged stroking head is locally called *chauras hathora* (see figure 1-4) and one with a round edged (gole or gulmuha hathora) (see figure 1-2). Both of these are commonly used for the raising and planishing operations. For raising and shaping delicate portions, raising hammer of 1-1 and 1-2 types are put into use (see figure 1).

**Mallet (Moongri or Moonger):** Figure 2:—
The mallet is a very useful tool which is employed while levelling metal sheets or giving a concave shape to certain metal objects. Wooden mallets used for shaping the various artwares are commonly of two shapes viz., mallets with square edged (*chauras*) and round edged (*gole*) stroking heads. The size of the wooden stroking head ranges between 10" to 14" (length) and 2½" to 4" (width). The smooth rounded wooden head is generally 12" to 14" long. Wooden mallets are made of *kikar* wood (wood of the acacia tree) and *seesam* wood (*dalbergia, sissoo*). Mallets of *kikar* wood are considered better and more durable. These are obtained from wooden tool dealers in the Teliwara or Paharganj localities of Delhi and New Delhi in the price range of Rs. 1·25 to Rs. 2·00 per mallet.

![Mallets (Moongri)](image-url)
Dividers (Parkar or Parkal): Figure 3-A:—
A pair of iron dividers is an indispensable tool. With its help precise circles or other required markings on metal sheets are inscribed. These markings serve as guide lines during the shaping, bending and cutting operations. The parkar (pair of iron dividers) is made of superior quality of iron stripes bought from Motia Khan or Jama Masjid at the rate of Rs. 1 to 1·75 per kilo and then shaped into suitable size by the craftsmen or by blacksmiths. Size of iron dividers ranges between 6” to 1'·5", and total cost varies from Rs. 1 to 2·50 according to the size and quality of iron used.

Shears (Katia): Figure 3-B:—Katia (shears or a pair of iron snippers) is a very useful tool designed to perform all the major cutting operations while manufacturing the artwares. The popular size of shears ranges between 6” to 16” (the cutting edges 1” to 2.5” long) and weighs between 1/2 kilogram to 2 kilograms. They are made of superior quality steel and obtained ready-made from the retail tools and implements shops at Jama Masjid or Chawri Bazar. Price of shears normally comes between Rs. 2 to 15 according to size and quality.
**Pincers (Sandasi):** Figure 4-A and 4-B:—A pair of iron pincers is one of the most serviceable tools and is commonly used for handling the semi-manufactured artwares placed over blazing furnace heat during the annealing and soldering operations. Pairs of iron pincers most commonly used are of two kinds: one with straight flat jaws (figure 4-A) and the other with curved flattened jaws turned at right angles (figure 4-B). The size of the iron pincers varies in length from 12" to 18" with 1½" to 2" long jaws, the flattened width being approximately 1/2" to 2/3". These are made of iron straps procured from Motia Khan Market at Rs. 1·50 to 2 per kilogram, which are then shaped into the desired size by the craftsmen themselves or at a local blacksmith's workshop.

**Pliers (Plas):** Figure 4-C:—Iron pliers are small pincers with firm straight jaws used for bending and cutting small strips of metal sheets. They are obtained from tool merchants at Chawri Bazar or Jama Masjid. The most popular lengths of the iron pliers varies between 6" to 10" and costs between Rs. 2·50 to Rs. 5.

**Solder iron (Kaiya):** Figure 5-A:—The solder iron is one of the most often used tools in artware manufacture. It is applied on the many objects requiring kutcha tanka, which literally means weak soldering and specifically refers to soldering with solder material made of tin or an alloy of tin and lead. The soldering iron has a small wooden handle 2" to 3" long and an iron rod 5" to 7" long, one nail-shaped end of which is fitted to the wooden shaft while the other end is nothing but a polygonally shaped thick piece of iron. It is procured from local tool and implements shops in Chawri Bazar and Jama Masjid in old Delhi. The cost of the soldering irons varies from Rs. 1·25 to 2.
Figure 5-B:—Iron spikes of sizes and sizes are used to adjust unmanufactured artware over the firing the annealing and soldering, ordinarily, these spikes are indigenously crafted by the craftsmen. Iron rods of and width are bought from the shops, or Motia Khan of Re. 1 per kilo. Usually, a spike is fashioned into a point and end is flattened. The length of invariably ranges between 10" and meter of the width between 1/3"

Figures 6:—Files of various kinds: the tikoni (triangular); half oval (gole); square (chaukor) and are used to smoothen irregularly shaped brass or copper articles. These are bought from the tool dealers in Jama Bazar, the Nicholson brand is considered to be better in quality. They vary from Rs. 5 to Rs. 17 according to size, the length 10" to 16" and the width from

FILE)
Chisels (Chhaini): Figures 14, K and I:—During the beating and shaping operations, sometimes the craftsmen also need sharp-edged chisels to cut out some specific portions where iron snippers cannot be used. Such sharp-edged chisels are normally made by the craftsmen themselves out of iron bars (taklas) of superior quality bought from junk dealers at Jama Masjid at the rate of Rs. 1·25 to 1·50 per kilogram. Such chisels normally have a straight edge, the width of the edge varying between 1/3" to 2/3" and the length of chisel ranging between 3" to 4".

Auger or hand driven mechanical drill (Burma): Figure 7:—Small hand driven mechanical drills are used for boring holes in certain parts of the artwares where iron bolts and iron nuts will later be fitted. This too is made of iron and has wooden handles. As a matter of fact, it has three wooden handles; the upper handle and the left mid-handle help the craftsman to hold the drill firmly in the desired position, while the third handle, connecting the rotating wheel of the drill, facilitates the rotation of the turning wheel which, in turn, rotates the drill mechanically connected with the rotator. It is procured from the local tool and appliance dealers and is available in the price range of Rs. 15 to 20. The mechanical drill has provision for fitting boring drills of different sizes, having boring capacity from one soot (a standard hand woven thread about 1/8" in diameter) to four soot (1/2" diameter).

Beating and Shaping Appliances

Flat iron block (Lohe ka para):—The first and foremost step in the manufacture of metal artwares consists of levelling the metal sheets. During the levelling operation, the metal sheets are placed over the rectangular or square flat iron blocks of various sizes, the size of flat iron blocks normally varying between 2'×3' to 2'×4', and then levelled with wooden mallets. The thickness of the flat iron blocks varies according to their sizes, from 1/3" to ½": These are obtained from the iron and steel merchants at Motia Khan at the rate of Rs. 35 to 40 per maund.
Circular hollow iron frames (Bangar): See figures 8:—Hollow iron frames constitute one of the most indispensable appliances that assist the craftsmen in giving the requisite shape to the artwares. Bangars of suitable sizes are mainly used to give concave bends to the artwares or to raise circularly and evenly some portion of the artwares. For raising operations, some bangars also have smooth, upwardly slanting, circular rims (see figure 8-A). Bangars having flat circular rim (see figure 8-B) and some having small mortars over their circular flat rims (figure 8-C), are also in common use. Such types of depressions are used while boring small holes with a chisel on the artware. The circular hollow iron frames of suitable shapes and sizes are bought from the iron and steel merchants at Motia Khan, or from junk dealers (kabari) at Jama Masjid, at the rate of Rs. 15 to 20 per maund. The bangars are obtained in the size of 8" to 12" (diameter of the bangar), 1/3" to 1" (width of the circular rim) and 6" to 8" (height of bangars).

Stakes and Anvils (Maikhs and Sandars): Figures 10, 11 and 12:—Stakes and anvils of various shapes and kinds are required to facilitate the raising and planishing operations. Most of the stakes are named after the shapes and forms they most resemble. For instance, there is the kauwa maikh, which, literally translated, means crow's stake. It has a head shaped like a crow's beak, and hence is popularly called kauwa maikh, kauwa, meaning crow, and maikh, signifying stake (See figure 10-B). Similarly, sumba maikh is an anvil having a horizontal pointed head (See page 73). Gole maikh or gulmatha maikh (bright stake) literally translated means round stake (gole maikh).
EKWAII MAIKH
(TWO NOSED ANVIL)

KAUWA MAIKH
(CROW BEAK SHAPED STAKE).

FIGURE 10B
or round faced stake (*gulmatha maikh*) (figure 11-B). *Gurda maikh*: *Gurda*, translated, is nephro or kidney and *maikh* means stake. Hence, this stake having an irregularly shaped head which in nature looks like a kidney is, quite appropriately, named after it (figure 11-C).

All the stakes and anvils are indigenously made at some local blacksmith's workshop as per order. Iron pieces of superior quality and of the desired form are procured from iron and steel merchants at Motia Khan or from the junk sellers (*kabari*) at Jama Masjid. Generally the iron pieces are bought for shaping stakes and anvils at the rate Rs. 30 to 40 per maund. Shaping charges of these vary in proportion to their size and shapes.

Interestingly enough, the artware craftsmen have no technical standards for judging the quality of steel or iron. It is guessed at by the sound it produces, when struck or from the impression given by merely looking at it. However, there is this to be said that their criterion of sound and look rarely betrays them or, at any rate, this was the general impression gathered during our enquiry regarding their tools and implements. A brief description of some of the most common stakes and anvils used by the local craftsmen while manufacturing the artwares, is furnished below:

**Ekwaii Maikh (Two nosed anvil): Figure 9:**
Ekwaii maikh is a two nosed stake each being 9" long—one nose being rounded with pointed end, the other nose being shaped flatly and slanting towards the end. The centrally placed stem of the anvil is 8" to 10" long and 1½" × 1¼" to 2" × 2½" wide, and is embedded in the ground 3" deep at its terminal end which is shaped like a spike. It weighs approximately 15 to 18 seers and costs Rs. 35 to 40. It is used for giving circular shapes to some artwares at the round-pointed end, and sharp angular direction to others.

**Sumba (One nosed anvil): Figure 10A:**
Sumba has a piercing rounded nose about 3

A **S U M B A**

(ONE NOSED ANVIL)

...
A. SANDAN
(PLANISHING STAKE)

B. GOLE MAIKH
(BRIGHT STAKE)

C. GURDA MAIKH
(NEPHRroid STAKE)
about 3" long. Its total length varies from 8" to 11" and the crow’s beak-shaped head is 2" to 2½" long and 1-1/2" to 1" wide. Its cost varies from Rs. 16 to 24 according to its size and quality of make.

Sandan (Planishing stake): Figure 11-A:— The sandan is mainly used for the planishing (matharna) operations over relatively large articles. It has a rectangular or square-shaped convex head. Its size varies from 14" long to 28" long and the size of the convex upwardly slanting head varies from 1"X1½" to 2"X3" or 2"X2". Its weight varies according to its size, from 10 seers to a maund, and cost from Rs. 25 to 75. The sandan is fixed into the ground with its sharp pointed terminal end.

Gole Maikh or Gulmuha Maikh (Bright stake): Figure 11-B:—The gole maikh facilitates raising and planishing operations over delicate rounded parts of artwares. It is made in different sizes, the diameter of the rounded head varying from ½" to 1½". It is about 9" to 11" long and fixed into the ground with its pointed end to a depth of 2¾". Its weight varies from 8 to 10 seers and cost, from Rs. 10 to 14.

Gurda Maikh, (literally meaning a kidney shaped stake): Figure 11-C:—It is one of the most useful appliances and is put to use whilst shaping the pie crust or egg and dart units of design on the raised rims of brass and copper circular or oval trays. Its head is about 2" long (and ½" to 1" wide in diameter) and is bent horizontally at one end. It is embedded 3" deep into the ground with the pointed terminal end down. Its total height ranges between 7" to 9" and the cost varies from Rs. 8 to 13 according to its size and make.

Kharwar, (Stake with an upwardly curved nose on its upper and lower ends respectively): Figure 12:—The kharwar is generally used to facilitate the shaping and planishing operations on the delicate, narrow circular parts of artwares. It has a rectangularly upraised and convexly slanting nose at one end and an upwardly turned flat, square-shaped nose at the other. The kharwar is generally 20" to 48" long and its respective ends are raised upwardly from 1" to 2½" high. The size of the rectangularly raised convex end varies from 1"X1½" to 1½" to 2½" and the size of square-shaped raised end ranges between ¾" to 1". The cost of Kharwar ranges from Rs. 30 to 150 according to its size and make.

Pankha (Blowers): See figure 13:—There are two types of hand operated mechanical blowers used to fan the furnace fire. They are: (1) sandookri pankha (literally meaning a box fan), and (2) gararidar pankha (windlass fan). The sandookri pankha (box type of air blower) is one of the most common type of air blowers that is used by the local artware manufacturers. It is indigenously made by the local craftsman with the help of a cycle wheel (obtained from the local market at the rate of Rs. 8 to 10/-. The sandookri pankha (axle-box) is also procured from the local market, or from Amroha, in Uttar Pradesh, at the rate of Rs. 14 to 18 each. The sandookri pankha has a circular diameter normally 6" high, and about 2" wide. It's one axle is connected with the cycle wheel and with a string which is made of iron or leather. A small iron or wooden handle is attached near the axle of the cycle wheel. Turning the cycle wheel rotates the axle's end inside the box, which, in turn, blasts out air. The blast of air is passed into the furnace through
a blow pipe (about 3" long 2" wide in diameter) connecting the axle-box with the furnace. The total cost of the sandookri pankha works out to Rs. 26 to 28.

The other type of mechanical blower is the gararidar pankha (windlass fan). It is mainly used for the blasting furnace during the delicate operations such as heating small artwares during the annealing and soldering operations, etc. It is driven with a small handle (hati). The most common size of the blow pipe connecting the axle box of the gararidar pankha and the furnace varies from 1" to 1¼" wide in diameter. It is directly obtained from the local market at the rate of Rs. 35 to 45.

(ii) Scraping Tools and Appliances

Principal tools and appliances put into use by the local craftsmen during the scraping operation are randas (iron scraping tools) of different sizes; a charakh (wooden lathe) and a wooden stick about 16" to 18" long.

Randa (Scraper): Figure 14:—The randa is an iron scraping implement having a small hook bent at right angles with a sharp cutting edge. It is made indigenously by the scraper craftsmen or a smith, from suitable iron pieces obtained from the local iron and steel merchants. The scraping blade is normally 3" to 5" long and has right angularly bent hook about 1/4" to 2/3" long. The cutting edge of the scraper ranges in width from 1/3" to 3/4". It has an iron shaft about 10" to 14" long. Its cost varies from Rs. 1·50 to 2·75 according to its size and quality.

Charakh: Figure 14:—The charakh is a wooden lathe driven by manually pulling a leather strap about 15’ long (costing Rs. 14 to 20)
with both hands. It is obtained from wooden tools dealers at Paharganj and Teliwara. Its cost normally varies from Rs. 16 to 18.

(iii) Chasing and Perforating Tools
Chisels of various shapes and sizes are used for carrying out chasing and perforation work on the metal surfaces of the artwares. Chisels are popularly known among the craftsmen as chhaini in Hindi, kalam in Urdu, and kabaaq in Kashmiri. These are made of a superior quality of steel and generally by the craftsmen themselves. The taqla (a steel bar) is procured from the local market at Rs. 1·50 to 1·75 per seer and then shaped in the desired sizes. The cost of chisels varies from Rs. 0·75 to 2·50

FIGURE 14
CHARAK
(SCRAPING LATHE)
according to their size, shape and quality of steel used. These are commonly 3" to 4" long in size, but their constant use often reduce them to 2". The shapes of the chisels vary markedly and they are popularly named according to their different shapes and according to the use to which they are put. For instance there is *seedhi* or *soot lagane wali chhaini* which literally translated signifies a straight chisel or a chisel for drawing straight lines, *i.e.*, floor chisel, having straight edge of width varying from 1/4" to 2/3" (see figure 15A, B and C). Similarly, there is *dohari soot lagane ke chhaini*, a chisel for drawing a pair of parallel lines close to each other (figure D), for it has a pair of parallel blunt edges 1/4" to 1" long. *Nakhuni chhaini* (convex chisel) may be translated as nail-shaped chisel. It is also known by the name of *nakhzir kabaqaq* among the Kashmiri *chiteras* (chasers). The most prevalent size of the convex edge, ranges from 1/4" to 2" (see figure 15 E and F). Convex chisels of larger size, *i.e.*, their convex edges being 3/4" to 2" are also known as *pail dalne wali chhaini* or a chisel for drawing the egg and dart motifs on the raised rims of the circular or oval brass and copper artware trays. These chisels are used by the craftsmen engaged in the shaping and soldering operations, but not by the chasers or engravers.
The Gulsum or gulchum chhaini, a rounded-edged hollow chisel (see figures 15, 15-I, 15-J) is used for inscribing small circles on the artwares. As is understandable, the constant use of chisels soon blunts their edges, so they are sharpened from time to time, as and when the chaser feels it necessary, by rubbing the edges of the chisels on a smooth piece of slate. Chisels made of steel having a smaller edge or a delicate design cut on their heads for inscribing it on the metal are considered superior ones. Great secrecy is maintained by the local chasers, so far as the use of such cherished chisels is concerned.

Perforation work on the artwares is commonly executed with the sharp-edged straight steel chisels. Frosted work and impression work on the artwares is carried out with the help of an iron impression pen (chilchila kalam or thappe ki kalam: figure 15-H). Impression pens or chisels are of various shapes and sizes and feature a number of motifs which are cut on the bases of them.

(iv) Chasing and Perforating Appliances

The appliances required during the chasing, perforation and impression work are small iron hammers to beat the caps of the chisels or impression pens; also wooden blocks (thaiya) and iron blocks (chauka or nihai) of suitable shapes and sizes to be placed underneath the artwares, the chauka (the square-faced iron block seen in figure 16) generally being 3"×3" wide and about 4" to 5" long. The nihai (circular iron blocks), the most common size being 6" to 10" in diameter and 8" to 10" long are procured locally or from Meerut, or Hapur, in Uttar Pradesh, or even from Ratlam, in Maharashtra. The cost of the chaukas or nihais varies from Rs. 45 to 120 according to their size and quality of make.

(v) Pickling and Polishing Appliances

Pickling acids are generally stored in round vats made of china clay, locally known as martban which are obtained from local dealers at the rate of Rs. 1.25 to 3.50. A martban has a capacity to store about 16 to 20 litres of acid. A cup made of china clay, or glass, is required for taking out the acid pickle from the martban (China clay vat) and pouring it over the artware. During the operation, the artware is placed over an earthen vat (kunda) so that when the pickling fluid is poured over the articles it will automatically flow into the vat and thus be utilised for one or two more washes. However, the manufacturers seldom adhere strictly to the use of the above mentioned methods and appliances. Instead of the earthen vat (kunda), one often sees the artware being placed directly over a drain and the acid pickle wash, temporarily stored in a tin canister, cut in half instead of in the round china clay vat (martban) being given with an iron or tin cup.

Polishing lathes are operated by electric motors. Electric motors of 2.5 to 5 H.P. are used. The cost of these varies from Rs. 400 to 700 according to their make and horsepower. Total fixed investment required in installing a set of 3 to 4 polishing lathes works out to around Rs. 1600. Polishing mops of varying sizes i.e., from 4" diameter to 9" and about 1" to 14" wide are commonly used. They are made of leather or cotton or linen, the leather mops being coated with emery paste when in use. The leather mops are available in the price range of Rs. 3/- to 12/-. Cotton mops are, of course, the cheapest, their price varying from Rs. 1.50 to 3 according to the size and the make of the mops. The cost of linen mops, which are used for final polishing and finishing, varies from Rs. 2 to 5.
PRODUCTION TECHNIQUES

STAGES OF PRODUCTION PROCESS

ROADLY speaking, the main stages of the manufacture of brass and copper artwares can be divided under four main headings, viz., (1) shaping of the artwares; (ii) scraping; (iii) chasing, perforation and impression work, and (iv) polishing. In the first three operations, namely, shaping, scraping, chasing and perforation, the work is carried out mainly by hand, although, for that matter, over four-fifths (87.8%) of the total forty-one production units of the craft here under survey are worked by hand. It is only in production units engaged in polishing that the use of electric power is employed. Table No. 4.1, shown below gives the distribution of production units in terms of the stage of production process and motive power used.

The technique of the manufacture of the artwares is simple but requires a great deal of skill and dexterity on the part of the craftsman to master the manipulation of all the indigenous tools and implements. The following paragraphs describe in detail the techniques of production

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Stage of Production Process</th>
<th>Done completely by hand</th>
<th>Electricity</th>
<th>Oil</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Shaping</td>
<td></td>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2.</td>
<td>Scraping</td>
<td></td>
<td></td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>3.</td>
<td>Chasing &amp; Perforation</td>
<td></td>
<td></td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>4.</td>
<td>Polishing</td>
<td></td>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>Composite process</td>
<td></td>
<td></td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>36</td>
<td>5</td>
</tr>
</tbody>
</table>
followed by the Delhi Craftsmen in different stages of the manufacture of their artwares.

(i) Shaping: The brass and copper artwares are given the desired shape in two ways; either by beating the sheet metal (brass or copper) into the required shape or by casting scrap metal for the production of purely decorative or religious objects by means of moulds, the former technique being more often used in the city than the latter by reason of the fact that the shapes thus produced are largely of a utilitarian nature.

The beating of the sheet metal into the required shapes is done with wooden mallets (moongri) and iron hammers (hathoras) of different shapes and sizes, over iron stakes, iron blocks and wooden blocks of different forms. The metal sheet for making a round brass tray is first levelled on a flat iron block. The required size is then traced out with an iron compass. The cutting of the metal sheet to the required size and shape is done with a pair of iron snippers (katiya). Iron snippers of different sizes are also used to cut pieces from metal sheets of varying thicknesses.

For the raising operations, the pieces of metal sheet are first annealed (tapana) over an open furnace (bhali) fuelled with coal. Annealing renders the metal pliant and considerably reduces the possibility of breaking of the metal when it is later beaten with hammers. During the annealing operation the craftsman sits close to the blazing furnace. With his left hand he operates the mechanical bellows that fans the furnace whilst with the other hand, and using the help of a pair of iron pincers (sandasi) or an iron spike (salai), he moves the metal sheet pieces to the desired position. Raising of the metal sheet pieces—a saucer-shaped tray for example—is done by skilfully beating the brass piece over upwardly raised rims of various bangars (hollow circular iron frames)—and over suitably shaped iron stakes (maftkh) with correspondingly suitable wooden mallets (moongri) and iron hammers (hathoras).

After the raising operations, the crude form of the artware passes on to a filer. The tools of a filer consist of a variety of files each of which is used for a specific purpose. Needless to say, the filer files off the rough edges of the artware in order to make them smooth.

Casting: There is one production unit in the city that undertakes the manufacture of brass and copper icons and artwares by the box-moulding technique of casting. The manufacture of artwares cast by this method is a complicated process. First of all, a pattern (namuna) of the image to be cast is made out of wood or of lead or zinc by some skilled wood carver or by the craftsman himself. For example, if the images of Hanuman, the monkey chief, are to be produced by the box-moulding-cum-core casting technique the craftsman will first make a pattern, the shape and form and every ornamental detail of Hanuman, on a metal sheet (by working upon the metal sheet with hammers and chisels) preferably of lead or copper; or he would go to a wood-carver and hire him to carve a pattern of Hanuman out of a piece of wood. In plate VI-1, the pattern of Hanuman made out of lead, is shown along with the accessories which will later be soldered to it to make it both more authentic and attractive and thus increase its sales value.

With this pattern, casting moulds (locally called rejás or sanchas) are prepared by taking imprints of the pattern in a moulding box made of two iron frames, arranged with a locking device, which will take the impression of the pattern inside the mould box with a soft dough-textured mixture of sand and molasses. The moulding sand is first sieved to remove stones, etc., and then kneaded with waste molasses with the help of the craftsman’s feet and also his hands (see Plate IV-2). The proportion of the sand and molasses is 80 : 20 by weight. During the summer season, a handful of water is also added to the masala (sand and

---

1 The three dimensional form of Hanuman is obtained by soldering two pieces of sheet metal together featuring a detailed pattern of the front half and the back half of Hanuman chased in high relief.
Hanumana as viewed from the back. The hole in the back is to provide a passage for an electric wire to be connected with the holder in the right hand. IV-B

Image of flying Hanumana, the monkey chief after casting, showing him in the finished state following oxidation. IV-A
The lead pattern of Hanuman in his fleet-as-the-wind pose, the accessories consisting of an inverted knob which will be added to adorn his crown; a semicircular flunda (hook) to be fixed on the left shoulder in order to hang the image from the ceiling with a chain; the handle of the gadha (mace) to be attached just below the right fist, and the electric lamp-holder which will be affixed just on the top of his right fist, all are to be cast and soldered to their respective positions after the main body of Hanuman is cast.

Before levelling is done with the roller, the craftsman sprinkles a small quantity of parting-sand dust through a cloth bag on the sand-cum-molasses mixture. The parting-sand dust reduces the adhesive property of the mixture (masala) and enables the craftsman to obtain every detail on the pattern. Then the craftsman places the pattern of the articles to be cast on the layer of the sand-cum-molasses in the lower frame of the box, in such a way that the back half of the pattern is embedded in the sand-cum-molasses layer and the front half of it faces up. Thereafter, carefully, with the gentle pressure of thumbs and palms, he covers the pattern with the sand and molasses mixture (Plate IV-4).

The craftsman then fixes the upper front frame of the moulding box on the lower one molasses mixture) prior to being used for making the mould of the object into which the molten metal will be poured when the casting operation takes place.

The moulding box which is used for producing mould-cast images is made of two hollow iron frames arranged with a special locking device for fastening them together swiftly and unfastening them with equal swiftness when they require to be separated. Depending upon the sizes of the images to be cast, some of the sets of moulding boxes are round with diameters varying from 8" to 15" or more and some are square or rectangular. The lower frame of the moulding box is covered up to its brim with the sand-cum-molasses mixture to form a layer. The layer is rendered smooth and uniform by rolling it with a small iron roller (Plate IV-3).
The craftsman is kneading the mixture of sand and molasses with his hands. A brass lota (a small water ewer with a wide spout) contains water which is added to the moulding masala (sandy molasses mixture) in order to make it damp enough to produce a sharp impression of the pattern.

IV-2.

Having dusted the parting sand on the sandy molasses mixture overspread in lower frame of moulding box, the craftsman is levelling the mixture with an iron roller.

IV-3.
The craftsman is covering the pattern with sand-cum molasses mixture. In his right hand he holds a spike that enables him to put the mixture over all the tinny details of the pattern.

by means of the locking device and fills up the composite mould box with the sandy molasses mixture by means of hand and foot pressure (see Plate IV-5) so that the pattern which is embedded in the mixture will leave a clear imprint when taken out. The craftsman again sprinkles parting sand dust over the sandy molasses and levels it even with the edges of the iron frame of the mould box, with an iron roller (Plate IV-6).

After sometime, the craftsman turns the moulding box up side down, lifts up the upper iron frame of the moulding box and, moving his hand with utmost care, takes out the pattern from the lower frame of it. Inside the upper and lower frames of moulding box the pattern leaves a clear impression of the front half and back half of the object to be cast. In the case of manufacturing solid icons, after taking out the pattern and cutting out a small runway linking all the cavities formed by the pattern inside the lower frame of moulding box and digging out the gate and funnel with a thin spike in the upper frame of the mould box, the upper iron frame of the moulding box is again superimposed upon the lower one and through the runner and the gate the molten metal is poured into the mould box.
Standing on the moulding box, the craftsman is gently tromping the sandy molasses mixture with both feet to ensure a sharp impression of the pattern inside.

The levelling of the sand and molasses mixture is being done with an iron roller.
to produce the solid cast article. But solid cast objects are heavy as well as costly and cannot be easily handled, so to achieve the obvious saving of the scarce metal, the craftsman works out a device whereby the interior of the casting is rendered hollow. The device is simple and consists of a free-hand modelling of a core (putla) which might literally be interpreted as a dummy pattern, but in technical jargon is referred to as the core, made of porous material which may be removed by scratching out by the core serves to provide the inner wall of the cast article while the sand-cum-molasses layer featuring the imprints of original pattern constitutes the outer wall of the cast article. It is only by constant practice that the craftsman gains skill to shape the core so accurately that the space left for the metal inside the mould is of an even thickness. The craftsman after giving the requisite shape and form to the core of Hanumana dries it near the fire for one to two hours (see Plate IV-7, core, putla of Hanumana). Now, in order to keep the core (putla) of Hanumana in the desired position inside the mould box, two pieces of small square cut metal stands (projecting spikes, the size being approximately 2 mm.) are suitably placed on the imprints left by the original pattern of Hanumana inside the lower frame of the mould box (see Plate IV-8). Thereafter, with great care, the craftsman places the core of Hanumana on the projecting metal stands so that no part of the core, putla, touches or spoils the imprints left by the original pattern, and the core occupies all the space in the mould box except the gap to be filled with molten metal. In this way the craftsman ensures the free flow of molten metal around the core and into the impression left by the original pattern inside the mould box. Finally, inside the upper frame of the moulding box which contains the other half of the impression of the original pattern of Hanumana, the craftsman digs out the runner and the gate with a small iron spike and then tightly superimposes the upper iron frame of the moulding box over the lower one.

Now, the moulding box is ready to receive the molten metal for producing the casting of Hanumana. Scrap brass is melted in a crucible (ghariya or kuthali) which is made of white clay, graphite and a little water kneaded together with pestle and mortar. It is then hand modelled in a U shape, and baked over the blazing furnace. A crucible normally has a capacity to melt 1000 to 4000 grams of metal. For melting the brass scrap, a clay crucible containing the required quantity of it is put in a coke-fired furnace (bhati) about 1' 8" to 2' deep. The temperature of the furnace is raised

References:
uo to 900°c—1000°c by forced blasts from a
hand-operated mechanical bellows.

The scrap metal is heated in the crucible for
about an hour or more. For removing impu-
rity from the scrap (brass), one or two grams
of borax (suhaga) are added while it is being
melted. Borax being a chemical agent acts
as a flux for making the metal more fusible.
The impurities floating on the surface of the
molten metal in the crucible are removed with
an iron ladle called a karchha.

During the casting operation, the caster sits
close to the blazing furnace which emits smoke
and irritating fumes. The area where casting
takes place presents a picturesque sight with its
smoky, dusty and suffocating atmosphere. In
case of heavy castings the caster places the
moulding box at a slightly slanting position and
puts one or two heavy weights on the moulding
box so that it may not slip while the molten
metal is being poured into the runner. When
the molten metal starts emitting a blue-green
smoke, the caster takes out the crucible with a
pair of large iron pincers (sandasi) and pours
the molten metal through the small
aperture called a gate, or runner, made in the top
of the locked moulding box (see Plate IV-10).
The molten metal now flows down through this
opening into the empty space between the im-
prints of the original pattern and the outer walls
of the putla, i.e., inner core, or dummy pattern.
After sometime, say five minutes or so, the
moulding box is broken open and the cast image,
now a brass replica of the pattern, is taken out
(Plate IV-11).

Normally it takes four to five hours for the
newly cast object to become cool enough to
handle. Then it is passed on to the filing ex-
pert who files off the casting blemishes, cuts off
the runner and gates and also removes the in-
ner clay core or dummy pattern by scratching
it out gradually with a thin spike. Finally,
the image is passed on to the soldering expert
who solders the cast accessories which are to
be added to it and thereafter it is buffed and

With a chimti (small iron tongs) the craftsman is
placing a small square cut projecting metal piece to
give support to the core, putla, to be placed right on
the imprints of the original pattern so that a gap is
maintained between the imprints of the original pattern
and the core. Thus a free flow of molten metal when
poured into the mould box is assured.
polished on the polishing lathe. In a large number of instances, the cast objects are oxidised in order to give them an antique look.

**Soldering (Tanka):** Some artwares made by the beating process or by the casting methods also necessitate soldering operations. There are two distinct processes of soldering, viz., hard soldering (*pucca tanka*) and soft soldering (*kutchta tanka*). The technique of *kutchta tanka* (soft soldering) involves the use of an easily melted solder rod bought from the local market containing an alloy of tin and lead, whereas...
The craftsman lifting up the crucible with a pair of large iron tongs is pouring the molten metal into the gate of the runner of the moulding box.

The newly cast image of Hanuman as it appears after unlocking the moulding box and removing it.
the technique of *pucca tanka* (hard soldering) requires the use of an indigenously prepared solder brick consisting of brass, lead and silver mixed with wet borax powder.

Soft soldering is done either with the direct heat or with a solder iron (*kaiya*). In the direct heat method, the surface to be joined is first cleaned with sulphuric acid pickle. The different pieces of artwares are put over the blazing furnace in a proper form. When the artwares get sufficiently heated up, a flux *viz.*, ammonium chloride, is applied by sprinkling it over the place to be joined. This particular flux helps in cleaning the metal, reduces oxide and helps the solder material to flow and combine with the metal which is to be soldered. The solder rod is rubbed all along the joinings while the outer surface of the joining area is being heated over the furnace. The craftsman ensures an even flowing of the solder over the joinings by adjusting the articles at an angle with a pair of iron pincers (*sandasi*).

In another method of soft soldering, *i.e.*, soldering with a solder iron (*kaiya*), a pair of them is half buried in an open blazing furnace until they become red hot. The craftsman washes the impurities from the surface of the article to be joined with nitric acid and then rubs the red hot solder iron on the solder, an alloy of tin and lead in the proportion of 80:20, usually placed over a piece of brick or stone, and then moves the solder iron bearing the molten solder material all along the ends of the article which are to be joined together.

In case of strong or hard solder (*pucca tanka*) solder material is indigenously prepared by mixing silver, brass and zinc in the proportion of 10:60:30. Having first washed the surface of the article to be joined with sulphuric acid (*gandhak ka tezab*), the *pucca tanka* mixed with 1/4 of borax (*shhaga*) by weight and a little amount of water to prevent oxidation of metal when red hot, is coated all along the joining band of the article. The article is then placed over the blazing furnace blasted by a hand operated mechanical bellows. Then the joining band becomes red hot, the solder melts and runs into the joints. The craftsman operates the bellows with one hand and with the other regulates the flow of solder over the joints by tilting the articles at the required angle with the iron pincers.

(ii) *Scraping (Chhillai)*:—There are a few units in the city which, along with the rest of their art metal production, undertake scraping work. Scraping is mainly done on decorative copper trays (*thals*) with an indigenous method locally known as *chhillai*. *Charakh* is a hand driven wooden lathe. On the mouth end of the wooden lathe a thick mass of *rai* (resin) is fastened. The tray to be scrapped is first heated over an *angithi* (small hearth) and then its base is securely mounted on the end of the wooden lathe which carries the resin. Now, the *chhillai* operation—*chhillai* literally meaning scraping—requires two craftsmen, one to rotate the wooden lathe and the other to scrape the revolving plate with a scraping tool. The wooden lathe rotates alternatively, first in a clockwise and then in an anti-clockwise direction as the rotater pulls first one end of the leather strap wound around the centre of lathe and then the other end. A craftsman sitting at a right angle about a metre away from the lathe, holds the two ends of the leather strap in his both hands. Pulling of the upper strap, he revolves the lathe and the plate in clockwise direction (and simultaneously the lower strap gets automatically rolled at the centre of the lathe); and the pulling of the lower strap revolves the lathe in anti-clockwise direction (now automatically the upper strap gets rolled at the centre of the lathe). The operation of revolving the wooden lathe by the leather strap is locally known as *khichai*, which literally means pulling. By its very nature the operation is a most monotonous and exhausting one. If practised over a long period of time, in the majority of cases, the craftsman becomes virtually hunchbacked.

It is only when the plate mounted on the lathe revolves in a clockwise direction, that the craftsman (scraper), sitting close to the revolving plate, can press the sharp-edged scraping implement (locally known as *randa*) against the plate. Little by little, the surface of the plate...
Craftsman scraping a copper tray.
is scrapped and smoothened. Holding the scraping implement firmly in his right hand the craftsman who does the scraping grasps at the same time a small wooden stick which is about a foot and a half long. One end of this supporting stick is embedded in the ground while over it, at its top end, the craftsman rests the scraping implement which is pressed against the plate as it revolves on the lathe. (see Plate IV-12 and IV-13).

The faces of the scraped copper plates are now ready to receive the extremely distinguished impression work designs, locally known as thappe-ka-kam. The craftsman doing this impression work on the plates is known as the thappe wala. He imprints a number of fine designs on the scrapped plates just by using his innate sense of scale and space relationships as he taps out the various designs cut into the bases of the iron impressions tools with a square-edged hammer. During the incising of these designs on the round copper plate, the craftsman rests it over a flat square-edged iron block known as chauka. While hammering on the butt ends of the iron impression chisels with the square-edged hammer in his right hand, the craftsman holds and/or moves the impression tool with his left hand as the designing proceeds to take shape on the copper plate's surface. With the toe of his right foot and the wrist of his left hand he keeps the plate in a firm position over the chauka. During the operation, the craftsman covers the toe of his right foot, which holds the plate, and his two lower fingers and the wrist of his left hand which touch the surface.
of the plate, with a piece of cloth. This is in order to protect the freshly-scraped, shiny surface of the plate from body perspiration. With each blow of the hammer, the craftsman mechanically but carefully goes on tapping out the designs with the iron impression chisels within the concentric circles that contain them leaving even distances between the lines which in the beginning he plotted with the metal compass and his own unerring sense of proportion (Plate IV-14).

(iii) Chasing, and Perforation:—Chasing locally called chitai, is the engraving of a design on the surface of the metal with blunt chisels. In the chasing process, the chisel, when hammered with the blows of light hammers, merely leaves its imprint on the surface of the metal. In most instances, the chaser (chitera), chases the designs from memory, relying mainly upon his native aesthetic judgement for the placement of them on the picture plane, so to speak, of the smooth surface of the given object. In case of chasing the designs of native scenes, such as a scene at the village well, a hunting scene where a lion is facing a wild elephant, the Taj Mahal, Red Fort or portraits of renowned Indian Kings like Shahjahan, Akbar, Rana Pratap or deities such as Shiva, the designs are first prepared on tracing or carbonized paper matching the dimensions of the given object (usually a tray or wall plate) and outlining them in pencil on the surface of the metal.

For carrying out chasing work on certain articles such as a thal (tray), its reversed side is embedded in a thick layer of ral (resin). This resin is a sticky, quasi-gritty substance locally prepared by heating a mixture of burnt brick powder, mustard oil and gum (beroja) in the proportion of 10:3:5 respectively in a large iron frying pan. The ral is generally prepared during the evening hours of the day, between 5-30 P.M. to 7-30 P.M., and is used to provide a cushion against the blows of the hammer on the chasing tools as they fall on the surface of the metal object on which chasing and perforation (jali-kat) work are to be done. Once prepared the resin can be used for a number of times, because, when heated, it melts and becomes very sticky and when it cools down, becomes solid and hard.

Before pouring the hot resin over or into the articles with an iron ladle, the sides or backs of them are smeared with a lubricant, generally of mustard oil (saron ka tail) or sesame oil (til ka tail), the reason for this being that it helps the hot resin to permeate smoothly over or into every part of the article; also, in order that after completing the chasing or perforation work, the resin may be removed.

For perforation work (jali-kat), the chaser first chases the required design on the article with blunt chisels of suitable shapes and sizes. Finally, after completing the chasing work, by cutting right through the lines thus produced with sharp-edged chisels, the perforations are made.

After completing the chasing or perforation work, the article is again heated over the furnace, or with a blow-torch that operates with
kerosene oil, melting and thus removing thereby the resin sticking to the article. The small amount of resin that cannot be taken out in this way is burnt to ashes by putting the object over a blazing furnace.

(iv) Pickling and Polishing:—Pickling and polishing operations are necessary to give the artware a smooth surface and the requisite gloss and thus to enhance its saleability.

The pickling operation, locally known as nikhar, is done for the purpose of removing the films of black oxide that the metal acquires during the process of annealing and heating and also to remove from its surface, dirt and other impurities.

Artwares featuring chased work are first given a bath of sulphuric acid pickle followed by a bath of chrome salt and then a wash in water. On the other hand the perforated artwares are given a wash with sulphuric and nitric acid pickle followed by a wash in water and then immediately scrubbed with sawdust.

Cotton and linen mops fixed to the spindle of a buff polishing lathe are used to polish the artwares. Polishing them consists of three distinct operations, the first of which is locally known as ghutai, or grinding. To remove surface scratches on the plain surface of the artwares featuring no ornamentation, the grinding is done with a lustre that comes in the form of Silica bars. During the operation, this lustre is applied on the periphery of the revolving mop, which is generally a cotton one; but for removing deep scratches, a leather mop coated with emery paste is used against which the plain surface of the article is pressed. The second operation is known as polishing, and the third one finishing. Polishing and finishing are done with soft linen mops on which the Rouge or Peerless brands of polishing compound are applied, the latter being available in bars. Peerless polishing compound is commonly applied on articles with a more or less plain surface, or featuring some types of chased work. But in the case of perforated article, the Rouge bar is used. In the case of the artwares featuring chased work, before final finishing, that is to say, immediately after polishing, the artware is cleaned with a brush covered with kerosene oil and sawdust. For giving a better shine to the article, the craftsman also sometime touches the Rouge bar with kerosene oil and applies it on the periphery of the revolving mop.

In general, there is perfect division of labour in the various production processes of the craft. In fact, the different processes are so markedly different one from another that it becomes practically impossible for a craftsman to attain perfection in more than one process. A craftsman such as Siri Kishan, now working in All India Handicrafts Board’s Design Development Centre in New Delhi, and having masterly command of all the processes from shaping and soldering, chasing, engraving, and perforation work (done with a bow saw), to the polishing operations is rarely found these days. Normally, a craftsman engaged in one operation—in shaping and soldering, for instance—is practically of no use in other processes such as chasing, scraping and polishing.

For further amplification of this detailed empirical study of the raw materials, tools and techniques involved in the production of brass artwares obtaining in Delhi today, the following pages attempt to present not only textually, but also by means of still documentary, the stage by stage manufacturing processes of two kinds of brassware objects, viz., perforated brass hanging lamp-shades and brass artware trays.

PERFORATED HANGING LAMP SHADE

Hanging lamps, traditionally known as akash deep a Hindi word literally meaning 'sky lamp', and also as Samadan, a Persian word meaning an object for keeping a lamp, form one of the most distinctive traditional artware products of the brass and copper craft of this country. Although no systematic historical account of the origin and development of the craft is available, yet an analytical study of the various books and journals on the subject shows that the manufacture of hanging lamps flourished in
Delhi and in some of the important capitals of northern India, and came to a high peak of technical and artistic perfection under the influence of the Mogul emperors.

The Place of Lamps in Hindu Culture

To Hindus, a lamp has always been a sacred object and therefore a symbol of worship: an object leading one from the darkness of evil and wrong-doing to light and eternal truth—

_Tamo mā jayotigamaya, ṭamā mā jayotigamaya:_ a form of the supreme spirit's "ever-lasting light of lights that protects one from perdition."

Hence, the lamps, especially the votive lamps (arati आरती; deepa दीप) used for consecratory purposes and for various domestic rites and festivals, consisted of innumerable varieties and featured equally innumerable symbolic motifs. The votive lamps (arati) made of bronze often had a handle, or stand, formed in the shape of a cobra, a fish, a swan and other animals and birds of symbolic significance; the elephant with its trunk bearing the lamp bowl; _Nandi_ the bull which is the _vahana_ of Shiva; the peahen and parrot—all figured prominently. Among the divine beings the _Dīpa-Lakṣmī_ (Lakṣmī holding one oil lamp);_Shakti_ (Durga) and _Ganesa_, the son of Shiva, formed the popular motifs of the time. Commonly prevalent floral motifs appears in the lotus-like form, of an oil bowl (deepa), and in the metal lamp-stand featuring engravings of _peepal_ leaves. The size of the votive lamp with a handle normally varies from 6 cm. to 21 cm. and, of the standing lamp, from 21 cm. to 130 cm.

Place of Lamps in Muslim Culture

During the Mogul period, the perforated hanging lamp-shades came into popular demand. In fact before the advent of the Moguls in Delhi hanging lamps were not in large demand among the Hindus. However, although rare, they popularly manifested themselves in certain secular designs and motifs (especially of birds

---

2. Sir J. Birdwood—_Industrial Arts of India_ Vol. 1, 1880.
and animals such as the sparrow, parrot, peahen, swan, elephant and so on). The size of these lamps varied from 11 cm. to 40 cm. But during the Mogul regime particularly in the 17th, 18th and 19th centuries we find that in some of the important capitals of northern India, the sumptuously perforated hanging lamp-shades were manufactured in a great variety and were used as ceiling lamps, columnal lamps and in the late 19th centuries, as parlour lamps. Thus lamps formed one of the most decorative items for illuminating the beautiful palaces of the kings, the Maharajas and the rich jagirdars (landholders). These perforated hanging lamp-shades are also known as Mogul lamps. They were mainly made of brass sheet metal in globular, hexagonal, octagonal shapes, the handi (राण) or patti (पट्टी) (i.e. the central frame of the lamp) featuring intricate geometric perforation work. All such lamps had a metal hook attached to the top of the tower or dome by which they were hung up at night to allow the lighted wick inside them to project their handsome perforated patterns on the floor and walls. The popular sizes of these lamps produced during the 18th and 19th centuries varied between 30 cm. to 82 cm. (see illustrative Plates IV-A1, IV-A2, and IV-3.)

Delhi having been the principal capital of the Mogul Empires and for that reason one of the main centres of the production of Mogul Crafts, it is just possible that the manufactury of the Mogul hanging lamps originated in Delhi. Jaipur, Muradabad and Lucknow, which are today noted for their metal artwares, were subordinate to Delhi, and as history supplies us with sufficient records to show that following

---

*Bhoo deepa bharayarooprasatawamjyotisanjyoti rakhsaya, Thrahi ma niryat ghorat deep jyotrinavastute.*

Translation: O Lamp form of the Supreme Spirit, everlasting light of lights, protect me from perditions. I salute thee. (Source: G. D. Kalkar *Lamps of India*.)

*Sir G. D. Kalkar—Lamps of India, Publication Division, Government of India.*
the fall of the Moguls during the second half of the 19th Century, the talented metal craftsmen of Delhi migrated to other States, they might well have been the carriers of the 18th Century vogue for the perforated hanging lamp shades to these cities.  

Revival of the Craft

However, after the Second World War, when Delhi became the cosmopolitan capital of India, the production of its traditional art metal crafts again gained momentum. Today, one finds that the perforated hanging lamp-shades are manufactured in Delhi in a large variety of shades featuring a number of perforated floral and geometric designs to suit the varied tastes of different customers: foreign tourists, business concerns, homes, luxurious hotels, restaurants and clubs. Almost all of these provide for the neat fitting of electric light bulbs. Some of the most widely favoured shapes and design motifs of these lamps are shown in pp. 46-47. The photographs II-7A to II-D were taken by Mr. Amar Singh of the Office of the Registrar General, India, in the New Delhi Showroom of Mr. R. C. Nirula, a well-known dealer in metal artwares.

---

*Anand K. Coomarswamy—The Arts and Crafts of India and Ceylon, 1913.*
The study of the manufacturing processes which go into the making of the perforated hanging lamps is in itself a fascinating one in the sense that they reveal the non-material culture pattern of present day India, those being aspects which have to do with consumer preference in forms and surface decoration of a commodity. Significantly that the manufactory of these so-called Mogul Lamps, whether polygonal, hexagonal or globular in shape, or featuring floral twining stems (creepers), flowers, preferably the rose and jasmine or geometric and imbricate motifs (mahipushpa), barfi (square shape) or sakkarpara (diamond shape), all involve a number of processes, many of which are similar. In the following pages the manufacturing processes of the per-

Hexagonal brass darwala (with doors). Jaipuri lamp-shade. The height of the lamp-shade measures 40cm. and it consists of six main parts, viz.:

1. Patti (the breast or the central frame).
2. Chappals (caps):—Lower and upper caps are fitted to the respective lower and upper ends of the central frame of the lamp-shade. The upper cap measures 2 cm. and the lower one 3 cm.
3. Dhakkan (lid) fitted to the lower caps 4 cm.
4. Two gole lattus (round tops), both super-imposed on the upper cap: 12 cm. high.
5. Nokdar lattu (conical top), super-imposed to the upper most round top: 5 cm. high.
6. A knob, 3 cm. long attached to the lower lid.

The sexlocular central frame of the lamp-shade contains six curved dar (mihrab shaped openings) on all six sides. When the lamp is complete and polished, ground glass is fitted into these mihrab shapers. The central frame of the lamp-shade features a perforated motif of creepers and leaves. The lower and the upper caps and the round top superimposed only on the upper cap and the lower lid, features floral fret-work in a creeper with leaves ogee pattern. The upper-most round top features a squared fret-work while the conical top features no fret-work at all.
The sequences of the processes that today obtain in respect of the manufacturing of the various parts of the perforated hexagonal hanging lamp-shade are similar and may be broadly divided into the following seven process headings:

1. Cutting of the sheet into the desired shapes.
2. Beating the sheet into the shapes required for the particular design of a lamp-shade.
3. Soldering, if required.
4. Chasing the design after filling the object with ral (resin).
5. Perforation (openings pierced in the metal lamp-shade).
6. Fitting the different components of the lamp-shade together, by soldering, where necessary.
7. Polishing of the composite lamp.

The raw materials and the particular tools required during the manufacture of the perforated hanging lamp-shade obviously vary from operation to operation. The basic raw materials required for the manufacture of the different parts of the lamp consist of brass sheet (4'X 4' of 18 gauge thickness), or the brass sheet scrap pieces of suitable size but of the same thickness.

The set of various tools and implements required during the shaping and fitting operations of the lamp-shade are mainly the kation (pair of iron snippers) of medium size; parkar (pair of iron dividers); a set of wooden and iron hammers and mallets, and a number of stakes, the ekwai maikh, gole maikh and the kharwar. For details of the drawings of these refer to Chapter III on Raw Materials and Tools and Appliances.

The soldering techniques in most widespread use are of two kinds, viz., kutcha tanka (weak soldering) and pucca tanka (strong soldering). The technique of kutcha tanka, weak soldering requires the use of a solder rod made of an alloy of tin and lead bought from the local market, whereas the technique of pucca tanka (strong soldering) requires the use of an indigenously prepared solder brick consisting of brass, lead and silver, mixed with wet borax powder. The acid commonly used for washing the parts of articles before soldering is nitric acid. A hand-operated bellows for fanning the open furnace, a salai (spike) and a pair of iron pincers to handle the article over the blazing furnace form the main tools required during the soldering operations.

Chasing and perforation work require the use of ral, or resin; an iron pan to melt the resin; an iron ladle to pour the hot resin where required; a lubricant (mustard or sesame oil) to grease the articles so that the ral can be more easily removed after chasing and perforation work is complete; a set of sharp edged and blunt, floor and convex chisels; number of wooden blocks to support the articles while carrying out the chasing and fret-work with the chisels; a set of small hammers and a burner or blow torch to melt or burn out the ral (resin) from the articles after completing the chasing and perforation work.

Polishing is done on electric lathes with the help of polishing brushes and mops of various sizes and kinds. Before polishing, the article is washed with powdered pumice stone and water and then dried with barooda, sawdust. The main polishing compounds are the Lustre, the Silica and the Rouge bars.

---

10 Ral, resin is a sticky, rather gritty substance which is used to provide a base cushion for the object. It helps to guard against a possible break-through of the metal when hammering with the chisels on the face of the object and thus ensures a clean cut with chisels during the chasing and perforation work.
Semifinished, hexagonally shaped perforated central frame (darwali patti) fitted with perforated chapals (caps).

The craftsman, having placed the brass sheet on a flat ground surface, levels it with a mallet and draws a semi-circular outline of the desired length and width on the sheet with a pair of iron dividers. He then snips along these markings with the iron snippers thus obtaining the required shape of the brass piece seen in this illustration.

A. Darwali Patti, Perforated Central Frame

For making the hexagonal central frame known as patti, or handi, of the perforated hanging lamp-shade, a semi-circular brass piece is cut out with a katia (pair of iron snippers) from a brass sheet of 4' × 4' of 18 gauge thickness. This is cut in such a way that its larger, or upper, semi-circular side measures 15 inches, while the lower circular side and the width measure 29 inches and 8 inches respectively. (see Plate IV-B 1).

This cut brass piece is given a circular shape by the craftsman placing it over the ekwali maikh (a two-nosed stake) and bending it with the force of both his hands (see Plate IV-B 2).

In one of the wide loose ends of the brass sheet, the craftsman cuts three rectangular small clips with a pair of iron snippers, each being approximately 1/4th inch wide and 1/2 inch long, by means of which the two loose ends of the circularly cut piece of brass sheet will later be joined together (Plate IV-B 3).
These brass clips are then bent slightly inwardly and the joining of the two ends is done, first, by affixing one wide loose end without clips with other wide loose end with clips (see Plate IV-B 4), and then striking the joining with a mallet which will be permanently sealed finally by soldering.

Before soldering is done, the circularly bent brass piece is given the shape of the hexagonal patti (central frame of the lamp) by placing it over the ekwaii maikh (two-nosed stake) and giving it the required hexagonal turns by striking each turning with a mallet (see Plate VI-B 5).

*The flat brass piece is being given a circular bend over the round-shaped nose of the ekwaii maikh. The stake has a sharp, pointed terminal by which it is embedded firmly in the ground.* 

*With his right hand the craftsman is cutting out the clips in one of the wide loose ends of the circularly bent brass piece with a katia (a pair of iron snippers) while his left hand supports the other circularly bent end of the brass piece with the added help of the two-nosed stake.*
With both hands the craftsman forces together the wide loose end of the circularly bent brass piece which is without clips with the other loose end which has the inwardly bent clips or hook. Thus does the craftsman give the circularly bent brass piece the shape shown in Plate. IV-A

A rough hexagonal shape is being given to the brass piece by striking it with angular blows of a mallet over the ekwaι maιkh (two-nosed stake). IV-B5
The process of soldering is simple but requires a good deal of labour and skill and consists of a number of operations. Firstly, the joint (the longitudinally meeting edges of the circularly cut brass piece) is washed with nitric acid and water. The acid is usually applied with swab, i.e., a small stick with a few pieces of rags, or cotton waste wrapped around it at one end. The jointing is then immediately washed with water. An indigenously prepared soldering material known as pucca tanka (strong solder) consisting of brass, zinc, borax and silver mixed with a small amount of water, is applied all along the joining band with a spike (salai). Then the area of the joining band is placed over the blazing open furnace. The craftsman sitting close to the furnace manipulates the hand-operated bellows with his left hand. When the band becomes sufficiently heated the soldering material starts to fuse and immediately the craftsman regulates its flow by tilting the band with a spike or a pair of iron pincers (sandasi) so that the molten solder becomes evenly flooded along the joining band. The craftsman then takes it out of the furnace. When the band cools down it is finally beaten with a chauras hathora (square edged hammer) over the two-nosed stake and symmetrically levelled. Thus does the brass piece attain the crude form of the hexagonal patti (central frame) of the lamp.

Raj (resin) is being heated in an iron pan used only for melting the resin. The pan is placed over the the pan from a tray to the left of his foot which dropping one of the hard, solid pieces of resin into open bhatti (furnace) on a temporary support of bricks, wood being used as fuel. The craftsman is holds them.
The craftsman is applying a lubricant to the interior surfaces of the hexagonal central frame of the lampshade with a small piece of folded cloth dipped in mustard oil which is in a dibba (tin container) lying near his right elbow.

Whilst still in the iron pan on the blazing furnace, the hot resin is being ladled into the hollow hexagonal central frame of the lampshade. As the ladle (Karachi) full of resin becomes quite heavy and unwieldy, it requires the use of both the craftsman's hands to handle it.
Now the hexagonal *patti* (central frame) enters the second stage of manufacture, viz., *chitai* and *jali-kat* (chasing and perforation) work. For this purpose the hollow space of the central frame is filled with a sticky substance known as *ral* (resin)—a mixture of burnt brick powder, mustard oil and beeswax, etc. The resin provides a kind of cushion for the metal object whilst the *chitai* (chasing) or *jali-kat* (perforation) work is being done with hammer and chisels. It is interesting to note that once prepared the resin can be used for a number of times, for its very nature is such that apart from being sticky substance, if heated it melts and when it becomes cool it gets solid and hard.

The resin is invariably heated and poured into the articles to be chased and perforated during the evening hours of the day so that it may get hard overnight and be ready for the chasing and perforation work on the articles on the following morning or later. The resin is melted by putting it into an iron pan used exclusively for heating it. It is placed over an open ground furnace draughted by hand-operated mechanical bellows (Plate IV-B 6).

Before pouring the resin into the hollow central frame of the lamp-shade (*patti*), its hollow interior is moistened with a lubricant (consisting of either mustard or sesame seed oil). The reason for this is that the resin being a sticky and rather gritty substance because of the powdered brick which is added to thicken the resin, it needs a lubricant in order that it may permeate each and every corner of the hollow central frame and also in order that after completing the perforation work the resin may be more easily removed (Plate IV-B 7).

Before pouring the hot resin into the interior of the central frame of the lamp-shade, that area (earth) is first dampened with water, the purpose being that soon after the hot *ral* (resin) is poured into the hollow central frame it should cool down quickly to form a solid base which will sustain the frame during the perforation and chasing processes. Finally, when the resin is sufficiently melted, the craftsman dips out the hot melting resin from the iron pan with an iron ladle and pours into the hollow inner side of the hexagonal central frame of the lamp-shade (Plate IV-B 8).

The resin sticking to the outer sides of one of the central frames of the lamp-shade is being taken off with the help of a floor chisel. Holding the floor chisel at the desired angle with his left hand, the craftsman strikes the chisel at an angle with a small iron hammer. The central frame of the lamp-shade is also tilted at an angle over a wooden block in order to help in keeping the central frame at an angle that matches that of the hammer blows on the chisel.

During the process of filling the hollow central frames of the lamp-shade with the resin, a portion of it usually sticks to the outer sides of them where the perforation work is to be done. It is, therefore, necessary to remove it so that the outer sides of the frame are clean and smooth for the ensuing chasing and perforation work. The resin sticking on the outer sides of the central frames is removed by means of a hammer and a chisel (Plate IV-B 9).
The craftsman, guided by both his long experience and his instinctive feeling for the aesthetically right spacing of his designs, is drawing two parallel lines at a distance of about 3/4" away from the lower end of the central frame of the lamp-shade with the double-edged floor chisel, (dohri soot lagane ki chhaini) used for chasing a pair of parallel lines. In the process, the craftsman moves the chisel with his left hand while his right hand gives straight right angle hammer blows to the chisel. The central frame is given the desired slope by tilting it against a wooden log. His right foot is used to give a firm support to the central frame whilst the chasing is being done.

With a pair of iron dividers, the craftsman is measuring the distance left in between the brass templet and the lines running parallel to the lower end of the hexagonal central frame.
First of all, using his own well trained sense of good space relationships in the matter of linear design placement, the craftsman draws a pair of parallel straight lines at a distance of about $\frac{1}{4}$" from the upper and the lower ends of the central frame of the lamp-shade with a dohari soot lagane ki chhaini (a double-edged floor chisel) (Plate IV-B 10).

As a next step, with the help of a parkar (pair of iron dividers) the craftsman again marks a distance all round the six sides of the central frame. The distance so marked towards the lower ends of the central frame constitutes the difference between the lower and the upper parallel lines marked earlier, minus the dimensions of the brass template, a cut out brass form, around which are to be marked the shape and size of the durs, i.e., mihrab-like openings in the six central sided frames of the lamp-shade (see Plate IV-B 11). At this distance, the craftsman again draws a pair of two parallel lines with a double-edged floor chisel (Plate IV-B 12), thus earmarks the lower border.

Subsequent steps of chasing the required design are explained in their proper sequence by means of the illustration—IV-B 1.

At this point a few words should be included regarding the sequences of the chasing process, known as chitai work, amongst the Delhi artware craftsmen. After drawing the lines marked by arrows 1, 2, 3 and 4 (refer to illustration—IV-B 1), on each side of the hexagonal central frame of the lamp-shade, the craftsman chases a pattern of leaves and branches of a creeper all along the six-sided border of the hexagonal central brass frame without benefit of having first made preliminary tracings of them on the frame. While doing so, the craftsman manipulates his chisel in such a way that a clear demarcation of the space required for chasing the branchlets of the creeper is achieved. After completing the chasing of the leaves on all six borders of the hexagonal central frame, the craftsman chases the branchlets with the floor chisel (Plate IV-B 13, Illustration—IV-B 1 Arrow 6).
On the upper side of the central frame, a pair of parallel lines has been chased with a double-edged floor chisel. On the lower side, the craftsman, with a pair of iron dividers, is marking off the distance at which a part of parallel lines will be drawn to provide the outlines to the lower border of the central frame.

With a sidhi chhaini (floor chisel), the craftsman is chasing the branchlets of the creeper along all the borders of the hexagonal central frame of the lamp-shade. During the process, the hexagonal central frame is supported by a wooden log (thaiya). A small square-edged hammer is being used to strike the head of the chisel. Striking the butt end of the floor chisel and operating it is almost an instantaneous process.

After deepening the two mihrab-shaped border lines marked on one side of the central frame, the craftsman is chasing similar mihrab-shaped lines on the other side of the central frame with a nakhuni chhaini (convex chisel). The upper end of the central frame is placed over a wooden block while the lower end rests on the ground. One of the side corners of the hexagonal central frame is balanced by placing it over one end of the convex chisel.

Then, just above these border, with an iron spike the craftsman traces the outline of the mihrab-like design on each side of the hexagonal central frame of the lamp-shade. This is done with the help of the brass templet, cut in the shape of a mihrab, (Plate IV-B 14). The trace marks are further deepened by chasing and another line running parallel to the mihrab-like line is also chased with the nakhuni chhaini (convex chisel). (See illustration IV-B1, Arrow No. 7 and Plate IV-B 15).

With an unerring judgment of the deployment of design forms on this particular area of his mental picture plane, partially based on a backlog of experience in having executed this particular design by means of chisels many, many times before, with the convex chisel the craftsman chases a creeper motif on the side adjacent to the...
mihrab shape. He first chases the pattern of leaves (patti) in the middle of the sill of the mihrab-shaped opening and then proceeds to chase the leaves on the outer sides of the mihrab form (Illustration-I, Arrow 8). With the floor chisel (sidhi chhaini) he finally chases the required branchlets. (Plate IV-B 16).

When the chasing work on all six sides of the hexagonal central frame is completed, the perforation work at last is undertaken. It begins with chiselling out the inner circle of the floral designs with a chisel having a hollow rounded edge (gulchum chhaini) as illustrated in Plate IV-B 17. With a sharp pointed floor chisel, the craftsman then cuts out all the triangular areas lying between the leaves and the branches. Finally, all the dars (mihrab-shaped openings) are chiselled out with the same chisel and the perforation work is completed (See Plate IV-B 18).
In order to pull out the central frame from the mass of resin, all the parts of central frame are being evenly heated with blow torch IV-B19

Now, all that remains is to remove the *real* (resin) from the interior of the hexagonal central frame of the lamp-shade. For this, all the sides of the central hexagonal frame are evenly heated with a blow torch fuelled by kerosene oil. During the process of heating, the craftsman rotates the central frame with a pair of iron pincers in his left hand so that all the sides will be uniformly heated by the blow torch held in his right hand (Plate IV-B 19). When the mass of resin inside the central frame becomes sufficiently heated and starts melting, the craftsman grasps the rim at the top of the hexagonal central frame with the claws of his iron pincers (*sandasi*) (Plate IV-B 20). At last, still holding the rim firmly with the claws of the pincers, the craftsman pulls out the central frame from the melting mass of resin (Plate IV-B 21).

*With the help of claws of iron pincers the craftsman pulls out the hexagonal central frame. The blow torch in his right hand is used to eliminate possible sticking which in the process arises out of the adhesive nature of the resin.* IV-B20, 21.
The corners of the central frame where the clips are to be soldered are being washed with nitric acid. The acid, which is in a cup, is applied to the specific areas with a small stick wrapped at one end with rags.

Sitting close to the open furnace, the craftsman is applying ammonium chloride (nosader) to the part of the central frame where the clip is to be affixed. The ammonium chloride is kept in a small metal cup (katora). In the left hand of the craftsman is a small iron pincer with which he takes the central frame out of the blazing furnace and holds it till the ammonium chloride is applied. The central frame is again placed over the furnace for further processes.

The hexagonal central frame is on the blazing furnace and the craftsman, sitting close to it, is rubbing the solder rod on one of the designated places where the clip is to be dropped.
A small amount of resin still remains sticking to the central frame of the lamp-shade, so, in order to free it from the sticky resin, the hexagonal central frame is placed over the blazing open hearth and the resin is burnt to ashes.

The six mihrab-shaped openings of the hexagonal lamp-shade now no longer clogged with the resin, are later to be fitted with panes of ground glass held in position by means of brass clips fixed on the inside. These are made out of a rectangular brass piece 3/4th of an inch by 1/2 inch, from the scraped brass sheet (see Illustration IV-B 2-1). This rectangular brass piece is cut lengthwise into two halves and then each half is twisted in the reverse direction by hand and thus given the shape shown in Illustration IV-B 2-2. These clips are soldered into place in pairs of two, one in the lower half and the other in the upper half of each of the bent side corners of the hexagonal central frame.

The process followed in soldering the clips inside the hexagonal central frame is actually quite simple. First of all, all six of the turned corners of the hexagonal central frame where clips are to be soldered, are washed with nitric acid (Plate IV-B 22) and water. 

Now, over the blazing furnace, each of the areas on the turned corners of the central frame where the clips are to be soldered, is gently heated from the outer sides and, when hot, is removed from the furnace with the purpose of applying a thin coating of nosadar (ammonium chloride) precisely on the spot where the clip is to be soldered (Plate IV-B 23). It is said that the ammonium chloride helps to reduce oxidation caused by heating the metal, and thus helps the solder material to fuse with the metal.

Over the blazing furnace, the part where ammonium chloride has been applied is heated, and in reaction it emits smoke. It is believed that ammonium chloride helps to cleanse the oxidation caused by heating the metal; also, that it speeds the melting of the solder rod. Immediately then, the craftsman rubs the solder rod (usually an alloy of tin and lead) just on the part where the smoke is emanating (see Plate IV-B 24). As the craftsman rubs the solder rod over the designated place, a portion of the solder rod is instantaneously reduced to molten form. At this point the craftsman drops the clip over the fluxion (Plate IV-B 25) in such a way that the straight base of the clip coincides with the straight line formed by the inwardly bending side corners of the hexagonal central frame. For arranging the clip in the exact position in which it is desired, an iron spike is also used.
Perforated Hexagonal Chappals (Caps)

Perforated hexagonal caps (chappals) are fitted in the upper end as well as the lower end of the hexagonal central frame (patti) of the perforated hanging lamp-shade. As the circumference of the upper end of it is shorter than the circumference of the lower end, accordingly, the upper cap is of a smaller size than the lower cap. However, in spite of the difference in size, the manufacturing processes of the lower as well as upper cap are much the same. In the following pages an attempt has been made to describe at length, and to depict by means of a still documentary, the manufacturing processes that go into the making of the lower cap of the hexagonal central frame.

The first of these processes starts with cutting out with a pair of snippers a circular piece of a given diameter from a brass sheet. The craftsman then puts the brass disc on a hollow iron appliance known as a bangar (Plate IV-C 1), and with the help of a pair of iron dividers (parkar) he draws three concentric circles on the disc, the circular lines thus marked serving as guide lines for indicating the different forms of concavity needed for the different parts of the circular piece before it assumes the final forms of the cap i.e., chappal. The first circle is drawn with a radius of 2½" from the centre of the plate. The radii of the second and third circles are 2 inches and 1½ inches respectively (see Plate IV-C 2).

The concentric circles serve as the guide line for the craftsman to follow while giving the required shapes to the disc. After drawing the circles, the brass plate is placed over the hollow iron frame (bangar) and is hammered with a round-faced mallet, the object being to bend the plate in such a way that the concavity of the area lying under the second circle is more than that on its outer side (Plate IV-C 3).

After giving the brass piece the required concave shape, a process technically referred to as raising, it is placed on the hollow iron frame (bangar) and a circle with a radius of one inch from the centre is drawn (Plate IV-C 4). The innermost portion of the circle is then cut out, a sharp edged sidhi chhaini (floor chisel) being used for this operation. The concave piece of brass is placed on the hollow iron frame and by hammer blows on the head of the floor chisel, the craftsman guides it along the markings of the above-mentioned inner-circle (see Plate
The craftsman, sitting on a gunny bag, holds the circular plate on the edge of the bangar with the pressure of the thumb of his left hand and draws a concentric circle on the plate with a pair of iron dividers (parkar).

The craftsman is giving the circular plate a concave bend by beating it over the rim of the bangar (hollow iron frame) with a wooden mallet. He uses his left hand to adjust the plate as desired in the process. While giving the plate hard blows of the mallet, the craftsman also uses his right foot as a supplementary holding tool.

The craftsman, holding the concave plate in his left hand over the iron bangar, draws the innermost circle with a pair of iron dividers.
In order to cut out the marked central portion of the brass piece which will form the cap of the lampshade, the craftsman places the plate over the bangar (the hollow iron frame) and holds it there with the toes of his left foot. That part of the innermost circle which is being chiselled out is held close to the inner edge of the hollowed out portion of the bangar. With the chisel in his left hand, the craftsman guides it to follow the markings on the inner circle, while with his right hand he wields the hammer that rains down strong strokes on the butt end of the cutting chisel.

In order to give the brass plate for the lampshade's cap its final hexagonal shape, it has to undergo a number of beating operations. To make the beating operations safe, the plate is heated in an open ground furnace (see Plate IV-C7) for by heating, the metal becomes pliant and thus can be beaten into the required shape without fear of breaking the metal. This process is known as annealing.

After being heated, the brass piece is placed over an iron bangar (see Plate IV-C B) with an upward slanting edge. The craftsman hammers the area lying between the second concentric circle originally marked on the plate, and the edges of the cut hole so as to turn this area of the piece down in a vertical direction. The
Holding the concave piece of brass vertically over the hollow iron frame with his left foot and left hand, the craftsman smoothens the rough edges of the chiselled-out portion of the brass plate with a round file. IV-C6

In an open ground furnace, the hollow concave piece is being heated prior to annealing. For heating all the portions of the plate evenly, the craftsman keeps moving the piece over the furnace with a spike. IV-C7

The circular area lying under the second marked circle is vertically inverted by heating it on the bangar's thick rounded rim, with round-edged hammer (gole hathora). IV-C8
hammering is done with a round edged hammer (see Plate IV-C 8). The area between the first and the second circle is made concave by beating it with a round-edged wooden mallet over the circular up-slanting rim of the hollow iron frame (bangar). The brass plate is placed over its raised rim in such a way that the area between first and second circle lies against the hollow opening of the bangar. With the round-edged mallet in his right hand, the craftsman gives right angled blows just below the marking of the second circle, while with his left hand he keeps moving the plate at the desired angle after each blow of the mallet (see Plate IV-C 9).

Finally, the concavity of the area lying outside the first circle is reduced and made flat by heating it with a square-edged wooden mallet over the horizontally flat part of the two-nosed stake (ekwai maikh). With his left hand the craftsman gradually and evenly moves the brass plate after each blow of the square-edged wooden mallet (see Plate IV-C 10).

Thus is the brass piece raised into the shape of a cap (chappal), but so far only in a crude form. For attaining the necessary refinement of shape, the crude cap is worked with fine iron hammers. First, the inverted bent edges of the cap are beaten with a square edged hammer (chauras hathora), and finally with a rectangularly edged hammer over a two-nosed stake (ekwai maikh) (Plates IV-C11 and IV-C12).

The concave part of the cap is now inverted over the bright stake (gole maikh) and is beaten evenly with the delicate blows of the square-edged hammer, chauras hathora (Plate IV-C 13).
The concave part of the cap is placed upside down over the bright stake and is being supported at an angle with the help of the craftsman's left hand while the toes of his left foot are also used to keep the cap at an angle. The blows of the square-edged hammer over the concave part of the cap fall close to the thumb of his left hand.

IV-C13

The cap is placed bottom side down over the recumbent two-nosed stake while the craftsman marks the placement of the six points with an iron compass between which the circular cap will be cut straight to form a hexagonal-shaped lid.

IV-C14

The cap is being supported on the wooden shaft of a hammer placed athwart the recumbent two-nosed stake. A pair of iron snippers is also placed at the desired angle with the support of a wooden mallet's shaft. The craftsman, grasping the handles of the iron snippers with his right hand, cuts straight between the six marked points, while with his right hand he turns the cap after each cutting.

IV-C15
To give the desired hexagonal shape to the chappal (cap), the outer circular ends of the cap have to be cut out in a hexagonal form. For this, the outer cones of the cap are first marked out with an iron compass (parkar) (see Plate IV-C14), and then cut out in a straight line with a pair of iron snippers. (Plate IV-C15).

In this way, then, the cap assumes the hexagonal shape as shown in Plate IV-C16. The

Chasing and Perforation work on Chappals (caps)

The processes of chasing the design and the perforation on the upper and the lower caps are the same as those described in making the hexagonal central frame of the lamp-shade. Both of the caps feature the bel patti (बेलपत्ती) (a design of a creeper with leaves) and perforation work commences after chasing the outlines of this design. However, before commenc-

upper chappal (cap) of the hexagonal lampshade is prepared in the same manner as the lower one. The only difference lies in the sizes of two. The upper cap is smaller than the lower cap. (Plate IV-C16).

It may be parenthetically added that although all the operations involved in producing the hexagonally shaped cap look simple enough, actually, they require consummate skill and experience which an artisan only gains through long and constant practice.
First, with a sure sense of linear space that goes for beyond mere approximation of it, the craftsman draws a pair of parallel circular lines immediately below the outwardly curved, i.e., convex portion of the cap with sidhi chhaini (floor chisel). 

The inner circles of the floral designs are chased with a gulchum chhaini (a round edged chisel). 

The leaves of the creeper and the petals of the flowers, are chased with a nakhuni chhaini (convex chisel). 

Last of all the small branchlets of the flower, leaf and creeper design are chased with a floor chisel all around the convexly curved portion of the hexagonal cap.

Perforation work is embarked upon after completing the chasimg of the floral design on the pair of caps (chappals). First, the inner circles of the floral design are chiselled out with a hollow round edged chisel (gulchum chhaini); then the space left in between the leaves and the creeper or curving stem form, is cut out with a sharp edged floor chisel (sidhi chhaini) (Plate IV-C18).

After completing the perforation work on the pair of caps (chappals), each is heated with a blow torch and then after removing the resin (ral) from them, they are placed over the blazing furnace in order to eliminate the resin still sticking to the interiors of the caps.
Chasing and Perforation work on Lower Dhakkan (Lid).

Like the other parts of the hexagonal perforated hanging lamp-shade, the lower dhakkan (lid) also features cut work i.e. fret-work motifs of creepers with leaves. Before chasing the floral design on the lid, the inner side of it is filled with resin (ral). Immediately after pouring the resin into the lid, all the rest of the lids are attached together, at their mouth openings in groups of two with the resin in between. First, a lubricant of mustard or sesame oil is applied to the interior of the bowl-shaped lid and then it is filled up to the brim with hot resin. After sometime, when the lids have cooled down somewhat they are stuck to each other in pairs of two at their mouth openings and thus scaled with resin. Thereafter on the following morning or later, the desired design is chased and perforated.

The sequence of operations followed in chasing the floral design on the lid under study is clearly shown by Illustration IV-C19. All the operations shown in the Illustration are performed by the craftsman with remarkable accuracy, without tracing the design on the lid or drawing guidelines to work out the design. The designs are chased by the craftsman mechanically purely from his memory, this being the direct result of his skill and long experience.

Perforation work on the lid is started after chasing the leaves and the branchlets of the creeper. The narrow spaces lying in between the leaves and the branchlets are skillfully chiselled out with a sharp edged floor chisel and magically enough without causing the slightest damage to the chased forms of the leaves and branchlets (see Plate IV-C20).

In the latter operation, after making the semicircular curves (Illustration IV-C19, Arrow-4) and joining their ends with the top end of the lid with a floor chisel (see Illustration IV-C19, Arrow-5; and Plate IV-C21) the small triangular area so formed outside the semicircular curves is chiselled out (Plate IV-C22).
After chiselling out the surplus space lying in between the leaves and branchlets of the creeper and chasing elongated petal shapes that converge in a point at the top of the lid to form a peaked rosette, the craftsman is cutting out small triangular terminal spaces between the petal formations on the dome-shaped lid. In this way, then, the floral and other cut work designs are completed on the lower lids of the hexagonal hanging lamp-shades. Finally, with the help of a pair of iron pincers (sandasi) and a blowtorch, the resin is melted out of the lids. The amount of resin still sticking to the lids is burnt to nothing but ashes by placing them over a blazing ground furnace.
Manufacturing Process of Perforated Gole Lattus (Round Tops)

A pair of round ball-like brass tops, known as gole lattus, is superimposed on the upper chappal (cap) of the hexagonal hanging lampshade. The manufacturing process of both the tops is similar, the differentiation between the two being evidenced only by their size and design. The first top which is fitted immediately into the cleavers (the outwardly bent rim) of the upper cap features floral perforation work, the motif being the undulating creeper with leaves. It is slightly larger in size in comparison to the upper top which is superimposed on the first (see Plate IV-A4, page 100). The upper top features a geometric fret design, the name of the motif of this perforation work being shakkarpura, an Indian sweet preparation cut into diamond shapes. In the following descriptive paragraphs, and by means of illustrations, the step-by-step processes that go into the production of the upper sphered top (including fretwork) are explained:

By moving the brass disc over the smooth depression in the wood and beating the disc with a round-edged hammer, the craftsman gradually shapes it into a hemispheric form.  

During the annealing process the lower bowl is placed over the wood fuelled ground furnace where the craftsman handles it with a long spike in his right hand whilst his left hand works the bellows.
The brass ball shape is made by soldering together the edges of the rims of the lower and upper bowls (katories) respectively, which needless to point out, are of the same size. For making the two bowls, which will be joined together to make one top (lattu), two discs, each four inches in diameter, are first cut out by the craftsman from a sheet of brass scrap. One after the other, the circular plates are given the shape of small bowls by beating them with an iron hammer over an okhal or smooth depression cut into a block of wood to the required shape and size of the bowl (Plate IV-D1 and IV-D2).

The lower bowls have to undergo a number of delicate shaping processes, and therefore, have to be annealed many, many times. For annealing, they are heated over an open ground.
furnace till they become red hot (see Plate IV-D3) and then are allowed to cool. As has already been explained, the purpose of annealing is to make the metal soft and thus obviate its cracking during further delicate shaping operations with the iron hammers.

When one by one, the bowls have cooled down, the craftsman puts them upside down over the bright stake (gole maikh) and with a pair of iron dividers (parkar), incises a concentric circle from the centre of the bowl, the radius from the centre, being about 3/4 of an inch (see Plate IV-D4). This is done in order to provide him with a guide line while making a circular hole through the centre of it.

Then the circular area marked by the compass is chiselled out with the help of a floor chisel (see Plate IV-D5). The irregular circular edges thus formed are finally made smooth with a file (rett) (Plate IV-D6).

Once again, the hollow bowl is annealed by placing it over the open fire of the ground furnace till it gets red hot. The bowl is moved about over the furnace fire with a long iron spike (salai), one end of which is slightly bent in the shape of a hook. The craftsman sits close to the furnace and while manipulating the bowl over the fire with a spike in his right hand, with his left he works the hand-operated mechanical
bellows to keep the furnace at white heat. (Plate IV-D 7). Annealing makes the metal soft and easier for the craftsman to handle the bowl during the subsequent raising operations.

When the bowl has cooled down, the outer cleavers, or the vertical outwardly bent circumferential edges of the bowl, are shaped over the round pointed end of the ekwaii maikh (two nosed stake.). The bowl is inserted at its face and over the end of the ekwaii maikh and where the edges of the bowl meet the rounded end of the ekwaii maikh, these are beaten with light blows of a chauras hathara (a square-edged hammer) and turned slightly flat so as to form the cleavers (Plate IV-D 8). The cleavers are formed in order to enable the craftsman to superimpose one top on the other while fitting the different perforated components of the lampshade together.

Finally, the outer edges of the bowl are made uniform by cutting the irregular ends with a katiya (pair of large-sized iron snippers) (see Plate IV-D 9).

Then the two bowls, viz., the lower bowl and the upper bowl, are soldered together at their circumferential edges. Before soldering, however, in order to give a firm grip to the two bowls by their circumferential edges thus to constitute the formal but crude shape of round

The irregular ends of the bowl are being cut off with the iron snippers. While moving the katiya with his right hand, the craftsman automatically adjusts the bowl with his left hand to the ongoing pace of the snippers. IV-D8

A kharwar, a long iron stake with both its ends turned up, is placed at an angle over a wooden log with the help of an iron nail fixed in the log itself. IV-D9

With the square-edged hammer, the craftsman is beating the edges of the bowl. The edges of the bowl are placed over a kharwar, and adjusted as desired in the process by the left hand. IV-D10
top (latu), the circumferential edges of the lower bowl and the upper bowl are made thinner. The circumferential edges of the lower bowls are made thinner by placing it over a kharwar (a large iron stake turned up at both ends) and hammering it with a square-edged hammer (Plate IV-D 10) whereas the circumferential edges of the upper bowl are rendered thin by beating them with square-edged hammer over a gole maikh, i.e., bright stake. (Plate IV-D 11).

The two bowls are now joined together at their circumferential rims, first by the hands of the craftsman pressing them together (see Plate IV-D 12) and then by beating the joined area over a long iron stake with upturned ends (kharwar) with a small square-edged hammer, this with a view to making the seam of the joint so smooth that it can never be detected (see Plate IV-D 13).

The joint is now to be made strong and firm by soldering it together with pucca tanka, a soldering material, indigenously prepared, the materials and preparation of which have already been described. The pucca tanka, referred to as the strong soldering material, is mixed with a small amount of water and then is spread with the help of a small spike all along the inner side of the median band which was formed by the joining together of the rims of the lower and upper bowls (see Plate IV-D 14).

The circumferential edges of the upper bowl are being beaten with light blows of the square-edged hammer over the bright stake. They fall close to the left thumb of the craftsman, while with his left thumb and the fingers he adjusts the edges of the bowl over the bright stake. IV-D11

Using both his hands, the craftsman is fitting together the rims of the two bowls. IV-D12

The joint of the two bowls is being beaten with the square-edged hammer over an upwardly bent end of the kharwar in order to obtain a smooth surface where their joining has been effected. IV-D13
The pucca tanka, strong soldering material is being applied with the flat end of the spike.

The round top is then placed over the furnace and when it is sufficiently heated up the pucca tanka, consisting of brass, lead and silver mixed with wet borax powder (borax serving as flux) becomes fluid and starts flowing over the joining band. Over the furnace, the top is moved and adjusted in the desired position by the craftsman with an iron spike (salai). Now again when cooled down the joint of the top is placed over a bright stake and hammered with the square-edged hammer in order to make the joining bands smooth and even (Plate IV-D 15).

Now the spherical round top is ready for the chasing and the fret-work. The technical process of chasing the design and carrying out the perforation work on the tops is the same as described in case of the caps and the central frame. As always, during the evening, the resin is heated and poured into the tops after applying mustard or sesame seed oil on the inner sides of the tops. On the following morning, the required design is first chased and then chiselled out where perforation work is indicated. The spherical top that will be placed uppermost on the hexagonal hanging lamp-shade, is decorated by squared fret-work (Plate IV-D 16 to IV-D 19), whereas the lower spherical top features floral fret-work, the motif being a creeper with leaves (Plate IV-D 20).
With a sharp-edged floor chisel the craftsman is chiselling out the square fret design on the upper top.

With a floor chisel the craftsman is incising straight-line marks, joining the upper corner ends of the perforated squares and the pyramidal end of the top.

A small circular hole is being cut out at the pyramidal end of the upper spherical top for putting an electric wire into the lamp-shade. While cutting out this circular hole with a small floor chisel the top is held firmly by the toes of the craftsman's left foot.

The floral design and the motif of creeper with leaves, is being perforated on the lower spherical top with the help of a floor chisel.
The process of taking out the resin from the perforated spherical tops is somewhat different from that used in the perforated caps (chapnats) or lids or central frame. Each top is first given a thin coating of clay loam on the outside so that while heating the top the resin may not flow through the perforated portions. Over a blazing ground furnace, the tops are heated for about ten minutes so that the resin inside them starts melting. The tops are then taken out of the furnace with the iron pincers and the loam covering their circumferential edges is broken open. The melted resin then starts flowing out from the perforated openings of the tops. When it cools down, it is stored for future use and the thin coating of clay loam sticking to other sides of the top is recovered by gentle hammering with an iron rod. As always, the small amount of resin still sticking to the tops is burnt away by placing them on the furnace fire once again.

With an iron rod in his right hand the craftsman is estimating the approximate distances between two opposite points of the lower end of the hexagonal central frame.

The craft Process of Fitting together the Different Parts of Lamp-shade

It is only when the chasing and the perforation work on all the different parts of the hexagonal hanging lamp-shade is complete that the work of fitting them together is undertaken. In the next few pages, how the art metal artisans of Delhi do this will be textually described and illustrated.

First of all, the artisan solders the perforated lower and upper caps of the lamp-shade to the

After placing the lower end of the hexagonal central frame over the lower caps the craftsman marks off the cap area extending slightly beyond the base edge of the central frame with a spike. This area will eventually be given an inverted hem, so to speak, with a mallet and hammer in order to ensure a neat fitting together of the lower hexagonal cap and the lower end of the hexagonal central frame of the lamp-shade.
lower and upper ends of the perforated hexagonal central frame respectively. He starts by soldering the lower cap to the base of the hexagonal central frame and then solders the upper cap to the upper end of the hexagonal central frame. The process of soldering both of these caps to the respective ends of the central frame follows the already described sequences.

To start with, the craftsman places the hexagonal central frame upper end down on the ground. Then with an iron rod he measures the distances between all the six points of the hexagonal frame which are directly opposite each other (Plate IV-F 1). This is done in order to determine whether the opposite points of the hexagonal central frame are equidistant from each other and thus form a perfect hexagonal position corresponding to the hexagonal form of the lower cap (chappal) and also to ensure prima-facie a neat fitting of the lower cap with the lower end of the central frame. With the aim of ensuring that the sides of the lower cap coincide with the hexagonal shape of the central frame, the craftsman first places the perforated lower cap on the ground with its flat hexagonal rim facing up. Over that he places the base of the lower end of the central frame. With the pointed end of a salai (spike) on all sides he marks that area of the cap which extends beyond the bottom edges of the lower end of the central frame (Plate IV-F 2). Thereafter the craftsman ships off the points of the hexagonal shaped border of the cap and straightens the edges between the points with a pair of iron snippers.
The craftsman is fitting the inwardly turned edges of the lower hexagonally-shaped cap inside the inwardly turned edges of the lower end of the hexagonally-shaped central frame. During the process, he uses the toes of his right foot and his left hand for pressing the two edges together while simultaneously with his right hand he hammers the fitted edges with light, sure downward strokes.

The craftsman files the edges of the lower hexagonal central frame where the border of the hexagonal cap was fixed inside it until the joining can scarcely be detected.

...katiya (Plate IV-F 3). The surplus area marked earlier by the spike on the cap is given a vertically inverted bend. In order to achieve this, the border edges of the cap are vertically placed over the end of the kauwa maikh, a stake, right angle arm of which is similar to the beak of a crow and the craftsman bends the border edges inwardly with the skillful slanting strokes of a round-edged wooden mallet (Plate IV-F 4). These bent edges are finally perfectly turned at right angles to the hexagonally shaped border of the lower cap by hammering evenly over the kauwa maikh with light strokes of a square-edged hammer (Plate IV-F 5). Then, finally, the lower cap is fitted into the lower end of the central frame of the lamp-shade with the help of the square-edged hammer in such a way that the vertically inverted edges of the hexagonally rimmed cap fit snugly just inside the vertically inverted rims of the hexagonally-shaped walls of the lower end of the central frame (Plate IV-F 6).

After fitting the rim of the hexagonal lower cap inside the edges of the lower end of the hexagonal central frame, the craftsman levels the edges of the latter and flattens them smooth and even, with the bordering sides of the lower hexagonal cap with a file (Plate IV-F 7).

Finally, the inwardly turned edges of the cap and those of the hexagonal central frame are soldered together. The soldering is done on the inside of the hexagonal central frame, the process being as follows: at the edges of the lower cap, where they were joined to the lower edges of the hexagonal central frame, nitric acid
is first applied (see Plate IV-F 8), after which this area is washed with water (Plate IV-F 9). Thus, the impurities from the surfaces that are to be joined together are cleansed.

Then the inverted edges of the hexagonal lower cap and those of the hexagonal central frame are evenly heated over the blazing furnace and a small quantity of naushader (ammonium chloride) is applied on them. Ammonium chloride helps to clean off the oxidation stains resulting from the heating of the metal; it also functions as a flux which renders the metal more fusible (Plate IV-F 10). When the ammonium chloride starts emitting smoke the craftsman applies a solder rod (which contains an alloy of tin and lead) to the hot inverted edges of the hexagonal lower cap and the corresponding inverted edges of central frame (Plate IV-F 11), and thus solders them together.

Following a process sequence similar to that described above, the craftsman fits in and solders the upper hexagonal cap into the upper hexagonal end of the central frame.
The vertically inverted rim of the lid is being given the required slope with light strokes of a square-edged hammer over a bright stake in order to allow it to fit over the outside of the rim of the lower cap. The square-edged hammer is in the right hand of the craftsman and in the process, with his left hand he is turning the rim of the lid to adjust it to the blows of the hammer. The left foot of the craftsman rests on wooden mallet, thus giving support to both the lid and the bright stake.

Here the craftsman is fitting the lid. With his left hand and foot he supports the central frame of the lamp-shade while with his right hand holding the lid he fits it on the outside of the raised rim of the lower cap.

The mouth ends of the lower hexagonal caps are now to be covered with lids (dhakkans), (which also feature floral perforated work). The process of fitting the lid into the open mouth end of the lower cap is fairly simple. The vertically inverted rim of the lid is first beaten over a bright stake (gole maikh) with delicate, even, angular blows of a small square-edged hammer (see Plate IV-F12) in order to give the desired slope. Then the vertically inverted rim of the lid is fitted on the outside of the vertically raised rim of the lower cap (Plate IV-F13).

The two spherical tops, that is to say, the (gole lattu) and the conical top (nokdar lattu), are now to be fixed one above the other on the upper hexagonal cap. To begin with, the lower spherical top featuring the floral scroll fret-work is fitted into the vertical outwardly bent rim of the upper hexagonal cap. To accomplish
The craftsman sitting close to the furnace is applying the solder iron on the rim after rubbing it over the solder material. The solder material is placed over a relatively hollow rectangular part of the earthen brick. The perforated lamp-shade is placed horizontally flat on the ground so that one edge of the spherical top falls on the earthen brick itself. The lamp-shade is moved in an anti-clockwise direction during the process by craftsman’s left hand. The ammonium chloride is in a metal cup and the bottle on the right side of the craftsman contains hydrochloric acid. IV-F15

In this complicated series of craft processes, the artisan beats the vertically raised rims of the cap and that of the lower spherical top over a kharwar (a kind of stake) with light strokes of a hammer. This is done so that the vertical outwardly bent rim of the cap can be inserted into the vertically outwardly bent rim of the spherical top. In Plate IV-F14, the craftsman is in process of accomplishing this difficult feat.

The lower spherical top is firmly affixed to the hexagonal upper cap by applying a solder-rod (alloy of tin and lead) all along the corresponding meeting line so formed by the fitting together of the vertically outwardly bent rims of the top end of the cap. Before applying the solder rod, the meeting rims are washed with acid (nitric) and water and then again washed with hydrochloric acid (namak-ka-tezab). The soldering material is applied over the meeting rims with the help of a pair of red hot solder-irons locally known as kaiya. In fact, the application of solder over the corresponding meeting rims of the lower spherical top and the upper cap require great care and skill. During the process the craftsman has to work almost mechanically. He sits on the ground very close to the open blazing furnace. A pair of solder-irons is half buried in the blazing furnace. He moves the mechanical hand-operated bellows with the left hand until the soldering iron becomes red hot, at which point the craftsman quickly picks up a small quantity of ammonium chloride, this being the substance known as flux, which allows the solder to fuse quickly, and

The hexagonal perforated lamp-shade is placed horizontally over a supporting wooden log while the craftsman files away the superfluous clots of solder along with the joints with a straight file. IV-F16.
The craftsman, sitting on a small reed moodha is boring holes on the conical top with a hand-operated mechanical drill into which will eventually be fitted a brass hook for hanging the shade.

Almost in a similar manner, the upper spherical top featuring squared fret-work and the conical top are fixed one on top of the other over the lower spherical top. After completing the soldering work the craftsman files off the accidental drippings of the solder material with a straight file (Plate IV-F 16).

The conical top (nokdar lattu) consists of two brass cones, the rims of which are placed in reverse and then soldered together. When this operation is finished, two holes of approximately 1/5th of an inch in diameter are bored with a hand-driven mechanical drill for the purpose of fitting a brass hook (kunda) through the holes by which the finished lamp-shape will eventually hang. The hook will be put in place later after all of the composite sections of the perforated hanging-lamp-shade have been fitted together and polished. The way in which the holes are bored on the nokdar lattu (conical top) is shown in (Plate IV-F 17).

Similarly, with the help of a hand-driven mechanical drill, the craftsman bores two bolt-holes directly opposite each other in the vertically raised rim of the lower cap and the vertically bent rim of the lower lid. During the operation, the craftsman with both hands and the toes of his right foot keep the lamp-shade steady. In Plate IV-F 18, sitting on a low reed stool (moodha) the craftsman bores bolt-holes (the approximate diameter being 1/5th of an inch) on the vertically raised rim of the lower cap. The perforated lamp-shade is supported on the ground at an angle by the wooden shaft.
The pyramidal centre of the lower lid is placed upside-down on one of the small circular hollow holes on the rim of the bangar. With his left thumb and two fingers the craftsman firmly holds the fastigiated small chisel just at the centre of the lid while heating the cap of the chisel with a square-edged hammer in order to make the bolt-hole in it. IV-F19

of a hammer and the moodha. During the hole-boring processes, the lamp-shade is firmly set in the desired position by the craftsman's left leg and the toes of his right foot.

On the inner side of the vertically raised rim of the lower cap, iron nuts are soldered over the bolt-holes just made, the reason for this being to fit the rim of the lower lid on to the lower cap, with brass screw bolts. Here, again, the process of soldering the iron nuts over the bolt-holes requires a great deal of care, skill and quick mechanical movements. The craftsman half buries a pair of solder irons (kaiya) in the blazing furnace, which he keeps at white heat by operating the hand-driven mechanical bellows with his left hand until the solder-irons become red hot. The soldering material having been put in a hollow part of an earthen brick, the bolt-holes on the vertically raised rim of the cap are placed on that part of the earthen brick itself. In order to remove the impurities from the surface around the bolt-holes, the craftsman first washes the place around the bolt-holes with hydrochloric acid, spreads ammonium chloride, which serves as a flux, over the solder material; picks up the red hot solder-iron from the furnace and rubs it with the solder material on the bricks cavity which immediately begins to fuse. The solder is then applied all around the bolt-holes with the soldering iron. The craftsman then drops immediately an iron nut over the solder in such a way that the hole of the iron nut and the bolt-hole coincide.

A small decorative brass knob carrying a screw bolt (ghundi) is fitted at the pyramidal centre of the lower lid. A bolt-hole at the centre of the lower lid is then made for the screw bolt of the decorative brass knob by placing the lid upside down over the rim of a bangar (a hollow circular iron frame) in such a way that the centre of the lid falls just above a small round depression, 1/5th of an inch in diameter bored on the circumferential rim of the bangar with a small fastigiated chisel (see Plate IV-F19). He then inserts the decorative brass knob carrying the screw-bolt through the bolt-hole.
The hexagonal darwala or the Jaipuri perforated hanging lamp-shade characterised by six mihrab-shaped window formation as it appears before polishing.

IV-F21

from the outer side of the lid and fastens the screw bolt with an iron screw-nut which he turns by hand (Plate IV-F 20).

Finally, the craftsman fits together the vertically raised rim of the lower cap and the vertically raised, inwardly bent rim of the lower lid in such a way that the respective bolt-holes of the cap and the lid fall into their correct positions, as also do the screws and the brass screw-bolts, which are generally manipulated by the fingers of the craftsman.

This completes the seemingly endless chain of operations required for producing, and at last fitting together, the different component parts of the perforated hexagonal lamp-shade into one single composite shape as planned (see Plate IV-F 21). It is now ready for the final polishing operations.
Pickling and Polishing of the Lamp-shade

The technique of pickling and polishing the perforated brass artwares is somewhat different and more complex than that which obtains in pickling and polishing the chased articles. For perforated articles, greater care, skill and the proper manipulation of the material and tools involved are required.

**Pickling:** The process of pickling is locally known as *nikhar*, the literal meaning of which is the giving of a gloss to an object, preferably with a wash. As reported before, pickling (*nikhar*) is necessary in order to remove the black oxide film that the metal acquires during the process of annealing while shaping the artwares, and also heating it for removing the resin (*ral*). It is also required for cleaning off from the surface of the metal various impurities, amongst others, just plain workshop dirt. For pickling, all the outer parts of the hexagonal perforated hanging lamp-shades are given a wash in water and after that a scrubbing with saw-dust. The latter is done in order to absorb the water and general humidity content from the outer brass surface of the perforated lamp-shade, a bit of scientific knowledge which is not often credited to these untutored metalsmiths who have acquired it through empirical study alone.

The acid pickle is usually kept in a china clay jar (*chini mitti ka martbal*), and once prepared, is utilised for three or four washes. Therefore, while giving this bath of the acid pickle, the craftsman places the perforated hanging lamp-shade over a big *kunda* (saucer-shaped earthenware vat), and pours the acid pickle from a kettle over all the parts of the lamp-shade. As the acid pickle runs through the various parts of the perforated lamp-shade, it accumulates in the *kunda* and after completing the wash, it is again stored in the china clay jar. (Plate IV-F 22).

The water and humidity content remaining on the outer surface of the perforated hexagonal hanging lamp-shade is absorbed by the craftsman rubbing its outer surface with dry sawdust, locally called *baroda* (Plate IV-F 23).
Polishing:—Polishing is done on an electric lathe with the help of cotton and linen mops fixed to its mandrel. In fact, for all practical purposes the polishing operations are divided into the following three distinct activities; the first is called _ghutai_, or grinding all the plain surfaces of the perforated lamp-shade in order to remove scratches and thus make them smooth; the second one is polishing and the third is finishing. During all of these operations, the craftsman sits on a wooden box close to the revolving mops on the lathes, holding the metalware to be polished between his knees. To protect his hair from the black dust flying off in every direction that results from the swiftly revolving polishing mop’s contact with the metal, the craftsman covers his head with a piece of cloth. All of these operations require a knowledgeable and expert handling of the perforated lamp-shades, because the slightest negligence in connection with the polishing lathe’s mechanised performance could cause tremendous damage, not only to the perforated lamp-shades but to the craftsman himself.

_Ghutai, or grinding:_—The grinding of the plain surfaces, such as the plain borders, the six bent turnings of the sides of the perforated lamp-shades and the outer plain surfaces of the inwardly bent rim of the lid and the conical tops, is done with cotton mops and a polishing compound, the trade name of which is Silica. This grinding compound is applied to the periphery of revolving mop and the unperforated plain surface of the lamp-shade is pressed against it (Plate F-24). The Silica acts as an abrasive material which helps to remove scratches on the plain surfaces of the brass.

_Polishing and finishing_ is done with soft linen mops. On all of the parts of the perforated lamp-shade, polishing by some means or other is required, but it requires an even more delicate and smooth handling of the lamp-shade where it is placed against the revolving mops. To give the requisite finish to the lamp-shade, the craftsman applies Rouge bar, a polishing compound (Rounk brand) to the periphery of the revolving linen mop (see Plate IV-F 25) and also gently buffs different parts of the lamp-shade against it (see Plate IV-F 26).

Immediately after applying Rouge bar to the periphery of the linen mop, with both hands the craftsman lightly places the perforated lamp-shade against the revolving mop and gently moves it up and down and sideways.

After polishing, all the parts of the hexagonal perforated hanging lamp-shade are gently buffed with soft linen mops on the polishing lathe and thus is the lamp-shade given what is referred to as the final touch.

After the perforated _darwala_ (Jaipuri mihrab-shaped gates) hexagonal hanging lamp-shade is polished, its _mihrab_-shape openings are fitted on the inside with ground glass by means of brass reversible clips fixed on the six turnings of the central frame (see page 100 Plate IV-A 4).
The craftsman sits close to the revolving mop on a wooden box and with his right hand he is applying lustre to the periphery of the revolving cotton mop, while with his left hand he holds the perforated lamp-shade and, one by one, presses the six sides of it against the mop.

The craftsman is applying Rogue bar to the periphery of the revolving linen mop.
Form the hollow end of the hexagonal perforated lower cap (chappal) the craftsman inserts the pieces of ground glass, which have been cut one by one into the required shapes. He then places these over the mihrab-shaped openings of the hexagonal central frame of the perforated lamp-shade (Plate IV-F 27). He bends the prongs of the brass clips horizontally towards the ground glass panes in order that they may stay in a firm position in the mihrab-shaped gates. The craftsman finally fits a brass hook (kunda), from which the lamp will be suspended, at the upper end of the lamp-shade’s conical top. The lower end of the brass hook has two inwardly bent hooks facing each other and these are put into their respective opposite holes of the upper end of the conical top. With light blows of hammer, the distance between the inwardly bent hooks facing each other inside the conical top is reduced (Plate IV-F 28).
THE ARTWARE TRAYS (THALS)

The brass and copper trays (pail dar thals) featuring the pie crust or egg and dart (pail) border formation on their raised rims, combined with their flat surfaces decorated with chased motifs based on the leaves of Kashmir's famous chinar tree, lotus designs or village life patterns; are at present in great demand both in Delhi and in foreign countries, with the result that they are produced in larger quantity than any other item of artware—thanks to the Delhi metalsmiths having been able to adapt these traditional brass trays to the contemporary living needs of their clients.

They are produced in various shapes and sizes, but whether circular, rectangular, square or oval, the processes involved in their production are basically the same. In the following pages these processes are described, stage-by-stage, with the visual aid of a still documentary made by photographers Amar Singh of the Office of the Registrar General, India, and H. P. Sarin of the Office of the Superintendent of Census Operations, Delhi, on the premises of M/s. Prem Chand Hazari Lal, manufacturer of brass and copper artwares, Phatak Namak, Hauz Qazi, Delhi, at whose workshop the photographs of the various processes required in the manufacture of these brass trays were taken.

The thickness of the brass sheet measuring 4'x4' which is used for producing these trays, varies with the size of the tray to be manufactured. For example, a brass tray with a diameter of 24" is manufactured with a sheet of 20 to 18 standard size gauge thickness. For the sake of clarity, we have taken for our study the production of a round brass tray with a diameter of 30", made of sheet brass of 16 standard wire gauge, which will eventually be used as a tabletop.

Shaping

The first process in the manufacture of this, or any circular brass tray, whether used as such or as a table-top mounted on a removable wooden stand, consists of outlining its circumference with a large iron compass (parkar) after the brass sheet has been placed on the ground and levelled flat with a wooden mallet (moongri); for it is only after the piece of brass sheet has thus been levelled that the craftsman can mark a true, unwavering concentric circle, or circles, on its surface with the large iron compass in order to guide him in shaping the tray. If the sheet is large enough, the craftsman sits on top of it during the marking operation, for this allows his body to turn with his compass and, by so doing, helps him to keep a firm grip on it, a matter of the first importance if the concentric circle is to be produced without distortion (Plate IV-T1).
A circle about half an inch from the cut edge of the brass disc is drawn with the compass to establish an even guideline for the craftsman to follow when he embarks on the process of horizontally raising, and then turning back, the narrow outer rim by hammering in order to give the tray a neat, narrow edging around the whole circumference.

The craftsman is cutting out the brass disc's shape with a pair of iron snippers (katiya) on the mark left on the brass sheet by the point of the iron compass.

The cutting of the circular piece of brass along the marking made by the iron compass is done with a katiya, a pair of large-sized iron snippers (Plate IV-T2). While cutting the disc the craftsman places a 4"x6" block of wood on the ground underneath it in order to provide free movement of the snippers.

After the cutting is completed, the brass disc is ready for further processing, this being the dual one of making two concentric circles with the iron compass (see Plate IV-T3 and IV-T3-A)—one that is made half an inch inside the brass disc's circumference for establishing a guide-line that the craftsman will later follow when he raises the outer rim with a wooden mallet, and the other for making a line two inches in from the edge of the rim in order to serve as a guide-line when the time comes for him to raise the saucer-shaped edge of the tray which will eventuate in an elaborate traditional border, formerly designed to function as the means by which table bearers gripped the edges of these heavy, food-laden brass trays and carried them from the kitchen to the dining hall and back again.

The first step in the fashioning of the elaborate border mentioned above, involves placing the brass disc right side up with the inner concentric circle resting on the edge of the slanting rim of the unorthodox, but extremely useful, iron blocking tool called a bangar (see pp. 71), the base of which is embedded in the earth. The craftsman hammers that area of the disc between the two compass markings with a large round-nosed wooden mallet (moon gri) and thus raises that portion into a saucer-shaped rim two and a half inches deep. Whilst hammering, the craftsman rests the back of the brass disc against his left leg and with his left hand and his right foot he rotates the edge after each succes-
sive blow of the mallet (see Plate IV-T4). This raising process is an important one since it is at this point that the disc begins to assume the shape of the tray here under survey. Unless a high degree of accuracy on the part of the craftsman is brought to bear on this beating, cracks in the brass may result. This is a highly skilled task requiring years of practical experience, for both dexterity and caution are required in delivering the uniformly swift strokes of the hammer needed for raising the saucer-shaped sides of the disc.

The base of the tray, for its present shape now precludes calling it a disc, becomes uneven during this hammering process. So, in order to make it even, the tray is placed upside down on the earthen floor and its base hammered with strong, evenly placed strokes of the wooden mallet (Plate IV-T5).

The tray is placed upside down on the ground and the base of it is hammered with the wooden mallet (moongri) to remove uneven areas resulting from the blows of the mallet made earlier on its face side; also, in order to define and refine the curve where the flat bed of the tray merges into saucer-shaped rim. IV-T5
With the tray right side up again, the craftsman places the inner face of the rim over the outer edge of the bangar’s iron collar and turning the tray after each of several strokes of the iron hammer, he gradually raises the rim, first horizontally and then slightly concavely, at the guideline originally marked for the purpose with the iron compass.

The next steps in the technical processes of the tray’s production require the outward-turning and folding over of the outer rim and flattening it against the reverse edge by hammering so that a neat metal hem will be made around the circumference of the tray. These processes are somewhat more complicated than those described above, because, whereas the processes illustrated in Plates 4 and 5 were achieved in virtually one single stage each, these require several. Again, although in the first hammering processes a wooden mallet was used, here an iron hammer (hathori) is employed for the various stages. As a matter of fact, the wooden mallet would be of no use in as much as at this point in the shaping of the tray the areas to be raised and turned are much narrower, hence a harder, more precision-edged beating instrument is required. In the first stage of this process, it is with the hathori (iron hammer) that the outer edge of the saucer-shaped disc is given a concave turning, or raising, as this process is referred to by metal craftsmen the world over. The craftsman does this by placing the edge of the tray on the outer edge of hollow iron collar of bangar and hammering it and turning it as needed under the guidance of his left hand and the toes of his right foot. The next stage is the “hemming” process, during which the narrow concave rim is inverted almost at a sharp right angle by hammering. For this, the disc is first placed right side up on the ground and the edge beaten at an inward angle with the iron hammer. In order to facilitate this operation, the craftsman squats on the top of the tray so that his weight will not allow it to move whilst the beating proceeds (Plate IV-T 7).

Squatting on the sunken bed of the tray to hold it steady, the craftsman turns the concave edge of the outer rim at an ingoing right angle by means of steady blows with the iron hammer (moongri).
The third and the final turning of the rim is done by again placing the edge of the tray which is now bottom side up, on the bangar. The inverted edge of the rim is then beaten with the iron hammer until it lies flush against the reverse side of the tray. During this hammering process, the craftsman sits on a small reed stool (moodha) and keeps on turning the rim of the disc with his feet and his left hand. While holding the square-edged hammer (chaurash-hathori) in his right hand he continues to strike the up-turned rim with inwardly slanting blows of the iron hammer until its edge is completely bent back on itself. Thus except for one last process “the hemming” of the tray’s circumferential edge is finally achieved (Plates IV-T 8, B, C); the tray is then placed on the slanting rim of the bangar’s iron collar and the uneveness of the flat edge hammered smooth and neat by strokes of the wooden mallet.

At this point, in the craft production sequences, the tray’s wide flanged lip is to be formed into both a useful and ornamental border design, which, although a very old one, is still in large demand today. The Delhi metalsmiths call it paildar design, we may refer to it as the pie-crust or egg and dart border design.12

12The egg and dart design reference is the more widely known one as it is a classical design which was used to decorate the carved capitals of stone pillars edging the outer galleries of ancient Greek temples.
The craftsman marks the guide line on the back of the sucer-shaped rim of the tray with a flat home-made piece of brass, hooked at one end, this line being required for positioning the depthwise dimension on the rim needed to contain the so-called egg and dart border design units.

Still in an inverted position the tray is placed at one of the marked areas made to receive the embossed egg and dart border design units, over a round-nosed bright stake (which is seen embedded in the ground between the craftsman's knees in plate T9. With a convex-edged chisel (nakhuni chhaini), he first hammers around the inner compass-markings and then just below the brass "hem" of the rim. He keeps on rotating the tray with toes of his feet as the work proceeds.

The uniform widthwise, lengthwise and depthwise area required for containing each unit of the design motif is being marked with a pencil around a brass templet of the required length, breadth and depth for making sure at the outset that the space required for embossing the last design unit will coincide perfectly with that used for embossing the first.
As mentioned earlier, during the lavish period of Delhi’s latter-day Mogul emperors, these sumptuously wrought borders served a basic function as the trays’ carrying device. Nowadays however, servantless foreign buyers of them, and even the Indian consumers of them who do have servants, find them more usable when mounted on wooden legs and functioning as a stationary living-room coffee-table. One must admit that although modern living may have made these so-called piecrust borders obsolete, the trays that feature them are still in demand because many persons in India and abroad find they make handsome “conversation pieces,” and this aesthetic dimension has not been ignored by the Delhi artware manufacturers in their gauge of consumer preference.

This piecrust or egg and dart border is produced by the following stages: first, a line is marked on the reverse side of the saucer-shaped rim for establishing the uniform width required for the egg and dart units of design. This line is drawn with a strip of brass having a sharp hook at one end that serves as a home-made stylus (see Plate IV-T9). It is between this circumferential marking and the base of “hemmed” edge of the tray that the egg and dart forms are to be embossed. Secondly, within this stylus-marked area, the craftsman plots the number of these formations which the border will be able to take, by laying down a brass templet, cut to the required lengthwise, widthwise and depthwise dimensions of one repeating design unit, against the base of the “hem” around the tray’s outer circumference. He then marks around the templet’s edges with a lead pencil until the whole sequence of spaces which will contain the egg and dart border motifs have been indicated (see Plate IV-T9-A). Thirdly, the tray, still on its reverse side, is placed at one of these markings over a bright stake (gole maikh or katori banane wali maikh), the latter to be fixed into the ground between the craftsman’s knees as in Plate IV-T9-B. With a convex-edged chisel (nakhuni chhaini), he first hammers around the outer edge of the bright stake’s polished head, which is “positioned” under the brass sheet, and then around the other edge, just below the brass “hem” of the tray’s circumference, until this preliminary border decoration process of embossing the egg-shapes is accomplished. In other words, the embossing of the metal border carrying the egg and dart design is the result of the hammer blows on the convex-edged chisel placed over the round-nosed bright stake underneath (Plate IV-T9-C).

Each stroke of the hammer on the concave-shaped chisel having automatically produced repeating concave egg forms on the face side of the tray, in order to give the walls of the egg shapes so formed a more defined shape, the craftsman turns the tray on its right side, and
placing the concave chisel around the base of each outer wall of these shapes, he strikes the butt end with the iron hammer (hathora) (see Plate IV-T 10).

The slight indentation between the bowed, upright outer borders of the egg shapes are also now given definition by hammering each intersection with the straight-edged chisel (chhaini), a process which can be said to produce the dart of the egg and dart design formations (see Plate IV-T 11).

By this time, the tray has undergone an unconscionably long siege of hammering, the upshot being that the face of the tray has again become wavy and uneven. In order to smoothen it, the tray is placed on a flat rectangular sheet of iron and levelled by beating the face of it with a wooden mallet (Plate IV-T 12).
Chasing

Probably the most important sequence in the overall craft production processes, and certainly the one that most quickly recommends the trays as table-tops to the consumer buying it is the chasing work (chitai) which is done on the face side of them. However, before this is undertaken, the craftsman prepares a viscid mixture called ral, made of powdered burnt bricks, mustard oil and resin melted and cooked for about an hour in a large iron receptacle over a fan-draughted ground furnace until a smooth paste results (see Plate IV-T 13).
The hot ral is being poured with an iron ladle into the back of a tray placed on the ground.

In order to save both the ral and the craftsman's time and labour, the hot resin, having been poured to an even thickness on the back of one tray, is now ready to receive the back of another.

After having poured hot ral over the back of one tray, the craftsman is fixing it into the back of another. The ral thus provides both of the tray's faces with a kind of cushion for ensuring against the possibility of the metal cracking from the repeated blows of the hammer on the chisels during the chasing of the designs on the faces of the combined trays.

A cut log of wood serves as a weight to place over the two trays so that they will stick firmly together until the ral hardens.
When this mixture \((ral)\), is sufficiently "cooked", it is poured out with a ladle \((karchha)\) into the back of a brass tray placed upside down on the ground (Plate IV-T 14).

The resin, \((ral)\) is then spread evenly by using the back of the ladle itself (Plate T14-A), and also by means of pressure from the back of another tray of the same circumference which is immediately fixed on top of it (Plate IV-T 15). In order that both the trays will remain firmly fixed together until the \(ral\) has cooled, a weight made out of a log of wood cut for this express purpose, is centrally placed over them (Plate IV-T 16). When the \(ral\) is first applied, it is hot, hence it goes without saying that until it is cool and hard and the trays firmly fixed together, chasing cannot be undertaken. Therefore, the trays are allowed to remain with the weight on them for about 10—14 hours. However, if the craftsman is in some special hurry, he may pour cold water over the trays to cool them down quickly so that chasing can then commence. As it cools, the \(ral\) forms a hard, solid adhesive that will keep the two trays attached together during the chasing process. This is important because the primary purpose of the \(ral\) is to cushion the successive strokes of the hammer on the chisels which is required during the chasing work; otherwise a break-through in the brass when the chasing is going on might well result. After the two trays are cemented together back to back, both their faces are in turn ready to receive their respective chased surface ornamentations.

Preliminary to the actual chasing, however, is drawing of the concentric circles which is marked with one or another iron compasses and or with the brass templets (Plate IV-T 17). After the areas for chasing have been so marked, the next step is to plot the placement of the design motifs to be chased. In the case of a new or specially ordered design, which is not necessarily meant to be enclosed in concentric circles, a pencil drawing is made on a sheet of paper and traced on carbon paper and then to the brass surface of the tray with a pencil, after which if it works out to the chaser's \((chitera)\) satisfaction, chasing will follow.
An oval brass tray is in process of being chased with hammer and chisels.

Ordinary chasing is done with a chisel (chhaini) and hammer (hathori), but very fine chasing is done with a tool called a kalam, literally meaning a pen, the one used here being about 3" long, which is tapped with a small-sized hammer. Needless to say, it is by long and repeated practice that the chaser produces his most distinctive and distinguished designs. (Plate IV-T 19). As the majority of the skilled chasers in the Delhi art metal industry are from Kashmir, it is understandable that one of the most common patterns chosen for chasing on the trays should be the chinar leaf motif, this being the beautifully shaped leaf of the chinar tree which in India is found only in Kashmir. It goes without saying that these Kashmiri chasers at any rate, do not have to exert their mind very much whilst chasing this particular motif. They nevertheless bring to it a very high degree of technical competence in the arrangement of their chinar leaf designs. Sometimes, when a special motif is ordered e.g., an elephant and mahavat (rider-driver) the chaser may first trace the figure of the elephant and driver in pencil on a sheet of paper and in turn trace it with carbon paper on the face of the tray. Or he may paste this design on a sheet of metal and then cut the latter to form a template, the outlines of which he then traces into the surface of the tray with one of the pointed ends of his small iron compass (Plate IV-T 18).

After the chasing is completed on both the faces of the trays, the ral (resin) is heated and when it melts the trays are hammered apart with a wooden mallet (see Plate IV-T 20). The residue of the ral is then removed by scraping with a sharp metal instrument whilst the trays are heated over a ground furnace. Such traces as may be left are burnt off.

After the chasing on both the trays is finished, they are hammered apart with a wooden mallet after heating them over a furnace to melt the resin (ral).

Final levelling of a tray is being done with a round-nosed wooden mallet.
Near the drain in the street an apprentice is sitting on the surface of a tray whilst washing it with sulphuric acid. To the right of his hand can be seen the bucket which contains acid pickle.

IV-T22

During the chasing process, the base of the face of the brass tray becomes warped and uneven and wrinkles are apt to appear on it. The artisan then has to smoothen the surface by first heating the tray to bear further hammering, after which it is placed on the rectangular piece of sheet iron on the ground for very careful levelling with the wooden mallet (mongri) (see Plate IV-T21). Until the tray is completely free from these wrinkles, hammering continues. The article is finally ready for polishing.

**Picking & Polishing**

To give the requisite finish to the brass artwares trays featuring chased or perforated ornamentation work, careful pickling and polishing is necessary.

**Pickling:** During the processes of shaping and chasing the tray has to undergo a number of heating and annealing operations which leave a black oxide film on the brass. Before polishing, pickling is done in order to remove it and other impurities from the surface of the tray. The tray is first washed with sulphuric acid pickle and given a wash of chrome salt pickle followed by a wash of water. All the pickling operations are carried on close to a drain in an open space, usually one on the street near or facing the factory. Pickling is very often done by boys working in the polishing factory as apprentices.

The operation of washing the tray with sulphuric acid pickle (gandhak ka tezab) is locally known as majhai or khatai, which literally means washing. One of the apprentices first rubs the surface of the tray with a piece of cloth dipped in sulphuric acid with his right hand protected from the acid by a rubber glove. If the chased brass tray is large enough, during the pickling operation the craftsman manipulates the acid whilst sitting on the surface of the tray itself (Plate IV-T22).

After washing the surface of the tray with sulphuric acid pickle, it is again washed with chrome salt pickle, this latter operation being known as nikhar the literal meaning of which is “shine with a wash”. It immediately gives the tray a yellow gloss. An apprentice dips the same piece of cloth in the chrome salt pickle and rubs the surface of the tray with it and as he rubs, the surface of the tray immediately records a brilliant shine (Plate IV-T23).
As soon as both sides of the tray are washed with the sulphuric acid pickle and the chrome salt pickle, the tray is taken to drain on the roadside and both sides of it are submerged in water. During this immersion of the tray, an apprentice dips water out of a tin bucket with a metal tumbler. He pours it over the tray with his left hand, which is encased in a rubber glove to avoid possible contact with the sulphuric acid and proceeds to rub the tray (Plate IV-T24).

Polishing:—Polishing the trays is done on electrically driven lathes with cotton, leather and linen mops fixed to the mandreis of the lathes. The polishing operations on the brass trays may broadly be subdivided into three heads, viz., 1, ghutai, or the grinding of the plain surface of tray with a view to removing the scratches on it; 2, polishing and the final finishing. All these operations require a highly knowledgeable handling of the trays as they are pressed against the revolving mops, for carelessness could result in serious danger to the tray, or to the craftsman, or both. Because he must hold the tray against the revolving mops fixed to the lathe, during all the polishing operations, the craftsman quite naturally has to sit very close to the lathe. Also quite naturally he keeps his head covered with a piece of cloth to shield his hair from the black yield of dust and grit ground off the tray by the polishing compounds as the mop revolves on the lathe.
After completing the grinding (ghutai) of one circular plain surface, the craftsman is grinding a plain surface of the tray facing its raised border. He goes on applying Silica to the periphery of the revolving mop and gives the tray the required pressure against it by a push from below with his knees and thighs. During the operation, grasping the edges of the tray with both hands he moves the tray in a circle. While pressing the tray up and down against the revolving mop with his thighs the craftsman's whole body moves in unison with this vertical rhythm.

Holding the tray against the polishing mop with his left hand, the craftsman is polishing the surface of the tray featuring chased work whilst with his right hand he is applying the Peerless bar to the periphery of the revolving linen mop.
For removing the scratches on a plain brass or copper surface of a tray where no chased work has been featured, grinding (ghutai) is done with cotton or leather mops coated with emery paste and silica (grinding compound). Sitting on a wooden box close to the revolving mop, the craftsman holds the tray with both his hands with the help of a pillow on his lap. After applying the silica to the periphery of the revolving mop, he presses the plain surface of the tray up and down against it (Plate IV-T25).

In a similar fashion the craftsman grinds the reverse side of the tray and after completing this operation on both the sides, the polishing and final finishing is done with soft linen mops. It is to be mentioned that those parts of the tray featuring chased work and the egg and dart design require no grinding. During the polishing and finishing work, in pressing the tray against the revolving linen mop, the craftsman first applies a polishing compound, called Peerless (available in the form of bars) on the periphery of the mop (Plates IV-T26, T27). He first polishes the surface of the tray featuring the chased work and then its plain surfaces.

Polishing on the border of the tray featuring the eggs and darts design (pails) is done last, after completing the polishing on both the sides (surface) of the tray. The border is polished with a small linen mop matching the size of the design element repeated in the egg and dart border (Plate IV-T28).

Before giving the final finishing the tray is cleaned with kerosene oil, which is applied with a brush, this being done in order to remove all vestiges of the Luster or Peerless bar that are bound to remain in the interstices of the tray. In order to remove the kerosene oil from the tray, it is again cleaned by rubbing it with dry sawdust. The final gloss of the tray is given with the help of buffs and Rouge or Peerless bars being applied as the finishing compound.
AS STATED in the Introductory Chapter, the manufacture of brass and copper art­wares is one of the most important of all the traditional crafts which are currently produced in Delhi. However, to reiterate another statement also projected earlier, with the fall of the Mogul rule, the British succession, the advent of the cheap machine-made artware products and finally the partition of India in 1947, the development of this ancient craft had virtually undergone an eclipse. Only very recently it has been revived and, in the process, made spectacular strides. Thanks to the existence in Delhi of so many outstanding metal­smiths, a fact that is perhaps due to the city’s unique position as an internationally important, trading and tourist centre which has led some of the local curio merchants to seriously promote this craft. Hence, it is not surprising to learn that at present most of the production units (72.2 per cent of the total craft units to be exact) were started by the existing owners, while only 11 (26.8%) units are ancestral. In this chapter it is attempted to analyse the production structure, employment structure, capital structure and marketing structure of the craft under study. In the last section of the chapter a brief circumspection of the socio-economic life of the craftsmen engaged in the manufacture of the brass and copper art­wares in the city is provided.

PRODUCTION STRUCTURE

Most of the production units of the craft are organised on a proprietorship basis which constitutes the dominant form of organisation in all the processes of the craft. There is only one cooperative society, viz., ‘Dhatu Patra Industrial Cooperative Society’, with 26 members registered in 1958 with the Registrar of Cooperative Society, as a ‘C’ class society. The society is merely functioning as a service cooperative and primarily aims at providing work to its members and meeting their raw material requirements. By and large, all the manufacturing units—even the members of the society—depend upon work orders received from the dealers. The following Table No. 4·1 gives the distribution of the production units of the craft according to their nature of organisation.
TABLE 5.1 Distribution of Production Units by Nature of Organisation

<table>
<thead>
<tr>
<th>Nature of the Production Units</th>
<th>Nature of Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Proprietorship</td>
</tr>
<tr>
<td>(i) Entirely based on labour of family members</td>
<td>16</td>
</tr>
<tr>
<td>(ii) Units run on labour of family members &amp; paid apprentices</td>
<td>11</td>
</tr>
<tr>
<td>(iii) Units run mainly on labour of employees</td>
<td>13</td>
</tr>
<tr>
<td>(iv) Others</td>
<td>..</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>..</td>
</tr>
</tbody>
</table>

There is only one unit in the craft running on a partnership basis. It is situated in Jama Masjid area and undertakes all the production processes, from the moulding and shaping of the sheets, chasing perforating the designs and the polishing operation, which gives the final finish to the artwares.

It is significant to note that although the proprietorship form is the dominant form of organisation of the craft, yet very few units undertake their own independent production. Table No. 5:2 gives the distribution of the production units according to the nature of the production process in which they are engaged and the manner of work they do.

TABLE 5.2 Distribution of Production Units according to Mode of Work

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Mode of Work</th>
<th>Production Units engaged in</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Process No. 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shaping &amp; cutting soldering work</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>On own account</td>
<td>..</td>
</tr>
<tr>
<td>2</td>
<td>On contract/piece rate wages</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>On own account and on contract/piece rate wages</td>
<td>..</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>..</td>
<td>..</td>
</tr>
</tbody>
</table>
Table No. 5.2 shows that only a small fraction, *i.e.* 12.2 per cent of the total production units in the craft carry out manufacturing work on their own account. These are comparatively larger units. The rest of the production units (87.8 per cent) depend on the orders of the dealers, exporters, etc. 48.8 per cent production units reported to be working mainly on contract basis. These are relatively small units, run mainly on the basis of family labour or family labour and paid apprentices. There are also what might be called “servicing” production units, which are engaged in executing specific orders on piece rates arbitrarily settled by free bargaining between the manufacturer and the dealer. This kind of work is most predominant among the units exclusively engaged in the shaping of the wares (refer to Table V.2: column 1) and chasing and cut-work or perforation work (column 2). This mode of work differs from the former which centres on production on its own account, in the sense that in this case the raw materials as well as the implements and entrepreneurial risks, *etc.*, are all borne by the unit. In the latter case, however, *i.e.*, production on a contract/piece rate basis, the unit does not take over the entrepreneurial functions of ‘guaging the market trends’—‘the risks of production’. 39.0 per cent of the total production units have been found working on combined kinds of work, *i.e.*, working on their own account as well as a contract/piece rate basis.

The brass and copper artware craft in the city is organised both on the basis of vertical integration as well as on horizontal integration, though perfect vertical integration, *i.e.*, the production unit undertaking all the production operations, beginning with the shaping of the artwares, to their final finishing, is very much less spectacular as there is only one unit that undertakes all of the composite operations. Yet, on the whole, 53.7 per cent of the total manufacturing units undertake more than one process of manufacture and thus broadly operate on the basis of vertical integration. The rest (46.3 per cent) of the production units, are horizontally integrated, as one single unit undertakes only one or the other process of manufacture. The ownership resides in outside dealers, or others who feed the chain of manufacturing units all along the line, or with the basic materials that belong to them. Thus, the horizontally integrated productions units work out as service units working for one or another dealer only. They do not undertake manufacturing work of their own. However, at the same time, they are seldom pertinently bound to any particular dealer. Normally, they are free to bargain for their services and accept a fair bid to undertake the work. The horizontal form of integration is most prominent amongst the manufacturing units engaged in the shaping and soldering operations; chasing and cut-work operations and polishing operations. (Refer Table 5:2).

**Employment Structure**

The brass and copper artware craft in the city provides employment to 167 craftsmen engaged in one process or the other in 41 manufacturing units. Thus the employment averages out to nearly 4 workers per unit. Table No. 5.3 on page 166 gives the break-up of craftsmen by their sex and the nature of work.

The table shows that out of the total of 167 craftsmen, 91.1 per cent are adult males and 8.9 per cent are children below the age of fifteen. The employment of women in the craft is conspicuous by its absence. The complete absence of female workers in the craft is surprising if viewed in the light of the fact that 39.0 per cent of the total production units of the crafts are running entirely on the basis of family labour, 28.8 per cent units are run on labour of family members and paid apprentices and only 32.2 per cent mainly run on labour of employees (refer Table 5:1 pp. 164).1 The

---

1 It is interesting to note that mainly on account of such form of the production structure the craft is virtually insulated from the complex problems of labour management, labour disputes and lock-outs etc. There exist no Union or Association or guilds among the craftsmen to protect their interest.
TABLE 5.3 Distribution of Craftsmen according to Nature of Work.

<table>
<thead>
<tr>
<th>Type of Work</th>
<th>Males</th>
<th>Females</th>
<th>Children (male)</th>
<th>Total</th>
<th>% age of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Shaping &amp; Soldering</td>
<td>71</td>
<td></td>
<td>4</td>
<td>75</td>
<td>44.9</td>
</tr>
<tr>
<td>2. Chasing &amp; Cutwork</td>
<td>53</td>
<td></td>
<td>5</td>
<td>58</td>
<td>34.7</td>
</tr>
<tr>
<td>3. Impression work</td>
<td>8</td>
<td></td>
<td>1</td>
<td>9</td>
<td>5.4</td>
</tr>
<tr>
<td>4. Casting</td>
<td>5</td>
<td></td>
<td>1</td>
<td>6</td>
<td>3.4</td>
</tr>
<tr>
<td>5. Scraping</td>
<td>8</td>
<td></td>
<td>8</td>
<td>16</td>
<td>9.0</td>
</tr>
<tr>
<td>6. Polishing</td>
<td>7</td>
<td></td>
<td>4</td>
<td>11</td>
<td>6.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>152</td>
<td></td>
<td>15</td>
<td>167</td>
<td>100.0</td>
</tr>
</tbody>
</table>

reasons for this are not difficult to find. Most of the operations are either very skilled or are extremely hazardous and exhausting, and are performed under very disagreeable, even unhealthy, surroundings. Furthermore, ordinarily, the craftsmen from the outside, as from Kashmir, Hapur, Meerut, etc., do not bring their families with them to Delhi, hence only male members migrate.

On the whole, the shaping and soldering process employs by far the largest unit of craftsmen, this being 44.9% of the total number. Chasing and cut-work, i.e., perforation work, employ 34.7% of the total craftsmen. In most of the operations, male children work as apprentice-cum-helpers. In the polishing operations, they mainly carry out the pickling of the artwares.

So far as the employment strength of different types of production units is concerned, Table No. 5.4 gives the pattern of employment in different types of production units.

TABLE 5.4 Employment strength of Different Production Units classified by the Nature of Work

<table>
<thead>
<tr>
<th>Production Units Employing</th>
<th>Process No. 1</th>
<th>Process No. 2</th>
<th>Process No. 3</th>
<th>Process No. 4</th>
<th>Process No. 5</th>
<th>Total Percentage of the Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>0—3 Persons</td>
<td>2</td>
<td>9</td>
<td>1</td>
<td>..</td>
<td>..</td>
<td>1</td>
</tr>
<tr>
<td>4—6 Persons</td>
<td>..</td>
<td>..</td>
<td>2</td>
<td>7</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>7—9 Persons</td>
<td>..</td>
<td>..</td>
<td>..</td>
<td>8</td>
<td>..</td>
<td>..</td>
</tr>
<tr>
<td>10—14 Persons</td>
<td>..</td>
<td>..</td>
<td>..</td>
<td>..</td>
<td>..</td>
<td>1</td>
</tr>
<tr>
<td>15 and above</td>
<td>..</td>
<td>..</td>
<td>..</td>
<td>..</td>
<td>..</td>
<td>..</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2</td>
<td>11</td>
<td>16</td>
<td>1</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

166
The above table shows that 70.8% of the total production units employ less than 7 persons each; 80.8 per cent of the production units, engaged exclusively in chasing and cut-work, employ less than 4 persons each. There are only two production units (4.8 per cent of the total) who employ more than 8 persons each. Both of these units are composite units. One undertakes manufacturing operations, from the shaping of wares right up to the scraping and impression work or chasing and perforation work; the other undertakes all of the manufacturing processes including the polishing of the artwares.

It is to be noted that no craftsmen were found to have received any institutional training in the craft. Almost all of them reported to have worked earlier as apprentices, initially earning nothing, nor paying any kind of fees to the craftsmen under whom they learned their trade. Generally, the teacher craftsmen and the apprentices are bound by some family tie, hence the relationship between the trainee and the master craftsman is of a personal nature. After two or three months of training, when the trainee starts making his own contribution, he is duly paid somewhat nominal allowance, say about Rs. 15 to Rs. 20 per month and then gradually the stipend is raised. As time passes, the trainee gains skill, confidence, perfection and finally recognition. For although he may remain illiterate in the sense that he has never been able to avail himself of a formal school education yet, in terms of knowledge relating to his craft he is a highly learned human being.

Regarding the intensity of the employment, it has been gathered that the craft suffers from the serious problem of seasonal unemployment and under-employment. The rainy season is the most devastating season of the year, for it is then that the craftsmen engaged in scraping and impression work on copperwares face virtual unemployment during the entire season. It is distressing, not to say depressing, to find these highly skilled and gifted artisans forced to take up carpentry work, or become temporary tea vendors, or reduced to whiling away their time in gossip and smoking *sulpha* balls (made out of the juice of *nicotine, i.e.,* tobacco leaves), an intoxicant which is prohibited by law (see plate V-A: Craftsmen smoking *sulpha*). The brisk season of employment for the craftsmen engaged in the shaping, scraping and impression work relating to the copper artwares is the marriage season, particularly in October, November, December, February, March and April. Apart from the general slackening in demand of artwares during the rainy season, other important factors accounting for low employment and low production of artwares during the rainy season are: (i) most of the production units carry out their work in open spaces facing the workshop’s veranda. In the monsoon season, rain does not permit of continuous hours of work for the craftsmen who perform shape the artwares out under the open sky; (ii) the humidity content during the rainy season makes it difficult to give the requisite finish to the artwares; (iii) the problem of properly storing the artwares during the rainy season is also a difficult one to solve and this discourages the craftsmen-cum-manufacturers from risking production of artwares other than those for which orders have already been booked. The intensity of seasonal unemployment and underemployment in case of craftsmen engaged in the shaping and moulding operations, chasing and cut-work, casting and polishing is naturally not as serious as in the case of those working at scraping and impression work on the copper wares.

Usually the craftsmen work on an average of 8 hours per day, that is, from 9.00 A.M. to 6.00 P.M., 12 noon to 1.30 P.M. being their meal time hours. Yet it was found that the craftsmen engaged in chasing and cut-work operations work longer hours per day than do their fellow craftsmen engaged in other operations of the craft. They work on an average of 10 hours per day, *i.e.*, from 8.00 A.M. to 6.00 P.M. with one hour off for lunch; and although physically the work of the chasers may be less tiresome because it is more creative and exacting than that of their counterparts in other operations, the lack of bodily fatigue is offset by their nervous exhaustion. The hours of work per day are the lowest in polishing, these
being hours, from 10.00 A.M. to 6.00 P.M. with one hour lunch break from 1.00 P.M. to 2.00 P.M.

**Wages & Profits**

The piece rate wages system is generally prevalent. The piece rate wages for unskilled craftsmen and those who are skilled differ widely from process to process. Hired labour is employed for doing unskilled work on the craft in all the processes at the rate of Re. 1 to Rs. 1.50 per day. Often skilled craftsmen are employed on a casual basis. It is only for extremely highly skilled craftsmen that employment is provided for on a regular monthly basis. For shaping and soldering work skilled craftsmen receive Rs. 4 to 6 per day; and for chasing and perforation work, Rs. 3 to 7 per day. Craftsmen engaged in scraping and impression work are hired at the wage rate of Rs. 5 to 6 per day, whereas in polishing, the daily wage rate averages Rs. 2 to 3.50. Young apprentices or child workers receive only Re. 0.62 to 0.75 per day in all the processes.

In case of craftsmen working on a contract basis, their earnings are reckoned at either by the weight (seers) of the metal on which they work, or by the volume of finished work they turn out. For instance, for shaping the brass or copper trays a skilled craftsman normally accepts Rs. 16 to 20 per maund. The chasers charge Rs. 3 to 6 per tray for chasing the decorative patterns on their face surfaces. Polishing on the trays (and artwares with chased surfaces) is normally fixed at the rate of Rs. 16 to 20 per maund. The contract rates for polishing on perforated artwares come to around Rs. 30 to 40 per maund.

It is extremely difficult to gauge accurately the exact profits of the manufacturing units. During the survey, no manufacturer was found who kept detailed records of his business dealings. Furthermore, most of the units did not cooperate when it came to disclosing the business details of their trade. Probably they suspected that the purpose of our enquiry would entail the imposition of new Government taxes, or an increase in the prevailing ones. It was learned that the practice of showing bogus accounts to government officials is prevalent, hence the fear on the part of the craftsmen in the various manufacturing units that the survey team might have been sent by Government to investigate their financial status is understandable.

However, it is gathered that the usual profits of an artware craftsman-cum-manufacturer average around Rs. 200 to 400 per month. Profits of the units engaged exclusively in shaping and soldering operations were nearly Rs. 125 per month; chasing and cut-work, Rs. 200 per month; the composite units on an average earn from around Rs. 300 to 700 per month depending upon the size and volume of work undertaken.

As a general rule the craftsmen-cum-manufacturers do not sell their wares directly to the customer, but supply them to retail dealers or exporters from whom the orders were received. The profits of the metal artware retailer are even more difficult to ascertain than those of manufacturers. Usually, they make a profit of about 6 to 15 per cent on their sales, and earn much more than the manufacturers earn.

**Capital Structure**

On account of the reluctance of the respondents to give an account of their capital structure, largely owing to the non-existence of proper records, it is not possible to present here a detailed factual account of it. However, a general attempt was made to analyse the capital structure of the craft as observed during the course of the survey.

Fixed capital requirements in different craft processes consist of tools and appliances, machinery and buildings; and the working capital include mainly wages and salaries of craftsmen, stock of raw materials, semi-manufactured goods, inventories and cash in hand. Broadly speaking, about four-fifths of the total capital in the artware craft is invested in the form of fixed capital, share of wages and salaries from working capital being unaccounted for. The proportionate contribution of buildings, sheds,
machinery, tools and appliances in the total fixed capital is 51:49. Inclusion of wages and salaries of craftsmen in working capital markedly changes the relative weight of fixed capital in the total capital structure. If the share of wages and the salaries of the craftsmen are included in the working capital, then the percentage of fixed capital to the total capital falls to 49.8 per cent. Regarding working capital, about three-fourths of it is accounted for by the wages and salaries bills and the rest of the one-fourth include the stock of raw materials, semi-manufactured products, inventories, etc.

Capital requirements in the different processes of craft vary markedly from one process to another. On an average, capital requirements are smallest for chasing work. Fixed capital requirements to a chaser consist of tools and implements, worth Rs. 15, and building rent, averaging Rs. 15 to 20 per month. The working capital includes expenditure on ral (resin worth Rs. 50, which is sufficient to last a year), and fuel and transportation expenses which amount to around Rs. 250 to Rs. 300. Capital requirements are highest in shaping and soldering operations. Relatively speaking, the
polishing operations require more investment in machinery and tools and implements. Over 80 per cent of the total fixed capital in the polishing units consists of machinery, tools and appliances alone. The corresponding proportion of machinery and tools and appliances to total fixed capital in shaping and soldering operations fall to 53 per cent and to 30 per cent in chasing and perforation units.

Source of capital is generally indigenous; that is to say, it is self raised through the family resources. Most of the manufacturers do not maintain any bank account. In case of an emergency they borrow money from their relatives, friends, artwares dealers and moneylenders. The rate of interest usually charged by the money lenders and dealers varies from 24 per cent to 36 per cent.

**Marketing Structure**

The artwares produced in the city are largely, if not entirely, for commercial use; that is to say, for sale in local markets and for export. When judged from the point of view of India's living standards the artwares produced are regarded as luxury or semi-luxury items. Thus, the internal demand for these is extremely restricted, and whatever small internal market that exists comes from the relatively well-to-do classes, luxury hotels, clubs, the Central Cottage Industries Emporium; the Delhi State Industries Emporium, and foreign tourists and foreign embassy personnel. By and large the craft stands to cater to the demand for these artwares from foreign countries, particularly from hard currency areas, the United States being the largest importer nation. Other important countries where the metal artwares of Delhi find their way are West Germany, the Middle East, the Commonwealth countries, such as Canada, Australia and Ceylon. The manufacturers do not undertake the export of the artwares directly. They receive orders from dealers, exporters and the exporters-cum-dealers at Delhi, Bombay and Calcutta and supply the goods to them.

Through their individual efforts these dealers, exporters and exporters-cum-dealers establish commercial contacts with foreign markets and export the artwares which are in the greatest demand. The means of transport adopted for the brassware shipments are the railways and road transport, sea and air freight. It is estimated that during the year 1962-63, artwares worth Rs. 30 lakhs were produced in Delhi and about four-fifths of this total value of artwares were exported. As the manufacturers do not maintain records of their retail or wholesale sales it is not possible to furnish dependable data relating to them. Normally, the margin of profits of manufacturers varies from 6 to 15 per cent and that of the dealers/exporters from 10 to 20 per cent. Neither the dealers/exporters, nor the manufacturers follow a uniform price policy.

It is surprising that the manufacturers do not put any kind of concentrated effort to boost up their sales by visual advertising or canvassing their products. They mostly depend on the orders from their dealers or local customers, these orders coming largely from foreigners and embassies. The main reasons that explain the inability of the local manufacturers to go in for visual publicity of their product, are shortage of capital and their own ignorance. The local dealers and exporters often exploit the innocence of the manufacturers. It is common to find certain dealers with foreign customers, moving around the manufacturing units belonging to the craftsmen, boasting as if the units belonged to them. It really so happened once that a well known dealer-cum-exporter of artwares took officials from the Office of the Registrar General of India and from the Office of the Superintendent Census Operations of Delhi to show them an artware manufacturing unit purportedly belonging to him, but, as discovered later, was not his own at all.

Thus evidently for all practical purposes, the local manufacturer of artwares depends on orders from artware dealers and other intermediary agencies and there is a large gap in the general market structure that is none too healthy. The terms and conditions on which the artwares are finally disposed of to the dealers are sometimes
highly uneconomical to the manufacturers. Many of these manufacturers who are mostly illiterate, reported that they are often cheated and greatly harassed when they finally come to settle with the dealers after supplying them with their respective ordered articles. The nature of work is such that it leaves ample scope for dealers to condemn the finished and delivered artwares on the pretext that they do not exactly correspond with the original order, or design, or whatever, and so only pay the craftsmen-cum-manufacturers a nominal price. They are left with no alternative but to accept what is offered and beware of the dealer in future.

At present, no Quality Marking Scheme for brass and copper artwares exists in the city. In view of the large export sales and the promising export potentiality of metal artwares, if stable remunerative markets are to be created in foreign countries, the need for Quality control can hardly be over-emphasised. It has been learnt that the All India Handicraft Board has recommended to the Directorate of Industries, Delhi Administration, to adopt a Quality Marketing Scheme for brass and copper artwares, but so far no action has been taken to implement this wise recommendation.

A BRIEF CIRCUMSPECTION OF SOCIO-ECONOMIC CONDITIONS

A study of social and economic aspects of the crafts, the craftsmen and the karkhanas (factories) leaves an unpalatable and pathetic impression upon the mind of an observer. The working conditions of the craftsmen, the surroundings and the environments of the workshops (karkhanas) where they perform the delicate craft operations that give such lively shapes and surface designs to the artwares, leave one with nothing but concern for them. In the following lines it is attempted to give a brief account of some of the important facts observed during the course of the enquiry regarding: (1) the workshops and working conditions; (2) level of living of the craftsmen; and (3) their social and recreational activities.

Workshop and Working Conditions

The workshops and the worksheds mostly consist of narrow verandas with one or two low rooms attached to them and some open space facing the verandas. These are located in the most densely populated areas of the city, viz., Sita Ram Bazar, Turkman Gate and Jama Masjid, generally in the often two-storied residential buildings which the craftsmen rent. Most of the narrow lanes where the karkhanas (workshops) are housed lead to blind alleys. The work is carried out preferably on the ground floors or on the veranda and open yards facing the verandas. One or two small rooms attached to the veranda are used as store rooms to store raw materials, semi-finished artwares and tools, etc., but normally rough tools and appliances of day-to-day use, such as anvils and stakes, iron and wooden blocks, hammers and mallets, are stored in some corner of the veranda itself.

The worksheds are generally without electricity, water taps, and lavatory facilities. The craftsmen frequently make use of public taps and store water in buckets.

Normal hours of work are from 9.00 A.M. to 6.00 P.M. (with a lunch interval of one hour from 12.30 P.M. to 1.30 P.M.). During the lunch hours, the factory represents a picturesque sight. On a summer day it is not unusual to
see a craftsman taking his bath in the open premises of the factory. After finishing lunch, the craftsmen generally lie down on the bare hemp-strung cots (charpois), if any, or on the bare floor itself, and thus relax (see plate V-B).

From the hygienic point of view the manufacturing units present an often distressing picture. In most of the units, open hearth ground furnaces have been constructed in one or another corner of the work-site without giving proper consideration to an outlet for the smoke. Furnaces are generally constructed just at the most generally used place of work and when it is fired its noxious fumes and smoke foul the congested working area.

Although most of the operations involved in the various craft processes are hazardous and carelessness or mischance are likely to result in serious injury to the craftsman, to say nothing of the workshop, yet no unit keeps either any kind of first aid facilities or fire extinguishers.

Craftsmen—their Level of Living

The quantum of earnings constitutes one of the most simple and straight criterion for measuring the level of living of these people. The income of a craftsman averages around Rs. 105 per month. As this income is not even sufficient to cover the bare necessities of his and his family’s life, food, clothing or housing, fuel and light, he obviously has little if any amount left over for his children’s education, his own medical care and theirs, and recreation. The craftsmen themselves are illiterate—only a very few are educated up to middle standards. However, perhaps for this very reason, these
Workshop-cum-Living Quarter—
No distinction is made between living space and work place. Means do not permit them to avail of separate rental accommodation and also to keep their families (wives) along with. In the picture a craftsman can be seen in a corner of workshop cooking meals and being helped by his son who also assists him in the craft operations involving the use of unskilled workmanship.

days they sense the importance of giving their children a good education. The earnings of those craftsmen engaged in chasing and perforation work appear to be relatively better, for they average Rs. 135 per month as against Rs. 110 per month received by their fellow craftsmen engaged in shaping the metal-wares and the soldering process; Rs. 65 per month is earned by those engaged in the scraping and impression-work.

The fact is that the incomes of the craftsmen are not only affected by the irregular flow of work but also by their own weak bargaining power, and unfortunately no union exists to safeguard their interests in this respect. The only way to ensure better incomes for the craftsmen, then, is primarily to provide them with a regular and equitable flow of work.

Regarding housing, a majority of the craftsmen live in pucca (cemented) houses taken on rent. Craftsmen having their families with them in Delhi mostly live in single room dwellings and those who do not have their families with them live either in the factory premises of the workshop manager or owner or by jointly sharing a room nearby with other craftsmen. Average rent paid by a craftsman varies from Rs. 7 to Rs. 15 per month. From the hygienic point of view and from the point of view of sanitary facilities, most of the houses are not worth living in. They are located in extremely congested parts of the city—in narrow lanes, lined on either side with dark and dingy, multi-storied, old and dilapidated buildings—and neither the craftsmen nor the owners would dream of incurring any expense to improve or repair them. Furthermore, in a number of units where
working sheds are also utilised as living quarters, there is no distinction made between living space and space for working (see Plate V-C). Thus, in many instances the bed-room, kitchen, lavatory and the workshop combined make one's living a pretty unhygienic affair. The smoke and heat from the furnaces in a small domicile is, to say the least, detrimental to any kind of healthy living. Regarding the sanitary facilities, over one-fourth of the craftsmen have no satisfactory provision for water supply within their residential premises. They have to depend upon the public taps for their needs. In the latrines, the flush system is conspicuous by its absence; and as most of the houses do not have electricity facilities, craftsmen's families depend on kerosene oil lamps for lighting.

**Disease and Medical Facilities**

The craftsmen are not covered by the Employees State Insurance Scheme. As most of them work on piece wage rate or contract basis, absence from work owing to sickness results in a net reduction in their income. Normally, in case of minor illnesses or diseases, they would not dream of resorting to scientific medical treatments. However, in case of serious illness or disease they rush to public hospitals—Irwin Hospital being the most popular. It is interesting to note that by and large the craftsmen prefer Ayurvedic medicines or medicines from Hamdard Dawakhana (Yunani medicines) and seek allopathic treatment only as a last resort. Incidentally, most of the craftsmen engaged in shaping and soldering, chasing, perforation and impression work were found hard of hearing. Craftsmen engaged in pulling of scraping lathe become hunch-backed in their old age.

**Leisure and Recreation**

The struggle for a livelihood is so difficult that in the end the craftsman is left with hardly any time or money to spare. Moreover, those whose families live with them have few if any leisure time activities. Whatever little spare time they can salvage from work is utilised in gossiping about the day-to-day family matters over a *bidi* (a cheap cigarette). However, the craftsmen whose families are not living with them have been found to be exorbitantly fond of the cinema. Kashmiri craftsmen smoke *huikas* (hubble bubble) with tobacco mixed with *elachi* (cardamon). Some craftsmen are addicted to smoking of *sulpha*, small balls of tob-eco juice, smoked in an earthen pipe (*chilam*). A small ball of *sulpha* weighing about a few miligrams is mixed with cigarette tobacco and then put in a pipe, fired with a match and smoked. Its smoke is said to be highly intoxicating, its inhalation causing the craftsmen to feel fresh and exhilarated, see Plate V-A—a picture of a craftsman smoking *sulpha*, and the other one with a match stick assisting him to light it.
INSTITUTIONS AND THE CRAFT

THERE are three principal institutions which have important bearings on the day-to-day functioning of the craft i.e., brass and copper artwares. These institutions are the following:—

1. Directorate of Industries, Delhi Administration, Delhi.

2. All India Handicrafts Board.

3. Dhatu Patra Co-operative Industrial Society Ltd.

All of these organisations are servicing institutions, directly or indirectly exercising a dominant influence on the craft and by and large are thus responsible for the present state and future development of the craft. The first one, The Directorate of Industries, is a Delhi State department which caters to the primary raw material requirements of the craft units of the raw metalwares as a whole. The second one, the All India Handicrafts Board, is a Central Government sponsored body which provides new and presumably saleable designs and various kinds of technical assistance to the craftsmen. The last one, The Dhatu Patra Co-operative Society Ltd., is a local body of the craftsmen which looks after and promotes their mutual interest. The following few paragraphs present a detailed study of the functions of these institutions with special reference to the craft under study.

Directorate of Industries

The Directorate primarily caters to meet the basic raw material requirements (imported or controlled raw materials) of the craft units and also works for the general promotion of the craft. It also provides hire purchase facilities to small scale and cottage industrial units through National Small Scale Industries; and grants loans to cottage units/artisan under the State Aid to Cottage and Small Scale Industries Act. Rate of interest charged on the loans advanced is 4½% per annum for ten years, and if the loan amount due is repaid in time a rebate of 1½% is given. Loans upto Rs. 1,000 are advanced on personal bond of the artisans and from Rs. 1,000 to 5,000 on personal security of a credit worthy person.

Regarding the distribution of raw materials to the craft units, the Directorate, in spite of best efforts, has been totally unsuccessful in providing the locally controlled raw materials.
(brass and copper sheets) to the craft units at fair price. The reason for the failure as reported by the officials of the Directorate, (and also by the craftsmen) is that the final distribution of the brass and copper sheets to the units is done by the local authorised metal dealers, and not by the Directorate itself. The Directorate is only concerned with the paper proceedings. Understanding the gravity of the problem, the Directorate once envisaged taking up the distribution of brass and copper (controlled metal) into its own hands. In 1962, the Directorate approached the Chief Commissioner to permit it to take in hand the direct distribution of the raw materials. The Chief Commissioner forwarded the case to the Secretary of the Industries, Ministry of Commerce and Industry, and since then, over one and half years the matter is still pending with that Ministry.

Regarding financial assistance and the hire and purchase facilities of machines and tools, during the year 1962-63, no such facility was availed of by the craftsmen.

The Delhi State Industries Emporium was set up on the 2nd of October, 1956 (the birthday of Mahatma Gandhi), the chief exponent of promoting indigenous Indian products with the main objective of promoting the handicrafts and small scale industries products by organising a standing exhibition of the products and thus giving them visual display and commercial publicity in the market.

The Emporium has a separate Handicraft section in which the display of brass and copper artwares of the city figures prominently. It also helps the craftsmen to market their products for it has a sales section. The main item of brass and copper artwares sold through the Emporium are decorative brass table trays mounted on wooden legs (oval and circular), perforated hanging lamp-shades, Tibetan bowls, tea-pots, jugs, images of Natraj, dancing figures, etc., which are cast artwares.

The Emporium celebrates what is known as Handicraft Week every year and craftsmen engaged in the production of artwares are invited to participate in that week’s various activities. The customers are allowed a rebate of 10 per cent on the purchases made during the week. It has also been reported that the Emporium makes special efforts to introduce new designs and items to be marketed during the week. This is done with a view to assess the market reaction to various new items of production. In case funds are available, the Emporium organises special Handicrafts exhibitions and participates in various exhibitions. At the suggestion of the All India Handicraft Board, the Emporium also organises exhibitions of Delhi crafts in Inter-State Emporia on a reciprocal basis.

All India Handicraft Board

The Board was set up in November, 1952 with a view to revive and re-instate the handicrafts of the country in domestic and foreign markets. The Board studies the various problems connected with the development of handicrafts, advises the Government, plans and executes development schemes through the State Governments, looks for ways and means to improve and develop the production techniques, through proper research and training. It secures raw materials, organises co-operatives and arranges credit for exporters-cum-producers.

To be pragmatic in approach, the Board has set up a number of technical committees, such as Central Handicrafts Marketing Committee, which functions as an All India Promotional and Co-ordinating agency; Technical Committee on Quality Control, which works in liaison with the Indian Standard Institute and works for the introduction of quality controls in the important handicrafts in each state; Indian Handicrafts Development Corporation, now re-named as Handicraft and Handloom Export Corporation of India Ltd., which originally was set up in 1956 with the primary object of promoting the Indian Handicrafts at home and developing foreign markets. The corporation is designed to enable the handicrafts manufacturers to procure raw materials at reasonable prices; to give loans to exporters and producers (at 5 per cent rate of interest) and guide them regarding the latest market trends. In order to give visual displays of exportable handicrafts; aimed at commercial publicity, the Corporation
has opened handicrafts sample rooms at home and abroad. These sample rooms are supposed to be equipped with a complete range of representative samples of exportable Indian Handicrafts which would provide a ready guide to visiting buyers. In 1957, the All India Handicrafts Board set up one of their regional Design Development Centres in New Delhi, the main objective of which is to revive and reorient the traditional crafts in terms of modern living needs and taste of the people in the region comprised of Delhi, Punjab, Uttar Pradesh and Rajasthan. The Centre has separate metal artwares section manned by expert metal craftsmen from Delhi, Varanasi and Jaipur who help in giving it technical guidance. The Centre also aims to stimulate the craftsmen to choose the best in our Indian craft traditions, re-design to suit modern design trends, so that when they leave the Centre they presumably will have acquired both the aesthetic and technical background required to run their own establishments. Designs are distributed by the Centre free of charge to craftsmen, manufacturers and the exporters in this area. Further, the All India Handicrafts Board has also launched a Supervised Credit Scheme to give financial assistance to the poor artisans whilst they are receiving technical advice and guidance during their stay at the Centre. The loan under the scheme is given without any security or with small security to recover the loan from the sale proceeds of the products manufactured at the Centre.

It is true that the scope of the area to be serviced and the operation and activities of the Board and its agencies have been generous and well meaning, yet the fact that its contribution, and those of its various agencies to the development of the brass and copper artware craft in the city, has so far not been significant can hardly be overlooked. Neither the craftsmen nor the craft have availed themselves of the much needed services offered by the Board. However, it is quite possible that the craftsmen's illiteracy and lack of resourcefulness stand in the way of their exploiting to the full benefits of the services offered them by the Board and its technical agencies.

Dhatu Patra Cooperative Industrial Society Ltd.

There is only one co-operative industrial society operating amongst the brass and copper artwares manufacturers in Delhi, viz., the "Dhatu Patra Cooperative Industrial Society Ltd." The society was registered with the Registrar of Co-operative Societies as a 'C' class society in September, 1958, with an initial share capital of Rs. 3,300 and a membership of 33. By 1963, the number of members in the Society had gone up to 46, and the amount of the total subscribed share capital to Rs. 8,200.

Dhatu Patra (धातु पत्र) are sanskrit words meaning 'metalwares'. Thus, as the very name suggests, the society deals only in metalwares. Its main task is to procure work and raw materials for its members and to market their finished products. The Society receives orders from various dealers and also maintains the stock of finished brass and copper wares for sale. The society also keeps the stock of raw materials, mainly brass and copper sheets, copper and zinc ingots, to meet the temporary raw material requirements of the members. Thus the society is a kind of servicing co-operative industrial society.

The stock of finished products maintained by the society consists mainly of utensils of everyday use. The stock of these in the store of the society is neither up-to-date nor very impressive. It includes only two or three varieties of thal (large round trays used for eating purposes) and a few brass plates ornamented with a poor quality of chased work. The main items of the finished products in the store of the Society are the following:

**Copperwares**

<table>
<thead>
<tr>
<th>Local Name</th>
<th>English Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patili</td>
<td>Small stewpan, with and without a joint.</td>
</tr>
<tr>
<td>Lagan</td>
<td>Stewpan, Farrukhabadi or Dilhiwala.</td>
</tr>
<tr>
<td>Kunde</td>
<td>Large wide-mouthed circular pot.</td>
</tr>
<tr>
<td>Sagar</td>
<td>Water jug with wide spout.</td>
</tr>
<tr>
<td>Sharia</td>
<td>Water jug.</td>
</tr>
<tr>
<td>Kalsa</td>
<td>Water jug.</td>
</tr>
</tbody>
</table>

177
BRASSWARES

*Raite Dan* . Nickel polished, a pair of bowls for carrying curd preparations.

*Sag Dan* or *Durke* . Nickle polished, a pair of bowls for containing curries.

*Kothies* . Water containers.

*Deg* . Cauldron.

*Thal* . Simple household tray or platter.

*Thal* . Artware tray.

*Parat* . Circular presentation salver.

*Bhagon* . Deep circular pan.

All the finished products shown in the store of the society are manufactured by the member-working units of the society on a contract basis. The society gives the raw materials to the member's working-units on piece rate wages to the workers for their production services. The wage rate is not fixed. This is decided upon by the Managing Committee while distributing the work, and thus depends upon the nature of work assigned. However, in no instance is it below the market wage rate. The society deducts 5% of the total wages paid to a member as a compulsory deposit, but upon withdrawing their candidature from the Society, the members are entitled to get back their compulsory deposits. The deposits also bear interest at the rate of Rs. 5 per cent per annum.

Regarding the manufacturing items of member-units of the society, it is significant to note that during the year 1962-63 out of the total of 26 working members units, 11 leading members units were mainly engaged in the production of brass and copper artwares and the 15 remaining were producing brass and copper utensils only. The nine members units producing mainly brass and copper artware include two units which exclusively manufacture brass and copper trays (*thals*) of shapes and designs as per the order of the dealers and also the customers, while one unit manufactures mainly cast articles of brass and copper, such as images of goods, goddesses, dolls, animals and dancing figures, etc. The rest of the 6 units undertake the production of almost every kind of brass and copper artware, such as, ash-trays, table trays, flower vases, hanging lamps, etc.

Of these nine members units, six leading members units of the society engaged in the manufacturing of the artwares are also registered as small scale factory units. The rated capacity to manufacture brass artwares and utensils of these six units taken together amounts to about 100 metric tons per year. As against this the rated capacity to manufacture metalwares of the remaining 20 member-units works out to be only about 100 metric tons per year.

The co-operative society meets only a part of the total raw material requirements of its mainly cast articles of brass and copper, such to the society by the Directorate of Industries Delhi, to procure the basic raw material from the wholesale agents at controlled rates during 1962-63, the society could get only 15,800 kgs. of copper ingots and 33,500 kgs. of brass sheets with which they could only meet about one-fourth of the total raw material requirement of its members. The remaining 3/4ths of the total raw material requirements that fell short of the requirements of the Society was met from the black market by the helpless members unit's own individual initiative.

Amongst all of the members of the Managing Committee, the Secretary is the most active one. He is responsible for the management of the office of the cooperative society. It is significant to note that all the members of the managing committee are running their own household operatives and none among them it educated even upto the middle standard. The office of the society is thus entirely run by the two paid officials of the society, one of them being a matriculate and the other one having studied upto middle standard. It has been further observed that the incidence of the paid officials berating the members of the society (and sometimes even the members of the managing committee) for their wrongs are not uncommon. However, what is more significant is that retaliation by the members who receive such scoldings is seldom taken.
It is a skilful imitation of one of the well known Indian metal icons of the past, the Deepa Laxmi, i.e., the goddess of riches, holding deepa. In the picture a village maid is dressed in typical rural vogue, wearing ghagra, a skirt, choli to cover the breast, orni to shelter the head, and the wrist full of bangles. On her head she carries a pitcher, as if coming from a well. Upon the picture is superimposed a holder for fitting an electric lamp or a candle stick.
TABLE 6-1 Distribution of the Working Members and Paid Officials of the Society

<table>
<thead>
<tr>
<th>St. No.</th>
<th>Name</th>
<th>Designation</th>
<th>Whether traditionally belonging to the craftsmen families</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>All running their operative—hold honorary portfolios in the Society</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Sh. Bharat Lal</td>
<td>President</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Sh. Lakhan Lal</td>
<td>Vice President</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Sh. Nanak Chand</td>
<td>Secretary</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Sh. Zadhey Shayam</td>
<td>Joint Secretary</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Sh. Ram Krishan Dar</td>
<td>Treasurer</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Sh. Keshav Ram</td>
<td>Committee member</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Sh. Mohar Singh</td>
<td>Committee member</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Sh. Narottam Das</td>
<td>Accountant</td>
<td>Yes</td>
<td>Salary Rs. 120/- P.m.</td>
</tr>
</tbody>
</table>

Area of Operation
All the member units of the Dhatu Patra Co-operative Industrial Society are located in Gali Sheesh Mahal, Gali Bajrang Bali, Bazar Sita Ram; Phatak Namak, Gali Bandook Wali (Hauz Kazi); Sirkiwalan and Churi Walan area. All these places fall within a radius of one mile from Hauz Kazi. During the period of our enquiry we found that in all, there existed 38 working units manufacturing brass and copper wares in these places. Out of these 38 units, 26 units (68·4 per cent) were members of the Dhatu Patra Co-operative Industrial Society—and four more units have applied for the membership of the society. Out of the remaining eight non-member units five were reported as being financially unable to purchase the shares. The remaining three were not willing to become the members of the society as they did not consider it to be worth their while.

The society has its headquarter in one of the narrow streets of old Delhi called Gali Sheesh Mahal, Bazar Sita Ram. Gali Sheesh Mahal, also known as Thateron ki Mandir Wali Gali (literally meaning—a temple lane of thateras) is very famous. In all there are 9 working units manufacturing brass and copper wares in the Gali, all of which are run by Thateras belonging to Kshatriya caste. In Gali Sheesh Mahal there are two mandirs (temples) which were constructed by the Thateras about a hundred years ago. In both the temples there are stone images of Radha and Krishna and Shiv Linga (phallic symbol of Lord Shiva). Both temples are the joint property of the Thateras and are taken care of by their caste Panchayat. The Dhatu Patra Co-operative Society is housed in one of the halls of one of these temples. The Co-operative Society pays Rs. 500 per year as rent to the Managing Committee (Panchayat) of the temple.

Caste Composition
All the members of the Dhatu Patra Co-operative Industrial Society are known as Thateras (meaning metal utensil manufacturers). All these persons claim to belong to the Kashyatriya caste, traditionally associated with the manufacturing of brass and copper wares. In September, 1963, the society had 26 working units accounting for a total of 40 working members of the society all of whom were Thateras. With the exception of four working
units all the other units were housed in the residential quarters of the members. The working members of the society running household operatives are masters in shaping the metal sheets to suit the various tastes of the customers. They undertake sheet cutting, sheet moulding and soldering work. The chhilai work or impression design work, chasing work and fret work on the brass and copper wares are done by the Kashmiris or Delhiwala Mohammedan chiteras (chasers), generally on contract basis, but occasionally also on a salary basis in the household factory (karkhanas) of the Thateras or at the residences of the chiteras (chasers).

Management of the Society
The Dhatu Patra Co-operative Society had, on the 30th of September, 1963, a total strength of 46 members and two paid office bearers (accountants) to maintain and run the office. The 46 members of the society include 40 working members and six sympathisers.

Every year a managing committee consisting of seven working members is elected by the members in the general meeting of the society. The following table gives the details regarding the composition of Board of Management and office bearers of the society.

Membership and share money
To become a member of the society one has to pay Rs. 2 as non-refundable membership fee, and also has to purchase at least one share in the society. The value of a share is Rs. 100, payable in a lump sum or in four equal monthly instalments of Rs. 25 each. The society maintains a separate share allotment register and issues a share certificate to the members on the receipt of full and final value of the share.

Since its inception, the society has issued 82 shares and thus has Rs. 8,200 as share money of the members. The liability of each individual member (or of the society) is limited to eight times the subscribed share capital in case of loss.

The society also maintains a provisional membership account. This account is opened for a person who, while applying for membership in the society, pays the first instalment of shares. If the managing committee refuses his admission to the society, the advanced share money is returned to the person concerned.

Co-operative Bank Account
The society has opened its current account with the Delhi State Co-operative Bank, Khari Baoli, Delhi-6. The credit balance of the society with the Co-operative Bank stood at Rs. 6,271.98 on 30th June, 1963.

The society has also purchased 8 shares of the Delhi State Co-operative Bank of Rs. 50 each and one share of Delhi State Co-operative Industrial Federation of the value of Rs. 50.

Dharma (धर्म) Account
The society, as stated earlier, is housed in a temple. It maintains a charity account known as Dharmda Account. The collections of the account are utilised to decorate the temple. On the sale of its products, the society charges 12 Paise per Rs. 100 as dharma (charity) from the customers.

TABLE 6.2 Allocation of Net Profits of the Society (1961-62)

<table>
<thead>
<tr>
<th>Name of the Head</th>
<th>Amount in Rs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserve Fund</td>
<td>1,816.00</td>
</tr>
<tr>
<td>Dividend on shares (fixed as 6.25 per cent per share)</td>
<td>4,75.00</td>
</tr>
<tr>
<td>Bonus to working members (also officials)</td>
<td>3,400.00</td>
</tr>
<tr>
<td>Share transfer fund</td>
<td>700.00</td>
</tr>
<tr>
<td>Commercial goods fund</td>
<td>680.64</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>7,261.64</strong></td>
</tr>
</tbody>
</table>
Profits, Dividends and Bonus
Since 1960-61 the Dhatu Patra Co-operative Industrial Society has been handling a total turn-over of goods and services amounting to more than Rs. 2 lakhs per year. The receipt and disbursement account of the society for the year 1962-63 shows that the actual turn-over of goods and services during the year by the society amounted to Rs. 2,28,576:15P.

During the first working year 1958-59 the society declared a net profit amounting to Rs. 3,656.65 P. Since then the society has never incurred any loss. The amount of net profits declared by the society during the financial year 1961-62 stood at Rs. 7,261.64 P. This amount was disbursed by the society under the various heads as shown in Table IV.3 indicating the broad pattern of allocation of net profits of the society during the year 1961-62.

Out of the profits the society distributes 6.25 per cent as dividend on the total value of the shares held by each of its members. After making allocation for the Reserve Fund, Share Transfer Fund and Commercial Goods fund, the remainder is declared as bonus to the workers.

For reference of the readers, a copy of the final accounts of the society for the year 1962-63 is given below:

TABLE 6.3 Final Accounts of the Dhatu Patra Co-operative Industrial Society Ltd., for the year 1962—63. (in Rs.)

<table>
<thead>
<tr>
<th>Trading Account</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening Stock</td>
<td>9373·43</td>
<td>Sale</td>
<td>99514·39</td>
</tr>
<tr>
<td>Purchases</td>
<td>77789·63</td>
<td>Closing Stock</td>
<td>30181·33</td>
</tr>
<tr>
<td>Wages</td>
<td>19805·46</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>109131·09</strong></td>
<td><strong>GROSS PROFIT</strong></td>
<td><strong>20564·63</strong></td>
</tr>
<tr>
<td><strong>GRAND TOTAL</strong></td>
<td><strong>129695·72</strong></td>
<td><strong>GRAND TOTAL</strong></td>
<td><strong>129695·72</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Profit and Loss Account</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Entertainment a/c</td>
<td>181·84</td>
<td><strong>GROSS PROFIT</strong></td>
<td><strong>20564·63</strong></td>
</tr>
<tr>
<td>Stationery a/c</td>
<td>669·92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post Office a/c</td>
<td>22·83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Travelling</td>
<td>265·93</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rent</td>
<td>500·00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>2234·28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salaries</td>
<td>2368·77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest</td>
<td>492·91</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>6142·98</strong></td>
<td><strong>NET PROFIT</strong></td>
<td><strong>14421·65</strong></td>
</tr>
<tr>
<td><strong>GRAND TOTAL</strong></td>
<td><strong>20564·63</strong></td>
<td><strong>GRAND TOTAL</strong></td>
<td><strong>20564·63</strong></td>
</tr>
</tbody>
</table>

Appraisal
Our enquiry into the working of the Dhatu Patra Co-operative Industrial Society Ltd., reveals that the society primarily consists of a class of Thateras basically engaged in the production of brass and copper utensils and artwares. Out of the total of 26 member units of the society 9 leading units are mainly engaged in the production of large varieties of brass and copper artwares and the rest of the 17 units only manufacture brass and copper utensils. Thus, the society claims to be the manufacturers and suppliers of every kind of brass and copper utensils and artwares. In actual practice, however, the society entertains direct orders for manufacturing and supplying brass and copper utensils only. Thus it deals only in brass and copper utensils, always maintaining a good stock of finished metal utensils but
TABLE 6.4 Balance Sheet for the year ending 30th June, 1963. (in Rs.)

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share Money</td>
<td>8200.00</td>
</tr>
<tr>
<td>Compulsory Deposit</td>
<td>768.35</td>
</tr>
<tr>
<td>Deposits</td>
<td>700.00</td>
</tr>
<tr>
<td>Reserve Fund</td>
<td>4696.16</td>
</tr>
<tr>
<td>Building Fund</td>
<td>1560.00</td>
</tr>
<tr>
<td>Share Transfer Fund</td>
<td>800.00</td>
</tr>
<tr>
<td>Membership Share a/c</td>
<td>250.00</td>
</tr>
<tr>
<td>Common Goods Fund</td>
<td>79.64</td>
</tr>
<tr>
<td>Dividends</td>
<td>75.00</td>
</tr>
<tr>
<td>Dharma a/c</td>
<td>108.25</td>
</tr>
<tr>
<td>Advance</td>
<td>252.00</td>
</tr>
<tr>
<td>Rent Payable</td>
<td>721.90</td>
</tr>
<tr>
<td>Salaries Payable</td>
<td>120.00</td>
</tr>
<tr>
<td>Sales Tax Payable</td>
<td>23.61</td>
</tr>
<tr>
<td>Wages Payable</td>
<td>622.40</td>
</tr>
<tr>
<td>Sundry Creditors</td>
<td>3315.68</td>
</tr>
<tr>
<td>Delhi State Co-op. Bank Loan</td>
<td>4650.00</td>
</tr>
<tr>
<td>Profit &amp; Loss a/c (last year)</td>
<td>1.87</td>
</tr>
<tr>
<td>Net Profit during 1962—63</td>
<td>14421.65</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>41366.51</td>
</tr>
</tbody>
</table>

Moreover, complaints have been made that even after the approval of the quota from the Directorate of Industries, Delhi, there are unusual delays and cuts in the actual realisation of the quota. As the demand for metal products of the society is of a seasonal nature, the brisk season being during the winter, from October to February-March, these delays sometimes result in serious disruptions in the normal functioning of the working units of the society. For if the raw materials are obtained after the season is over, the products subsequently produced (or the raw materials) have to be stored till the next season. It was reported that during the year 1962-63 about one-third of the total products produced by the member units of the society remained unsold only because raw materials could not be procured in time.

not of artwares in its showroom and in the store. So far the society has not taken any substantial steps to encourage its member-units to manufacture metal artwares.

The task of procuring the required quantity of the basic raw material (brass and copper) for the member units at controlled rates presents one of the most difficult problems to the society. It has been reported that the total amount of raw materials obtained by the society at control rate is not sufficient to meet even after the approval of the quota from the members of its member-units. It is mainly for this reason i.e., shortage of raw materials, that the society does not take up manufacturing of artwares, nor does it attempt to raise its membership.
Tara, the Buddhist Goddess
Art for Art Sake

The need for creating additional employment opportunities, the necessity of increasing production and the obligation of an independent nation to revive the best in its traditions, form the basic norms of a free developing economy. And since the capital requirements of the craft under study are quite modest, its place in the context of a developing economy like ours and suffering as it does from a serious shortage of capital, can hardly be over-emphasised. By fostering the development of the crafts, and perhaps of the craft here under study in particular, we not only serve the purpose of creating additional employment, boosting internal production, augmenting foreign exchange, but also add stature to our national culture and through this to our nation's pride.

The development of craft assumes special importance "particularly in a country where the home is abode of Beauty and Art is handmaid of utility." Further, "Where the crafts flourish, there prosperity dwells, unemployment vanishes, waste is converted into wealth, and brains and emotions co-operate under the restraining leadership of will. The sanctity of the home is preserved. Moral values are conserved in society and the outpouring of the human soul on works of art woven into utility elevates the nation's culture to the highest altitude. Work becomes worship and labour becomes capital and functions as the eternal wealth of the world. Labour and life by their confluence enrich the stream of national self-realisation and self-competence." 

Hence, on all counts, the crafts must be revived and developed in order for India to march ahead with the dynamics of the time. The problems faced today by the craft are varied and complex. In the preceding chapter an attempt has been made to present an analytical account of the craft as it flourishes in the city. Some of the more important problems highlighted therein call for revivification. Broadly speaking, these problems may be divided up into four headings viz., (i) problems pertaining to the revival and development of the standard and quality of the craft; (ii) combination of tradition and modern technology; (iii) raising the standard of living of the craftsmen; (iv) gearing the institutions and the schemes into quick responsible action.

---

Revive and Reorient the Traditions

A free nation is under an obligation to revive the best in its traditions; that is to say, those craft traditions which in the past have brought honour to India from the rest of the world by reason of their great technical and aesthetic stature. The large variety of brass and copper artware products for which Delhi has earned considerable fame in the past must be revived and redesigned in the light of modern requirements and taste. With the impact of 20th Century ways of life, significant changes have taken place in the aesthetic values of the people. Patronage of the arts and crafts is shifting from the aristocracy to a growing and highly art conscious middle class. Most people no longer want elaborately ornamented crafts which in the 1880's were referred to as the 'sumptuary arts' of India. Nowadays, people require simple and well-designated objects of utility, inexpensive and handy ones yet having beauty of form. These may or may not be embellished by decorative motifs, but if they are, they should be simple so that they amplify but do not compete with the form which carries them. To achieve this end it would be worth the while of the experts from the Delhi Design Development Centre to pay periodical visits to the crafts units for on the spot demonstration aimed at improving traditional designs and evolving new ones. Regular training courses (with some stipend) should be opened at the Design Development Centre and further, in order to check the deterioration in the general standard and quality of Delhi artwares, a quality marking scheme should be effectively implemented. Moreover, the Government should patronize and give recognition to the skilled craftsmen who have produced truly fine works of metal art, just as they give it to painters, sculptors, dancers, poets and musicians. Such efforts would go a great extent help in restoring the creative urge and imagination, freedom of initiative and above all a resurgence of the craftsmen's self respect.

Combine Traditions with Contemporary Technology

The word "handicraft" has an extended meaning in the machine age. The Encyclopaedia of Social Sciences says: "Handicraft is both a method of industrial production and a form of artistic activity." The Encyclopaedia Britannica goes on to define Handicraft as a "skilled work done with hand, the skill acquired by long practice and training or skilful use of tools and machines for transformation of material substance."

It goes without saying that craftsmen's use of improved types of machines, tools and implements, would also very favourably affect the quality, the standard and the increase of the production of the artwares particularly those of metal. Most of the tools and appliances used by the metal craftsmen of Delhi are essentially traditional, cumbersome and technologically obsolete. They not only involve exhausting and hazardous operations, but also have a low turn-over. A production-cum-training centre or a common facility centre (since the majority of craftsmen are too poor to own costly machines and appliances) with improved type of machines, viz., sheet metal cutting machine, scraping and turning lathes, should be set up. Side by side, such a centre should be equipped to encourage research in the development of better techniques. The working of improved machines, tools and appliances should be demonstrated for the benefit of the craftsmen and they should be given free training for the proper handling of these techniques and appliances. Arrangements should be chalked out to give the craftsmen financial assistance, or hire-purchase facilities, and to provide cheap electricity in order to induce the craftsmen to go in for the use of such time-saving and technically improved equipment.

Ensure Dignified Living to the Craftsmen

As poverty is said to be a curse, and it is one, a frontal attack must be launched to fight it. The level of living of the Delhi artware artisans is extremely low. Their earnings are not enough to even provide them with the bare requirements of their stomachs. They are mostly illiterate. They live in very cramped quarters where no distinction is made between living and working space, which are utterly devoid of such basic sanitary facilities and necessities as water taps, separate bath-rooms, separate latrines and
electricity. Many of the craftsmen's living quarters are in such an incredibly dilapidated condition that one fears they may collapse at the first monsoon rain.

In the free market, the metalsmith's employment conditions and terms of work are very erratic and they are at the mercy of both the dealers and exporters. Procurement of raw materials, even at black market rates, poses almost insurmountable problems; and in order to market their products they have no recourse but to look to these local metal artware entrepreneurs. In the light of all these considerations, the most effective way to increase the income of the Delhi artware craftsmen is to ensure a steady and sufficient flow of work through the Delhi State Industries Emporium and the Central Cottage Industries Emporium and Government agencies; improve working conditions through State legislation and State aid and to provide raw materials at fair prices. The Directorate of Industries or the Handicraft and Handloom Export Corporation of India Ltd., might well take in hand the distribution of raw materials and arrange to guarantee the marketing of their products, both at home and abroad.

To ensure a better deal for the craftsmen, the structure of production as such needs to be reorganised so as to lessen the domination of dealers, exporters, financiers and middlemen. The craftsmen should be encouraged to learn how to form and run their own Associations, Unions, and Co-operatives and thus reap the advantage of collective bargaining. Credit facilities, such as the Supervised Credit Scheme of the All India Handicrafts Board, on easy instalments, without any security, but with technical advice and guidance, should also be provided.

Regarding medical aid to the craftsmen, the Employees State Insurance Scheme, or some group health insurance scheme, should be introduced on a compulsory basis.

An adult literacy drive, through social education centres, and audio-visual education via films shows and still documentaries must be launched, as should also be arrangements for combining education with craft training for the craftsmen and their children.

Gear Institutions and Schemes into Subtle Actions to Benefit the Craft & Craftsmen

The contributions made by the various institutions connected with the development and promotion of the craft in the City, such as the All India Handicrafts Board, the Handloom Exports Corporation of India, Limited, and the Directorate of Industries, etc., have so far been very feeble. The vast scope and area of operation of these institutions and shortage of funds and technical know-how no doubt stand in the way of the implementation of various promotional schemes on a substantial scale. But the scarcity of finance and technical manpower can hardly block the way of the true devotees who have the determination, the spirit of service and strong willpower to work for a new resurgence of the craft and a New Deal for the artisans who produce it. No doubt such selfless love for it, would cost them their comfort and result in certain amount of physical strain, but such a price is always demanded from those who work for a great cause. Thus, the future of the craft largely depends upon the determination and the staunch spirits of those crusaders who are closely associated with, and concerned about, the functioning and development of this art-metal craft, not only in Delhi but in all the art-metal centres in India.
### APPENDIX A

#### GLOSSARY

<table>
<thead>
<tr>
<th>Local Term</th>
<th>English Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abhaya</td>
<td>Fearless</td>
</tr>
<tr>
<td>Agni</td>
<td>Fire</td>
</tr>
<tr>
<td>Akash deep</td>
<td>Hanging lamp</td>
</tr>
<tr>
<td>Akshmala</td>
<td>Rosary of beads</td>
</tr>
<tr>
<td>Angulas</td>
<td>Fingers</td>
</tr>
<tr>
<td>Ardhanari/Ardhanarishavara.</td>
<td>Shiva in half male and half female posture</td>
</tr>
<tr>
<td>Arati</td>
<td>Ceremonial moving of lamp around the deity.</td>
</tr>
<tr>
<td>Arati lamps</td>
<td>Votive lamps</td>
</tr>
<tr>
<td>Ashram</td>
<td>Abode of rishis, saints</td>
</tr>
<tr>
<td>Asura</td>
<td>Demon</td>
</tr>
<tr>
<td>Avatar</td>
<td>Incarnation</td>
</tr>
<tr>
<td>Bail or Bel patti</td>
<td>A creeping design with a creeper and leaves.</td>
</tr>
<tr>
<td>Baja</td>
<td>Horn</td>
</tr>
<tr>
<td>Bazar</td>
<td>Market</td>
</tr>
<tr>
<td>Bangar</td>
<td>Hollow iron frame</td>
</tr>
<tr>
<td>Barfi</td>
<td>A sweet prepared with milk and sugar cut into squares</td>
</tr>
<tr>
<td>Beroja</td>
<td>A kind of rough gum</td>
</tr>
<tr>
<td>Bhatti</td>
<td>Furnace</td>
</tr>
<tr>
<td>Bhagona</td>
<td>A circular pan</td>
</tr>
<tr>
<td>Brahma</td>
<td>The Creator of the Universe</td>
</tr>
<tr>
<td>Chameli</td>
<td>Jasmine</td>
</tr>
<tr>
<td>Changer</td>
<td>Flower vase</td>
</tr>
<tr>
<td>Chappal</td>
<td>Cap, sandal</td>
</tr>
<tr>
<td>Charakh</td>
<td>Wooden lathe used to revolve artwares while scraping operation is being performed.</td>
</tr>
<tr>
<td>Charpci</td>
<td>Cot</td>
</tr>
<tr>
<td>Chaukaliya</td>
<td>Four petals pattern</td>
</tr>
<tr>
<td>Chaukor</td>
<td>Square</td>
</tr>
<tr>
<td>Chauras Hathora</td>
<td>Square-edged hammer.</td>
</tr>
<tr>
<td>Chauka</td>
<td>Square iron block</td>
</tr>
<tr>
<td>Chhaja</td>
<td>Projecting roof</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>English Equivalent</th>
<th>Local Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chisel</td>
<td>Chhaini</td>
</tr>
<tr>
<td>Scraping</td>
<td>Chhilai</td>
</tr>
<tr>
<td>Engraving work with some coloured background</td>
<td>Chikan</td>
</tr>
<tr>
<td>Earthen pipe</td>
<td>Chilam</td>
</tr>
<tr>
<td>Impression pen</td>
<td>Chil Chila Kalam</td>
</tr>
<tr>
<td>Iron tongs</td>
<td>Chimta</td>
</tr>
<tr>
<td>Small iron tongs</td>
<td>Chimiti</td>
</tr>
<tr>
<td>Chasing</td>
<td>Chitai</td>
</tr>
<tr>
<td>Chaser</td>
<td>Chitera</td>
</tr>
<tr>
<td>Door, a pattern corresponding to the shape of Mibrab door</td>
<td>Dar</td>
</tr>
<tr>
<td>Dispensary</td>
<td>Dawakhana</td>
</tr>
<tr>
<td>Lamp</td>
<td>Deepa</td>
</tr>
<tr>
<td>Cauldron</td>
<td>Deg</td>
</tr>
<tr>
<td>The inhabitants (original) of Delhi</td>
<td>Delhi wala</td>
</tr>
<tr>
<td>Deities</td>
<td>Devas</td>
</tr>
<tr>
<td>Lid</td>
<td>Dhakkan</td>
</tr>
<tr>
<td>A small drum with a hollow body</td>
<td>Damaru</td>
</tr>
<tr>
<td>Casting</td>
<td>Dhalai</td>
</tr>
<tr>
<td>Metal</td>
<td>Dhatu</td>
</tr>
<tr>
<td>A pair of bowls used for serving curries</td>
<td>Durke</td>
</tr>
<tr>
<td>The era when Lord Vishnu incarnated as Rama</td>
<td>Dwapar-yuga</td>
</tr>
<tr>
<td>Cardamom</td>
<td>Elaichi</td>
</tr>
<tr>
<td>Two nosed Anvil</td>
<td>Ekwanii maikh</td>
</tr>
<tr>
<td>Art</td>
<td>Fun</td>
</tr>
</tbody>
</table>

189
<table>
<thead>
<tr>
<th>Local Term</th>
<th>English Equivalent</th>
<th>Local Term</th>
<th>English Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td></td>
<td>Kabari</td>
<td>Junk seller</td>
</tr>
<tr>
<td>Gada</td>
<td>Mace</td>
<td>Kafir</td>
<td>Non-believer (or Prophet)</td>
</tr>
<tr>
<td>Gajahasta</td>
<td>A dancing pose—hand hanging down across the body</td>
<td>Kalya</td>
<td>Soldering iron</td>
</tr>
<tr>
<td>Gandhak-ka-tezab</td>
<td>Sulphuric acid</td>
<td>Kalai</td>
<td>Nickel</td>
</tr>
<tr>
<td>Ghararidar Pankha</td>
<td>Windlass fan</td>
<td>Kalam</td>
<td>Chisel, pen</td>
</tr>
<tr>
<td>Ganesha</td>
<td>Son of God Shiva, known for his sagacity, wisdom &amp;</td>
<td>Kali-yuga</td>
<td>The age of death &amp; fear; the present age</td>
</tr>
<tr>
<td></td>
<td>obedience to parents.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ghanta</td>
<td>Bell</td>
<td>Kalsa</td>
<td>Water jug</td>
</tr>
<tr>
<td>Ghariya</td>
<td>Crucible bowl</td>
<td>Kamadeva</td>
<td>God of passion</td>
</tr>
<tr>
<td>Ghartia</td>
<td>Metal-smith</td>
<td>Kamadhuenu</td>
<td>A blissful cow (divine)</td>
</tr>
<tr>
<td>Ghutai</td>
<td>Grinding</td>
<td>Kamal</td>
<td>Lotus, water lilly</td>
</tr>
<tr>
<td>Gilas</td>
<td>Glass, glass of metal</td>
<td>Kamal rupi</td>
<td>Like lily—a simile given to earth</td>
</tr>
<tr>
<td>Gole maikh</td>
<td>Bright stake</td>
<td>Karanda mukuta</td>
<td>A crown of fine knots of hair</td>
</tr>
<tr>
<td>Gulmatha maikh</td>
<td>Bright stake</td>
<td>Karchha</td>
<td>Iron ladle</td>
</tr>
<tr>
<td>Gole or Gul muha maikh</td>
<td>Round edged hammer</td>
<td>Karkhana</td>
<td>Factory, workshop</td>
</tr>
<tr>
<td>Gole or Gul muha hathora</td>
<td>Round edged hollow chisel</td>
<td>Kasera</td>
<td>A class traditionally engaged in selling of utensils</td>
</tr>
<tr>
<td>Guldasta</td>
<td>Bouquet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gulsum or Gulehun ehhaini</td>
<td>Round edged hollow chisel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gurdha maikh</td>
<td>Nepro stake</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Handi</td>
<td>The central frame of the lamp-shade</td>
<td>Katar</td>
<td>Cut, cut-work</td>
</tr>
<tr>
<td>Hansa</td>
<td>Swan</td>
<td>Ketaka hasta</td>
<td>Hand given a bend from the waist</td>
</tr>
<tr>
<td>Hanumana</td>
<td>The monkey chief, son of the wind. One of the most</td>
<td>Katori</td>
<td>Bowl</td>
</tr>
<tr>
<td></td>
<td>faithful and sincere disciples of Lord Rama.</td>
<td>Kauwa maikh</td>
<td>An anvil having its stroke end similar to the beak of</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>crow</td>
</tr>
<tr>
<td>Hatha</td>
<td>Handle</td>
<td>Khasdan</td>
<td>Betel box</td>
</tr>
<tr>
<td>Hathora</td>
<td>Hammer</td>
<td>Khatai</td>
<td>Pickling</td>
</tr>
<tr>
<td>Hukka</td>
<td>Hubble bubble</td>
<td>Khadris</td>
<td>A caste traditionally associated with the Kshatriyas</td>
</tr>
<tr>
<td>Husan-dan</td>
<td>Betel-nut box</td>
<td></td>
<td>(warriors) class and in few cases with business class</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ista</td>
<td>The deity of faith</td>
<td>Kothi</td>
<td>Large circular water container</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jaal/Jaali</td>
<td>Net</td>
<td>Kuchha tanka</td>
<td>Soft soldering</td>
</tr>
<tr>
<td>Jaalikat</td>
<td>Free-work or perforation work</td>
<td>Kunda</td>
<td>Earthen vat</td>
</tr>
<tr>
<td>Jagirdar</td>
<td>Landholder, Grantee</td>
<td>Kunda</td>
<td>Hook to hold a string</td>
</tr>
<tr>
<td>Jasta</td>
<td>Zinc</td>
<td>Kasa</td>
<td>A kind of grass</td>
</tr>
<tr>
<td>Jata</td>
<td>Lock of hair</td>
<td>Kutcha</td>
<td>Raw</td>
</tr>
<tr>
<td>Jata mukuta</td>
<td>Crown of lock of hair</td>
<td>Kuthali</td>
<td>Crucible bowl</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kaam</td>
<td>Work, profession</td>
<td>Lagan</td>
<td>Stewpan</td>
</tr>
<tr>
<td>Kabaq</td>
<td>Chisel</td>
<td>Lahariya</td>
<td>Undulant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lakshmi</td>
<td>Goddess of wealth, wife of Lord Vishnu, the creator of</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>the Universe</td>
</tr>
<tr>
<td>Local Term</td>
<td>English Equivalent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>--------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lattu</td>
<td>Top (toy)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loba</td>
<td>Iron</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lohé-ku-Patra</td>
<td>Flat iron block</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lota</td>
<td>Brass ewer with wide spout</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mahesh</td>
<td>Another name of Shiva</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mahipusta</td>
<td>Scales of fish</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maida</td>
<td>Fine wheat flour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maikh</td>
<td>Anvil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Majhai</td>
<td>Pickling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mandir</td>
<td>Temple</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mantras</td>
<td>Hymns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Martban</td>
<td>A container made of china clay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Masala</td>
<td>Sandy molasses mixture used to prepare casting moulds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mela</td>
<td>Fair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mihrab</td>
<td>To quote Chamber's Twentieth Century Dictionary, mihrab is &quot;a niche or slab in a mosque marking the direction of Mecca&quot;. The outer rectangle or square of the niche being innerly decorated with repeating outswelling curves that come to a pointed apex at the top</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moongri</td>
<td>Mallet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Makuta</td>
<td>Crown</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Murti</td>
<td>Icon, image.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nabhi</td>
<td>Navel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nakashi</td>
<td>Low relief work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nakhuni Chhaini</td>
<td>Convex chisel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nali</td>
<td>Tube</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Namak</td>
<td>Salt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Namak-ka-tezab</td>
<td>Hydrochloric acid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Namuna</td>
<td>Pattern</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nandi</td>
<td>Bull, \textit{Vahana} of Shiva</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natraj/Natraja</td>
<td>Shiva in his mystic dance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nausadar</td>
<td>Ammonium chloride</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nav-tal</td>
<td>Nine talas; it was a standard size of icons in Ancient India (approximately 1.54 metres long)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nayeka</td>
<td>Dancing girl</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nihai</td>
<td>A circular iron block</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nikhar</td>
<td>Pickling</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Local Term</th>
<th>English Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Niyamat khana</td>
<td>Tiffin carrier</td>
</tr>
<tr>
<td>Nokdar</td>
<td>Conical, pointed</td>
</tr>
<tr>
<td>Okhal/Okhli</td>
<td>Mortar</td>
</tr>
<tr>
<td>Padam pitha</td>
<td>Lotus pedestal:</td>
</tr>
<tr>
<td>Pail</td>
<td>Concave patterns shaped all along the circularly raised-rim of the trays. \textit{Pail} corresponds to the egg and dart design or pie crust design.</td>
</tr>
<tr>
<td>Paildar</td>
<td>Semi rounded (concave) pillars</td>
</tr>
<tr>
<td>Palang</td>
<td>Bedstead</td>
</tr>
<tr>
<td>Pandan</td>
<td>Betel box, spices box</td>
</tr>
<tr>
<td>Pankha</td>
<td>Fan</td>
</tr>
<tr>
<td>Param hansa</td>
<td>Perfect swan, a simile given to a man having perfectly gentle nature.</td>
</tr>
<tr>
<td>Parat</td>
<td>Circular salver</td>
</tr>
<tr>
<td>Parkar</td>
<td>A pair of iron dividers</td>
</tr>
<tr>
<td>Parmeshwara</td>
<td>The supreme God, the Shiva</td>
</tr>
<tr>
<td>Parsa</td>
<td>Large axe</td>
</tr>
<tr>
<td>Parvati</td>
<td>Mountain's daughter</td>
</tr>
<tr>
<td>Parshu Ram</td>
<td>Rama with axe, an incarnation of Lord Vishnu to destroy the Kshyatriyas (class of warriors).</td>
</tr>
<tr>
<td>Patra</td>
<td>Utensil</td>
</tr>
<tr>
<td>Patila</td>
<td>Stewpan</td>
</tr>
<tr>
<td>Patti</td>
<td>Central frame of the lamp-shade</td>
</tr>
<tr>
<td>Pava</td>
<td>A leg stand of bedstead</td>
</tr>
<tr>
<td>Pavan</td>
<td>The Wind, wind</td>
</tr>
<tr>
<td>Pavan Putra</td>
<td>Son of the Wind. \textit{Hanuman}</td>
</tr>
<tr>
<td>Pectar</td>
<td>Brass</td>
</tr>
<tr>
<td>Plas</td>
<td>Pliers</td>
</tr>
<tr>
<td>PraKritik</td>
<td>Natural</td>
</tr>
<tr>
<td>Pucca tanka</td>
<td>Strong solder</td>
</tr>
<tr>
<td>Pujx</td>
<td>Worship</td>
</tr>
<tr>
<td>Putla</td>
<td>Dummy pattern of the article to be produced through casting technique.</td>
</tr>
<tr>
<td>Qila</td>
<td>Fort</td>
</tr>
<tr>
<td><strong>Local Term</strong></td>
<td><strong>English Equivalent</strong></td>
</tr>
<tr>
<td>----------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td><strong>R</strong></td>
<td><strong>Wife of Lord Krishna</strong></td>
</tr>
<tr>
<td>Radha</td>
<td><strong>Passional</strong></td>
</tr>
<tr>
<td>Rajasika</td>
<td></td>
</tr>
<tr>
<td>Raita dan</td>
<td><strong>A pair of bowls used to carry curd and curd preparations.</strong></td>
</tr>
<tr>
<td>Ral</td>
<td><strong>Resin</strong></td>
</tr>
<tr>
<td>Randa</td>
<td><strong>Scraping tool, scraper.</strong></td>
</tr>
<tr>
<td>Rath</td>
<td><strong>Charriot or temple car.</strong></td>
</tr>
<tr>
<td>Rati</td>
<td><strong>Goddess of beauty, Wife of Kamadeva (god of passion)</strong></td>
</tr>
<tr>
<td>Reja</td>
<td><strong>Casting mould</strong></td>
</tr>
<tr>
<td>Reti</td>
<td><strong>File</strong></td>
</tr>
<tr>
<td>Rithi</td>
<td><strong>Saint</strong></td>
</tr>
<tr>
<td><strong>S</strong></td>
<td></td>
</tr>
<tr>
<td>Sakkarpara</td>
<td><strong>A popular sweet prepared with fine wheat flour and sugar cut into diamond shape.</strong></td>
</tr>
<tr>
<td>Salai</td>
<td><strong>Spike</strong></td>
</tr>
<tr>
<td>Samhara</td>
<td><strong>Destruction</strong></td>
</tr>
<tr>
<td>Sancha</td>
<td><strong>Casting mould</strong></td>
</tr>
<tr>
<td>Sandan</td>
<td><strong>Stake</strong></td>
</tr>
<tr>
<td>Sandasi</td>
<td><strong>Iron pincers</strong></td>
</tr>
<tr>
<td>Sandooki Pankha</td>
<td><strong>Box type air blower</strong></td>
</tr>
<tr>
<td>Sarasvati</td>
<td><strong>Goddess of learning &amp; truth</strong></td>
</tr>
<tr>
<td>Sariya</td>
<td><strong>Water jug</strong></td>
</tr>
<tr>
<td>Sarpaivalaya</td>
<td><strong>Twisted snake (around the neck or arms of Shiva)</strong></td>
</tr>
<tr>
<td>Sattvika</td>
<td><strong>Truthful</strong></td>
</tr>
<tr>
<td>Sat yuga</td>
<td><strong>The age of truth</strong></td>
</tr>
<tr>
<td>Seedhi</td>
<td><strong>Straight</strong></td>
</tr>
<tr>
<td>Seedhi Chhaini</td>
<td><strong>Floor chisel</strong></td>
</tr>
<tr>
<td>Seer</td>
<td><strong>930 grams (approximately)</strong></td>
</tr>
<tr>
<td>Seesam</td>
<td><strong>Dalbergia, Sissoo</strong></td>
</tr>
<tr>
<td>Shalya</td>
<td><strong>Bed</strong></td>
</tr>
<tr>
<td>Shilpa-shastra</td>
<td><strong>Art treaties</strong></td>
</tr>
<tr>
<td>Shesha naga</td>
<td><strong>Sheshha serpent</strong></td>
</tr>
<tr>
<td>Shrikshi</td>
<td><strong>The Universe</strong></td>
</tr>
<tr>
<td>Sikka</td>
<td><strong>Lead</strong></td>
</tr>
<tr>
<td>Silapchi</td>
<td><strong>Washing basin</strong></td>
</tr>
<tr>
<td>Siva/Shiva</td>
<td><strong>Puranic God</strong></td>
</tr>
<tr>
<td>Soot</td>
<td><strong>Thread, a local measurement to measure diameter of circular object approximately 1/8&quot; in diameter</strong></td>
</tr>
<tr>
<td>Soot lagane ki chhaini</td>
<td><strong>Floor chisel</strong></td>
</tr>
<tr>
<td>Subaga</td>
<td><strong>Borax</strong></td>
</tr>
<tr>
<td>Sulpha</td>
<td><strong>Small balls made of tobacco juice</strong></td>
</tr>
<tr>
<td><strong>S</strong></td>
<td></td>
</tr>
<tr>
<td>U</td>
<td><strong>Master craftsman</strong></td>
</tr>
<tr>
<td>Ustad</td>
<td><strong>Craftsman</strong></td>
</tr>
<tr>
<td>Urassutra</td>
<td><strong>Chest band</strong></td>
</tr>
<tr>
<td><strong>V</strong></td>
<td></td>
</tr>
<tr>
<td>Vahana</td>
<td><strong>Vehicle</strong></td>
</tr>
<tr>
<td>Vishnu</td>
<td><strong>Puranic God</strong></td>
</tr>
<tr>
<td><strong>W</strong></td>
<td></td>
</tr>
<tr>
<td>Wazir</td>
<td><strong>Minister</strong></td>
</tr>
<tr>
<td><strong>Y</strong></td>
<td></td>
</tr>
<tr>
<td>Yajnopavita</td>
<td><strong>Sacred thread</strong></td>
</tr>
<tr>
<td>Yoni-vat</td>
<td><strong>Virgin part of female</strong></td>
</tr>
</tbody>
</table>
APPENDIX B

HANDICRAFT SURVEY SCHEDULE

CENSUS OF INDIA 1961

1. GENERAL CRAFT SCHEDULE

Name of the Craft............................

A. GENERAL DESCRIPTION OF LOCALITY particularly with reference to

(a) Distance from nearest railway station—nearest Main Road—Post Office—B.D.O. Office—Registrar of Cooperative Societies Office—Main Marketing Centre—.

(b) Topography and physical environment

(c) Residential pattern including manner of concentration and dispersion and distance from the place where the main production processes are carried out by the craftsman or other involved in the craft in its different stages

(d) Social environment (immediate or primary and wider or secondary set up) with reference to caste/language/religion/nationality characteristics whichever may have any role in regard to the development and/or persistence of the craft

(e) Approximate number of families belonging to each group

(f) Main characteristic of the locality (commercial centre, pilgrimage centre, tourist or health resort centre, historical centre, etc.)

(g) Significant history of the locality which may have any bearing on the history of the craft concerned

(h) (i) Whether there are any other crafts in the same locality

(ii) If yes, is there any casual link for clustering the different crafts in the same area (record the views of the leading craftsman, Local Industrial officer, and 3 or 4 key persons separately.)

(i) Institutions having any bearing on the development of the craft

(j) Whether the craft has any bearing on any aspect of the life of the non-craftsmen neighbours. (Economic, social, cultural, hygienic, etc.) (Record the views of five leading craftsmen, local Industrial officers, Village headman; Local Cooperative officials; or 4 leading persons belonging to different occupations)

B. Particulars about the communities concerned with the craft in its various stages

(a) Name of Caste/Community

(b) Traditionally connected with which aspect of the craft

(c) Approximate number of families:

(i) Total—

(ii) Actually engaged in the craft—

(d) Workers actually engaged in the craft

Adult

\[
\begin{align*}
\text{Male} & : \\
\text{Female} & : \\
\end{align*}
\]

Minor

\[
\begin{align*}
\text{Male} & : \\
\text{Female} & : \\
\end{align*}
\]
(e) Number of persons mainly working in own houses.

(i) Independently
(ii) Under cooperation
(iii) Partnership
(iv) Others

(f) Number of persons mainly working in workshops set up by private employers

(g) Number of persons mainly working in workshops set up by cooperative societies or Government

(h) Number of families producing for own consumption only

(i) Number of families producing for sale to outsiders only

(j) Number of families producing both for consumption and sale

C. Are there any other areas in town where families practising this craft live? If so, give the names of the villages/towns/other areas approximate number of families concerned

D. When did the community oldest practising family come to this locality? Who was the patron? How old is the craft in this area?

E. (i) Legends or myths connected with the origin and history of the community
(ii) Status of the community in the local social structure
(iii) Status of the family in the local social structure
(iv) Particulars about Panchayat of the community

F. Legend myths or history connected with the origin and development of the craft as a whole of different techniques, tools, processes, designs, etc., relating to the craft

G. Particulars about guild of the craftsmen

H. Local markets/agencies from where raw materials are procured

(a) Source (b) Distance from Village
(c) Nature of establishments and number of each
(d) Terms and conditions under which raw materials are obtained by the artisans from each category of establishment
(e) Which category of establishment is preferred by the artisans?
(f) Nature of transport
(g) Availability of raw materials during different seasons.
(h) Special problems

I. Local markets/fairs/other agencies for disposal of products

(a) Name
(b) Distance from the Village
(c) Nature of establishments and number of each
(d) Terms and conditions under which the finished products are disposed of by the artisans through each of the above categories and establishments
(e) Which category is preferred by the artisans and why?
(f) Nature of transport
(g) Fluctuations of demand in different seasons, state causes and extent
(h) Special Problems
I. If there is a co-operative society, when it was started? What is its area of operation? What are the qualifications for membership? How many members of different categories (e.g., artisans, business members, etc.) are there? What are the different functions undertaken by the Society? What aid the society received from the Government or the Statutory Bodies for different operations? What is the extent of business according to last audit report? Dividend, if any, given to the members. What is the loss or profit according to last audit report? To what extent, the interest of the artisans is represented in the management of the Society? General note on its role in regard to development of the craft and whether all sections of the population are equally attracted by it, what are its problems etc.

J. Particulars about the families connected with the craft in various capacities.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Aspects of the craft</th>
<th>No. of families belonging to Community I</th>
<th>No. of families belonging to Community II</th>
<th>No. of families living at a distance from the main centre of 0-1 miles</th>
<th>1-3 miles</th>
<th>3-5 miles</th>
<th>Above 5 miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Manufacture of tools for the craft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Production of raw materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Collection of raw material</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Sale of raw material</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Owner of workshop</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Both owner and craftsman</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Financier</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Skilled craftsman</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Unskilled labourers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Craft supervisor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Trader</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Salesman</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Managerial and account personnel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Transport</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Packing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Others</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

K. Approximate price of the tools relating to the craft in the area (based on opinion of 4 or 5 key persons, viz., officer of Industry Deptt., officials of co-operative society, leading craftsmen).

L. Approximate circulating capital in the area in connection with the craft (based on opinion of 4 or 5 key persons).

M. Approximate annual output of the craft in the area (based on opinion of 4 or 5 key persons).

   (a) Quantity of produce
   (b) Price of produce

N. (i) According to the key informants what are the relative positions of the various types of establishments in terms of their capacity to produce more in proportion to investment? (Type of establishments—Co-operatives, Private workshops with paid workers, self-employed, households, Governments Production Centre, others).
(ii) What are the factors determining the relative position in the above matter?

O. (i) According to the key informants what are the relative positions of the various types of establishments in terms of their capacity to earn more profit in proportion to investment

(ii) What are the factors determining relative positions in the above matter?

P. (i) According to the key informants what are the relative positions of the various types of establishments in terms of their capacity to produce more in proportion to the number of skilled craftsmen

(ii) What are the factors determining the relative position in the above matter?

Q. Particulars of five reputed craftsmen of the centre ascertained through discussion with Local Industry Officer, Officials of Panchayat, 3-4 craftsmen of the area, 2-3 traders in the craft.

<table>
<thead>
<tr>
<th>Name</th>
<th>Community</th>
<th>Age</th>
<th>Academic Qualifications</th>
<th>Nature of training in the craft</th>
<th>Since in the craft</th>
<th>Specialities in which the reputation is based</th>
<th>Appr. income (in Rs.)</th>
<th>Other significant data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

R. Unstructured biography of 2-3 master craftsmen, 1-2 very old craftsmen, 12 new entrants in the craft.

2. SCHEDULE FOR THE STUDY OF CO-OPERATIVE SOCIETY

(These are additional points to be covered after administering the Family Schedule (for practising craftsmen) to the Co-operative Society, considering, it to be a unit, leaving the portion not relevant).

**PART A**

1. Name of the Society
2. Year of Registration
3. Year of commencement of work
4. Area and scope of operation
5. Registered Headquarters
6. Note on the history of development of the Society including the sponsoring, agency, leadership, etc.
7. (a) Crafts dealt with
    (b) Particulars of castes and communities in the locality traditionally connected with the craft (name, number)
8. Categories of membership (ordinary members, business members, etc.) and qualifications for each category of members
Composition of membership

<table>
<thead>
<tr>
<th>Category of member</th>
<th>No. of members from traditional craftsmen, families</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Below 3 miles</td>
<td>4-6 miles</td>
</tr>
</tbody>
</table>

10. (a) Value of each share

10. (b) Method of realisation (whether to be realised at a time in cash or by instalments or by labour and so on)

10. (c) Total number of shares sold

10. (d) Amount of share value realised

11. (a) Rate of admission fee

11. (b) Total amount realised as admission fee

12. Particulars of working capital loan received from Government or Semi-Government agencies

12. (a) (i) Name of Source

12. (a) (ii) Amount received (if a part or whole was received in kind, particulars of the same along with cash value are to be recorded)

12. (a) (iii) When received?

12. (a) (iv) Rate of interest

12. (a) (v) Other terms and conditions

12. (b) (i) Amount repaid (in Rs.)

12. (b) (ii) When repaid?

13. Working capital loan received from other sources

13. (a) (i) Name of source

13. (a) (ii) Amount received (if a part or whole was received in kind, particulars of the same along with cash value are to be recorded)

13. (a) (iii) When received?

13. (a) (iv) Rate of interest

13. (a) (v) Other terms and conditions

13. (b) (i) Amount repaid

13. (b) (ii) When repaid?

14. Subsidy received from Government or Semi-Government agencies

14. (i) Name of Source

14. (ii) Amount received (if a part or whole was received in kind, particulars of the same along with cash value are to be recorded)

14. (iii) When received?

14. (iv) Purpose for which received

14. (v) Terms and conditions on which received

---

197
(vi) How much has been utilised and in what manner?
(vii) Remarks.

15. Subsidy, gift and donation received from other sources.

(i) Name of source

(ii) Amount received (if a part or whole was received in kind, particulars of the same along with cash value are to be recorded).

16. Net profit or loss

(a) According to latest audit report............................................

(b) During 1959-60............................................. 1960-61

17. Dividend given during three years.

1958-59............................................. 1959-60............................................. 1960-61

18. Assistance given during 1960-61 to the Members.

<table>
<thead>
<tr>
<th>No. of members</th>
<th>Total value</th>
<th>Range</th>
<th>Purpose</th>
<th>Terms and conditions</th>
<th>Realisation</th>
<th>Remarks including adequate credit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Max.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mini.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Finance . . . .
Tools . . . .
Workshop facilities . .
Raw materials . .
Technical Assistance . .
Servicing . .
Marketing . .
Training . .
Other benefits in respect of the credit . .
Welfare activities (education, health) . .

19. Composition of the Board of Management and Office bearers.

<table>
<thead>
<tr>
<th>Name of the office</th>
<th>No. of official in ex-officio capacity</th>
<th>No. of non-official members belonging to</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Traditional craftsmen families</td>
<td>Businessman concerned with the craft</td>
</tr>
<tr>
<td></td>
<td>Traditional craftsmen families</td>
<td>Businessman concerned with the craft</td>
</tr>
</tbody>
</table>
PART B
(To be administered to various categories of the members)

1. Particulars of the Members

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Community</th>
<th>Main occupation</th>
<th>Subsidiary occupation</th>
<th>Office, if any</th>
</tr>
</thead>
</table>

2. (a) Has he been benefited by the cooperative society?
   (b) If yes, how?
   (c) If no, why?

3. Are all his needs in connection with the craft satisfied through the cooperative? Yes/No
   (a) What per cent of the various needs are satisfied through the cooperative?
   (b) Particulars of the other Agencies through which the various needs are satisfied

<table>
<thead>
<tr>
<th>Name of agency</th>
<th>Nature of need</th>
<th>Extent of fulfilment</th>
<th>Remarks</th>
</tr>
</thead>
</table>

   (c) Why all the needs cannot be satisfied through the co-operative?
   (d) What according to him are the main problems of the cooperative society and what should be done to solve the same?

PART C
(To be administered to the non-member practising artisan in the area covered by the society)

1. (a) Do you know that there is a cooperative society in your area, dealing with your craft? Yes/No.
   (b) If yes, since when it is in existence?
   (c) Who runs the cooperative?
   (d) What are its activities?
   (e) How is it functioning?

2. (a) Why you have not become a member of the cooperative?
3. (a) Do you think that the members of the cooperative can attract all the craftsmen of the locality with certain adjustments?

(b) If so, what are those adjustments?

4. (a) Do you think that the members of the cooperative have some advantage conferred to the non-members?

(b) If yes, what are they?

5. (a) Even though you are not a member of the cooperative, have you been benefited by it in any manner?

(b) If so, how?

6. (a) Do you think that establishment of the cooperative has been beneficial/harmful to the craft in any manner?

(b) If so, how?

7. What are the problems of the cooperative and what are your suggestions?

### 3. CRAFT UNIT SCHEDULE

#### A. NAME OF THE CRAFT UNIT

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name</th>
<th>Relation</th>
<th>Sex</th>
<th>Age</th>
<th>Education</th>
<th>Religion</th>
<th>Caste</th>
<th>Marital Status</th>
<th>Marriage Payment</th>
<th>Father's Occupation</th>
<th>Traditional Occupation</th>
<th>Whether being followed, if not, when and why</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Contd.**

| Training in Craft | Main Occupation | Subsidiary Occupation | Remarks-
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Source of Period of Remuneration</td>
<td>Engaged</td>
<td>Place of work and its distance</td>
<td>Remuneration</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------</td>
<td>-----------------------</td>
<td>------------------</td>
</tr>
</tbody>
</table>
| Training in Craft | Main Occupation | Subsidiary Occupation | Remarks-
|-------------------|-----------------|-----------------------|------------------|

200
B. PARTICULARS ABOUT ARTICLES PRODUCED

(A). Local names and English equivalents for the types of articles produced by the family (put in serial order in terms of importance with reference to the value to produce).

(i) Before 1947:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Local Names</th>
<th>Sl. No.</th>
<th>English Equivalents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td>4.</td>
<td></td>
</tr>
</tbody>
</table>

(ii) At Present:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Local Names</th>
<th>Sl. No.</th>
<th>English Equivalents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td>4.</td>
<td></td>
</tr>
</tbody>
</table>

(B). Details of articles produced at present (Use separate sheet for different categories of articles).

(a) Name of articles

(b) Seasons of productions

(c) Describe the approximate size, height form of each part of the articles as well as the article as a whole

(d) Describe the uses of each part of the article as well as the article as a whole

(e) Whether there is preference for production of a particular variety of the article? If so, why?

(i) Has there been any attempt to standardise?

(ii) If yes, by whom and how?

(iii) To what extent has it been successful?

(iv) What has been its impact on the volume of production?

(v) Has it involved any shift in the position of any particular craftsman or craftsmen family?

(vi) If there has been no attempt of standardisation, do you think that any aspect of the craft requires to be standardised? If so, why?

(vii) Do all the craftsmen families have necessary tools, equipments, skill and capital to fall in line in case of standardisation?

(f) Remarks
C. PARTICULARS ABOUT RAW MATERIALS

(a) Name of the articles with their parts (both Local & English equivalents);

(b) Main Raw Materials

<table>
<thead>
<tr>
<th>Name</th>
<th>From where obtained</th>
<th>Form</th>
<th>Price</th>
</tr>
</thead>
</table>

(c) Subsidiary Raw Materials

<table>
<thead>
<tr>
<th>Name</th>
<th>From where obtained</th>
<th>Form</th>
<th>Price</th>
</tr>
</thead>
</table>

(d) Privileges enjoyed, if any, in obtaining raw materials

(e) Difficulties, if any, in obtaining raw materials

(f) Terms and conditions on which raw materials were obtained from different sources during 1961

(g) Remarks

D. PARTICULARS ABOUT DESIGN AND DECORATIVE MOTIFS

(Use separate sheet for different categories of articles)

(a) Name of articles

(b) Base material

(c) Name of designs. Brief description of design including colour schemes and aspects which are considered to be purely decorative and which are considered to be of ritual significance

(d) Symbolic aspects and legends associated with the design

(e) Source of design. Whether, according to the craftsman, the design is a traditional one or whether it is a result of an innovation

(f) Is there any section of the population among whom the design is more in demand? If yes, give details

(g) According to the craftsman, whether similar designs found in other types of crafts of the region

(h) Is any design confined to certain families or certain recognised section of the population? Is there any taboo against adoption of other designs? Is there any sanction against copying of designs by others? If so, what is the nature of sanction

(i) Remarks
E. PARTICULARS OF TOOLS

(a) Name of articles produced

(b) Base Material

<table>
<thead>
<tr>
<th>Name (Local and English equivalent) and description of the tool</th>
<th>Function of the tool</th>
<th>From where obtained</th>
<th>At the time it was obtained</th>
<th>Present market Price</th>
</tr>
</thead>
</table>

(d) Who makes the tools, name of the tools when and from where obtained?

(e) (i) Whether the tools are used to the full capacity

(ii) If not, why?

(f) (i) Is the craftsman satisfied with the tools?

(ii) If not, why?

(iii) (a) What other tools he desires?

(b) Why is he not having those tools?

(g) Remarks—Describe magico-religious performances and taboo associated with different techniques, tools and different stages of production or different aspects of craft

F. ESTIMATED COST OF PRODUCTION PER UNIT

<table>
<thead>
<tr>
<th>Name of article</th>
<th>Description</th>
<th>Qty. of raw material</th>
<th>Price of raw material including transportation (in Rs.)</th>
<th>Labour cost (in Rs.)</th>
<th>Other payment for processing (in Rs.)</th>
<th>Total cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
G. PARTICULARS CF THE VARIOUS, SOURCES FROM WHERE THE CAPITAL HAS BEEN REALISED

<table>
<thead>
<tr>
<th>Source</th>
<th>When received</th>
<th>Approximate amount</th>
<th>Terms &amp; conditions (including rate of interest, security, mortgage, etc., manner of realisation, etc.)</th>
<th>Form (Cash or kind)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Self</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) Loans &amp; advances</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(c) Sale of assets (including land, jewellery, livestock, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(d) Diversion of funds from other productive activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(e) Others (specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

H. PARTICULARS ABOUT STORAGE, MARKETING AND TRANSPORT

(Use separate sheet for each article):

(a) Name of article
(b) Time gap between production and disposal
(c) In case of long duration, measure, if any, taken for preservation
(d) Storage: (i) Place
(ii) Distance from workshop
(iii) Container
(e) How disposed of to retailers, wholesalers, cooperatives and other different agencies, on what terms?

I. STATEMENT OF THE CRAFTSMAN ABOUT

(i) Who are main clients?
(ii) What is the main use (ceremonial, domestic, etc.)?
(iii) Whether any change is taking place in the relative importance of different means of disposal and the nature of use.
(iv) Remarks

J. GENERAL DESCRIPTION OF WORKSHOP AND ORGANISATION OF WORK

(a) Location
(b) Physical structure (size and description).
(c) In addition to place of work, whether used for any other purpose; if yes, state the purpose
(d) Environment and hygienic conditions
(e) Number of persons working in the workshop
(f) Hours of Work
(a) Types of Operations:

<table>
<thead>
<tr>
<th>Type of operation</th>
<th>Names of tools used</th>
<th>Whether working individually</th>
<th>Whether working in groups</th>
</tr>
</thead>
</table>

(i) Number of persons engaged in each operation.

<table>
<thead>
<tr>
<th>Type of Operations</th>
<th>Members of family</th>
<th>Employed members</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Skilled</td>
<td>Unskilled</td>
<td>Skilled</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>F</td>
<td>M</td>
</tr>
</tbody>
</table>

(ii) Wage rate for each type of operation and availability of labour.

<table>
<thead>
<tr>
<th>Type of Operations</th>
<th>Wage Rate</th>
<th>Whether Competent hands are available</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Skilled</td>
<td>Unskilled</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adult</td>
<td>Minor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adult</td>
<td>Minor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>M</td>
<td></td>
</tr>
</tbody>
</table>

(h) Nature of utilisation of space in the workshop in respect of each operation

(i) Nature of supervision

(j) Observations about the general atmosphere; relation between individual workers, group supervisors and workers etc.

(k) Remarks
APPENDIX C

BIBLIOGRAPHY

Vincent A. Smith • • • • • • History of Fine Art in India and Ceylon: Oxford History of India; Oxford 1920.

A. K. Coomaraswamy • • • • • • Arts and Crafts of India and Ceylon: London 1913 The Indian Craftsman London 1913.

Sir George C. M. Birdwood • • • • • • The Industrial Arts of India: London 1880.

Sir G. Watt • • • • • • Indian Arts Exhibition Delhi 1902-3.

Abul Fazal • • • • • • Ayine Akbari 'Institutes of Emperor Akbar', Translated by H. Blockmann: 1937.

T. A. Gopinath Rao • • • • • • Elements of Hindu Iconography (4 Volumes), 1916.

E. B. Havell • • • • • • Ideals of Indian Art: London 1911.

Dr. Mulk Raj Anand • • • • • • The Hindu View of Art: Bombay 1956.

Sir G. D. Kalkar • • • • • • Lamps of India, Publication Division, Government of India.

Mrs. Ruth Reeves • • • • • • Cire Perdue Castings in India 1962.

Sewell • • • • • • A Forgotten Empire: London 1900.

Chintamoni Kar • • • • • • Indian Metal Sculptures: London 1952.

Sukracharya • • • • • • Sukraniti; Allahabad: 1914.

M. R. Kale • • • • • • Raghuvansha of Kalidasa, 1925.

K. B. d’z Codrington • • • • • • An Introduction to the Study of Medieval Indian Sculptures.

B. H. Boden Powell • • • • • • Punjab Products 1868, Handbook of Manufacturers of Punjab, Lahore 1872.

Jean Baptiste Tavernier • • • • Travels in India In 2 Vols. English translation by Dr. V. Bell.

S. K. Saraswati • • • • • • Survey of Indian Sculptures.

A History of Technology • • • • • • Edited by Charles Singer, E. J. Homyard and A.R. Hall, Vol. 1 From Early Times to the Fall of Ancient Empire; Oxford, 1858.


GMGIPND—Job II—39 C.P. (JC. 4194)—21-1-66—1,000

206