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CENSUS OF INDIA 1961

VOLUME XIV

RAJASTHAN

PART VII – A (i)

SURVEY OF SELECTED CRAFTS

1. BADLA OF JODHPUR
2. CARPET OF JAIPUR
3. WOODEN TOYS OF UDAIPUR
4. LAPIDARY WORK OF JAIPUR

Field Investigation and First Draft by
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1966

FOREWORD

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

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

An early opportunity was therefore taken in February 1960 to suggest to State Census Superintendents that the Census provided a unique opportunity for conducting and documenting a survey of this kind. As such a survey was quite outside the usual terms of reference of Census work it was thought prudent cautiously to feel one's way with the thin end of the wedge of what would, it was hoped, prove to be an exciting pursuit. It was therefore considered the wiser course to wait until the State Census Offices felt so interested that they would no longer take the inquiry as an imposition but rather want to do it on their own and ask for the necessary staff and equipment. This

office, too, in its turn, could make use of the interval to organise and elaborate the design of inquiry in order to feed the appetite that work in progress would serve to whet. Because it was a labour of love, sought to be unobtrusively thrust on one's colleagues and because the inquiry itself was so vast that normally it would demand in any country as big a set-up, if separately established, as the Census organisation itself and that over a much longer period, and because it was almost a pioneer venture, nothing like it having been undertaken since the 1880's, it was decided to move towards a build-up by stages, to let the inquiry unfold itself only as fast as my colleagues chose to ask for more.

Thus, in the first circular of 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 organising and taking the census count, although several States even during this period had not allowed the grass to grow under their feet but made exploratory studies and decided in their minds how the inquiry should be organised. A series of regional conferences held in Trivandrum, Darjeeling and Shrinagar 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 operation of middlemen and of co-operative societies, the people who gave new designs and demanded new products. Finally the several stages of production of the articles themselves were to be fully described including the final and finishing stage and a list of very skilled 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 toward pointed observation and analysis, to enable them to write, not just general descriptions, but with their eye on the object and on facts.

Investigations conducted between September 1961 and May 1962, including a study group of all States and the Social Studies Division in December 1961 at Delhi, stimulated many of the States into going in for a much enlarged schedule. The revised village schedule itself, the counterpart of the first part of the February 1960 schedule, contained 19 large sections containing elaborate and probing questions. The Family Schedule for practising artisan families similarly contained 19 main questions each 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 enthused enough to scrap the work based on the original short schedule and do it 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, indigenuos 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,
July 30, 1964.

ASOK MITRA
Registrar General, India.

PREFACE

Home of many a renowned artist, Rajasthan has a proud artistic heritage. Of the many crafts that have contributed towards this artistic excellence, the zinc badla, the wooden lacquered toys, the woollen carpets, lapidary work, art brassware, hand block printed and tie and dye textiles, blue art pottery, marble and camel hide work are the most prominent.

Presented in this book are the results of investigation done for the survey of Badla at Jodhpur, Toys at Udaipur, Carpet and Lapidary at Jaipur-the first four out of the fourteen reports on crafts selected for study.

As already observed by the Registrar General, India, in his Foreword, this was a labour of love. The work was done under certain limitations and at times it was found very difficult to grasp the technical details and intricate processes of work involved. The indulgence of the reader is therefore requested in cases where one may come across some lack of thoroughness or perfection.

The field investigation and the first drafting of the reports was done by Shri R. C. Sharma M. A. Investigator incharge of craft surveys in this office. These were examined at different stages by Sarvashri G. R. Gupta, Senior Supervisor and R. N. Raizada, Tabulation Officer. Shri L. R. Pendharkar also scrutinised them and prepared a number of sketches to illustrate the reports. Photography was done by Shri P. C. Acharya. Dr. U. B. Mathur, Dy. Superintendent, Census Operations, Rajasthan, assisted me in editing and Shri S. R. Luhadia, Tabulation Officer, has seen this through the press. I thank them all.

I am greatly beholden to Shri Asok Mitra, Registrar General India, for his general guidance in the work. I am grateful to Mrs. Ruth Reeves, Hony. Advisor and Dr. Roy Burman, Officer on Special Duty of the office of the Registrar General, India for their help and advice at the various stages of the work.

Rambagh Palace Annexe,
Jaipur.
28th Feb., 1966.

C. S. GUPTA
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CENSUS PUBLICATIONS

for

Rajasthan State

The Rajasthan 1961 Census Publications, which will have volume No. XIV in All India Census series, will be published in the following parts :—

Part I-A	...	General Report.
Part I-B	...	Subsidiary Tables.
Part II-A	...	General Population Tables (A Series) and Primary Census Abstract.
Part II-B (i)	...	Economic Tables (B Series, Tables I-IV).
Part II-B (ii)	...	Economic Tables (B Series, Tables V-IX).
Part II-C (i)	...	Cultural Tables (C Series).
Part II-C (ii)	...	Migration Tables (D Series).
Part III	...	Household Economic Tables (B Series, Tables X-XVII).
Part IV-A	...	Report on Housing and Establishments.
Part IV-B	...	Housing & Establishment Tables (E Series).
Part V-A	...	Tables on Scheduled Castes and Scheduled Tribes.
Part V-B	...	Ethnographic notes on Scheduled Castes/Scheduled Tribes.
Part VI-A to F	...	Survey of Selected Villages.
Part VII-A	...	Survey of Selected Crafts.(i – The present Volume)
Part VII-B	...	Notes on Selected Fairs & Festivals.
Part VIII-A	...	*Census Administration Report (Enumeration).
Part VIII-B	...	*Census Administration Report (Tabulation).
Part IX-A & B	...	Census Atlas.

A separate District Census Handbook prepared by this office will be issued by the Government of Rajasthan for each of the 26 districts.

*Not for sale.

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BADLA INDUSTRY OF JODHPUR



A fine specimen of Badla

CHAPTER I

INTRODUCTION AND HISTORICAL BACKGROUND

THE most striking feature about the physical geography of Rajasthan is that about three-fifth of this vast land, which lies to the west and north-west of Aravalli range, is a wide expanse of wind blown sand. Water is exceedingly scarce and some 200 to 300 feet below the surface. The paramount importance of water supply in such region can be easily understood by the fact that wherever villages have sprung up, they have generally received a name ending in *Sara*, *Kor*, *Par* or *Tal*, all denoting a well or a tank.

2. Travelling in this desert is extremely difficult. Camel, the ship of the desert, has all along been of the greatest service to the inhabitants of this region, although horse and bullock cart have also contributed their mite in this direction. During the expeditions and travels, which involved long journeys, people had to carry water with them in adequate quantities to quench their thirst, obviously, because the areas which they had to cross were devoid of water for miles and miles together. Water carriers that proved serviceable in the former times were leather or canvas bags called *devdi*, *mashak* or *pakhal*. These could be hung on both sides of the camel back or attached to the saddle of the horse. *Budkas*, made of clay, were carried in bullock carts. The water carried in leather buckets grew warm and unsavoury on account of the heat of the sun The canvas bags, on the other hand, had the disadvantage that they could not retain water for long time. It trickled down drop by drop. Moreover, the use of leather bags for drinking water was objected to by orthodox people on religious grounds. This gave rise to the invention of big zinc vessels called *tungs*, of the capacity of 15 to 20 gallons each, which were covered with cloth and kept wet to keep the water cool. The *tungs* were loaded on both sides of the camel and served the purpose of transporting water over long distances during times of peace and war for a very long time.

3. Near about the middle of the 19th century an idea occured to a *thathera* technician, named Chaturbhuj (1814-1886), of Jodhpur to utilise zinc metal for preparation of handy water carriers. He derived the idea from *hukkas* (smoking pipes) and wine jugs which were in common use at that time by the rulers of the states, the jagirdars and other rich persons. He prepared a semicircular pot of zinc with a narrow mouth, covered it with cloth, supplied it with a tumbler and gave it the name of *badla*, signifying a cloud containing water. In course of time, the water pot, thus prepared, was designed into various convenient and suitable forms and the articles so prepared acquired the name of badla, *surahi* and kettle, according to the shape in which they were made and came to be known collectively as badlas. A small seedling, thus planted in the middle of the 19th century, has now grown into a full grown tree and has come to occupy a place of pride amongst the group of traditional cottage industries of Jodhpur. The study of this craft was undertaken because it is of special importance to the arid zone of Rajasthan and has become famous throughout the country for its serviceability and beauty.

4. It is said that the original inventors of badla were the *thatheras* of Kuchaman, an ancient town of Marwar, situated at a distance of about 144 kms. from Jodhpur. Badlas of Kuchaman were famous for more than a century, but it appears, that the expert *thatheras* in this art shifted from Kuchaman to Jodhpur as it offered them more attractive terms and a wider field for their craft.

5. There have been a few important factors which were responsible for the growth of this industry. The first and foremost is the acute

scarcity of water and difficulties of travel in Rajasthan, specially in the north-west part of it, which necessitates the possession of a water carrier. Conditions there, even now, are not much better than what they were more than a century ago. Apart from the zinc bottles being superior to the leather buckets and clay pots, another circumstance which has favoured the badla of Jodhpur is that in the ayurvedic system of medicine, zinc is considered to be associated with medical properties. Association of water with zinc is considered to be helpful in the treatment of eye-diseases, urinal disorders and asthma. It is also considered to be a tonic useful in skin diseases. Physicians have prescribed preparations of this metal in chronic fevers, secondary syphilis, gonorrhoea, leucorrhoea, spermatorrhoea etc. Zinc ointments are applied in cases of ulcers and superficial inflamations. Water contained in the zinc-made badla is, therefore, supposed to derive all the benefits mentioned above.

6. Jawahar Lal Kansara, the great grandson of the technician Chaturbhuj referred to above, is now the proprietor of the firm Jodhpur Zinc Metal Works which are by far the biggest manufacturers of badla there. The firm was established in the year 1933. Before the establishment of the firm, badlas were not common in use as they were costly. They were used by the rulers, the aristocrats and the rich persons who only could afford to pay the high price at which they were then sold. The badlas in those days used to be decorated with gold and silver and consequently very high prices had to be paid for these articles. Gradually, however, the factors which made the articles costly were eliminated and simpler and cheaper types came into existence; and the badlas became so economical that people even of very ordinary means could afford to have them.

7. Notwithstanding the fact that the process of manufacture of the badla is not a very complicated one and an intelligent and experienced worker with the requisite experience of the craft can manufacture good badla, the craft is altogether confined to Jodhpur. This is mainly due to the fact that this industry has arrived at the stage of marginal utility through the keen competition of the local manufacturers. They have specialised in the art and there is not much scope now for making big profits in it if the industry were started elsewhere. The skilled labour required for manufacturing the articles is available only in Jodhpur at present.

CHAPTER II

THE CRAFT AND THE CRAFTSMEN

Prior to the year 1931, i. e., before the establishment of Jodhpur Zinc Metal Works, badla used to be manufactured by a limited number of *kansaras* at their houses. Manufacture of badla was then a household industry. Only a limited number of these articles was prepared to meet the demands of the rulers, the jagirdars and the rich people who desired them to be decorated with gold and silver.

9. The establishment of Jodhpur Zinc Metal Works, however, is a landmark in the history of the badla industry. Henceforth the articles began to be manufactured not only to suit the requirements of the aristocracy, but also to meet the demand of the general public.

10. Badlas are now manufactured by the following firms in Jodhpur :

1. Jodhpur Zinc Metal Works;
2. Aryan Zinc Metals;
3. Parihar Stores;
4. Devilal Pokardas;
5. P. N. Kansara;
6. Gulab Chand Ram Narain; and
7. Narainsingh Zinc Metal Works.

Most of the work is, however, done by Jodhpur Zinc Metal Works. Their production is more than twice of the rest of the firms combined. The firm has standardised its products and fixed separate prices for different models. It also issues a monthly price list of the articles prepared by it.

11. About fifty families of artisans are engaged by these firms for manufacture of the badla. Formerly when badlas were decorated with gold and silver, the persons engaged in the artistic decoration were known as *kansaras* while those engaged in the beating of the metal and other rough and hard work were known as *thatheras*. There was, however, no distinction in the castes of these two classes of workers. As a matter of fact they belonged to the same community. The former difference of rank no longer continues and both the classes are designated by the common name of *kansaras*. The following extract will be of interest in this connection :

> "The *kansaras* work in brass, copper and other metals with the exception of iron and tin.
>
> Like other artisans, the *kansaras* claim descent from the Rajputs. Sir Henry Elloit calls them *kasbhara* from *kasa* (bell metal), *bharna* (to fill) and describes them as forming one of the sub-divisions of the *sunars*. In Marwar they follow most of the customs of the Bamania sunars.
>
> Properly speaking, the *kansaras* are workers in *kasa*. Those working in brass are called *thatheras*, whereas those employed in smelting metals or casting moulds for vessels are known as *bharawas*. They do not, however, form distinct castes in Marwar, but all belong to the same class and intermarry with each other.....In the Punjab, as well as in Benaras, they are stated to be living entirely apart, not intermarrying with each other. According to Mr. Ibbetson, 'The *thathera* is the man who sells, as the *kasera* is the man who makes vessels of copper, brass and other mixed metals'. The Revd. Mr. Sherring says, '*thatheras* are distinct from the *kaseras* although to some extent they labour in the same metals. Yet their work is of a heavier and rougher cast and embraces iron, tin and zinc as well as brass, copper and *kasa*. They also carve the vessels manufactured by the *kaseras*'. 'The Bharawa caste' he further says, 'is especially engaged in the occupation of preparing moulds of various shapes and kinds for casting vessels.'

The Revd. Mr. Sherring describes them as occoupying a high position, even holding a place above *vaishya* or the commercial caste, but that is not the case in Marwar, where they rank at par with the artisan castes "*

12. With the passage of three quarters of a century, since the above observations were made, there does not appear to have been any significant change in the status of *kansaras.*

13. Gradually persons from some other castes, i. e., Sonies, Brahmins, Kumhars from Hindus and a Muslim household have also engaged themselves in this work. The following table gives the number of households and persons of each caste who are engaged in badla industry at the moment :

Name of the Community	No. of Households	Persons	Males	Females
1. Kansaras	24	134	75	59
2. Sonies	15	54	29	25
3. Brahmins	11	60	32	28
4. Kumhars	1	4	3	1
5. Muslims	1	8	4	4
Total	52	260	143	117

Out of the total population of 260 souls from the 52 households mentioned above, the actual workers employed in the industry are given below according to age groups :

Age group	Persons	Males	Females
0 - 14	-	-	-
15 - 34	14	9	5
35 - 59	41	38	3
60 and above	7	6	1
Total	62	53	9

The badla craft is no longer a household industry. The craft has now been taken up by the firms, the list of which has already been given. The firms run it as a cottage industry. The *kansaras* no longer make the badla at their homes.

*Census of India 1819-Castes of Marwar, Pages 147-148

Place of Work and Working Conditions

14. Working conditions of an industry go a long way in determining the quality and quantity of the articles produced by the industry concerned. They also, to a great extent, serve as an index of the prosperity or backwardness of the firm or the unit concerned. Badla industry, though not carried on scientific lines existing in large scale industries, has fairly good working conditions.

15. The factories, though situated in the heart of the city, have got enough enclosed open space which does not create any sanitary problems. They are served with pucca drainage system and provided with clean lavatories. Ventilation is satisfactory. The working places are covered with galvanised iron sheets and provided with *jaffaris* (bamboo net works) which allow free passage of fresh air. Doors and windows allow cross-ventilation. Lighting arrangement is also good. There is enough of natural light. The factories are also provided with electricity.

16. Excepting the Jodhpur Metal Works, there is not much space in the factories, and the result is that there is congestion. Free movement of workers is hampered. More space is, therefore, required to enable the workers to carry on their work smoothly.

17. Efforts are required to be made to improve the working conditions, for example, separate arrangement for workshops, different places for storing the raw materials and finished products and proper accommodation for displaying the finished articles.

Economic Conditions of the Workers

18. Labour is the most important factor in a small scale industry like the badla. Its efficiency is affected by the remuneration it receives. The prosperity and advancement of an industry can very well be judged from the rate of wages which the workers engaged in it are paid.

19. In badla industry, both work-charge and time-wage methods of wage payment are

prevalent. Almost all the workers are engaged on time-wage system with the exception of the female workers who perform the function of dressing the badla with cotton and woollen material.

20. The following table gives the average earnings of different kinds of workers engaged in the industry:

Category of Workers	Daily Wages (in Rs.)
1. Cutter	2.50
2. Body maker	3.50
3. Parts maker	5.50
4. Solderer	3.50
5. Dresser	3.25
6. Decorator	3.25
7. Female worker	2.50

21. The earnings of the female workers, engaged on work-charge system, differ according to the work done by them which depends upon the time which they are able to spare from the household duties they have to perform. They are paid 10 to 30 paise per piece. A housewife can finish 20 to 25 pieces per day and her income comes, as already stated in the above table, to Rs. 2.50 per day.

22. The workers of the firms are granted weekly holidays with pay. Apart from these, any furlough can be availed of but without pay. In the same way there is no concession for granting them leave with pay for festivals or when sick.

23. Workers engaged in badla industry are not addicted to bad habits like smoking and drinking. The social habits and customs, such as those observed on occasions of marriage and death, however, involve them in expenditure which is nothing short of extravagance.

24. The workers engaged in the industry are permanent local inhabitants. They have got their own houses.

25. On the whole, the economic condition of the workers employed in the badla industry appears to be fairly satisfactory. They are better off than their fellow workers in other industries. Fairly good wages, possession of their own residential houses and their simple living habits go a long way in keeping them happy and contented.

CHAPTER III

RAW MATERIALS, TOOLS AND IMPLEMENTS

Raw Materials

The following raw materials are required by this industry:

Zinc Ingots and Sheets: Zinc ingots are processed into zinc sheets and these are used in preparing the body of the badla. The firms get zinc from Delhi and Rewari in addition to the bulk they secure from Bombay. The metal is imported from foreign countries, i. e., the U.S.A., Burma, Australia and the U.S.S.R. In India, zinc is mined in limited quantity only at the Zawar Mines in Udaipur district of Rajasthan. The State Industries Department also supplies the quota of zinc for this industry through the State Trading Corporation of India. But the demand of the firms is not fully met from this quota and they have to get their requirements from the open market. About a decade ago the ingots used to be heated and beaten with hammers by the workers themselves for preparing the sheets. Now the firms get the ingots processed into sheets by the rolling mills at Jodhpur, Nagaur, Pali and Jalor. About eight tons of zinc is annually consumed by the badla industry.

Copper Slabs : Copper is mixed with zinc to prepare brass sheets of the required lustre to suit the purpose of the industry. They are purchased from the local market and also obtained from Bombay. They are used in the preparation of accessories of badla such as stands, taps and corks.

German Silver Sheets: The firms purchase them from Bombay in the required form and size. They are used for decoration purposes, i.e., for the inscribed plates, mouths for ice-chamber and other ornamental accessories and also used for stands, handles, tumblers, rings etc.

Felt (*Namada*) and Cotton Cloth: Felt and cotton cloth are used for covering the badla. The badla covered with cotton or felt, when kept wet, keeps the temperature of the water low and renders it cool for drinking.

Broad Cotton Tape (*Niwar*): It is used for preparing cotton belts for carrying the badla.

Cotton Drapes: These multicoloured narrow strips are fastened round the body of badla over the woollen or cotton cover. They serve double purpose, i.e., they fix the covers on the body at the required place and add beauty to the article.

Soldering Materials

27. Chloride of ammonia and hydro-chloric acid are used for cleansing the portions to be soldered; and borax powder (*Sohaga*) is used for fixing the tin slabs for soldering.

Polishing and Metal Chemicals

28. Various chemicals and salts are used in polishing and working and processing of the metals. A few of them are given below :

Sulphates: Chromium, nickel, copper and zinc sulphates are used for polishing. These are salts of chromium, nickel, copper and zinc with sulphuric acid.

Cyanides : Sodium and potassium cyanides are mostly used in electroplating and polishing. They are salts of these metals with hydro-cyanic acid. They are the deadliest poisons and are handled very carefully.

29. The article to be electroplated is first thoroughly cleansed of dirt, oil and grease. This is done by washing it with a diluted solution of acid. It is then made the negative pole or *cathode* of the battery or dynamo of the electric bath. The solution (electrolyte) contains the precious metal such as gold or silver as the metallic base. Generally double cyanide, i.e., the cyanide of the



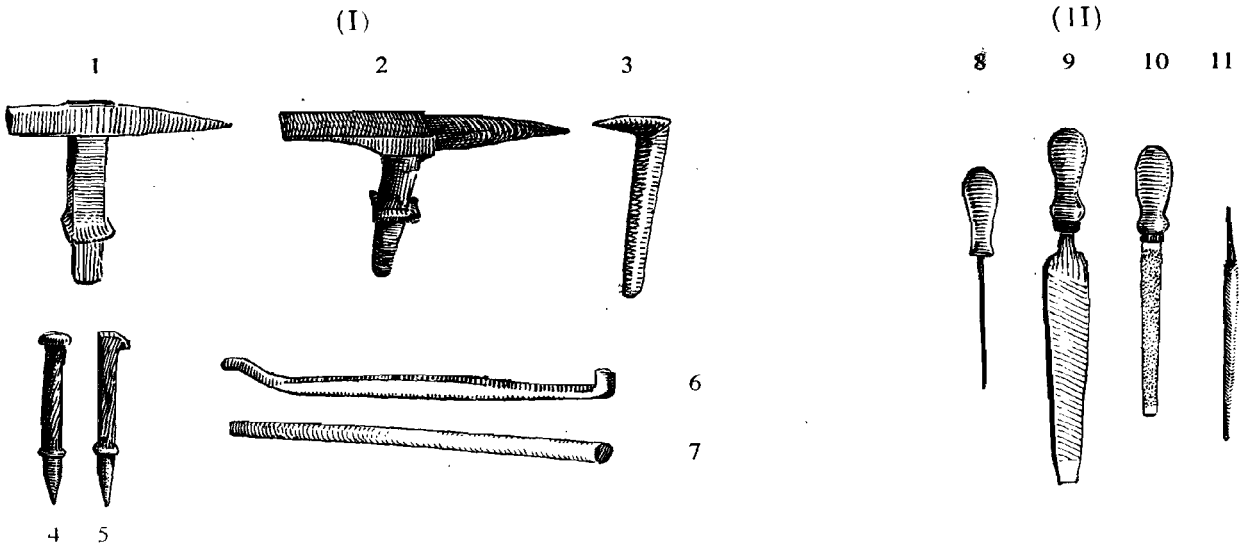
An outer view of the workshop



The basic raw materials—Zinc and Copper

Zinc ingots made by Australian Metal Company. Below the ingots is a flattened zinc sheet, prepared by beating a *gulli* (three shown in the foreground) which is made of the zinc ingots. In the back ground are the brass sheets. Lying on the left side are copper slabs.

SOME TOCLS AND IMPLEMENTS

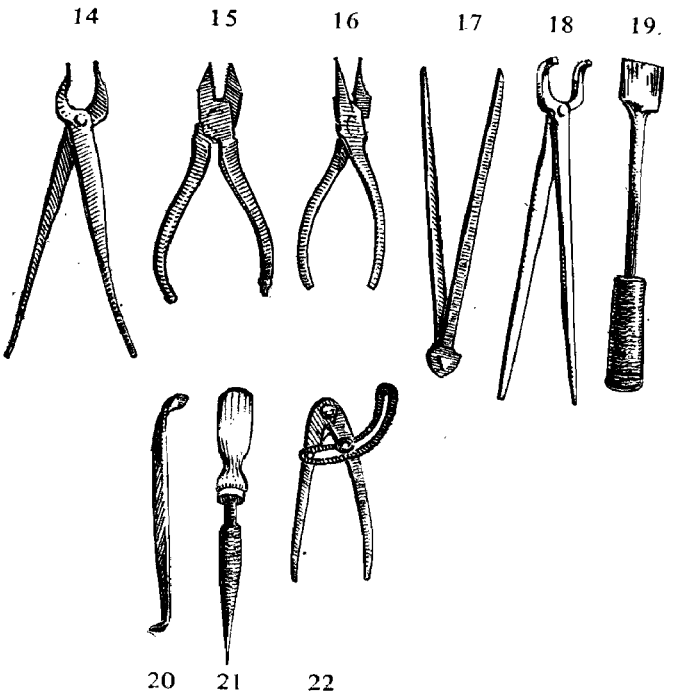


I
1. Gattedar Iklai
2. Chhajedar Iklai
3. Nalwali Iklai
4. Gol Mukh ki Mekh
5. Dadhiwali Mekh
6. Takara or Aga Khara
7. Gol Mukh wala Khara

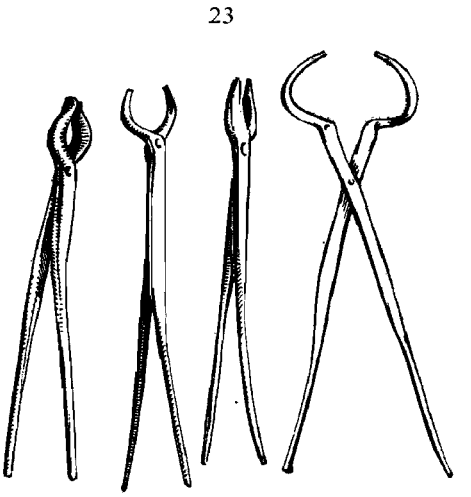
II
8. Chhoti Reti
9. Flat Reti
10. Gol Reti
11. Tikora

III
12. Takla (Punches for making holes)
13. Chhini (chisels)

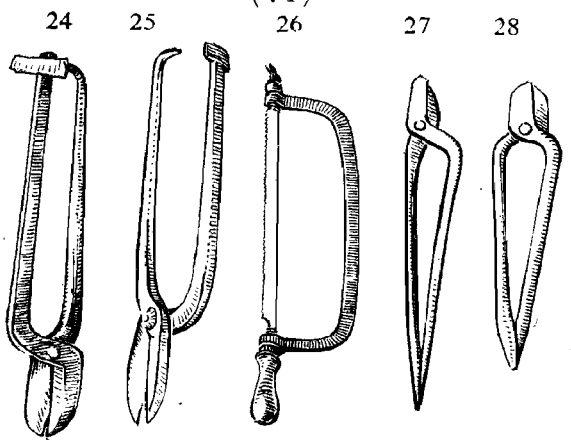
(IV)



(V)



(VI)



IV
- 14. Sandasi
- 15. Jamura
- 16. Chugga
- 17. Ajola
- 18. Khadi Nok ki Sandasi
- 19. Kaya
- 20. Len
- 21. Tirpan
- 22. Napwala Ajola

V
- 23. Various Types of Sandasi

VI
- 24. Kat
- 25. Nokdar Kat
- 26. Aari
- 27. Nokdar Katia
- 28. Bandu Katia

metallic base and potassium are used. It forms an excellent depositing solution. As the electrolysis takes place the metal of the solution is consumed; and, to make up this loss, the *anode* (which is made of the metal with which the article is to be electroplated) goes into solution. For example, when an article is to be gilded by electroplating with gold it has to be made the *cathode* and the *anode* in that case is of pure gold and the solution is prepared from gold salt. The same remarks apply to electroplating with another metal. When electroplating is done care has to be taken that the current which passes through the solution is of uniform strength, for the deposit becomes brittle if the strength of the current differs. The strength of current for depositing different metals varies according to the metal which is used for electroplating.

30. These chemicals are bought from Messrs. W. Canning and Co. Ltd. of Birmingham, U. K., Messrs. S. Mitra and Messrs. Mathura Dass from Bombay and Messrs. Shanker & Co. of Delhi.

31. In addition to the above materials, gold and silver are also used for decoration in artistic designs when costly badlas are in demand. In some of the badlas, silver has been used for decoration to the extent of 150 tolas per piece.

Tools and Implements

32. The following tools and implements are used by the industry :

Lathe: This is the main tool of the industry. Lathes are used for boring, drilling, turning, placing and threading the articles. They are obtained from Hindustan Machine Tools at Jalahalli in Mysore State.

Hammers (*Hathora*) : They range between 1/8th of a lb. to 20 lbs. but the most common sizes being used are 1/8th, 1/4th, 1/2 and 1 lb. They differ in shape due to the difference of their panes, such as, cross-pane, straight-pane and sledge-pane. They are used in moulding the zinc and brass sheets in desired shapes and serve the purpose of finishing and cutting holes therein with the help of chisels and punches.

Punches (*Takla*) : They are made of steel sheets. Three types of punches are used, i. e., solid punches for cutting small holes, hollow punches for cutting larger holes and the rod punches for removing any residue out of the holes.

Chisels (*Chhini*) : They are made of steel of hexagonal shape and the popular size is 8" long. Chisels are used for cutting sheets, pipes and tubes. The different varieties of chisels are flat chisel, cross-cut chisel, round-nosed chisel and diamond pointed chisel with their edges ranging between 1 to 3 cms. according to the requirements.

Files (*Reti*) : Two types of files are used-flat and round-for scraping the surfaces of the metal sheets. They vary in sizes according to requirements. The popular sizes are 15, 20, 30 and 45 cms.

Anvil (*Iklai*) : It is made of wrought iron with the upper surface made of carbon steel. It is 55 cms. above the floor level and used for flattening and turning the metal sheets into proper shapes.

Tongs (*Sandasi* or *Tanpala*) : They are of 6 to 8 varieties of different shapes and are used for holding the articles in a particular position while beating or heating.

Pliers (*Chugga* or *Jamura*) : They are used for holding small articles or cutting their thin edges. Wires are also cut with them. Their noses are usually round or long type.

Clippers or Scissors (*Katiya* or *Kat*) : They are of different sizes and are used for cutting the metal sheets.

Stakes (*Kusia*) : They are used for giving the plates the desired shapes and are of the following types :

(1) Hatchet Stake (*Chajedar Kusia*) : It is used for shaping the plates;

(2) Funnel Stake (*Khatra*) : It is used for folding cover parts of articles;

(3) Grooving Stake (*Nalwala Kusia*) : It is used for converting the flat sheets into round tubes and pipes;

(4) Anvil Stake (*Gaddedar Kusia*) : It is used for smoothing the surface of the sheets.

Soldering Iron (*Kaya*) : It is a pointed metal tool used for melting and applying the tin slabs with the borax powder in the process of soldering. It is heated in the furnace.

Dividers and Callipers (*Ajola*, *Sada* and *Napwala*) : These are instruments used for measuring the girth, diameter and thickness of the articles.

Coal Furnace (*Bhatti*) : It plays an important role in the manufacture of badla. All the accessories are processed in it and the soldering is also done in it. Coal is used as a fuel in the furnace.

33. In addition to the above mentioned tools and implements, crucibles, casts, moulds and patterns are also used in the industry.



Zinc plates are cut into required sizes



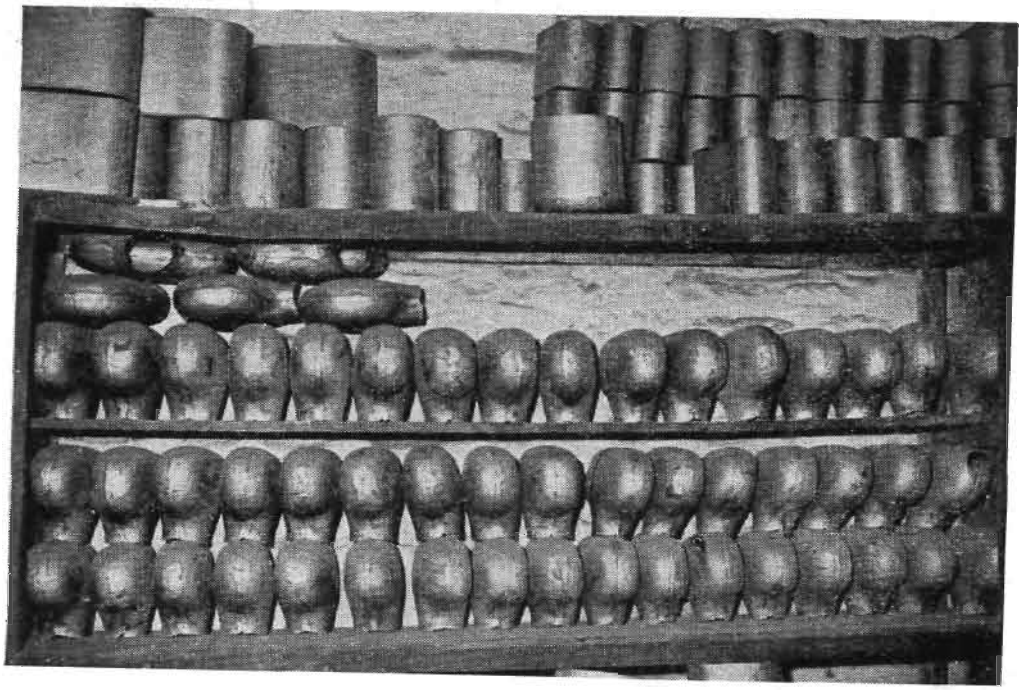
Plates are then beaten to the required shape



The process of soldering



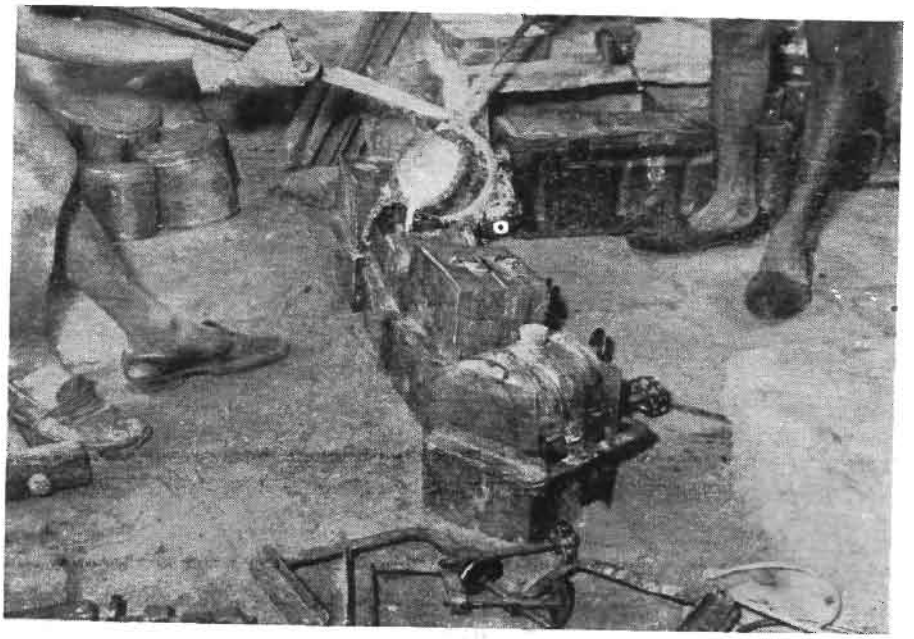
Checking up for any possible leakage



The main body of the Badla is now ready for further work, covering it with cotton or wool and fixing of other accessories



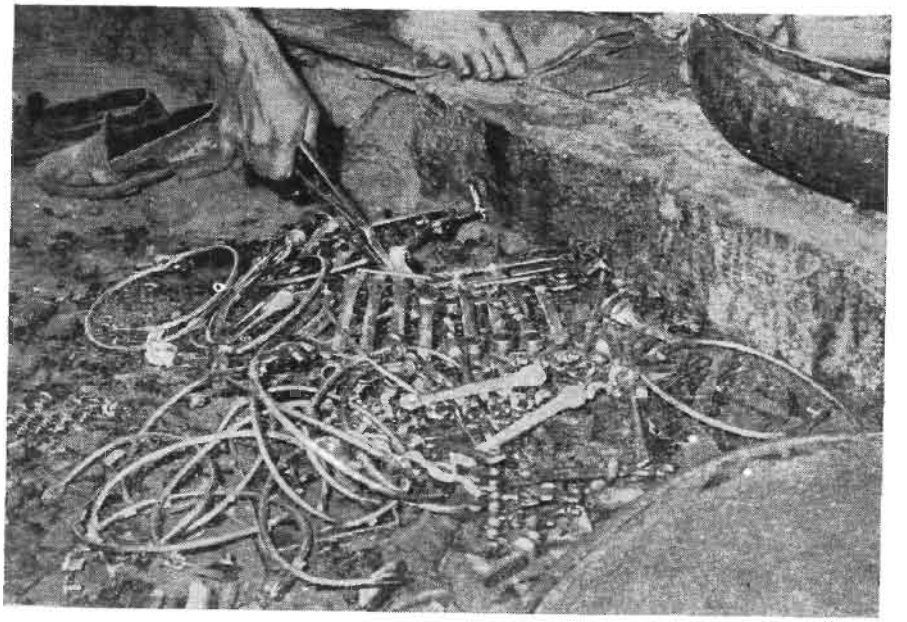
Preparing the earthen moulds
for casting the accessories



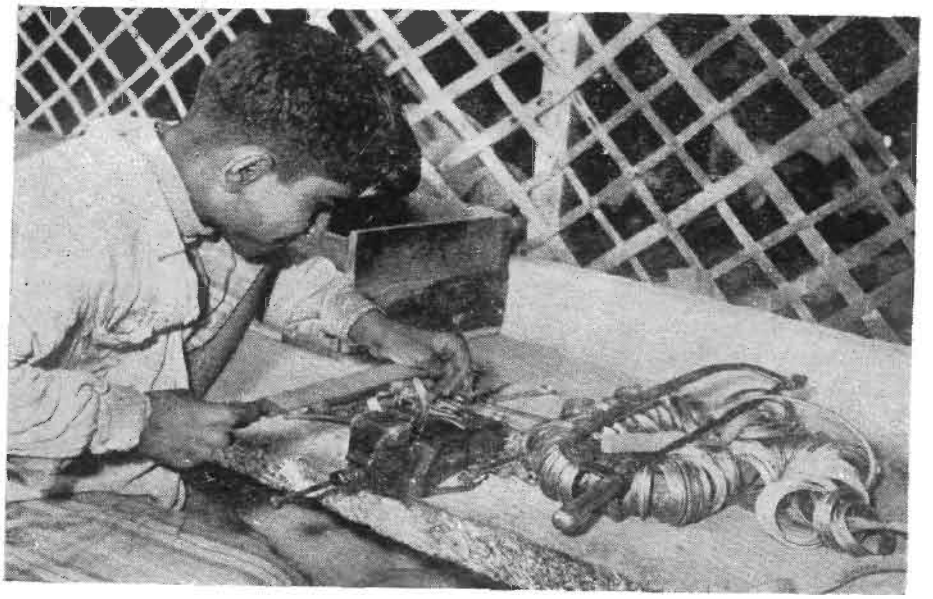
Molten metal is poured
in the moulds



Accessories are taken out of the moulds



An assortment of accessories



Filing to make accessories smooth



Makng of delicate decorative designing i over certain accessories.



Badlas are provided with cloth covering



Fixing of the accessories



The Badlas are ready for sale

CHAPTER IV

PROCESS OF PRODUCTION

The following is the process of the manufacture of badla, stage by stage:

I Stage

35. First of all, the craftsman cuts the zinc plates into the required sizes and shapes. Generally 22 semi circular shaped pieces are cut from a full sheet and two such pieces are required to complete a body of badla. These sheets are cut with the help of scissors. These plates are then beaten with the help of a hammer on the anvil to make them hollow in the middle for the required shape of the article. The waste cutting, left in this process, is used again for preparing the zinc sheets. In case of costly badla, appropriate accommodation is provided to house the ice chamber in the body.

II Stage

36. The two pieces are then soldered together. Soldering, as is well known, is the process of uniting two pieces of metal by the interposition of a metal or an alloy which, by fusion, combines with the metal. The solder has to be more fusible than the metals to be united and, therefore, the composition of the solder varies with the metals to be soldered. Flux has to be used to facilitate the fluidity of the solder. Usually the solder is composed of 60% tin and 40% lead. This melts at the temperature of 370°F.

37. The surface of the metal to be soldered is first cleaned thoroughly of dirt and grease by applying ammonia of chloride or hydrochloric acid. The joints to be soldered are placed together with care. Then the tool called soldering iron is placed in the furnace to be heated, and then plunged into flux to be applied to the joint to be soldered. If in the first attempt the soldering is not thoroughly cleaned the soldering iron may be used again to produce a good soldered joint. Ample care is exercised in soldering so as to prevent a leakage from the joint at a later stage. The body is then tested for leakage of water.

III Stage

38. Holes are made in the body for the tap and ice chamber and in the bottom for the nuts and bolts. Simultaneously, the various accessories e.g., handles, stands, self-closing taps and the rings, which are fitted in the mouth of badla, and some parts which are used purely for decorative purposes are prepared in another section of the workshop. For this purpose clay moulds are used. Molten metal is poured into the mould and after some time when the metal is set thoroughly the parts thus made are taken out of the mould and kept in cold water. They are then filed and polished. Some of these parts are only for decorative purposes and require further work by expert craftsmen who, by means of a chisel and a hammer, make delicate designs over such accessories.

IV Stage

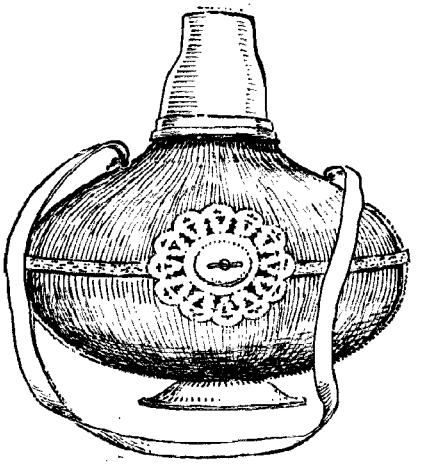
39. The body is then covered with a cotton or woollen cloth. This work is done both by male and female workers. Numerous coloured tapes are arranged systematically on the cover that add to the beauty of the article. In some costly designs superior quality of wool is wrapped around the body which is decorated with thin engraved metal strips. Apart from decoration it serves the purpose of fastening and keeping the cover in its place. In both these cases the covers are stitched with threads. These threads do not appear on the surface. In the case of *surahi*, however, which is round in

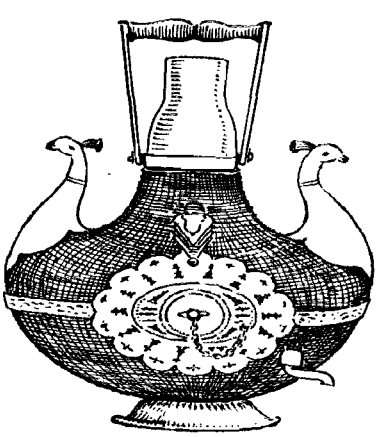
shape, the body is covered with one piece of felt or cotton cloth which is exactly fitted on the body and lasts long as there is no joint.

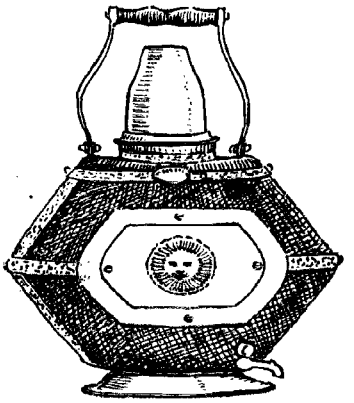
V Stage

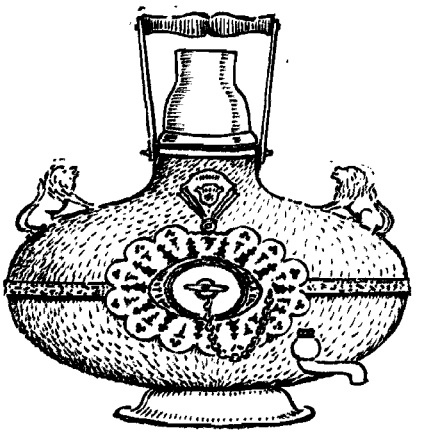
40. A metal stand is fixed at the bottom of the badla with the help of nuts and bolts. Sometimes it is soldered with tin solder In costly badla a brass self-closing stopcock and a tumbler are also fitted. There is a metal ring at the mouth of the badla. The threads of this ring ensure safety against leakage of water as the lid is fixed tightly therein. The tumbler can be fixed both inside as well as over the mouth of the badla. In order to provide proper and convenient handling a cotton belt is fixed around the badla so that it can be carried in hand or on shoulder. In some costly badlas a nickel-plated handle is fixed on the mouth which serves as a substitute for cotton belt. Artistic covers for the mouth of the ice chamber are also fixed at this stage. In the case of badla an artistic metal plate, usually cantaining designs of flowers, is fixed in the centre of the body. In costly articles designs like a pair of peacocks or a pair of lions are affixed on either shoulders of the badla with a view to enhance its beauty.

41. The process of manufacturing the kettle is quite similar to that of the traditional badla and the only difference lies in their shapes; whereas the badla is approximately semicircular in shape, the kettle is rectangular. The process is also more or less the same in case of *surahi* which is round in shape. The difference lies in the shape and capacity for water. An average badla can store 8 lbs. of water while a *surahi* can contain any quantity upto 20 lbs. In *surahi* a metal stand is provided as a substitute for the cotton belt. Wine jug is also rectangular in shape like kettle but it carries two tumblers instead of one.

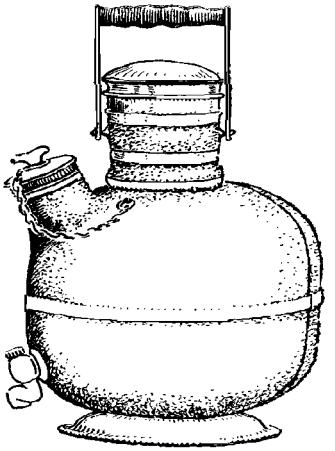


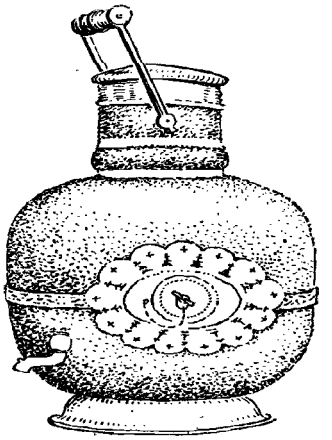


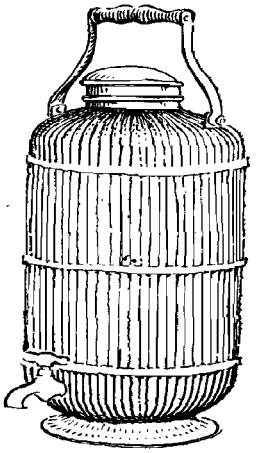




The badlas are available with cotton and woollen covers, having either movable handle or strong shoulder strap, usually having 8 lb. standard capacity. The improved varieties have ice-chambers, taps and stands. Costly models have decorations like a pair of peacocks or lions.

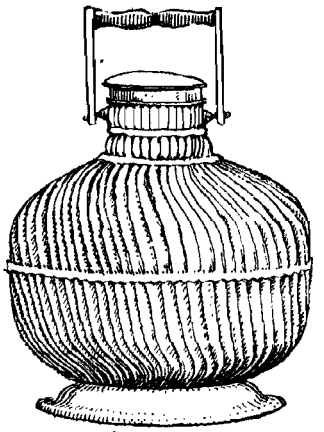


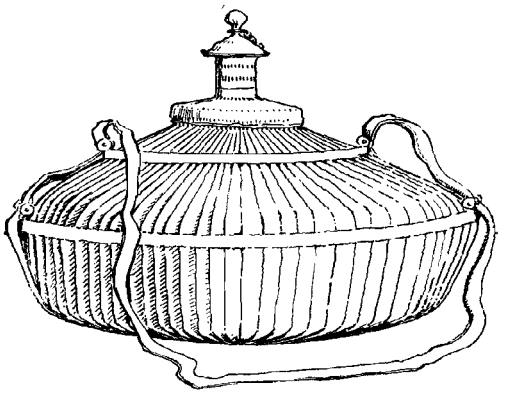


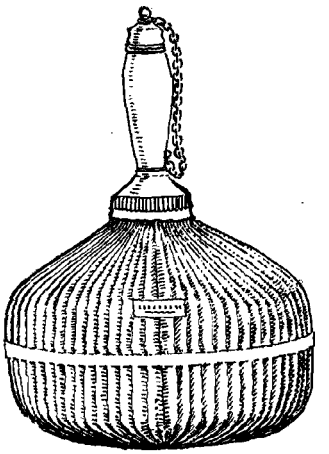




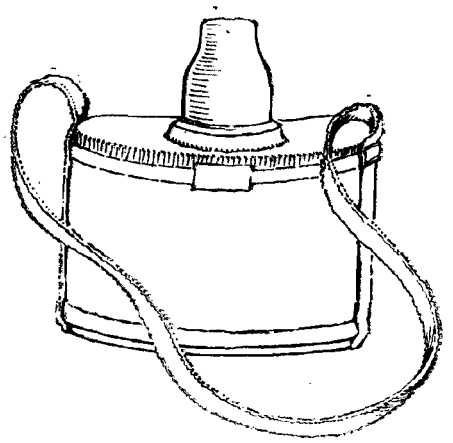
Surahis are meant for family travel or excursion parties as they have large capacity ranging from 15 to 20 lbs. Improved varieties have ice-chambers, taps and stands. Ice pockets in these surahis are large and it is necessary that the mouths of the pocket and the surahi should be tightly closed and the cover remain dry to keep the water cool.

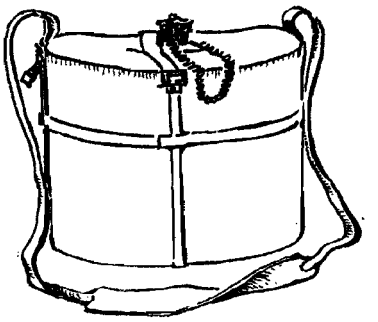


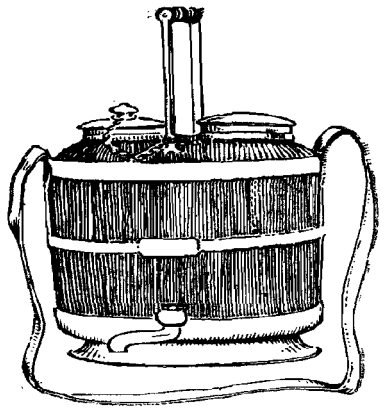




Some surahis have very small mouths and the ring provided at the mouth is required to be unscrewed at the time of filling the water.









Kettles are the cheapest varieties of the badlas. The inferior types have a covering of pressed *namada* and an adjustable shoulder strap. These are generally used by police and military personnel as they are handy and are available in 2 lb. standard capacity. The superior varieties are fitted with ice-chambers, taps and stands. Recently a special design has been introduced wherein the ice-chamber is fitted in such a manner that it can be removed and refitted easily. The ice-chamber is very spacious and can accommodate a bottle of liquor along with ice.

CHAPTER V

DESIGNS AND ARTISTIC BEAUTY OF FINISHED ARTICLES

Designs of articles are determined by the skilled craftsmen who are employed by the firms. The designs are made according to the demands of the consumers. The artisans watch the market closely and note the preferences of the users. The mouth of *surahi* was formerly very narrow. This caused inconvenience in filling water in it and cleaning it from inside. This led to the widening of its mouth. Similarly, the original articles were not provided either with taps or the ice chambers. These are of later origin.

43. Badlas were originally prepared for travellers on camel or horse back. They can also be conveniently used by the railway passengers. Being covered with cotton cloth or felt they keep water cool to a remarkable degree. An average badla costs from Rs. 10 to Rs. 20, but the price increases according to the size and the number of accessories and the decorations on it and in that case the cost may go upto Rs. 100. In costly badla an ice chamber, which can contain half a pound to one pound of ice, is fitted. This helps in keeping water cool for 4 to 6 hours. A brass tap is fixed at the bottom of badla to facilitate taking of water from it. A cotton belt or wooden handle or both are fixed to the badla. In all, about 10 designs of *surahi* are available, prices of which range between Rs. 12 to Rs. 35. Some 8 to 10 varieties of kettles are available, the prices of which range between Rs. 4 to Rs. 20. They are more in demand by the Police Department. Wine jugs are like kettle. They are priced from Rs. 10 to Rs. 25.

44. Badla is an embodiment of perfect workmanship, durability and beauty of designs prepared by master craftsmen in a marvellous artistic manner covered with cloth of maroon or orange colour with variegated, enamelled brass peacock feathers or a pair of brass lions. A badla is a coveted prize or an article of present. It is on account of their beauty, utility and durability as well as the reasonableness of price that the badla and *surahi* are in great demand; some of them have reached even the foreign countries notably Ceylon, Japan, the U.K., the U.S.A., and the U.S.S.R.

CHAPTER VI

FINANCE AND MARKETING

The capital required for the industry is provided by the owners of the firms who deal in this craft. Some of them obtain loans from the Department of Commerce and Industries of the Rajasthan Government at concessional rates of interest but the terms of repayment prove to be rigorous. The total amount has to be repaid in seven annual instalments. The first instalment commences after two years of advancement of the loan. The manufacturers, however, have not utilised this source of finance to any great extent.

46. It is estimated that the raw materials, the interest on capital and the rent consume upto 55% of the total cost, 25% goes towards wages and the remaining 20% is the profit of the industry.

47. Some 25,000 items are annualy produced by the firms employed in this industry. The total amount of sales aggregates Rs. 367,000 as detailed in the table given below:

Name of the Producer	Production in Rupees (,00) 1958	1959	1960	1961
1. Jodhpur Zinc Metal Works	2,020	2,300	2,500	2,600
2. Aryan Zinc Products	320	325	330	370
3. Parihar Stores	155	150	154	175
4. Devilal Pokhar Dass	160	175	180	210
5. P. N. Kansara	100	105	120	130
6. Gulab Chand Ram Narain	85	80	65	75
7. Narsingh Zinc Metal Works	88	90	95	110
Total	2,928	3,225	3,444	3,670

48. About one third of the produce is sold in the local market by various shop keepers. The Aryan Zinc Products has opened a stall at Jodhpur railway station which helps in the advertisement of and popularising the badla.

49. The Government emporia at Jaipur, Mt. Abu and Delhi are doing their bit in displaying the articles and putting them on sale. They are also displayed and sold in the various important towns of the country specially at the time of exhibitions. The total sales through the emporia in the year 1961 amounted to Rs. 25,000.

50. Badlas are exported by the firms to the U.S.S.R., the U.S.A., Middle East, the U.K., Ceylon and Hongkong. There is a great demand for them in the Middle East, Africa, Persian Gulf countries and Japan. A stage has come when the industry is not able to cope with the demand. The annual exports range between Rs. 30,000 to Rs. 35,000. The Jodhpur Zinc and Metal Works employ travelling agents to advertise and popularise their products. The following table gives the percentage of sales of badlas at the various marketing centres :

Marketing Centre	Percentage of Total Sales
1. Local (Jodhpur city)	35
2 Rajasthan (excluding Jodhpur city)	15
3. Chief centres in India (Bombay, Calcutta etc)	40
4. Foreign countries	10
Total	100

CHAPTER VII

PROBLEMS OF THE INDUSTRY AND ITS FUTURE

Procurement of Raw Materials

So far as the procurement of raw materials is concerned the industry faces difficulty in getting zinc sheets according to the quota alloted to it through the State Government. The manufacturers complain that the quota allotted to them is neither sufficient nor made available in time. Moreover, the routine procedure of supply takes so long that the patience of the manufacturers is exhausted. They have, therefore, to pay higher price in the open market for the material which raises the cost of production. Other raw materials are utilised in limited quantities and the problem of their supply is not so acute. They are obtained from the open market.

Training of Artisans

52. There is no fixed course for training of badla makers. New workers are recruited on the recommendation of the artisans already working for the proprietors of the firms. The apprentices are not paid any wages till they pick up some work. Usually it takes about six months for a beginner to acquire necessary rudiments of the craft. Then a nominal stipend is given by way of pocket-money. After this, emoluments depend upon the ability of the worker to learn the specialised technique of the craft. It takes some five years for an apprentice to become a skilled worker. The recruitment and training of artisans require proper standardisation.

Designs

53. The master craftsmen introduce changes in designs to attract the public demand and to make the articles more beautiful, serviceable and economical. The system of designing should be based on a more rational basis.

Finance

54. The scope of the industry could be extended if adequate financial help is made available to it on easy terms. The manufacturers find the existing rules and conditions prescribed by the Government of Rajasthan to be quite stringent and irksome.

Standardisation

55. The leading firms dealing in the industry have tried to standardise the quality and prices of the articles manufactured by them and on the whole they appear to be reasonable. But looking to the exigencies of the extending market, which includes foreign countries as well, it would be expedient to further standardise the quality and prices by a quality marking scheme through the agency of the State Industries Department as is practised in regard to some other industries such as handloom cloth, brasswares etc.

Publicity

56. Publicity is already given to the products of this industry through cinema slides, participation in exhibitions and show of the finished articles at the State emporia. The leading firms issue periodical price-lists and illustrated catalogues. A concerted action, however, on the part of the manufacturers assisted by the State Government for a publicity drive in other States and foreign countries is necessary.

Future

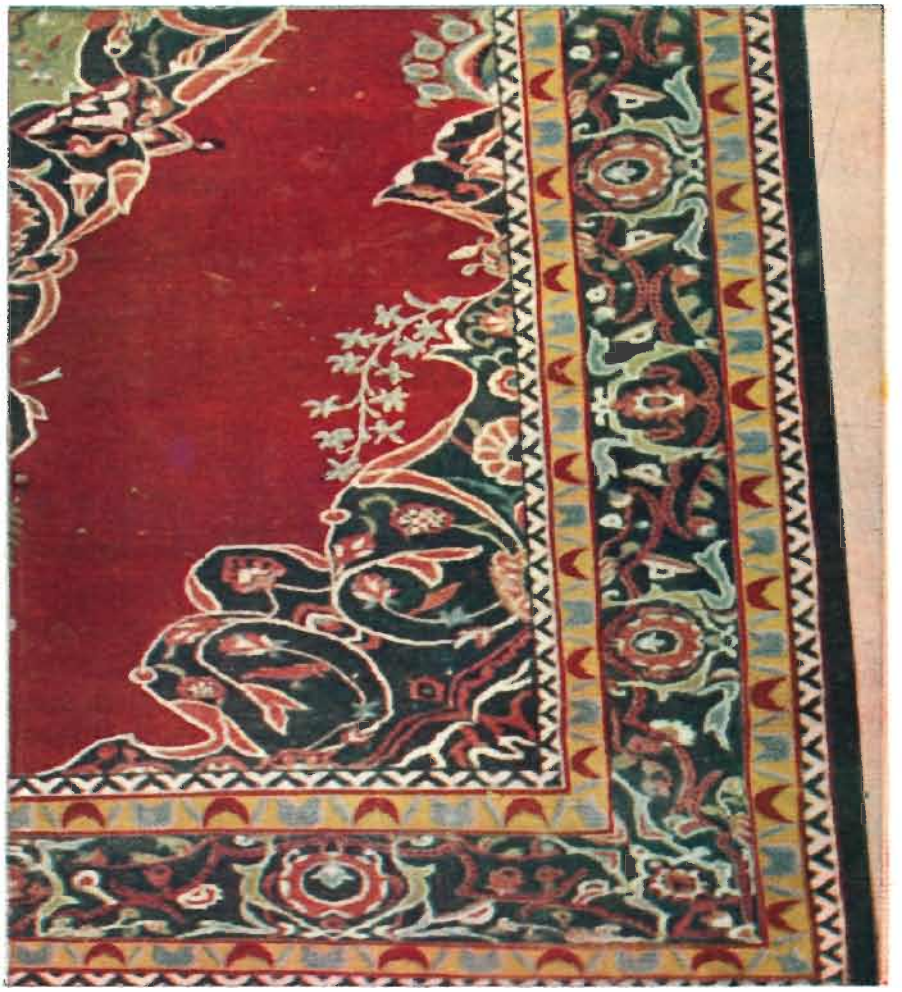
57. The future of the industry is no doubt very bright. Badlas which have both artistic beauty and utility are bound to appeal to refined taste, and in the words of Chevaliar Ramsey "We content ourselves to present to thinking minds the original seeds from whence spring vast fields of new thought, that may be further cultivated, beautified and enlarged."

APPENDIX

List of the skilled workers

1.	Shri Bhagatram	(50)	S/o	Ganeshdass
2.	Shri Nathuram	(50)	S/o	Ramdass
3.	Shri Chandmal	(35)	S/o	Gulabchand
4.	Shri Nanuram	(40)	S/o	Naraindass
5.	Shri Lalchand	(25)	S/o	Mohanlal
6.	Shri Daumal	(60)	S/o	Bhoorchand
7.	Shri Ramgopal	(40)	S/o	Bachraj
8.	Shri Kesrimal	(65)	S/o	Rajmal
9.	Shri Chauthmal	(55)	S/o	Ramswaroop
10.	Shri Shyamji	(65)	S/o	Raghunath
11.	Shri Shanker	(70)	S/o	Ramswaroop

CARPET INDUSTRY
OF
JAIPUR



A corner of a richly designed carpet

CHAPTER I

INTRODUCTION AND HISTORICAL BACKGROUND

THE primitive man passed his life under great hardships and, to ameliorate his condition, has been continuously making efforts to make his life worth living in ease and comfort ever since. In the primitive stages, when he was living in caves like other lower animals, he was making use of leaves and grasses as his bedding and furs and skins of animals his only clothes to cover his body against the rigours of weather. Further ceaseless efforts on his part enabled him to make use of barks and fibres of different trees and plants to add to his comforts and also gave him impetus to explore further possibilities of making his life still more comfortable. With the passage of time, he learnt the art of weaving and produced yarn out of cotton and wool to provide himself with better and more convenient garments. The beautiful carpets and rugs that we see today and make use of are the results of his industry and skill.

2. Writers differ on the question as to when the earliest pile-carpets originated. Sir George Birdwood, in his book 'Oriental Carpets', assigns it an ancient origin as early as 5,000 B. C. during the period of Greek civilisation. Nothing can be said with certainty about this period but we can safely say that carpet-weaving originated in south-west Asia in the remote past. The earliest specimens of pile or knotted carpets now known to exist, may be taken as a starting point beyond which it is not necessary to pursue enquiries in detail.

3. The earliest pile-carpets known are the three pieces preserved in the mosque of Ala-ed-Din at Konieh (Iconium) in Asia Minor. They are archaic in design, and, it seems probable, that they were made in the early part of the 13th century-the date of the completion of the mosque. The historical importance of these carpets is considerable; yet they stand almost alone, and we must look at mediaeval paintings if we wish to gain a comprehensive idea of what early pile-carpets were like.*

4. Carpets are represented in the European paintings as early as the 14th century. The colours of these carpets are bright. The designs are of a floral and geometric style with a fondness of interlaced ornamentation. There is an interesting illustration in the National Gallery in a painting representing the betrothal of the Virgin. The pattern shows birds in square compartments alternatively in yellow on a red ground and red on a yellow ground.$

5. From the 15th century onwards numerous representations of the pile-carpets occur in the pictures of the Italian, Spanish, German, Netherlandish and French schools, and many are seen to be similar to carpets which have come down to our own times.★

History of Carpets in India

6. Indian carpets have been famous for centuries for their beauty, size, colour and attractiveness. The beautiful carpets prepared by experienced Indian artisans is a matter of pride and great attraction to the foreigners. Usually Indian carpets are not very expensive because wages, cost of implements and raw materials are not high; and this has sustained interest in Indian carpets.

7. Mr. R.S. Brinton, an authority on carpets, has very well expressed the importance of hand-loom Indian carpets in the following words:

> "The hand tufted carpet possesses own individuality even in its faults, which no product of machine can attain, which

*Guide to the Collection of Carpets - Victoria and Albert Museum, London, Department of Textiles - 1931.

$ Ibid.

★ Ibid.

after all is an attribute to a work of art. More of the soul of the worker has passed into it than the clashing metal of a power loom will permit to filter into its product."

8. "All writers seem to agree in thinking that pile carpet-weaving, like a great many of the arts of India, came from Persia. With that opinion there would seem no great occasion to demur, though it is quite probable that India possessed a carpet-weaving industry of its own (possibly not in pile-carpets) long anterior to advent of any Persian influence. There are methods and designs, met here and there, in the Indian carpet trade, that are very possibly indigenous and which have greatly tended to bring about the peculiarities that allow of Indian carpets being at once recognised from those of other countries."★

9. "It is now believed that the art of manufacture of pile-carpets was introduced into India by the Saracens as they did into Europe. Yet it must have been Persia-from Kurdistan, Khorassan, Kirman-that they themselves must have derived the art."* In support of the Persian derivation of the art,it has been pointed out that nearly all the patterns on them can be traced back to Persian origin, yet many like Santi Swaroop refute the theory : "It was once believed that India learnt carpet-weaving from Persia, but the methods and designs of the carpet weavers in our country are so peculiarly indigenous and so distinctly recognisable from those of other countries that now this theory has been abandoned."**

10. In India, carpets and rugs are either of cotton, called *daris* and *satrangis* of wool; the correct term for woollen pile-carpets is *galicha* or *kalin*. The foundation of a carpet is a warp made of the required number of strong threads of cotton or hemp. The pile is formed by skilfully twining short lengths of different coloured wool round each of the warp threads so that two ends of woollen tufts stick out in front and which are subsequently trimmed. "The hand-woven cotton rugs of India, the true *daris*, are unlike any in the world, this indigenous craft being as old as Aryan migration into the country. The *dari* is a pile-less cotton fabric with a simple design, usually plain stripes of blue, red and black, or blue and white slightly modified with simple geometrical patterns. However old this art may be, it must be admitted that the manufacture of pile-carpets-even if an indigenous industry- reached a high stage only during the reign of the Mughals, Akbar having brought the Persian weavers to the country. Under royal patronage the industry grew and flourished, atleast till the time of Shahjahan, even the lesser potentates of the different provinces also maintaining carpet weavers and patronising their workmanship."* The princes and aristocrats, who were the chief patrons of the art at that time, maintained skilled artisans in their palaces and homes. They were provided with salary, daily rations and allowed to pursue their work leisurely so that they could develop beautiful designs and bewitching artistic pieces. They were provided with salaries even after they were not able to work due to age or accident and their sons, trained extensively in the work by them, took their place. If the artisans could please their employers by excellent workmanship, their salaries were increased and honours conferred. In addition to the salary they were granted other benefits also in the shape of land, residential buildings and grants in cash. These ideal conditions of work providing security of job, hereditary occupation and enough time for creative work resulted in the improvement of art.

11. "Mr. John Kimberly Mumford, in his most admirable work 'Oriental Rugs' has fallen into the popular notion of assuming that from Akbar's time there had been originated and developed the large trade in Indian carpets of which Mr. Vincent Robertson affirms: 'The spread of this manufacture extended over the whole of India as late as the middle of this century (19th century), was practised, very much in its integrity, from Kashmir and as far south as Tanjore.' "§ It cannot

★Indian Art at Delhi - 1901-'2 - Sir George Watt-1903-p. 426

*Handicrafts and Industrial Arts of India - Rustam J. Mehta -1960 - p. 131.

**Arts and Crafts of India and Pakistan-Shanti Swaroop -1957-p.83.

*Handicrafts and Industrial Arts of India-Rustam J. Mehta-1960 - p. 131-'2

§Indian Art at Delhi-1901-'2-Sir George Watt - 1903 - p. 426

be properly explained that how such a big industry could come to almost an end in so short a period, but it seems to be the case. As stated by Mr. Mumford, the apparent first cause of this decline was the provision of work to prisoners in the jails throughout the country. The jail products could very well compete with the produce of the caste weaver, as only the apparent cost of raw materials and a little remuneration as payment to prisoners was taken into consideration.*

12. In the case of carpets, the art is admittedly one that was introduced by Mohammedans and which attained its great perfection under the guidance of Mohammedan rulers. The Emperors of Delhi and Agra encouraged the craft and kept their State weavers and they doubtless had their State artificers in each and every craft, is probably correct. The weavers, under these circumstances, produced marvellously beautiful carpets goes without saying. Moreover, it is fairly certain that at many important centres of administration all over the Empire there were State factories, although the Ain-a-Akbari throws little light on this matter.

13. If the origin and growth of carpet manufacture in India on the basis of geographical and environmental conditions is considered, it will clearly reveal that it came into vogue with the cultural influence of Muslim invaders; and further progress was made under the British rulers. There is little to show that the princes and nobles of India used woollen pile-carpets more extensively prior to the influence of Mohammedan culture. The invaders and conquerors, who had personally lived in and experienced cool climates, the advantages and need of such carpets was naturally realised sooner than the people of this tropical country who rather sought coolness than warmth. The desire for comfortable flooring and decoration was met by gold *masnads* than by these expensive carpets. Although there were centres where beautiful carpets were made under Mogul Empire, the required impetus to the craft was given by the interest aroused in Indian carpets in the European countries by the London Exhibition of 1851. This exhibition resulted in arousing the interest of the European dealers towards these unexploited yet cheap articles than those prepared in Turkey and Persia. Large trade followed and, to safeguard against any deterioration in quality or beauty, orders were sent with specific details about quality, material, designs and price, a practice which is still continuing.

* Indian Art at Delhi-1901-'2 - Sir George Watt - 1903 - p. 426

Jaipur Carpets

14. Jaipur, the Pink City of India, is famous for some of its handicrafts all over the world. Its enamelled jewellery, brass artwares, tie and dye fabrics, ivory articles are very well known. The carpets and druggets also find a place of pride in the arts and crafts of Jaipur. The artistic skill that the carpets of Jaipur embody in them compares very favourably with the oriental carpets woven anywhere else.

15. The three main centres of carpet weaving in Rajasthan viz., Jaipur, Bikaner and Ajmer have been widely known not only in India but also in foreign countries for the last two centuries. Rajasthan is a desert area and its potentiality of wool is very great. The total number of sheep reared in the State, according to the latest figures, comes to about 8.725 million, which is about 22% of the total population of sheep of the country. The annual production of wool in Rajasthan is about 34.8 million lbs. which forms about 45% of the annual production of wool in India.* Natural shrubs grow in abundance in the desert and provide a good feed to sheep without the necessity of making any arrangement for grazing. Not only this, the best quality of wool in India is produced in the Bikaner area of this State.

16. No fixed date or year can be assigned to the beginning of carpet-weaving at Jaipur. This famous city of artistic crafts was once the seat of Mogul art. Some of the carpets in Jaipur Museum, which are as old as 400 years, show workmanship of the highest order. Specimens of

*Sheep and Wool in Rajasthan - Animal Husbandary Department, Government of Rajasthan-1961 - p. 1.

this craft of Jaipur are preserved in Kensington Museum, London.*

17. In the near past, mention may be made of a firm named Zoraster & Company, established at about the beginning of the 19th century in Jaipur, which used to produce high quality carpets. It was owned by the famous house of the Golechas. It is said that the word *Golecha* is the changed form of the word *Galichawalas* by which name the family was known in those days. The factory used to produce carpets of high quality only; of 400, 350, 300 and 256 knots per square inch. The minimum was 144 knots per square inch. The factory was closed down in the year 1952, as the proprietors shifted their business to more profitable avenues.

18. It was only in the last decade of the 19th century that a Sindhi businessman named V.G.Maharaj, who was already dealing in carpet business at Karachi, came to Jaipur in search of finding possibilities of establishing the same industry with an exportable surplus. He experimented with the idea of producing cheap quality carpets and started his own factory. His attempt was successful.

19. He was followed by a Gujarati businessman, named Keshav Lal, who established his concern, Indian Woollen Carpet Company, in 1901. Others followed him and the industry got settled firmly in Jaipur.

20. Although the industry can be very well presumed to have developed and progressed under the patronising hands of the rulers of the erstwhile princely states, yet the first reference in published literature to the high quality and workmanship of Rajasthan carpets made at Jaipur, Bikaner and Ajmer is made by Sir George Watt. The products from these centres were highly acclaimed and appreciated by the organisers of the exhibition held at Delhi in 1901-1902. It has been mentioned that there "are many centres where carpet-weaving has flourished for many years. Those that are best represented at the exhibition and which, therefore, deserve special consideration are Jaipur, Bikaner, and Ajmer."$

21. The growth of the industry at Jaipur thus continued and the number of firms rose gradually till the end of World War II. Between 1919 and 1945, there was a mushroom growth of firms engaged in carpet-making due to a sudden spurt in demand for oriental carpets in the western countries. During World War II this industry was in such a flourishing state that there were as many as 50 carpet factories in Jaipur city; but due to want of proper quality control and lack of direct sales organisation and also due to the speculators having entered the trade, the industry faced a serious crisis between 1947 and 1950, when large quantities of Jaipur carpets lay unsold in London, Paris and other principal markets of the world. Unscrupulous speculators, having no technical knowledge of the industry, exploited the exceedingly high demand for carpets from Europe by resorting to malpractices such as using non-fast dyes, waste wool for spinning yarn and cheating the buyer of quality at every step. In consequence, most of the factories closed down by about 1951 or 1952.

22. According to the survey conducted by the All India Handicrafts Board in June, 1961, there were five commercial firms engaged in the manufacture of carpets in addition to the Government organised training-cum-production centre and Jaipur Central Jail factory. At present the number of the firms in private sector is four. The Government training centre has been closed down. Of the four factories in private sector, one is a branch of an Amritsar firm, a very old established foreign concern known as Messrs. Oriental Carpet Manufacturers of Amritsar. Two other factories make quality carpets and export them directly to foreign markets. The fourth supplies its products to small buyers in Bombay. It manufactures the lowest quality available at Jaipur.

* Carpet Review - March, 1956

$ Indian Art at Delhi-1901-'2-Sir George Watt-1903- p. 443

CHAPTER II

THE CRAFT AND THE CRAFTSMEN

The carpet industry in Jaipur can be divided into two sectors. The first comprises of the private factories and the second of the establishment run by the State Government in the local Central Jail, established about 37 years ago. At present four factories are working in Jaipur in the private sector, which are as follows:

	Name of the Unit	Address	Year of establishment
1.	Indian Woollen Carpet Co.	Pan Dariba, Jaipur	1901
2.	East India Carpet Co.	Amber Road, Jaipur	1909
3.	Krishna Kapoor & Co.	Amber Road, Jaipur	1952
4.	Prabhakar and Sons	Achrol House, Jaipur	1958

24. Both these sectors employ about 245 workers (male, female and child labour). One characteristic of the Jail factory is that its employment varies, though slightly, with the increase or decrease in the number of the inmates from time to time.

25. The following table gives the number of workers employed in each unit:

	Name of the Unit	Number of Workers			
		Males	Females	Children above 14	Total
1.	Krishna Kapoor & Co.	59	11	–	70
2.	Indian Woollen Carpet Co.	13	6	31	50
3.	East India Carpet Co.	22	8	17	47
4.	Prabhakar and Sons	26	9	8	43
5.	Central Jail, Jaipur	35	–	–	35
	Total	155	34	56	245

26. Female workers perform the work of cleaning, sorting and spinning the wool, while the youngsters help the skilled craftsmen and also learn the craft. The craftsmen are mainly engaged in weaving and dyeing. A small number of them work as insizers also. The skilled workers can be further divided into the following four categories:

	Name of the Unit	Workers engaged				
		Weavers	Dyers	Insizers	Repairers	Total
1.	Krishna Kapoor & Co.	44	8	6	1	59
2.	Indian Woollen Carpet Co.	10	1	2	–	13
3.	East India Carpet Co.	19	–	3	–	22
4.	Prabhakar and Sons	19	3	4	–	26
5.	Central Jail, Jaipur	28	4	3	–	35
	Total	120	16	18	1	155

27. Out of the 178 looms possessed by the five units, only 130 (73.03%) are working and 48 (26.97%) are lying idle. Unitwise number of installed and working looms is as follows :

Name of the Unit	Number of installed looms	Number of working looms	Percentage of working looms to installed looms
1. Krishna Kapoor and Co.	76	55	72.37
2. Indian Woollen Carpet Co.	20	13	65.00
3. East India Carpet Co.	40	27	67.50
4. Prabhakar and Sons	24	22	91.66
5. Central Jail, Jaipur	18	13	72.22
Total	178	130	73.03

28. The above mentioned 48 non-working looms are lying idle at present partly due to want of orders and partly due to lack of skilled workers. The latter cause is more significant in case of the Central Jail, Jaipur, where the number of workers depends on the inmates and due to the reason that each entrant has to be trained before he can start working and by the time efficiency is attained he may be released. Some of the big looms are lying idle due to lack of orders for big carpets. Some of them need repairs and a few have become almost unserviceable through disuse.

29. According to the survey conducted by the All India Handicrafts Board, during June, 1961, the number of looms in the then seven units was 209, out of which 145 (69%) were working and 64 (31%) were idle.

30. No particular caste or community is predominant in the industry. Workers of all castes among Hindus and Muslims are employed. An attempt is made in the following table to show the community-wise component of workers of the industry:

Name of the Unit	Workers engaged			
	Hindus	Muslims	Others	Total
1. Krishna Kapoor and Co.	23	36	-	59
2. Indian Woollen Carpet Co.	3	10	-	13
3. East India Carpet Co.	5	17	-	22
4. Prabhakar and Sons	7	19	-	26
5. Central Jail, Jaipur	30	4	1	35
Total	68	86	1	155

31. It is evident from the above table that while Muslims form 55.48% of the total skilled workers, Hindus and one Sikh worker in the Central Jail, Jaipur, form the rest viz. 44.52% of the workers.

Working Conditions

32. The buildings of the factories are very simple. There are generally four walls having doors. The roofs are made of galvanised sheets, tins, etc. There are no pucka floors for the workers to sit on in any of the units. Pucka floors cannot be provided as the owners have to remove old looms and fix new ones according to the trend of the demand; big and small looms are to be fixed according to the nature of the work. But the floor can be pasted with cow dung and clay as it is already being done in one of the units. This would help in keeping the place clean as it would enable it to be swept daily. The dust and pieces of wool, otherwise scattered over the kutcha floor, could be easily removed.

33. The factories are usually divided in five sections : (i) the shed for weavers working on

looms; (ii) the place for dyeing; (iii) the store for keeping raw materials and finished products; (iv) the section for the office staff and designers etc.; and (v) a small portion for female workers engaged in opening the yarn and other processes.

34. Cleanliness and drainage system need improvements. There should be some arrangement for the daily sweeping of the sheds and other spaces in the factories. Water gets accumulated in rainy season as there is no exit for it in some units. Moreover, the water used in dyeing is thrown on the ground itself near the *bhattis* i. e. dyeing ovens.

35. The looms are fixed very close to each other and there is every possibility of a person being hurt while moving about. Moreover, they obstruct the passage of light inside the work shed. In summer the workers have to face hot and dusty winds and in winter the cold breeze as there are no doors to check them. There is no arrangement for a place where the workers can rest and take meals in the afternoon. They have to take their meals on or near the looms which, in addition to being uncomfortable, is most unhygienic as the scattered fibres of wool are inhaled and swallowed with food. It tells badly on their health and many of them suffer from respiratory disorders. As the floor is kutcha it becomes damp during rains.

36. The Jail factory stands at the top in regard to working conditions. The sheds are well covered, there is arrangement for cold and hygienic drinking water, their meal-hour is regulated and the workers take their meals at a separate place.

Economic Conditions of the Workers

37. The wages of workers go a long way as an indicator of their financial lot and their efficiency. The workers in carpet industry are usually paid on piece wage system. Almost all the categories of workers-sorters, carders, spinners, weavers, and clippers-are paid according to the work done by them, barring the dyers, designers, a few master weavers and the clerical staff who are paid on monthly basis. The details are as follows:

(i) Dyers and Designers : They are the most handsomely paid lot. For example the dyeing master in Messrs. Krishna Kapoor & Co. is paid as much as Rs. 500 p.m. while his assistants get between Rs. 80 and Rs. 120 p. m. The other factories pay Rs. 120 p. m. to their dyeing masters. Messrs. Krishna Kapoor & Co. and Messrs. Prabhakar and Sons also employ a designer each who are paid Rs. 150 p.m. The other firms do not employ regular designers and ad-hoc arrangements are made by them for designs.

(ii) Carders : Generally the carding is done by machines. A carder gets about Rs. 3 for carding 40 kg of wool and the monthly income of a carder comes to Rs. 50. The worker, on an average, can handle only about 30 kg of wool in a working day of 8 hours.

(iii) Spinners : Spinning is done by female workers. Usually an efficient spinner can spin about a kg of wool per day after doing her household work. She is paid at the rate of Re. 1 per kg and in this way she is able to earn about Rs. 30 p.m.

(iv) Weavers : The income of a weaver depends upon the quality of the carpet woven which further depends upon the number of knots per square inch. The permanent weaving masters kept by the firms are paid between Rs. 150 and Rs. 200 p.m. The average rate for weaving comes to Rs. 4.25 per square yard for a carpet of 16 knots per square inch. It varies almost in the same ratio for other varieties. For example, for a carpet of 32 knots per square inch, the average rate is Rs. 8.50 per sq. yard, but for the superior qualities above 100 knots per sq. inch, the rate is slightly higher. Extra amount is paid for complicated designs of different colours.

The weavers are classified as 'half-weavers' (semi-skilled) and 'full-weavers' (skilled) in the industry. The average earning of a skilled weaver, who works as an incharge of a loom, comes to Rs. 200 per month. It goes even to Rs. 350 in case of exceptionally brilliant weavers. The average income of a semi-skilled weaver comes to between Rs. 85 and Rs. 100 per month.

(v) Clippers : The work of a clipper is to trim the carpet evenly without wasting large quantity of wool. His work requires great skill as he smooths the surface of the carpet just by 'feel' as he has to maintain the pile of the carpet. He is paid at the average rate of Rs. 0.40 per sq. yard for clipping a carpet of 16 knots per sq. inch. The rate varies in the same proportion for higher qualities. Extra amount is paid for complicated designs and embossed work. The average monthly income of a clipper varies between Rs. 80 and Rs. 100.

38. There have been efforts, from time to time, for increasing the remuneration of the workers by the firms. For example the rate of weaving (for 16 knots per sq. inch quality), which came down to Rs. 2.50 per sq. yard in 1952 from Rs. 3.50, was again raised to Rs. 3.50 in the year 1955. It was further raised to Rs. 4 in 1959 and now, as has already been said, it is Rs. 4.25 per square yard.

39. Three factories - Messrs. Krishna Kapoor & Co., Indian Woollen Carpet Co. and Prabhakar & Sons - are paying bonus to their workers. In the case of Messrs. Krishna Kapoor and Co. it is paid at the rate of $8\frac{1}{2}\%$ while in the case of the other two it is paid at the rate of 7% of the annual earnings of the workers; but, it may be noted here, that while in the case of the first unit it is paid on the condition that the worker should not leave the job for the whole year and that he should be working in the factory in the bonus paying month, there is no such condition in the case of the other two units where the workers are paid their bonus even if they leave the work.

40. The workers are also provided with advances by the owners whenever there is any need, specially on the festive occasions. This helps in easing their economic condition.

41. Inspite of the above mentioned reforms and the consequent increase in wages, the workers are not sufficiently well-paid. The beauty of a carpet is the expression of the skill of the workers who prepare it. Carpets made from the same quality of wool can fetch different prices if they are given different shapes, colours and designs.

42. A carpet is the product of the artisan's skill, but those who are wholly responsible for its quality, are low-paid. The reason of their being paid low is the small output and poor demand coupled with the relatively inferior quality of the products.

43. In this connection, from the entrepreneur's point of view, it can be reasonably said that about 25% of the cost price of a carpet goes towards the wages of labour and there is little scope for any further improvement.

44. The other factor, though not directly connected with the wages, which is responsible for their deplorable conditions is their evil habit of drinking and gambling. They spend a major portion of their income on these heads. Mostly Muslim workers are infested by these vices. Hindu workers are better off in this connection. For example, while most of the Hindu workers have got their own houses, very few of the Muslim employees possess them.

CHAPTER III

RAW MATERIALS, TOOLS AND IMPLEMENTS

Raw Materials

The main raw materials used in the carpet industry are wool, cotton yarn, jute twines and dyeing stuffs. Woollen and cotton yarn are used in the shape of twisted or untwisted form. Either of them, but mostly cotton yarn, forms the surface of the carpet. Silk is also used for this purpose in Central Jail, Jaipur, to meet with some special orders. Dyeing stuff and fuel form other important raw materials in the manufacture of a carpet, for it is essential to dye the yarn in attractive colours before it can be used. Following is the detailed description of all the raw materials :

(i) Woollen Yarn : Woollen yarn is the most important of all the raw materials. Yarn made of wool is the ideal material for the surface of the carpet as wool is capable of being spun easily into yarn of any required count or thickness; and it can be easily dyed to any shade of colour.

Both hand-spun and mill-spun yarn are used in carpet-weaving in Jaipur. Mill-spun yarn came into vogue only after World War I. However, European firms dealing in carpet industry in the country were using it even before that time. As there is no grading before it is woven, the hand-spun yarn is not of superior quality and does not take good colours. The mill-spun yarn is evenly spun and gives better finish. Mill-spun yarn is mainly used by the factories in Jaipur. Messrs. Krishna Kapoor & Co., East India Carpet Co. and Prabhakar & Sons are using mill-spun yarn exclusively. The other two units viz. Indian Woollen Carpet Co. and Central Jail, Jaipur, use both mill-spun and hand-spun woollen yarn.

Woollen yarn is purchased in the shape of hanks (*attis*) of spun yarn and they generally weigh between half a pound to one pound. It is washed and dyed in the factories. All the units except Krishna Kapoor & Co. get spun yarn. Krishna Kapoor & Co. has got their own spinning plant where raw wool is carded and spun to meet their demand.

If wool is purchased in raw form and processed by the factories it will result in economy of 8 to 10 percent in the cost of the yarn. This method has not been adopted due to want of funds for purchasing the spinning plant and raw wool.

Apart from the economy which may result in buying raw wool, it will also result in the improvement of quality. Better wool can be purchased in season and the quality will remain the same; while the spun yarn purchased from the market is of mixed grades which results in lowering the quality of carpets.

The other handicap is the non-acceptance of raw wool for spinning by the spinning mills in small quantities. The factories cannot afford to purchase all the wool needed by them at one time as it means blocking of their capital.

Wool dealers from Jaipur, Bikaner and other places provide the industry with the woollen yarn. All the units except the East India Co. get their yarn from the above local dealers. East India Co. gets its dyed yarn from its main factory at Amritsar. Central Jail, Jaipur, has got its own purchase committee which invites tenders from the dealers and purchases yarn from them as and when required at the fixed prices. Purchase is made by other units according to their need and money available with them.

If wool is purchased by the units in crop season it will result in a further economy of about 15 to 20% of the total cost of wool. The crop seasons for wool are *Chaitra* (March-April) and *Shravan* (July-August). Apart from the economy so resulting, the best of wool can be purchased at crop seasons, but this is also not feasible due to lack of funds. For example, one

unit named Prabhakar & Sons needs about 2,000 lbs. of wool every month. If it has to purchase wool at one time in the first crop season of *Chaitra* then it will need 12,000 lbs. of wool for the next six months till the new wool comes into the market. For purchasing 12,000 lbs. of wool at the average rate of Rs. 6 per lb., it will require about Rs. 172,000 which is a huge sum. Moreover, it will need proper storing facilities.

Price of woollen yarn varies from quality to quality. Woollen yarn ranging from 120 counts to 40 counts is used by the industry. Woollen yarn is purchased at the following rates per kg. for different counts of mill-spun and hand-spun shape :

120 Counts—	Mill - spun	Rs. 21
	Hand-spun	Rs. 17
100 Counts—	Mill - spun	Rs. 19
	Hand-spun	Rs. 16
60 Counts—	Mill - spun	Rs. 19
	Hand-spun	Rs. 16
40 Counts—	Mill - spun	Rs. 16
	Hand-spun	Rs. 15

Consumption of finished woollen yarn by Jaipur carpet factories is about 80,000 lbs. annually, costing Rs. 480,000 at the average rate of Rs. 6 per lb The whole consumption can be divided in the following categories with their approximate requirements :

Quality of wool	Annual consumption of wool (in lbs.)		
	At Central Jail, Jaipur	At other units	Total
1. 120 Counts	1,000	1,000	2,000
2. 100 Counts	4,000	4,000	8,000
3. 40-80 Counts	6,000	64,000	70,000
Total	11,000	69,000	80,000

The total value of wool consumed, according to the report of the All India Handicrafts Board for the year 1960, amounted to Rs. 418,630.

(ii) Cotton Yarn : Two types of mill-spun cotton warp are used. The most commonly used is the hand-twisted mill-spun cotton yarn but some firms also use mill-twisted yarn. Hand-twisted yarn is cheaper but it is inferior in strength and results in inferior and uneven finish.

Cotton yarn of different counts is used but the most common is of 8 counts. Other qualities such as 6 and 10 counts are also used. A bundle of 10 pounds of 8 count yarn costs about Rs. 17. The annual consumption of cotton yarn for Jaipur carpet industry comes to about 25,000 lbs. amounting to Rs. 45,000. The figures for the years 1959 and 1960 were 22,336 lbs. and 22,484 lbs. amounting to Rs. 34,328 and Rs. 35,314 repectively, according to the report of the All India Handicrafts Board.

Local market is the main supplier of cotton yarn to the industry. Central Jail, Jaipur, and Krishna Kapoor & Co. invite tenders from the dealers and get their quota from them. Like woollen yarn, the cotton yarn is also received from Amritsar by the East India Carpet Co.

In low quality stuff, either jute or waste cotton thread is used. However, it is very rare.

(iii) Jute Twine : In low quality products jute twine forms the weft and is also used as *duffer*, the lower portion of the carpet which touches the ground and acts as a medium to stand the presure on it. Jute twine costs Rs. 160 per quintal. It is supplied by the local dealers who get it from Calcutta. The total annual consumption of jute twine comes to about 20,000 lbs. amounting to Rs. 15,000. The figures for the years 1959 and 1960 were 20,410 lbs. and 24,439 lbs. valued at Rs. 11,953 and Rs. 14,404 respectively, according to the survey conducted by the All India Handicrafts Board.

(iv) Dye Stuffs : The dye-stuffs have their own fundamental importance as the beauty

and effectiveness of all the designs and patterns depend on the subtle effects of light and shade produced by suitable arrangements of colours.

All the firms are using chemical dyes for dyeing woollen as well as cotton yarns. Here one thing has to be noticed that different dyes are required for wool and cotton. Wool, being animal substance, cannot be dyed with alcoholic dyes and cotton cannot be dyed with acid colours and so wool is dyed in acid colours while colouring of cotton yarn is done by alcoholic or direct colours.

Although the vegetable dyes of Indian origin are fast and lighter than the synthetic colours, the difficulty about them is that they are not uniformly strong in all seasons. It is also not possible to lay down an exact formula for a particular shade of vegetable dyes as is possible in case of synthetic dyes; and hence it is almost impossible to reproduce exactly the same shade with vegetable dyes. When many carpets have to be made of the same design and colour, vegetable dyes cause variations in shades to such an extent that no two items from the same batch are exactly alike. The vegetable dyes are not a healthy commercial proposition for carpet industry. Synthetic dyes provide the dyer with a larger range of shades and colours to choose from. They are easier to be used and more reliable.

Sulphuric acid and sodium sulphate with other salts hereafter described are other important chemicals used for securing clearness, evenness and deep penetration of the colours in the yarn. In order to give more lustre to the yarn, it is washed by another process known as chrome dyeing. Chrome colours are specially made with a potassium or sodium chrome compound. The yarn when washed with a weak solution of bleaching powder ($1\frac{1}{2}\%$) and again by a $\frac{1}{2}\%$ solution of caustic soda gives lustre to the yarn. This process is called as chrome dyeing.

Dye stuffs are purchased from the local market from the agents of chemical industries. The most important of these are I. C. I. (India), CIBA Limited and Indo-Kem.

On an average, 2 lbs. of dye-stuffs are required for every 100 lbs. of yarn. The annual estimate of expenditure on dye-stuffs and chemicals for carpet industry in Jaipur comes to about Rs. 40,000. The annual expenditure for the same head for the years 1959 and 1960, according to the survey conducted by the All India Handicrafts Board, was Rs. 35,038 and Rs. 30,001 respectively.

(v) Fuel: Fire-wood and coal are used by the units engaged in carpet manufacturing in Jaipur. It amounts to an annual expenditure of about Rs. 15,000. Expenditure on fuel, according to the survey report published by the All India Handicrafts Board, came to Rs. 12,036 and Rs. 12,300 for the years 1959 and 1960 respectively.

46. If an attempt is made to classify the estimated annual expenditure on raw materials on various heads amounting to Rs. 595,000 the following results would follow :

Raw materials	Estimated annual expenditure (in ,000 Rs.)
1. Finished woollen yarn	480
2. Cotton yarn	45
3. Jute twines	15
4. Dyes and chemicals	40
5. Fuel	15
Total	595

47. The following table based on the above data shows the percentage of expenditure on each head of raw materials to the total expenditure on raw materials, in comparison with the figures obtained in the survey report of the All India Handicrafts Board for the years 1959 and 1960 :

Raw materials	Percentage to the total expenditure on raw materials		
	1959	1960	1962
1. Finished woollen yarn	82 0	82.1	80.7
2. Cotton yarn	6.5	6.9	7.6
3. Jute twines	2.4	2.8	2.5
4. Dyes & chemicals	6.7	5.8	6.7
5. Fuel	2.4	2.4	2.5
Total	100.0	100.0	100.0

Tools and Implements

48. Carpet industry does not require huge machinery or plants, complicated tools or well designed and spacious buildings. Rather its requirements are very simple tools and implements. Nevertheless it requires professional efficiency of the highest order. A carpet is a huge though delicate article and the delicacy is the result of skill that is spent in producing it.

49. The following description concerns the tools and implements used in carpet-weaving at Jaipur :

The Carpet Loom and its Components : The construction of a carpet loom is very simple. It consists of a pair of horizontal wooden rollers or beams supported by two flat poles on which they can revolve. Weaving is done between these horizontal rollers round which the warp threads are stretched vertically. On the top roller is wrapped the cotton warp while the lower beam is placed between the travel dug of the trench for wrapping the woven part of the carpet. The weaver sits inside the loom on a wooden plank touching the lower beam; and the dyed wool, in different colours for the pile, hangs over on one side of his head in the shape of small bales.

The height of the loom is usually between 6 to 7 feet and the width (between the two vertical flat poles) ranges between 4 and 20 feet.

The various components of which the loom is composed of are described in detail as below:

(i) *Mukrays* : They are made of wood and the warp is pulled up and down by them. Every worker uses two *mukrays*, one each for keeping the warp up and down separately. When a thread is passed in the middle of the warp and the thread is hammered the worker draws one *mukray* and the thread goes down and another thread is passed between these two portions. It is hammered again and the other *mukray* is pulled on and so on. The *mukrays* are supplied by the local carpenters.

(ii) *Ghori* and *Gullas* : The *mukrays* are put on the *ghori* and are tied up with bamboos. *Gullas* are rounded over the bamboos and the warp is attached to the former. Rounds of the thread taken from the warp are thus wrapped over the bamboo, which, as already stated, are attached with the *mukrays*. The *gullas* help in coming up and going down of the warp.

The *ghori* on which *mukrays* are placed, is a rafter put on the two *kainchi* (scissor-like stands on the side of the frame) which are named as *Haths* (like the two stands on both the corners). As weaving goes further the *ghori* is removed onwards. Their life is short; they last for hardly three months as they are constantly rubbed against the rafter. The life of a *ghori* is about 5 years.

(iii) Bamboos and Rafters : They are used to keep the warp tight which is very essential for carpet-weaving. The bamboos are kept almost in the middle of the warp at a distance where the rounds of the thread taken from the warp are wrapped. The rafter (locally called *balli*) is itself put on the two *haths* on the corner and *mukrays* are kept on these rafters. Their life depends on their quality. A rafter of an average quality lasts for about ten years; and once broken it cannot be repaired.

(iv) Loom Tightening Chain : This is made of iron. It is a heavy chain having an 'instrument' by which the chain can be opened and closed, lengthened or shortened. The chain is passed through the two holes in the horizontal wooden beams which are, as already stated, supported by the vertical flat poles. The chain serves the purpose of fixing the position of the wooden beams and also of tightening the warp. A carpet loom costs between Rs. 200 to Rs. 300, depending upon its size.

50. A new type of loom has already been evolved by the Mirzapur carpet manufacturers. Its mechanism is similar to the same old one-though its vertical poles are not fixed in the ground or on any other base. It is helpful in removing congestion due to the fixed looms as this new loom is portable and does not cost as much as the fixed ones★.

★ Carpet Iudustry in Mirzapur—Andesh Singh.

51. Apart from the loom described above, the following tools are also required for carpet-weaving :

(i) *Chura* (the round pile-cutter) : It is made of tempered steel. This is a sort of knife with a wooden handle and its file is more or less semi-circular in shape. It is used for cutting the pile after the knot has been tied. Left hand knots the warp with the woollen yarn, while the right hand cuts the pile with the help of the *chura*. This is done so quickly and systematically that the process can be favourably compared with any automatic machine. The *chura* must be very sharp; hence it requires sharpening, generally every week, in order to maintain its sharpness. It is due to its constant sharpening that it becomes useless earlier as compared with other tools. Its construction does not require much technical skill and is made by the local blacksmiths. Its normal life is about two years and it costs about Rs. 5.

(ii) *Panja* (comb) : This is the most important tool used in carpet-weaving. It is a sort of a metal comb made of iron with wooden handle. Generally it has got 6, 9 or 12 teeth. Its purpose is to settle and fix the woven weft between the cotton warp lines. The advantage of the iron comb is that it is heavy and its weight helps to settle down the knots tightly, but when finer work is done, a light one is used. It normal life may be estimated between 2 to 3 years. It is locally available for Rs. 2 to Rs. 3 per piece.

(iii) *Kainchi* (ordinary scissors) : It is used for clipping the surface while weaving and requires sharpening every week or ten days. Its normal life is about two years and can be locally purchased for about Rs. 3.

(iv) Finishing scissors : These are used in levelling up the piles and giving the carpet descent shape and smooth surface when it is completed. These scissors are larger in size than the ordinary ones and also different in shape. They cost about Rs. 5 and are available in the local market. Their life is about 5 years.

(v) Brushes : These are ordinary brushes used in daily life, but are bigger and made of stiff hair fibers. They are used for cleaning the finished carpets of the unwanted fibers. They cost about Rs. 2 and are locally available.

(vi) Painting Brushes : These are water colour painting brushes and are used for preparing the designs and patterns of carpets on paper, generally graph paper, representing various colours and shades. They cost about Re. 1 each in the local market.

52. Apart from the above mentioned tools and implements, big copper pots are also required for dyeing the woollen yarn. Manufacturers who prepare woollen yarn themselves have to dye the yarn in various colours.

CHAPTER IV

PROCESS OF PRODUCTION

Carpet-weaving, like all other artistic crafts, requires a great skill on the part of the artisan. It is really a matter of great appreciation, when, with simple tools and appliances, an artisan is able to prepare delicate and excellent pieces of artistic beauty.

54. Before the work of weaving is started the woollen yarn has to be thoroughly washed and correctly dyed. The process of carpet preparation can be divided into two broad divisions. Washing and dyeing of yarn can be put under the first head while weaving under the other.

Washing and Dyeing

55. Washing : Washing of the woollen yarn is essential before actual dyeing is undertaken. The wool collected from sheep's back is not free from dirt and contains many weight-increasing elements which prevent the dye from penetrating into the fibre.

56. There is a little bit of difference in washing the hand-spun yarn and mill-spun yarn. It is discussed as follows :

(a) Washing of Hand-Spun Yarn : For cleaning the hand-spun woollen yarn the two materials required are *reetha* (soap nut) and a chemical known as lissapol. For washing 100 lbs. of woollen yarn, 5 lbs. of *reetha* and 2 lbs. of lissapol are required. Powdered skin of *reetha* is a well known cleanser. It is soaked in water and, after removing its seed, the skin is used for washing the yarn.

Water with the *reetha* skin is shaken well and foam is prepared. It is then poured into the tub and lissapol (which comes in paste as well as in powder form) is added to it. Ratio between water and yarn to be washed is kept between 5:1 to 8:1. The yarn hanks are put in water for half an hour. The washer picks them up one by one with their ends and shakes them well in the foamy water. When they are well cleansed, they are rinsed and put into pure water. After this they are spread for being dried.

(b) Washing of Mill-Spun Yarn : The mill-spun yarn is to be washed with soap after it has been washed by the above process. About 3 lbs. of ordinary washing soap is required for 100 lbs. of wool. It is done in order to remove the oily elements in the mill-spun yarn. The yarn is kept in the soap-water for about half an hour and then it is thoroughly pressed and cleaned. After this it is washed in pure water.

Sometimes soda ash is used if the greasy elements do not go with the *reetha* and lissapol. One lb. of soda ash is required for 100 lbs. of water; but it has to be used with care as it weakens the fibre if employed in excess.

Some of the private units have adopted modern chemicals for washing the yarn. In place of *reetha* they have started using idet, a chemical from Swastik Ltd. Three per cent of idet is dissolved in water which is added to 3% of lissapol and one percent of soda ash. The yarn washed by this process gives better results in dyeing than the old method.

57. Dyeing : Fast and accurate dyeing is of cardinal importance in carpet manufacture. The following items are required for dyeing 100 lbs. of yarn :

1. Colour	1 to 3 lbs.
2 Sulphuric acid	3 to 5 ,,
3. Glauber's salt	5 to 7 ,,
4. Lissapol	2 to 3 ,,

58. If yarn is not scoured well before it is dyed, it may require excessively long boiling periods in order to obtain level and well-penetrated results.

Lissapol is added to the solution of the dye-bath to overcome these difficulties. It effectively removes the dirt and grease from the yarn in the dye-bath itself and thus ensures shades in a reasonably short period. Lissapol is also of value where water supply contains suspended dirt and decomposed substances from vegetable matter. It prevents this suspended matter from being absorbed by the wool during the dyeing operation.

59. Acid dye-stuffs, as the name indicates, are usually applied to wool with the addition of acids and salts from which acid is liberated in course of dyeing. The acids generally used are sulphuric, acetic and formic acids and the salts are sodium acetate, ammonium sulphate and Glauber's salt. The addition of Glauber's salt to the dye-bath usually assists uniform dyeing. For dye-stuffs, which do not give satisfactory results, Glauber's salt is added.

60. (i) Cool Dyeing : Cool dyeing, although the most economical and traditional method, is not resorted to. It results in saving; but it does not produce good quality dyeing. The results are inferior and there is every possibility of the colour fading away because the yarn is not boiled.

61. At Jaipur, wool is never dyed in cold water and only cotton yarn and jute twine (that too in a few cases) used as weft in carpets are dyed by this process. In all the cases, bake system is followed.

62. (ii) Bake Dyeing : Big ovens made of bricks are used in this system. The dye-stuff is first dissolved in warm water and converted into a paste by boiling; and then added to the dye-bath. The temperature of the water in the dye-bath is set at 105°F and dissolved dye-stuffs are added to the dye-bath through a sieve.

63. The solubility of some dyes is reduced by the presence of sulphuric acid. This leads to decreased fastness in deep shades, specially at a low commencing temperature. The acid is, therefore, not added until the dye-bath reaches a temperature of 140°-160°F. Then other materials e. g. Glauber's salt, lissapol and sodium bisulphate are added.

64. The yarn is put in at 160°F and boiled and treated for 1 to 2 hours. The temperature is not allowed to drop. With the help of long wooden sticks the dyer brings the yarn hanks up and down constantly. This, with the help of Glauber's salt, results in even dyeing.

65. The yarn is taken out and thoroughly rinsed in cold water. When it is fully washed it is spread in shade for drying in order to avoid the effect of the sun on the colour of the dyed yarn.

66. The big copper dye-bath, tub or pot, is called *deg* in local parlance and fire-wood and coal are used to heat it.

67. The manufacturers get coal on permits. A comparison between the expenses on fire-wood and coal showed a ratio of 6:1. Inspite of getting coal at controlled rates, according to their requirements, two units are using wood and are continuing the uneconomical method because shifting to coal will mean an expenditure of about Rs. 5,000 for the required changes and alterations to be made in the ovens.

68. (iii) Steam Dyeing : This system is prevalent in Mirzapur. Although it has not yet set its foot in Jaipur, it is the most economical and better method of dyeing. Yarn can be dyed twice or thrice to give a uniform colour under this system while it is not possible under other systems of dyeing.

69. Wooden bath-tubs are used in this system. Steam is passed into the tub through a pipe and temperature of the water is raised through it. Woollen yarn hanks are hung on an iron rod with raised ends and lower middle portion where the hanks are fixed. Both the ends are rested on the dye bath and the lower middle portion hangs in the tub. The hanks in this way are fully dipped into the dye-stuff.

70. This system requires much skill. Regulation of steam has to be supervised carefully. Due to lack of skilled labour, the system has not yet been adopted in Jaipur.

71. As informed by the proprietor of a firm, at least 10 Paise per lb. can be saved if the yarn is dyed through steam, but it requires a sum of about Rs. 25,000 to start it and secondly economy can result only if yarn is dyed in large quantities.

Carpet-weaving

72. A carpet has to go through the following stages before it is complete and ready for sale :

I Stage - Making of the Warp : The type of the cotton thread used as warp goes a long way in determining the quality of the finished product.

For making the warp two rods are fixed on the floor at a distance which is four to five feet more than the length of the carpet to be made and the warp is prepared just as a weaver does in case of the ordinary weaving. The thread runs across these rods as many times as the width of the carpet calculated in terms of knots per inch. For example, if the carpet has to be prepared with 400 knots per sq. inch, and in one inch width there are 20 threads, and the width of the carpet is 5 feet, there will be (20x12x5) 1,200 threads in all.

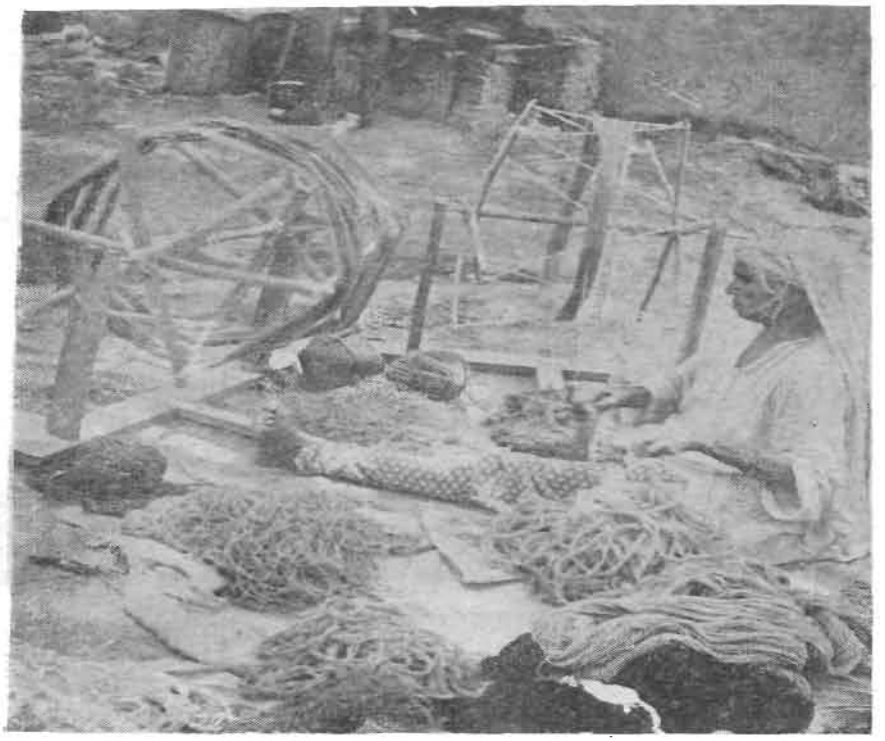
The warp is then spread on the ground and the thread, called *gulla* (heald), is fixed alternatively in both the hind and front threads of the warp.

The *gulla* is prepared by taking two threads of atleast double the thickness of the warp and twisted. All the odd number threads of warp are taken in one loop and even number threads are taken in another loop.

II. Stage - Mounting the Warp on the Loom : After fixing in the *gulla*, the warp is wrapped around the two round iron rods, measuring about 5/8" to 6/8" in diameter and then it is fixed on the hooks of the lower beam of the loom and wrapped fully around it. The other end of the warp is fixed to the upper beam; and then the whole of the warp is wrapped round the upper beam by revolving the beams with the help of the iron rods called *sambal*. The warp is entirely rolled upon the upper beam with the other end fixed to the lower beam. This is done as stated above by fixing one iron rod to the hooks of the upper beam and the other to the hooks of the lower beam. Thus the warp is mounted on the loom vertically and the required stretch is given with the help of the lower chains before the weaver starts with the next stage.

III. Stage-Filling of the *Bei* in the Warp : Filling of the *bei* is an important step after the warp has been mounted on the loom. As already said, there are two threads in the warp-one in the front and the other at the back-and for this purpose the warp is made horizontally. *Bei* is alternatively filled in the warp threads, first in the front warp threads and then in the back warp threads. This helps in advancing both the warp threads, the front as well as the rear, as required, while weaving the carpet.

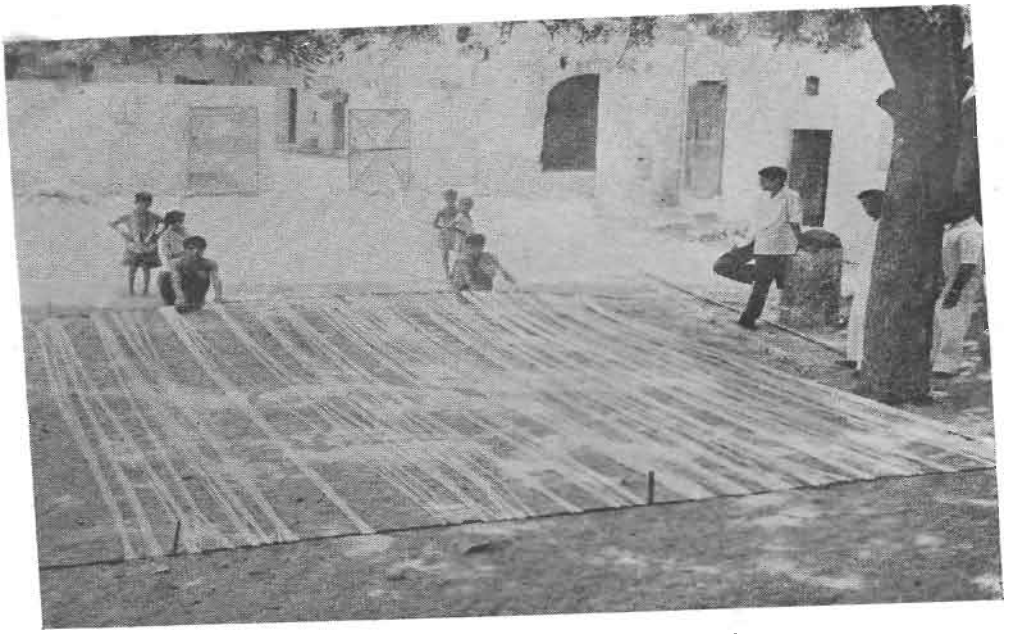
IV Stage-Filling in the Knots According to the Given Design: A pattern (*naksha*),made on a graph paper, representing the design, colour, shade and number of warp threads is hung before the master weaver at the loom in order to facilitate the work and to avoid any mistakes. He is also shown a woven specimen, if the design is altogether new, to which he can refer now and then until the carpet is finished. In the Central Jail, an experienced weaver, known as 'Reader', performs this work while in the other units the weaver-in-charge at the loom reads the design for all the weavers at the loom and does his weaving also. Bales of wool keep hanging on the loom before the weavers. A knot is made over the foundation threads and the wool cut off with the knife (*chhura*) kept hanging, from the weaver's right wrist. When one row of knots has been tied, a weft thread is passed through the warp and pressed against the row of knots, with the blunt comb-like instrument, called *panja*. Sometimes, for added strength, the knots may be further stitched to the warp threads. After a number of rows have thus been completed, the wool is cropped with a pair of curved scissors, but is not cut to final length at this stage, as that is a step in the process of manufacture carried out by another expert who uses a broad and very sharp knife for the purpose. When the whole carpet has



Woman processing wool



Preparing the warp

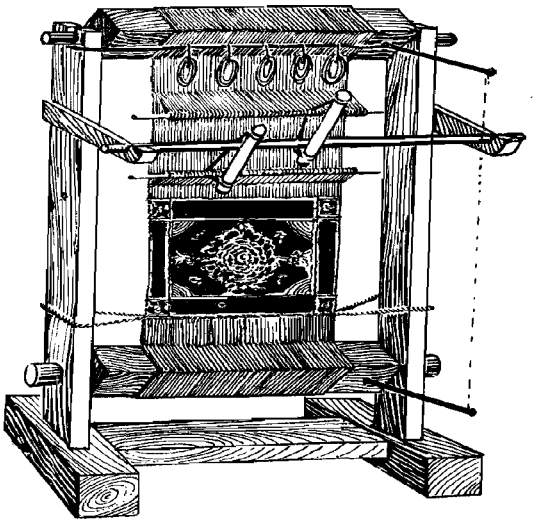


Spreading the warp on ground



Preparing the *gulla*

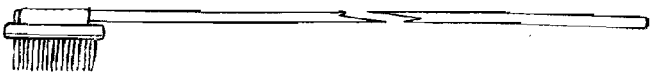
SOME TOOLS & IMPLEMENTS



Loom for weaving carpet



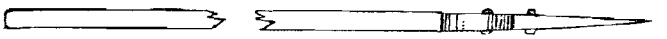
Brush



Side view of brush



Knife



Side view of knife



Chura



File



Khurra



Panja



Side view of panja

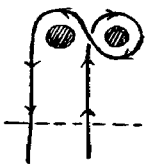


Ordinary scissors



Clipping scissors

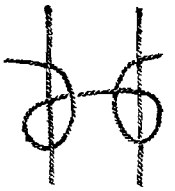
DIFFERENT TYPES OF KNOTS



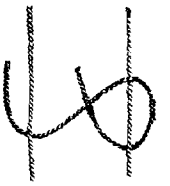
Plain knot



Front view of plain knot

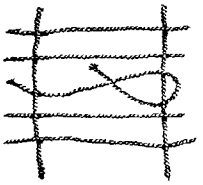


Ghirod or Turkish knot

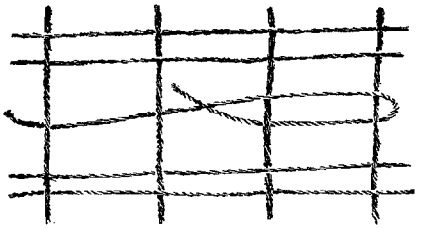


Sachna or Persian knot

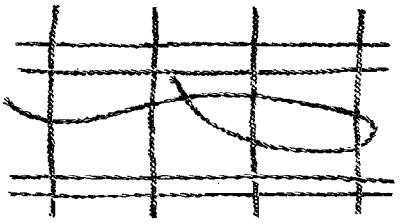
DIFFERENT SYSTEMS OF SACHNA KNOT



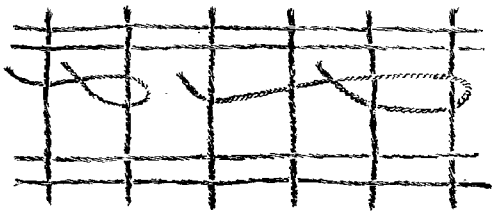
I System



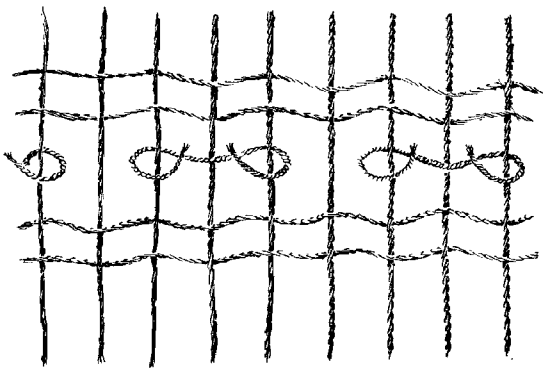
II System



III System



IV System



V System

thus been knotted and cropped it is taken off the loom and undergoes further treatment.

V Stage-Knotting : Strictly speaking, there are no knots in the literal meaning of the word. They are twists of the woollen yarn kept in place merely by the pressure of the warp threads on either sides and the tight weft lines of the other twists below and above. Each twist is tied upon two adjacent threads of the warp; the front and then the hind line of the twin warp lines. When a row of twists is complete and pressed down with the *panja*, it becomes so closely woven that the twist does not give way.

There are two types of knots, as described below, used in carpet weaving :

(i) The *Ghirod* or the Turkish Knot : The *ghirod* knot is used only for the border of the carpet in the lines adjacent to the edges or the *kinaris*. Thus in a carpet there are only two vertical rows of *ghirod* or Turkish knots and all the remaining knots are *sachna* or the Persian knots.

In *ghirod* knot, the pile woollen yarn is taken on the adjacent warp thread in such a way that it goes above the first warp and passes below the second, after going around the first thread; and finishes after taking an alternative round around the second thread.

(ii) The *Sachna* or the Persian knot : This knot is used in Jaipur for weaving the remaining twist body of the carpet.

The woollen yarn is passed below the second thread and it takes a round around the first thread by going first above it and then below it.

The following are the variations of the *sachna* knot used in carpet-weaving at the various centres in Jaipur ;

I System :

(a) The weaver makes knots by ;

(i) looping a strand of pile yarn around a (the first) warp thread;

(ii) passing the strand behind the adjacent (the second) warp thread to the left of the first warp thread;

(iii) pulling the strand and cutting it.

(b) He then weaves the backing between two adjacent rows of knot by :

laying two (or more) weft threads interlacing each with warp threads as in a plain weave (a weave repeating on two warp threads and two weft threads).

II Sytem :

(a) The weaver makes knots by :

(i) looping a strand of pile yarn around a (the first) pair of warp threads;

(ii) passing the strand behind the adjacent (the second) pair of warp threads to the left of the first pair of warp threads;

(iii) pulling the strand and cutting it.

(b) He then weaves the backing between the two adjacent rows of knots by :

laying two (or more) weft threads interlacing each other with pairs of warp threads as in basket weave (a weave repeating on two pairs of warp threads and two of weft threads)

III System :

(a) The weaver makes knots as in System II.

(b) He then weaves the backing as in System I.

IV System :

(a) The weaver makes some knots as in System I.

(b) He then makes some other knots as in System III.

(c) Weaves the backing according to System I.

It is used only in figured carpets.

V System : One more method of knotting in carpets is prevalent, which is almost a variation of the Turkish knot and hence very similar to it :

(a) The weaver makes knots by :

(i) looping a strand of pile yarn around a (the first) warp thread;

(ii) passing the strand behind the adjacent (the second) warp thread to the left of the first warp thread:

(iii) passing the strand behind the adjacent (the third) warp thread to the left of the second warp;

(iv) pulling up the strand and cutting it.

(b) He then makes the knot as in (a) above after leaving the adjacent (the fourth) warp thread to the left of the third warp thread; and

(c) Weaves the backing, according to the System I.

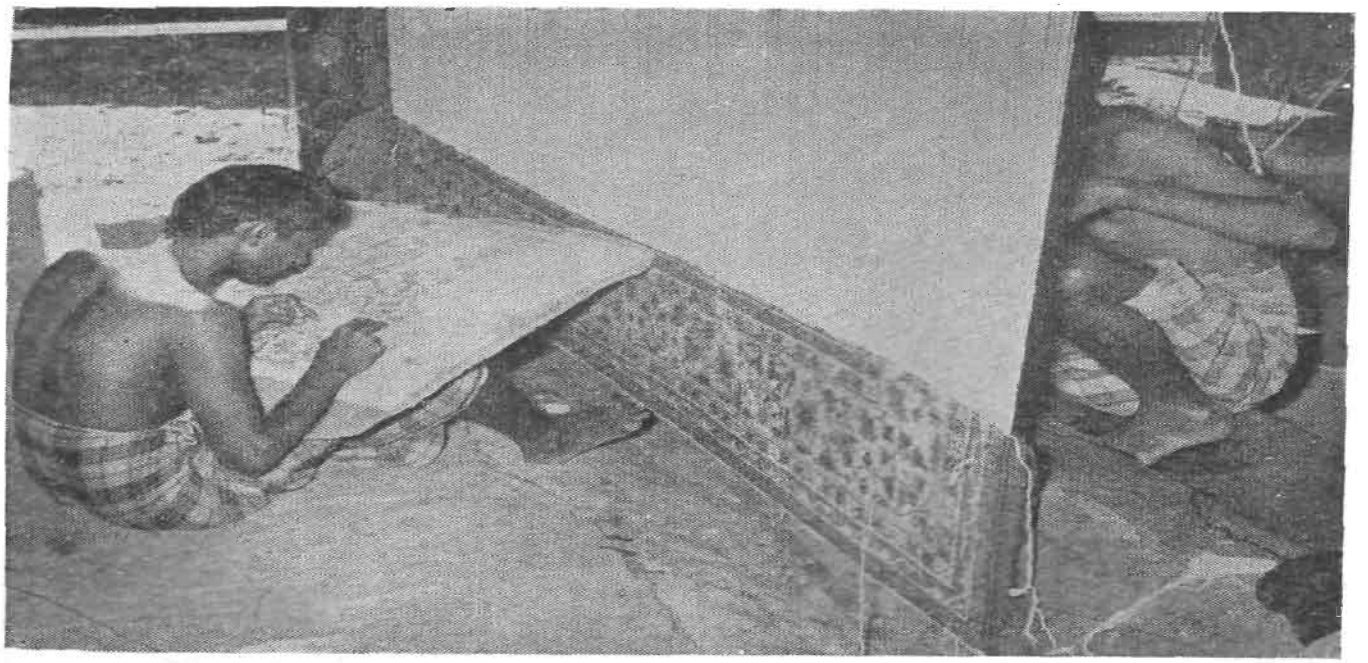
It is used generally in finer stitches i.e. carpets having 256 or 400 knots per square inch. For this finer yarn is required. It gives a better back to the carpets and also results in a slight saving in yarn as the strand has to cover only one thread of the weft and not two as in the case of other systems.

VIth Stage - Clipping : This is meant to give finishing touch to the carpets. The knots are paralleled and the surface is smoothed with the help of clipping scissors after the remains of the knots are cut with ordinary scissors.

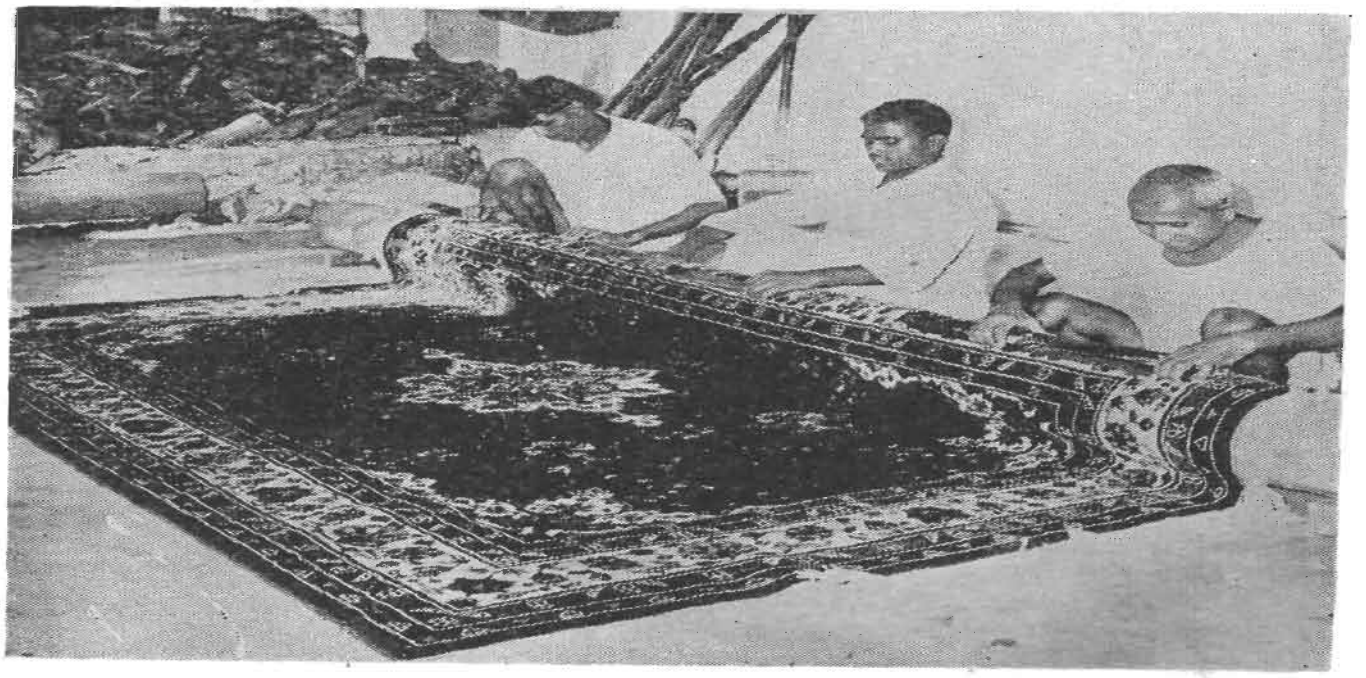
VIIth Stage - Final Checking and Finishing: The carpet is then examined by the master craftsman regarding its designing, weaving and other relevant aspects. When he is satisfied it is ready for sale or to be dispatched to the customer.

73. There is no final washing as practised in Kashmir. In the case of the Kashmir carpet generally vegetable colours are used which render the finished product to be washed in order to remove the fragments of leaves etc. from the yarn.

74. Secondly, in Kashmir, the carpet-weaving is a household industry. In the very limited space household duties e. g. cooking, washing etc. are performed in addition to using the space for living and animal keeping. Work is carried on in this very space which renders every possibility for the article being spoiled in the considerably long period of its preparation. It is, therefore, essential to wash the product before it is finally considered suitable for sale.



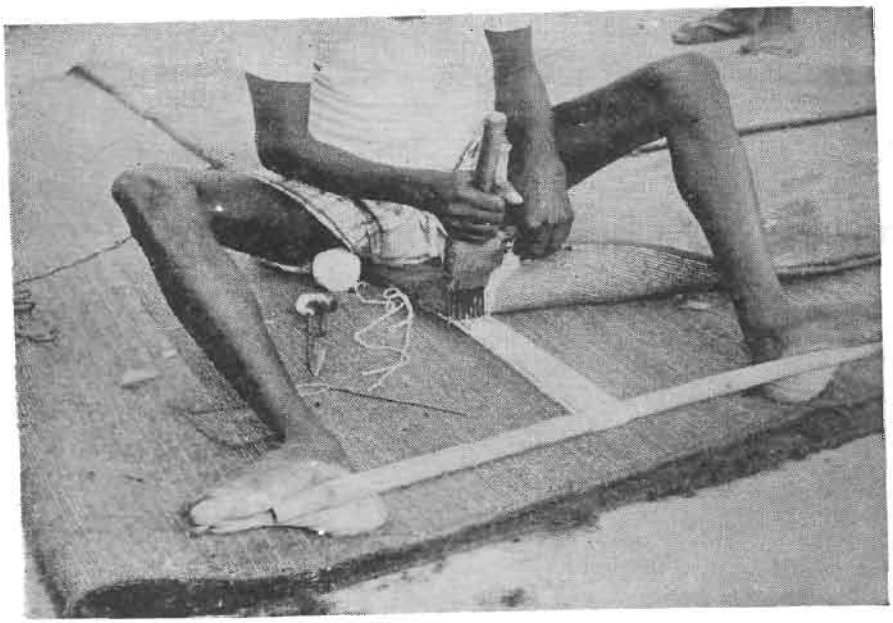
Weaving the carpet



Clipping to level the woven carpet



Finished products in the store



Repairer at work

CHAPTER V

DESIGNS AND ARTISTIC BEAUTY OF FINISHED ARTICLES

"Carpet designing is a branch of applied arts, which makes exacting demands upon its adherents, requiring, as it does, technical knowledge of exceptional quality."* Thus the designer, however high his artistic ability may be, is liable to fail in achieving practical success unless he keeps in his mind the 'particular capacity and limitations' of the fabrics and 'ever changing tastes' of the users.

76. Although individual tastes differ in all respects and consequently a carpet may have unlimited number of designs, yet for the sake of convenience and simplicity the different designs can be classified into the following two categories :

(i) Geometrical or Naturalistic; and

(ii) Conventional or Floral or Ornamental.

77. The former is the oldest and more or less traditionally adopted by eastern countries. "It is generally represented by patterns of abstract geometrical and angular forms, stiff interlacing designs, cryptic signs and symbols and the like."† The same effects may also be produced by arbitrary arrangements of circles, squares, spirals and intersecting lines or a repetition of simple figures. The second type, as the name itself suggests, concerns itself with the natural objects and represents indigenous blossoms and lady scrolls, conventional arabesques and botanical forms.

78. The oriental taste, especially that of orthodox Muslims, was favourable towards the geometrical designs, pure and abstract, reflecting perfect austerity in the faith, while those who were not austere, allowed more freedom and could welcome floral, botanical and even animal forms of designs. The designs of the austere type can be seen in most of the old carpets of Turkey and Asia Minor. The other type can be found in almost all the Persian carpets.

79. The geometrical style was not confined to the East only. It was prevalent in British carpets also in the beginning, but it stayed for a short period and was succeeded by the naturalistic style. In modern times the naturalistic style, better known as 'plants and flower forms', has been given up and a tendency towards the geometrical style has returned. This does not have any reference to natural designs and is composed of arbitrary forms treated in simple manner and depends for its success mainly upon a combination of shades and colours which appeal to one's eyes. This has come to be known as 'modernistic style' and is ascribed to American artisans.

80. Designs occupy a very important place and a successful designer requires good technical knowledge to an exceptional degree; but there are no regular designers whose business is to invent new designs. The workmen are still copying the same designs which their forefathers prepared and which are still preserved. For the sake of progress in a particular industry or art, the age and even the changing taste of the users have to be considered; and the business of a designer should be to produce new patterns to meet new demands.

81. Countries of the world differ in taste for various articles and have certain common characteristic features among themselves and as such their requirements for these articles give rise to particular designs and patterns, generally named after the names of those countries. Carpets, too, are designed or prepared according to the tastes or requirements of the different people. The best and the simplest way of broadly classifying the various designs, perhaps, is an association with the names of the countries they belong to. An attempt is made in the following pages to acquaint the reader with the more famous designs in use in various countries of the world. Almost all these

* Encyclopeadia Britannica
† Ibid

designs, with slight modifications and adaptations, are prepared in Jaipur.

82. (1) Persian : The patterns are floral, representing leaves, buds and flowers and show a tendency to naturalistic drawing with graceful and often intricate lines. Their colour schemes of delicate hues are not only beautiful but in perfect harmony. These carpets are popular all over the world.

> "Persia has been called the cradle of the carpet industry. We cannot say that carpets were made in that country earlier than elsewhere and it is by no means proved that the oldest carpets now existing are of Persian origin, yet there is much to excuse in such a statement. For freedom and beauty, for splendour and harmony of colour, and for excellence of craftsmanship, the carpets of Persia are unsurpassed and this holds true for the last five centuries atleast.....

> "Broadly speaking a Persian prefers a floral to a formal design, and a curved to a geometric treatment. The technique of carpet weaving imposes a certain angularity upon all the designs reproduced, since each knot must be inserted at right angles to the warp, and occupies a space roughly in the form of an oblong. Remarkable skill is shown by the Persian craftsman in adapting this stubborn technique to reproduce the bold curves and floral designs which he favours.

> "During the 17th century carpets of Persian design were made in India by workmen. The motifs were such as were employed in the 16th century, but the tendency was for the arrangement either to become scattered and comparatively meaningless, or else to stiffen into the opposite extreme of rigid formality."*

83. (2) Turkish : It is also of floral design. Flower forms are more conventional than natural and there are fewer repetitions of motifs and patterns than in Persian. The curves are not angular but are more graceful. A large majority of prayer rugs are in Turkish rather than in Persian design.

84. (3) Caucasian : Although the designs are similar to the Persian on the one hand, and the geometric Turkish on the other, as a whole the carpets have characteristics which mark them out as a distinct and separate group. The general term 'Caucasian' meets the difficulty presented by the frequent shifting of political boundaries in the past and comprises a group of carpets in which the main characteristics are the same. Floral, geometric and animal motifs are included, but the general tendency is towards a geometric treatment, the outlines often being serrated. Some of the designs may almost be described as a stiff rendering of the older Persian floral motifs; others are almost entirely composed of stars, polygons, diamonds and such geometric figures. Grotesque representation of animals, birds and men, generally of diminutive size, sometimes help to fill up the background. Some diagonal stripes or zigzags, and flowers and leaves stiffened into angular shapes, are a common feature in the borders.

85. (4) Central Asian: A very characteristic class of carpets is produced in the Transcaspian region, extending from the further shores of Caspian Sea eastwards as far as Bokhara, northwards to the sea of Aral, southwards to the borders of Persia, and touching Afghanistan on the north-western boundary of that country. Besides rugs for sitting and sleeping upon and for prayers, long narrow tent-bends, narrow fringed borders for tent-entrances, large and small bags to be hung round the inside of the tents, or to be used for the transport of household goods, camel-collars and other articles, are made principally by the women who begin to learn the craft at an early stage.

86. The designs are geometrical. Polygons, crosses and star-shapes are prevalent, and 'hooked' ornamentation is frequently found. A deep brown-red, sometimes tending to assume a dark purple tinge, is predominant to such a degree as to render the whole class distinguishable

*Guide to the Collection of Carpets — Victoria & Albert Museum, London, Department of Textiles - 1931.

at a glance. Other colours are blue and white – these three forming the whole colour scheme of the carpets. Green, yellow and black are less frequently added, and more than one shade of red are sometimes introduced. The carpets are excellently made, the wool being of fine quality, the dyes good, the knotting close and regular and the work durable.

87. (5) Chinese : Chinese carpets became known to the outer world only in the first quarter of this century. It is assumed that the art was introduced through contacts with carpet-weaving neighbouring countries. Even then, the patterns of Chinese carpets belong to the art of that country. The colours are generally light, with a tendency towards the bright tones familiar in other branches of Chinese art. The knotting is comparatively coarse, and the fact that in technicalities of this craft the Chinese are far surpassed by the carpet-weavers of Western Asia supports the view that this nation was not amongst the first weavers of carpets. A peculiar feature of Chinese carpets is the artificial rounding of the contours in the designs performed by a careful process of clipping downward into the pile after the weaving is completed and not by the fineness of knotting and skill in setting out the pattern as done in other places. Human figures and dragons are favourite designs for them; the lower portion generally has a design of sea-waves rendered in the convention adopted by Chinese artists, and at the top edge is usually a festoon of jewels. Another common feature of the Chinese carpets is a beautiful representation of natural scenery giving subtle and accurate shading. The borders are equally typical; they are invariably narrow and generally consist of a single stripe which is figured and surrounded with a coloured edge.

88. (6) English : Attempts to introduce the craft of carpet-weaving were made as early as the reign of Queen Elizabeth, but it was only in the 18th century that efforts succeeded in establishing the craft on a substantial scale.

89. The outstanding feature of the English carpet is that it has no resemblance to the Indian, Chinese or the traditional Persian designs in as much as it has got the differentiating feature of having the same colour in border as well as in the ground being separated by only a line of a different colour. Patterns and figures are generally open and there are no flowers or figures as in the case of the Persian carpets. The latest tendency seems to be towards manufacturing plain carpets generally without borders, flowers or any other sort of decoration work on it.

90. (7) American : The latest designs, not in the least comparable to the eastern designs, and to a certain extent to English designs, have been introduced in America. The main features of American carpets are a plain carpet with embossed and engraved flowers, curves, circles with flat lines etc. The whole carpet has a particular colour and there is not much blending of light and shade.

91. (8) Indian : The main features of the Indian design are that it has specified borders ; there is some margin framing the border line filled with different patterns and a suitable combination of similar patterns or flowers in the middle of the carpet. In theory they resemble the Persian rugs but do not possess the same artistic value.

> "In all these carpets first thing to observe is the complete subordination of the decoration to the surface. A carpet presents, of course, a flat surface and the decoration in these Indian carpets, it will be seen, is never allowed to disturb the impression of their flatness. This effect is obtained by representing the ornamentation on them in a strictly conventional manner, and without shadow. The next thing to observe is the skill with which the ornamentation is distributed, nearly always in a symmetrical manner, and with such perfect balance that even where it is most crowded there is no effect of crowding.'
>
> "With unconscious subtlety, thin and light fabrics are delicately coloured and ornamented, and the heavier materials more richly, both the ornamentation and the colouring, perhaps subconsciously, adapted to the effect desired, especially

The Industrial Art of India-Sir George Birdwood- 1881.

when the fabric is used as it is meant to be. It is rightly said that it is 'difficult to analyse the secret of the harmonious bloom of Indian textures, even with the aid of Chevreul's prismatic scale', and that 'it is only through generations of patient practice that men attain to mystery of such subtleties.' "*

92. P. C. M. writing in the Statesman (1 - 1 - 1956) applies an esoteric symbolism to the designs of Indian carpets :

"There is a hidden meaning in almost all designs found in Oriental carpets. The circle represents eternity; the zigzag water and lighting; the swastika guiding light in darkness; the meandering line continuity of life; the tree bounty. The whole carpet is said to be the emblem of eternity and the pattern the visible world of change."$

93. The above mentioned designs have several patterns in themselves and there cannot be any limit to the varieties of designs and patterns which a particular taste may require from time to time. Moreover, the Jaipur Craft has to meet with the foreign requirements and so the taste of the users is an important factor influencing the mode of production. The factories are supplied with exact requirements placed before them with graphical maps representing exact designs and colours. For the small local requirements, they have to bear in mind the taste of the country's users who prefer Indian and Persian designs and the mixed adaptation of both. The following lines about Jaipur carpets, written about more than half a century ago, still hold good:

"The carpets woven copy the designs found chiefly in the rugs of eastern and middle Persia. They nearly always present the cypress tree and also many animal forms, laid upon a ground of dark red, blue or ivory white. The borders have swaying vine pattern, with the customary floral adjuncts."★

94. Jaipur carpets have been famous for their beauty and attractiveness not only in India but in many foreign countries also. They were highly acclaimed, as early as in the beginning of this century, by the organisers of the exhibition held at Delhi in 1901-'2, with the products of other two cities i.e. Bikaner and Ajmer, of the State.

"Jaipur : Some half a dozen carpets have been shown on the walls of Exhibition as representative of the State. These are beautifully finished, of excellent wool and splendid colours. One of the most historic carpets in India is in the possession of His Highness the Maharaja of this State, and it has been utilised time and again in the carpets that are produced.....

"Bikaner : has, through the enlightened action of His Highness the Maharaja, attained a higher position of merit than has been by any of the modern centres of production. The Viena patterns are closely followed, the dyes carefully supervised and the wool used of a superior quality. In fact Bikaner produces the best wool in India, and it is thus pre-eminently suited to become great carpet-weaving centre.

"Ajmer : turns out many excellent carpets and one of the most beautiful rugs in the Exhibition being from there. This is a dark brown or deep maroon with the imperial lily portrayed most vividly in grey and pale yellow."*

95. The above lines clearly point towards the typical patterns woven at Jaipur but by and large the plain western designs as ordered by the users are prepared. The factories, themselves, sometimes prepare designs of their own accord and, when approved, manufacture carpets according to them, but on the whole the industry is influenced by the western taste.

96. Besides the purely artistic considerations about designs, another factor of commercial value is to be considered by the manufacturers. The competition which the Indian

* Handicrafts and Industrial Arts of India - Rustam J. Mehta - 1960 - p. 131

$ Ibid - p. 131

★ Oriental Carpets - John Kimberly Mumford - (from Indian Art at Delhi, 1901-'2-Sir George Watt-1903-p. 443.)

*Indian Art at Delhi, 1901-'2--Sir George Watt-1903-p. 443.

carpets face in the foreign markets and the imposed price-range by the foreign dealers also go a long way in determining the quality and designs of the carpets manufactured in Jaipur. Non-availability of a customer for a quality carpet due to its high price comes in the way of their resorting to such 'adventures'.

97. It is unfortunately true that the art of the carpet-weaver has deteriorated today in almost all parts of the country. If so, the blame lies at the doors of the ignorant customers, for as Sir George Birdwood believed :

> "Few people seem able to realise that when buying oriental carpets they are in fact choosing works of art, and not manufacturer's 'piece goods', produced at competition prices. Formerly the native artist strived his utmost to produce a pleasing design, knowing that the payment he would obtain for his work would depend upon the beauty of its design and super-excellence of fabrication; but now his first thought is to reduce his work to the tariff of charges ruling in the European markets, and to deliver it punctually within the time fixed by the export firms of Calcutta, Madras and Bombay."*

98. Apart from the designs other factors, influencing the quality, depend on the kind of wool used, knots tied in a particular space and the quality of weft thread used along with other considerations. All these factors have to be weighed against the pockets of the users and thus result in influencing the quality of carpets.

99. A cursory glance at the history of carpet-weaving at Jaipur would reveal that the high quality carpets of 350 knots per square inch and above are rarely produced now. The main concentration of work these days is on the quality of 16 and 36 knots per square inch. The quality carpets of 256, 400 and 600 knots per square inch are prepared only at the Central Jail, Jaipur, and rarely by the units in the private sector.

* The Industrial Art of India-Sir George Birdwood-1881.

CHAPTER VI

FINANCE AND MARKETING

Finance

Finance is the backbone of an enterprise. It is required for equipment including machines, tools, buildings, etc. and also for purchase of raw materials and for wages of the labour. The following table gives an idea of both types of capital viz. the fixed capital and the circulating capital invested in each unit of the industry at Jaipur:

	Name of the Firm	Capital Invested (in ,000 Rs.)		
		Fixed	Circulating	Total
1.	Krishna Kapoor & Co.	200	200	400
2.	Indian Woollen Carpet Co.	50	150	200
3.	East India Carpet Co.	100	150	250
4.	Prabhakar & Sons	150	100	250
5.	Central Jail, Jaipur	40	25	65
	Total	540	625	1,165

From the above table, it is evident that the average investment per establishment in private sector comes to Rs. 275,000 out of which Rs. 125,000 are invested as fixed capital and Rs. 150,000 as circulating capital.

101. According to the survery conducted by the All India Handicrafts Board, the total capital invested in the then 7 units of carpet industry at Jaipur was valued at Rs.7 lakhs, out of which Rs. 4 lakhs were invested as fixed capital and Rs. 3 lakhs as circulating capital. Thus the average investment for one unit came to Rs. 1 lakh, out of which Rs. 58,000 were invested as fixed capital and Rs. 42,000 as circulating capital.

102. A large percentage i. e. 99.92% of the total investment is subscribed by the owners and shareholders and only a meagre amount is raised through loans. A firm had taken a loan of Rs. 30,000 from the State Government about 2 years ago and Rs. 20,000 have already been repaid towards it. The interest on this loan is paid at the rate of 3% per annum. Most of the firms cannot avail of the Government facilities for loans as they are advanced only against security of immovable property which they do not possess. The need of the hour seems to be that the Government should advance loans to the factories on the basis of their assets and goodwill.

103. The following table shows the expenditure on various factors of production in carpet-weaving at Jaipur:

Factor of Production	Percentage of Expenditure
1. Raw materials	63
2. Labour	24
3. Transportation (including freight and insurance charges)	1
4. Expenditure on rent, interest, insurance, office establishment and publicity	6
5. Entrepreneur's profits	6
Total	100

The above conclusions have been deduced on the basis of average expenditure but it is worth mentioning that the expenditure on raw materials and wages vary with the quality of the carpet. For example, in high quality carpets share of labour forms as much as 45% of the total expenditure while for raw materials it comes down to 44%. In plain carpets the expenditure on raw materials is more than the wages of the labourers. Expenditure on other factors remains almost static.

Marketing

104. For the timely disposal of the finished products concerted efforts are required on the part of the producer. He should acquaint himself with the preferences of the consumers and adjust the production accordingly.

105. Different procedures for marketing are adopted by the private as well as the public sector. Each process is discussed separately.

106. (A) Marketing by the Private Sector: Most of the carpets produced in the various units at Jaipur are sold in foreign markets and only a small portion of the total output is sold in India.

107. The factories receive orders from the foreign dealers and carpets are manufactured according to these orders. Sometimes they do prepare carpets of standard specifications of Indian designs of their own accord. On the basis of the data collected, it can be concluded that 85% of the articles are prepared according to orders from abroad specifying exact requirements and business terms and only 15% are manufactured by the factories on their own, partly to meet the demand of the home market and partly to make some of their designs popular in foreign markets.

108. For purposes of transportation the carpets are rolled and not folded. This has been preferred because it eliminates the formation of folding marks, which mar the beauty and show of the delicate articles to a considerable extent. The rolled carpets are covered with water proof paper and carefully wrapped and sewn in *tat* (jute covering). The rolled bales are then marked with some special signs so as to avoid dislocation in transit.

109. The general practice adopted by the firms is that they send goods to the forwarding and clearing agents at the ports who ship them to the countries concerned and receive commission in lieu of their services. The whole responsibility lies with them once the goods reach them. The firms also export carpets direct to their overseas agents in the countries concerned. The goods are sent under insurance as a safeguard against their being spoiled or lost in transit. On the whole, no establishment reported any accumulation of stocks; their products being taken off as soon as they are ready.

110. Carpets are sent to foreign countries on 'order basis' and not on 'consignment basis'. The latter method was prevalent in the industry before World War II, and under it goods were sent on one's own risk and on arrival they were auctioned publicly in foreign markets by their agents.

Advertisement

111. As regards advertisement, these factories get their goods advertised through newspapers and cinema-slides. For example, the East India Carpet Co. and Indian Woollen Carpet Co. get their goods advertised through cinema-slides. The former, with their headquarters at Amritsar, maintain their show rooms at Amritsar and Agra. Recently M/s Prabhakar & Sons has established its well equipped show room at Jaipur. Government emporia and exhibitions also play their part especially in case of carpets manufactured in the jails. Still a concerted effort is required for the promotion of sales in the country so that the industry might compete successfully with other centres of carpet-production in India.

112. Small pieces of carpets are sent to the agents at ports and dealers in foreign countries. These are displayed by them in their show-rooms. Orders are booked by them and sent to the producers mentioning the designs and other specifications.

Export Promotion

113. As the major demand is confined to foreign countries, more attention is required to be focused on export. The small samples sent to the agents abroad free of cost for publicity are able to create new demand to a certain extent.

114. As there is a lot to be done in this direction the Central Government is also paying attention to it. Importance of a serious effort in this direction is clear from the following statement

of Shri D.N. Saraf, which he gave while presiding over the meeting of the Wool Sectional Committee of the Indian Standard Institute, New Delhi, on 23th May, 1961 :

> "The prospects of the entire carpet industry very much depend on one aspect and that is production of quality goods both for internal consumption and for export. We are anxious about the quality as well as the costs to compete in the foreign markets. It is gratifying to note that as much as 90 percent of the carpets produced in centres, such as Bhadohi, Mirzapur, Agra, Jaipur, etc. are exported. In order to maintain our foreign market and to compete with other foreign manufacturers, it is necessary to export carpets of standard quality. The sub-standard goods will never generate confidence in the foreign buyers and as such great emphasis should be laid on the production of standard goods."

115. The Indian Standard Institute has fixed standards for the carpets in respect of the system of knotting and weaving, knots per 100 square centimeters (or square inch), depth of pile, weight per square meter (or square yard), proportion of the weight of pile-yarn to the weight of carpet, proportion of wool in the pile-yarn, colour fastness, etc. and gradation is made according to the certificates granted by the Institute. It gives consideration to the matters regarding gradation, labelling, packing, marking etc. also. The manufacturers are required to give all the details of the articles sent by them to be approved, such as samples of the yarn of different types used, actual method of weaving, colour fastness etc.

116. Inspite of all the steps recommended by the Institute, many problems remain unsolved. A few of them may be enumerated here :

(i) As the industury is purely a cottage one scattered over a wide area, it would be impracticable to implement any rigid method of grading therein.

(ii) It would be impossible to dissect any samples from the carpets as the same would render the carpets useless and unsaleable. Sometimes the carpets cost more than Rs. 3,000 each.

(iii) On account of the special nature of the industry, occasional structural defects in carpets cannot be avoided. If even after repair they cannot be removed, the articles have to be shipped as 'seconds'.

(iv) Fixing a weight per sq. meter or sq. yard has got its practical difficulties. It is rather impossible to find out the weight of the carpet correct to the nearest fraction.

(v) It is very difficult to ascertain the correct proportion of weight of pile yarn in a carpet. The quantity of weft used in the carpet varies from carpet to carpet even in the same quality as the proportions differ with the depth of the pile.

117. Even though the above mentioned points pose a problem, the Institute has been able to do considerable work in standardising and improving the quality of the articles for export.

118. It is a matter of pride for the Indian producers that they have been able to command foreign markets. Wrong goods cannot be, however, allowed to be circulated in the foreign markets

119. (B) Marketing by the Central Jail, Jaipur : There is no problem of marketing as goods are prepared according to the orders received from indivisuals or from the Government. Some carpets of exceptionally good quality are also prepared and sent to the Jail depot, Government emporia and also to various exhibitions. The Central Jail factory is going to have an exclusive section in the Handicraft Emporium in Jaipur, which will help in popularising its products. A discount of 15% is given for Government orders on standard rates.

120. The Jaipur carpet industry prepares carpets worth Rs. 955,000 annually. The following table gives the annual production of all the units in Jaipur for the last 5 years :

Year	Annual Production of the Firms (in ,000 Rs.)						
	Krishna Kapoor & Co.	East India Carpet Co.	Indian Woollen Carpet Co.	Prabhakar and Sons	Total	Central Jail	Grand Total
1. 1958-59	300	Not avilable as it	90	52	542	22	564
2. 1959-60	250	is sold by their	110	150	610	20	630
3. 1960-61	350	H.O. at Amritsar.	125	192	767	47	814
4. 1961-62	300	Average produc-	120	285	805	76	881
5. 1962-63	290	tion 100	115	350	855	95	950
Total	1,490	500	560	1,029	3,579	260	3,839

If an average annual production is calculated from the above table, it comes to Rs. 767,000. Average annual production for the private sector comes to Rs. 894,750.

121. The following table gives the distribution of sales in various areas :

Area of Sale	Percentage of Total Sale
1. Local (Jaipur city)	5
2. Rajasthan (excluding Jaipur city)	2
3. Sales at important centres in India outside the State	60
4. Foreign countries (direct sales)	33
Total	100

Most of the 60% of the production, sold to Bombay, Calcutta and Madras businessmen, is exported to dealers in foreign countries and hence foreign sales amount to not less than 85% of the total production.

122. If an attempt is made to divide the annual production into various qualities, the following results will follow :

Quality of Carpet Produced	Percentage of Total Production
1. With less than 16 and 16 knots per sq. inch	19
2. With 16 to 36 knots per sq. inch	30
3. Above 36 knots per sq. inch	51
Total	100

As is evident from the above table, most of the firms are concentrating on low quality products. High quality carpets are produced by the Central Jail, Jaipur. Average price per square yard for the carpets, by the private units, comes to Rs. 45 but it varies from unit to unit. It is Rs. 60 for Messrs. Prabhakar and Sons, and Messrs. East India Carpet Co., and Rs. 50 for Messrs. Krishna Kapoor & Co., while it is only Rs. 25 in case of Messrs. Indian Woollen Carpet Co.

123. On the basis of designs, the whole production can be divided in the following manner :

Nature of Carpets	Percentage of Total Production
1. Plain without any design	50
2. Medium variety with designs scattered over corners and borders of the carpet	35
3. Better variety with designs spread all over the carpet	15
Total	100

It is evident from the above table that foreign markets are influencing the industry to a great extent. Plain designs, popular in western countries, form 50% of the total production.

124. Foreign influence is evident in another respect also. As the season for sales of carpets in western countries is from September to January, it results in concentration of production of carpets during the months of February to September.

CHAPTER VII

PROBLEMS OF THE CRAFT AND ITS FUTURE

Procurement of Raw Materials

Except the present emergency when the Government has diverted the supply of wool for defence purposes, the industry did not face any difficulty in the past in the procurement of raw materials. Coarse wool is available in plenty. Finer wool is, however, taken away by businessmen for hosiery making.

126. There is a complaint that evenly spun good quality mill-spun yarn is not easily available. For example, yarn of 80 counts may be having 40, 60, 100 and 120 counts also. This is the result of using condemned machinery in the spinning of yarn for carpet industry. The margin of profit for carpet yarn is about 20% while hosiery yarn yields cent per cent profit to the mills. The use of inferior quality yarn necessarily lowers the quality of carpets.

Training of Artisans

127. The carpet industry, for its operation, requires a very diverse kind of labour, ranging from unskilled coolie labour, for handling raw materials and bales of finished products, to the highest artistic and technical skill of the weavers and master weavers. In between them are groups of skilled and semi-skilled workers engaged in various processes such as sorters, carders and spinners and in the actual manufacturing process as weavers, designers and dyers.

128. Training is an essential prerequisite for working in most of the processes of carpet manufacturing. It requires special skill on the part of the workers and unless they have undergone a regular period of training they cannot work in an efficient manner.

129. In the beginning adults and young trainees are kept under master weavers or senior workers who acquaint them with the preliminaries of the craft. The period of apprenticeship differs from individual to individual. For example one can pick up the work of tying the knots within a week and take hardly two months to complete the course while another may have to continue the training for six months. But generally, it takes four to six months for a worker to learn the art. Generally the setting up of the warp on the loom and other more technical and precise work take a much longer time and a weaver becomes a master of the art within a period of 18 months

130. The following table gives the period of training required in the various processes of the work :

Name of the Process	Time taken in Learning		Time required for Efficient Workmanship	
1. Sorting	15	days	1½	months
2. Spinning	1	month	3	months
3. Carding	4	months	7	months
4. Clipping	4	months	8-12	months
5. Weaving				
(a) Knot tying	1	month	3	months
(b) Warping	8	months	1-2	years
6. Dyeing :				
(a) Preparation of dyes	1-2	months	1-2	years
(b) Master dyer	1-2	years	4-5	years
7. Designing :				
(a) Colour work	8	months	1	year
(b) Pencil work	1-2	years	4-6	years
(c) New design work	4-5	years	8-12	years

131. For meeting the increasing demand of carpets in foreign countries, more and more trained workers are required. At present the industry can absorb another 300 workers conveniently and this number can increase further, depending upon the requirements of the market.

132. The shortage of skilled labour was felt in the mid-fifties and the Rajasthan Government was approached to provide facilities for the training of artisans. As a result, a training-cum-production centre for carpets and druggets was established in Jaipur in 1956. The quality of training imparted at the training centre was not upto the mark and the artisans who came out of the centre after completing their training were found far below the standard of skill required by the employers and only a small number could be engaged by the industry. Now the centre has ceased to exist as no provision was made for it in the third development plan.

133. It is suggested that the training should be arranged by the Government in the factories. The candidates should be selected by the Government. Stipends should be given to them for the training period. Efficient training can be imparted only in this manner.

134. Another suggestion in this regard is that women labourers may be profitably employed by the industry, if proper arrangements are made for their training and employment. An experiment made in this direction by one of the firms in the year 1956 proved successful. It was stopped due to lack of separate arrangement for working by the female workers. Except for this difficulty, the female workers could easily pick up work and discharge their duties more efficiently than the male labourers. The employment of cheap female labour will reduce the cost of production.

135. The need for skilled labour is more evident from the fact that the Jaipur manufacturers are getting some of their orders executed through Mirzapur and Bhadohi workers due to lack of skilled labour in Jaipur.

Labour-Employer Relationship

136. The relations between the employers and labour are cordial. There have been no strikes or lock-outs for the last 3 years. The bonus scheme to workers, its prompt and timely payment and advances of loans to them, whenever required, have all contributed in making them happy and contented.

Child Labour

137. Inspite of labour legislation prohibiting the employment of children as workers, the carpet-manufacturing factories are employing many children as weavers. They are shown as trainees while full work is taken from them. They assist the master weaver at the loom in his work who pays a small amount to them. As they are very cheap for both the weaver as well as the employer they are engaged in good number. It is profitable for them also as they are able to earn some amount and at the same time they also learn the art. The practice is, however, not salutary.

Utilisation of Bye-Products

138. The left-overs of the waste wool are used in upholstery of cars, tongas, etc. The upholsterers purchase waste wool from the factories.

Industry and Co-operation

139. An association named 'Rajasthan Carpet Manufacturers' Asssociation' is in existence for the last 30 years. Its sphere is limited to the function of representing the industry as a collective body to the Government. It maintains a liaison between the manufacturers and the Government. It also decides the mode of relationship between its members and the labour employed by them.

140. A labour association named 'Rajasthan Carpet Workers' Union' is in existence. Although all the workers are its members, it has been almost ineffective due to indecisive attitude of the members regarding issues in hand.

Research in the Industry

141. The fixing up of a new loom having 'lever and pully' arrangement devised by Messrs. Prabhakar and Sons, in place of the prevailing one with '*mukrays* and chain system', is under

consideration. This will result in increase of production with an initial expenditure of Rs. 500 per loom in addition to what is incurred on the present loom. This will also mean less of exertion on the part of the weavers who have to pull the *mukrays* with difficulty. This will also remove the defect of uneven breadth of the carpet woven on the present loom and help in weaving carpets with the same breadth throughout.

142. The same unit has also devised a new method of weaving by which ten times the present production will be possible with the same amount of labour and time. This will go a long way in removing the present difficulty of lack of skilled labour available at Jaipur.

Craft and the State

143. The Government can give support in improving the craft by a concerted and helping approach. It is estimated that India gets foreign exchange to the tune of Rs. 5 crores by the export of carpets to foreign countries. In addition to the export promotion the industry has also got high employment potential. On a 9-feet loom, 5 weavers and one master-weaver can get employment directly. Indirect employment for supply of dyed material, woollen yarn, cotton yarn, etc. would involve employment of 12 more people per loom, which would mean that for every loom at least 18 persons will be employed directly and indirectly. From the point of view of investment, the average investment required for a loom is not more than Rs. 4,000. Thus it will be seen that for an investment of merely Rs. 4,000 about 18 people get employment. There is hardly any industry in India which would employ 18 people on a 26 day-month on an investment of Rs. 4,000. If Mirzapur can employ 6 lakh weavers in carpet industry, why not Rajasthan can also, if planned wisely, give employment to many times of workers engaged presently, in a period of 5 to 10 years ?

144. It is an irony of fate that Rajasthan, the largest wool producing State in India, and also the grower of finest wool in the country should be selling most of its raw wool in public auctions in Liverpool, where the machine carpet industries from all over the world buy their requirements of raw wool. With proper planning most of the wool produced in Rajasthan could be converted into carpets and more foreign exchange earned, apart from providing employment to lakhs of persons. It is significant to note that a new State like Pakistan which had no carpet industry of significance until 1948, is now one of the leading exporters of woollen carpets. Pakistan carpets have earned a reputation today which is the envy of Iran, Iraq and Central Asian Countries, which were famous for their Persian carpets from the 15th century. Pakistan carpet industry was planned by Gen. Claude Auchinleck between 1948 and 1952 and today Pakistan employs nearly 4 lakh people in this industry.

145. The following suggestions require immediate consideration for proper rehabilitation of the industry in Rajasthan :

(i) Prompt arrangement may be made for training of artisans. Selection of trainees, fixation of their syllabi and examination of candidates should be done by a committee consisting of representatives of the industry and the Government.

(ii) Government should arrange for the supply of raw materials especially woollen yarn and dyes to the firms at controlled rates. This would result in standardisation and regulation of finished products besides removing the difficulties met by the firms in obtaining raw materials at high costs. To guard against the misuse of raw meterials by the manufacturers i.e. selling them in black market for earning profits, their supply should be adjusted to the needs of individual firms.

(iii) The Government should take steps for establishing the industry near the Ghat gate in Jaipur by providing land to the factories at reasonable instalments. Land is available at the site and most of the working population is also concentrated there. It would help the owners in building their own factories and save a good amount which they have to pay on account of rent as at present. This would also help them in acquiring loans from the Government by meeting

the condition of security of immovable property.

(iv) Quality marking scheme, which the industry is ready to accept, should be introduced. Such a step would ensure against any deterioration in quality which may adversely affect export markets.

(v) The Government should extend its help in introducing traditional Rajasthani designs in Jaipur carpets, by providing guidance in the preparation of such designs. As an experiment, it may initially be started by the Central Jail factory, and further adopted by other units.

(vi) It may be noted here that the rate of sales tax on carpets in Rajasthan is very high in comparison to other States. While there is no sales tax in Madras and it is at the rate of 2% in Andhra Pradesh and Punjab and 3% in the U.P., the rate in Rajasthan is as high as 10%. This should be reduced in fairness to the industry.

(vii) The Government should help in the publicity of Jaipur carpets through the State emporia as it is doing for other handicrafts.

Future

146. The carpet industry has a bright future and prospects of continuous progress if the industry is run on proper lines. Standardisation of products by the firms and a helping hand from the Government are bound to give the much needed impetus to the industry which is bound to become more important as standards of living go up in this country under planned development.

APPENDIX – A

List of the skilled workers

	Name of the worker		Age	Firm in which working
1.	Shri Imamuddin	S/o Deen Mohammed	45	Krishna Kapoor & Co.
2.	Shri Jahir Ahmad	S/o Bashir Khan	35	Krishna Kapoor & Co.
3.	Shri Raghuvar Mistri	S/o Kishan Lal	35	Krishna Kapoor & Co.
4.	Shri Munshi Khan	S/o Chotey Khan	40	Indian Woollen Carpet Co.
5.	Shri Nazir Khan	S/o Roshan Khan	40	Indian Woollen Carpet Co.
6.	Shri Kamruddin	S/o Vahid Mohammed	35	East India Carpet Co.
7.	Shri Prem	S/o Nanag Ram	35	East India Carpet Co.
8.	Shri Alladin	S/o Ghasi Khan	45	East India Carpet Co.
9.	Shri Ahmed Hussain	S/o Nabi Bux	45	Prabhakar & Sons
10.	Shri Deva Ram	S/o Bhanwari Lal	30	Prabhakar & Sons
11.	Shri Gurubachan Singh	S/o Bahadur Singh	25	Central Jail, Jaipur

APPENDIX–B

Cost–sheets of carpets of various qualities

The following four cost-sheets for carpets, produced by the Central Jail, Jaipur, will give an almost fair estimate of costs incurred in preparing carpets of all the four varieties (8 stich, 12 stich, 16 stich and 20 stich), in other units of carpet-manufacturing at Jaipur also if the following points are given due consideration :

1. Labour charges paid to the Jail labour are fixed at Re. 0.75 per day and the daily average of output comes to 4,000 stich a day per head. The private units have to pay between Rs. 1.50 to Rs. 1.70 for the same amount of work. The prison inmates are provided with free boarding and lodging and if this cost is included then it would amount to be the same.

We may very sefely calculate the labour charges for private units to be between $1\frac{1}{2}$ to 2 times of that of the Central Jail.

2. Another factor, although responsible for slight variations in costs of production, is that while the Central Jail purchases raw materials at a fixed price through tenders throughout the year while the price for the private units depends on the market conditions. Sometimes they can save some amount and sometimes they have to pay much.

(1) Cost Sheet of Woollen Carpet of 8×8 Stich (64 knots per sq. inch).
Size – 6′ × 3′
Weight – 14 lbs (6.37 kg)

	Heads of Expenditure		Expenses
1.	60 count hand–spun woollen yarn–10 lbs or 4.54 kg @ Rs. 9.37 per kg	Rs.	42.54
	Wastage 20%	Rs.	8.51
2. (a)	10 counts cotton yarn – $2\frac{1}{2}$ lbs (1.13 kg) @ Rs. 17.90 per bundle of 10 lbs	Rs.	4.47
(b)	6 count cotton yarn-$1\frac{1}{2}$ lbs @ Rs. 15.50 per bundle of 10 lbs	Rs.	2.33
	Wastage $6\frac{1}{4}$%	Rs.	0.43
3. (a)	Dyeing charges of 10 lbs of woollen yarn @ Re. 0.68 per lb	Rs.	6.80
(b)	Dyeing charges of $\frac{1}{2}$ lb cotton yarn @ Re. 0.30 per lb	Rs.	0.15
4.	Labour charges for 32 heads @ Re. 0.75 each per day	Rs.	24.00
	Total	Rs.	89.23
	Extra unforeseen charges	Rs.	10.77
	Grand Total	Rs.	100.00
	Rate per square yard	Rs.	50.00
	Rate per square metre	Rs.	59.80

(2) Cost Sheet of Woollen Carpet of 12 × 12 Stich (144 knots per sq. inch)
Size — 12′ × 12′
Weight 112 lbs (50.80 kg)

		Heads of Expenditure		Expenses
1.		100 count mill-spun woollen yarn-88 lbs or 39.92 kg		
		@ Rs. 14.21 per kg	Rs.	567.26
		Wastage - 18%	Rs.	102.11
2.		14 Count cotton yarn (grey) 24 lbs-(10.09 Kg)		
		@ Rs. 19.62 per bundle of 10 lbs	Rs.	47.09
		Wastage - 6¼%	Rs.	2.94
3.	(a)	Dyeing charges of 88 lbs of woollen yarn		
		@ Re. 0.68 per lb	Rs.	59.84
	(b)	Dyeing charges of 6 lbs of cotton yarn @ Re. 0.30 per lb	Rs.	1.80
4.		Labour charges for 397 heads @ Re. 0.75 each per day	Rs.	297.75
		Total	Rs.	1,078.79
		Extra unforeseen charges	Rs.	25.21
		Grand Total	Rs.	1,104.00
		Rate per square yard	Rs. 69.00	
		Rate per square metre	Rs. 82.52	

(3) Cost Sheet of Woollen Carpet of 16 × 16 Stich (256 knots per sq. inch)
Size - 14′ × 12′
Weight - 140 lbs. (63.60 kg)

		Heads of Expenditure		Expenses
1.		100 Count mill-spun woollen yarn - 104 lbs or 47.173 kg		
		@ Rs. 14.21 per kg	Rs.	670.33
		Wastage - 18%	Rs.	120.66
2.	(a)	20 Count cotton yarn (grey) - 20 lbs (9.0721 kg)		
		@ Rs. 21.31 per bundle of 10 lbs	Rs.	42 62
		Wastage - 6¼%	Rs.	2.67
	(b)	14 Count cotton yarn (grey) 16 lbs (7.257 kg)		
		@ Rs. 91.62 per bundle of 10 lbs	Rs.	31.39
		Wastage - 3⅛%	Rs.	0.98
3.	(a)	Dyeing charges for 104 lbs of woollen yarn		
		@ Re. 0.68 per lb	Rs.	70.72
	(b)	Dyeing charges for 6 lbs of cotton yarn		
		@ Re. 0.30 per lb	Rs.	1.80
4.		Labour charges for 1,000 heads @ Re. 0.75 each per day	Rs.	750.00
		Total	Rs.	1,691.17
		Extra unforeseen charges	Rs.	7.50
		Grand Total	Rs.	1,698.67
		Rate per square yard	Rs. 91.00	
		Rate per square metre	Rs. 108.84	

(4) Costing Sheet of Woollen Carpets of 20 × 20 Stich (400 knots per sq. inch)
Size 12' × 9'
Weight 76½ lbs (34.75 Kgs)

	Head of Expenditure		Expenses	
1.	120 Count hand-spun woollen yarn–54 lbs or 24.494 kg			
	@ Rs. 12 53 per kg		Rs.	307.49
	Wastage 33%		Rs.	92.22
2.	(a) 20 Count cotton yarn (grey)–12 lbs (5.443 kg)			
	@ Rs. 21.31 per bundle of 10 lbs		Rs.	25.57
	Wastage 6¼%		Rs.	1.60
	(b) 14 Count cotton yarn (grey)–1½ lbs (4.763 kg)			
	@ Rs. 19.62 per bundle of 10 lbs		Rs.	20.60
	Wastage 3 1/8%		Rs.	0.64
3.	(a) Dyeing charges of 54 lbs of woollen yarn @ Rs. 0.68 per lb		Rs.	36.72
	(b) Dyeing charges of 3 lbs of cotton yarn @ Rs. 0.30 per lb		Rs.	0.90
4.	Labour charges of 1,065 heads @ Rs. 0.75 each per day		Rs.	798.75
		Total	Rs.	1,284.49
		Extra unforseen charges	Rs.	35.51
		Grand Total	Rs.	1,320.00
	Rate per square yard	Rs. 110.00		
	Rate per square meter	Rs. 131.55		

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TOYS INDUSTRY OF UDAIPUR



A lacquered wooden lamp-stand

CHAPTER I

INTRODUCTION AND HISTORICAL BACKGROUND

NAMED after its founder, Rana Udai Singh, in 1559 A. D., Udaipur, known the world over as the City of Lakes and Palaces, has become a great tourist centre. Among the momentos of his stay in the old Mewar Capital, the visitor carries back with him, almost always, one of the several locally made brightly coloured wooden toys for which the place is justly famous.

2. The wooden toys of Udaipur are famous not only in Rajasthan but in the adjoining States of Madhya Pradesh, Gujarat and Maharashtra also. They are famous for the rich blending of colours, the depth of tone and the fine polish produced by the local turners who form a community of their own, the Kumhawats. Though they trace their origin from Rajputs, Kumhawats are said to be the successors of Kumbhaji, who was a potter by caste. The former assumption seems to be true as their sub-castes still bear Rajput names.

3. Apart from Udaipur, the other centres of wood ornamentation in Rajasthan are Partapgarh, Bassi (a village about 18 kms south of Chittor), Sawai Madhopur and Karauli. The workers at Partapgarh also are Kumhawats while at Bassi about ten households of Suthars and one of Muslims are engaged in it. In Karauli and Sawai-Madhopur some Muslims are engaged in the work. All the above workers are known as Kharadis, as they work on *kharad*, the country lathe.

4. The history of wooden toy-making of Udaipur is shrouded in mystery. According to one belief, the craftsmen are supposed to have learnt the art from some nomadic Muslim families hailing from Hosiarpur in the Punjab who had immigrated into Rajasthan and stayed for sometime in the city. The exact date of their migration is not ascertainable at this distance of time. The Kumhawats in Udaipur took advantage of the stay of these craftsmen in their town and learnt from them full details of their technique. The Hosiarpur Muslims, due to their nomadic habits, however, did not settle down at Udaipur. They went away towards Gujarat via Bassi and Partapgarh, where they halted for some time and trained the local persons, whose descendents are still carrying on the artistic work there.

5. According to the report 'Toys and Leather Shadow Figures of Andhra Pradesh' by the Directorate of Industries and Commerce of that State, some 300 families of artisans from Rajasthan appear to have gone to Kondapalli, 21 kms from Vijaywada, in Krishna district in the year 1362. These artisans are known as 'Arya Kshatriyas' who could very well have been Kumhawat Rajputs. At no other centre in Rajasthan than at Udaipur and Partapgarh are Kumhawats engaged in this craft. The last quarter of the 13th century and early part of the 14th century was a scene of upheavels in Mewar due to attacks on Chittor by Alla-ud-din Khilji and its final seizure by him in the year 1290 A. D. Following the fall of Chittor the grandson of the Rana, Sujunsi, was sent towards the South. Other upheavels also occured during the period and the craftsmen might have migrated from these centres in Mewar to Andhra Pradesh.

6. Almost every artistic industry or craft has been patronised by some important personality or institution but toys of Udaipur are an exception to this rule. It has acquired prominence without any external help, guidance or patronage. The main reasons for its establishment and tremendous progress are availability of raw material, trained labour and wide market. Paradoxically enough, the biggest market for the products is not in the Udaipur city or even in the Rajasthan State but in the adjoining States of Gujarat and Maharastra.

CHAPTER II

THE CRAFT AND THE CRAFTSMEN

The industry at Udaipur provides employment to 82 households comprising of 372 persons. Households of different communities engaged in the craft are denoted in the following table:

	Community	No. of House-holds Engaged	Percentage of Total No. of House-holds Engaged	Number of Persons Engaged			Percentage to Total No. of Persons
				Male	Female	Total	
1.	Kumhawats	55	67.07	134	119	253	68.01
2.	Sindhis	16	19.51	36	30	66	17.74
3.	Bohras	8	9.76	23	18	41	11.02
4.	Non-Bohra Muslims	3	3.66	7	5	12	3.23
	Total	82	100.00	200	172	372	100.00

Kumhawats form the majority of the households. Next in order are Sindhis, Bohras and Muslims. The average size of a household for the industry as a whole comes to 4.57. There is not much variation from this figure if all the communities are taken separately; the average size of a household for Kumhawats is 4.6, while those of Sindhis, Bohras and Muslims is 4.12, 5.12 and 4.00 respectively. Largest household of the industry consists of 12 members while single member households are only 5 in number.

8. The households usually work in their own houses. Some of them work in rented accommodation, while 8 of them, all Sindhis, are engaged by Messrs J. N. Industries and work in their workshop as shown in the following table:

	Nature of Working Place.	No. of House-holds	Percentage to Total No. of Households.
1.	Owned houses	64	78.05
2.	Rented houses	10	12.19
3.	Under employers.	8	9.76
	Total	82	100.00

Hours of work

9. Hours of work differ from worker to worker as all of them work on contract basis. Whatever articles are manufactured by them against the orders of the traders, are given in the evening to the traders and remuneration is taken from them. Even those workers who are engaged by Messrs. J. N. Industries are given work on piece-wage system although their hours of work are regulated by the working hours of the firm viz. from 8 O'clock in the morning to 5 O'clock in the evening with a lunch break from 12 O'clock to 1 O'clock.

10. Usually a worker starts his work in the morning at about 7 O'clock in summer and about 8 O'clock in winter. He continues at it upto 4 or 5 O'clock in the evening with a lunch break ranging from half an hour to one hour. During this period he may also attend to the multifarious household duties, entertain his guests and friends or may take a short nap if so desired. At 4 or 5 O'clock in the evening, the worker winds up his work and goes to the trader to dispose of his finished goods and get work for another day.

11. Working hours of housewives are regulated according to the needs of the household duties attended by them.

Working and Living Conditions

12. The working and living conditions of various communities engaged in the industry are described below :

(i) *Kumhawats* : The Kumhawats engaged in the craft are all concentrated in a locality known as 'Kharadibada'. It is a low lying area devoid of any drainage system. There are neither proper streets nor roads in this locality. During the rainy season this area is filled with water. Consequently there is a lot of mud and mosquitoes breed, rendering the surroundings most unhealthy. The houses in which they live are small and made of mud wall and thatched roofs. There is a lot of congestion in the houses and, due to their insanitary habits and want of education, their condition is fast deteriorating. They have been leading a life of abject poverty.

The Kumhawats live in joint families. Generally their houses serve as residence-cum-workshops. All the members of the family, male and female, are engaged in the craft. Every adult member is provided with a separate *kharad* (lathe). When a child is born in the family a new *kharad* is added in his or her name. When a girl is married, the one fact which receives the greatest consideration by the bridegsoom's family is whether she is able to manage her *kharad* skillfully and whether she is capable of augmenting the family income by practising the craft.

The Kumhawats form a distinct community. They do not marry outside their caste. They observe the usual customs prevalent among the Hindus on occasions of birth, marriage and death.

Apart from the various gods on whom the Hindus in general rely, the Kumhawats have their own deities, the chief among them being the 'Roudi Mata' the 'Chouth Mata' the 'Amba Mata' and the 'Chamunda Mata'. They offer animal sacrifices i. e. of goats to the two last named deities. Hanuman is also offered special worship. On the Purnima day they hold the *katha* of Satyanarain. They sometimes arrange the recitals of Ramayana and Shrimad Bhagwat also.

The craft is proving advantageous to the joint family system among the Kumhawats. Increase in the number of members means increase in the income of the household. It is especially so in case of female members. If there are more female members the household duties are shared equally or discharged by rotation and more time is spared for the work on *kharad* resulting in increase of the income of the family.

All the Kumhawat population in Udaipur is engaged in the work. With the spread of education some of the youngsters, about 5, have shifted to more profitable jobs but their wives still continue to work in the joint family occupation. These youngsters are also adopted to the craft and in spare time or on holidays contiune to work.

There is no specialisation of work amongst the members of a household except that cutting and shaping of wood, required in different sizes, is done by male members only. All the other processes are carried out by both male and female members. The females are as efficient in the craft as their male counterparts.

(ii) *Sindhis* : They have picked up the work recently. They were trained in the work by Messrs. J. N. Industries. Some of them are still continuing work with the firm, while others have started their own business independently.

Only the male members of these families are engaged in the craft as against all members of families among the Kumhawats. They live scattered all over the city.

(iii) *Muslims* : They are also engaged in the craft by tradition and, like the Kumhawats, all the family members are engaged in the craft. They are also occupationally known as Kharadis.

There is no distinct feature in their craft which can distinguish them from Kumhawats.

They also believe in the myth that the craft originated from the nomadic Muslim artisans who migrated from Hosiarpur. They learnt the art from the Kumhawats.

The Kumhawats and the Muslims are on good terms. There is a healthy competition between them. They often discuss the technical problems relating to the craft. They too live scattered all over the city.

(iv) *Bohras* : They are exclusively businessmen. They prepare, however, by hand, imitation dry fruits from wood. This work is done by them exclusively. The males do the work at their shops while the female members do it at home.

They live in the locality named 'Bohrawadi.' They are all economically sound. They are not known as Kharadis as the three communities mentioned previously are. They work with hand with the help of some small tools.

Working Force

13. Out of the 82 households with 372 souls, 239 workers consisting of males, females and children (below 16) are engaged in the craft. The following table gives the number of workers engaged community-wise :

Community	No. of House-holds Engaged	Percentage of Total No. of Households Engaged	Persons Engaged				Percentage of Total No. of Persons Engaged
			Males	Females	Children below 16	Total	
1. Kumhawats	55	67.07	86	85	17	188	78.66
2. Sindhis	16	19.51	16	–	–	16	6.70
3. Bohras	8	9.76	13	12	3	28	11.71
4. Non-Bohra Muslims	3	3.66	4	3	–	7	2.93
Total	82	100.00	119	100	20	239	100.00

The working force of 239 persons forms 64.22% of the total population with an average of 2.92 workers per household. It is evident from the above table that Kumhawats form a majority of working population, constitituting 78.66% of the total workers. They are followed by Bohras, Sindhis and Muslims with 11.71, 6.70 and 2.93% of the workers. The low percentage of workers among Sindhis is due to the non-participation of females or children.

14. Although the average of workers per family comes to 2.92 persons yet the number of workers in the households ranges between 1 to 8. The following table depicts this feature of the industry:

Community	Total No. of House-holds	Households Having Number of Workers							
		1	2	3	4	5	6	7	8
1. Kumhawats	55	4	20	10	7	5	4	3	2
2. Sindhis	16	16	–	–	–	–	–	–	–
3. Bohras	8	–	3	1	2	1	1	–	–
4. Non-Bohra Muslims	3	1	–	2	–	–	–	–	–
Total	82	21	23	13	9	6	5	3	2
Percentage	100.00	25.61	28.05	15.85	10.97	7.32	6.10	3.66	2.44

Households having 2 member-workers are on top followed by those having more member workers. The percentage of single-member-worker households is, howevee, high. The large number of such households is due to the fact that it includes 16 households of Sindhis. If households with 1 to 4 workers are taken together they form more than 80% of the total number of households.

Economic Conditions of the Workers

15. The daily income of a skilled worker varies between Rs. 2.50 to Rs. 4.00. It is Re. 00.50 to Rs. 1.50 for female workers while for children it ranges between Re. 00.25 to Re. 00.75.

16. The average number of workers per family, as stated above, comes to 3 (2.84 to be exact). If we take one male, one female and one child worker comprising these three workers and take their daily mean incomes as base, a clear picture of the economic condition of the family will come out. The mean income for male workers will, thus, come to Rs. 3.25, for female Re. 1.00 and for children it will be Re. 00 50. The total income for such an average family of 3 workers, will come to Rs. 4.75 resulting in a monthly income of more than Rs. 140. If a margin is given for 4 non-working days in a month, this average will come to Rs. 120 a month.

17. Now, in the light of above facts, the average size of a household in the industry may be considered. As recorded previously, it comes to more than 4 persons viz 4.57 persons per family. After giving these latitudes in number of workers and size of a family in a household one arrives at a figure of Rs. 30 per member per month which can be rightly said to be the maximum.

18. The Kumhawats indulge in a lot of expenditure on ceremonies relating to marriage and death. On these occasions they hold community feast which put a great strain on their economy and heap debts on them.

19. The result of their economic backwardness is that the Kumhawats are in a much depressed condition. They are not in a position to start their own business independently. They are always in the clutches of the agents who advance them money. Each day a worker takes his articles to the agent, who is generally a member of the Bohra community, and has to accept the amount that is assessed by the agent, howsoever inadequate it may be.

20. Whenever a death occurs in a hosehold the work stops for 12 days. The family having nothing to fall back upon, the only alternative left to it is to have recourse to the money-lender who advances it at an exhorbitant rate of interest. During times of illness again, the same is the case. The family members attend on the patient and the work comes to a standstill The result is that most of the Kumhawat households live in a condition of abject poverty. The seriousness of the situation can be gauged from the fact that a worker is not in a position to raise even a petty sum of Rs. 100 for the purchase of tools and implements to start his work independently. Thus, from the very beginning of his career he has to depend on the money-lender for his support and it is impossible for him to get out of his hold.

21. As every member of the household is engaged in the craft, its total income comes to a sizable amount, but the male members of the Kumhawat households are greatly addicted to the evil habit of drinking. A major part of the income derived each day is spent on liquor. Due to this the economic condition of Kumhawat households remains deplorable.

CHAPTER III

RAW MATERIALS AND TOOLS AND IMPLEMENTS

The main reason for the settlement of the toy industry in Udaipur is the easy availability of light wood in the nearby forests at cheap rates and other necessary raw materials in abundance.

23. The following raw materials are used in the making of toys and other articles :

(i) Wood : Wood is the primary and the most important raw material required for the preparation of toys and other articles. The wood of the *khirni* or *dhudhia* tree (Wrightia tinctoria) is used in the craft. It is soft, easy to work on, and specially suitable for doing fine work as there are no fibres in it. The branches of *khirni* tree are long, straight and devoid of knots. The wood being smooth and round, little labour is required for giving it the desired shape on the lathe. *Khirni* wood has a natural light yellowish colour which provides the necessay base for further colouring. There is, moreoverr, elasticity in this wood and so the toys do not easily break even if they fall on the ground from considerable height. The wood is available in abundance in the forests of Ratanpur and Parsad, about 16 to 24 kms from Udaipur. Formerly Bhils used to fetch the wood from the forest, but now, due to restrictions imposed by the State Forest Department, they no longer do so. Now the artisans have themselves to go to the forest and purchase it from the Bhils who fell the trees under the instructions of the Forest Department.

The Kumhawats believe that wood cut during the bright half of a month is liable to be affected by worms. Wood is, therefore, generally cut during the dark half of the month. As soon as it is cut, its bark is removed and and it is allowed to dry in shade.

The *khirni* tree is tall and slender. When a tree grows thicker than about 20 cms in diameter, its wood becomes hollow. Consequently, wood of lesser thickness is used in the craft. The requirements for the entire year are purchased at a time. With the passage of time the wood dries up in the sun and gets seasoned and becomes well suited for the work.

(ii) Lac and Lacquer : Lac is a dark red transparent resin crust which gathers on twigs of certain trees notably *sal* (Shorea robusta) and *dhak* (Butea frondosa) as the result of the gummy excretion from the body of a variety of scale insects.

Lacquer, on the other hand, is a vegetable oleo-resin which naturally exists in a liquid state and is thickened by ashes into a elastic material that can be moulded.

One point in common between the two is that, with the exception of indigo, practically all the other pigments used in the lac and lacquer wares are metallic oxides.

Lac and lacquer both produce very attractive finish. They can be applied with greater rapidity and dried quickly and can resist water to a considerable extent. Lac is available in the form of cakes and is secured from Mirzapur in Madhya Pradesh. Recently the use of lac has decreased as a lot ot time and labour has to be spent in preparing the required material from it. It requires cleaning as it contains impurities. Shellac, which is refined lac, is now preferred. It is prepared by melting lac in cotton bags and straining and thus the refined material drops out into the form of sticks. It is locally available in the market in plenty.

(iii) Colours : Paints required for colouring the articles are prepared by the craftsmen themselves. The pigments employed are orpiment, sulphur, white lead, red mercury, prussian blue, lamp black and indigo. Recently, however, aniline dyes have been adopted, but the delicate artistic

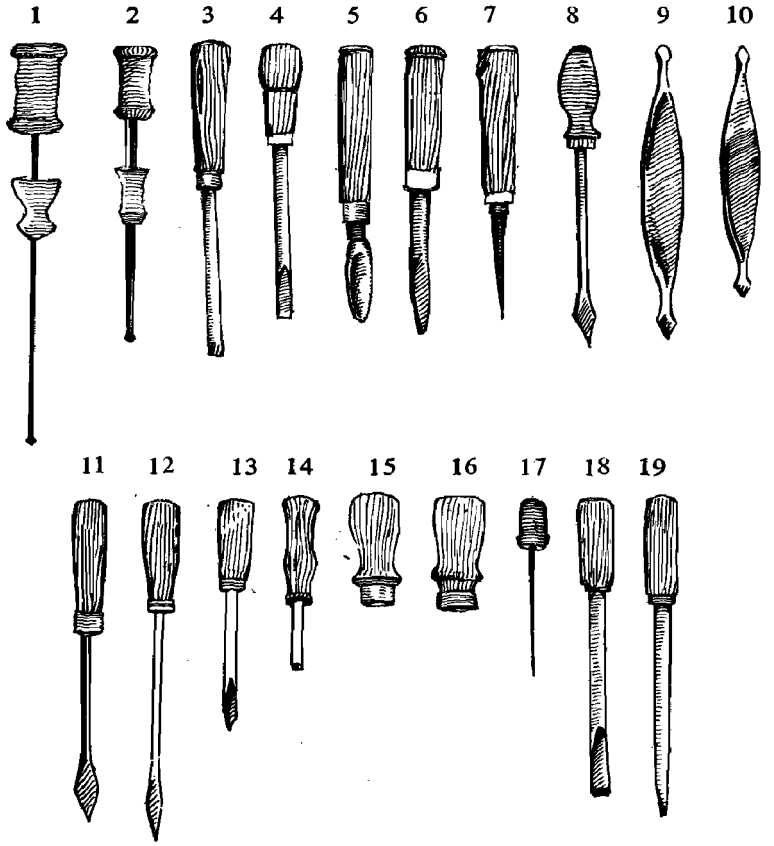


The logs of wood for Toys and other articles



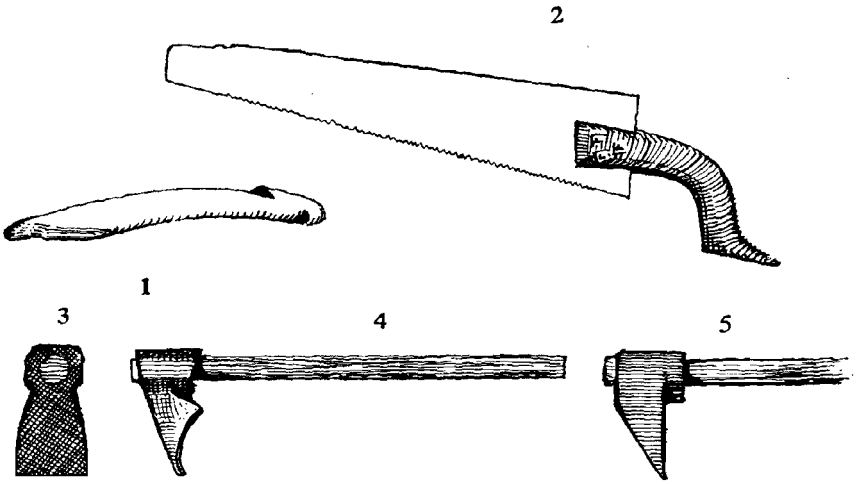
Wood being cut into required size

Scratchers and drillers



1. Burma
2. ,,
3. Bijni
4. ,,
5. Noola
6. ,,
7. ,,
8. Chinari
9. Chodra
10. ,,
11. Chinari
12. ,,
13. ,,
14. ,,
15. Bibdi
16. ,,
17. Burma
18. Chinari
19. ,,

Cutting instruments



1. Hand-saw
2. Adge
3. Basoola
4. ,,
5. ,,

colours produced by the former are not obtained by the latter. The articles coloured by aniline dyes fade and tarnish to such an extent as to render them no more desirable.

Two kinds of colours are used :

(a) Opaque, and

(b) Translucent.

Opaque effects are produced by mixing zinc powder and other colours in shellac. The speciality of this variety lies in the fact that, besides giving a smooth finish to the articles, it produces better shade effects. It, however, involves more labour for the craftsman.

Translucent effects are produced by colours which do not contain zinc powder. This variety is obtained by a simple mixture of shellac and colour. It is used for polishing surfaces showing various designs or scenic forms as well as silver work.

Manipulation : Shellac is held over the fire until it is rendered elastic. It is then placed in a hole in the middle of a smooth stone of the dimensions 30×30 cms. A small quantity of pigment (previously dissolved in water or oil) is also deposited. The hole is closed over and the shellac is vigorously hammered and pulled with the hands until the colour is uniformly mixed. The hammering continues to produce heat as a result of which the mixture gradually assumes the consistency of India rubber. The coloured lac is then formed into sticks of the length and thickness of a lead pencil or many times thicker, as may be desired. These sticks are known as *battis* which are applied to give colour to wood work.

(iv) *Kewara* Leaves (Pandanus or Screw-Pine): *Kewara* is a flowering plant with strong sweet smell. The leaves of this plant are required by the craftsmen to give finish to the coloured products.

Kewara grows in abundance in the marshes that surround the town of Udaipur. Due to the sweet smell of the *Kewara* flower the plants are infested with cobra and there is always a danger of being bitten by them. The collection of *kewara* leaves is, therefore, quite a risky job. Moreover, the leaf bears a row of pointed and sharp thorns on its edges and on the middle vein of the back side. Utmost care has, therefore, to be excercised in plucking thorny leaves. Leaves with breadth of less than 3 cms are of no use to the craft, and only those leaves are utilised which dry upon the plant itself without decomposition. When the leaves are plucked, the thorns are removed from them, and they are arranged in the form of pads and hung on walls for further drying. Whenever the leaves are required for use, they are soaked in water the previous evening. In the morning when work is begun they are placed by the craftsman beneath his seat so that they may become even by his weight. Pads with thickness of about 4 cms are required for polishing the wooden articles. The thicker the leaf, the better are the results produced.

(v) Sand Paper : Paper covered on one side with glass sand is used for smoothening surface of the articles. Sand paper of various gradations viz. very coarse, coarse, medium, fine and superfine is used according to necessity.

Tools and Implements

24. The following tools and implements are required by the craft :

(i) *Kharad* : A *Kharad*, the simplest form of a lathe, is essentially a tool for shaping the articles by holding and revolving them rapidly on an axis against the sharp edge of a cutting tool. *Kharad* comprises of the following parts :

(a) *Khoonta*	(b) *Jeebhi*
(c) *Bayan*	(d) *Ghodi*
(e) *Koodi*	(f) *Bibdi*

Khoonta is a storng wooden peg firmly fixed in the ground. Besides the *khoonta* is fixed another small peg which is locally known as *jeebhi* 'tongue'. The *khoonta* carries aross it a sharply pointed iron spindle, on the live or spur centre of which the wooden piece to be turned is placed. When an artisan is at work the *khoonta* is on his right hand side. On the left hand side of the artisan is placed an 'L' shaped wooden piece which also carries a sharply pointed iron spindle across it. This is known as *bayan* 'left' as it rests on the left hand side of the worker. It can be moved

anywhere along the lathe bed, and can change place at any point. The wooden piece to be worked is fixed between the two points of the *khoonta* and the *bayan*. The spindle of the *bayan* has a semi-circular bend which is meant to accommodate one end of a small piece of wood locally known as *ghodi* 'mare'. This is a device to keep the wooden piece to be worked in proper position which would otherwise quiver or oscillate under the pressure of the cutting thrust. The other end of the *ghodi* is kept pressed by a thick and flat iron piece known as *koodi*. The *koodi* at the other end is placed on the *jeebhi* and it serves as a base on which the cutting tool rests. In order to keep the *bayan* in position a heavy stone-slab is put on it in a slanting position.

(ii) *Biodi* : *Biodi* is a tool in which small pieces of wood can be fitted and its end can be fixed to the pointed end of the spindle of the *khoonta*. This is used as a measure of econmy and to prevent wastage of small pieces of wood which cannot otherwise be worked on the *kharad* and are likely to go waste.

(iii) *Dhooni* or Bow : The wooden piece to be turned is rotated speedily by means of *dhooni* or *kabani* which is made of a slightly curved stick to which a loose cotton string is fastened at both ends. The *dhooni* has a clip at one end which, when pressed, stretches the string and brings it in the working order. Before the wooden piece is fixed on the lathe a single turn of the string is given round it. Forward-backward movements of the *dhooni*, like those made with a hand-saw, rotates the wooden piece on the axis of the *kharad*. The *dhooni* costs aboxt Rs. 3.

A *kharad*, prepared by the local carpenters or the artisans themselves, costs about Rs. 25.

(iv) Cutting instruments : The cutting of wooden pieces on the lathe is done by several cutting instruments which are moved towards the *khoonta* of the lathe so that their leaning will take the cutting thrust. A number of cutting instruments used by the craftsmen are the following :

(a) *Karoti* (Hand-saw) : This is a cutting tool available in various sizes. It consists of a thin blade of steel with an edge bearing a series of sharp teeth. It is used for cutting wood into pieces of required length for preparation of the articles. It is locally available for Rs. 5.

(b) *Basoola* (Adze) : This is a tool for cutting away surface of wood; an axe with sharp edge at right angles to the handle. It is locally manufactured and costs about Rs. 8.

(v) Scrachers and Drillers :

(a) *Novla* : It is an outside bevel gouge used for converting the stockfrom its rough original shape to a cylindrical form. Its cost ranges between Rs. 2.50 and Rs. 3.50.

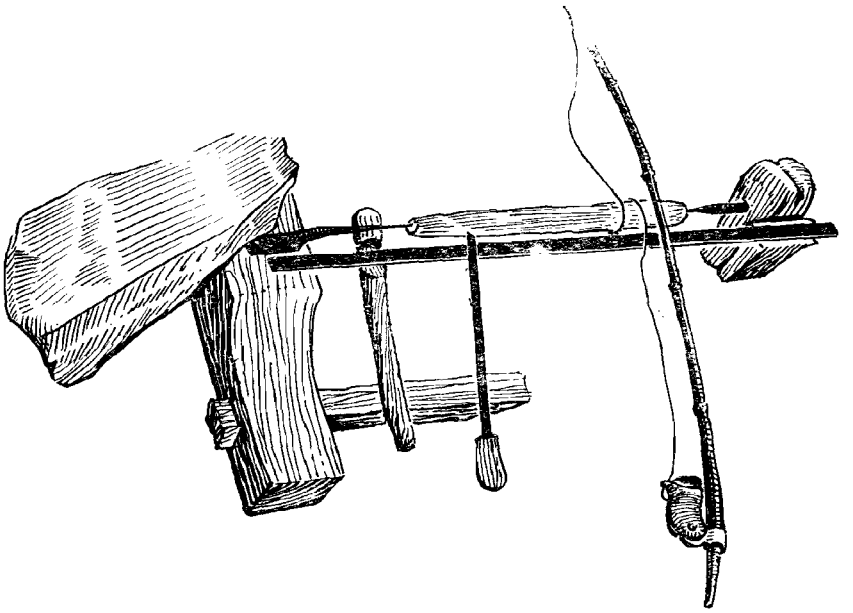
(b) *Beejani* (Chisel) : Chisels are of various types. A skew or shaving chisel is used to obtain a smooth finish after roughing with the gouge. Scraping chisel is employed for both finishing cuts and for grooving the angular cuts. The pasting chisel is generally used for grooving work at points to various definite diameters to serve as a guide in turning, thus eliminating frequent measurement. The chisels are equipped with wooden handles. Each piece of *beejani* costs about Rs. 3.

(c) *Chinari* : This is a special type of chisel used for making lines on the wooden articles. It costs Rs. 3.

(d) *Chodra* : This is another tool resembling a chisel and is used for making the inner sides of the articles hollow, as in the case of cups and is locally availabie for Rs. 3.50.

(e) *Barma* or *Hinyar* (Drill) : This is a tool for boring holes in wood and costs Rs. 3.

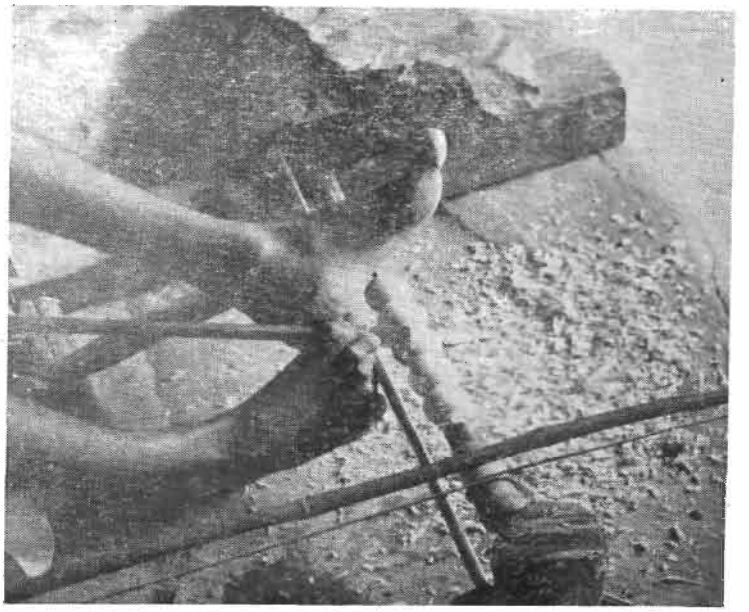
25. The aforesaid tools are made and repaired by the local blacksmiths and carpenters. Expert craftsmen can prepare them for their own use. The entire equipment does not cost more than Rs. 100.



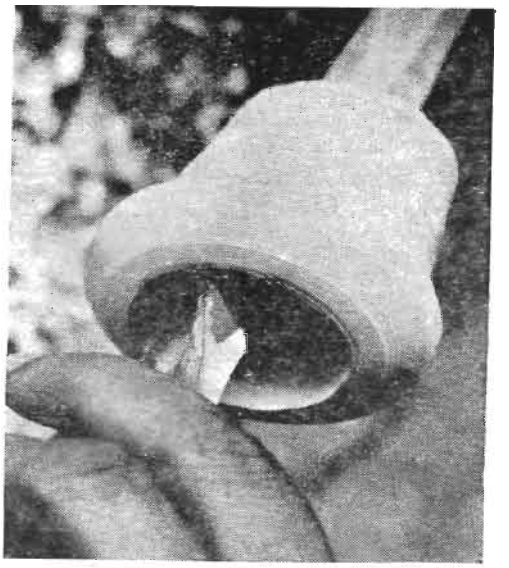
The Kharad (Lathe)



The workman at his lathe



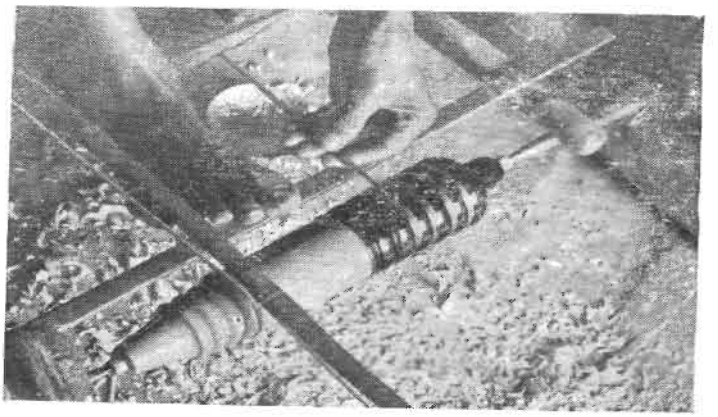
Filing the wood to the required shape



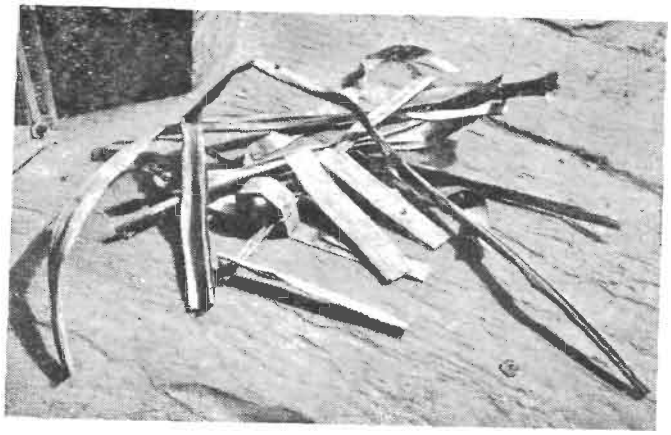
Carving the wood from inside



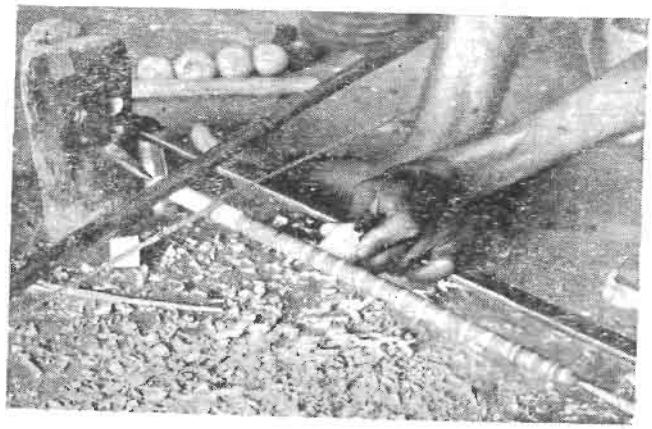
Applying colour to the article on lathe



Working out a design over coloured surface



The Kewara leaves



Kewara leaves being applied to obtain the required smoothness



Members of a household at work

CHAPTER IV

PROCESS OF PRODUCTION

The process of production of toys and artistic articles of wood may be considered in three stages :

Stage I : The wood is cut into pieces of appropriate length by the use of *karoti* (hand-saw) and reduced to the required thickness by means of the *basoola* (adze).

Stage II : Heat is then applied to the piece of wood to make it completely dry. It is then mounted on the *kharad* (lathe), after the string of the *dhooni* is put round it. The craftsman occupies his seat (*tudi*) and holds the *dhooni* in his right hand. By his side lie small pots containing water and oil separately. Water is frequently applied to the string of the *dhooni* to keep it trim. Oil is applied to the pointed ends of the spindles as lubrication. Pressure is applied to the clip of the handle of the *dhooni* so that its string stretches and the tool is brought into working position. A forward and backward movement of the *dhooni* causes the wooden piece to turn rapidly. The craftsman holds the cutting tool (*bijna*) in his left hand which rests on the *koodi* and the right hand guides the cutting edge. When the *dhooni* moves in the opposite direction the chisel is withdrawn from the wooden piece. To ensure an effective cutting, the craftsman uses the big toe of one leg and the heel of the other to give support to the left hand in the operation of the chisel.

That part of the wooden piece which is covered by the string of the *dhooni* remains unexposed to the action of the cutting instrument. It is, therefore, necessary to change its position so that the part of the wood which has remained so far unaffected is also brought under action of the cutting tool.

By applying skilled manipulations in the application of pressure of the sharp edges of the cutting tools over the surface of the wood the craftsman creates articles of exquisite beauty and excellent designs.

Sand paper of appropriate grade is then used to smoothen the surface of the article.

Stage III : The stage is now set for the work of applying colours to the articles. The cutting instruments having played their part are withdrawn and hung at their proper places on the walls of the workshop for the time being. The accessories used in the colouring process consist of an earthen pot containing live charcoal, *battis* of lac and colours of various shades, and the pads of wet leaves of the *kewara* plant. After the articles have been prepared and smoothed, a *batti* is pressed against it as it revolves on the *kharad*. The heat generated melts the lac and colours the wood uniformly. Thin pieces of hard wood are pressed firmly on the revolving article and the colour is effectively diffused. A piece of rag dipped in *til* oil is held against the revolving object when the lac takes a polish which is further given a final finish with the *kewara* leaf. This polish on the article lasts for a long time.

The articles are either uniformly coloured in one shade or ornamented with rings and bands of different colours. In the higher flights of artistic designs created on lac turnery a diversity and richness in effect is produced.

Metallic effects are produced by mixing the lac with powdered mica, powdered tinfoil, imitation gold leaf or amalgam of mercury, lead and tin. These metals, if used in large particles, give a quaint mottled appearance that simulate the grain of stone and produce a rich effect.

27. *Abri* : The craftsman takes in his hands a specially prepared *batti* of red or orange colour.

This is exceptionally hard, sharply pointed and not thicker than a lead pencil. By allowing a red hard oil-*batti* to 'tremble' in the hand and then touch the revolving object interruptedly, numerous irregularly shaped spots are created. By using next a water-prepared big black *batti* of big size and soft texture, black borders are communicated to the red spots. Lastly the intervening spaces are filled by a white water *batti*. By various modifications of the process enumerated above the craftsmen produce many pleasing effects that have given rise to the name *Abri*.

28. *Atishi* or Fire work : The puculiarity of this style is that the article receives a coating of finely divided tinfoil made into a paste with glue, the coating being either uniform or made up of a multitude of minute dots after the fashion of *Abri* work. Over the top of the tin a layer of red or yellow lac is given with the result that the object contains a rich fiery glow. It is then polished on the *kharad* by means of a stone known as *mohra* (a form of agate) which produces so much heat that the lac becomes more transparent than what produced by other method of ornamentation.

29. *Nakkashi* or Pattern work : Of this there are two well marked styles :

Section A : Etched *Nakkashi*

Section B : Scraped *Nakkashi*

In etched *Nakkashi* an object is coated on the *kharad* first with one colour, then over it a second, third or fourth colour is applied, uniformly all over. The *battis* used are for the most part soft and water prepared. The first colour is usually yellow, the next red, followed by green and last of all black, but any assortment or number of colours may be imparted, layer upon layer, the one over the other. With a fine chisel or a small rod, with a pointed end, the lac coated surface is now scratched, the hand being made to move lightly or pressed heavily as may be thought necessary to bring out the colour required from the numerous layers beneath the surface. In this way, upon a black background, yellow stems and leaf stalks, green leaves and red flowers with yellow or part-coloured veins and shades may be elaborated, and floral designs produced in brown and red which manifest a softening and blending of the colours that bespeak of great skill and delicacy of touch. The scrapped *Nakkashi* is an example of *Atishi* ware polished with oil. It has patterns, floral designs, or hunting scenes etc. subsequently worked on the surface. This is accomplished by scratching the lines, loops or patches of the oil varnish and then applying a water prepared *batti* as the article revolves on the *kharad*. The portions scrapped off receive the new colour but none of the intervening oil-varnished spaces do so. The article is oil varnished all over and further portions scrapped off when these in turn are given the further colour desired. This is repeated time after time until the floral and other designs or pictures have every outline and details of colouring imparted to them.

30. Zig-Zag Ornamentation : Occasionally longitudinal and parallel lines are scrapped on a lac-coated surface, one after the other and superfluous colour removed until an article is seen to have a ground with a multitude of lines running over its length. If now it is desired to cause these to become variegated, an eccentric movement is communicated to the *kharad* while a piece of hard wood is pressed firmly against the lac-coating. The result of this is that the straight lines are turned into zig-zag forms.

31. Painted Ornamentation : In this class of work the articles to be ornamented are elaborately smoothed and polished. When sufficiently good surface has been obtained, certain portions, panels and medallions, upon which bunches of flowers, groups of animals or hunting scenes are to be shown, receive a coating of white paint or chalk. The desired illuminations are then made in water colours with a brush and, when quite dry, are covered over with lac dissolved in spirit. The articles are again placed on the *kharad* and the designs completed by one or all the methods of ordinary lac ornamentation.

32. Tinfoil Ornamentation : A fragment of coloured lac is placed on a sheet of tinfoil and held over mild fire until the lac completely covers the

spot. Tinfoil colour in this form is regularly sold and employed as an adjunct to ornamental turnery. Spools and shutters, especially flat surfaces, that can not be treated on the *kharad*, are ornamented by clipping up coloured or plain tinfoil into various shapes and forms and gumming them as desired, over the surfaces. When the pattern has been completed, the surface is painted with a spirit-and-lac varnish or, if capable of treatment on *kharad*, covered in the ordinary way. By colouring the yellow varnish the tinfoil shows up as if it were in gold.

33. Imitation Dry Fruits : Udaipur is also famous for its imitation dry fruits made of wood. Betal nuts, cardamom, raisin, *munakka* (dry grapes), pistachio, almond, apricot, walnut etc. are all prepared from *khirni* wood. They are exactly like the real dry fruits so much so that one is easily deceived by their appearance.

34. The imitation dry fruits are, however, not prepared by the Kumhawats. They are manufactured by members of the Bohra community exclusively . They prepare these articles in their shops while transacting other business at the same time. At their house their women folk also prepare these articles in their spare time. Small pieces of *khirni* wood are taken and they are cut to the required size by the skilled Bohras with the help of small files which are only instruments required for giving shape. When they are cut and shaped into the proper form the articles are coloured with the help of pastel colours and placed in small plates for sale.

CHAPTER V

BEAUTY AND UTILITY OF FINISHED PRODUCTS

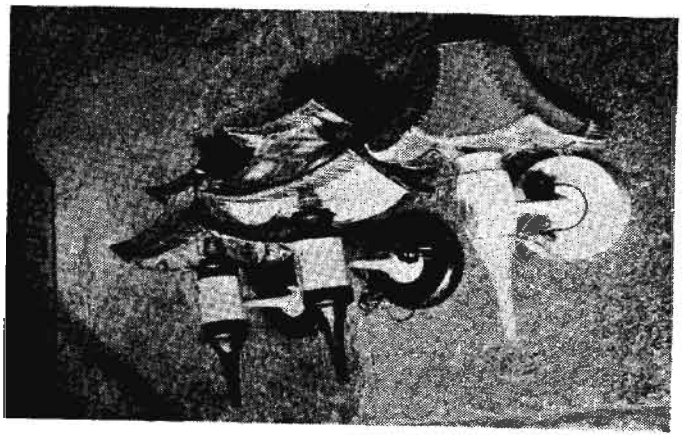
There is a formidable list of the articles prepared by Kumhawat artisans of Udaipur. They can be classified under two heads (*a*) toys and (*b*) other articles for decoration and utility. Some of these artistic articles are named below :

Toys

1 Aeroplane
2 Ball (Ordinary)
3 Ball (Bajnewala)
4 Bat-Ball (Ornamented)
5 Chidiya Gadi
(A Cart drawn by a Sparrow)
6 Choosani
7 Danda (Rod)
8 Locomotive (Small)
9 Locomotive (Medium)
10 Locomotive (Large)
11 Firkani (Spinner)
12 Counting Stand
13 Gilli Danda
14 Ghughra (Rattler)
15 Ghodi Palna
(Cradle on Stand)
16 Gramophone
17 Jeep
18 Lattoo (Top)
19 Kitchen set
20 Motor Car
21 Mogra Box (Toilet)
22 Pankha (Hand fan)
23 Pankha
(Hand fan) Ornamented
24 Thali (Plate)
25 Tokri (Basket)
26 Telephone
27 Ghantaghar
(Clock Tower)
28 Chakki (Mill) Small
29 Chakki (Mill) Large
30 Cup-Ball (Ornamented)

Other Articles

1 Agarbatti (Incense stick) stand
2 Belan (Roller pins used for making Chapaties-Gujarati)
3 Belan (Large)
4 Belan (for making Papdi)
5 Belan Lathia (White)
6 Belan (Ornamented)
7 Burani
8 Chakla-Belan (Large)
9 Chouper set
10 Chouper set (Small)
11 Chouper set (Medium)
12 Chouper set (Large)
13 Flower Pot (Small)
14 Flower Pot (Large)
15 Flower Pot (With Glass)
16 Flower Pot (Very small)
17 Gulab Dani (Sprinkler)
18 Gasbatti (Gas lanteren) Small
19 Gasbatti (Gas lanteren) Large
20 Glass (Tumbler) Lota
21 Handle (With Rope)
22 Kunkwati (Toilet)
23 Pankha (Hand fan-double)
24 Powder Box (Small)
25 Powder Box (Large)
26 Powder Box (Largest)
27 Pullung (Bedstead) Small
28 Pullung (Bedstead) Large
29 Wine glasses (Small)
30 Wine glasses (Large)
31 Table lamp (Small)
32 Table lamp (Medium)
33 Table lamp (Large)
34 Table lamp (Largest)
35 Singardan (Toilet Box)

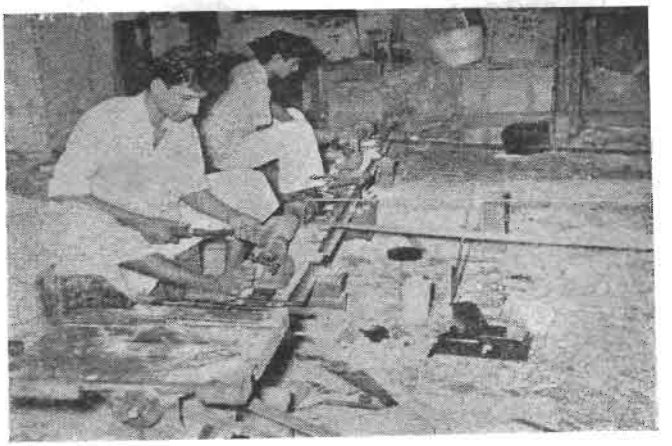




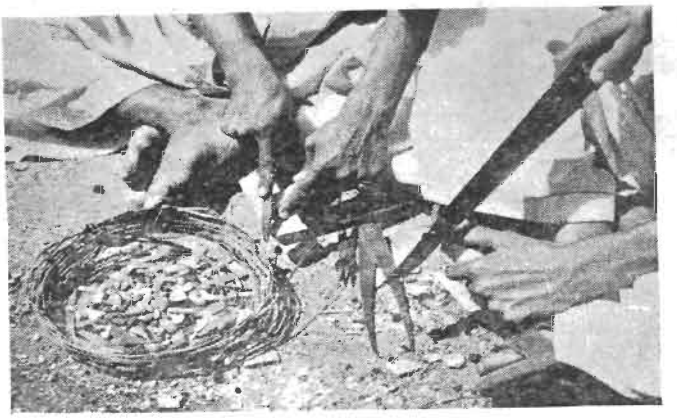


Wall Lamps & Toys

Beautiful specimens of the industry



Workers on lathe in a power driven factory



The Bohras making wooden
miniatures of dry fruits



A view of a shop showing a rich assortment
of products of the industry



Workers at Bassi



Toys and other artistic wood work are very attractive and command market. It is due to fine colouring and attractive finish of these articles that they are in great demand. It is really surprising how the multicoloured articles are prepared with exquisite dexterity and elaborate shadings. Floral designs, hunting scenes, mythological stories, birds and beasts, articles of every day use and numerous other articles of beauty provide motifs to the craftsmen. The designs vary with their instincts and the religious feelings of the people. It is, however, plain lac work which is mostly in demand because it is cheap and durable.

36. There is no specialisation or emphasis on production of any particular variety of articles by the different households engaged in the craft. All items are prepared by them as and when they are asked to do so by the dealers. Their work depends on the demand for the particular items which the businessmen order them to prepare.

37. Apart from the toys various articles of utility such as trays, boxes, chess and *chauper* sets, electric lamp stands, wall-lamps etc. are notable for their exquisite beauty.

38. The imitation dry fruits prepared by the Bohras of Udaipur have their own artistic value. They are a speciality which is not found elsewhere.

39. Bassi Work : The wood work of Bassi in Chittor District is also famous for its artistic beauty. A reference has already been made to the Muslims of Hoshiarpur who stayed for sometime at this place on their way to Gujarat. The local artisans have since then practised the art with great proficiency. Toys of numerous kinds, wooden *chowkis* (locally known as *bajote*), *toran* and *thambh* (articles indispensable at marriage ceremony) swings, *chopras* (boxes used for keeping the red vermilion to be used on ceremonial occasions) in the shape of peacocks and betel leaves, bed posts, idols of Issar and Gangore and the wooden statues of kings and queen, to be used in the puppet show are all manufactured wonderfully well. The technique is the same as prevalent at Udaipur. The articles look almost living as the motifs are derived from nature and life. Bassi also occupies a place of pride so far as the artistic wood work of Rajasthan is concerned. It is, however, to be noted that Bassi, being a village situated in a corner, away from bigger towns, has not commanded wide market as articles made at Udaipur have done. Its products are sold in the nearby villages, and only a few are sent to Chittor and Bhilwara.

40. Here it is worthwhile to mention that while in the case of Udaipur the industry has to meet demand of urban population, the Bassi artisans have to satisfy that of the rural folks.The articles prepared at Bassi, are mostly utility goods.

CHAPTER VI

FINANCE AND MARKETING

Finance

A reference has already been made to the economic condition of the members of the Kumhawat community, who are the main manufacturers of wooden toys and other artistic wood work in Udaipur. The entire community is dependent on the local Bohras for finance. The Bohras control the entire trade of wood craft.

42. The artisans themselves are so poor that it is difficult for them to raise even a small capital of Rs. 100, required initially to start work on an independent basis. Each one of them is already indebted to one or the other of the Bohra money-lenders. A craftsman takes the day's production in the afternoon to the Bohra agent and receives payment for his articles from him. The Bohra lends raw materials to the worker and, hence, the worker is obliged to sell his products to him. It is obvious that the Bohras charge higher price for the raw materials and make payments for the finished goods at rates far below the market selling price. Thus the workers are exploited on both counts.

43. The Bohras advance loans not only for the craft, but also to meet the ordinary demands and social and religious ceremonies of the workers. The loans are advanced at a very high rate which varies from 5 to 10% per month, The poor debtor seldom comes out of the money-lender's clutches and the loans pass on from generation to generation.

44. An analysis of the total cost of the finished articles brings out the following facts. 40% of the total cost is spent on the price of wood, 25% on colouring materials and the balance of 35% falls to the lot of the craftsmen as wages.* The details of expenditure in completing the finished articles has been given in the following table:

Head of Expenditure	Percentage of Total Expenditure
1. Raw materials	55
2. Wages	20
3. Marketing and other expenses	10
4. Profit of the dealers	15
Total	100

Marketing

45. The finished articles are sold in Rajasthan and other parts of India by Bohras. The State Government purchases goods worth Rs. 10,000 per annum on tender basis from them. The Bohras send finished articles to important cities such as Jaipur, Jodhpur and Ahmedabad where there is a great demand for them. More than 50% of the entire production is dispatched to Ahmedabad from where it is sent to the principal cities of Gujarat and Maharastra.

46. The daily production of goods is estimated at Rs. 500 and the value of annual production is Rs. 2 lakhs. The following table based on figures obtained from the dealers,@ gives the percentage of sales of toys in the country:

Region of Sale	Percentage of Total Sales
1. Local sales	35
2. Other places in Rajasthan	6
3. Gujarat	55
4. Other places	4
Total	100

47. A concern known as Messrs. J. N. Industries, Udaipur, was established more than a decade ago by a Sindhi displaced businessman and

* Appendix–D, @ Appendix – B

it turns out, by power-driven lathes, 25% of the total goods prepared at Udaipur. This process is, in essence, based on the indigenous method of the Kumhawat craftsmen, but the main difference lies in the fact that the lathe is worked by power. In the year 1954, a scheme for training the workers engaged in this craft was launched by this firm in collaboration with the Central Government. The course was of one year's duration. Government had sanctioned stipends of Rs. 30 each to the trainees and, apart from that, a tuition fee of Rs. 10 per pupil was paid by the Government to the concern. This scheme lasted for 6 years from 1954 to 1959, during which period 100 persons were trained. Out of the hundred persons so trained, ten have started their own independent work of toy making. Eight have become employees of the firm. The rest 82 could not make any headway and have, therefore, taken to other occupations. Only 18 were absorbed in the industry and 82 joined other jobs. The scheme has proved a failure.

48. The quality of the products manufactured by the above mentioned firm is not in any way better than of articles produced by the local artisans. Moreover, articles prepared on *kharad* by hand by the Kumhawat craftsmen have their own charm and beauty. Its products are, however, comparatively cheaper.

CHAPTER VII

PROBLEMS OF THE CRAFT AND ITS FUTURE

Procurement of Raw Materials

The principal raw material required is *khirni* wood, which is available in the forests near Udaipur. Recently the State Government has imposed a tax of Rs. 7 per ton on the import of this wood to the city presumably on the basis that there is a considerable scope for revenue in the trade of wood work. This has created difficulties for the artisans. The imposition of tax has consequently hit the industry hard. The cost of production has gone up but the return to the workers remains almost the same. The dependence of the worker on the Bohra tradesmen has put him in a miserable position. He is deprived of the whatever little freedom he had of bargaining with the Bohra dealer. He is paid a price far below the normal for the finished article whereas he is required to pay a higher price for the wood given to him due to the tax imposed by the State Government.

50 There is no difficulty regarding other raw materials used in this craft which are freely available in the market.

Production

51 The recent advent of machinery in the industry in the field of production of toys in Udaipur has introduced an element of competition which is going heavily against the production of wooden toys by the indigenous method. Toys mass-produced by the firm J. N. Industries, although not of the high quality as prepared by the Kumhawat artisans on their hand lathes, are cheaper. Cheaper rate of production, improved management, larger finance and better business contacts are helpful in increasing the quantity of production. Bulk production at cheaper rates, due to power driven lathes, has raised the firm to a domineering position in the market. It is unfortunate that the indigenous industry, which needs and deserves all patronage and support of the State, is being gradually ousted by the firm.

Finance

52 The problem of finance is the most important one which is proving to be the greatest hinderance in the work of amelioration of the economic distress of the craftsmen. Their main financiers are the Bohras, and as has been already shown, it is difficult for the Kumhawats to get out of their clutches. The formation of a cooperative society is an obvious solution, but under the existing circumstances even that is not a realistic suggestion. Both the factions, headed by the *Patels*, of the Kumhawats formed a cooperative society 5 years ago but only 18 members joined it by purchasing shares. The society could not be registered as they fought over the election of the chairman. Each group had equal number of members and wanted to have the chairman from their own group. The election of the chairman is still pending and there is no further progress. Illiteracy, factionalism and groupism have not allowed the society to be registered. Added to the rivalry between the two groups headed by two *panchas* is the interest of the Bohra tradesmen whose monopoly of the industry will be at stake if the scheme materialised.

Marketing

53 There is a lot of scope for improvement in the marketing facilities of the products of the industry. Adequate publicity is required before sale. Although the Government of Rajasthan is doing something in the direction through the handicrafts emporia at Jaipur and Delhi, concerted efforts appear to be necessary to give wider publicity to the products of Udaipur.

Training and Designs

54 The traditional method of training workers at present prevalent in the house

hold requires to be improved upon by making suitable arrangement for systematic training in designing and production. On account of their conservative habits and traditional backwardness and illiteracy, Kumhawats themselves can not make much headway in this direction. The same old designs which were in vogue generations ago are still current. Only recently a few craftsmen have taken up the manufacture of attractive articles such as electric lamp stands, toilet boxes etc. which are becoming quite popular. New designs are very important to save the craft from extinction.

Future

55 The future of the wood craft industry at Udaipur is not bright at present. It is closely linked with the future of Kumhawat community which is engaged in it. If the economic condition of the workers goes on deteriorating the future would indeed be dark and the time may not be very distant when they will be altogether ousted from the field by mechanical process that has come into the field. It is, therefore, very necessary that arrangements be made for imparting education to the children of the Kumhawat community and vigorous efforts made to train them in designs and improved art of production. They should also be made alive of the evils of drinking and gambling and exhorted to lead sober lives. Side by side it is necessary to effect improvement in the designs of the articles and maintenance of a higher standard of efficiency of the products, organisation of better market facilities and a wide publicity of finished goods. These steps may ensure stability. Attempt should also be made to produce, on a large scale, articles such as the pedestal lamp stands, trays and other attractive things which may compete with the articles of the same type manufactured elsewhere in the country. Their artistic beauty, durability and reasonableness in price may create a vast opening and widen the scope for future development.

APPENDIX A

List of the skilled workers

1.	Shri Baluji	(54)
2.	Shri Kaluram	(25)
3.	Shri Kishanlal	(30)
4.	Shri Peeru	(45)
5.	Shri Mathuralal	(30)
6.	Shri Kewalram	(25)
7.	Shri Padamchand	(27)
8.	Shri Khuman	(45)
9.	Shri Jairam	(45)
10.	Shri Chokchand	(50)

APPENDIX B

List of the deale

1. Messrs. Tayyabi Toy Industries, Udaipur.
2. Messrs. J. N. Industries, Udaipur.
3. Messrs. J. P. Industries, Udaipur.
4. Messrs. Sharaf Ali, Udaipur.
5. Messrs. Abdul Husaini (Husaini Stores), Udaipur.
6. Messrs. Rajasthan Toy Industries, Udaipur.
7. Messrs. Udaipur Khilona Stores, Udaipur.

APPENDIX C

Price list of some articles

	Article	Per	Cost (Rs.)		Article	Per	Cost (Rs.)
1.	Agarbatti Stand (small)	Doz.	0.95	42.	Ghughra (small)	Doz.	1.25
2.	-do- (ornamented)	,,	2.50	43.	-do- (silken)	,,	1.25
3.	Aeroplane (small)	,,	5.50	44.	-do- (small-ornamented)	,,	2.25
4.	-do- (ornamented)	,,	7.50	45.	-do- (large-ornamented)	,,	3.75
5.	-do- (large)	,,	15.00	46.	Ghodi Palna	,,	15.00
6.	Belan (Gujarati)	100	15.00	47.	Gasbatti (small)	,,	24.00
7.	-do- (large)	Doz.	2.50	48.	-do- (large)	,,	36.00
8.	-do- (for papdi)	100	15.00	49.	Gramophone	,,	0.95
9.	-do- Lathia (white)	Doz.	2.50	50.	Gilas lota	100	5.00
10.	-do- (ornamented)	,,	3.75	51.	Handie with rope	Doz.	3.00
11.	-do- (for papdi-ornamented)	,,	2.50	52.	Jeep	,,	1.90
12.	Burni	Pair	0.95	53.	Kitchen set (small)	,,	15.00
13.	Ball thos (small)	100	3.75	54.	-do- (in box)	,,	21.00
14.	-do- (large)	100	5.75	55.	Latto (small)	,,	1.50
15.	Ball bajnewale (small)	Doz.	1.90	56.	-do- (medium)	,,	2.25
16.	-do- (large)	,,	3.75	57.	-do- (large)	,,	3.50
17.	Bat Ball (small-ornamented)	,,	7.00	58.	Motor car	,,	1.90
18.	Cup Ball (ornamented)	,,	3.75	59.	Pankha small (ornamented)	,,	7.50
19.	Chakki (small)	,,	0.75	60.	-do- Double (ornamented)	,,	15.00
20.	-do- (large)	,,	0.95	61.	Powder Box (small)	,,	5.25
21.	Chakla	,,	1.00	62.	-do- (large)	,,	7.50
22.	-do- with legs	,,	1.40	63.	-do- (largest)	,,	12.00
23.	Chidiya Gadi	,,	9.00	64.	Pullung (small)	,,	7.50
24.	Choosni (small)	100	2.50	65.	-do- (large)	,,	15.50
25.	-do- (large)	,,	3.50	66.	Thali (small)	,,	3.75
26.	Dry fruits	Gross	1.90	67.	-do- (medium)	,,	7.50
27.	Danda (small)	Pair	2.25	68.	-do- (large)	,,	11.00
28.	-do- (large)	,,	3.75	69.	-do- (largest)	,,	13.00
29.	Locomotive (small)	Doz.	1.25	70.	Tokri (small)	,,	7.50
30.	-do- (medium)	,,	1.40	71.	-do- (medium)	,,	11.00
31.	-do- (large)	,,	9.40	72.	-do- (large)	,,	13.00
32.	Firkani (small)	100	2.50	73.	Wine glass (small)	,,	1.40
33.	-do- (large)	,,	3.50	74.	-do- (large)	,,	1.90
34.	Flower pot (small-ornamented)	Pair	1.25	75.	Table lamp (small)	,,	15.00
35.	-do- (large)	,,	1.50	76.	-do- (medium)	,,	15.00
36.	-do- (with glass)	,,	2.00	77.	-do- (large)	,,	18.00
37.	Counting stand (small)	Doz.	7.50	78.	-do- (largest)	,,	22.00
38.	-do- (large)	,,	15.00	79.	Telephone	,,	22.00
39.	Gulab Dani	,,	3.75	80.	Singardan	,,	60.00
40.	Gilli-Danda (small)	,,	1.50	81.	Pankha (plain)	,,	5.00
41.	-do- (large)	,,	3.75	82.	Ghantaghar	,,	12.00

APPENDIX D

Cost analysis of some of the articles per dozen

Items	Aeroplane (large) Rs.	Engine (large) Rs.	Kitchen set (12 pieces) Rs.	Table lamp Rs.
1. Raw Materials				
a. Wood	7.00	4.00	7.50	8.50
b. Colour	0.50	0.50	0.50	0.50
c. Lac	0.50	0.50	0.50	0.50
d. *Kewra* leaf	0.25	0.25	0.25	0.40
Total for 1	8.25	5.25	8.75	9.90
2. Wages	3.00	2.00	3.00	3.60
3. Marketing and other expences.	1.50	0.75	1.50	1.50
4. Profit of the dealer	2.25	1.50	2.25	2.50
Total	15.00	9.50	15.50	17.50

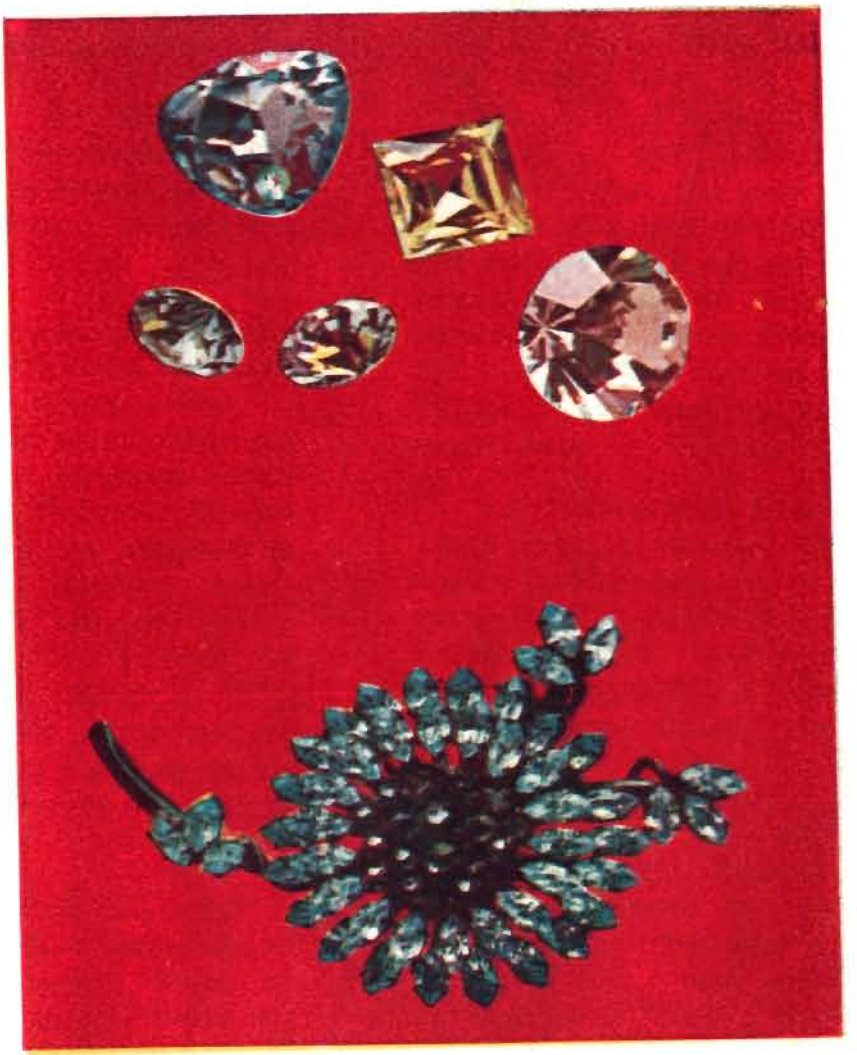
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LAPIDARY WORK
OF
JAIPUR



An assortment of Gems

CHAPTER I

INTRODUCTION AND HISTORICAL BACKGROUND

JAIPUR, named after its founder Sawai Jai Singh II (1699-1743 A. D.), has been a centre of cottage industries since its beginning. The fame of her products has spread all over India and foreign lands. Not long ago, a major portion of the working population of this Pink City was dependent for its living upon these industries.

2. The most important art industries of Jaipur are artistic brasswares, ivory and marble carving, *minakari* or enamelling and ornamentation of gold and cutting and processing of precious and semi-precious stones.

3. The British rulers in India were deeply concerned with the import of finished products from their native land. In the construction of railways and roads in India they were motivated mainly by the consideration of ensuring timely supplies and distribution of finished English products and transportation of raw materials to Britain for feeding those industries. This policy not only threw Indian goods out of foreign markets but also disturbed the balance of industries by depriving the local artisans of their livelihood. But for this policy some of the industries of the country, specially the gem-cutting industry or lapidary, would have made tremendous progress in India.

4. The art of gem-cutting of Jaipur is older even than the city itself. It is characterised by a record of continuous progress since its beginning some three centuries ago at Amber, the then capital of the princely Jaipur State. Like many other artistic industries gem-cutting was granted protection and patronage by the State rulers, who were great connoisseurs of things of art and beauty.

5. Mirza Raja Ram Singh of Amber (1667-1689 A. D.) was the first to make a beginning in the direction of making Jaipur a centre of this industry. Delhi, which had witnessed the rise and fall of many ruling dynasties, had ever remained the home of artists and artisans and it enjoyed unsurpassed fame for manufacture and sale of precious stones. Since the rulers of Jaipur wielded considerable influence at the court of the Mughal Emperors, they could induce the jewellers and artisans to make Amber their home.

6. Mirza Raja Ram Singh was staying in Delhi during his father's (Mirza Raja Jai Singh's) regime and he entered into an agreement with the proprietor of one of the famous firms of royal jewellers there, Messrs. Devidass Gordhandass Mukim. In Samvat 1712 (1655 A.D.) he exchanged *pugree* (head dress) with Seth Gordhandass.[1] In Samvat 1724 (1667 A. D.), i.e. when he ascended the throne of Amber, he invited Seth Gordhandass to come and settle in Amber along with his *karigars* (artisans). The Mukims agreed and came to settle in Amber. Even today the descendents of this Mukim family are top class jewellers. They were followed by many other families from Delhi, Lucknow and Banaras

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The royal firmans granted to Mukim family, now available with their descendents, Messrs. Danmal Basantilal Mukim, Dariba Pan, Jaipur:

[1] "लिखित रामसिंहजी गौरधनदासजी सूं पगड़ी बदली कंवरपदा से तो हमारे वंश इनकी औलाद की गौर न करे तो वो चित्तोड़ मार को पाप। संवत १७१२ कार्तिक सुदी ६"

"On Kartik Shukla 6, Samvat 1712, Prince Ram Singhji exchanged 'pugree' with Gordhandassji and took an oath bringing on himself as well as his successors the duty of taking special care of the family of Seth Gordhandass and his descendents failing which the sin of killing thousands of Hindu soldiers killed in the battle of Haldighati fought between Maharana Pratapsingh, ruler of Mewar, and the royal forces of emperor Akbar, led by Mirja Raja Mansingh of Amber, will fall upon them. It is believed that the sacred thread worn by those killed in the battle weighed 74½ maunds i.e. 27½ quintals."

(Contd...)

The jewellers were granted privileges and facilities from time to time for the growth and development of the industry.[2]

7. In the beginning the jewellers confined their activities to the import and sale of ready-made jewels in Amber. The downfall of the Mughal empire and the insecure conditions created by the raids on Delhi by the Persian, the Jat and the Maratha confederates compelled most of the families of skilled workers there to migrate and settle in Amber where they found a ready market for their skill. The celebrated royal gem-cutters, Mustakim Sheikhs, were the first to start the work.

8. With the shifting of capital from Amber to Jaipur in 1723 A.D. the jewellers and workers also moved to the new capital and they were granted necessary facilities such as free land for residential buildings and import of tax free raw material. Important place-names like Manak Chowk, Moti Katla, Johri Bazar, Jariyon-ka-Rasta and Kashinath Johri-ki-Gali in today's Jaipur show their associations with the gem industry. All the favours were showered on the jewellers by Raja Sawai Jai Singh II who further nourished this infant industry. The Maharaja encouraged this infant art by granting to Seth Poonamchand Mukim, the son of Seth Gordhandass fixed amount of Rs. 1,000 to purchase half of the cloth for his personal dress as a compensation till such time the trade was not found remunerative. Other jewellers were also granted similar concessions and privileges. The same policy of help and guidance by the State was followed by the successive rulers who all took personal interest and adopted all possible measures for the development of the industry.

9. In the reign of Sawai Pratap Singh (1778-1803 A. D.), the grandson of Seth Gordhandass, Seth Nathoolal Mukim, was declared State jeweller, granted 50 bighas of land and vested with judicial powers. Further he was granted Rs. 600 annually and a village in *muafi*. He was placed in-charge of the *Kapardwara* (the State jewellery house) of the State. The Maharaja also granted similar concessions and privileges to other jewellers. For the regulation of trade, it was made compulsory for all the traders to get themselves registered with the *Kapardwara* which used to grant them financial help and purchase their finished goods apart from guiding and regulating the industry. Some rules were also framed by the State for the smooth conduct of the trade. In the Samvat 1873 (1816 A.D.) the number of jewellers was 22. The tax was also levied for the first time and all of them promised to get their goods certified from the *Kapardwara* before sale and pay a tax on it.[3] The Mukim family represented the community.

10. The jewellers formed themselves into a sort of a community association (Panchayat), and in the Samvat 1886 (1829 A.D.) they signed an agreement according to which a new entrant to the trade was required to pay Rs. 125 to the Maharaja as *nazar* and entertain the community panchayat to a feast.[4]

11. Other measures were also taken to regulate the number of the *Karigars* (craftsmen) and rules were framed. Only family members of

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[2] "अतथे खातिर राख देश में वणज करो थाने व थांकी औलाद जो देश में व हजूर में व्यापार करे त्यांने हांसल माफ फरमायो छ और खास पौशाक फ़रमाई छ। संवत् १७३१ माघ बदि ३"

"On Magh Krishna 3, Samvat 1731, Seth Gordhandass was requested to do business in the State, he and his descendents were exempted from taxation. He was also granted robes of honour."

[3] "लिखित समस्त जौहरी अत्र बीवते का माल को सदावछ चुके छै सो माल दखियात कर बेचस्यां। मिती प्रथम सावण सुदी ७ संवत् १८७३ और सदा बन्दजयकी जो माल ठीक छ सो जाहिर कर बेचस्यां"

[4] "और गंगादासजी जौहरी छै और वा जीता छै वह तो रहसी। सीवाय जौहरी होसी सो पंच्यां को गोठ देसी और दरबार का नजरानी का रु० १२५) देसी। कार्तिक सुदी ६ संवत् १८८६"

the original Sheikh workers from Delhi known as *begaris** were allowed to follow the profession. Others had to obtain permission from the *Kapardwara* and pay a *nazrana* for each new entrant. Their wages were decided by the State from time to time and only authorised persons were allowed to work as brokers.

12. The period of prosperity, which lasted upto the year 1947, was disturbed after the death of Maharaja Sawai Madho Singh, in the year 1922. A council was set up for the minor prince to discharge the duties of guardian. It imposed an ad-valorem duty of Re. 1 and as. 9 (Rs. 1.56) on the sale of jewels valued Rs. 100. It was so resented by the jewellers that the work was brought to a stand still for a period of about one year as a protest and no levy could be collected. Representations were made by the jewellers through their Association founded in the year 1928. It is to be remembered in this connection that one of the factors responsible for the progress of the trade was the immunity from any other tax met with wherever the trade was practised. It enabled the Jaipur traders to favourably compete with others in the country. In the end it was decided between the State and the jewellers that the Association should pay an amount of Rs. 16,000 annually to the State by collecting it from among its members. It was in 1931 that His Highness Maharaja Sawai Man Singh abolished this levy.

*The word 'begari' is supposed to be the corrupt form of the Sanskrit word 'Vaikatik' meaning the gem-cutter.

13. By this time, the industry had well developed and was having trade with foreign countries like the U.K., the U.S.A., France, Japan and Germany. The other factor for the progress of the industry was easy import of raw materials. The jewellers of Jaipur imported emerald from U. S. S. R., South and East Africa, and South America; ruby from Burma and Panama; and synthetic stones from Switzerland.

14. The World War II dealt a heavy blow to the industry. Its demand decreased in belligerent countries and it became difficult to import raw materials. Germany and Japan were declared enemy countries and the import of raw materials from the U.S.A., the U.S.S.R. and France became difficult. Due to the War, mining of ruby in Burma was completely stopped as it became a field of war. The economy of India was geared to war purposes and the export and import policy was subordinated to the needs of the war. The lapidary industry had to be content with the existing stocks and whatever new stones could be procured within the country.

15. This marked the decline of the industry. It could not recover from the severe set-backs due to the War. Even after attainment of independence in 1947, foreign exchange problem posed a big threat. The import of the raw materials for the industry was considerably curtailed by the Government. Not only had the free flow of precious stones stopped, but the severe restrictions on imports and exports encouraged smuggling of gems and production of sub-standard goods.

CHAPTER II

THE CRAFT AND THE CRAFTSMEN

Characteristics of the Craft

Every craft or artistic industry has its own peculiar features and characteristics. Before an attempt is made to deal with the conditions prevailing in the gem cutting industry and its workers in Jaipur, the salient features of the industry may be touched upon. They are as follows:

(i) Secrecy of trade: The traders seldom give out secrets of the trade. It is difficult to assess the value of their assets and the source of obtaining the precious stones.

(ii) Heredity in trade : Dealers whose families have been following this trade for generations have great credit in the market and they control the trade to a great extent for they are most skilled and experienced in the work of differentiation and evaluation of precious and semi precious stones. Their suggestions and advice are greatly valued by others.

(iii) Absence of a fixed place for trade : The trading centre is not always the shop. The dealers do their business mostly at home where they work on stones. They are, however ever ready to contact and strike a bargain at a place desired by their customers.

(iv) Indispensability of brokers: Terms and conditions for the sale of precious stones are settled mostly through the brokers. They play an important part in almost every transaction that takes place for the trade is so organised that it mostly depends on the brokers for its business.

(v) Impossibility of standardisation of the stones: The gems cannot be standardised according to any scale due to variability in their constitution and colours even in the same class. Moreover, value of stone goes on increasing as the raw piece undergoes various stages before it is finally ready for the market. A stone, for example, costing Rs. 500 in raw form may be sold for Rs. 2,000 after cutting and polishing.

(vi) Uncertainty of price: Gems have no fixed price. It depends on the bargaining capacity and knowledge of the buyers and sellers. The price depends also upon their suitability for particular purposes. A stone cut, designed and polished with a particular view may be very costly for one buyer and useless for another.

Employment

17. The present position of the industry is not satisfactory. The number of skilled workers is constantly going down as they find it difficult to maintain themselves with the insufficient income that they usually make from it. There is dearth of quality stones and mostly synthetic stones are imported. At present 80 per cent of the workers are engaged in cutting and processing of synthetic and artificial stones and very few are employed in the cutting of precious stones which are not available in required quantity.

18. The number of households engaged in the industry is 1,333. These consist of both Hindus and Muslims. The following table shows community-wise the number of households engaged in the industry with the number of males and females :

Community	No. of house-holds engaged	Percentage to total No. of house-holds engaged	Males	Females	Persons	Percentage of total persons in the household
Muslims	1,282	96.17	4,057	3,954	8,011	96.15
Hindus	51	3.83	168	153	321	3.85
Total	1,333	100.00	4,225	4,107	8,332	100.00

It is evident from the above table that Muslim households form the majority of the families engaged in the craft, constituting 96.17% of the total households, while Hindus form only 3.83% of the total households. The Muslim workers belong to many sects. The chief among them are Sheikhs, Sipahis, Julahas, Bisayatis, Pannigars, Hiranmars, Khumres, Bhistis, Khairadis, Mahawats etc. Among the Hindu workers no particular cast of workers can be said to be most representative. Malis, Agrawals, Brahmins, Sutars, Jats, and a few others are engaged with having not more than 4 workers each. The average size of a household engaged in the craft comes to 6.25 (8,332 persons for 1,333 households) for the whole of the industry; but it is 6.27 (8,011 persons for 1,282 households) for Muslims and 6.3 (321 persons for 51 households) for Hindus. Single-member households are non-existent while the largest household consists of 14 members.

19. These households are scattered in many *chowkries* (localities) of the city. The following table shows the number of households in various localities engaged in the industry with persons in these households :

Localities	No. of households engaged in the industry	Percentage of total No. of households engaged in the industry	Males	Females	Persons	Percentage of total persons in the households
1. Topkhana Hazuri	690	51.76	2,164	2,147	4,311	51.74
2. Ghatgate	256	19.21	819	782	1,601	19.21
3. Chowkri Ramchandraji	151	11.33	484	459	943	11.32
4. Bas	80	6.00	264	237	501	6.01
5. Other localities	156	11.70	494	482	976	11.72
Total	1,333	100.00	4,225	4,107	8,332	100.00

The above table clearly reveals that the highest concentration of households is in Topkhana Hazuri which forms 51.76% of the total households. It is followed by Ghatgate, Chowkri Ramchandraji and Bas having 19.21%, 11.33% and 6.00% of the total households engaged in the industry. Other localities form 11.70% of the total households. In the above mentioned localities, there is no particular concentration of a particular sect or caste of workers differentiating from each other. Yet Mahawats, Khumres and Julahas are in majority in Topkhana Hazuri, while Khairadis and Mahawats in Ghatgate and Pannigars in Chowkri Ramchandraji form the majority. Bas has a mixed population of all the sects. While Muslim workers are exclusively residing in these four localities, Hindus are scattered all over the city with no particular locality.

20. The following table shows the total number of workers from 1,333 households engaged in the industry, showing number of workers in these households :

No. of workers from a household.	No. of households	Total No. of workers
1	769	769
2	345	690
3	129	387
4	59	236
5	21	105
6	6	36
7	3	21
8	1	8
Total	1,333	2,252

It is evident from the above table that single-worker families are highest in number. They are followed by two and three-worker families. As the number of members goes on increasing that of households decreases. There is only one eight-worker household in the industry.

21. The following table shows the number of workers community-wise :

	Community	No. of workers	Percentage of total workers
1.	Muslims	2,171	96.41
2.	Hindus	81	3.59
	Total	2,252	100.00

From the above table it is evident that Muslim workers comprise 96.41% of the total number of workers while Hindus form 3.59% of the total working population.

22. The reason for the Muslim majority is that only Muslim workers were brought to Jaipur from different parts of the country and in turn they trained their relatives for the work. On the other hand Hindus regarded this work as below their dignity and did not take it up as a source of livelihood. Most of the Hindu workers are from Gujarat. They came from Cambay to Jaipur about 20-25 years ago. Only a few local Hindus are engaged in the industry.

23. If a comparison were made of the above figures with the Census figures of 1951 and 1961, it will be clear that there is only a slight difference. The following table compares these figures with the Census figures of 1951 and 1961 :

	Nature of figures	No. of workers	Remarks
1.	Survey figures	2,252	
2.	Census figures of 1951 (according to the sub-division 4.04 of occupation classification of District Handbook, Jaipur)	2,377	Difference of only 5.55%
3.	Census figures of 1961		
	(i) According to the Industrial classification code No. 393	5,195	
	(ii) According to National classification of occupations		
	Code Nos. 741 1,531		
	742 3,730	5,261	

The difference between the census figures and survey figures is due to the fact that the census figures had a larger scope. In 1951 census code No. 4.04 covered 'gem setters or precious stone dressers' which included not only the cutters but other workers also. Even then difference between survey figures and Census figures is only 5.55%. In 1961 Census code No. 393 of Industrial classification includes "manufacturers of jewellery, silverware and wares using gold and other precious metals", which is a still broader category than that employed in 1951 Census figures. According to occupational classification, code No. 741 took into account 'Jewellers, goldsmiths and silversmiths' while code No. 742 included 'jewellery engravers'.

24. The workers can be classified into three categories, namely:

1. Employers
2. Own-account workers and
3. Employees or *Karigars.*

(1) Employers : An employer is one who owns a *karkhana* (workshop) and employs workers on wage system. They also supply the *Karigars* with work at their homes.

(2) Own-account workers : Own-account worker is one who operates his work himself without hiring other workers. He owns his own implements and takes work directly from the dealers and not from those classified as employers.

(3) Employees or *karigars* : A *karigar* is a skilled artisan who works for wages. He may work in the work shop established by the employer or at home and tender the finished products to and receive his remuneration from the employer.

25. The following table gives the total number of households and workers of all types employed in the industry :

Nature of workers	No. of house-holds engaged	Percentage of total No. of H. Hs. engaged.	No. of workers engaged	Percentage of total No. of workers engaged
Employers	124	9.30	247	10.97
Own-account workers	892	66.92	1,627	72.25
Employees or *Karigars*	317	23.78	378	16.78
Total	1,333	100.00	2,252	100.00

The above table clearly reveals that own-account workers form the majority constituting 72.25% of the total workers. The *karigars* form 16.78% while the employers are only 10.97% of the total working population.

26. The following table shows the number of the three kinds of workers in various localities of the city :

Locality	Nature of workers						Total No. of households (col. 2+4+6)	Total No. of workers (3+5+7)	Percentage of total workers
	Employers		Own-account workers		*Karigars*				
	No. of H. Hs.	No. of workers	No. of H. Hs.	No. of workers	No. of H. Hs.	No. of workers			
1	2	3	4	5	6	7	8	9	10
1. Topkhana Hazuri	58	118	494	901	138	162	690	1,181	52.44
2. Ghatgate	26	49	150	274	80	96	256	419	18.61
3. Chowkri Ramchandraji	25	51	54	98	72	87	151	236	10.48
4. Bas	5	11	66	121	9	11	80	143	6.35
5. Other Places	10	18	128	233	18	22	156	273	12.12
Total	124	247	892	1,627	317	378	1,333	2,252	100.00

The highest concentration of workers, as revealed by the above table, is in Topkhana Hazuri while the Ghatgate, Chowkari Ramchandraji and Bas return 18.61%, 10.48% and 6.35% of the total working population respectively. Other localities have 12.12% of the total workers.

It is evident from the above table that the work is mostly hereditary as 71.12% of the households are engaged in this work for more than 20 years. They are either employers or own-account workers. *Karigars* are mostly those who have picked up the craft during the last decade.

27. Most of the households have been following the craft for generations as revealed by the following table :

Period of pursuing the work in years	No. of house-holds	Percentage of total No. of households
0 - 5	132	9.91
5 - 10	206	15.45
10 - 15	36	2.70
15 - 20	11	0.82
Above 20	948	71.12
Total	1,333	100.00

28. The total number of persons directly employed in the industry is shown below :

	Workers		No. engaged
1.	Jem-cutters	...	2,252
2.	Engaged in about 250 jewellery concerns at an everage of 4 persons in each concern	...	1,000
3.	Brokers	...	200
	Total		3,452

If the old average of 6 persons per household is taken for these 3,452 workers the total number of dependents on the industry will come to more than 20,000 persons. This number does not include persons engaged in selling goods and abrasives required for the industry, gem-setters, enamellers, ornament makers and others, who are indirectly dependent on this industry.

Housing

29. There can be various criteria for judging the housing conditions of a particular group or class of people. A house should be neat, well-ventilated, commodious and should have the primary amenities such as latrine, bath, kitchen. Here we shall apply all these criteria in judging the housing conditions of the workers engaged in gem-cutting industry.

30. The following table will show the number of households and their title in the houses occupied by them, owned or rented:

Households having	No. of house-holds	Percentage of total No. of households.
Own houses	1,154	86.57
Rented houses	179	13.43
Total	1,333	100.00

Most of the workers have their own houses. The workers, mostly Muslims, have been living in Jaipur for generations. When their forefathers migrated to Jaipur, they were given all the facilities to settle down permanently. Land was allotted to them free of cost and they invested their savings in erecting the structures. Majority of the households having rented buildings are Gujarati workers from Cambay.

31. The idea of ownership taken independently may convey a very high opinion of the housing conditions of the families engaged in gem-cutting industry, but the above impression will be partly belied when we apply the other criterion to their houses viz. whether they are pucka or kutcha. The following table will show the number of households having pucka or kutcha houses :

Households having	No. of house-holds	Percentage of total No. of households
Pucka houses	724	54.31
Kutcha houses	609	45.69
Total	1,333	100.00

32. Number of rooms with a household gives an idea of housing conditions to some extent. The following table shows the distribution of households by the number of rooms at their disposal :

Households having	No. of households	Percentage of total No. of households
One room	1,129	84.70
Two rooms	127	9.53
Three rooms	28	2.10
Four rooms	19	1.42
Five rooms	17	1.27
Six rooms	13	0.98
Total	1,333	100.00

One-room and two-room houses taken together form more than 94% of the total structures. As we have said the average size of a family comes to more than 6 persons, single member households are non-existent and the number of members of a household goes to as high as 14. Keeping in view these facts the accommodation is far from satisfactory.

33. Moreover, necessary amenities such as bathroom, electricity and water supply are rarely found in the houses. Latrines, which have been provided in many houses, due to purdah system, are dirty, dark and dingy.

34. The workers have been living in the remote localities which are not properly looked after by the Municipal Council. Public streets are not cleaned for weeks and there is no arrangement for proper drainage. To some extent workers

are also responsible for the insanitary conditions. They throw refuse, dirt, ash etc. on the streets before their houses. There are numerous mosquito breeding places in their dwellings as well as in the surrounding area. The houses are never white-washed, even for the Diwali.

Working Conditions

35. (i) Place of work : The workers have been doing work either at their residences or in the buildings provided by the employer. Own account-workers execute work either at their houses or in rented houses. The following table will show the number of households and the nature of working place :

Nature of working place	No. of house-holds	Percentage of total No. of households
Households working in own houses	591	44.30
Households working in rented accommodation	601	45.10
Households working in employer's workshop	141	10.60
Households working under cooperation	--	—
Total	1,333	100,00

It is evident from the above table that families working at home amount to 44.3% of the total number af households. Households working independently in rented houses come 45.1%, while those working in employer's workshop are 10.6%. Workers working under a cooporative society are non-existent.

36. If an attempt is made to classify the working places into pucka and kutcha, the following table emerges :

Nature of working place	No. of house-holds	Percentage of total No. of households
Kutcha places	914	68.57
Pucka places	419	31.43
Total	1,333	100.00

It is evident from the table that the working places are deplorable. More than 2/3rd of the total households work in kutcha places.

37. (ii) Hours of work : The working period is 8 hours a day. There is under-employment. If the work is finished earlier on a particular day, the rest of the day is wasted, for it is devoted to depositing the finished articles and procuring orders. The craftsmen work from 8 a. m. to 4.30 p. m. with a break of half an hour at 12 O'clock.

38. (iii) Effects on health : The work produces bad effects on the fingers. As fingers are kept in water for most of the time, it results in skin diseases. Spraying of water during working hours also affects their health in the long run. It strains the eyes. There is, however, no 'cutters' disease which is said to be prevalent in countries elsewhere practising the trade.

39. (iv) Condition of houses : Most of the houses are one-storeyed kutcha houses, covered with tins or thatched roofs. The floor of some houses is made of lime, but in most cases of mud. The rooms are dark and without ventilation. The accommodation is inadequate and many households live in a single room. The general housing condition is thus far from satisfactory.

Economic Conditions of the Workers

40. (i) Method of Payment : Piece-wage method is prevalent in the industry due to the following reasons :

(a) As the work is mostly done by workers independently either at their homes or at rented places, no criteria can be fixed for wages as no supervision is possible.

(b) Various kinds of stones are used in various ways and this negatives all efforts to devise a method of time-wage system.

(c) Due to the efficiency of the worker, the output of work differs from man to man.

(d) Differences also arise in cutting varieties of stones. There is no fixed way of cutting a particular piece. One worker will cut a stone in one way while another worker will adopt another method for cutting the same stone. The price of a finished piece depends on the quality of its cut and polish. Therefore no uniform scale can be devised on time basis.

(e) With the differences in skill, stones and ways of working, it is not possible to devise any scheme of inspection which is the sine-quo-non of time-wage system.

41. All the workers i.e. employers, own-account workers and *karigars* are paid on piece wage system, with a difference that employers make a profit over the payment made to the *karigars*. It is, however, a very nominal profit.

42. (ii) Level of wages : The following table shows the annual income of the workers ;

Type of workers	Annual income of the workers in rupees					Total No. of workers
	Below 360	360-480	480-600	600-720	Above 720	
1. Employers	142	21	21	42	21	247
2. Own-account workers	535	876	107	107	2	1,627
3. *Karigars*	176	176	25	1	–	378
Total	853	1,073	153	150	23	2,252
Percentage	37.88	47.65	6.79	6.66	1.02	100.00

It is evident from the above table that workers earning less than Rs. 480 (Rs. 40 P. M.) are 85.53% of the total number of workers. Those earning more than Rs. 480 but less than Rs. 600 annually come to only 6.79%, while those with Rs. 600 to Rs. 720 annually to 6.66%, those with more than Rs. 720 annually to only 1.02% of the total working population.

43. (iii) Inter-class wage differences : No marked difference is found between the earnings of employers, own-account workers and *Karigars*. As the basis is the efficiency of the worker, no difference between their wages is found because of the fact that they belong to different classes.

44. The income of employers is slightly more than the other two categories because of two reasons. First, they are able to make a little profit as commission from the remuneration they pay to *karigars* employed. Secondly, they augment their income a little more from the work done by the apprentices learning the craft under them. This is not substantial profit. They are, therefore, not economically far better than the other two categories.

45. Efficiency is the main cause of higher income. In order of income, employers are on the top, followed by own-account workers with the *karigars* coming last.

CHAPTER III

RAW MATERIALS, PROPERTIES AND TESTS OF DIFFERENT STONES

Raw Materials

Raw materials required for the industry are either procured from other places in India or imported from foreign countries. The big traders get them from foreign countries while the small traders meet their demand from the local market. For the last five years the jagirdars (State grant-holders) and princes have been disposing of their jewellery. The stones are reshaped and cut according to the demands and the traders secure stones in auctions taking place in the local market. The import of stones from foreign countries is permitted on the guarantee to export the same quantity within a period of six months. The stones used by the workers can be classified as follows :

(i) Precious stones;
(ii) Semi-precious stones and
(iii) Synthetics and artificial stones.

47. (i) Precious stones : With a few exceptions, the precious and semi-precious stones are natural and hence products of an inorganic process. They are composed of the same substance throughout, having definite chemical composition expressable in chemical formulae. "The division between the two is rather arbitrary".* Out of the vast number of natural stones known, however, very few are used for adornment and it is with these that we are mainly concerned. The necessary qualities to make a stone precious are beauty, rarity and hardness. The only fine stones recognised today as precious are diamond, ruby, sapphire, emerald and opal. Pearls and corals are also considered precious on account of their beauty and rarity, although they are products of organic process.

48. (ii) Semi-precious stones: They are also natural stones used in jewellery other than the precious variety. Although they lack the brilliance and 'fire' of precious stones, on account of their unostentatious charm and individuality they very well compete with the precious stones. All these stones are sufficiently attractive for ornamental purposes when suitably cut and polished. They have depth of intrinsic colour and are sufficiently hard to withstand ordinary wear. Under this head the following stones are usually included :

1. Zirconium
2. Topaz
3. Crysoberyl
4. Tourmaline
5. Jade
6. Amethyst
7. Spinal
8. Alexanderate
9. Chrysolite
10. Cat's eye
11. Aquamarine
12. Agate
13. Amber
14. Peridot
15. Felspar
16. Lapislazerette
17. Corundum
18. Zircon
19. Hessonite

49. This division of stones between 'precious' and 'semi-precious' is arbitrary. It may be remembered that a poor specimen of diamond may be worth only a few rupees while a good specimen of alexanderate of the same weight may be worth as many as twenty times a carat to that of diamond. Again, a necklace of a poor quality of emerald may be purchased for a lower amount of money than a necklace of jade. It is, therefore, evident that neither prevailing price not the trend of fashion affects the theoretical distinction between precious and semi-precious stones. The three factors influencing this distinction, as already said, are beauty, rarity and hardness.

50. (iii) Synthetics and artificial stones : Synthetics are manufactured by a process in which the constituent elements of the real stones are so combined that the resulting material has the same composition and physical characteristics as the genuine stones simulated. Synthetic stones are frequently used in moderately expensive jewellery.

*Michael Weinsten—Precious and Semi-precious Stones.

They have several advantages over the purely imitation stones which are products of an artificial process in which glass is usually used. Then they are coloured. This colouring is known as 'pasting'. The use of plastics in imitation non-transparent stones is increasing in importance as they can be easily and cheaply produced, moulded and coloured.

51. The synthetics assumed importance in the year 1904, when a French chemist, named Vernail, succeeded in producing rubies and sapphires by laboratory process. Although synthetics of all the varieties of precious stones have been prepared, the process has proved very expensive and only small crystals are obtainable. The synthetics which require notice are of rubies sapphires in precious stones and spinals in semi-precious category. The synthetic approximating the spinal is marketed under the name of corfundolite. Its properties are the same as that of spinal; but its specific gravity is lower than the genuine stone. The other synthetic stone which demands attention is synthetic emerald although it has not been made its appearance in the market in quantity.

Gem Stones used by Jaipur Industry

52. Brief description of all the stones used by Jaipur craftsmen is given below :

(I) Precious Stones

(1) Diamond (*Heera*) : It is pure carbon and is the most highly priced gem of the hardest substance. It is generally white in colour but is also found in black, brown and yellow colours. Flawless pure white diamond goes by the name of 'first water'. Blue white is most valued. A tinge of yellow diminishes its value. Blue and green are other very rare fancy colours.

Diamond is found in the South Africa, Angola, Australia, Borneo, Brazil, British Guinea, Gold Coast, Tasmania, U. S. A. and U. S. S. R. In India it used to be mined in Golcunda in Andhra Pradesh. These mines are now exhausted. The local industry procures its supplies largely from Panna mines from Madhya Pradesh with a little supply from Africa. Its specific gravity is 3.52, hardness 9 and refractive index 2.42.

The most historical and valuable four diamonds were found in India. Kohinoor (186 carats) valued at one lakh pounds and Pitt (410 carats) costing about four lakh pounds were mined in Golcunda ; Orlaff (194¾ carats) worth £ 90,000 was discovered in Trichnapolly and the Great Mughal (787 carats) was from Colar mines in Mysore.

(2) Ruby (*Manak*) : It is a bright corundum gem. A good size, flawless ruby may be worth more than a diamond of an equal weight. It is red in colour and hard in cutting. Kabul, Siam and Burma were the main suppliers during pre-Independence days. Now-a-days, the supplies are from Burma alone. At one time a 400 carat ruby was found in Burma mines and one of its pieces was sold for Rs. 7 lakhs in Calcutta.*

(3) Emerald (*Panna*) : It belongs to grass green beryl species and is usually flawed. It is green in colour and hard in cutting. This is the most important of the gems cut and polished in Jaipur.

Before 1948 emerald was imported from the South and East Africa, Mexico, Columbia, Madagaskar, Brazil, Peru and U. S. S. R. The U. S. S. R. was the greatest supplier and the Siberian emarald was very much preferred. Now-a-days the industry depends on the reserves of Rajasthan. Udaipur, Bhilwara and Ajmer are the three districts which feed the industry. One mine is at Kalagiwarn in Udaipur district while another is near Bhilwara. The other two places are Rajgarh and Gugra in Ajmer District. The Rajasthan emerald is considered to be inferior. Pure and flawless emerald, however, fetches very high price, but it is almost impossible to find it. Even flawed stones of Rajasthan are quite beautiful and retain their colour in any sort of light. Quite a large number of imitation stones looking like pure emerald in beauty are sold in the market. There is one test to distinguish an imitation class from the pure emerald and that

* Ratna Prakash-Roop Raj Tank Johri, 1959. p.–6.

is by rubbing it on turmeric which changes its colour into red if it is imitation. Its specific gravity is 2.65 to 2.76, hardness 7 to 8 and refractive index 1.56 to 1.58.

Apart from the above mentioned sources, two other varieties of emerald are also found. The first one is known as *Pyalon ka Panna* (cup emeralds). It is said that Humayun had cups of emerald. Pieces of those broken cups are still found. These are considered to be the best type of emeralds. Another variety is known as *Jagat Seth ka Panna* (Jagat Seth's emeralds). It is said that Jagat Seth was a resident of Murshidabad. A foreigner, who had brought with him a large quantity of emeralds, had sold them to Jagat Seth at a very low price. Stones processed from this lot are still available in India and are famous by this name. Both these species of emerald are considered to be best and famous as 'old emeralds'.

At present His Highness of Alwar in Rajasthan possesses an emerald of 365 *rattis* valueing Rs. 30 lakhs. One emerald is with Duke of Davonshire in England. It is the biggest of the emeralds so far found. Its weight is 384 carats and is two inches in height, length and breadth. It is a little defective also.*

(4) Sapphire (*Pukhraj* or *Neelam*) : It also belongs to corundum family. It is a hard stone and is found in two colours yellow and blue. The yellow sapphire is called *Pukhraj* and blue one is known as *Neelam*. It is imported from Burma, Siam and Ceylon. There are very rich sapphire mines in Kashmir. Sapphire cutting is best done in Cambay. The local industry gets a major portion of its supplies from Burma. Its specific gravity is 3.97, hardness 9 and refractive index 1.76 to 1.77.

(5) Pearl (*Moti* or *Mukta*) It is pure calcium. It is imported from Persian Gulf called *Basra Moti* and from Ceylon, Venezuala, Mexico called *Chura Khari*. Major portion of supplies for Jaipur industry is obtained from Bay of Bengal, Darbhanga (Bihar) and Tuticorin (Madras). Pure pearls are obtained from shells. In order to distinguish between cultured and natural pearls they are rubbed with rice. This test enhances the lustre of the natural pearl, while it diminishes the brilliance of the cultured one. One of the best pearls preserved in Moscow named 'Za-Pellegrina' was obtained from India. Another pearl (55$\frac{3}{4}$ carats) from India is with the Henry Philip Pope and its cost is £ 15,000. Its specific gravity is 2.40 to 2.78, and hardness 2.50 to 3.50.

(6) Coral (*Munga*): It is red-brown coloured gem. It is also used in the preparation of ornaments. Its supplies are obtained from France, Australia and England. Its specific gravity is 2.60 to 2.70 and hardness 3.5.

(II) Semi-precious Stones

(1) Amethyst (*Katela*) : It belongs to valuable quality species. It is violet and purple in colour. Germany and Australia were the main suppliers previously, but now the local industry depends almost entirely upon mines in Mysore State. Its specific gravity is 2.66, hardness 7 and refractive index 1.62.

(2) Aquamarine *(Beruj)* : It belongs to beryl family. It has properties of emerald, but is usually flawless when compared with emerald. It is of blue colour and found in Ceylon, U. S. A., U. S. S. R., Brazil and India. Jaipur obtains its supplies from Ceylon and a mine from Salem district in Madras State. Its specific gravity is 2.74, hardness 6 and refractive index 1.42.

(3) Topaz *(Topas)* : It is one of the misnamed stones in jewellery. Everything yellow is called topaz. True topaz is khown as Brazillian topaz. Though in limited quantity, it is imported from Germany and Australia. Its specific gravity is 3.53, hardness 8 and refractive index 1.61.

(4) Spinal (*Naram*) : It is another gem just like topaz and is yellow in colour. It is imported from Germany and Australia. Its specific gravity is 3.60, hardness 8 and refractive index 1.72.

(5) Garnet *(Tamda)* : It is another important gem best cut and polished at Jaipur in

*Ratna Prakash-by Roop Raj Tank Johri-1959 pp. 26-27

the country. It is a dark red transparent stone and found in violet and blue colours also. Sawar mines in Ajmer district in Rajasthan are the main suppliers of garnet to the local industry. Its specific gravity is 3.40, hardness 7.5 and refractive index 1.79.

(6) Lapis lazuli *(Lajbarad)* : This is the most beautiful and eye appealing opaque stone deep blue in colour. Its mixed composition of silicate and sulphur and hardness renders it difficult for drilling. Lapis lazuli is supplied to the local industry by the mines near Badaskhan in Afghanistan, which are the oldest mines in the world. Its specific gravity is 2.40, hardness 5 to 5.5 and refractive index 1.50.

Besides the above mentioned stones Turquoise (S. G/22.6), Jade (S. G./3.3), Opal (S.G. /2.10), Peridot (S. G. /3.3), Turmaline (S.G./ 3.00), Crystolite and Hessonite (S. G./3.55 to 3.67) are other principal semi-precious stones which are processed and polished in Jaipur, but the quantity in which they are imported and finished is very small.

(III) Synthetics

Due to the Government restrictions on import and inadequacy of precious and semi-precious stones, cutting and processing of synthetics has developed in Jaipur. Synthetics have gained much importance in the last decade. They are very easy to work upon and cheap in comparison with real stones. As already said, from the labour point of view, about more than 80% of the working population is engaged in cutting and processing of synthetics.

Formerly Switzerland and France were the main suppliers of synthetics to Jaipur industry but now Germany and U. S. A. have assumed importance.

Gem Stones in Rajasthan

53. India was one of the very few civilized countries which recognised the value of gem stones and some of the best diamonds known to the world were obtained from the diamond bearing localities in South and Central India. The sapphires of Kashmir and emeralds of Rajasthan have been famous for ages. According to geological findings, the following gem stones are found in Rajasthan :

(1) Amethyst : According to Crookshank, there are veins containing amethyst in Singhania area (Jhunjhunu district) and also near Kishangarh (Ajmer district). They have been opened upto certain extent but deserve further prospecting.

(2) Beryl : There are rich deposits of beryl in Sora hills and Taragarh hills of Ajmer, at Bhojpura and Rajmahal in Jaipur district and Jamoli in Udaipur district. It is also reported to be present in Alwar, Dungarpur, Kishangarh, Jodhpur and Tonk areas but no high grade mineral has been located so far and the mines are not of much economic importance.*

(3) Emerald : It is mined in negligible quantity at Kalagawaran and Tekhi (Udaipur district) and Rajgarh and Gugra (Ajmer district). Recently Sir B. C. Roy undertook a survey of all the emerald mines of Udaipur and Ajmer areas. In his opinion Rajasthan possesses rich fields and veins of emerald deposits and they need further exploration. At present the output does not exceed the sale value of Rs. 3 lakhs annually.@

(4) Garnet : It occurs in Ajmer, Jaipur, Tonk and Udaipur districts. Sarwar (near Kishangarh in Ajmer district) Sarwarabad (Tonk district) and Meja mines (near Shakhpura in Bhilwara district) deserve special mention. These mines were yielding good stones but further work on them was suspended because the working cost proved higher than the return from their sale.

(5) Lapis lazuli, Opal and Turqoise : As reported by R. H. Irvine there are traces of rich finds in Ajmer and Shekhawati areas. They have been located in Nagpahar hills and Srinagar (Ajmer district) and Ramgarh (Sikar District). $

* Geological Survey of India, Vol. 86- Rajasthan and Ajmer 1954 pp. 377–401.
@ Ibid.
$ Ibid.

Properties and Tests of Different Stones

54. Test for differentiating the synthetics from the real stones: It is very difficult to differentiate between a real and a synthetic stone and only competent jewellers are able to do it. The following are the main differences between the two :

(1) In synthetic stones the thin linings are small and generally in perfect round shapes while a real stone always possesses regular linings often resembling its original form.

(2) The ingredients of the included matter in a synthetic stone are arranged in a curved formation while in a natural stone this inclusion of the matter would be irregularly distributed.

(3) Stripes, streaks, channels or thread-like parallel lines, though present in both the varieties, differentiate the one from the other. In natural stones these lines are straight while in synthetics they are generally curved.

(4) The peculiar internal optical effect shown by many rubies and sapphires known as 'silk' is not found in synthetic stones.

(5) The difference in the colours is also a differentiating factor. In synthetics colour is too uniform and 'glassy' while in rubies and sapphires it frequently varies in different parts. If bands of colour occur, they are either parallel or irregular but never curved as in the case of synthetic stones.

Nearly all the synthetic stones are imported from France and Germany but Italy, Switzerland and Russia are also producing and exporting synthetics.

55. Artificial stones : There are imitation stones also, prepared from various kinds of glasses, generally foiled or baked with quicksilver. The better qualities contain a large quantity of lead oxide which increases the lustre of the glass. This addition makes the paste very soft and it also becomes tarnished rather quickly so that although a paste has quite a brilliant effect when new, it looses its brilliance after a very short time. The different colours are produced by adding metallic oxides and, in general, the colour is never the same as that of the natural stone imitated.

56. Other varieties : There are some other types of stones which are sold in the market under the name of precious stones. They are neither precious, semi-precious nor wholly imitation. They may be 'doublets' locally known as *dippels* which is a combination of two stones joined together to look like a single stone. The upper half, known as the 'crown' is generally a real stone, but it is based on an imitation stone with similar or deeper colour to that of the 'crown'. In this way, the colour of the doublet is improved though the cost is lessened. Another variety is also prepared by arranging three stones in the same way and it is called as 'triplets' known as *tippels* in the local market. Emeralds, sapphires, rubies and opals are the main varieties which are frequently used in the form of 'doublets' and 'triplets'.

Physical Properties of the Stones

57. The physical properties of a stone include colour, hardness, specific gravity, lustre, cleavage, crystal, form etc. which are discussed as below :

(i) Colour of Stones : As already stated, value of a stone depends on its colour which enhances its beauty and charm but it is not a very reliable guide in determining the value and beauty as stones of the same variety and species are found in various colours and shapes. One talks of only white diamonds yet they are found in black, yellow and brown shades. They are, however, rarely in pink and green shades. The colour of a gem is given due consideration while classifying it and assessing its value.

(ii) Hardness of stones : By hardness is meant the resistance which a stone offers to the separation of its parts. The degree of hardness can be reassured relatively by scratching the mineral which is done by a harder substance.

Mohs' Scale of Hardness : One of the several ways of determining the hardness (designated H)

of a mineral is by testing its resistance to scratching or abrasion. The test is performed by observing if the smooth surface of a mineral of unknown hardness is scratched by a sharp edge or point of a series of minerals or other substances whose hardness is known. Rapid mineral identification is greatly facilitated whenever the approximate hardness is easily determinable.

A series of ten minerals (all common except the last, diamond) has been devised, as an arbitrary scale of reference, against whose hardness the relative hardness of any other species may be checked. The scale of species arranged in order of increasing relative hardness is :*

1. Talc	6. Feldspar
2. Gypsum	7. Quartz
3. Calcite	8. Topaz
4. Flourite	9. Corundum
5. Apatite	10. Diamond

Thus, if a mineral is scratched by feldspar but not by apatite, its H=5.5. It is known as Mohs' scale of hardness, after its originator Friedrich Mohs (*1773–1839*), a German mineralogist, who first revealed it in 1812.

In the determination procedure it is necessary to observe whether the known species is harder and is actually producing a groove, or whether it is softer and is itself being abraded by the unknown to leave a removable mark. If the unknown species is fine grained, friable or pulverulent, the scratch test may only loosen grains from the aggregate without loosing the individual mineral surfaces ; thus certain textures or aggregate forms may hinder or prevent a true hardness determination.

(iii) Cleavage in Stones : By cleavage is meant the tendency of a stone to break in certain directions producing more or less smooth surfaces. This property is directly connected with the crystallographic form of the stone concerned and as such the cleavage is an important quality in the working of such stones. It is so specially in the case of diamond, which, though extremely hard, may easily be cleaved.

(iv) Specific Gravity of Stones (S. G.) : Specific gravity is a sure means of testing the purity of all elements. In simple language relative density or specific gravity is the comparison of the heavyness of a substance with water at 4°C, of course, taking equal volume of each.

There are several methods of finding out the specific gravity of a stone. A comparative method, which is very useful and usually resorted to, in case of small stones, is to immerse the stone in a liquid of known specific gravity. If the stone floated, it must have a lower specific gravity than the liquid ; if it sank, a higher one. The local workers find out the S. G. of a stone by feeling it in their hands. For accurately assessing it the dealers use the scientific methods.

(v) Electrical Properties of Stones : The stones develop and exhibit electric properties also but this cannot be used as a distinguishing factor for a particular stone. Topaz, quartz, diamond and tourmaline develop electricity when heated. Amber becomes negatively charged when rubbed. Some stones exhibit positive electricity when polished and negative electricity when unpolished. Diamond is an exception.

(vi) Effects of Heat on Stones : Most stones are entirely spoilt when subjected to high temperatures. Opal cracks and looses its opalascence, tourmeline becomes electrically charged, amethyst turns into yellow citrine and smoky, quartz turns brown or yellow in colour when heated. Some sards turn to cornelian, while some zircons become white and their lustre is increased on heating. Diamond will burn like charcoal and produce Carbon-di-oxide if strongly heated. Sherry-coloured topaz looses its colour on heating but becomes pink on cooling. Rubies and some other stones display changes in their colours when heated but on cooling regain them. Pearls become brown and get split while amber burns with camphor smell and gives off black fumes.

The effect of heat on a stone depends upon the matter included in it. In case of the

* McGraw Hill - Encyclopaedia of Science and Technology 1960, Vol. 6, p. 337.

intrinsic matter being organic heat completely destroys the original colour, which may return to normal on cooling or may change into a different colour if the included matter is inorganic.

(vii) Optical Properties of Stones ; Colour and transparency are the two chief optical properties of stones. These are the most important for they help us in distinguishing the various stones. Nature works in a wonderfully consistent way and from whatever part of the world a stone is mined, its constituent parts are almost uniform and its optical properties are the same and largely depend upon its original crystal formation. Internal structure is, therefore, the most important part to be considered along with hardness, colour and transparency which are the main properties for identifying a stone. Of these transparency plays a very important part. When light strikes a substance and most of it passes through it, the substance is called transparent. Substances which allow no light to pass are neither transparent nor opaque, but allow some light to pass through and they are called translucent. White light is composed of seven colours viz. red, orange, yellow, green, blue, indigo and violet in varying proportions. These different series of colours form the so called spectrum. When white light is brought into contact with any medium, such as a stone, it is partly absorbed at the surface of the object and partly during transmission through it. The fundamental colour of the stone depends on this process. Generally absorption is selective; certain colours of the spectrum are more strongly absorbed than others. Certain minerals absorb certain colours and the transmitted colours, therefore, vary in different stones. The selective absorption may vary in certain direction in a particular stone itself and for this reason some species appear differently coloured when viewed from different angles, e.g., tourmaline. This property is definitely connected with the molecular formation of the crystal.

Refractive Index (R. I.) : When any incident ray meets the surface of a medium, such as a gem stone, it is bent away from its normal course. The refracted ray makes a definite angle with the normal plane and this angle is found to be constant in each stone and thus this measurement of the angle of refraction provides means of indentifying a particular stone. This is the best and surest method in practice. The series of the angles of incidence are compared with the sine of the angle of refraction and this constant is known as the Refractive Index (R. I.). The constant can be measured and read on an instrument known as 'Refractometer'.

It is to be noted in this connection that certain stones have more than one refractive effect. In double refractive stones, the rays of light split from the incident ray are often differently absorbed and different colours emerge commonly known as 'Dichroism'. It is difficult to analyse the different colours with the naked eye and hence 'spectroscope' is used.

In order to show the effect known as 'dichroism', i. e. the double refraction which shows two colours, strongly or weakly, an instrument known as 'Dichroscope' fitted with iceland spar is used. The 'spar' is a sensitive mineral which exposes the result of refraction. Alexanderate, corundum and tourmaline show strong colours. Chrysoberyl, ruby, emerald, peridot and topaz appear distinct, whereas beryl and blue topaz look weak. Zircon shows no dichroism.

The breaking up of white light by a stone and the production of a visible spectrum is known as 'dispersion' and this power determines the 'fire' of a stone. The 'fire' is strongly seen in diamond, garnet, sapphire and zircon when these stones are properly cut.

(viii) Stones and Rontgen Rays : The effect of Rontgen rays on many stones is interesting and in many instances serves as a test to distinguish the real stone from a simulated one. Certain stones allow the rays to pass through while others absorb them to a certain extent.

Diamond, amber and jet are completely transparent, when these rays are allowed to fall on them. By this means, diamond can be distinguished from pastes (hard and vitreous substance used for making imitation gems) and other white stones.

Similarly ruby and sapphire, being nearly transparent, may be distinguished from other similar coloured stones. Opal and chrysoberyl are less transparent to these rays. All varieties of quartz, felspar, topaz and spodumene are semi-transparent; turquoise, tourmaline, peridot and apatite are nearly opaque and almandine, garnet, beryl, zircon and all forms of glass and pastes are opaque.

58. It will, therefore, be seen that there are many different properties by which stones may be distinguished from each other and at the same time from imitation stones, pastes and synthetics. In short, most reliable tests are the observation of their crystalline shape, hardness, specific gravity and colour, whilst cut stones may be determined by their refractive index, specific gravity, dichroism, hardness and colour, if these properties may be ascertained properly. More than one test should be applied before a decision is taken and it should be remembered that colour alone is the most uncertain guide.

59. After this elementary discussion about the kind and properties of gem stones, an attempt is made in the following pages to mention the important stones used by the local industry and the sources of their procurement.

CHAPTER IV

PROCESS OF PRODUCTION

Gems are processed in order to bring out the best optical effects. Rarely is a precious stone used in its natural form in mounted jewellery for it is often irregular. From mines most of these stones are obtained in the form of pebbles, broken crystals or slabs. Time and weather influence their surface and beauty and their interior colour has to be brought out by washing, cutting, shaping and polishing. Lapidary or gem-cutting is an art of producing beautiful gems from the pieces of unattractive rough natural stones. Considerable skill and experience are required for this art as cleavage, optical properties and hardness have to be considered in giving proportionate and definite shape.

61. Modern stone-cutting is based on the physical properties of a particular stone. Its refraction and dichroic effects are so well understood by the skilled artisans that its facetting and cutting is checked by the eye only and no actual angular measurements are taken. The outcome of a cut stone from a rough stone differs from stone to stone depending on the flaws which may be present in it. As a matter of fact the finished stone is one-third to one-sixth of the size of the natural, original rough piece. The waste material from diamond is used for drilling and as polishing material but faulty material from other stones is practically useless.

62. The local gem-cutting art has undergone a considerable change during the last 50 years. Previous to it, gems with more weight were preferred and this conception affected the fashion and mode of gem-cutting. In those days, after removing the flaws, much care was taken to retain as much weight as possible without giving much consideration to perfection in shape and facetting. A gem with highest weight fetched maximum price. This saving of weight often resulted in not bringing out the best of the stones' refractive and dichroic effects. In modern lapidary art facetting, brilliance, refraction and dichroic effect of the gem are considered and they add to its value.

63. Usually raw stones locally known as *kharad* are to be dipped in different solutions, kept in water for 20 to 24 hours, then washed and dried up and finally oiled. For removing any foreign substance attached to it, the *kharad* is washed with lemon and soda. New *kharad* has to be dipped in this solution only for 3-4 hours, but if it is an old one, it is kept in this solution for 24 hours. They are sorted according to quality and shade and then slitted with pliers or on wheels before they are ready for shaping and polishing. Cutting and shaping is done by workers on grinding wheels. A grinding wheel is commonly a thick disk of stone or other abrasive material, the disk being mounted on a strong shaft and driven round at a controlled speed, either by hand, foot or an electrical motor. Some harder stones require a grinding disk of sapphire and softer stones are cut and shaped on a disk prepared out of corundum and shellac. Polishing is done with the help of *Gawa* which is a sort of stone. In order to bring out the real beauty of the stone by removing foreign matter a sort of mixture is used by the jewellers. While cutting and polishing a stone some foreign substance settles on the stone and as such the use of green leaves of *Ratanjyot* (a herb), copper sulphate and resin mixed with oil is necessary to remove the dryness and foreign matter. This process is known as *Joban* and every jeweller has his own technique of applying it which he generally keeps as a secret.

64. For processing, the method described above is the same for all kinds of stones but the hardness of a particular stone is the only differentiating factor which necessitates the use of different metal wheels and abrasives. There are six distinct stages of processing a stone, as discussed overleaf:

I Stage	--	Cleaning and chipping.
II Stage	—	Sawing.
III Stage	—	Rough grinding.
IV Stage	--	Shaping.
V Stage	--	Facetting.
VI Stage	--	Polishing.

65. The first and the second stages are common in all kinds of stones and are performed on the same wheel, while the remaining four stages differ from stone to stone in one respect or the other as will be clear from the following discussion. Again these last four stages are performed in two ways, namely on vertical or horizontal wheels, which may be called as 'Method A' and 'Method B' respectively for the sake of convenience and comparison.

66. *I Stage*-Cleaning and Chipping: Stones found in natural form have some foreign matter attached to them and chipping is the method by which foreign matter is removed from the body of the stone. It is an easy job done with the help of pliers and small hammers. This work is necessary in the case of natural stones only. The synthetics do not have any foreign matter attached to them.

67. *II Stage*-Sawing: If the rough piece is in large mass having a flaw big enough to mar the beauty of the stone, sawing is resorted to in order to avoid the waste that would be involved in breaking up the piece. However, small pebbles or fragments are not subjected to this treatment and they are put to grinding on the wheels.

68. The abrasive solution locally known as *katai ka masala* is prepared with diamond powder (1 ratti or 1/96 tola), fuller's earth (1/8 tola) and *murda singhi* (pieces of a white herb) (1/5 tola) in water. The ratio between the diamond powder, soap stone and *murda singhi* comes approximately to 1 : 12 : 19 respectively.

69. Sawing requires two persons-one to move the handle of the big wheel of the *chanti* (cutting wheel) and the other to break the stone with the help of the small tin wheel which makes about 100 to 150 revolutions a minute. The instruments required are kept in the 'pocket' attached to the machine itself. The solution is applied again and again to make the sawing smooth.

70. In the case of precious and semi-precious stones, they are split into two parts on the wheel itself while in the case of synthetics it is enough to make a line and then break it into parts with the help of a hammer and a chisel. Generally the big wheel is handled by a woman and the actual breaking is done by a male worker.

71. The remaining four stages are completed, as already said, on two kinds of wheels vetrical and horizontal. The difference between these two methods (Method 'A' and Method 'B') is important and is described below:

Method 'A'

72. *III Stage*-Rough Grinding: After sawing the stone is taken for rough grinding to remove the corners which are left in sawing.

73. Rough grinding is performed on the wheel called *Jindra* in the local dialect. For ruby, sapphire and other stones of great hardness, the wheel made of *Rai* (Emery) and shellac (in the proportion of 2:1) is used and for emerald and other stones of lesser hardness, the wheel is made of corundum and shellac (in the proportion of 2:1). These wheels are prepared by the artisans themselves at their homes. One wheel is used for about 15 days after which it is broken and replaced by a new one. The material from the broken wheel is used for preparing the new wheel.

74. First the piece of the stone is fixed on a stick called *Kandi* with shellac. The worker moves the wheel with the help of *Kabani* (a spring-bow) and the stone fixed in the *Kandi* with shellac is brought in contact of the wheel with the help of the other hand. The revolution of the wheel removes the extra corners and makes the stone smooth by removing the irregular parts and edges.

75. The wheel grinds the stone because it has got grit. Grit refers to the thickness or fineness

of the material used for grinding. The basis of measurement is one square inch. If 100 small pieces of matter can pass through one square inch, it is said to have a grit of 100, while if only 80 can go through, it is said to have a grit of 80 and so on. For rough grind the wheel used is of thick grit.

76. *IV Stage*-Shaping: After rough grinding, the stone is given shape. The process of shaping is performed on the same wheel as in III stage, but of finer grain. The material which becomes finer because of friction under III stage is used for the wheel of finer grain. The procedure is exactly the same as in the case of III stage. The stone is dipped in water and shaped on the wheel by friction. The wheel sprays water in all directions and the worker becomes completely drenched after some time.

77. For the shaping of synthetics the wheel used is of inferior quality.

78. *V Stage*-Facetting: Facetting is the process by which a stone is made opaque to produce best refractive effects. The process is a recent outcome of foreign influence on the local industry.

79. Wheels made of different metals are used for facetting different kinds of stones. The wheel used for facetting ruby, sapphire and other hard stones of about 9 hardness is made of copper. The wheel used for other stones of lesser hardness is made of bronze. These wheels cost about Rs. 20 and are available with local *Thatheras* or smitheries. For synthetics and artificial stones a wheel made of *Arusa* wood is used. The abrasive used for precious and semi-precious stones is known as *Gawa* (an opaque white coloured stone of agate specie). This stone is burnt before being used.

80. While facetting the worker presses many stones at a time against the wheel. All these stones are worked upon at one time according to the required facets of the stones. One disadvantage of this wheel is that many facets cannot be cut to a single stone at one time. Everytime their position has to be changed for obtaining new facets.

81. *VI Stage*-Polishing: After facetting, the stone becomes opaque. polishing makes it transparent and it reflects or refracts the light and looks brilliant.

82. Polishing is done on the same wooden wheel which is used in V stage where it is used for facetting the synthetics and artificial stones.

Method 'B'

83. In the method 'A' the wheel used is in vertical position while in the method 'B' it is horizontal. Horizontal wheels came to Jaipur with the migration of Gujarati cutters from Cambay about 30 years ago. At that time this wheel was operated with the help of two persons. The unskilled worker used to drive the wheel while the skilled cutter held the stones to be worked upon. Horizontal wheels began to be revolved with power only about 20 years ago. The old big driving wheels are still preserved to meet emergency in case of failure of power. At present all the horizontal wheels are power-driven.

84. The 'machine' used for this purpose is simple. One-quarter horse power motor can run three to five wheels a time. This 'machine' is made of wood and its height is about $1\frac{1}{2}$ feet with a belt, joining it and the motor, is placed on the central axis just under the wheel. The 'stick' is a bamboo stripe or made of wood and lasts for many years. It is fixed in the apparatus with the help of 'Angura'. This 'stick' is about 3″ in length. The machine costs Rs. 550 to Rs. 600.

85. *III Stage*--Rough Grinding: The wheel used is made of corundum and shellac (in the ratio of 2:1) as in the case of method 'A'. As the wheel revolves the stone attached to the 'stick' is pressed against it. This removes the extra corners and makes the stone smooth and plane. The circumference of the wheel is 3″ but bigger wheels are also made when required.

86. These days rough grinding is done on vertical wheel and not on the 'machine', and these 'Ghats' (processed planes) are sent for further processing on the vertical wheel for bringing out

the internal facts of the crystal by shaping them in following different shapes as required :

(*a*) Cubical	(*d*) Rhombic
(*b*) Tetragonal	(*e*) Mono-clinic
(*c*) Hexagonal	(*f*) Tri-clinic

87. *IV Stage* - Shaping: Shaping is invariably done on the 'machine'. The wheel is of the same material as in the case of vertical wheel, but of higher grit. Shaping on horizontal wheel is better done than on the vertical wheel.

88. *V Stage* - Facetting: The wheel used for facetting emerald and zircon is made of bronze and for ruby and blue sapphire of copper.

89. The stone is pressed against the wheel, fixed in the 'stick' with shellac. The stick is moved to as many sides as required according to the facets to be made on the stone.

90. *VI Stage* - Polishing : Polishing and facetting are done together on the same wheel and the stone is fixed on the same 'stick'.

91. The abrasive used in facetting and polishing is known as *Hakik* (Agate), which is a stone found near Cambay in Gujarat. It is used there for many purposes and its powder, which is a by-product of several processes there, is brought to Jaipur and used as abrasive. It is cheap and is available at about Rs. 2 per kg.

92. The wheel is also prepared by the workers themselves. Bronze or copper is bought in the local market and is moulded in shape. After polishing it is ready for use. The wheel costs about Rs. 50 and lasts for a year.

Comparison of Method 'A' and Method 'B'

93. Although the introduction of horizontal power wheel may be said to be an improvement over the old hand-driven vertical wheel, one cannot entirely substitute the other. Their distinct characteristics and uses are as under:

Method 'A' is meant only for two or three stones such as emerald, zircon, ruby and blue sapphire while method 'B' is common to all stones. The above mentioned stones can be processed on vertical wheel also but the polish obtained by this method is not so fine as that obtained on a horizontal wheel. The reason is obvious. The horizontal wheel is power driven and runs at a uniform speed continuously unlike the hand-driven one. The difference is so great that the old stones processed on vertical wheels are now processed on the horizontal wheels and fetch higher price in the market. Handling of the horizontal wheel, however, requires longer time and practice as compared to that of vertical wheel. The income of workers doing work on the power driven wheel is more than the income of workers engaged on the hand driven vertical wheel and, consequently, it is noticed that those working on the former belong to lower middle class while those working on the latter are from the poor classes.

Diamond Cutting

94. Diamond cutting came to Jaipur with the migration of some diamond cutters from the former princely state of Panna (Madhya Pradesh) about 50 years back. There are five diamond cutting centres in Jaipur today, one of which is owned by a Muslim worker.

95. The processing of a diamond is the most delicate and difficult task because of its hardness. The small 'machine' for this purpose is run with power. Five such 'machines' can be run simultaneously with a motor of one horse power. It is prepared by the workers themselves with the help of the black-smith and costs about Rs. 300.

96. It was only in the 15th century that it was discovered that two diamonds rubbed together could grind each other. This lead to the use of diamond dust to cut and polish diamonds. Diamonds are now called 'brilliants'. One cannot see through a diamond. If it is held up to the light, it would appear dark except the tiny cullet, the only spot in it through which light can pierce it. A perfect 'brilliant' contains 58 facets, 33 at the front and 25 at the back of the girdle.



Testing and selection of gems



Grading of finished gems

97. After breaking the diamond into pieces if necessary, sawing is done by another diamond. One diamond is fixed in a stick and another one is pressed against it from above with the help of another stick. After sawing it is known as 'Ghat'.

98. Facetting and polishing is done on a steel wheel fixed on the 'machine'. The 'Ghats' are fixed on an iron stick and the stick is pressed against the wheel with a weight on it so that proper pressure may be applied to the wheel. Six diamonds are cut at a time on the wheel. A higher power glass is required for sawing the facets. Two craftsmen can work on a machine at a time. In this way one horse power motor can give employment to 15 persons. 10 persons can work on the wheel whiles 5 others can prepare and supply their companions the 'Ghats' on the sticks.

CHAPTER V

BEAUTY AND UTILITY OF FINISHED PRODUCT

Ornamental Use

Since the earliest times people have been impressed by the beauty of precious stones and they have been using them in ornaments, statues, inlaying of furniture, decoration of palaces and other articles of royal and aristocratic use. Gems have also been used by superstitious people as efficacious agents to ward off the effects of evil eyes and malignant spirits, for magical practices and therapeutic purposes. With the ancient people certain types of stones were the most valued. For example yellow stones in Greece, green stones in Rome, turquoise in Egypt and Persia, jade in China, ruby and diamond in India were the most prized stones which were in general fashion and treated as national gems. During the middle ages turquoise was the most favourite wear of the European aristocracy. In the Victorian period jade was the most fashionable stone of the English. Jade has been regarded as the most pure and most divine natural stone. To the Chinese wearing of a jade was a religious ritual and it was worn for its symbolic powers. Even today it is said, a Chinese holds a piece of jade in his hands and rubs it when he has something important to do or discuss. The highest form of praise for a man in China is to be likened to a jade. In India a virtuous person is cited as a diamond or pearl.

Superstitious Use

100. Superstition and irrational attitude of the ancient people have been characteristic of the dark ages and their beliefs have left an indelible mark on the posterity. This is the reason why the precious and semi-precious stones are still in use for such purposes. It was believed that coral, malachite, eye-onyx and sardine were good agents against an evil eye ; load stone prevented one from quarrelling; hematite could ensure success in law suits ; light green jasper guaranteed good crops ; vermillion could render athletes and wrestlers invincible ; turquoise was protection against accidents and amber was a simple preservative to infants against secret poisoning and counter charm of witchcraft. The ancient people recommended use of amulets studded with stones to be worn on the arms. The wearing of semi-precious stones is still in use for these purposes. It is said that turquoise possesses remarkable properties of growing paler when its owner is sick and regaining its colour when he recoups health.

Therapeutic and Medicinal Use

101. The therapeutic virtue of the stones may sound fantastic but they are supposed to possess very pleasing effects. According to the physicians, both Unani and Ayurvedic, precious stones are to be administered as medicine in two ways : either in the form of powder or as ointment. The purpose can also be served by wearing them. Some of the stones and their therapeutic values are noted below:

(i) Jasper is used for stopping haemorrhage.

(ii) Jade serves as a cure for kidney diseases. It is said that the administration of jade with honey increases the flow of milk in wet-mothers. Jade also serves as an antidote to some poisons.

(iii) Jet cures epilepsy. Jet mixed with wine is a sure treatment of toothache and, when mixed with bees-wax, is a remedy for tumour.

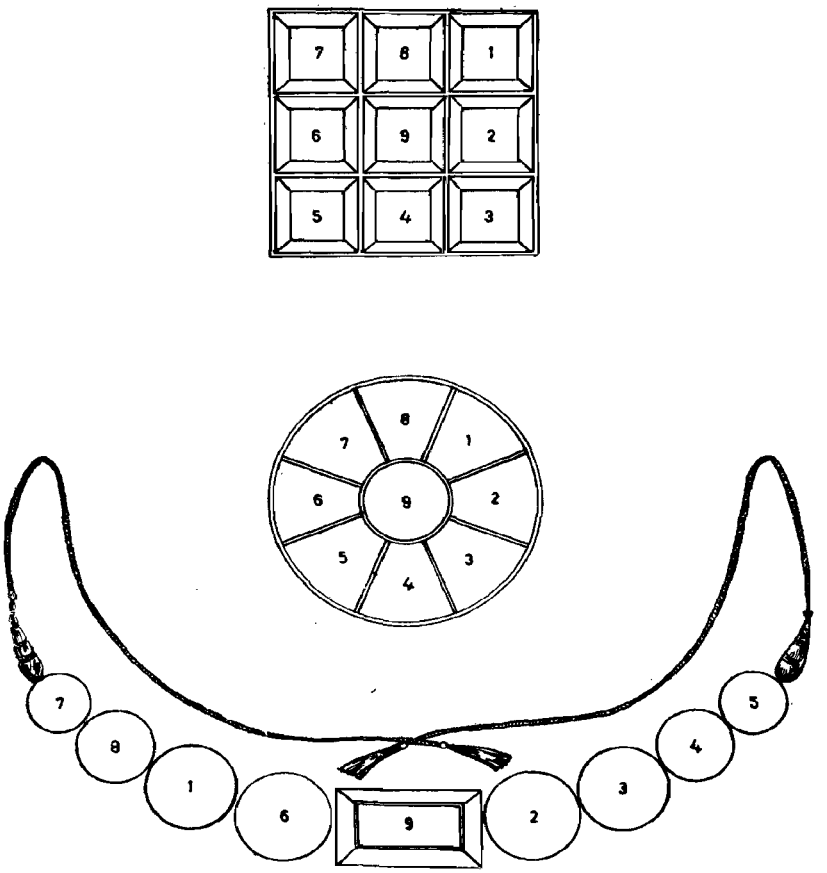
(iv) Amber is a sovereign medicine for maladies of the stomach. Its powder mixed with rose-water and honey is a nice medicine for ear troubles. Amber is also efficacious in eye troubles. Its lotion mixed with honey is soothing to the eyes. It is also a sure medicine to stop bleeding.

(v) Peridot is used for stopping hiccough.*

(vi) Lapis lazuli is administered for curing venereal diseases, tuberculosis and jaundice.$

* Ratna Prakash - Roop Raj Tank Johri, 1959, p. 56.
$ Ibid p.74.

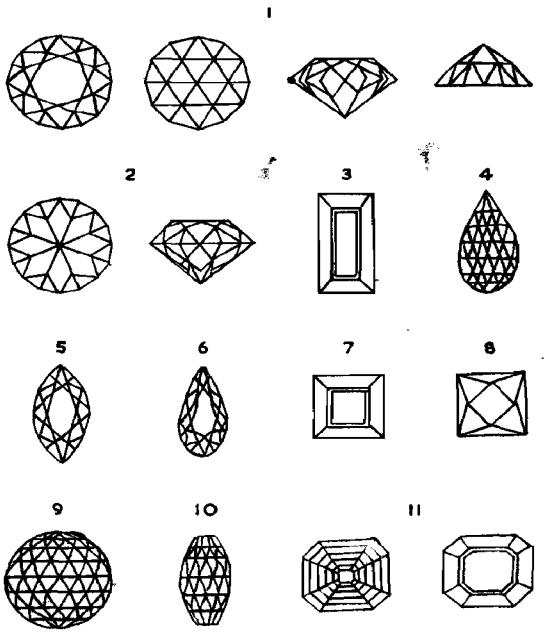
SEQUENCE FOLLOWED IN SETTING OF THE NINE GEMS



REFERENCES

1 Emerald	4 Coral	7 Cat's eye
2 Diamond	5 Hessonite	8 White Sapphire
3 Pearl	6 Sapphire	9 Ruby

VARIOUS STYLES OF CUTTING THE GEMS



102. Although belief in curative power of most of the stones has wellnigh disappeared, it still persists in the case of amber. Wearing of an amber necklace is supposed to keep off attacks of erysipelas and defend the throat from chills. Wearing a green jasper around loin is prophylactic aga.nst formation of a stone in the bladder.

Astrological Use

103. Precious stones have a definite chemical composition. The foreign atoms in their formation account for the striking difference in colour. It is contended by astronomers that existence and formation of precious stones is due to the influence radiated by the sun and other planets belonging to the sclar family. It is further put forward that the composition of these stones is similar to the composition of matter present in the various planets. The astrologers recommend the use of certain precious stones to negative the evil influences of maleficent and to enhance the wholesome effects of the beneficent.

104. According to the astrologers the ruby is the Sun's precious stone ; and a pure spotless pearl that of the Moon. Coral belongs to Mars ; emerald, shaped like 'Garud', belongs to Mercury; Jupiter has *Pukhraj* (white sapphire) and Venus diamond. Sapphire *(Neelam)* is the favourite of Saturn. Hessonite (*Gomed*) and Cat's eye *(Lahusunia)* are the property of *Rahu* and *Ketu* (nodes) respectively.

105. These stones are recommended to be worn when the life of a person passes under the *dasha* (influence) of the particular planets which are believed to control the life of human beings. Sun is the life-giver and all the planets including the Earth are the members of his family and at one time formed a part of it. Therefore, the composition of stones and elements in human body is similar to that present in these planets. Whatever be the truth of these astronomical and astrological findings, the precious stones command sale on account of their astrological value in India.

Arrangement of Stones in Ornaments

106. According to the above mentioned belief in *Navgrahs* and corresponding *Navratnas* there is an age old practice of arranging the nine gems in telesmatic jewellery ornaments in order to make them capable of benefiting and befitting the possessor.

Cutting Styles

107. Innumerable cutting styles are used to fashion gem stones. The two basic types are those that employ carved surfaces, which are called cabochons, and those with flat surfaces, which are said to be facetted.

108. The two basic arrangements of facets are known as the brilliant and the step-cut. Both are characterised by a large facet (table) topping the crown facets, which slope to the periphery of the stone (girdle) and by a base portion, which slopes from the periphery to a tiny facet (culet) at the lowest point. The two styles differ in that the facets on step-cuts are parallel to the table and the girdle, so that they are all trapeze-shaped, whereas brilliant cut facets, other than the table and culet, are triangular or kite-shaped. The brilliant style is usually used for stones with round or curved girdle outlines and the step-cut for those with square, rectangular, or other straight-rided girdle outlines. The brilliant forms illustrated include the pear shape, marquise, round brilliant and heart shape. A square step-cut and the so-called emerald cut exemplify the step-cut style.

Diamond Cutting

109. The most popular style of cut for diamonds is 58-facet brilliant, the stone having 33 facets above the girdle and 25 below. When cut to proportions a diamond will possess its maximum brilliance and fire. Other cuts frequently used are the emerald and marquise. Important fancy cuts include kite, triangle and baguette. The term *melee* is applied to stones cut from small fragments of diamonds resulting from saving or cleaning. Usually from 8 to 16 *melees* are required to make a carat, and many are cut with the usual 58 facets. Smaller *melees* have usually only 58 facets and may be so small as to require hundreds of them to make a carat.

CHAPTER VI

FINANCE AND MARKET

The trade in jewellery commenced some three hundred years ago in right earnest at Jaipur as the rulers of the State and their jagirdars were accustomed to purchase jewellery from Delhi before the commencement of the local trade. Even before the establishment of local industry purchases of jewellery did take place. They were bargains by individuals who imported finished articles from Delhi. The regular purchase of gems by the members of the ruling family from different places in India created a somewhat regular demand for the articles and this made the occupation of agents in Jaipur profitable. At that time the local cutting of stones had not begun and, therefore, the local traders had to go to different places in the country to find out jewels preferred by the rulers. In some cases, they used to secure prior orders from their patrons. The important centres of jewellery at that time were Delhi, Banaras and Bombay.

111. Articles for the use of the local industry when it was established were available in European markets, and the supply trade was mostly in the hands of an English firm. The firm had its branch in Bombay and it used to deal with foreign traders in jewellery. Goods were purchased from Indian jewellers and exported to foreign countries. Thus the foreign trade was not in the hands of local jewellers.

112. The jewellery trade at Jaipur started developing on modern lines before 1914 A. D. The jewellers could then establish business contacts with their counterparts in different countries. Imports of rough stones and exports of finished products was started. The foreign trade continued to flourish till the beginning of the world war II when a number of problems affecting the import and export of jewellery goods cropped up. Since the very commencement of the war the import and export of stones was strictly regulated by the Government of India. The foreign trade policy of independant India after 1947 A. D. was guided by dollar shortage. Imports of rough stones and also exports of finished goods, tremendously decreased. Seizure of contraband articles, which lasted for about one and a half years, seriously damaged the trade.

113. At present about 250 concerns are engaged in the trade of jewellery. While the industry is more or less a monopoly of the Muslim workers, the trade aspect of it is a monopoly of the Hindus. The majority of the traders are Jains, but Hindus of other castes are also there. Most of the firms are partnership concerns. The partners, in most of the cases, are relatives in one way or the other. Some concerns, no doubt, continue to keep the old status of sole proprietorship or joint Hindu family business.

114. The jewellers can be divided into many classes. Some are both importers and exporters of raw materials and finished goods as well as employers of artisans. The small traders purchase rough stones from importers and return to them after getting them polished by cutters.

115. The peculiarities of the jewellery trade have made brokers an indispensable part of it. Brokers knew the requirements of the buyers and also the traders who possess required types of the stones. Their help in bringing the buyers and sellers together is necessary. The brokers, who earn a handsome commission, also help persons who want to dispose off their old stones.

116. The local Jewellers Association has framed rules to regulate the trade. These rules are binding on all the members of the Association. The rules have been framed to promote trade and avert bottle-necks. The trade among the members of the Association interse is free but a transaction between a member and a non-member is affected through a member who acts as a commission agent. Members who deal both in precious stones and synthetics are enjoined to keep them separately.

Rules have also been framed for auction and weights.

117. The rules provide for arbitration in case of dispute amongst the members. Instead of adjudication by court, the members are enjoined to refer every dispute to the arbitration board of the Association. In complicated disputes, the parties nominate their Panch, who must be a member of the Association. The Sarpanch is nominated by the Association from among its members. In all such disputes a fee of Rs. 5 for first one thousand rupees and 50 paise per each hundred rupees thereafter, is levied over and above the usual arbitration fee for the training fund which is utilised for providing training to new entrants. These rules facilitate the smooth running of the industry.

Finance

118. Trade in precious stones is a costly affair. Only those who can make heavy investment can deal in jewellery. The very nature of the trade involves risks and no bank advances money on the security of jewellery as its price cannot be ascertained. It is also not possible for the Government to advance loans for this business as it is difficult to assess the value of stones against which loans are required. Only rich jewellers can secure loans from the banks on the security of their immovable properties or face value of the imported stones. As stated above the industry is solely financed by the jewellers and it is only in times of emergency that they are helped by their relatives and friends who may advance loans to them at reasonable rates of interest which vary from 6% to 12%. Sometimes the jewellers are required to mortgage their property even to friends and relatives.

119. The artisans, as a matter of fact, do not need much money for investment in tools and implements. Most of them are wage earners. The jewellers, however, advance small sums of money to the workers for manufacture and purchase of wheels and tools as and when needed and the loans are recovered in easy instalments out of the wages paid to them.

Imports

120. The imports of rough stones were totally suspended in the year 1947. The acute foreign exchange position necessitated the suspension of imports of rough stones. The jewellery articles were considered as luxury by the Government.

121. Various representations were made to the Government of India by Jaipur jewellers as well as by the jewellers of Calcutta, Bombay, Delhi and Cambay. The Government, after consideration, permitted the import of rough stones against licences which were issued on the basis of the exports of the previous years. In the beginning the import was limited to 50% of total exports of the preceding year, later on it was raised to 90% and finally to 100%. In the beginning it was difficult to procure the import licence but now conditions have been changed and the traders do not face any problem in getting them, provided they can 'prove' their exports. The process has been simplified and the conditions liberalised.

122. At present emerald is imported from Columbia and U. S. S. R. In small quantity, ruby from Burma, diamond from South Africa, amethyst from Australia, aquamarine from Ceylon, topaz and spinel from Germany and Australia, and lapis lajuli from France, the U. S. A. and Germany. The exports of raw materials from most of these countries is duty free.

123. The Government of India insists on exports. When rough stones are imported, the importer has to give a guarantee for exporting it within 6 months; and for this, a bank guarantee of 10% of the value of stones has to be given. The Government does it with a view to balance imports with exports.

124. The import of finished goods is treated on different basis. In 1947, the import of finished goods was entirely suspended. The import of finished goods is a net loss of foreign exchange. On the representation against it by the traders, the Government of India has given option to the

importer to import finished goods upto 10% of the total imports.

Marketing

125. The polished stones are sold either at Jaipur or anywhere else in India. It may be exported to foreign countries.

126. Local demand : Local demand comes from the Indian as well as foreign tourists who visit Jaipur. They purchase stones and finished articles and ornaments mounted with stones. The local gem-setters and ornament makers (sarafs) also make handsome purchases. In the local market there is demand for the precious stones on account of their astrological and medicinal value though the local demand can be said to have gone down considerably in the last few years.

127. Internal demand : Polished stones are also sent to many other places in the country where they are used in ornaments and clothes. Bombay, Delhi, Agra and Lucknow are important centres for the sale of precious stones. Polished synthetics are also sent to various places in the Punjab and Uttar Pradesh where they are used in cheap ornaments. Varanasi is an important market for small pieces of stones which are used in preparation of famous Banarasi saris.

128. Exports : At present finished stones are exported to all European and American countries. The U. S. A., England, France and Canada are important purchasers. These countries prefer coloured stones such as emerald, sapphires and ruby. White stones such as diamond are not in much demand. Semi-finished synthetics, known as 'Ghats', are exported to Burma, where they are polished and exported to South-East Asian countries.

129. The export of finished goods is duty-free. The exports are made in two ways-outright basis and consignment basis. The consignment basis is more prevalent.

130. The import duty fixed by the importing countries poses a problem. In the U. S. A., it is 10% on ruby and sapphire and 5% on emerald. The U. K. imposes a purchase tax of 60% on all kinds of finished stones and similarly has an import duty of 22% on all finished stones. France discriminates between import for consumption and import for re-export, and levies a lower duty on the latter ; for example it imposes 3% duty if the goods are imported for re-export.

CHAPTER VII

PROBLEMS OF THE CRAFT AND ITS FUTURE

Conditions of the Workers

The income of the workers is quite low. It is the chief cause of their extremely poor standard of living. Most of them come from families for which gem-cutting is a hereditary occupation and they toil in the unhygienic places in the neglected remote corners of the city to earn their livelihood. It is tradition which solely accounts for their attachment to this underpaid job. All this suggests that urgent steps must be taken to ameliorate their condition.

132. The first step in this direction can be the establishment of a cooperative society (Kraya Vikraya Sahkari Samiti) of the workers. Some efforts in this direction were made previously, but as they were done half-heartedly, they did not bear any fruit.

133. Membership of this society should be open to all the cutters-whether they are engaged in processing precious stones or synthetics. This cannot obviously be made compulsory but efforts should be made to popularise it and bring all the workers into its fold. Some difficulties will arise in its formation and working. First of all, the different natures of working by the cutters engaged in precious stones on the one hand and those engaged in processing synthetics, is likely to pose a problem of co-ordination ; and until it is solved the society will not function efficiently. To guard against this danger, all the leading cutters from all localities should be taken into confidence and their support and cooperation should be sought. The objectives of the society should be explained to all the workers.

134. The share capital should come from the workers for the formation of the society. As the workers are poor they cannot be expected to contribute much. If Rs. 5 or Rs. 10 per family is contributed, the amount will come to about Rs. 6,500 and Rs. 13,000 respectively. This amount supplemented by Government loan will be sufficient to begin with.

135. Management and control of the society should be in the hands of elected office bearers. Different localities of cutters should be given adequate representation to safeguard efficient and smooth working of the society.

136. Firstly, the function of the society should be to import synthetics from foreign countries and distribute them among the workers. It will result in improving the wages of the workers as it will eliminate the dealer's profits. The society can either export the finished products or sell them to the local dealers if good price is obtainable. It will again eliminate the surplus profit of the traders. According to the Government's present export policy preference is given to cooperative societies. This privilege should be fully availed of.

137. Secondly, the society should establish work centres in all the important localities for workers. Raw materials should be made available to them at these centres and arrangements should also be made to take delivery of finished articles prepared by them at the centre. This will result in saving of time which is otherwise spent in bringing raw materials and returning the finished products. It should also be ensured that these work centres are established in a building well-ventilated and provided with enough light and air. Other facilities such as drinking water, urinals and latrines should also be provided at these places. The working hours should be regulated according to labour laws. The workers should be given a weekly holiday in addition to those on festival days. This will result in increase of output and efficiency of the workers.

138. Thirdly, the society must run a training centre for new entrants. At present the arrangements are very unsatisfactory. The society can employ experienced part-time workers to

guide and impart training to new entrants, in the morning hours and at night, on nominal allowance. The training so imparted will take less time. It should be well planned and particular attention should be paid to the trainees who should receive thorough knowledge and adequate practice. During the training period the difference between the working of synthetics and precious stones should be given due weight. The former are standardised while the latter differ widely. The beauty of precious stones depends upon the special skill and efficiency of the cutter. The same stone, if cut brilliantly, will fetch more price. Keeping this in view, the society should have a separate precious stone section and the most efficient and skilled workers of the industry should be kept on its advisory council to suggest the best methods of training.

139. Horizontal wheel, which is not popular at present, should be given importance in place of the vertical wheel. Thorough training should be imparted to the trainee in the use of horizontal wheel. After the training is completed, loan should be advanced to the trainees to purchase these wheels and other implements, etc. Lastly the sons of those who are in the profession should be given priority in admission for the training.

140. The Government of Rajasthan should also step in to help the industry. The developed industry will provide employment to a large number of workers. Most of the finished articles are exported to foreign countries where they command market. The importance of the industry can be judged from its exports in the past and the foreign exchange it has earned.

141. The Government should provide grants-in-aid for the training centre and should make provision for loans for the trainees. It should also advance short term, medium term and long term loans to the cooperative society for the purchase of raw materials, for the import of synthetics and stones from foreign countries, for the purchase of tools and epuipment and for establishing work centres.This proposal will inflict severe blow to the financiers, who are making huge profits at the cost of the workers. Much depends on the organisation and efficient running of the cooperatives, but concrete steps in this direction are the need of the hour.

142. The horizontal wheel should be popularised and all precious and semi-precious stones should be cut and processed on it. This will result in the rise of incomes of workers. As suggested above, these wheels should be provided to the workers by some other agency, as their poor economic condition does not allow them to invest money on wheels. This can be done either by a cooperative society by opening work centres or by the traders who should set up these wheels in their worksheds. The workers should be allowed to work there on reasonable rates. The third alternative is the grant of loans to the workers by the Government for purchasing the wheels.

143. Regarding synthetics it can be said that due to their inferior polishing and finishing they are not much liked by foreigners. Inferior finished synthetics, known as 'Ghats', are exported to Burma where they are further improved and sent to South and South-East Asian countries. If improvements are made in this sphere it will increase the demand of synthetics in foreign countries as well as in India itself. This needs more emphasis due to the fact that 80% of the workers are engaged in processing synthetics.

144. The industry should study the methods prevalent in Burma such as sawing by machine and try to follow them in Jaipur. For this Jewellers Association and Government should provide funds. A fund known as 'Technical Training in Jewellery Arts Fund' was initiated by the Jewellers Association by remitting the arbitration fees it received to this fund. Nothing substantial was, however, achieved from that. Scholarships may be granted to deserving candidates for studies abroad.

145. Imports : The present import policy is not proving beneficial to small importers. They need time and vast sums if they desire to import under the present policy which is based

on export promotion scheme. Due to these reasons they do not consider it worthwhile to apply for an import licence. Here it is worth mentioning that the number of such traders is higher than those who have been given import licences.

146. Another difficulty is the condition of the export of the goods of the same value within six months for which a guarantee of 10% of the value of imports is to be furnished. It is not possible to export the goods within six months in every case. Another difficulty arises due to the reason that indirect exports take place because of purchases made by foreign tourists in India.

147. Another consideration in this concern is that diamonds, which form the bulk of imports, are not exported for these are utilised in India. Foreigners prefer coloured stones such as emerald, ruby and sapphires.

148. Another defect in the present system is that most of the consignments of finished gems are sent by air-mail in the form of small parcels. Proper accounting is not possible by the Government and the traders, due to time-lag in despatch and sale. In this way the industry fetches more foreign exchange firstly due to difference in price of raw material and finished products and secondly due to export of refashioned old jewellery.

149. India is known as 'the country of jewels and arts' and a large variety of gems in unmounted and jewellery form are purchased by tourists and foreigners stationed in India. No proper account is maintained of these transactions.

150. Considering the above factors, if open general licence in place of present system of import licence is adopted for import of raw materials, except diamonds, no loss of foreign exchange will be incurred, by the exchequer. Nay it will result in removing the difficulties faced by the traders at present.

151. Re-export trade : The condition of allowing only 10% of value of imports in the shape of finished stones should be removed as far as Burma and Ceylon are concerned. The imports from these countries should be liberalised.

152. Exports : Exports should be duty-free, and efforts should be made to popularise Indian products in foreign countries. The Jeweller's Association and the Government should make coordinated effort in assessing the demand in foreign markets and to popularise the products.

153. Miscellaneous : Licences for imports are approved by Union Ministry of Commerce and Industries at Delhi and parcels for imports and exports are certified by the foreign Post Offices at Delhi and Bombay. The Customs Office at Delhi clears and certifies the goods brought and sent by Jaipur dealers. This centralisation of import and export activities at Delhi and Bombay creates difficulties for Jaipur dealers. For removing these difficulties a branch of foreign Post Office should be opened at Jaipur. A custom post may also be attached to it. This arrangement will go a long way in solving the difficulties of traders and facilitate the export trade.

Future

154. In the end it can be safely asserted that gem-cutting is an important and paying industry of Jaipur. If the present difficulties are removed and the conditions of industry and workers are improved, it can become a big foreign exchange earner. This will also mean an improvement in economic lot of the workers, who are continuing with the profession, believing that gem-cutting which has a hoary past, has a future as bright as the stones which they process.

APPENDIX-A

List of skilled workers

	Name of the worker	Age	Address
1.	Shri Hafij Ji	80	Chudiwalon-ka-Rasta, Jaipur.
2.	,, Mumtaj Khan	45	Kattiyon-ki-Pipali, Jaipur.
3.	,, Thakurdas Gujarati	55	Moti Singh Bhomiyan-ka-Rasta, Jaipur.
4.	,, Nathu Mal	40	-do-
5.	,, Jeet Mal Kattaiya	60	Sonthliwalon-ka-Rasta, Jaipur.
6.	,, Sharrifuddin	36	Chudiwalon-ka-Rasta, Jaipur.
7.	,, Mahawat Khan	48	Topkhana Hazuri, Jaipur.
8.	,, Ahmed Hussain	45	-do-
9.	,, Ajim Khan	45	-do
10.	,, Khuda Bakhsha	40	-do-
11.	,, Abdul Rahim	55	Julahon ki Masjid, Jaipur.
12.	,, Gopal Gujar	58	Kundigaron-ke-Bhairon-ka-Rasta, Jaipur.
13.	,, Wali Mohammed	54	Neelgaron-ka-Nala, Jaipur.
14.	,, Wali Mohammed	50	Kattiyon-ki-Pipali, Jaipur.
15.	,, Suraj Narain	52	Kundigaron-ke-Bhairon-ka-Rasta, Jaipur.

APPENDIX-B

List of manufacturers and dealers

	Name of concern	Address
1.	Messrs. Shanti Bhai Durlabhji	Johari Bazar, Jaipur.
2.	,, R. Y. Durlabhji	-do-
3.	,, Ratan Ji Pansari	-do-
4.	,, Badhi Chand Gangwal	-do-
5.	,, Sardar Mal Daga	-do-
6.	,, Shri Chand Golecha	Bara Gangori Bazar, Jaipur.
7.	,, Gokul Das Kotewala	Lal Katla, Johari Bazar, Jaipur.
8.	,, Raj Roop Tank	Johari Bazar, Jaipur.
9.	,, Hafij Ji Khurrewala	Julahon-ki-Masjid, Ghatgate, Jaipur.
10.	,, Rahimulla Kulada	-do-
11.	,, Shri Narain Ganesh Narain	Gopalji-ka-Rasta, Jaipur
12.	,, K. C. Kothari	-do-
13.	,, Meena Lal Tedykiya	-do-
14.	,, Hanuman Sahai & Co.	-do-
15.	,, Mohan Lal Shah	Hanuman-ka-Rasta, Jaipur.

APPENDIX–C

84 kinds of precious and semi-precious stones

Name of the Stone	Quality, Colour & Description
1. *Manik* (Ruby)	Red.
2. *Heera* (Diamond)	White.
3. *Panna* (Emerald)	Red
4. *Neelam* (Blue sapphire)	Blue.
5. *Lahsaniya* (Cat's eye)	Like the eyes of a cat.
6. *Moti* (Pearl)	White.
7. *Munga* (Coral)	Red.
8. *Puhhraj* (White sapphire)	White with yellowish tinge.
9. *Gomedak* (Hessonite)	Like red smoke
10. *Laladi* (Spinel ruby)	Like the rose flower. Known as *lal* if more than 24 *rattis* in weight.
11. *Feroja* (Turquoise)	Sky blue. Found in pebbles.
12. *Emni*	Dark red with blueish tinge. Preferred by Mohammedans.
13. *Jabarjadd* (Peridot)	Pure red. No thread in it. Preferred by Mohammedans.
14. *Upal* (Opal)	In various colours and kinds. Its colour is affected by every other colour.
15. *Turmali* (Turmaline)	Five colour, *Pukhraj* variety, but softer and lighter in weight.
16. *Naram* (Spinal ruby)	Red with yellowish tinge.
17. *Sunela* (Topaz)	Like golden smoke.
18. *Katela* (Amethyst)	Like brinjal in colour.
19. *Dhunela* (Smoky topaz)	Like golden smoke.
20. *Sitara* (Gold stone)	Various kinds, with golden sprinkling on the surface.
21. *Titak-Billore* (Crystal)	White.
22. *Godanta* (Moon stone)	Like cow's tooth with a slight yellowish tinge.
23. *Tanbda* (Gomet)	Black with reddish tinge.
24. *Ludhaya*	Red.
25. *Marayam*	White. Its polish is good.
26. *Maknatish* (Load stone)	White shining stone with blueish tinge.
27. *Sondariya*	Rose colour with white tinge.
28. *Leelee*	Of blue sapphire variety. Soft than sapphire with yellowish tinge.
29. *Beruj* (Emanerij)	Slight green.
30. *Margaj* (Jade)	Of emerald variety. Green in colour.
31. *Pitoniya* (Blood stone)	With red sprinkling on green colour.
32. *Vansi*	Slight green. Softer than *Songesam*. Polish is good on this.

Name of the Stone	Quality, Colour & Description
33. *Durrenajg*	Like semi-ripened corn in colour. Polish is good on it.
34. *Sulemani* (Onyx)	Black with red thread above.
35. *Alemani*	Gray with thread of *Sulemani* variety.
36. *Jajemani* (Omyx)	-do-
37. *Satore*	Green with gray lining above.
38. *Tursava* (Zircon)	Yellowish with rose colour tinge. Very soft stone.
39. *Ahava*	Rose colour with big sprinkling above.
40. *Abari*	Golden in colour with blackish tinge.
41. *Lajbarad* (Lapislazuli)	Red with greenish above with golden colour sprinkling.
42. *Kudurat*	Black with white colour above yellowish spots.
43. *Chitti* (Tiger stone)	Black in colour. Appears golden sprinkling and white thread above.
44. *Sangesam* (White Jade)	Two varieties-grape and white colours.
45. *Las*	Of *Marwar* variety.
46. *Marwar* (Marble)	Bamboo colour. Due to mixing of red and white colour it is called *Makrana.*
47. *Dana Firang* (Kidney stone)	Slight green in colour.
48. *Kasoti* (Gold Tester)	Gold is tested by it.
49. *Darchana*	Used by Mohammedans in preparing pictures.
50. *Hakikul Bahar*	Green with yellowish tinge. Used by Mohammedans in preparing *Malas.* Found in water.
51. *Halan*	Rose colour. Its interior substance looks like moving.
52. *Seejer*	White. A green tree looks above it.
53. *Mubenajg*	White with hair-like line on it.
54. *Kaharva* (Amber)	Yellow. *Mala* is prepared of it.
55. *Jharna*	Earth colour (Matriya). If water is poured on it it will drop one by one.
56. *Sambhvasan*	Used in *surama.*
57. *Dantla*	White with yellowish tinge. Like old shell in colour.
58. *Makadi*	Black. Formations like Spider's net above it.
59. *Sangipa*	Like shell in shape, white, used in preparing of sticks.
60. *Gudadi*	Various kinds. Non transparent. Used in preparing *Malas* by Fakirs.
61. *Kasla*	White with greenish tinge.
62. *Sifari*	Sky blue with greenish tinge.
63. *Hadid*	Black with grayish tinge. Heavy in weight. Used in preparing *Malas* by Mohammedans.
64. *Hawas*	Green with golden tinge. Used in medicines.
65. *Singali*	Black and red mixed. Of emerald variety.
66. *Thedi*	Black. Used in preparing bowls and motar-and-pestle (*Kharal*).
67. *Hakik* (Agate)	Of all colours. Used in preparing top of sticks, bowls and toys.
68. *Gori* (Arsenic)	Of all colours. White thread above. Used in preparing bowls and weights for weighing jems.

Name of the Stone	Quality, Colour & Description
69. *Suja*	Black. Used in preparing idols.
70. *Simak*	Yellowish red with black tinge. White, yellow, rose colour sprinkling above.
71. *Musa*	White dull colour.
72. *Panandhan*	Black with slight green shade used in preparing toys.
73. *Amaliya*	Rose colour with slight black tinge. Used in preparing mortar and pestle.
74. *Door*	*Katha* colour.
75. *Tilyar*	Black with white sprinkling above.
76. *Khara*	Black with greenish shade.
77. *Payejahar*	Like white bamboo in colour. Heals the wound of poision.
78. *Sirkhadi*	Earth colour. Used in preparing toys. Heals up wound if applied.
79. *Jahermohara* (Serpentine)	Green with slight white tinge. If put in poisionous liquid or food it does away with the effect of poision.
80. *Khat*	Red. If tied in neck it does away with night fever.
81. *Sohanmakhi*	Blue. Used in medicines.
82. *Hajarate Ood*	Like white earth in colour. Used in urine diseases.
83. *Surama*	Black. Used in preparing *Surama*.
84. *Paras*	Black. It is believed that if touched with iron, it turns it into gold.

APPENDIX-D

Lucky stones or birth stones

In India stones are used in accordance with the supposed condition and influence on one's fate of different planets. In Western countries birth day determines the type of stone to be used by a particular person and these are known as 'Lucky Stones', or 'Birth-Stones'.

The following is the description of these different stones month-wise :

	Date of Birth	Corresponding stones
1.	20th of Jan. to 19th of Feb.	Garnet, diamond, jade, onyx and ruby.
2.	20th of Feb. to 20th of March	Amethyst and jasper.
3.	21st of March to 19th of April	Bloodstone, acquamarine and emerald.
4.	20th of April to 19th of May	Diamond. In western countries diamond is usually preferred for this period with the exception of Americans, Russians, Italians and Yahudis who prefer blue sapphire.
5.	20th of May to 20th of June	Agate and emerald.
6.	21st of June to 20th of July	Emerald.
7.	21st of July to 21st of Aug.	Ruby, onyx and turquoise.
8.	22nd of Aug. to 22nd of sept.	Sardonxy and peridot.
9.	23rd of Sept. to 22nd of Oct.	Blue sapphire, topaz and chrystolite.
10.	23rd of Oct. to 22nd of Novr.	Opal and acquamarine.
11.	23rd of Novr. to 20th of Dec.	Topaz.
12.	21st of Dec. to 19th of Jan.	Turquoise.

APPENDIX-E

Weights used in jewellery at different centres in India

BOMBAY

Pav Ana Bhar	=	1/64th part of a *Ratti*
Adh Ana Bhar	=	1/32nd part of a *Ratti*
Ek Ana Bhar	=	1/16th part of a *Ratti*
Solah Ana Bhar	=	1 *Ratti*
24 Ratti	=	1 *Tank*
62 Ratti	=	1 *Tola*

In South India Bombay weights are prevalent.

JAIPUR

20 *Bisva*	=	1 *Ratti*
24 *Ratti*	=	1 *Tank*
$64\frac{3}{4}$ *Ratti*	=	1 *Bhari* (*1 Tola*)

CALCUTTA

20 *Biswa*	=	1 *Ratti*
24 *Ratti*	=	1 *Tank*
64 *Tank*	=	1 *Bhari* (*1 Tola*)

Uttar Pradesh, Assam and Bihar provinces are usually governed by Calcutta weights.

International trade in precious stones is done in carats these days :

100 Cents	=	1 Carat
58 Carats	=	1 *Bhari* (*1 Tola*)
5 Carats	=	1 Gram
5000 Carats	=	1 Kilogram

Inter-provincial difference of weights

Bombay	100 *Ratti*	=	$93\frac{3}{4}$ Carats
Jaipur	100 *Ratti*	=	90 Carats
Calcutta	100 *Ratti*	=	$90\frac{1}{2}$ Carats

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APPENDIX

CENSUS OF INDIA, 1961

Survey of selected crafts in Rajasthan

SCHEDULE

Name of Industry

Location-Village/Town Tehsil District

A. The Households

1. Approximate number of households engaged in this industry

   (i) Approximate number of households working in their own houses

   (ii) Approximate number of households working in rented houses

   (iii) Approximate number of households working in workshops set up by their employers

   (iv) Approximate number of households working under some cooperative scheme

2. Do the households engaged in this industry originally belong to this place
   If not, when did they come here ?

3. Community and caste-wise number of households engaged in this industry

	Name of caste or community	No. of households
1.		
2.		
3.		
4.		

4. In case of the households of certain particular communities being engaged in the industry, describe their religion and social customs etc. along with any legends or myths on the origin of the community in brief

B. The Industry

5. History and origin of industry in brief

6. Approximate number of workers (belonging only to the households engaged in this industry)

   Male

   Female

   Children

7. Approximate number of workers (belonging to households other than above)

   Male

   Female

   Children

8. Daily wages paid to workers mentioned at item 7 above

   Male

   Female

   Children

9. Hours of work for household workers and for hired workers mentioned at item 7 above

10. General description of workshop-size (length, breadth, height), ventilation, and general set up of machinery and tools. Give sketch

11. Describe machinery or tools and the nature of power used, if any. Sketch of the tools may be given

12. Who makes and repairs the tools and from where they are obtained ?

13. Who gives the designs ? Name the designs, and mention myths or stories behind the names, if any Explaining what the design stands for. Give sketches of designs

14. What are the colours used and from where they are obtained ?

15. Names of the main raw materials used

(i) (ii) (iii)

16. Names of subsidiary raw materials used

(i) (ii) (iii)

17. From where the raw materials are obtained ?

18. Name of the Finished Product

19. Describe production—stage by stage illustrated by appropriate sketches :

1st Stage

2nd Stage

3rd Stage

Final stage

20. Describe the purposes for which articles produced are used – specially mentioning the ceremonial of ritualistic purposes, if any

21. How the articles are sold - its principal market

22. Name the pioneers, expert craftsmen of fame (dead and alive) who have contributed to the development of the industry

Signature of Investigator