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INDIAN TEXTILE MOTIFS AND TECHNIQUES FROM GUJARAT AND THEIR ADAPTATIONS FOR CONTEMPORARY DECORATIVE DESIGN ON FABRICS

by

© SARABJIT KAUR SINGH

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The undersigned certify that they have read, and recommend to the FACULTY OF GRADUATE STUDIES AND RESEARCH, for acceptance, a thesis entitled INDIAN TEXTILE MOTIFS AND TECHNIQUES FROM GUJARAT AND THEIR ADAPTATIONS FOR CONTEMPORARY DECORATIVE DESIGN ON FABRICS submitted by SARABJIT KAUR SINGH in partial fulfilment of the requirements for the degree of MASTER OF SCIENCE.

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Date Aug 24/1989

ABSTRACT

The objectives of the study were to investigate whether the textiles of India could be useful as inspiration for a designer of hand-painted textiles, investigate the region of India most favorable for that study, investigate the nature and breadth of the production techniques, the motifs, and history of the textiles from that region, and to interpret the traditional techniques and motifs from that region as designs for contemporary textiles.

The textiles of Gujarat, India were chosen as the focus of the study. Data for this investigation was collected from both primary and secondary sources using historical and ethnographic research methods. A preliminary exploration was conducted before the work on larger textile designs proceeded.

For the final textiles the subjective selection of raw materials, tools, and equipment, along with the choice of a colour palette, motif categories, and techniques, were used as broad limits within which the researcher worked. The stylized flower and creeper motifs within geometrical forms and a wide range of colours typical of Gujarati textiles were incorporated. The method of direct painting was selected as a technique for fabric decoration. Silk and procion fibre reactive dyes were chosen as raw materials for the final textiles.

Though each of the six textiles produced in this investigation was unique, the unifying features were: broad

bands; conventionalized flower motifs; curvilinear stems; nearly symmetrical distribution of elements; closeness of motifs without creating an oppressive crowding; the use of foliated stems as a unit of repeat; variation in the ornamentation of motifs; and the use of intense dark backgrounds. This study revealed the infinite potential of the traditional designs, techniques and unique colour schemes of Gujarati textiles for a contemporary designer.

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Table of Contents

List of Figures

List of Plates

CHAPTER I

INTRODUCTION

Statement of the Problem

Research in textile design has suggested non-indigenous cultures can provide inspiration for the production of contemporary designs on fabric. For the purposes of this investigation, contemporary designs on fabrics are defined as the textile designs produced by the designer during the investigation period reported, and non-indigenous cultures are defined as non-North American cultures.

The textiles of India have been the focus of many studies; however, the majority of the research has been carried out for curatorial purposes. It has often led to major exhibitions and the cataloguing of Indian textiles found in collections within India and in other parts of the world. One of the major collections which has been the source of a series of exhibits and research studies is the Elizabeth Bayley Willis Collection of Textiles of India, which is housed in the Costume and Textile Study Centre, University of Washington, Washington, D.C. The exhibits and research studies have consisted primarily of surveys of Indian textile designs and personal adornment but have not discussed either the techniques of production or the dye methodology in detail.

Similarly, the Calico Museum of Ahmedabad, India, has been the source of major exhibitions and publications. Four volumes of catalogues, each dealing with a group of Indian textiles, have been produced by the Calico Museum. Yet in all the volumes within this series, it is not so much the techniques or motifs but the styles which are emphasized.

There is a lack of research conducted which has as its focus the interpretation of Indian textile designs and techniques for the contemporary designer.

In the past, some designers have sought inspiration from non-indigenous cultures. For example, Stahl (1971) conducted a study in which she analysed four Persian motifs through three historic periods and selected three motifs as sources of inspiration for adaptation on contemporary textiles.

Similar studies of textiles have since been conducted by other researchers using the textiles of the Ashanti (Campbell, 1972), the Hopi (Hester, 1970), and the San Blas Cuna Indians (Merriam, 1973).

This researcher proposes that Indian textiles can be studied with the aim of interpreting historic Indian textile designs for contemporary surface embellishment of fabric.

Significance of the Study

The questions that this study seeks to answer are:

1. Can the textiles of India be useful as inspiration for a designer of hand-painted textiles?

2. Is there a region of India more favorable than other regions for that study?
3. What is the nature and breadth of the production techniques, the motifs, and the history of the textiles from that region?
4. Which of the traditional techniques and motifs from that region would be most suitable for adaptation by textile designers in order to produce contemporary textile designs?

Limitations of the Study

The limitations related to the study of textiles from India which may provide inspiration for the designer of hand-painted textiles will be discussed under three headings: limitations related to data collection; limitations related to traditional production methods; and limitations related to the subjective nature of the design process.

Limitations Related to Data Collection

Data was collected from both primary as well as secondary sources. Primary data collection in this study involved conducting interviews, taking oral histories, and studying textiles in the marketplace and in museums in India. There were certain limitations imposed upon the researcher by these methods. The conducting of interviews and the taking of oral histories depended on the accuracy of

the respondent, on recall lapse and on the interviewer's probing.

The study of textiles in the marketplace limits the researcher to studying primarily artifacts of a popular nature -- the textiles of everyday life or those which are produced for the tourist trade. The study of textiles in museums is limited by the accessibility permitted by the curatorial staff and by the particular regional focus of the collection.

The data collected through secondary sources in this study included books and museum catalogues on Indian textiles.

Limitations Related to Traditional Production and Dyeing Methods

A hindrance to analyzing Indian textiles, especially village textiles, is the lack of published records. The village caste members, the chief executors of textiles in India, have neither been encouraged, nor felt the need, to document production and dyeing methods. Many descriptions of Indian textiles are vague and unsubstantiated, and explanations of production techniques and dyes are not well explained. Information is sometimes derived from references found in poetry and in court documents. For example:

> With spring the heart awakens to new rythms and life quickens in the mango trees. Pearls linger on rounded breasts, trembling under the movement of perfumed breadths. Hips are impatient of golden chains. Maidens wear silk garments dyed yellow or red with the juice of the Kusembha flowers, and on

> their breasts are tissues stained ochre brown. In their garments are woven bright flamingoes. In spring, the bodiless love-god enters the limbs of maidens (Jayakar, 1956, p. 12).

Thus, there is a paucity of sufficiently detailed information regarding how and by what means traditional textiles from India have been executed such that the contemporary designer can fully understand the technical aspects of Indian textile production and dyeing. Certain production methods, tools, and dyes used in the past in India are either unavailable or not suitable for the contemporary designer working in a studio setting in Canada.

Limitations Related to the Subjective Nature of the Design Process

The use of any source of inspiration for textile design inevitably involves a synthesis of the factual data collected with the designer's personal aesthetic vision. As a result, no collection of textiles produced by any other designer will result in similar textiles; indeed, the designs might be expected to be widely divergent. In no sense should the following research be considered as exhaustive of the full range of designs which might be derived from the textiles of India.

Definitions

Alum Oxide of aluminium, the metallic mineral used as a mordant for red when dyeing with madder and other dye plants which bear alizarin.

Ari A hooked awl used by Mochi embroiderers of Kutch.

Bandhana, Bandhani

The technique of patterning a fabric by tie-dyeing small spots with thread before the fabric is placed in the dye-bath.

Buta, Buti A floral motif derived from Persian sources during the Mugal period. Traditionally, a flowering plant with a curling bud at the top designed within a compact curvilinear form variously described as a cone or a mango. A buta is a large motif of this type, and a buti is a small one.

Chakla An embroidered square cloth in which the bride wraps the articles of her dowry, mainly textiles such as quilts and other articles for the house, and personal clothing. When she reaches her husband's home, the chaklas are hung upon the walls of their sleeping-chamber as auspicious emblems.

Chinoiserie

The name applied to those styles of European decorative art in which the conventions of Chinese art are imitated.

Chunari A veil or head-cloth for a woman. Traditionally, a chunari is red with a spotted pattern, printed or tie-dyed, and is associated with festive occasions.

Dupatta A veil or head-cloth for a woman, made from two widths of fabric sewn together along their length.

Geru Iron-oxide.

Hir The name used in western India for silk floss.

Kalamkari Literally, pen-work or brush-work. The kalamkari refers to the technique of painting mordants to cotton fabrics with a kalam (pen).

Katab Applique work of western India. Usually worked upon white or unbleached cotton, using coloured cotton fabrics.

Kimkhab Silk fabric brocaded with silver and gold. The metal thread used for the brocading is made from from a fine strand of flattened metal wound over a core of silk, using yellow silk under gold, and white silk under silver.

Koliphul A geometric pattern in the folk-embroidery of Kathiawar. A square is divided into nine smaller squares which are futher sub-divided into triangles.

Mordant A subtance which has a chemical affinity for colouring-matter and serves to fix a dye by chemical reaction with the dye-stuff.

Patola A silk sari tie-dyed in the warp and the weft by the ikat technique, woven at Patan, Gujarat.

Pichhavi A hanging for a temple of Vallabhacharya sect, usually depicting scenes or ceremonies associated with the life of Krishna.

Toran An embroidered frieze with a row of pendants at its lower edge, hung over the doors in Gujarat.

CHAPTER II

REVIEW OF LITERATURE

The review of literature germaine to this investigation is discussed under the following headings: literature related to recent research using non-indigenous textiles as design inspiration; literature related to Indian textiles in general; and literature related to the textiles of Gujarat.

Literature Related to Recent Research Using Non-indigenous Textiles as Design Inspiration

In the past, some researchers have studied non-indigenous textiles with the aim of interpreting motifs and techniques for use as contemporary textile designs. A recent study by Muc (1989) investigates Sumatran motifs and production techniques in order to produce a collection of textiles for interior decor which integrates handweaving with applied decorative design. In 1984, Baudin used an ethnographic approach to study West African textile production methods and interpreted specific African decorative designs as contemporary textiles.

Into indigo by Claire Polakoff (1980) is a source related to the study of non indigneous textiles commonly cited in the literature. Polakoff gives an overview of some aspects of current investigations on cloth which use African design and dyeing methods. According to Polakoff,

the social and economic aspects of African designs are as important as the technical aspects of fabric design.

During the early 1970s, a number of studies were undertaken which had cross-cultural textiles as the focus. Merriam (1973) studied the designs of the Cuna Indians from the San Blas Islands in order to create contemporary textile designs. The study included an investigation of the social organization, technology, and ideology of Cuna Indian culture. Similar studies were conducted by Fu (1972) who investigated Chinese textile motifs, and by Campbell (1972) who documented design motifs and methods of production of the Ashanti tribe in Ghana. She used screen-printing, weaving, batik, block-printing, and tie-dyeing techniques to produce 17 fabrics.

Stahl (1971) investigated the development of weaves and designs found on Persian silk textiles during the Sasanian, Islamic, and Safavid periods. She found that the dominant characteristic of the Sasanian period was the use of animal motifs; whereas, arabesque designs characterized the Islamic period. Stahl selected three motifs (the peacock, the star-medallion and the rosette) as sources of inspiration for the design of modern fabrics.

Historical research on Hopi textiles was conducted by Hester (1970) with the aim of adapting Hopi designs to present day fabrics. She found that cotton was initially used in prehistoric textiles but was replaced by wool, that the yarns were dyed with natural dyes until 1880 when

anniline dyes were introduced, and that design motifs on Hopi textiles included both geometrical and naturalistic forms.

Geothalis (1969) used contemporary West African art and craft items as inspiration for producing textiles. She used batik, screen-printing, tie-dyeing, stitching, photographic silk-screen processes, and drawing techniques in her investigation. Haden (1965) investigated the ancient Peruvian textiles. She studied the motifs, colours, symbolism, equipment, and techniques used in their textile production.

McHaffy (1954) reviewed the use of seven subjectively chosen traditional motifs in contemporary textiles. She surveyed leading designers and textile firms to compare the commercial value of designs that were traditional in inspiration with designs that were abstract. The results indicated that traditional designs are more significant than those purely abstract in character, that the traditional designs have a longer life, and that they will not disappear from the market as rapidly. She also produced a series of textile designs inspired by the cross-cultural traditional motifs studied in the research.

Literature Related to Indian Textiles in General

Influence of History

The earliest written reference to Indian textiles is in the Rig Veda (1200 B.C) and the Upanishads (700 B.C), where the universe is envisioned as a fabric woven by the Gods. The Rig Veda also mentions a 'cloth of gold' which has usually been interpreted as a type equivalent to cloth known as *Kimkhab* (Irwin, 1970; Silverstein, 1981).

The details of Indian textile history begin to emerge with some clarity from approximately 600 B.C. During the period preceding the Mauryan Empire (4th Century B.C.), India was invaded by the Achaemenid Persians, followed by the Greeks. Mehta (1960) supports the above evidence and reports that the Seleucid envoy, Megasthenus (302-298 B.C) described the textiles at the court of Chandragupta as flowered muslins of finest weave and as robes embroidered in pure gold. He was most likely referring to *Jamdani* weaving (Silverstein, 1981).

The following five hundred year period from 200 B.C. - 300 A.D. was a period of intense political, religious and economic activity in India. This led to the flourishing of Buddhist and Jain religions, the consolidation of professional craft guilds, the expansion of trade with western Asia and Greece, maritime contact with Rome and Africa, and overland contact with China. As early as the second century B.C., the Romans used a Sanskrit word for

cotton (Latin *Carbasina*, from Sanskrit *Karpasa*). During this time, delicately translucent Indian muslins were fashionable in Rome under such names as *Nebula* and *Venti* textiles (woven winds), the latter translating the technical name of a special type of muslin woven in Bengal and still in use in the modern period (Irwin,1970; Silverstein, 1981).

The Gupta period (320-650 A.D.) was an important period in textile history. Muslins and brocades of silk, cotton, and wool were produced in quantity in northeast and west India. These textiles enjoyed north-south trade within India as well as continued exchange with already established trading partners outside of India (Silverstein, 1981).

Due to the paucity of written records and actual surviving textiles pre-dating the seventh century, researchers have been limited to identifying the types of textiles produced during the medieval period by refering to early stone sculptures and paintings.

> The cave paintings at Ajanta portray a wide variety of vividly coloured geometric, floral, and animal patterns on cloth. It is difficult to identify specific techniques and materials, but it can be summarized that brocaded and printed examples are depicted and the technique of Ikat weaving can be identified with some certainty. (Silverstein, 1981, p. 7)

was the spread of the Moslem religion in India that denotes the next major foreign influence on Indian textiles.

> This period of Indian history -from A.D. 1290 to A.D. 1525 -- with its military expeditions, annexations and revolts, experienced only brief spells of peaceful existence. And yet, the lack of political stability did not upset the economic equilibrium of the country. Historical and literary writings of this period mention great cities with

> rich markets, wealthy merchants, skilled craftsmen and agricultural techniques. (Silverstein, 1981, p. 8)

Chandra reports that the names of the fabrics mentioned in the literature of this period provide interesting additional information about t'eir appearance. Terms such as *Anhinvala* (silk from Anhilvad-patan in Gujarat) and *Tanchera* (Tanjore silk) indicate their place of manufacture, while others such as *Kadali-garbha* (silk comparable to the inside of banana tree trunk) and *Mukhtaphna* (silk with lustre of pearls) suggest their texture. Some words like the *Dandaprakara* (striped silk) and *Hamsavadi* (cloth with geese motif), describe the pattern and some like *Panchavarnapadi* (five coloured silk) and *Parevaupata* (pigeon coloured silk) indicate the colour.

From the Akbar period (1556-1605 A.D.) onward there are consistent accounts from Mughal and provincial schools of painting of the textiles associated with life at court (Silverstein, 1981). Regional craftsmen were invited to the royal workshops of the Mughals where they worked under the direction of Persian master-weavers. Many Hindus converted to the Muslim religion in order to benefit from Mugal patronage, and the blending of Persian with Indian traditions had a profound influence on subsequent artistic development. The impact was felt at both the urban and village levels (Buhler, Fischer, & Nabolz, 1980; Mehta, 1960; Saraswati, 1961). During the Akbar period, fabrics from other countries were in constant demand as Muslim

royalty and nobility exhibited a marked preference for them (Chandra, 1973).

European trade interests were present in India from the fifteenth century onward. First, the Portugese, followed by the Dutch, English and French, established trading stations along India's coasts. The main textile centres were Gujarat, Sind and Rajputana in the west, the Coromandel coast in the southeast, and Bengal and Orissa in the northeast. The weakening of centralized Mugal authority, prompted in part by the revival of Hinduism, was coincidental with a growing European influence, and by the eighteenth century the English virtually monopolized trade in India (Irwin & Hall 1970; Silverstein, 1981).

Western India in the seventeenth century enjoyed pre-eminence as an exporter of painted and printed calicos, the best and more expensive being painted rather than printed. A considerable change took place in the middle of the seventeenth century when the craftsmen were asked to modify traditional Indian patterns according to English taste. This led to the development of Anglo-Indian patterns and motifs on textiles. Sample patterns prepared in England were sent to India. This trend continued until the industrialization of Britain in the mid-nineteenth century resulting in a decline in demand for Indian handcrafted products (Baker, 1921; Irwin, 1953; Irwin, 1949; Irwin and Hall, 1970; Silverstein, 1981).

Methods of Data Collection

For this investigation, qualitative research methods, which are commonly applied in the arts and humanities were used. According to Kirte (1982), "research methods which are appropriate for qualitative design include those that are not easily quantified or lose their meaning in quantification; are comprehensive in nature; and are in the exploratory stages of development" (p. 42). The nature of data available for this study meets the criteria suggested by Kirte. The qualitative methods proposed by the researcher are historical and ethnographic research methods.

Data was collected both in Canada and in India and was taken from both primary and secondary sources. The data gathered showed the nature and breadth of the production techniques, the motifs, the dyes, and the history of the textiles of Gujarat.

Data collected in Canada included primary sources such as artifacts housed in the Clothing and Textile Study Collection of the Faculty of Home Economics at the University of Alberta. Secondary sources of data included books, exhibition catalogues, journals, and unpublished theses related to Indian textiles.

Data collected in India included primary sources such as: focussed interviews held and oral histories taken from the local craftsmen who use traditional techniques of textile production. The aim of the interviews and oral histories was to acquire data regarding the textiles of

Gujarat, in general, and of Ahmedabad and Baroda, in particular. The researcher gathered information about the methods of production, dyes, interpretations, and symbolism of the motifs (including oral traditions) that may not have been recorded in the literature.

Another source of primary data in India was participant observation in which the researcher visited local craftsmen to observe and learn some of the production techniques. This method helped the researcher to become acquainted with aspects of traditional methods of production and the tools and dye technology which craftsmen usually take for granted and normally pass on verbally through the family.

A number of Gujarati village markets were visited with the aim of collecting popular textiles produced by traditional production methods. Textiles and tools used by local craftsmen for printing were also collected both from the craftsmen themselves and from handicraft outlets. Shopkeepers were interviewed to determine the use of traditional and innovative motifs with regard to the overall design trends currently produced in Gujarat.

The researcher also visited the Calico Museum of Texiles, the National Institute of Design, Shreyas Folk Museum, and the Vaisala Museum to study the historic textiles of Gujarat. Sketches of textile motifs from these museums were made in a sketch book and notes were of about the colours and motif placement. In addition, photographs of textiles and their wearers were taken.

The researcher visited the library of the University of Baroda and the library archives at Gujarat University in Ahmedabad to investigate the extent of research done with respect to the textiles of Gujarat. In addition, books, unpublished theses, catalogues, and articles pertinent to the investigation (and not available in Canada) were collected.

A glossary was compiled to assist in the interpretation of a number of technical terms pertaining to the construction and decoration of Indian textiles.

Treatment of the Data

For the investigator, who is also a designer, research is a tool for assimilating knowledge which will be passed on in the form of a body of art work to express the essence of the textiles of Gujarat. The purpose here is not to duplicate. The needs, environment, and lifestyle that make textiles from Gujarat meaningful cannot be replicated as Polakoff (1980) remarks "... life in anything hand-crafted must come from the reality around it. Our art must come from who we are, from what we learned and from what we need and have today...." (p. 181).

The researcher summarized the information gathered from all sources according to the history of the types of dyes and colours, textile production methods, and motifs used in the textiles of Gujarat. These catagories have proven useful when applied to a studio setting in Canada.

The next step involved the assimilation of data collected with the researcher's artistic ability to produce a body of decorative designs on textiles. The logical way to achieve this was to proceed in the following manner: firstly, to select dyes which are readily available in Canada and closely approximate the range of hues found in Gujarat; secondly, to select production methods which are similar to but not necessarily those which are used in Gujarat; thirdly, to select certain motifs and colourways and to produce decorative designs on fabrics which will convey the spirit of the textiles of Gujarat.

It was not possible at this point, however, to predict what types of motifs, patterns, colours and techniques could be used to produce surface embellishment on textiles which could convey the spirit of the textiles of Gujarat. Consequently, a preliminary exploration was conducted before the work on larger textile designs proceeded. This preliminary exploration included a number of steps. Firstly, sketches were made and motif studies were undertaken in the sketchbook. Secondly, various pattern plans were experimented with on graph paper. Thirdly, six studies of motifs, patterns, and colours were undertaken using gouache on watercolour paper. Fourthly, using Procion dyes on silk and cotton cloth, numerous colour studies were conducted. Finally, twelve dyed textile samples were produced using silk painting techniques.

For the final projects, the researcher chose techniques, motifs, patterns and colours based on the results of the preliminary studies. The methods leading to the final textiles have been documented in this thesis to enable future designers to benefit from this approach to the design process and to guide their explorations.

Methodology

Preparation for the investigation began with the subjective selection of raw materials, tools, and equipment to be used. These, along with the choice of a colour palette and motif categories, were used as broad limits within which the researcher began to work.

Motifs

Most researchers are concerned with factual data. The artist, on the other hand, is concerned with the correct assessment of his/her own aesthetic judgements and with accurately conveying them. One of the devices that can be used by an artist is carefully selecting motifs that accurately represent those found in the textiles of the area under investigation. These motifs should have a potentially broad appeal and be capable of relating to the wider common experience of an audience. The stylized flower and creeper motifs alongside geometrical forms chosen for this study can be found, in one form or the other, in all types of textiles from

Gujarat, that is, they can be found in textiles of the court, the village, and the temple.

Colours

Gujarat, known as the colour belt of India, has always been noted for its brilliant colour palette and for the keen colour sensibilities of its artisans. Jayakar (1980) reasoned that "it was as if the arid wasteland of the desert, the gnarled babul tree, the fierce noon day sun and the absence of green in the landscape, demanded the recompense of colour"(p .21).

A wide range of colours typical of Gujarati textiles were incorporated in this researcher's textiles. The background of the cloth was always kept dark so that the positive space, in lighter colours, would stand out in contrast. For the background, deep colours in red, green, blue, and violet of similar values were used. Variations in intensities of yellow, orange, pink, and yellow-green were decided upon for the floral and foliage motifs. Keeping the above guidelines in mind, the colour scheme for each of the projects was planned while the pattern was being developed. In combining the colours, the influence that one colour had upon the other was carefully considered so that they could be arranged in such a manner to enhance and enrich each other thereby conveying the vigour and vitality of the textiles of Gujarat.

Techniques

The review of literature revealed that the craftsmen of Gujarat used numerous techniques in the production of their textiles. For the purposes of this study, direct painting was selected as the technique for fabric embellishment. The craftsmen of Gujarat have been well known for the mastery of this method of fabric decoration. Moreover, the use of this method was practical in the Canadian studio setting.

Fabric Selection

Silk was selected as the fabric appropriate for producing the final textiles. It was chosen mainly for its excellent dye receptivity and its suitability to the painting techniques used in this study. Fabric with no commercial finishes applied such as permanent press, wrinkle resistancy, soil retardancy, and water repellency was used. White pongee silk (12 mm) was purchased from Sureway, Toronto at $7.00 per metre.

Methods and Materials

Dye Selection

Procion fibre reactive dyes, manufactured by Imperial Chemical Industries, were the dyes used for each of the projects in this investigation. Fibre reactive dyes are named for their ability to react with fibres by forming co-valent bonds which are not easily broken by heat, light,

or water. Fibres dyed with the reactive dyes have good to excellent wash and light fastness characteristics.

There are other features which make reactive dyes suitable for use in the studio situation. They dissolve easily in water; they diffuse into the fibres readily; the hues produced are bright and strong; and the dyes mix readily with each other to give a wide range of colours and intensities. Futhermore, these dyes are easy to use, requiring only salt and sodium bicarbonate or sodium carbonate as dye assistants. The dry dye powder is very stable and, if stored in air-tight containers, away from excessive heat and light, will keep almost indefinitely. The liquid form is easily used and potential hazards of dye particles being inhaled can therefore be avoided.

There are some drawbacks to these dyes. They will hydrolyze; they are somewhat expensive, and in powder form, they can cause respiratory allergies. Due to hyrolysis, stock solutions tend to decompose quickly and cannot be used over months the way acid dye solutions can. Their higher cost is more a problem for industry than the individual dyer who consumes comparatively small amounts of dye over a year's work. Safety precautions for handling dyes should be observed. Mixing the dyes in a fume hood, using a face mask, wearing gloves and protective covers will reduce exposure to the dye.

Design Production

Designing is a continuous, ongoing process and the act of producing handcrafted textiles involves a series of evolutionary steps. During the data collection, a large number of rough drawings were made. Finally, one version of an idea that appeared to be sucessful was chosen and refined. The drawing was then enlarged to standard design size (20 cm by 15 cm). A number of photocopies of the individual motifs were made to aid in the placement of individual elements within the final layout. Numerous arrangements of motifs were experimented with until an aesthetically pleasing and balanced arrangement evolved. Necessary readjustments were made and the motifs were drawn and traced onto newsprint paper. The result was a polished layout of a finished line drawing of the design to be produced on cloth samples.

It is not possible to complete the polished layout without any thought to the colour of the design; therefore, experiments with a variety of colour combinations and placement were undertaken along with the development of the layouts of the motifs. A number of colour studies using pencil crayons on photocopied reproductions of the designs were produced. Using the ideas from the colour experiments, an exact painted rendering of each of the planned designs was produced using gouache on watercolour paper.

Fabric Preparation

The fabric was washed to remove any soil or finishes, such as sizing, which would interfere with the ability of the fabric to accept the dyes. Some of the fabric used in this study was dyed a pale gold by ir rsion dyeing in a fibre reactive dyebath.

The fabric was then laid on a clean padded table on which the layout was taped and pinned into place with T-pins. The designs were traced with a fast dissapearing fabric pen and layouts were saved for future reference. A similar layout was later used with different motifs, or same motifs were used in different arrangements.

Direct Painting Process

Two methods of direct painting were used in the production of the final textiles. Firstly, hot wax was used as a resist to seal off areas in which the dye was to be painted and secondly, thickened dye paste was used for painting fine details.

The fabric was stretched onto a wooden frame, using fine pointed plastic-topped push-pins placed at five centimetre intervals. Hot wax, composed of a 60/40 mixture of beeswax and parafin was used to trace out all the lines of the design. To achieve a fine, controlled and clean image, the wax was applied with a Ukrainian tjanting tool called a *kiska*. The wax lines completely isolated each colour section. Breakages in wax lines were identified by

holding the fabric against the light and by painting water in the enclosed areas to detect possible bleeding.

The colours were mixed in small jars and were tested on a strip of silk identical to the silk of the final textiles. With a watercolour brush, colours were worked into the enclosed areas. Applying the colour in shapes smaller than needed, since the dyes bleed outwards, prevented the brush from sweeping over the waxed lines. It was also found desirable to work from light colours to dark. Fine details were painted using a brush and dyes thickened with a water soluble *gutta resist*.

The finished dried textiles were removed from the frame, rolled in plain newsprint and steamed for twenty minutes. After steaming, the pieces of silk were then washed in cool running water until the water ran clear. The pieces were then washed with hot water and non-ionic synthropol detergent and finally dry cleaned to remove the remaining wax.

CHAPTER IV

ANALYSIS AND DISCUSSION

The textiles of western India are noted for their aesthetic qualities, their beautiful colours, their rich patterns, and their many uses. To better appreciate the textiles of Gujarat, a geographical and historical study was undertaken to comprehend the relationships of the Gujarati craftsmen and the production methods and dyes used on textiles from this region of India.

There were several reasons for choosing to study the textiles of Gujarat. Firstly, Gujarati textiles utilize a variety of decorative design techniques and have been well known for their high quality. Secondly, there is a wide, though scattered, selection of secondary sources of data related to textiles from this region available in Canada. Thirdly, there are numerous primary sources of information housed in several museums and among the various craftsmen producing traditional textiles in and around Ahmedabad, Gujarat. Fourthly, the researcher's familiarity with language and customs of people of Gujarat made understanding the region less difficult than other regions.

This investigation revealed the infinite potential of the traditional designs, techniques and unique colour schemes of Gujarati textiles for a contemporary designer. The six textiles produced in this investigation represent the researcher's interpretation of only some of the design

sources available to the contemporary textile designer using the cloths of Gujarat as inspiration.

The floral motifs and foliage which are the themes common to all the final textiles produced for this investigation were chosen due to the researcher's interest in the Indo-Persian art style evident in the embroidered and painted textiles of Gujarat. The Indo-Persian style was a result of the fusion of Indian art and Persian stylistic elements common during the Mughal dynasty of the seventeenth and eighteenth centuries. The formal flowering plants or clusters of blossoms arranged regularly over plain surfaces became dominant motifs in textile patterning during the Mughal period and provided inspiration for the researcher's textiles.

Alternate 'flower and leaf' motifs were used as the basis of textiles 2, 3, 4, and 5. As in the Indo-Persian designs, the flowers are bold, conventionalized, and larger in size than are the stems and the leaves. The borders almost always consist of alternate flower and creeper motifs, an arrangement which is present in village, court, and religious textiles. A popular adaptation of this arrangement used in village embroideries is floral motifs which alternate with parrots, an arrangement considered, but not pursued, by the researcher during preliminary studies.

The spatial arrangement of motifs in the final textiles produced for this study, except textile 1 and 5, is unlike that found in Gujarati textiles where the field is

interpersed with conventional motifs at regular intervals. The motifs in textiles 2, 3, 4, and 5 were placed within broad vertical bands lending direction and balance while the curvilinear lines in the undulating stems were used to create a feeling of buoyancy and motion in the design. The relation of the motifs in each band with those in the adjacent ones was carefully considered to produce pleasing and balanced compositions. The use of rows of chevrons was another element used to achieve rhythm in the design. Chevrons symbolize water and are used abundantly in all indigenous textiles of Gujarat.

A wide range of intense hues were utilized in the textiles, reflecting the vitality and richness of the textiles of Gujarat. Gujarati craftsmen have always been known for their keen colour sensibilities. Jayakar (1956) observes that no matter how many colours have been used to form a traditional design, they blend smoothly, never producing a single jarring note. The basis of colour distribution in the final textiles was influenced by the embroideries of Gujarat which are bold in combining large areas of intense colours. In the final pieces, the interplay of dark colours in the background with the bright intense colours of the foreground was utilized to enhance the vividness of the compositions. A similar division of colour is often used in Indian textiles to give a design life and vibrancy.

Textile 1

Textile 1 reflects the strong influence of Persian designs found in Gujarati textiles (Plate 1 and 2). The design motifs are so composed that the whole area is filled, without any interruption of continuity, by the interweaving of foliated stems. This design unit is a variation of the flowering scroll which originated in the Middle East and can be found, in one form or the other, in all the textiles of Gujarat. The design is strictly symmetrical and illustrates the Indian textile designer's preference for filling the whole available area.

The colours used in this textile are inspired from the rich colour traditions of embroidered textiles of Gujarat. The division of colours into major fields gives the design life and vibrancy, though it is a discreet vibrancy in that the medium does not provide the same relief as seen in the embroideries of Gujarat. The yellow wax line, which forms a continuous outline, serves to link the colours together by imposing an overall chromatic key. Prominent outlines, usually black in colour, are characteristic of Gujarati Kalamkari fabrics.

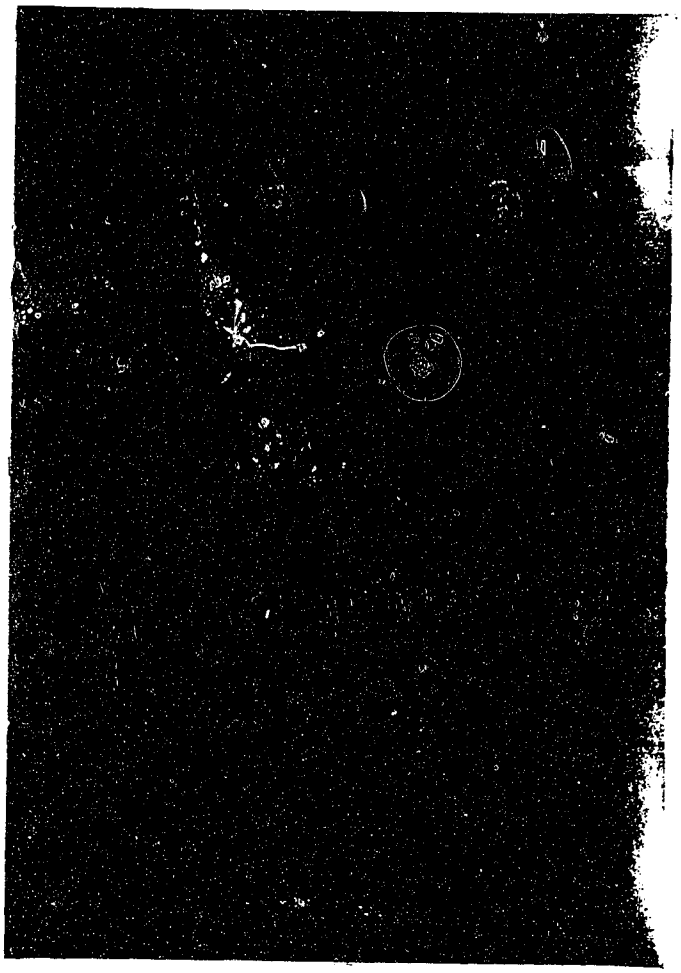

Plate 1. Textile 1

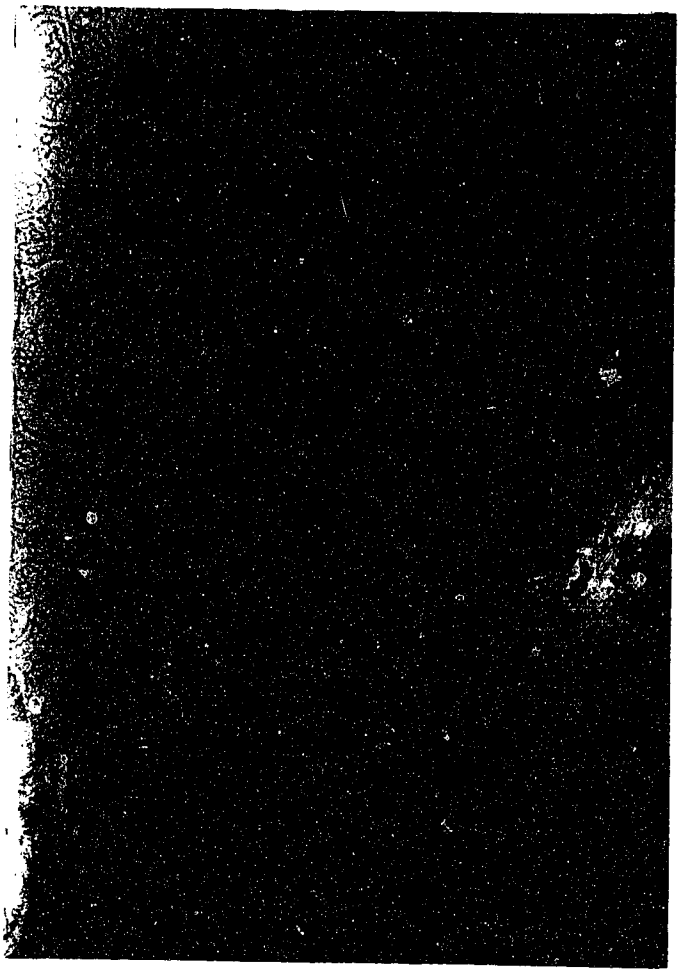

Plate 2. Textile 1

Textile 2

Textile 2 was inspired by the painted tent hangings from Gujarat, common from the eighteenth century onwards. It incorporates the characteristic tradition of arches containing flowering plants and the intertwined foliated scrolls of the borders (plate 3 and 4).

The light coloured grid formed by undulating stems and leaves stands out in contrast on the dark background. It defines not only the internal divisions of design but also provides for the clarity. The design is based upon an ogee repeat which is emphasized by alternating the background colours.

The practice of Indian block printers using different smaller blocks within the larger block to bring about variations in the design (especially notable in Mata Di Pachedis) inspired variations in the flower motifs. The treatment of the stamens in this piece reflects the use of sequins in the embroidered textiles to draw attention to certain parts of the design motifs.

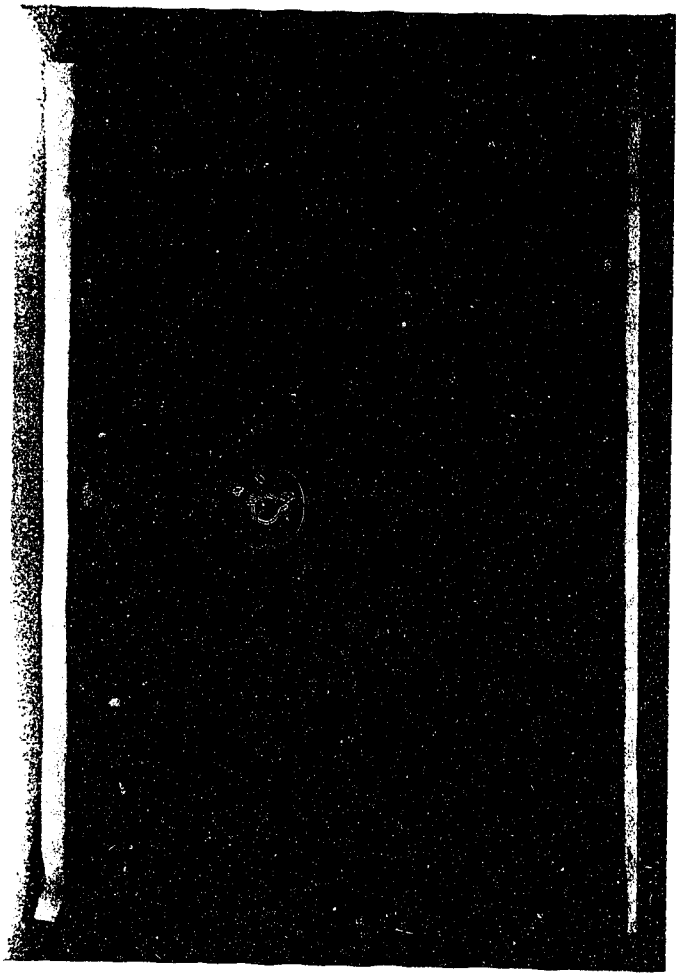

Plate 3. Textile 2

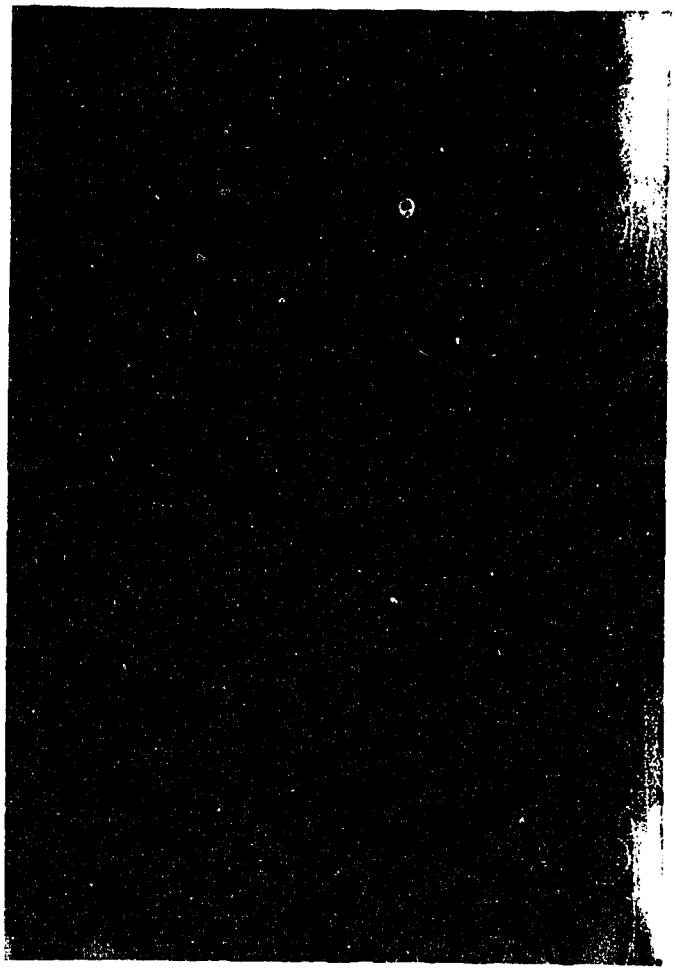

Plate 4. Textile 2

Textile 3

Textile 3 was inspired by painted Gujarati textiles in the Indo-Persian style (plate 5 and 6). The emphasis in this piece is on the panel within which the design is placed (as opposed to the formalized ogee shapes of textile #2).

The stem with flowers and serrated leaves constitutes the unit of design. The use of cross-sections of flowers is a feature found in both painted and block printed textiles. A distinguishing attribute of Indian art is the impression of flatness of surface. This effect is obtained by representing ornamentation in a strictly conventional method and without shading (Jayakar, 1956). This characteristic was noted in all Gujarati textiles and was reflected in all the pieces in this study.

The use of rows of chevrons was inspired by the Mata Di Pachedis and by the painted tent hangings where chevrons were frequently used to separate design fields and to enhance the border designs. These chevron rows also served to link the colours together thereby imposing an overall colour harmony.

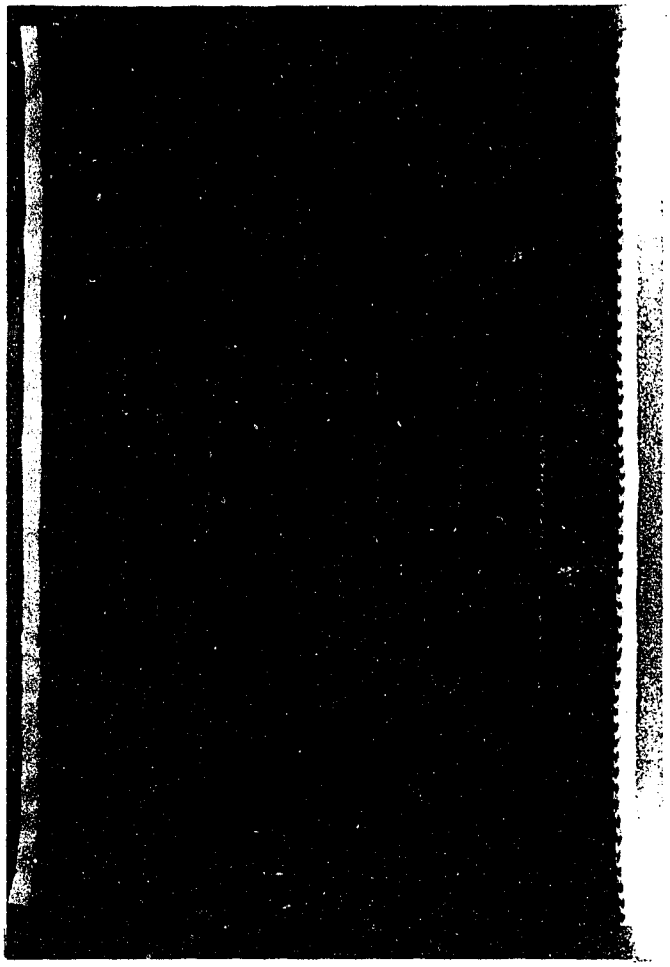

Plate 5. Textile 3

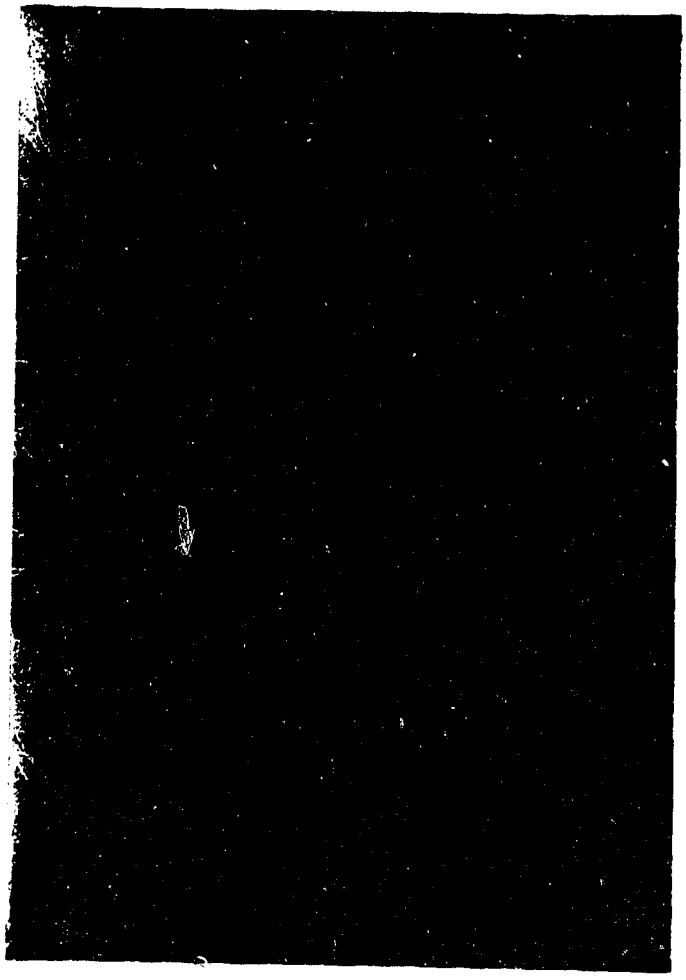

Plate 6. Textile 3

Textile 4

In textile 4, conventionalized lilies and carnations were utilized in an arrangement which was formal and yet full of movement (plate 7 and 8). The variety of colours used in this textile reflects Indian mordant dyed reds, indigo and green rather than the bold colours used in the embroideries.

This piece incorporates some resist dyeing and painting techniques found in Kalamkari textiles. For example, the spotted petals of carnations are inspired by chintz which was derived from the word *Chinta* meaning 'spotted cloth'. In the Kalamkari textiles, spotted areas were achieved either by painting mordants over a fabric which had been printed with a resist or by spraying mordants to obtain flecks of colour. In textile #4, the area was resisted by applying wax dots with a kiska and by painting selected areas with dye. The spots in the background of the large panels were inspired by the 'panch-bundi' design of Bandhani chunari textiles using gutta as a resist.

Plate 7. Textile 4

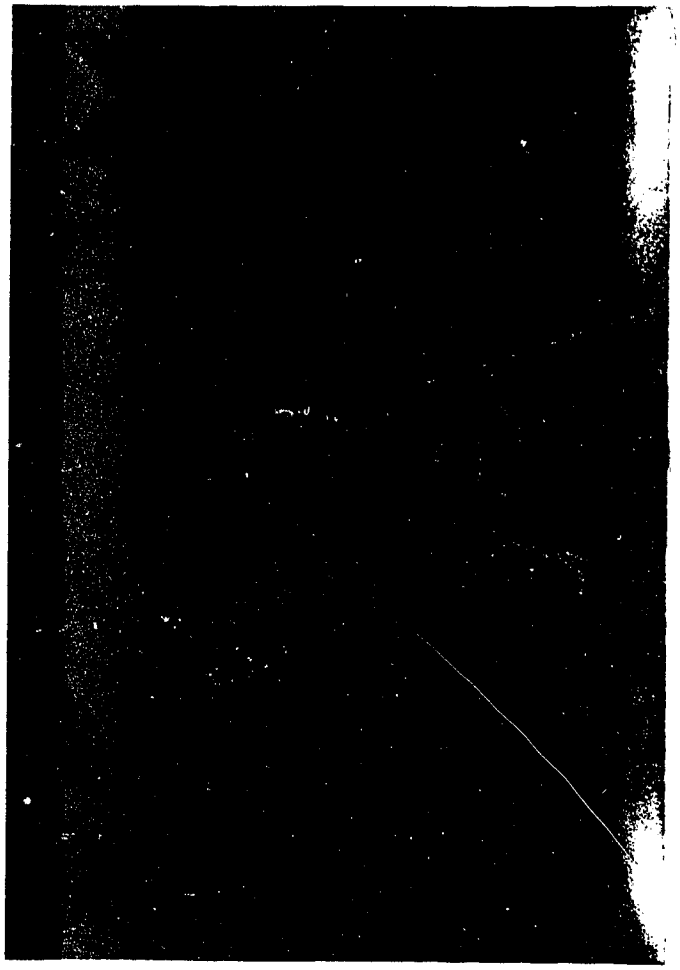

Plate 8. Textile 4

Textile 5

Textile 5 incorporates some features found in textile 2 and textile #4. The serrated leafs and flower motif echo the Indo-Persian influence while the colours used were influenced by the embroideries of Gujarat (plate 9 and 10). The design also borrows heavily from embroideries in the ornamentation of the flowers.

The pattern in the background of the panels derives inspiration from forms of brocades which the earliest fabric printing set out to emulate. An illusion of depth resulted from the placement of this pattern. The colours used reflect the colour sensibilities of Gujarati craftsmen. The complementary colours are used to create strong tensions in this design. Similar colour schemes are popularly used in the embroidered *gaghras* of village women in Gujarat.

The twentieth century has been a period of social and economic upheaval in India. Many forms of textile and craft production are still being practised, but only as the domestic market can sustain them. This is particularly true in isolated rural areas where traditional customs remain relatively undisturbed. Dhamija (1970) holds that folk art, being a spontaneous expression of the people, retains the past experiences of the community, yet also plays a vital role in the present.

Influence of Geography

India's geographical location has been an important factor in the evolution of Indian decorative styles. Physically, India is isolated from the greater part of Asia by the mountains of Afghanistan in the north west and by the Hindu Kush and the Himalaya in the north. These barriers isolated India so that India evolved a characteristic civilization of its own, however, not sufficiently that it could keep out the inflow of foreign peoples, cultures and ideas. The Indus valley and the Kutch are accessible from Iran, Afghanistan, and central Asia over difficult routes passing through deserts and over high passes (Figure 1). Due to its strategic location between the Far-East and Europe and the Middle-East, India played an important role in overland trans-Asian trade (Gittenger,1982; Vollmer, Keall, & Nagai, 1983).

Figure 1. Map of India

Though overland trade routes continued to play significant roles throughout the Middle Ages, after the fourth century, sea trade gained dominance. The coasts of the Indian penninsula, especially its western coasts and the southern tip, were open to shipping. India began trading with south western Asia, Arabia, Egypt, Thailand, Indonesia, China, and Europe. By the sixteenth century, English, Dutch, and Portugese trading companies had established what became known as *three corner trade* with India and other ports. European bullion was taken to India and exchanged for Indian textiles, which were in turn, traded for spices in the southeast Asian islands. Spices were in much demand in Europe. Similar trade patterns also developed along the west coast of Africa, where Indian cottons were bartered for slaves for the new colonies (Irwin & Brett, 1970; Vollmer, Keall, & Nagai, 1983).

Influence of Religion and Caste

Today, India is a secular state, however the influences of religion are still seen in every aspect of life. In the Indian experience, religion is not simply a set of ideas, but rather a comprehensive way of life which defines and shapes values. The traditions of the village, including caste and work patterns, have either been determined by, or incorporated into, the religions of the people. This has helped to insure permanence and create resistance to change

in these practices. In India, Hinduism, Jainism, Buddhism and Islam all teach religion as a way of life.

In studying the relationship of the current textiles to the religious and cultural heritage of India, Wegner (1967) observes that because village life has been relatively static, ancient forms as well as attitudes from that level of society continue to exist. Silverstein (1981) reports that Indian textiles, their techniques, and symbolism are the outward forms of a system in which a group's social identity is tightly regulated. He further states that the temple is a centre of religious and social life in India. Craft schools have grown around many of the major religious centres supplying the needs of the temple and also those of the pilgrims. For example, most temple hangings are pictoral, depicting scenes from religious scriptures or events from the legends of the Gods. Their function is primarily didactic. In a country where literacy is the privilege of only a minority, they provide the important graphic accompaniment to oral recitation. Religious motifs and depictions of Gods are often incorporated into clothing and household textiles.

Varadarajan (1982) suggests that an understanding of the caste system and the community complexion of textile producing groups is very important to the understanding of textile production. During the Medieval period, she reports, the Khatri community (Muslim as well as Hindu) were virtually the only participants in textile production in

Gujarat. According to Jain (1980), Khatri (printers), Bharsar (dyers), Vankar (weavers), and Mochi (leather workers) can still be found in Gujarat today.

Literature Related to the Textiles of Gujarat

In the past, researchers have classified Indian textiles based upon style or the end use of the fabrics. Irwin (1956) categorizes Indian textiles as follows: textiles produced by the skilled work of professional weavers and dyers who usually work close to large market towns; articles of luxury made under court patronage or in the court tradition; folk embroideries traditionally produced by women and belonging to the villages; and textiles of aborginal tribes.

According to Jayakar (1956) the printed and painted textiles of India follow two streams of craftsmanship which she classifies as the earth or village tradition, and the mosiac or inlay tradition including fabrics produced for the court and for trade purposes. For this investigation, it was useful to discuss Gujarati textiles according to their methods of production: embroidered textiles; bandhani or tie-dyed textiles; printed textiles; and painted textiles, and to use either Irwin's or Jayakar's classifications.

Due to common external influences and the fact the textiles described in this section are produced within the same region, the designs from any one production method share common features with those produced by other

production methods. For example, Irwin (1961) remarks that the seventeenth century designs of Gujarati embroidery were clearly influenced by the contemporary calicos, many of which were supplied by European *factors*. Embroideries and cotton paintings were sometimes worked from the same stencils. Similarly, the designs produced under court patronage can be found at the village level, though these are highly simplified and severely conventionalized (Irwin & Brett,1970).

Embroidered Textiles

Irwin and Hall (1973) list Indian embroideries under four headings: those used by the court; those used as trade cloths; those used as temple hangings; and those used by local villagers. They state that these categories frequently overlapped since professional embroiderers welcomed patronage of any kind, whether it came from court, temple or merchant. They also observe that due to gaps in the literature, the embroideries cannot be classified regionally.

A useful classification for Indian embroideries is produced by Dhamija (1964). According to Dhamija, there are six distinctive styles of embroidery produced in the north western region of India at present, which are: *Heer Bharat (satin stitch embroidery)*; *Abhla Bharat* (mirror work embroidery); *Kutchi Bharat* (chain stitch embroidery);

Sindhi Taropa (interlacing stitch); *Katab Bharat* (applique work); and *Moti Bharat* (bead work).

Heer Bharat derives its name from the floss silk (Heer) used for this type of embroidery in which the entire surface of the cloth is covered by embroidery using long satin stitches measuring as much as two centimeters in length. Geometrical designs and combinations of rectangles, triangles and squares form the main patterns. The stitches in one triangle run parallel to the warp thread; whereas, in the adjacent triangle they run parallel to the weft, creating an interesting texture and an effect of light and shadow without any change in the colour of thread. Heer Bharat embroidery is mostly executed on a deep blue background. The dominant colours of the threads are usually monochromatic reds, violets, yellows and greens. White and black are also used occasionally, although mainly in small areas. To emphasize the pattern, the intersections of the patterns are enhanced with mirrors. Heer Bharat is produced mainly by Mahajans, the commercial community (Dhamija, 1964).

Abhla Bharat evolved during the Mughal period. During this period, a process for manufacturing small mirror discs from sand, lime and soda in furnaces was developed. The mirrors were then embroidered onto the fabric. Shah Jahan, a Mughal emperor, built many palaces where mirror mosiacs were incorporated in the rooms. These palaces were called *shish-mahals*, meaning the palaces of mirrors, and according

to Pandit (1982), mirror work embroidery was inspired by the shish-mahals.

The technique and motifs employed in Abhla Bharat embroidery have remained unchanged since ancient times. Stitches used are the herring-bone, darning, stem, ladder, satin and couching stitches (Dhamija, 1964; Pandit,1982). Naturalistic motifs (Figure 2) such as mangoes, parrots, elephants, peacocks, lotus, creepers and flowers are used, although geometrical motifs are preferred by the Mahajan class. Rich shades of red, rust, saffron, yellow, green, indigo, purple, and fuschia are among the most popular colours used (Pandit, 1982; Dhamija, 1964).

Sindhi Taropa, the interlacing stitch, is characteristic of Sindh region. The foundation for this stitch is produced first, using long stitches on the surface of the fabric. The stitch is built by looping the thread around the basic structure several times so that lozenges and hexagons form and are shaped into four or six petalled flowers. At times the centres of the motifs are decorated with mirrors. Irwin and Hall (1973) suggest that the influence of the embroidery of Baluchistan is evident in Sindhi Taropa, and results in black or white outlines often being used to enhance the pattern.

Kutchi Bharat, or chain stitch embroidery, is the most popular of all the embroidery styles in Gujarat. Kutchi Bharat evolved from the embroidered leather work of Sind. Both are worked entirely in chain stitch, using an

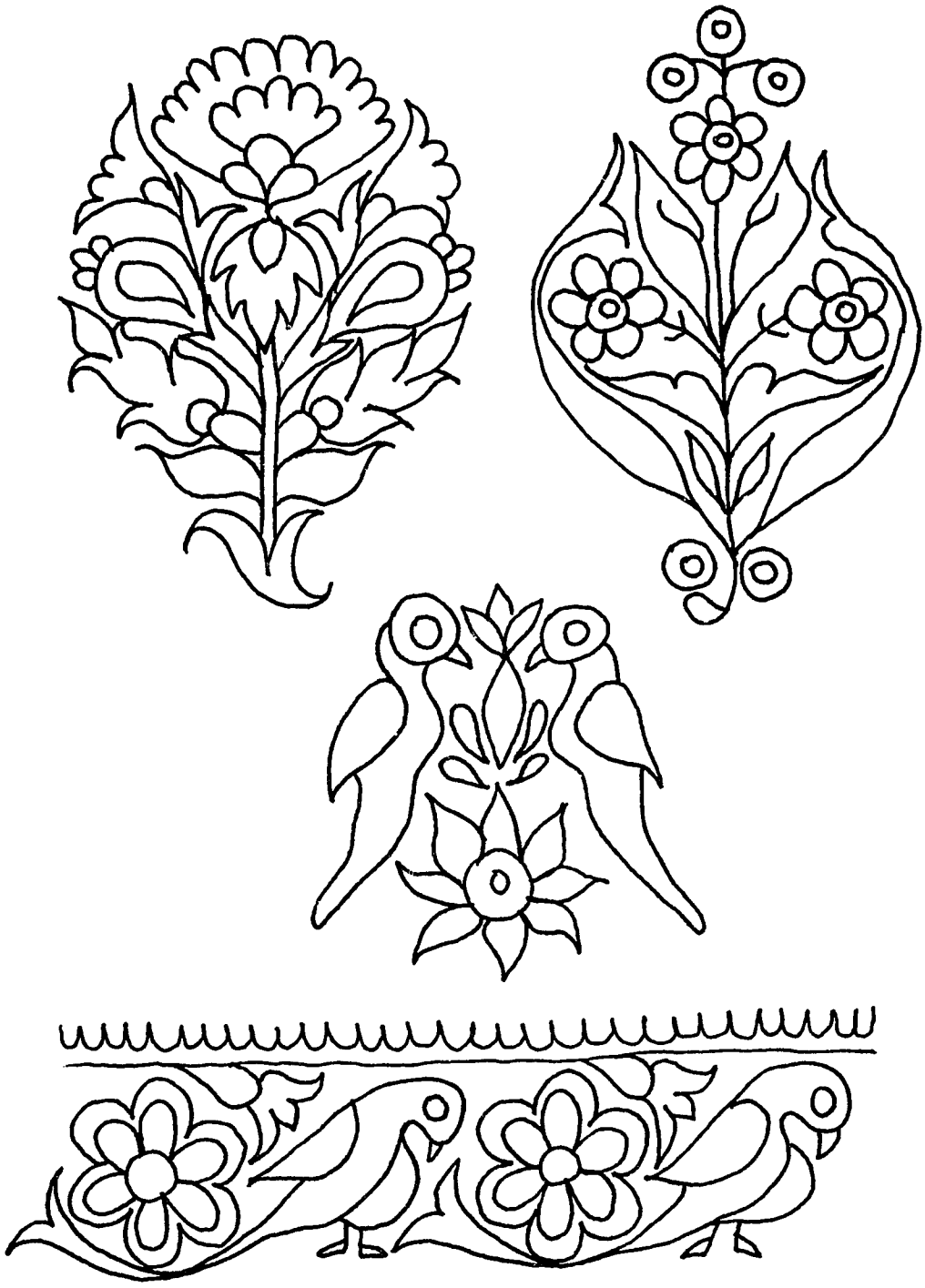

Figure 2. Selected motifs from traditional embroidered textiles

embroidery hook called an *ari*, which is similar, though more precise, to the European tambour embroidery hook. The stitches are tiny and the motifs evolved are rich in appearance. A typical embroidered textile consists of a body of flowering plants (*butas*) or two alternating patterns, usually peacocks and flowering plants, with a border (Irwin & Hall, 1973; Pandit, 1982).

Kutchi Bharat embroidery was prepared by professional embroiderers of the Mochi caste, who were traditionally leather workers. During the Mughal period, Mochi embroiderers worked mainly under royal patronage but also undertook private commissions. With the decline of the Mugal period, some of the embroiderers moved to Kathiawar and were employed by Kathi landowners. From the sixteenth century onward, some adapted to the demands of foreign tastes and produced textiles for trade to European countries. Irwin(1961) remarks that

> Sometimes the designs which sold best abroad were simply variations of traditional patterns, intended to appeal to the western fashions for the exotic. Sometimes they were composed of diverse and seemingly incongruous elements borrowed from different cultures, as widely separated as Europe or China. More often than not they were adapted straight from buyers or his agent. Whatever the elements and their sources, however, the final effect -- the combination of colour, rhythm and line -- was always unmistakably Indian, embodying the genius of local tradition (p. 35).

The designs used in embroideries for European trade usually consisted of serpentine flowering trees and tree-lets, interpersed with birds, butterflies, and small animals.

Applique or Katab work of Kathiawar originated from patchwork whereby coloured pieces of leftover fabrics are stitched together to make a textile. Applique work is used mainly for large hangings and for articles which receive heavy wear, such as the covers of carriages and the back-cloths for draft animals. Katab work is still being produced in Gujarat. Large motifs are cut from pieces of coloured cotton, which are stitched onto white cotton fabric. The dominant colours are red and blue. Dhamija (1964) states that the Bihar reverse applique style or *katwa* is not found in Gujarat, however, the Calico Museum catalogue *Indian Embroideries*, which illustrates many examples of reverse applique done by the Mahajan communities of Gujarat, contradicts Dhamija's statement. The motifs commonly found in applique are parrots, peacocks, flowering trees, horsemen bearing swords, royal processions, deities, women churning curds, and borders of interlacing scrolls, lozenges or pyramids. The figures and animals are severely stylized (Dhamija, 1964; Irwin & Hall, 1973).

Moti Bharat, or beadwork of Gujarat, evolved in the nineteenth century. Here cloth is not utilized at all. With the help of needle and thread, a large number of coloured bead designs are formed, creating a surface in itself. The beads, which were imported from Europe, were used to make articles such as wall hangings, decorations for cradles, and pot stands. The designs are similar to those produced by embroidery. Among the popular motifs are flowers, animals

deities, horsemen, elephants with riders and women churning curds.

Bandhani Dyed Textiles

Bandhani is a technique used to describe a resist dyeing process whereby designs are produced by tying individual parts of fabric before dyeing. The word *bandhani* originates from *bandha* or *bandhana*, the Sanskrit words for tying.

According to Jayakar (1947), there are two traditional types of bandhani: the *Gharchola* and the *Chunari*. She states that gharchola bandhani is more intricate in pattern and is traditionally used as the *odhani* (shoulder cover) of the bride at the wedding of Rajputs and other affluent groups. Gharchola bandhani is characterized by intricate figurative patterns of flowers, girls, elephants, and birds (Figure 3). It has, as a rule, a dark background of red, brown, or black. The bandhani work is in white, yellow, red, or green. In the more expensive garcholas, gold squares are woven into the fabric and the tie-dyed pattern is produced within these squares. In some designs, the bandhani work is restricted to the border and to large circles within the sari. These borders and circles are intricately patterned, usually in the form of circles of figures in traditional dance pose. Each gharchola piece has a specific name due to its predominant design, colour combination, technique, or relation to a particular ritual. For example, when more than

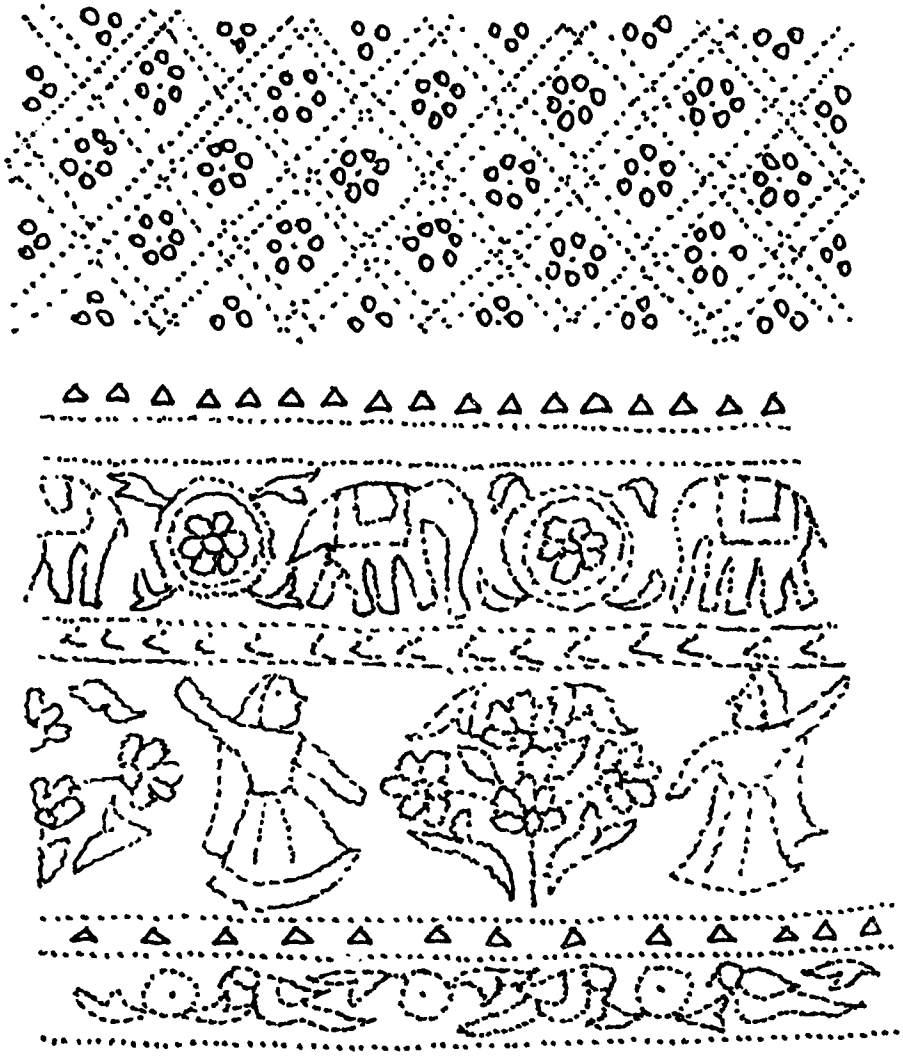

Figure 3. Selected motifs from traditional bandhani textiles

two colours are used, the design is known as *phulwar* or flower garden; where the animal motif predominates the design is known as *shikari* (Buhler & Fisher, 1980; Jayakar, 1947).

Chunari bandhani has a simple pattern and is of a lightweight fabric. The bandhana work is scattered throughtout the fabric in isolated dots or in dots grouped to form simple designs. Fabrics are named by the designs formed by the grouping of the dots. Popular designs are *Ek bundi* (one dot), *Tri bundi* (three dots), *Chau bundi* (four dots), and *Sat bundi* (seven dots).

To produce bandhana work, the fabric is first folded several times, wetted with water, and pressed over a wooden block with nails fastened in the configuration of the design. It is then taken off the block and given to a girl who skillfully picks up the portions raised by the wood block with her exceptionally long thumb and forefinger nails. These portions are deftly tied around with a waxed string that is carried over from one raised point to another without cutting. Great skill is needed not only to securely grasp all the layers of the cloth at once, but to also hold each portion so that it may crinkle in a particular manner while being wound and tied. Some of the work has as many as fifteen knots to a centimeter. The cloth is dyed in the lightest colour indicated by the design. It is then impressed on the second block and the tying and dyeing process is repeated. This is continued until all the desired

colours have been obtained and the design is complete (Jayakar,1954).

Printed Textiles

The severe nature of the Indian climate with its monsoons and high humidity has erased practically all evidence of Indian textile history prior to the sixteenth century, therefore, it is impossible to trace the early development of Gujarati printed textiles. The earliest known examples of block printed textiles are small fragments of Indian cloth which were found in the ruins of Fostat in Eygpt and have been dated as trade cloths from the fifteenth century (Irwin & Hall, 1971).

Jayakar (1956), working from indirect references in historical literature, has determined that from as early as the first century A.D., Gujarat was exporting Indian cotton prints, and during the Middle Ages, Gujarat continued to an be important Indian cotton printing centre. The other well known area for mordant dyeing and printing was the Coromandel Coast, which lies along the south-eastern margins of the Indian peninsula (Irwin & Hall, 1971).

Block printing represents perhaps the most widely practised textile process in Gujarat and incorporates several different techniques in its application. The discussion of printed textiles in this section will include the techniques of mordant printing, block printing using dyes, pigment printing, and flocking.

In preparation for printing, the blocks are manufactured by a specialized group of block makers who work on a commission basis for the printers. The blocks are made of teak wood known as *sag*. This wood is cut into blocks of various sizes, eight to fifteen centimeters in thickness, and stored for a year in a cool dark place. The smooth work surface created by leveling and sanding receives a coating of plaster to enable the design to be seen easily. The designs are first drawn on paper, which is pasted onto the surface of the wood block. Using a bow-drill, outlines of the pattern are perforated to a depth of approximately one half centimeter and, with a small chisel, the design is cut in a high relief. Holes are often cut into the block to allow for the air to escape from the design while printing. Finally, a handle is carved into the back.

Techniques associated with mordant printing during the seventeenth century, as practised in Western India, are described in a manuscript written between 1678 and 1680, by Roques, a merchant of *Companies des Indes*. The translation of this document gives a detailed account of the textile trade and the textile manufacturing process in Ahmedabad, Boranpur, and Sironj districts.

Contemporary methods of mordant printing as described by Fisher, Jain, and Shah (1978) and Vardharanjan (1982) indicate that the starch free cotton cloth used for mordant printing is soaked in water containing caustic soda and castor oil and left to dry. The outlines of the design are

printed with an iron mordant prepared by soaking iron shavings in water containing sugar molasses. The interior of the design is stamped, using another block, with alum solution thickened with the flour of tamarind seeds. The fabric is then dipped in a madder or alizarin dye bath. The colour which emerges is madder red. If darker tones are needed, a stronger solution of alum is prepared.

Amongst the mordant printed textiles produced in Ahmedabad are *Mata ne Pachedi*, temple cloths for the *Mata* or mother goddess. Produced by families of semi-nomadic *Vaghries*, these cloths serve as temporary and portable temples for worship of Mata. The worship of the mother goddess, who represents creative and destructive forces in the universe, is one of India's most ancient cults and varies from region to region. The central theme of Mata ne Pachedi is always the same; the Mata appears seated on a throne with weapons in each of her many hands. In front of her is a priest depicted leading a sacrificial animal, usually a buffalo, towards her. The rest of the hanging portrays religious subjects, legends, themes from local life, processions of worshippers, rows of animals, birds and flowers. The making of these cloths, and even the cutting of the print blocks, is dominated by taboos of religious rites. The tools and materials used to make Pachedis are not offered for sale or even shown to the people outside of the community (Fisher, Jain, & Shah, 1969; Irwin & Hall, 1971).

The technique of block printing with dyes was extensively used for cotton prints from which the clothing of the village people was produced. Although the printed cloths in the village styles were always somewhat less valued than the embroidered and woven fabrics, and thus not well recorded, the actual volume of printed cottons produced was enormous. As dictated by local custom, villagers wore new clothes at all religious festivals. For these occasions, cotton prints, brightly dyed muslins, and bold printed fabrics provided festive dress for even the poorest.

In the textiles made for the village people, the emphasis was on colour and mass rather than on pattern. According to Jayakar (1980), pattern was used to enhance the colour and to relieve monotony, but was rarely the focal point. The decorative motifs were highly stylized. Motifs such as flowers, animals, birds, rings, dots, and zig-zag ornamentations were commonly used (Figure 4). New motifs which influenced the village craftsmen were simplified, and unessential details were deleted. Two blocks were used for each pattern, one for the outline and another plain one for filling in the colour. Clear bold outlines are distinctive features of these regional prints. Even though commercial dyes, used with thickeners, have replaced mordants in present day textiles, colour schemes typical of earlier times are still being used by the village craftsmen (Irwin & Hall, 1971; Jayakar, 1962).

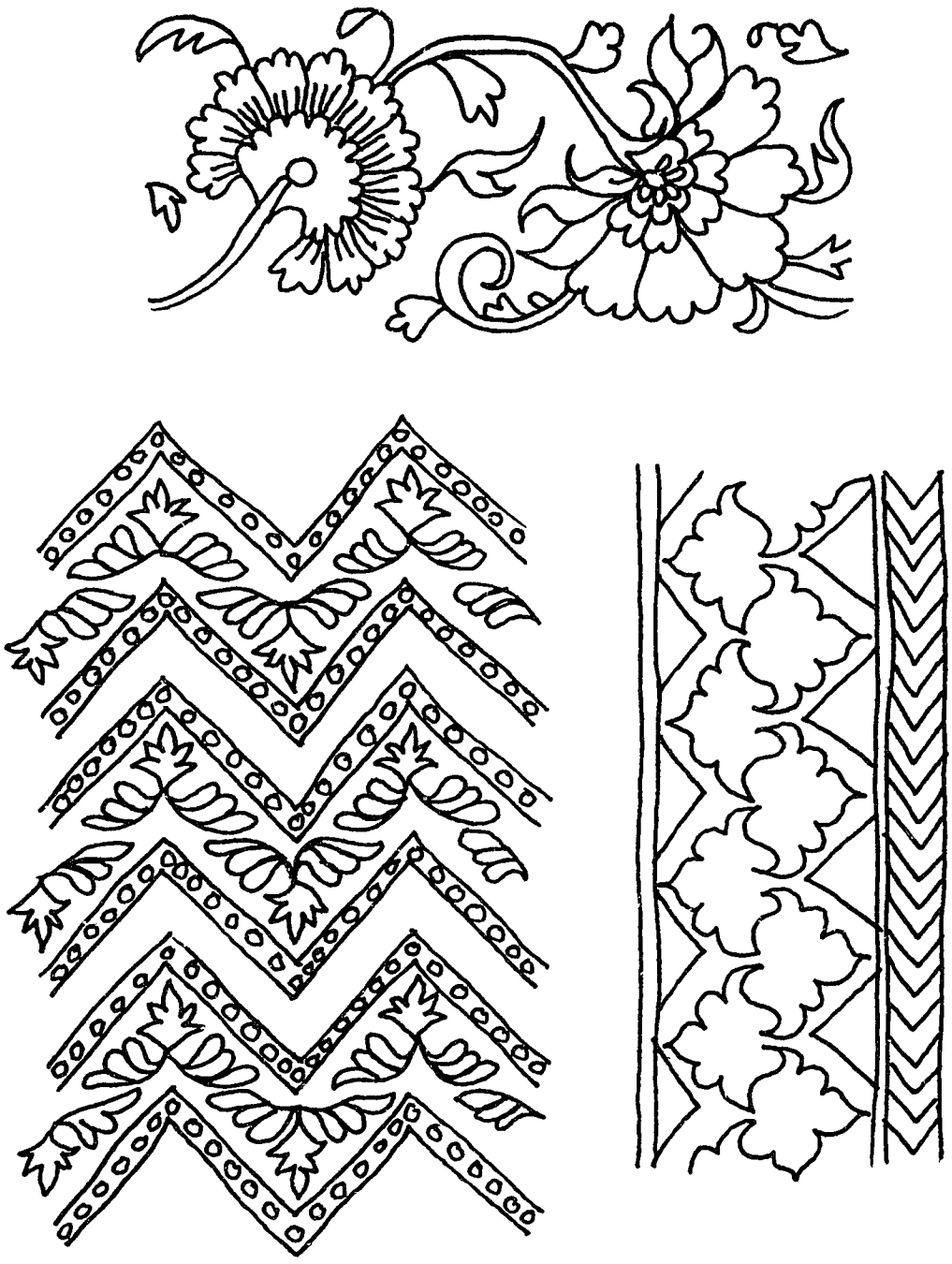

Figure 4. Selected motifs from traditional block printed textiles

Besides the textiles produced for local consumption, printed textiles were also made in Gujarat for trade purposes. Gujarat offered ports suitable for foreign shipping which had comparatively good inland communications and political stability. The chief centre of cotton printing was Ahmedabad. Though an enormous number of textiles were produced in this area for trade purposes, the printed textiles were considered inferior to the painted textiles due not only to the mechanical nature of the process, but also to the fact that the mixing of gum with the mordants inevitably reduced the efficiency of the chemical agents, thus, a lower quality of colours were achieved by mordant printing.

India also produced fabrics which were intended for East Asian markets. The patola or double Ikat of Gujarat was prized in Indonesia. Almost as valued as the patola were the block printed immitations of patolas produced by Indian craftsmen. These printed textiles and patolas became a focal point in many rituals of the Indonesian people. Not only were these textiles saved as heirlooms to be used in funeral, initiation and marriage rites, but they also played a central role in an elaborate barter system (Gittenger, 1982).

Rogan printing is still practised in several towns in Gujarat State. This process involves printing the surface of the fabric with thick coloured pigments which produce raised motifs on the cloth. A recent innovation is dusting the wet

pigment with coloured wool felt particles. To produce the design, fine threads are worked out of the pigment with a pointed metal rod, which are deftly applied to the fabric. Although the rough pattern is indicated before the printing begins, the details are always filled in free-hand by the worker. Rogan prints are also produced by block printing. The block consists of a brass box with a perforated design at the bottom. The pigments are pushed out with a wooden mallet that fits into the box. The designs are usually floral, or geometrical, and are simple versions of block-printing and embroidery design motifs found in this region (Bhusan, 1958; Mehta, 1960; Watt, 1910).

The process of *tinsel printing*, which is similar to flocking, consists of printing the design on cloth with thick pigments having adhesive properties. The cloth is then dusted with coloured powders or covered with silver or gold leaf, tin foil, mercury amalgam, or immitation metallic substances. Tinsel printing is not an indigenous technique to India. According to Irwin and Hall (1971), it originated in Persia and was introduced to India during the Mughal domination in the sixteenth or seventeenth century. The quick and simple method of tinsel printing was an ideal substitute for the expensive brocades of silk and gold (Bhusan, 1958). The designs used were similar to those found in embroidered textiles and printed textiles.

Painted Textiles

The discussion of painted textiles includes the techniques of *Kalamkari* (mordant painted) textiles as well as pigment painted temple hangings. The term 'Kalamkari' literally means penwork. Irwin (1956) remarks that the ability to apply colours free-hand was of revolutionary importance in the history of textile design because it liberated the designer from the limitations of the repeat patterns enforced by print blocks.

The techniques of Kalamkari have been recorded by a number of European eye-witnesses from the eighteenth century onward. Detailed accounts of mordant printing and mordant dyeing techniques were written by Daniel Havart in 1660, Antoine Beaulieu in 1735, Father Coerdoux in 1742, and by an English botanist, William Roxenburg in 1795 (Irwin & Brett, 1971).

In preparation for painting, the cotton cloth is half-bleached with an aqueous solution of fat and astringent (buffallo milk mixed with myrobalan). This is followed by beetling to give it a smooth surface necessary for painting. The pattern is traced onto the fabric by dusting powder through perforated outlines of the paper. The outline is traced out with a pen dipped in mordants. To obtain a black colour outline, an acetate of iron is applied and for red, the outlines are traced with alum. Since alum is colourless, the solution is tinted with sappanwood to make the outlines visible. The cloth is dipped into a vat filled with red dye

derived from *chay*, a plant of the madder family, the effect resulting in further blackening the lines already black and to develop the red lines. Next, the whole fabric, except the section that is to remain blue or green, is covered with wax. The cloth is then dyed in a vat of indigo, dried, and the wax is removed with boiling water. The lines which are to remain white within the red area are waxed, followed by painting of mordants (alum tinted with sappanwood). The concentration of the alum varies according to the tones required. A weak solution of alum provides red, while the addition of iron produces violet. The cloth is dipped again in chay solution to develop the red colours. Finally, yellow dye of vegetable origin, usually turmeric, is painted onto the cloth to produce yellow or to produce green by superimposing the yellow dye on blue.

One of the main uses of mordant painted textiles during the Mugal period was for tent hangings and for *Kanats* or screens which were used to surround the tents and provide privacy to the occupants. It was a custom for the ruler to make journeys of state to all parts of the kingdom to regulate affairs, administer justice in person, and hunt. The tent hangings usually consisted of several panels. Each panel (Figure 5) was decorated with a cusped arch containing a conventional flowering plant, and the spandrels of the arches were decorated with leaf scrolls bearing flowers. The panels were surrounded by borders of floral ornamentation, with a narrow border of chevrons. The placing of the flower

Figure 5. An example of hand painted tent hanging

heads within the arches, before adding stems and leafs, is characteristic of Mughal art. Sometimes the flowers were produced by block printing and the stems and leaves produced by painting (Irwin and Hall, 1971).

Another important category of Kalamkari textiles were the *chintz* fabrics which were produced for the European trade. The word 'chintz' is used today to describe any glazed cotton or linen furnishing fabric with a floral pattern. During the eighteenth century, this term described dress as well as furnishing material made of cotton and was produced in India for the European market.

When European countries began trading in India, they were mainly interested in Indian fabrics and other articles which were to be used for barter in the spice trade. It was not until the middle of seventeenth century that a demand for exotic Indian textiles began to develop in Europe. Painted and dyed fabrics from India became fashionable in Europe and were used as hangings, bedspreads and apparel. England, France, Denmark, and Sweden each engaged in the textile trade with India and imported chintzes for their domestic market.

The design motifs of chintz fabrics were influenced by the demands of the European customers. By 1660, sample patterns were sent from England for Indian painters to copy. Motifs depicting coats of arms, bouquets and festoons of flowers, *chinoiserie patterns*, and branched hanging designs were produced. By the turn of the century, the *tree of life*,

a design which the Indian chintz is frequently associated, gained popularity. Irwin and Brett (1971) suggest that the tree of life is a hybrid of patterns inspired by Persian miniatures, English crewel embroidery patterns, and European Chinoiserie. Other types of trade fabrics produced for European countries during the eighteenth century included those with a centre medallion and corner details, those with uninterrupted floral patterning, as well as motifs such as mixed flower bouquets with trailing ribbons. Most of these motifs were alien to Indian craftsmen (Irwin & Brett, 1971).

Apart from India, the only other country where mordant dyed fabrics were produced was Iran. Some information about mordant dyeing took place between the two countries, possibly due to the movement of craftsmen. In addition, large quantities of textiles were imported into Iran from Gujarat and Southern India during the seventeenth century (Varadharajan, 1982).

Another type of painted textiles produced in the area of Gujarat is the pigment painted temple hanging known as *Pichavai*. The Pichavais of Gujarat were made by the Vallabhacharya sect of worshipers of God Krishna. This sect, founded in the early sixteenth century in Mathura, north India, was forced to migrate to western India in the seventeenth century. The Vallabhacharya sect offers its followers a religious system which portrays the feelings of love for Krishna through the elaborate rituals of *seva* or service. The function of the Pichavais is to decorate the

room of the idol in a temple which is changed in accordance with the rituals of the day, the seasons, and the festivals. The centre fields of Pichavais usually portray episodes of the life of God Krishna, while the rest of the Pichavais are divided into scenes depicting the lives of other Gods,such as Brahma, Shiva and Vishnu. The Pichavais, in its decorative style, was influenced by the eighteenth century school of mural paintings at Jaipur (Irwin & Hall, 1971).

There is another type of pigment painted textiles known as *chitra patas*, meaning 'work of art' in Sanskrit. These textiles were not included in this study for they are considered to be close in tradition to fine art paintings on canvas.

CHAPTER III

RESEARCH DESIGN OF THE INVESTIGATION

The research design for this study is discussed under the following headings: selection of the region for investigation; methods of data collection; and treatment of the data.

Selection of the Region for Investigation

Gujarat State was chosen as the region of focus for this investigation for a number of reasons. Gujarat produces textiles which utilize a greater variety of decorative design techniques than any other area of India. Further, this region has been well known for hundreds of years as a centre for the production of painted and printed fabrics.

Ahmedabad, the largest city in the state, is an important cotton textile producing centre. In addition, Ahmedabad houses the Calico Museum of Textiles and the National Institute of Design which have gained recognition for their collections, publications and exhibitions of Indian textiles.

In addition, the researcher is familiar with the language and customs of the people of Gujarat. Gujarat is also more accessible by road, rail, and air than are some other areas of India.

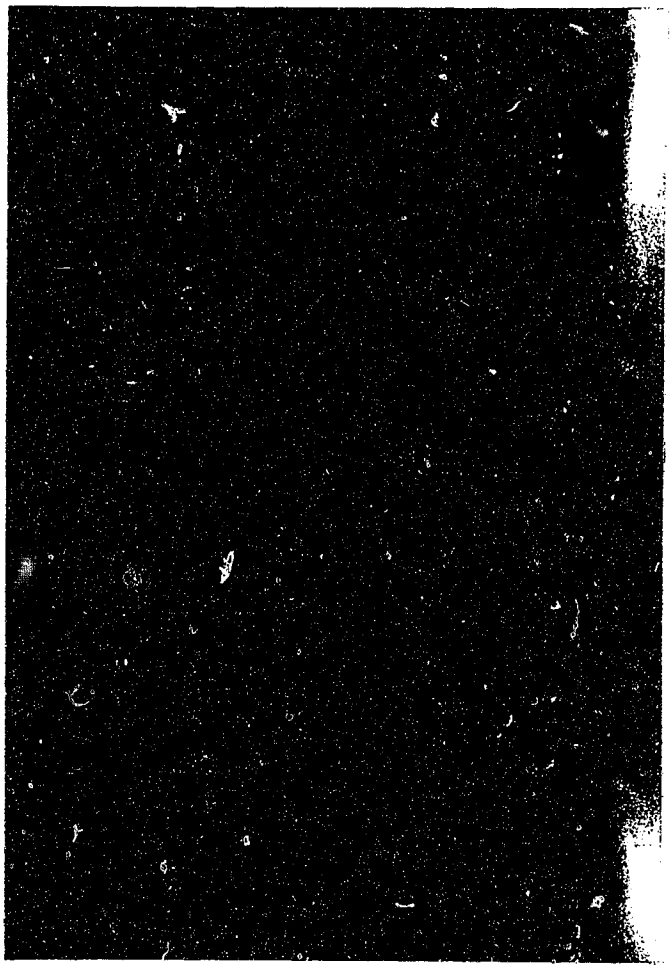

Plate 9. Textile 5

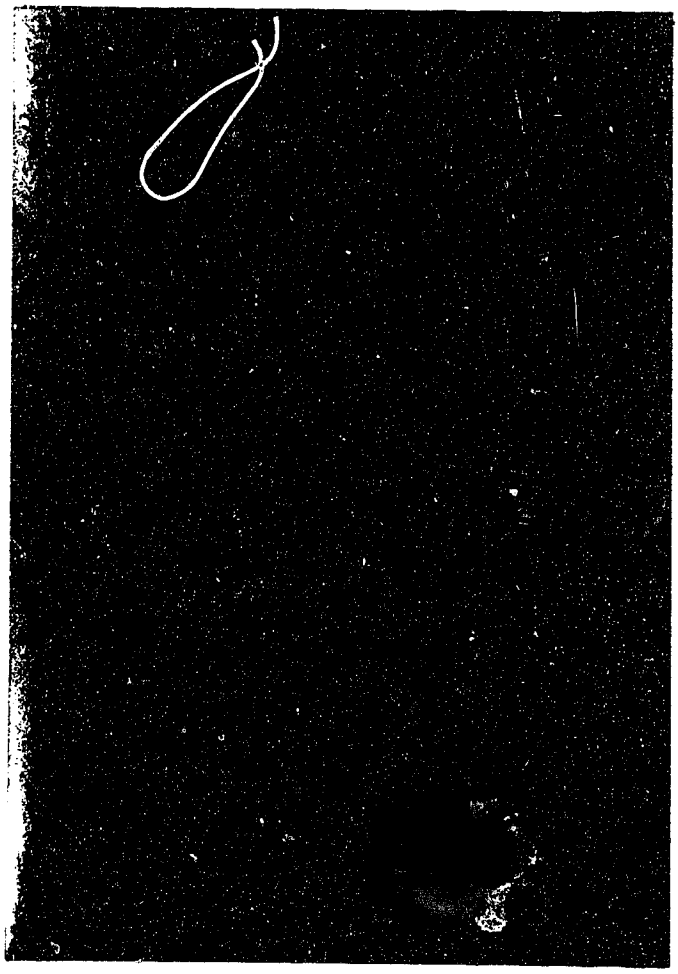

Plate 10. Textile 5

Textile 6

In textile 6 the spatial arrangement used is similar to those found in Indian painted chintz. The design incorporated 'serpentine flowering branches' bearing leaves and flowers of hybrid character typical of the trade fabrics (plate 11 and 12). Cooler and muted colours were used, as opposed to the warm, complementary colours applied in other textiles in the exhibit, to reflect the mordant dyed colours. The rows of chevrons were used, though not for dividing the design field as in the other textiles but to create a grid in the background and convey an impression of upward movement. The stems were extended beyond the rectangular design to suggest a movement beyond the actual object.

Plate 11. Textile 6

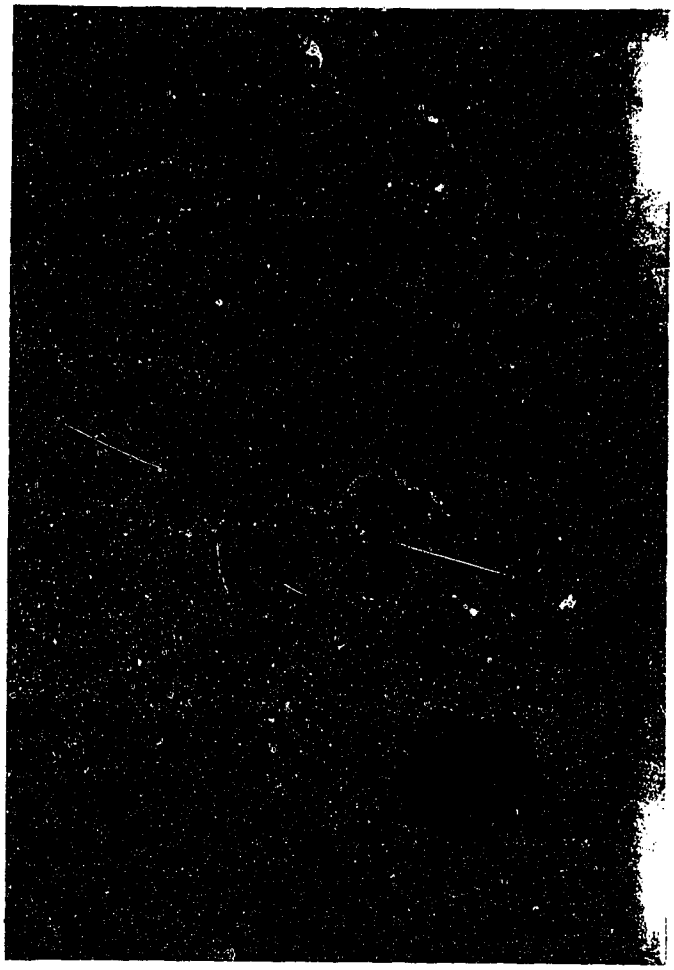

Plate 12. Textile 6

CHAPTER V

SUMMARY AND CONCLUSION

In this investigation the researcher proposed that Indian textiles could be studied with the aim of interpreting traditional designs and techniques for contemporary surface embellishment on fabric. The objectives of the study were to investigate whether the textiles of India could be useful as inspiration for a designer of hand-painted textiles; to investigate the region of India most favorable for that study; to investigate the nature and breadth of the production techniques, the motifs, and the history of the textiles from that region; and to interpret the traditional techniques and motifs from that region as designs for contemporary textiles.

The literature reviewed in preparation for the study included three areas: literature related to recent research using non-indigenous textiles as design inspiration; literature related to Indian textiles in general; and literature related to textiles of Gujarat.

The review of literature revealed that from earliest times, India has been known for its proficiency in producing cotton textiles and for the patterning of these textiles with brilliant, fast colours. The technology utilized ranged from simple methods of dyeing and weaving yarns to sophisticated methods of patterning involving a range of decorative processes such as the application of mordants,

various resist processes, bleaching, printing, and painting with dyes.

The production of Indian textiles was a part of everyday life. Indian textile craftsmen were deeply involved with religion, and it was religion that supplied the motive and gave impetus to the design of these textiles. Gujarati craftsmen have always depended heavily on myth and legend to explain the use of ritual designs.

In addition, the reciprocal design influences which resulted from trade between India and other countries led to an evolution of Indian decorative styles. Due to its strategic location between the Far-East, Europe, and the Middle-East, India played an important role in overland trans-Asian trade. Though overland trade routes continued to play significant roles throughout the Middle Ages, after the fourth century, sea trade gained dominance, and India began trading with south-western Asia, Arabia, Egypt, Thailand, Indonesia, China, and Europe. As a result India's textile traditions, although distinctly Indian, became a composite of many artistic styles.

The major foreign influences on Indian textiles came with the spread of Moslem religion during the Mugal period which led to the blending of Persian with Indian traditions and trade with the European markets which led to the Anglo-Indian patterns and motifs on textiles.

Data for this investigation was collected both in Canada and in India and was taken from both primary and

secondary sources. Primary data collected in India from sources such as participant observation, focussed interviews, and oral histories of craftsmen and from the Calico Museum of Texiles, the National Institute of Design, Shreyas Folk Museum, and the Vaisala Museum. Primary data collected in Canada included artifacts housed in the Clothing and Textile Study Collection of the Faculty of Home Economics at the University of Alberta. Secondary sources of data consisted of books, unpublished theses, exhibition catalogues, and journals pertinent to the investigation. The data which was gathered showed the nature and breadth of the production techniques, motifs, dyes, and history of the textiles of Gujarat. During the process of data collection sketches of textile motifs and notes were made about the colours and the motif placement. In addition, photographs of textiles and their wearers were taken.

The information gathered from all sources was summarized according to the history of the types of dyes and colours, textile production methods, and motifs used in the textiles of Gujarat. A preliminary exploration was conducted before the work on larger textile designs proceeded.

For the final textiles the subjective selection of raw materials, tools, and equipment, along with the choice of a colour palette, motif categories, and techniques, were used as broad limits within which the researcher began to work. The stylized flower and creeper motifs alongside geometrical forms chosen represented those found in the textiles of

Gujarat. A wide range of colours typical of Gujarati textiles were incorporated. The technique of direct painting was selected as technique for fabric decoration. Silk was selected as the fabric appropriate for producing the final textiles and procion fibre reactive dyes were used due for suitability for use in the studio setting and their ability to produce intensities similar to those found in Gujarati textiles.

Six textiles which were produced for exhibit in this investigation use floral motifs and foliage as themes. These motifs were chosen due to the researcher's interest in the Indo-Persian art style evident in the textiles of Gujarat. Though each piece in this investigation was unique, the features that brought about unity were: broad bands; conventionalized flower motifs; curvilinear stems; nearly symmetrical distribution of elements; closeness of motifs without creating an oppressive crowding; the use of foliated stems as a unit of repeat; variation in the ornamentation of motifs; and the use of intense dark backgrounds. This investigation revealed the infinite potential of the traditional designs, techniques and unique colour schemes of Gujarati textiles for a contemporary designer.

Recommendations for Further Research

As a result of this research, it is clear that several areas should be investigated. The researcher makes the following recommendations:

1. The textiles produced in this investigation cannot be considered exhaustive of the range of designs which may result from the textiles of Gujarat. Other motifs and decorative techniques of Gujarati textiles should be explored and interpreted as contemporary textiles.
2. A systematic investigation which has as its focus the interpretation of textile designs and techniques from other regions of India could be conducted.
3. There is a lack of comprehensive research on the influence of Persian designs on Indian textiles. A study should be undertaken to investigate the development of Persian and Indo-Persian motifs in the Indian textiles and their potential for adaptation to contemporary textiles.
4. A number of studies have been undertaken on the economic effects of home-produced textiles. These studies have shown that fabrics represent an important asset to daily household incomes. This researcher believes that rural India could become the focus of an indepth study of all stages of fabric life from the original textile design to the marketing of the fabric and consumption of that fabric by the consumers.
5. A study should be conducted to determine the nature and scope of the roles of genders related to textile production and marketing.
6. The approach of this thesis might be applied to other countries having important textile traditions.

BIBLIOGRAPHY

Amalsad, D. M. (1950). Cotton cloth printing. Bombay: Orient Longmans Limited.

Aryan, K. C. (1981). Basics of decorative element in Indian art. New Delhi: Rekha Prakashan.

Baker, G. P. (1921). Calico painting and printing in the East Indies in the XVIIth and XVIIIth centuries . London: E. Arnold.

Beer, A. B. (1970). Trade goods: A study of Indian chintz. Washington D.C.: Smithsonian Institute Press.

Baudoin, M. C. (1984). The use of African designs and techniques for contemporary fabrics. Unpublished master's thesis, Auburn University, Auburn, Alabama.

Bhushan, J. B. (1958). The costumes and textiles of India. Bombay: Taraporevala's Treasure House of Books.

Buhler, A., & Fisher, E., & Nabolz M. L. (1977). Clamp resist dyeing of fabrics, towards an interpretation of large wooden-blocks in Calico Museum of Textiles. Ahmedabad: Calico Museum.

Buhler, A., & Fisher, E. (1980). Indian tie-dyed fabrics. Ahmedabad: Calico Museum.

Calico Museum of Textiles, (1980). Treasures of Indian textiles. Ahmedabad: Marg Publications.

Campbell, J. M. Z. (1972). Contemporary fabrics from Ashanti traditions. Unpublished master's thesis. Auburn University, Auburn, Alabama.

Chandra, M. (1973). Costume: Textiles, cosmetics, & Coiffures in ancient and medivial India. New Delhi: Allied Publishers.

Chandra, M. (1980). Costumes through ages. In Calico Museum of Textiles (ED.) Treasures of Indian textiles. Bombay: Marg Publications.

Chattopadhyaya, K. (1963). Indian handicrafts. New Delhi: Allied Publishers.

Chattopadhyaya, K. (1977). Indian embroideries. New Delhi: Wiley Eastern Limited.

Dhamija, J. (1964). Bandhani. Marg, 18(1), 28.

Dhamija, J. (1964). A Survey of embroidery traditions. Marg, 17(2), 48-55.

Dhamija, J. (1970). Indian folk arts and crafts. New Delhi: National Book Trust.

Edgerton, R. B., & Langness, L. L. (1973). Methods and styles in the study of culture. San Francisco: Chandler and Sharp Publishers.

Elson, V. C. (1979). Doweries from Kutch: A women's folk art tradition in India. Los Angeles: Museum of Cultural History.

Fisher, E., Jain, J., & Shah, H. (1969). Mata Ne pachedi: A book on the temple-cloth of the Mother-Goddess. Ahmedabad: National Institute of Design.

Fisher, E., Jain, J., & Shah, H. (1978). Matano Candarvo: Textile pieces for Goddess worship in Gujarat. Marg, 31(4), 61-63.

Frater, J. (1975). The meaning of folk art in rabari life: A closer look at mirrored embroidery. Textile Museum Journal, 4(2), 47-60.

Fu, M. W. (1970). Creative visual directions for contemporary design based on Chinese motifs. Unpublished master's thesis, University of Washington, Seattle.

Geothalis, M. J. (1969). Creative designs inspired by a collection of arts and crafts of West Africa. Unpublished master's thesis, Iowa State University.

Gittenger, M. (1982). Masterdyers to the world: Technique and trade in early Indian dyed cloth. Washington, D.C.: The Textile Museum.

Hacker, K. F., & KRISTA J. T. (1982). Courtyard, bazaar, temple: Traditions of textile expression in India. Seattle: University of Washington.

Haden, A. (1965). The influence of ancient Peruvian textiles on fabrics today. Unpublished master's thesis, Colorado State University, Fort Collins.

Hester, G. A. (1970). Hopi textiles designs in modern fabrics. Unpublished master's thesis, Colorado State University, Fort Collins.

Holfor.. M. H. (1975). Designs in western folk embroidery. Unpublished master's thesis, University of Rhode Island.

Irwin, J. (1956). Indian textiles in historical perspective. In M. Wheeler (ED.), Textiles and ornaments of India. New York: The Musuem of Modern Art.

Irwin, J. (1964). The commercial embroidery of Gujarat in the 17th century. Marg, 17(2), 71-72.

Irwin, J., & Schwartz, P. R. (1966). Studies in Indo-European textile history. Ahmedabad: Calico Museum of Textiles.

Irwin, J., & Brett, K. (1970). Origins of chintz. London: Her Majesty's Stationary Office.

Irwin, J., & Hall, M. (1971). Indian painted and printed fabrics. Ahmedabad: Calico Museum.

Irwin, J., & Hall, M. (1973). Indian embroideries. Ahmedabad: S. R. Bastikar.

Jain, J. (1980). Folk art and culture of Gujarat: Guide to collection of the Shreyas Folk Museum of Gujarat. Ahmedabad: Shreyas Prakashan.

Jayakar, P. (1947). Bandhani. Marg, 2(1), 28.

Jayakar, P. (1951). Cotton printing of Gujarat and Kathiawar. Marg,4(4), 40-43.

Jayakar, P. (1954). Indian printed textiles. Bombay: Marg Publications.

Jayakar, P.(1956). Indian fabrics in Indian life. In M. Wheeler (ED.), Textiles and ornaments of India. New York: The Museum of Modern Art.

Jayakar, P. (1962). Traditional textiles of India. Marg, 15(4), 10-11.

Jayakar, P. (1980). An earthern drum: An introduction to ritual art in India. New Delhi: National Museum.

Kirte, J. (1982). A commentary on the need for qualitative research in Home Economics. Journal of Home Economics, Summer, 42-43.

Mehta, R. (1960). The handicrafts and industrial arts of India. Bombay: D.B. Taraporevala sons & co.

Mehta, R. J. (1970). Masterpieces of Indian textiles. Bombay: D.B. Taraporevala Sons & Co.

Merriam, S. L. B. (1973). Adaptations of the designs of the San Blas Cuna Indians to contemporary textiles for interiors and apparel. Unpublished master's thesis. Auburn University, Auburn, Alabama.

Muc, L. (1989). Applied decorative design on handwoven cloth inspired by the textiles of Sumatra, Indonesia. Unpublished master's thesis. University of Alberta, Edmonton.

Nanavati, J. M., Vora, M. P., & Dhaky, M. K. (1966). The embroidery and beadwork of Kutch and Saurastra. Ahmedabad: Department of Archaeology.

Olson, E. (1965). The textiles and costumes of India: A historical review. The Musuem, 17(3).

Pandit, S. (1982). Mirror work embroidery of Kutch and Kathiawar. The Indian Textile Journal, September, 53-55.

Polakoff, C. (1980). Into indigo: African textiles and dyeing techniques. New York: Anchor Press.

Price, M. J. (1966). Selected design techniques from Indian textiles in the Costume and Textile Study Collection, University of Washington. Unpublished Master's thesis. University of Washington.

Sarawati, S. K. (1961). Indian textiles. New Delhi: The Publications Division, Ministry of Information and Broadcasting.

Silverstein, J. (1981). Woven winds: The art of textiles in India. Ontario: The Gallery Stratford.

Stahl, J. E. (1971). Designs in Persian silk textiles. Unpublished master's thesis. Colorado State University, Fort Collins, Colorado.

Talwar, K., & Krishna, K. (1979). Indian pigment paintings on cloth. Ahmedabad: B. Balsari.

Tana, P. & Tana, R. (1981). Traditional Designs from India. New York: Dorce Publications Inc.

Varadarajan, L. (1982). South Indian traditions of kalamkari. Bombay: The Perrenial press.

Vollmer, J. E., Keall, E. J., Nagai, B. E. (1983). Silk roads and China ships. Toronto: Royal Ontario Museum.

Watt, G. (1910). Indian art at Delhi. Calcutta: Superintendent of Government Printing.

Wegner, S. A. (1967). The relationship of current textiles to the cultural heritage of India. Unpublished master's thesis. Oregon State University.