MODERN DESIGN IN FABRICS

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Since the beginning of civilization, man has recorded the outstanding characteristics and important developments of his time in the art which he created. These records can be traced from the tine of the prehistoric man, who decorated his cave with the pictures of animals which he hunted for food, to the present time.

Decorative designs for any utilitarian purpose reflect definitely the lives and interests of all social classes in any given period of history. Interest in personal adorment and desire for artistic expression results, not only in the use of jewelry and ornaments to be worn, but also in decorative design applied to fabrics.

When we come to a consideration of the period in which we live, the first part of the twentieth century, this question arises: Is decorative fabric design of the contemporary period commonly referred to as "modern" characteristic of the time at which it is being created, and does it reflect the development of the period as the art of other centuries has done? It is for the purpose of justifying an affirmative answer to the question that this study has been made.

In this "contemporary modern" period, as in other periods, many of the decorative designs produced are not worthy of being called typical of the time in which they are being ereated. This study is concerned with those designs which, because of their inspiration, execution, creative interpretation of current developments in art and industry, or
reflection of modern life and interests might be said to represent this era as a period in historic design.

Outside of fabric samples, all illustrative material and information was obtained from magazines and books, and from publications of articles by professional people. Opportunity for first-hand information was linited to observation and study of fabrics found in retail stores. Since use of museums, art collections, or original exclusive designs was not possible, reference to specific examplos is based on photographs and illustrations found in books and magazines. Illustrative material includes, aside from my original designs, tracings and designs copied from conmercially designed textiles, as well as actual fabrics.

Each illustration has been selected because it represents some point discussed in relation to fabric design. Different qualities and kinds of material were used in order to show that modern fabric design is not confined to any one quality or class of textile merchandise. Some of the examples are not as good as others from the standpoint of design, but they have been chosen because of typically modern motif, color, or some other quality that makes them characteristic.

The collection of material and the analysis of characteristics and contributing factors in the development of modern decorative design have been both enlightening and interesting. In making the study, I have gained perspective as well as breadth of view, and shall be better prepared to detect and understand changes in the style of de-
sign and the further development in related phases of industry.

OUPLINE

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The fabric designs of today are as definitely a phase of modern art as painting, although emphasis on decorative design of the "contemporary modern" type did not begin early In the development of the "modern art" period. Stating a definite time for the period of modern art is made difficult by the fact, that authorities do not agree as to the time of its beginning. Because the machine age, which has been the underlying influence in all fields of modern life, had its beginning in the great industrial change following the French Revolution, Walter Pach places the modern period between the French Revolution and the World War, and speaks of later artists as belonging to a period he terms "To-day". Paul Prankl speaks of "the beginning of the modern movement, a2 bout 1900", while Gardner, in Art Through the Ages, includes the nineteenth and twentieth centuries in the chapter 3
on modern art. The period most commonly accepted as the mociern in painting is the nineteenth and twentieth conturies.

The art of the world is concrete expression of the religious, social, economic, and cultural development of nations. The Renaissance, beginnirg in Italy in 1400 and spreading throughout Europe in the fifteenth, sixteenth, and seventeenth centuries, recorded a new attitude toward life. Attention was turned from thonghts of religion and supremacy of the

1 Walter Pach, 解asters of Modern Art.
2 Paul T. Frankl, Form and Re-Form, p. 101.
3 Helen Gardner, Art Through the Ages.

Church to humanitarian interests and the importance of the masses as individuals. This trend of thought culminated in the French Revolution, near the end of the eighteenth century .

New thoughts and new modes of living followed the rench Revolution, and their influence soon was felt in the art of the period. Along with the growing possibility of mass production brought about by inventions, and the inevitable decrease of the craftman's importance in relation to his work, the emphasis on individual thoughts and reactions was reflected in the artist's subjective portrayal of what he saw.

The firgt definite change came with the interest in the classical, influenced greatly by the Pompeilan excavations in the eighteenth century, and by Napoleon's conquests in Italy in the early nineteenth century. The Romantic period followed, characterized by the emphasis on the emotional reaction of the artist to his subject. The Barbizon school of landscape artists is included in this group.

A little later in the nineteenth century William Morris, an English artist, became a leader among painters interested In the decorative side of art. Morris and some of his friends organized, and became members of, the firm of Morris, Marshall, Faulkner and Company in England. The purpose of the organization was to raise the standard of the applied arts, and to restore beauty in objects of ordinary workmanship. Morris tried to turn public interest from machine products to the work of craftsmen, and to stimulate regard for attractive
everyday things. His influence was felt throughout the field of applied arts - stained glass, fabrics, tapestry, and wall paper. Although he did not succeed in his fight against the machine, his idea of art in everyday life is now one of the most fmportant selling features of modern products as well as one of the main considerations in designing and manufacturing.

The modern decorative art movement began in 1897, a year after the death of Morris, in Vienna and Darmstadt. ${ }^{4}$ The movement began with smaller objects, poster art, book bindings, book wrappers, and illustrations. An effort was made to develop a new form of expression in textile design. Paul T. Frankl describes the results as bold in design, vivid in color, challenging in contrast. ${ }^{5}$

After beginning as a revolt against the romantic type of painting being done early in the nineteenth century, the modern art movement extended through several periods of development to include the work of contemporary artists. Outstanding among the radical groups of the nineteenth century were the Impressionists, whose work should be judged by its portrayal of light. Strokes of pure color were applied so that the effect of different intensities, hues, and values was obtained when the picture was observed as a whole. Following the Impressionists were the Neo-impressionists, whose work sometimes was called Pointillism. This

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Fiqupe 1 a
"Impressionist" Influence


Fiqune 16
"Pointillist" Influence
group of artists applied the paint in dots or "points" instead of in strokes. Impressionist and Pointillist influences in fabric design are found in Figures $l a$ and $l b$, and, to a certain extent, in Figure 2.

Cezanne, a French artist, was the leader of the Postimpressionist group. He used color to show what he considered the three essential things about an object - the plane movement, the mass or weight, and the space occupied. He thought that the space around an object must be painted, and also the space between objects.

The Cubists took their inspiration from Cezanne, who maintained that "Nature can be expressed by the cube, the cone, and the cylinder". ${ }^{6}$ They undertook to show, by the use of planes and lines placed in a design, both the interior and the exterior of an object as interpreted by the individual artists.

Several other groups stressed the abstract in getting away from natural representation of what they saw and felt. Futurism included the Cubist idea of external and internal form, and added the time element of past, present, and future; Surrealism turned to dreams and the subconscious mind for material for pictures besed on fantesy; Dadaism placed no limitations or reatraint which would prevent the artist's expressing himself.

Since the decorative art movement of the twentieth century resulted from these earlier developments in modern

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Fiqune 2
painting, the "contemporary modern" art period, which had its beginning with Cezanne, is best suited to a discussion of modern art in fabric design. Park states that new patterns in textiles and upholstery follow the mode of modern painting, "pleasing patterns derived from natural forms, but never literal or hinting of the past, basing their appeal on rhythm, juxtaposition of value and color, regardless of a possible subject. ${ }^{17}$ (Fig. 2)

The machine in industrial art is credited with the accomplishment of two things - quantity production and modern craftsmanship. Out of the Industrial Revolution grew the factory system, made possible by the invention of machinery which could produce on a large scale. Improvements in manufacturing processes soon made greater quantity production en important factor in raising the social and economic status of the middle-class individual by bringing within his "economic reach" things which he could not afford when they were made by hand.

Kaphasis on commercial output of goods replaced that on quality of workmanship. Up to this time designs were suited to handicraft products; with the coming of the machine, importance of design gave way to stress on mechanical processes of application. The tendency was to copy rather than to craste the decorative patterns used in fabrics during the nineteenth century.

Representative of this idea of decoration is the quo-

[^2]tation from a copy of the Scientific American Magazine for 1896. "In flower patterns the rench designs are remaricably free from incongruities, being copled from nature with scientific precision." 8 Not until the twentioth century did the designer begin to develop a mare thorough understanding of the factory machine as a means of producing design. He learned by experience what Bichard F. Bach expressed in his statement, "It is not the machine that dostroys design. To blame it on the machine is to confess inability properly to use the machine. ${ }^{\text {© }} 9$

Hachinery has brought about a closer relationship between manufacturer, designer, and consumer-public than was found at any other time since the begiming of the factory system. During the orld War, the aesthetic factor was neglected for production of goods in large amounts. Since that time, attention has turmed to good worimanship and to design which will not dopreciste in the process of quantity production.
A. T. Coveli's comment, made in 1924, is characteristic of the attitude in the Post-War period in manufacturing. He seid, "If textile design is to mean something, if it is to becane a recognized form of expression in American industrial art, a great deal of serious thought must be expended

[^3]on it by manufacturers and public alike. ${ }^{10}$ The manufacturer realizes that the artist designer is the only person who can create designs which will be consistent with modern life. Some large textile manufacturing plants, such as Mallinson Silk Company, have their own designing rooms, and employ outstanding artists. Others buy from comercjal design studios or from free lance designers. In either case, the designs are checked and, if not suited to the proportions of the cylinder, are altored by technicians so that the repeats will be accurate. The artists worl with increasing lmowledge of the machine and its limitations and possibilities in reproducing their designs. The manufacturer, in turn, has a bettor understanding of the artist's viewpoint.

In 1929, the Art Alliance organized a department whose aim was to bring mamifacturer and designer together by arranging that the decorative artist or craftemen look at the manufactureris goods and give advice and criticism. This step was taken at the request of the manufacturer, who felt that he needed guidance in producine goods in the unprecedented modern style. He has overcome his earlier fault of centering his attention upon the mechanical side of production and excluding assthetic interest, and is anxious to discover and encourage any new talent in the field of design.

Decorative design in Pabrics may be woven or printed. The mechanical possibility of more intricate weaves has

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A. T. Covell, "Ilenent of Design in American Textiles", Arts and recoration, 21 (October 1924), p. 40.
placed greater emphasis on texture and woven pattern such as one finds in the hand-woven Rodier fabrics. This now omphasis on weave and texture, making concealment of poor quality and bad workmanship difficult, has caused more attention to bo given to the weaving processes and the invention of new devices for weaving. Woven design may be affected by the kind of yarn used, in this case being dependent upon the spinning process which precedes wesving.

Use of novelty yarns will give interesting texture to plain weaves which would otherwise be commonplace. In this case, the spinning process determines the surface appearance of the finished cloth, although the mechanism involved in the weaving must be suited to the size and type of yarn. Novelty jarns are spun by using variations in twist and by combining yarns which are not the same size. (Fig. 10a). Yarns which have been twisted in different directions and at different tensions will produce a crepe effect when woven together.

Design in plain weave also may be obtained in other ways. The introduction of different colors in warp and filling thread make some very interesting and unusual stripes and plaids in the modern manner. Varying the number of yarns alternated in interlacing warp and filling will give basket weaves. Weight of a plain-weave material may be varied from sheer to opaque by the addition of extra threads (Fig. 3). Many woven shadowstripe and open-work effects are accomplished by spacing of yarns (Fig. 4b). Ribbed or corded fabrics such as pique are


Fiqune 3 Woven Design by Daul Doiret

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\begin{aligned}
& \text { Modern Textile Collection } \\
& \text { Dominica Mastalia }
\end{aligned}
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Fiqupe 4 a


Fiqure 4 b
made by using a warp or filling which is heavier than the yarns used at right angles. One or more heavy warp threads used at regular intervals appear as stripes. Since cottons have been definitely accepted as being suitable for both general and formal wear, much of their interest, aside from printed designs, has depended upon these variations in the weave. Materials made from other fibers likewise may use variations in weave to give decorative interest. Shantungs, corded silks, novelty rayons, woolens with decorative threads of another fiber, and fabrics in variations of waffle weave are some of the examples which may be found.

The dobby attachment for plain looms may be used in making textiles having small woven patterns. In this type of weaving, the mechanism works in such a way that small strips of wood with inserted pegs control the harness and shuttle to make the design. The pegs correspond to the cards used in controlling the warp in a Jacquard loom.

Woven designs of an embroidery type may be made by use of the swivel and the lappet attachments. Shuttles or needles carry extra threads which embroider or weave in the design as the cloth in woven. These effects are not as durable as dobby or Jacquard weaves. The yarn not visible in the design does not become a part of the fabric, but is either carried on the wrong side from one unit to another, or is cut so that the loose ends remain on the underneath side. The dobby, swivel, and lappet methods are much less expensive than that of the Jacquard locm.

With the revival of interest in historical and peasant motifs, as well as in the use of modern designs of other inspiration, the Jacquard locm has made possible the weaving of interesting designs in linens, brocades, and other materIals used in home decoration and furnishing. The Jacquard loom was invented in 1801, about sixteen years after the invention of the power loom by Cartwright. Improvements on the original invention have increased the possibility of woven patterns, many of which are very complicated from the technical standpoint of reproducing design. A recent advertisement for Seely-Scalamander Co., Inc. found in the Arts and Decoration Magazine for January, 1937, 1llustrates a brocade which requires eight thousand cards, and which, With two weavers working at one loom, is made at the rate of three-fourths of a yard per day. Materials woven on a Jacquard loom are expensive because a great deal of time is required to prepare the cards which control the design and to thread the loom, and weaving cannot be done as rapidly as on machines for simpler weaves.

The printed design introduces another mechanical process which has developed in the field of textile industry since the invention of cylinder printing in 1785. The use of this invention today offers possibilities as important in the surface decoration of textiles as the complicated power loom does in the field of woven pattern.

For materials produced in large quantities to sell at popular prices, with the time element a determining factor in production cost, cylinder printing by machine is used.

To make a fabric "exclusive", but necessarily much more expensive, the yardage produced in one design is limited to a few hundred yards. Other very expensive materials are made by hand block-printing, but these are not within the price range of the average consumer. Block-printing may be done by machine, but this method has largely been replaced by cylinder printing.

In machine printing with the revolving cylinder, or roller, the design must conform to the dimensions of the cylinder in such a way that a continuous pattern is obtained without a break or any apparent beginning of a repeat. By this method, several thousand yards of material can be printed in one day.

The design may be engraved on the copper roller in either of three different ways - by hand, by machine, or by the pentagraph. In designs using more than one color, a separate roller or cylinder must be engraved with that part of the design included in each different color. As many as sixteen cylinders sometimes are used. The greater the number of colors in a design the slower the printing process and the greater the cost of production.

Engraving by hand is the most expensive, and used only for delicate work or for large designs in which only one repeat can be placed on the roller. This is the oldest method used. A steel tool called a graver is held in the hand so that the pressure of the palm on the handle engraves the design on the surface of the metal cylinder.

In machine engraving, the design is first engraved
mechanically or by hand on a softened steel roller which is then hardened by a special process. This is used to transfer the design to another softened steel cylinder by pressure, so that the surface of the second is forced into the indentations of the first, producing a raised design. After being subjected to the hardening process, the second roller, or mill, is used to impress the design as deeply as possible on one made of copper. The circumference of the latter must be a multiple of the one from wich it is imprinted in order that the design will be repeated an even number of times in the transfer.

In using the pentagraph, the design is first enlarged and made technically correct. It is then engraved by hand upon a zinc plate and transferred by a pentagraph machine, which scratches the design on a varnish-covered copper roller. A solution of nitric acid is used to etch the deaign on the copper cylinder where the surface has been exposed. The varnish is removed, leaving the engraved design.

To print the design, the eloth is passed over a large central cylinder around which the engraved rollers, one for each color in the design, revolve, each partiy submerged in its ow dye bath. A scraper removes surplus dye from the surface of each, leaving the color in the engraved lines. The color is stamped on the fabric as it passes over the large central cylinder, which is padded to give more elasticity. The rollers work simultaneously, printing from two to sixteen colors at one time.

The emphasis on technical accomplishment early in the "contemporary modern" period caused rapid advancement to be made in the use of the machine for printing designs on cloth. The manufacturer was more interested in copying the mechanically difficult decoration than he was in selecting and applying simple, but good, original design. Consequently, textile design advanced more from the standpoint of machine technique than from the artistic standpoint.

The fact that a copper cylinder must be engraved with a pattern for each different color places mechanical limitation, however, in the number of colors which may be used in one design. Since the stress is now on good contemporary design which will suit the means of application, as well as on further development of processes, a high degree of attainment has been reached in the production of patterns and colors.

With the increasing popularity of cotton goods for both wearing apparel and home decoration, many interesting textures and finishes have been acientifically produced. Crepe effects are obtained by printing designs on cotton material With a caustic soda paste which causes the treated part to shrink when subjected to a washing process. The same principle may be employed in wool fabrics, using chlorinated yarn instead of caustic soda to produce the design in the shrinking process. Mercerization of cotton yarn is done chemically, also, although rayon has, to a great extent, replaced mercerized cotton.

Textile printing involves the scientific factor as well
as the mechanical. Successful application of color to cloth is based upon the principles of chemistry; therefore, a complete understanding of the chemical composition of dyes is necessary in comercial production. Dyo solutions must be prepared according to formulas, and temporature and time elements must be scientifically related to the steps of the dyeing process if the result is to be satisfactory.

Until the discovery of synthetic dyes, plants were the source of textile colors, with the exception of mineral dyes and of cochineal and other animal dyes made from insects and shellfish. Some of the most important dyes date from ancient times. Among these are henna, indigo, and Tyrian purple, which was used in the time of the Roman Rmpire. Logwood, made from the heart of a tree found in Central America, has been used more extensively than any other natural dye since the discovery of synthetic dyes.

The first artificial dye was a mauve made from coal-tar in 1856, by H. W. Perlins. A French chemist later discovered how to get magenta from the same material. Attention soon turned to coal-tar as a source of dyes, and several hundred colors were produced from that source within the next fifty years. Dooley states that over fourteen thousand colors have been made from coal-tar. ${ }^{1 l}$ at first the colors could be used only on wool, but later developments produced coaltar dyes for other fibers. Today, synthetic and mineral dyes are used more than any others in textile production.

[^4]In addition to colors previously made by vegetable dyes, synthetic dyes have added many which make production of the coloring in modern design possible.

Before 1914, most of the dyes were imported from Europe. During the World War, this source of supply was no longer available, and it was necessary for the United States to develop her own dyestuff industry. At first the results were unsatisfactory, due to lack of materials and knowledge. Much experimenting had to be done before dyeing processes were successful. Black hose became dull green after the first laundering, and black silk was dull and unattractive. Cotton prints became white, or nearly so, in a short time. Colors were often harsh and uninteresting, as well as being apt to fade when exposed to sunlight or moisture.

Following the period of experimentation, gradually the dye industry became firmly established. There is now comparatively little trouble given by lack of color fastness, and excellent color quality is found in design used for all textile fibers. Linen has presented the greatest dyeing problem to be found among the natural fibers. Dyes do not have as great affinity for linen as for cotton, wool, or silk, especially if the color is a blue or a green. Fastness of color in linens has been improved, but the natural structure of the flax fiber is not conducive to dye absorption.

In recent years science has had a new problem in the coloring of synthetic fibers. Rayon, which is the most
important of these fibers at the present time, may be made by four different processes. The first of these, the nitrocellulose process, was invented by Chardonnet in 1884. The other three processes are the viscose, cuprammonium, and cellulose acetate. The term rayon was at first intended to include all synthetic fibers, but when the early viscose method failed to produce a textile satisfactory to consumers, two manufacturers of synthetic silk by the other processes gave the brand names of Bemberg and Celanese to their respective products. Bemberg is made by the cupremmonium process, and Celanese by the cellulose-acetate. The cellulose-acetate process was invented in 1869, but was not used for making fabrics until after the world War. Mixtures of rayon and other fibers do not respond to dye in the same way. Vat dyes may be used for dyeing synthetic silks, with the exception of celanese, or celluloseacetate rayon, which requires special dyestuffs labelled "S.R.A." ${ }^{12}$ This fact has been used to an advantage when the undyed celanese threads running through a fabric are desired for decorative interest; but otherwise it has been a handicap in combining this type of rayon with another fiber. The other types of rayon have good affinity for dyes used on cottons and linens.

Other interesting synthetic fibers which have been made in recent years are cellophane and spun glass. Cellophane is made "of pure, regenerated cellulose which has been
hydrated". ${ }^{13}$ The name "Cellophane" is the registered trademark of the Du Pont Cellophane Co., Inc. The most common uses for this interesting material are in gift wrappings and in window display, but narrow strips are woven into purses, hats, belts, and yard goods. It may be used alone, or may be combined with other yarns to make fabrics; the cellophane serving as decorative yarn.

Spun glass is used principaily for draperies and for costume accessories, such as purses and fans. The greatest drawback in the use of spun glass is 1ts lack of elasticity and pliability. Gradually, however, this disadvantage probably will be campletely overcome, and spun glass will take its place among the ranking synthetic fibers. Its luster, and the fact that it can be produced in colors, make it desirable as decorative fiber, and its fireresistance quality makes it ideal for use in drapery or upholstery fabrics.

The machine as a symbol of the whole trend of thought in the nineteenth and twentieth centuries has definitely influenced the art of the period. Mechanics and science, in their efforts to further progress in the textile industry, have given both limitations and breadth to the possibilities in fabric design. In this "contemporary modern" period there are greater possibilities than ever before in woven design and texture, in range and avajlability of colors, in mechanical application of design and color, and in the use

[^5]of synthetic fibers. Principal limitations are found in the technical processes of printing, and in the complexity of design reproduction as it affects the cost of manufacturing. Commercial advertising has had a definite place in deVeloping a consciousness of, and a desire for, modern design in comercial products, among which textiles are of great importance. This has been done not only by suggestion through use of words and illustrations concerning the articles to be sold, but also through the style of the advertisement. Wilenski, in "The Modern Movement in Art", states that "Imitations of Post-Impressionist, Cubist, and Post-Gubist are not confined to actual works of painting and sculpture; they are seen in contemporary interior decoration, in posters, clothes, theatrical designs, in advertisements in newspapers, and, of course, in architecture itself". ${ }^{14}$ Advertisements are directed to the particular social and economic class represented by the readers of the newspaper or magazine in Which the advertising is being done. For this reason, goods advertised will vary greatly in quality and price, but the emphasis still will be on the "modern".

Advertising agencies, aware of women's influence in the consumer-world, plan the psychological appeal of their "sales talk ${ }^{n}$ ith her in mind. Knowing that practically every woman wants to be pleasing in appearance, and to live in the midst of attractive surroundings, the suggestion is forcefully made that anything but the modern type of thing makes

[^6]her appear unattractive or out of date. The great mass of consumers had to be persuaded to accept the new trend of design in both utilitarian and decorative goods. Once conVinced, through appeal to vanity and by contrast of the new with the old, stressine always the desirability of the new, the consumer in turn began to desire and demand the things which were "modern" in structural and decorative design. Modern design, although a style in the sense that it represents a distinct period, was for a time, in the advertising sense, a fashion. "Some manufacturers and retailers are powerful enough to play important parts in the creation and launching of fashions. . . However, once under way, fashion creates wants which all those who recognize them can fill."15

In directing waman's attention to textile fabrics through advertising, special emphasis has been placed on the design of the naterial used, whether it be woven pattern, texture, or color. As in other historic periods, names have been given to materials because of some current event or interest which has served as an inspiration. Sametimes the name of the designer is given. Whether contemporary or historic in inspiration, the designs illustrated are found to be modern in spirit and execution, perhaps even reflecting some definite trend of Hodern Painting such as the Cubist art of recent years.

Observation of advertisements in any style magazine reveals examples of emphasis on fabric design in all products of the textile industry. In the Harper's Bazaar for June,

1937, there were several examples of this. Bergdorf-Goodman displayed a "peppermint print original" in red and white on navy. Bathing suits by B.V.D. included a blue bathing suit with "Paris Zurich Rome" printed all over it in white, and another "suit tatooed with crescents". There was also a "nautical sailboat coat" with sailboats scattered among waves in the shape of scallops. A printed cotton beach suit shown by the Bloomingdale Company was "a Javanese blaze of color. - . In a strangely different printed cotton", and Everfast Fabrics Inc. pictured a "zebra-stripe swim suit". There was a "white silk crepe Schiaparelli, printed like sheet music with blue ribands for the bars and roses for the notes"; a dress in a "flower print by Mainbocher"; and "Mainbocher's black net coat printed with four-leaf clovers". Sanforizedshrunk had "Janet Hollander's exclusive designs in Garden Prints".

The Vogue Magazine for June 1, 1937, had an even wider range of named designs. Glentex advertised large printed squares to be worn as neckerchiefs, turbans, halters, and sashes, with the information that Piesta is a riot of mammoth flowers, Indian Bazaar is a vivid variation of Paisley, Alpine Holiday reproduces the merry flower prints that you bring back from holidays in the Tyrol, and with the Game Scarf, you can play checkers or backgammon werever you go". In a Talon advertisoment was "Patou's charming wall-paper print". Bathing suits by B.V.D. were in "Grecian", "Maritime Print", "Raindrops", and "Twin Stripe" designs. Phere
were Chanel's desien in "white organdie embroidered with black flowers", "a dark red crepe dress marked with white hearts", "a natural linen dress embossed with dark blue woven flecks", and, from Saks-Fifth Avenue, "a white, con-fetti-showered facket". Towels from Cannon were "Ship's Wheel" and "Anchors Aweigh"; Martex had towels named "Tuxedo", "Rio", "Bubbles", and "Floral". Du Pont pictured "two of the seven current weaves", and on another page was a "play suit of blistered white pique". An evening dress was made of "Harlequin-printed chiffon", a design composed of graduated diamond shapes varying in color value.

In other magazines were found mention of a print in "budding leaves", "a little spade print", "Chanel's bow-knot print", and "Golden apple print". "Table-cloth" and "horseblanket" checks, and a tweed called "corroded copper" were mentioned also.

Various sources are used for design inspiration. Before 1918, the principal source of design motifs for American decorative artists was the period styles of foreign countries. When the World Mar deprived artists of this source, an effort was made to develop a typical school of American design. During and immediately follow: ne the forld far, many designs developed from motifs directiy suggesting the war - the Verdun pattern, the coat of ams of Verdun; helmets, rifles, swords; tricolor; the Croix de Guerre.

Then American textile designers turned to the museums for inspiration from prehistoric relics of the new world and from historic art and handicrafts. The collection of Peruvian
textiles at the Museum of Natural History in New York was used extensively. Historic art influence was shown in the Goth1c trend about 1920. Stained glass windows and motifs of Oothic cathedral carvings were used as inspiration for designs in linens, brocedes, and velvets. A nation-wide contest in textile design was conducted by four men who represented science, art, manufactured products, and the press - M. D. C. Crawford, Research Associate in Textiles at the American Museum of American History; Dr. Clark Wissler, Curator of the Departanent of Anthropology; E. W. Fairchild of Women's Vear Company: and Albert Blum, treasurer of United Piece Dye Works. ${ }^{16}$ The results were satisfactory in their use of the ancient to create designs both original and modern in spirit.

Cubist influence produced many creative designs in abstract and geometric forms (Fig. 5). In this type of pattern, the artist either works with purely abstract shapes, or he uses natural forms expressed in such abstract forms that they are not recognizable to the observer. (Fig. 2 and 22) A woman silk designer in Paris is said to design her fabrics by painting lines and figures on white silk as they occur to her. When she gets a design which she likes, a stencil is cut and the design made on fabric. ${ }^{17}$ Color harmony and contrast of values play an important part, because much of the

[^7]Helen Churchill Candee, Weaves and Draperies, p. 285.

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design interest lies in the use of color and dark and light.
Nature has suggested many of the conventionalized forms used in designs. (Fig. 4a and 4b and $10 a$ show the use of motifs inspired by nature.) Not only the plant world, with its wealth of flower and leaf forms, but also the animal world, serves as inspiration. (In Figures 11, 12,15 and 25 both plant forms and human figures are used in conventional designs.) In an advertisement for the National Silk Dyeing Company, "Flying South" has flying birds in two shades of blue on a pink ground, and "Catalina" scatters fish, snails, and starfish among waves in a very modern way. Schiaparelli is at present using the butterfly as the outstanding motif in her costumes; consequently, this motif has become popular for the year 1937. (Fig. 9a)

With machinery such a vital part of contemporary life, industrial motifs have entered the design world. Wheels, wires, and the mechanical forms are used. (Fig. 6a,b,c,d, and Fig. 20) Paul Rodier's "The Mechanical World" is made up of discs suggesting wheels of different sizes. In "Crossed Wires", in a National Silk Dyeing Company advertisement, groups of diagonal stripes in various widhs cross at angles to form diamond-shaped spaces. The lines in Figure 23 suggest wires, although no definite source of inspiration is given.

Both the student and the professional designers are becoming more aware of the design possibilities in things about them, and are turning to contemporary life and enviroment,
as well as to everyday interests, for ideas. (Fig. 7) The results are apt to be novelty rather than staple designs, lasting one or two seasons. The "It" print, deaigned by Ruzzie Green and produced by the Stehli Silk Corporation, was based on the term "1t" which has been so closely associated with personality in recent years. Similar in type is a Vogue print in which the written word "Vogue" was used for the design. (Figure 8 is a design of this type.)
"nhapsody", by John Held, Jr., is a cartoon type of scene in dark and light, depicting an orchestra in action. Ruth Reeves does scenes of American life, one of these being named "The American Scene". Her "Kitchen Print", for use in a country house, contains fruits, vegetables, and other supplies for kitchen use. Another of her scenic prints is a pattern of activities in New York city. F. V. Carpender's "Metropolis" is scenic, but is so conventionalized that one hardly realizes the presence of human figures, even on close examination. The landscape design in Figure ib is made up of flower garcien motifs so conventionalized that they have an abstract quality.

Scme other named prints of this type are "April" (Fig. 21), a pattern of open umbrellas, gay rainbows, and slanting rain; Elevated Prains", "Motors", "Big City Night", "Traffic Lights"; and Ruth Reeves" "Central Park", "Rudes in a Pool", and "Polynesian". Sometimes a dress designer is responsible for the popularity of a novelty motif. Desigas inspired by Chanel's bowknot prints and Schiaparelif's



Fiquie 8
butterfly motif have been used extensively in materials of all qualities. (Fig. 9a and 9b)

The idea of scenic design is not new, but artists today have new things to tell, and a new way of telling them. The daily routine of modern life has many activities not found in scenes of the past. Ocoupational interests are more varied and the importance of recreation has increased. The ancient Egyptians left picture records of their daily lives in decorations for tombs and temples. We have learned much about the life of the ancient Greeks by studying the decorative scenes on vases and other articles which they used. In still another part of the world, the Chinese and Japanese ornamented costumes, screens, and hangings with symbolic figures and scenes telling of their lives and beliefs. Tapestries of all periods have been scenic. French Toile de Jouy prints were very popular in the eighteenth century, and have been used a great deal since that time with period farniture.

Scmetimes a single event is of national or world-wide intepest. Again a record is made in the fabric design of the time. In 1922, the discovery of the tomb of Iutenkhamon in Egypt was the source of inspiration for a fashion trend of Egyptian design in all things, especially in fabrics and costume. After Lindbergh's flight across the Atlantic, airplanes and other aviation motifs made their appearance. The "Charleston" dance, very popular at one time, affected fabric design for a ahort time. In 1929, a series of "Early


Fiqure 9 a


Fiqune 9 b

American Prints" included the following named designs based on histor ical events: "Spirit of 176 ", "Paul Revere", "Betsy Ross", "Liberty Bell", and "The Covered Magon". During the season of the George vashington Bi-centennial celebration in 1932, designs in red, white, and blue were the most prominent.

Athletic events, such as the Olympies and the Helen Wills Moody tennis championship had their place in the more popular patterns of thoir time. Both the Century of Progress Fixposition and the Dallas Exposition were reflected in Pabric design and color. The Century of Progress architecture inspired Walter Dorwin Teague's "Science Tower", "Flying Buttresses", and "sky Ride", designed for Marshall Field. The high point of interest for 1937 was the coronation of England's new king and queen. "Coronation prints" were the vogue, with decorations in the form of crowns, lions, and other motifs representative of English royalty. (Fig. 10b). The thistle, shamrock, and maple leaf were used at this time in "British Empire" prints (Fig. 10a). "Thistie" (Pig. 13)
was a Coronation color.
Tyrolean and other peasant influences have made their appearance in several succesaive seasons. Figures 11 and 12 are tipical prints of peasant motifs. There is a suggestion of peasant design in the motifs of Figure 4 a and 4b. The idea of the American Indian is associated with the Onited States in much the same way that the colorful peasant life represents Buropean countries. Figure 15 shows one of a


Fiqupe 10 a
British. Empire Prints


Fiqure 10 b
Coronation Print


Fiqure 11
Peasant Inspipation


Figure 12
Peasant Inspiration ~ Original Design


Fiqure 14
"W/allis Blue"
series of Indian scenic prints made by Maliinson Silk Company, with designs inspired by tribal motifs and traditions of American Indians.

Colors often gain prominence through association of the name of the color with people or events. "Gauguin pink" is named for the artist who used the color. "Thistle" (Fig. 13) is a color made popular because of the coronation influence, the thistle being a British Empire flower. Blue, as the favorite of certain outstanding women, has held a prominent place among colors in the twentieth century. "Alice blue" was made popular by Alice Roosevelt when her famous father was president. Wives of two later presidents set color styles in dress fabrics by wearing blue. One was Mrs. Warren G. Harding, for whom "Harding blue" was named, and the other, His. Franklin D. Koosevelt, was responsible for "IVleanor blue". "Wallis blue" was the color favored by Mrs. Wallis Warifeld simpson in 1937.(Fig. 14).

Anrual recurrence of the same seasonal influences have their effect on the type of designs used at different times of the year. Spring and summer prints are gay in color and design, suggestive of bright flowers and foliage. In autumn the colors are browns, rust, dull green, and others seen in autumn landscapes. Vigure 26 is a seasonal print of a novelty type. Durjng the resort season in January and February, and again during the months of sumner vacations, travel and sport motifs are used. (Fig. 7; 17a,b,c; 18). There are sailboats, anchors and cables, starfish and other marine life, birds,


Fiquise 15
American Indian Print
Mallinson Silk Company


Fiqune 16
Novelty Seasonal Print


Fiqupe ira


Fiquere $17 b$


Fiqune 120


Fiqure 18
Spont Motif~Oniginal Design
golf clubs and tennis racquets, and horses' heads. The coming of the circus brings designs of clowns, balloons, tents, and circus animals, especially suited to children's clothing or to playroom decoration.

Steichen, one of the most outstanding style photographers as well as a photograph artist, has been responsible for some of the most interesting photographic prints. Many of the prints are designed by arranging commonplace objocts in a design and photographing them under lighting which gives unusual dark-and-ilght effects. His "Latches and Match Boxes" is a photograph of match boxes surrounded by matches placed with definite thought of design quality. "Buttons and Thread", as the name implies, is made of a hamonious tangle of thread. "Rice", too, is a photographic print, of rice grains on a dark background.

Some deslgns are made to have a photographic effect, although they are not photographs. (Fig. 19). Their inspiration is a photograph or some type of photographic work. Many are in values of gray or some color used in a design of three-dimensional form, while others are composed of parts which merge in such a way that no deilnite line boundaries are formed.

Whatever the source of inspiration may be, modern design turns for its interest and beauty to rhythmic repeat (Fig. 2), harmonious space relationships (Fig. 28), pleasing use of color (Fig. 2,4b,11,15,23), and contrast of dark and light (Fig. 20,21,22). Early modern designs lacked the


Fiqure 19
Photographic Stule
simplicity and restraint that are now found in decorative art. Living as we do in a period of speed and activity, it is not strange that characteristics which are typical of our mode of life, and even of our thinking, are found in today's fabrics.

Paul T. Frankl, speaking of modern design in general, says that it is expressive of a purpose to serve, and explains the use of line in the following manner: long, uninterrupted horizontal lines, denoting speed; vertical lines, emphasizing compression; straight lines, typical of present day directness; sharp angles (Fig. 20), keen and to the point; and curves (Fig. 27), expressive of sentimental, rounded forms. ${ }^{18}$

Examples of each of these uses of line in fabric design may be easily found by observation of dress goods, readymade garments, and decorative fabrics for household use. In each case, the lines are definite and clear-cut, a characteristic of machine products. Many fabrics have definite horizontal or vertical line movement such as that found in the vertical lines of Figure 23. In "Crossed Wires", made by the National Silk Dyeing Company, both rhythan and interesting space relationship are obtained by using parallel straight lines of different widths, with variation in the spaces between lines. In the same design are found sharp angles, formed by the crossing of groups of lines. Ruth Reeves: "Play Boy" (Fig. 26) shows the use of both atraight


Fiqure 20
Original Design
lines and angular forms, and also horizontal and vertical lines. Curved lines in a design are graceful and restrained, becaming an integral part of the design as in "April" (Fig.21), by Clayton Knight.

Space relationships are carefully considered in good fabric design, whether the pattern is composed of lines, forms, or areas of dark and light. One typically modern type of design is the use of parallel stripes of lines which are separated by spaces of different widths, as seen in figure 23. Areas of dark and light (Fig. 22) or of color may be used to show space division. Many geometric and abstract designs are made up entirely of spaces and related forms. Other examples are checks or wide stripes in different values.

Color is daring, with sharp contrasts, but the emphasis is on the pleasing relationship of values and intensities rather than on startling combinations of color without regard for the principles of harmony. As previously mentioned, the colors used at the beginning of this period were vivid and startling. Those used today are gay and bright, with strong contrasts, but there is a definitely planned harmony and balance. During the World War, as in all times of spiritual or mental depression, colors in dress became somber and dark. Following the war they again became very brilliant. Intense, harsh colors used during this period were due to two different causes - the psychological reaction of the nation at the close of the war, and the fact that the American dye


Fiqure 21 "April" by Claytoon Knight


Fiqune 22
Design by Tom Lamb
Modern Textile Cullection Dominica Mastalio
industry had not developed to a stage of technique sufficient to produce colors as interesting and as beautiful as those used today. Hues are now grayed without being dull (Fig. 4b, 14, 23), and contrasted without clashing. Baby blues and Vivid pinks have given may to grayed pinks and blues such as "ashes of roses" and "powder blue". There is a wider range of color fran which to make a selection. Blues are fousd in all values and intensities, from palest tints to midnight blue; reds vary fron dainty flesh tints to scarlet, Dubonnet, or the brilliant yellow-reds; yellows may be had from cream to lemon yellow, rich orange-yellow, or soft, dull, old-gold shades.

Whether the decorative design of a textile is in different colors, or in values of one color, contrast of dark and light is an important characteristic. Some of the smartest prints are in solid color on a contrasting background (Fig. 10a); mang of them are cambinations of white with black, dark blue, red, green, or brown. Ruth Reeves? designs have strong contrasts of dark and 11ght (Fig. 26); Dorethy Trout ereates desiens of the same type (Fig. 24); Raoul Dufy, the French designer, develops textile patterns typically modern from this standpoint; and more commonplace designs found in less expensive materials, by designers whose nanes are not identified with their work, show this quality.

A deaign repeat often includes not only one motif, but several related units which are so arranged that they become an inseparable part of the whole (Fig. 24, 25). Again the


Fiqure 23



Fiqure 2 る
"Play Boy" print (Fig. 26) may be used as an examply. It contains highly conventionalized forms of various sport activities cambined to form a large unit or repeat composed of closely related parts. Also, the American Indian print (Fig. 15) and the peasant prints (Fig. 21, 12) illustrate the use of different motifs. Contemporary scenic prints show, not one scene or activity, but several different ones. Prints for sports or beach wear, or for decorating beach homes or sumner cottages, show great variety in the adaptation of design units. A design by Maria Hay of the Reimann School in Berlin, Germany, contains the following in one repeat: a beach house, an ocean liner, a motor boat, three different reclining figures, figures swimining, and life guards. Materials for children's clothing and nursery or playroom decoration are covered with assorted figures suggested by nursery rhymes, stories, child activities, or peasant figures (F1g. 11, 12).

Simplicity is a distinguishing characteristic in all good modern designs, whether they are made up principally of lines, abstract shapes, or conventionalized forms. Line suggests forms instead of giving them accurately or in detail. only those details necessary for design interest are included. abstract or geometric shapes are simple and are intended to suit the space they occupy so as to be a part of the continuous all-over pattern. Scenic designs are conventionalized; human figures are expressed in terms of line, color, and dark and light, with details minimized or mitted. Many


Fiqupe 26
"Play Boy" by Ruth Reeves
Aptes and Decoration ~Dote?
floral patterns and other adaptations of natural forms are simplified shapes in solid colors on a plain background. For the artist who is able to recognize and interpret the spirit and life of the times in fabric design, there are opportunities in the professional fleld. As in all other professions, success depends upon hard work as well as on artistic ability. The employed artist in the average factory or studio must produce a minimum quota of designs for a given period. He is governed by the employer's policy of producing more or less conservative designs which will minimize the risk in market value of the goods. The designer for a wealthy manufacturer has more freedom in creating designs and also more pleasant working conditions. Free lance deslgners have more freedom in working hours and conditions without being limited by the demands of the employer, but they have the added problem of selling their own designs, either to a commercial studio or to the manufacturer. Agents who work on a commission basis are sometimes employed to sell the work. Free lance designs which do not conform to the dimensions of the printing cylinder to be used must be reworked by an adapter who changes them so that they suit the technical requirements.

Training for textile designing may be obtained in different ways, Same designers have gained their knowledge fram practical experience, having advanced from work in departments involving technical knowledge of processes. This type of training gives the designer a better foundation for
understanding the relation between fabrics and design, but he als o must have artistic ability. Some colleges and universities have departments which offer training in textile design, and art schools offer more extensive courses of this type. There are also textile and industrial schools which offer a wider range of instruction in related subjects, with more emphasis on a study of fabric analysis and technical processes.

One of the greatest drawbacks in textile designing as a profession is the fact that the majority of designers do not receive recognition for their work. If they are in the employ of the manufacturer, their work, as a part of their paid duty, becomes his property. If designers work for a commercial studio, again their identity is submerged through affiliation with an organization. Relatively few are ever known through their work.

There is a growing demand among decorative artists for signed designs. If a designer's name becomes identified with a successful piece of work he has a much better chance for advancement and recognition in his profession. Realizing this, the artists in all fields of decorative design - textiles, wood, metal, glass, furniture, rugs - are interested in being known as individual designers. Paul T. Frankl, a decorator and producer, is a leader in the movement for signed designs. He refuses to contribute to commercial products unless the source is given. His textile cesigns, typically modern, are only one of the fields of decorative design in which he is
prominent.
There are some examples of destigners who have been outstandingly successful in the toxtile fleld. Perhaps no contemporary designer is better lnow than Ruth Reeves, whose Guatemalan textiles have been so prominent recently. In 1935 she was sent by the Carnegie Institation of Washington to Central America for the purpose of obtaining a collection of Guatemalan textiles. These were to serve as inspiration for a series or printed fabrics of her ow design. as a result, due to her influence, there was a decided "Guatemalan" trend. She also has done scenic prints based on contemporary American Life, as well as other dosigns which have given hor a place in the textile design world.

There are other desicners who, although they are several in number, represent a very small percentage of the people who desten fabrics seen in the retail stores. The members of this cmparatively small ix mp, like Ruth Reeves, have done typically modern work and have, through the quality of their workmanship, gained national and even intermational recognition. Same of them do not limit their work to the textile ficld, but, as professional designers or artists, a re versatile onouch to express their creative ability through different mediums. Wolegang and pola Hofiman are designers of textiles, rugs, glassware, and interiors. Donald Deskey is a distinguished artist designer of textiles and furniture. Raoul Dufy, one of the best-known French textile artists, is also a painter.

France has given another noted textile artist in the person of Paul Rodier, whose woven patterns of modern dosign are based upon a thorough undergtanding of materisis and the techique of weaving. with his nephows, Messieurs Jacque Rodier and Henri Favier, ho produces Rodier fabrics at his factory in Bohair, in Picardy. The employees, or "ertisans" as he calls them, ${ }^{19}$ mako the materials on hand locms in their own homes. Although not products of highly developed factory machines built for speed and quantity output, Rodier textiles reflect the true modern spirit of decorative art in simplicity, line, motif, and use of dark and light (Fig. 27, 28).

Modern design is not limited to any one country or nationality. It is ropresented in the art of all nations, although national traditions and racial temperament influence the art styles of individual countries. The French, as a nation, have an inherent design ability and sensitiveness to art quality that the more practical, mercenary mericans do not have. The asme fact is true in other countries where art and culture have for many years been a part of everyday life and envirorment. They are willing to devote unlimited time and effort to the cause o: Art. Americans are beginning to realize the importance of art in cultural iffe and are discrininating more carefully between things which are artistically good and those which are not.

Whether designed in woven pattern or in suriace decoration, typical fabrics of today, regardless of the textile


Fiqure 2 ? Design by Paul Rodier
Apts and Deconation Date?
fiber used, reflect in line, color, and feeling a poriod which is one of industrial growth, The spirit of this "Machine Age" is shown in contemporary design as definitely as the life in each preceding historic period is recorded in the decorative arts of the time. Industrial activity is so much a part of everyday work and recreation that its influence on national ilfe and thought is reflected in all forms oreative expression.

Decorative design follows closely the trends in patnting and sculpture and at the sane time is influenced by the posm sible means of execution at the time it is used. Definite oxamples of Cubist (Fig. 22), Impressionist (Fig. la), and Pointillist (fig. 15) influences are found in fabric designs. clear-cut lines and areas of color in these designs result from the mechanical processos involved in cylinder printing. The influence of modern methode of quantity production, brought about by a rapid succession of inventions, make this period unlike any previous time in the history of art and industry.

Basic qualities found in modern design are not limited to the decorative art of this particular period, but their source of inspiration and the in which they are expressed distinguishes them from other period styles. Interesting space relationships, contrasts of value and hue, conventional forms, simplicity - all are found inthe art of the past as woll as in the art of the present. Each of these quallties is present in the Egyptian designs of ancient times. Greek
art set atandards in space relationships for succeeding generations throughout the world. Wherein ancient art motifs symbolized religious ideas and visible farms or forces of nature, moderin art tends more to an interpretation of abstract qualities and unseen forces expressed through use of both conventionalized and purely abstract motifs. Both, through scenic design, have recorded contemporary life.

It may be said in conclusion, therefore, that typical "contermporary modern" fabric design, although ofton inspired by historic motifis and ccmparable in its simplicity to the art of the ancients, is a definite period style, representative of life in the first part of the twentieth century. It reflects in feeling, in motif, and in execution the Machine, which is tho symbol of contemporairy thought and activity, and indiractiy one of the fundamental controlling factors in present civilization.

## APPENDIX

Bagge, Fic. French designer o textiles and wallpaper; oreates atriking modern designs of geanetric and abstract motifs.

Benedictus. French designer; uses geometric, abstract, and highly conventionalized natural forms; strong contrasts of dark and light.

Buoy, Jules. An artist designer; French by birth, but allied with the art life of this country nearly twenty years.

Chanler, Robert. Textile designer; uses fish motifs extensively; noted for his screen designs.

Chernoff. Creates many designs for use in silu fabrics. Deskey, Donald. Industrial designer; creates typically modern designs, especially in furniture and textiles.

Dubost, Michel. French textile designer; is in charge of Hessrs. Ducharne's studio.

Dufy, Raoul. Prench painter, designer; creates modern deaigns for silks, hand-blocked linons, and damasks. Fis designs are used by Bianchini and Ferrier, silk manufacturers in Lyons. He prints his hendblocked designs in one color.

Frankl, Paul T. American decorative artist and producer; refuses to contribute designs unless the source of the design is given. He is an outstanding leader
and organizer in furthering the cause of the decorative designer in securing recognition for his work.

Gahn, Martha. Outstanding Swedish textile designer.
Held, John, Jr. Popular cartoonist who designs in a scenic cartoon style for textiles; created "Rhapsody", a scenic design showing an orchestra; also does wood blocks.

Hoffman, Molfgang and Pola. From Stryz, Poland; designers of textiles, rugs, glassware, and interiors.

Karasz, Ilonka. A young artist fron Budapest, Hungary; produces her own dosigns. Her designing includes textiles, furniture, silver, mugs, interiors. Knight, Clayton. Americaa designer. Created "April", a scenic, novelty type of desicn for a silk print.

Lamb, Tom. Anerican textile desfgner; typically modern designs with strong contrasts of dark and light. Lurcat, Jean. French artist; paints tapestries and wall hangings in modern designs; designs rugs.

Maas-Firetterstrom, Marta. Prominent Swedish textile designer. Mergentime, Marguerita. American textile designer; makes unusual designs for household linens.

Poiret, paul. French designer, primarily in the field of dress design and textile fabrics. He was one of the first to bring out a new line of fabries; these were designed under his supervision by the Martine Sehool and show his ability in the uso of color.

He refused to accept conventional styles; a pioneer in introducing sensible styles in dress design.

Reeves, Ruth. American; noted for her interpretation of contemporary American scenes in modern textile designs. Has helped to popularize the Guatemalan designs throueh her adaptabions of Guatemalan motifs. Reiss, Henriette. American; designs for Mallison Silk Compary .

Rodier, Paul. French designer of woven fabrics. Designs fabrics for both wearing and decorative use. His designs usually are abstract, geometrical, and on a large scale; works in color or with shaded effects.

Sarg, Tony. American designer who first became know trrough his marionettes; he now dasigns for textiles and wall paper. Most of his decorative designs are for children's clothing or playroom decoration.

Scelmandre, Seeley. American textile designer. Does the designing for the establishnent of SeeleyScalamandre Co. Inc.

Schey, Robert. American; Has broad experience in the textile design field; a large studio of workers are under his direction. He has a library of fabric samples that offers a complete record of what has been manufactured both here and abroad for more than a mundred years.

Steichen, Idward. American artist photographer. Photographic designs in prints developed from his design photographs.

Trout, Dorothy Byrd. American textilo designer; creatos modern scenic designs with strong contrasts in daris and IIght.

Mieselthier, Vally. Austrian sculptor and desigrer, makes interesting toxtile designs.

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[^0]:    4 Paul T. Frankl, New Dimensions, p. 75.
    5 Paul T. Frankl, Form and Re-Form, p. 101.

[^1]:    6 Clarence Joseph Bulliet, Apples and Madonnas, p. 4.

[^2]:    7 Edwin Avery Park, New Backgrounds for a New Age, p. 102.

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    9 Richard F. Bach, "Industrial Art in America". Arts and Decoration, 17 (September, 1922), p. 362.

[^4]:    12
    William H. Dooley, Textiles, p. 65.

[^5]:    13
    Ibid, p. 108.

[^6]:    R. H. Wilenski, The Modern Movement in Art, pp. 164-165.

[^7]:    16 Marion Nicholl Rawson, "American Textile Designs", Review of Reviews, 58 (August, 1918), p. 189.

