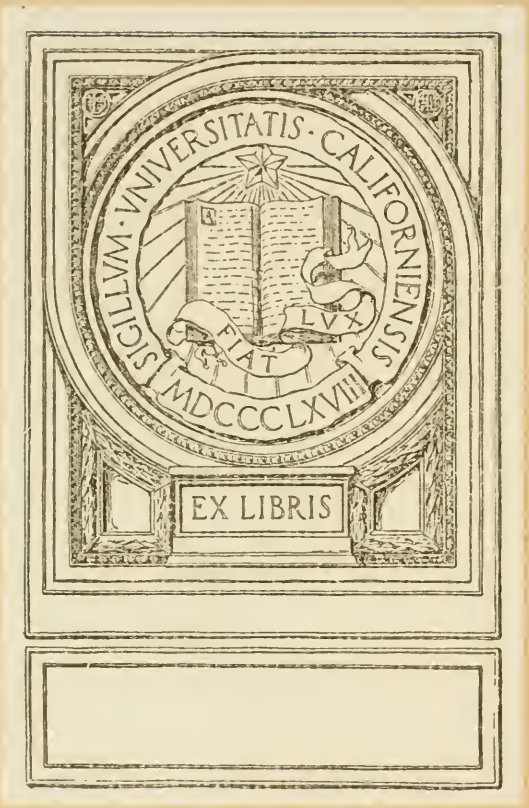
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A TEXT-BOOK OF DESIGN

BY

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BOSTON NEW YORK CHICAGO
HOUGHTON MIFFLIN COMPANY
The Riverside Press Cambridge

The Riverside Press
CAMBRIDGE . MASSACHUSETTS
U . S . A

PREFACE

THIS book, while intended primarily as a text-book for students of the degree of advancement usually found in the early college years, will, it is hoped, be read by many no longer formally classified as students, who are desirous of establishing in their own minds standards of judgment for things which they see about them. No text-book containing the mere bones on the subject has been available. There are many good books on design for those who have had practice and are far enough along to be able to reject as well as select, but these books are altogether too advanced and technical in character for the average college student who is thinking of design as a whole for the first time or for the general reader.

The authors believe that this book will prove of value to beginners in the study of design who are not ready for work of an advanced character and that it will recommend itself as well to those who have gone deeper into the subject. Any statement or theory worthy the name must relate itself constantly to practice. If one is compelled to depart from theory in order to practice successfully, that point of departure marks a weakness in the theory.

This book is the statement for design of the universal laws of expression which have been so amply developed in music and literature. The theory here set forth is new in treatment rather than in substance. The theory of pure design now generally accepted is presented with but a few minor points of difference. Each step in theory has been correlated with the practical side of the question and no point has been dwelt upon that is not met constantly in the practice of design.

It is always difficult to decide just where to introduce the problems in value and color. This must be determined entirely by the circumstances under which the book is used. The chapters on value and color may be taken up at any time during the course. It seems advisable to study them rather early in order that the student may be thinking in color and value images. It will be well, however, to follow the other problems in the order in which they are taken up in the book, as it has been developed logically from the simple forms to the more complex.

It is to be regretted that it is impracticable to use colored illustrations in a book of this kind. The processes of reproduction are unsatisfactory, and printer's ink frequently changes color rapidly. It will be impossible, of course, for the student to get any accurate idea of color without making the diagrams in the colors for himself; but that would be necessary, in any case, whether the diagrams were reproduced in color or not. Standard pigments have been suggested as a means of checking the accuracy of results.

The subject has been presented as briefly as possible and may be very easily enlarged upon. The scope of the work was determined by the amount that it has seemed practicable to teach in a full college course. The material of the book as it stands has been used for two years and the results obtained seem to justify the feeling that it was of such value as to warrant its production in book form for general use.

CONTENTS

ILLUSTRATIONS

The authors wish to acknowledge the courtesy of the Boston Museum of Fine Arts in permitting the use of the following illustrations: — Nos. 3, 4, 7, 40, 41, 44, 47, 48, 49, 50, 63, 86, 95, 97, 105, 106, 107, 126.

A TEXT-BOOK OF DESIGN

CHAPTER I

THE PROBLEM OF DESIGN

IT is the purpose of this book to consider design from a theoretical rather than a historical point of view. The evolution of design has been more or less the same throughout the world in similar civilizations. Peruvian fabrics, executed about the fifteenth century, closely resemble Coptic fabrics of the second to the sixth centuries. As it is impossible that the Peruvians and the Copts could have come under the same influences, they must have arrived at similar results by independent thought and expression. The same visual sensation was evidently pleasing to people of similar stages of civilization, no matter how remote. Rhythmic dances and rhythmic repetitions of design motives are found among primitive peoples the world over.

In distinction from such separate beginnings, there were long periods in the past when design motives were handed on from one nation to another. Thus the art of the Greeks and Romans was a development or refinement of motives which, originated by the Egyptians, reached Greece through the Assyrians, Persians, and Phœnicians, by the way of the islands of the Ægean. So much were the borrowed forms depended upon, that the Greeks and Romans, in their treatment of ornament, seldom went direct to nature for their inspiration. The Italian designer of the Renaissance, though following the Greek and Roman examples as decorative forms, frequently used a more natu-

ralistic treatment, which indicates that he had observed nature as well as the art of the ancients. These Western peoples form a broad contrast to those of the East, the Chinese, Japanese, Javanese, and Indians, who have obtained their motives by separate evolution of design units, working directly from nature.

The approach to the design problem is here made through the most rudimentary forms, such as have been used and still are employed by savage tribes. The repetition of spots is taken as a starting-point, followed by a study of lines, and then of areas, a logical sequence which may very well have been the course of the development of design in the constantly broadening civilization of the world.

Because the Japanese possess this conception of the subject in greater degree than any other people, examples of Japanese work are here used for a considerable part of the illustrations. Their viewpoint arises from a naïve appreciation of all the phenomena of nature, coupled with a philosophical consideration of all the beautiful things with which they are constantly surrounded. They have learned, first, to keep their eyes open and then to think clearly about the appearances of the things which they have seen. Rather than close adherence to historical motives there should be emulated this closer connection with nature, its more accurate observation: designs so inspired have a charm and freshness which can be attained in no other way.

What is here attempted is to give a general understanding of the function of design, its evolution for the mind of the individual and its relation to nature, rather than schemes and rules of solution for definite problems.

CHAPTER II

THE THEORY OF DESIGN

THE object of design is the achievement of beauty. Beauty is separable in our thought of it into two main phases, one of which, the outcome of the personality of the designer, of his time and his environment, is beyond analysis; the other, the outcome of suitability to use in particular circumstances, and adaptation to conditions imposed by particular materials and their methods of combination, may be analyzed in considerable detail.

Design is organic: it is the expression of the relation (1) between the object and its use, and (2) between the object and the forms and methods of combination of the material or materials in which it is executed. Fitness for function is a most essential quality of design; is, in fact, an indispensable minimum requirement. The construction of an object should be expressed in a straightforward manner. Music is an exemplification of design. It is constructed and arranged according to the laws of harmony. The purpose of the musical composition is nevertheless the all-important thing. "Ragtime," however perfectly written, is not suited to a church service, nor is religious music adapted to light opera. That which a design accomplishes beyond the bald justification of its existence is the expression of its function, whether that be practical, as in the design of a book-cover, or ideal, as in the design of a steeple, or both in combination, as in a great hymn. A mechanical adherence to those laws of design, which have been discovered by the possible analyses of beautiful objects, does not constitute an "open

sesame" to the production of satisfactory works of art; but law is nevertheless as necessary to beauty of design in graphic art as it is to design in literature or music. Those elements of beauty which are unanalyzable are achieved not without law but through law.

The first step in the design of an object of any sort is the consideration of the use to which it is to be put. The aim should be to make the object take its place and perform its function naturally and beautifully, as does the handiwork of nature. If a design be successful, the object designed will seem to fulfill its purpose joyfully, causing pleasure to the beholder. Any variation in the form of that object, or any decoration of it that interferes in any way with its use, is meretricious and can unhesitatingly be termed bad design. Design has thus, first, to do with the object in its entirety.

The question of the material to be employed is of next importance. The forms into which a material is shaped and the combinations into which the pieces are constructed should be those which the material is peculiarly adapted to take. Whenever a form is produced in wood which would have been more suitable to stone, or whenever objects are made in brass which would better have been done in wood, directness, one of the surest approaches to organic beauty, is lost. A straightforward, direct design will probably please, just as does a frank and straightforward person. This sincerity is as indispensable in design as in daily tasks and relations. The esthetic treatment of an object as a whole rests on these two practical grounds of use and material. The choice of form and materials must be determined by good taste and common sense. Good design, being organic, may be said, in so far as the expression of material is concerned, to be a result of the pleasure of a skillful craftsman in bringing out the peculiar properties of the material with which he is working in as complete and enjoyable a manner as possible.

The degree of simplicity or elaboration of an object bears a direct relation to what may be termed its ideal use in distinction to its easily understood practical use. The furniture and bric-à-brac of the period of Louis XVI, or the sacred vessels of a church, are shaped by the demands of ideal fitness into forms which accurately display the sentiments of which they are the expression. To call "decoration" such additions to the bare forms of "fitness to use" as are possessed by the objects referred to, without constantly keeping in mind the fact that these additions are not irrelevant but are always expressive, is to admit a lack of unity between use and appearance which is foreign to design.

Pure design, in distinction to organic or applied design, deals, not with the relationships of function and appearance, but with the agreeable relationships of shapes and colors only; it is inorganic. The beauty resulting from the creation of an object according to the laws of design is due, in its analyzable portion, to the orderly expression of (1) practical and ideal fitness, (2) material, and (3) construction. Pure design is lower and more fundamental and must be considered at the outset, as it is introductory to the higher involved forms.

Continued exercise in the production of pleasant relationships of forms and colors stores the memory with beautiful graphic ideas, which will eventually present forms admirably suited for practical application in organic design. If in this latter case a design motive is not immediately suggested, the right line of thought should surely present itself because the ground has already been covered many times in the study of pure design. Pure design concerns itself with just this training in the fundamental processes of thinking in visual images, divorced from all the multitude of practical considerations which are inseparable from organic

design. It is extremely unlikely that any form of pure design, conceived without regard to execution, will be absolutely fitted for use in any problem of applied design which may occur. Decorative shapes which are applied to add to the attractiveness of objects of design are invariably influenced in character by the material and the manner of execution of the object decorated.

Pure design is based upon fundamental, pleasing arrangements known as Sequence, Rhythm, and Balance, all of which are kinds of Repetition, a phenomenon which lies at the base of all design.

The most frequent arrangement in design is a SERIES or SEQUENCE of objects, that is, a repetition of the form at equal or regularly varying distances. If, for example, a number of eggs be placed in a row upon a table and the spaces between the eggs be fairly regular, a repeat of a circular or oval motive is realized. If the spacing be very irregular, no idea of orderly arrangement will be perceived, and the fact that the eggs lie all in the same straight line will hardly be noticeable. If a row of alternate eggs and oranges be placed at regular intervals, a more interesting repetition results, as another idea has been introduced. After this arrangement has been studied for a few moments and followed in either direction, an egg is expected to follow an orange or an orange an egg in the scheme or motive. This kind of alternation is seen in the egg and dart molding (Fig. 1). A SEQUENCE is a series or regular repetition of a motive.

The expectation of continued repetition, as seen in the case of the eggs and oranges, leads to the following-out of a series. This entails a certain idea of rhythm, though there is no reason why the repetition should be followed in one direction rather than the other. Nothing forces the eye to move to the right instead of the left, or *vice versa*. If, now,

this repetition were rhythmic, as rhythm is here defined, the eye would be forced to move to the right or left, up or down, involuntarily. Bare repetition is not necessarily rhythmic.

Rhythm conveys the idea of motion to the eye, compelling it to follow in a definite direction; it contains, therefore, a sense of change or progression. A progression, geometrical or arithmetical, is in a sense rhythmic, as is a constantly

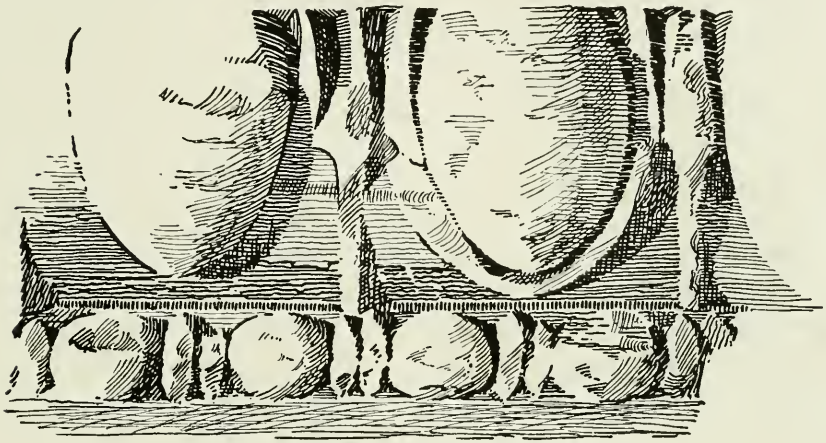


Fig. 1. EGG AND DART MOLDING

changing curve or a continually developing figure. In a regular repetition of unbalanced units there is the idea of motion in one direction. The result is a rhythmic sequence or rhythm. As commonly understood, rhythm is a vague term, and it must be limited here. By rhythm is meant a regular recurrence of accents of one sort or another that will give to the eye a definite idea of motion. Imagine a piece of music written in 3–4 time, that is, with three beats to the measure. These three beats are of equal duration. This is a repetition, but the first beat in each measure is accented by the laws of harmony, and the recurrence of an accent at regular intervals produces a rhythm. Without the

accent it is impossible to discover in what time the piece is written, and the rhythm is lost. In spot design it is always found in a series of unbalanced separate units, but in line composition the elements of the rhythm may be continuous. As used in this book RHYTHM means that quality in design which suggests movement.

BALANCE is directly opposed to rhythm, because it produces a sense of rest or cessation of movement. Balance is more commonly thought of as existing only about horizontal or vertical axes. In a repetition of, say, three or five units equally spaced in a line, there is a feeling of balance about the central unit. If the repetition be continued indefinitely, the balance is not as apparent as before; but if the center of this arrangement be emphasized, the balance will become more apparent. A long repetition actually balances about its central unit as does a short one, but there is always some difficulty in determining the central unit unless it be accented. An appearance results, therefore, which is neither balance nor unbalance, but a sequence without the characteristics of either. Regular geometrical figures always appear to balance. BALANCE in design is a combination of spots, lines, or areas, separately, or in combination, which appear to be at rest, giving the idea of absence or cessation of motion.

There are two kinds of balance, obvious and occult. Obvious balance is symmetrical; occult balance is never symmetrical. The law of occult balance is much like the law of moments in physics, with the difference that, instead of varying weights, varying interests are involved. If it becomes desirable to cause given spots or areas to appear balanced without modifying them or their arrangement, a "center of gravity" may be found about which all will balance. This center of gravity may be directly indicated, but that would remove a subtle charm which it is desirable

to retain. Better, a line may be circumscribed about the group, forming an outline, the center of which coincides with the center of interest of the group contained. The spots seem at once to have a certain relation to one another that was lacking before, and appear perfectly at rest within the inclosing line. This is just the reverse of the procedure of the practical designer who begins with a form adapted to a particular use and arranges shapes within it, as seen in the Renaissance Key (Fig. 2). Japanese designs in large part owe their peculiar charm to occult balance. Screens, fans, sword-guards, in fact, almost all of the objects used by the Japanese, will be found subtle, restful, and beautiful, but very seldom symmetrical (Fig. 3).

FIG. 2. RENAISSANCE KEY

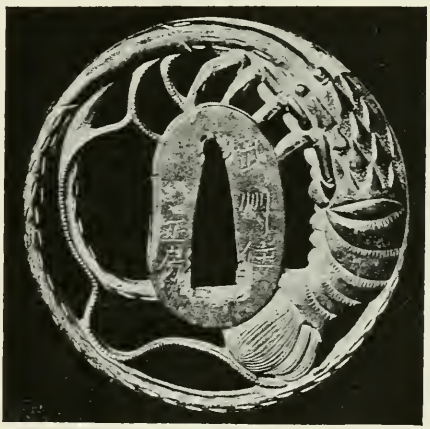


FIG. 3. JAPANESE SWORD-GUARD

The general shape of the sword-guard illustrated was rigidly prescribed by use and custom, but the great variety possible under such prescription will be apparent on comparison with the several other guards illustrated in the following pages.

All possible combinations of the spots, lines, and areas which make up design are analyzable in terms of the subdivisions of repetition: sequence, rhythm, and balance.

CHAPTER III

SPOT COMPOSITION

POSITION is the most elementary consideration of design. It is natural to take up the study of position in the composition of spots so small that their shape does not materially affect the problem. A spot in itself is a small area chiefly interesting because of its position, and not because of its intrinsic beauty. In dealing with spots the problem is that of variously related positions. It follows, therefore, that a spot must be used in combination with other spots or design elements in order to be of value, because position is entirely a relative matter. Many of the most conscientious designers, the Japanese and Chinese, for example, take such pleasure in executing designs and creating new ideas, that small areas in their compositions which appear at first to be simple spots are found upon examination to be little marvels of design in themselves, repaying the closest study. The Japanese sword-guard shown in the illustration (Fig. 4) is an excellent example of spots which in themselves are design units. The general scheme is a border composed of small circular spots pierced by very delicate but simple design motives, all of which are different. The sword-guard is of wrought-iron cut by chisels. For the purpose of this study the shape of the spot is not important, as it is indistinguishable at a short distance. In the making of finished designs, nevertheless, the minor interests cannot be neglected, but must be present to hold the attention on a nearer view. Position will be studied then by means of spots.

Spots are generally used in design in combination with other forms, but they are also frequently used alone, especially in the designs of primitive peoples. The simplest designs of the present day illustrate the use of spots, as, for instance, in the familiar dotted muslins. In them are found arrangements of light upon dark, dark upon light, in varying sizes, colors, spaces, and groupings, giving a great variety of effects to the fabrics. Thin light materials worn over

FIG. 4. JAPANESE SWORD-GUARD

darker ones are frequently embroidered with spots. English eyelet embroidery consists almost entirely of spots, which are in this case formed by holes cut out of the cloth. Spot repetitions are seen more frequently and definitely in the textile products of early civilization than in more highly developed work. The reason is, perhaps, that as spots are so simple and rudimentary when used by themselves, they are more interesting to simpler intellects.

In these elementary spot designs the scheme is usually straightforward and simple, producing an effect at first

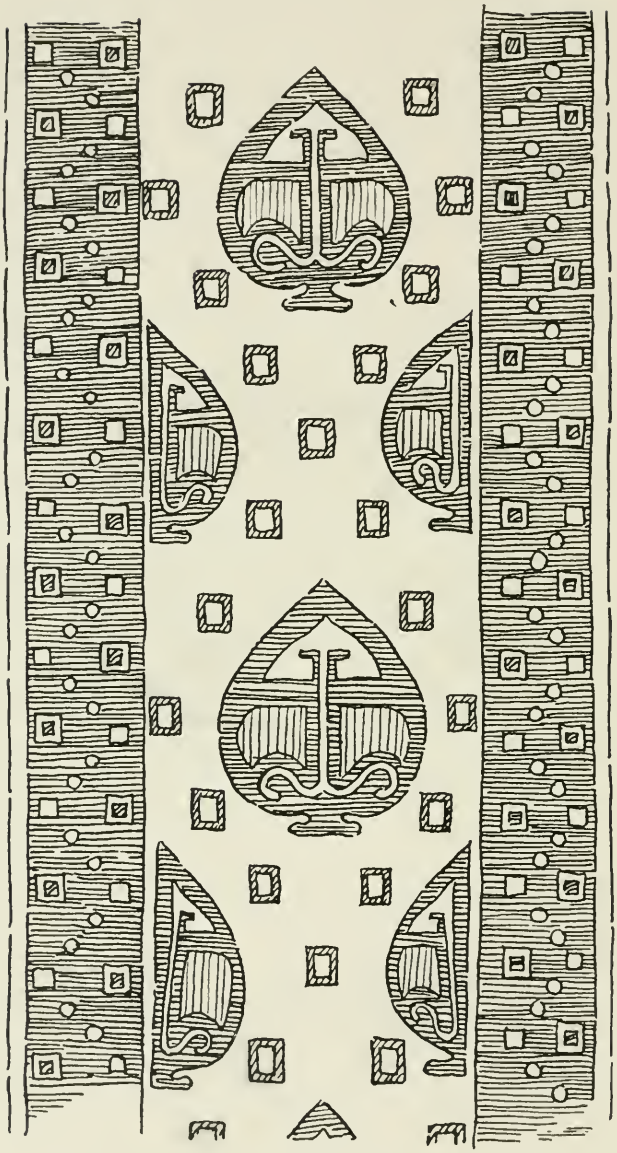


FIG. 5. COPTIC BORDER

glance (Figs. 5 and 6). This cannot fail to convey the most powerful sensation to untutored minds. Advancing civilization, constantly evolving a more complex mental attitude, has demanded more elaborate designs to satisfy a less easily pleased sense of the beautiful. The rudely painted lotus borders of the Egyptians developed into the honeysuckle borders of the Greeks, and the rich and intricate Roman acanthus. In a similar manner the discussion of design proceeds from the least intricate ideas to the constantly more complex.

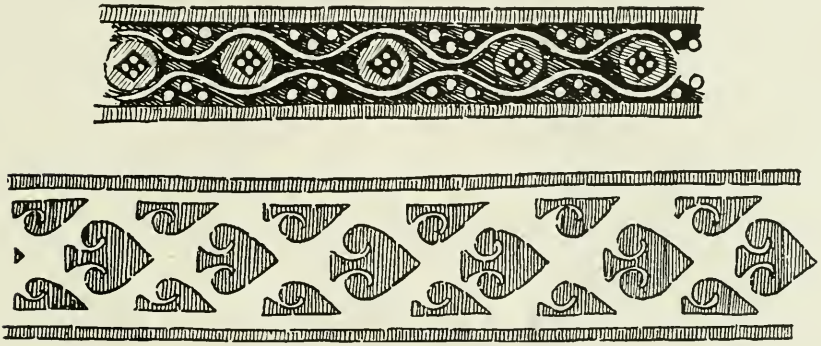


FIG. 6. COPTIC TEXTILES

Organic and inorganic design must be continually correlated (Fig. 7). If the theory of pure design alone were studied, the method of attack upon a problem in organic design would not appear. Its study, however, establishes a reasonable basis for procedure, eliminating many mistakes and false moves, and having as its only end the application of its results in organic design (Fig. 8).

Good examples of organic spot design are found in the Renaissance chests, which were covered with leather to protect and preserve them. As the leather had to be fastened securely all over in order to prevent buckling and crawling, it was thickly studded with nails. There was a function for

the nails to perform — they were not merely decoration — and the craftsman who made the chests felt, with perfect justice, that as the nails were useful they should be made ornamental as well. In contrast to this, modern wooden chests, without leather coverings, often have upon them initials or designs carried out in brass nails which look decidedly out of place. In this case the craftsman has failed to see the reason for the nails in the original design, and has no use for them in his work. His idea is consequently motiveless. The initials might have been carved in the wood, a natural solution of the problem, otherwise the chest would have looked much better without them. Instead of trying to borrow an idea organic with materials other than those which he was using, the old-time workman accepted the necessity for the nails instead of trying to disguise them, and, in order to lend beauty to his chest, he placed them in agreeable space relations. This example shows at the outset that so-called limitations are really full of the most valuable suggestion. If the choice of units or motives is restricted, a good design will very probably result, as in the Kabyis ornament (Fig. 9). A great variety to choose from is bewildering in its very richness. Any attempt to disguise processes will nearly always result in an unsatisfactory and insincere design. The limitations imposed by one condition or another serve to direct the designer in the right path, and are always aids — never hindrances.

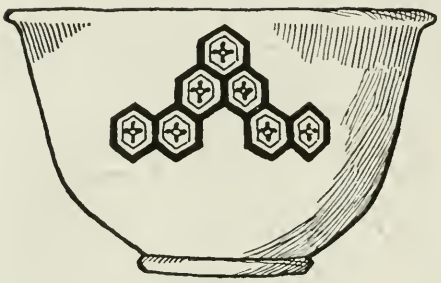


FIG. 7. JAPANESE POTTERY

A number of spot problems follow in which the spots are considered for their position only. At the outset no organic

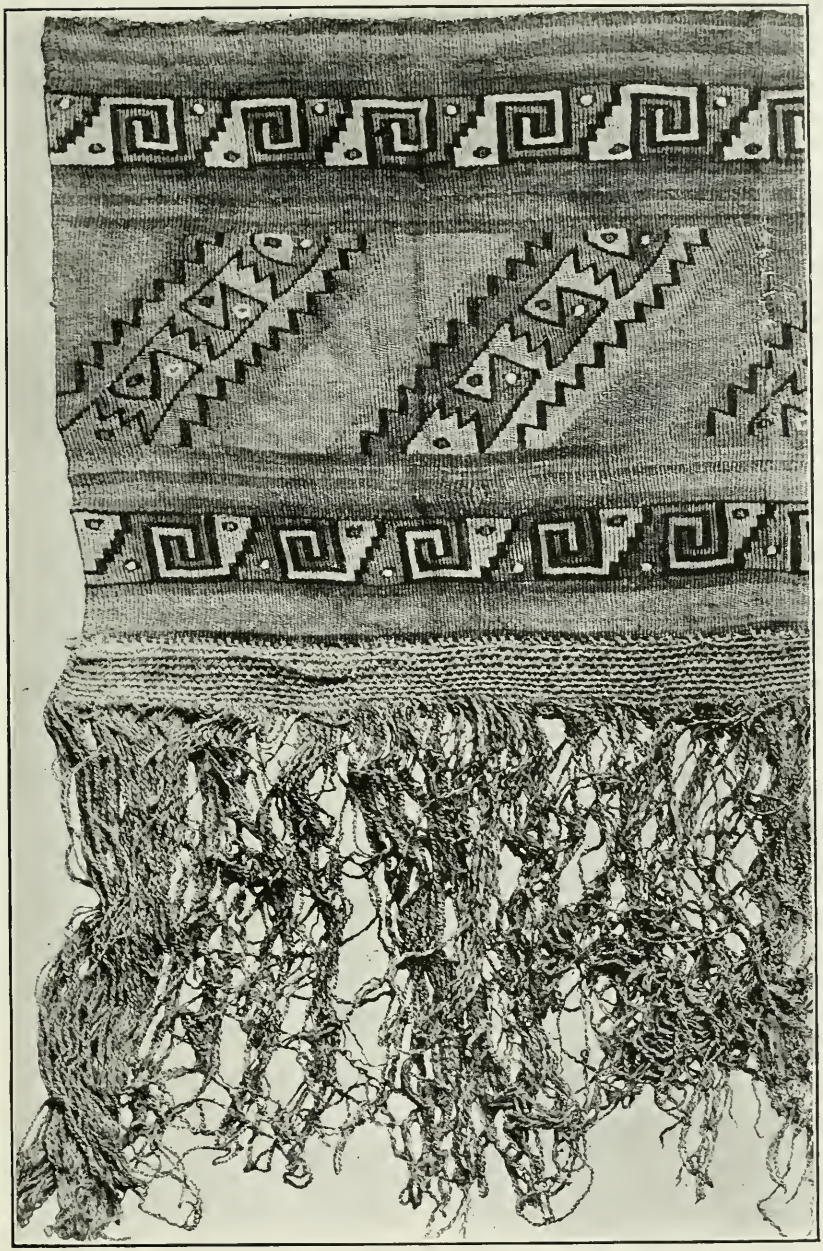


FIG. 8. PRE-COLUMBIAN PERUVIAN TAPESTRY

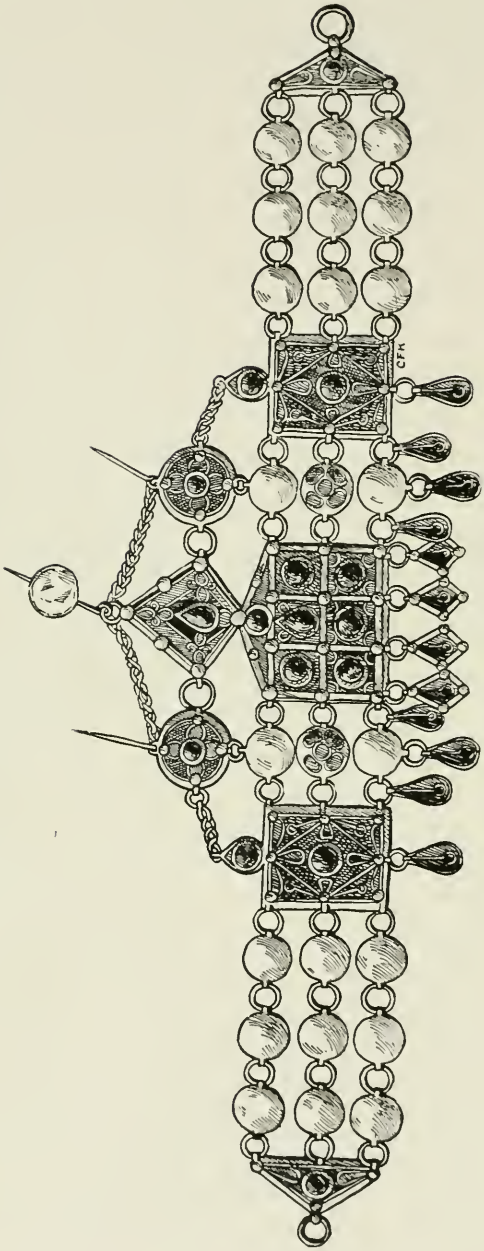


FIG. 9. BARBARIC JEWELRY (KABYIS, AFRICA)

conditions should be thought of, but the spots should be such as can easily be made with a brush and black ink upon white paper. As Repetition is the basis of design, Sequence, its simplest form, will be considered first in the problems.

Sequence has been defined as a repetition of shapes and measures in equal or regularly varying distances and directions (Fig. 10). It will be first considered with regularly varying distances, but without variation of shape, direction, or measure (size). Two distances only are used, and the variation in each example is different, though regular (Fig. 11). The second group of spots contains the same distance relations as the first, with one change of direction. The same change of direction is differently used in each example (Fig. 12). These first two groups show only a few of the more obvious arrangements, where the spots have no interest on their own account, but are used to mark position relations only. These examples are all without rhythm, for the eye follows them as easily in one direction as in the other.

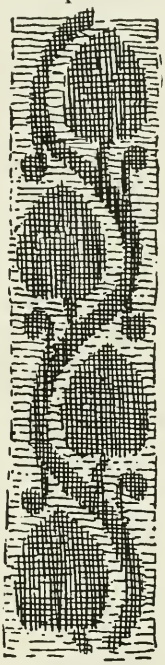


FIG. 10. COPTIC BORDER

Emphasis upon certain spots in regular repetition will add interest to any of the foregoing examples. Some of the simplest combinations follow (Figs. 13 and 14). This emphasis is obtained by one change of measure. Groups shown in Figs. 11 and 12 are used as bases. Rhythm can be introduced into spot problems where an unbalanced *group* of spots is used as a unit, but the method most commonly employed is to use an irregular or unbalanced spot to produce this effect. The spot is here important on account of its irregularity, because in itself

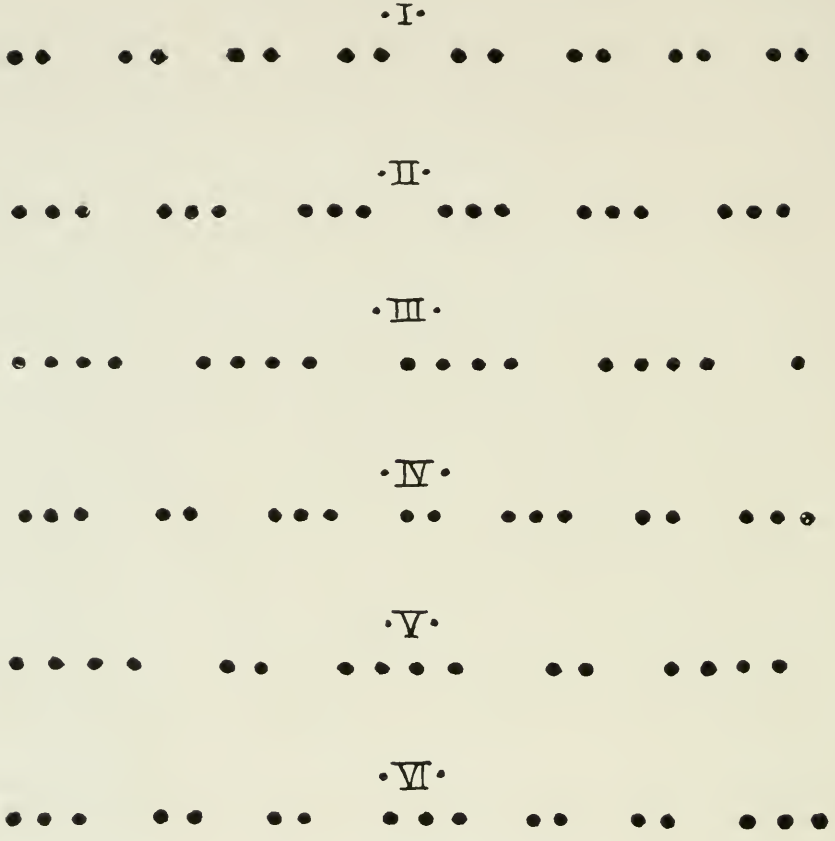


FIG. 11. SPOT REPETITIONS

it contains a certain idea of direction. Fig. 15 contains only rhythmic repetitions.

In the examples of rhythm here shown the eye tends to move from right to left as the unit employed points in that direction. The eye moves most easily along I, as there is nothing to retard its progress, but the examples which follow exhibit greater variety of movement produced by secondary direction movements and progressions of distance.

In the examples of balance illustrated, Fig. 16, I, shows the simplest form. Each spot attracts the eye with equal force,

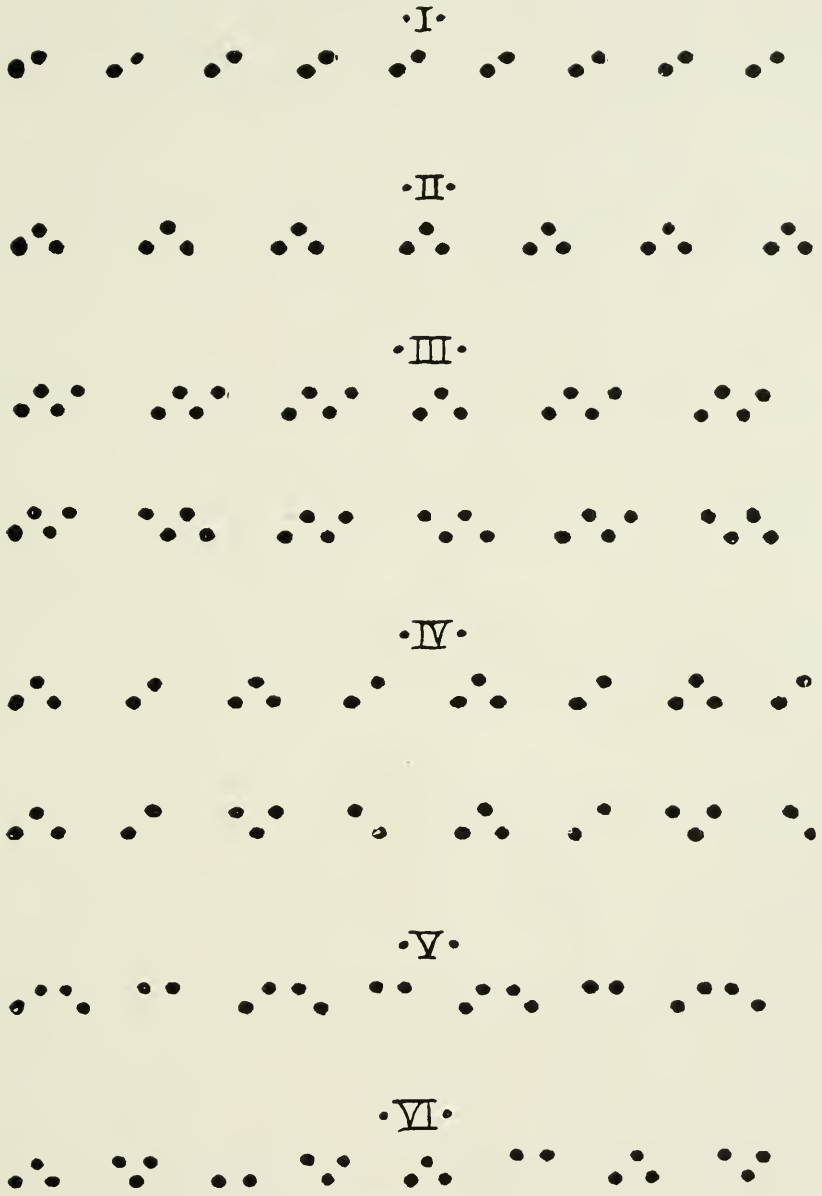


FIG. 12. SPOT REPETITIONS

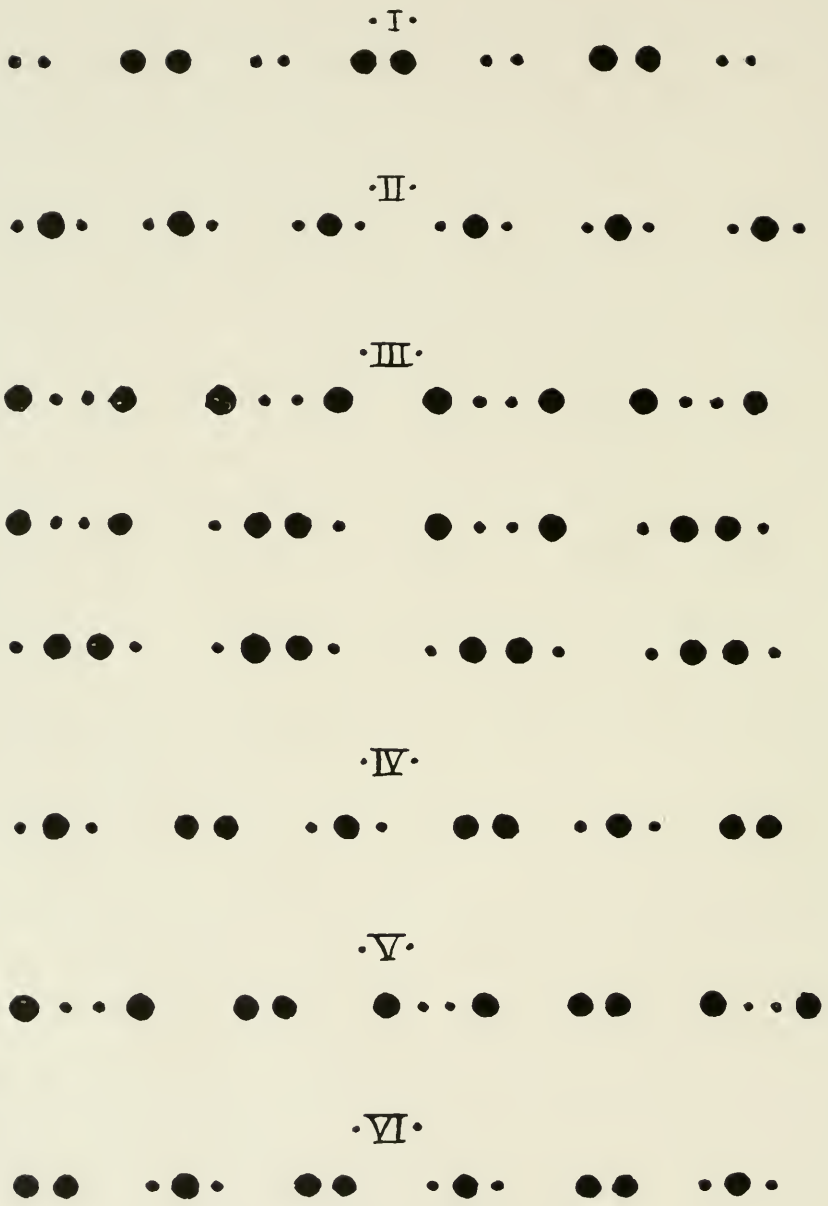


FIG. 13. SPOT REPETITIONS

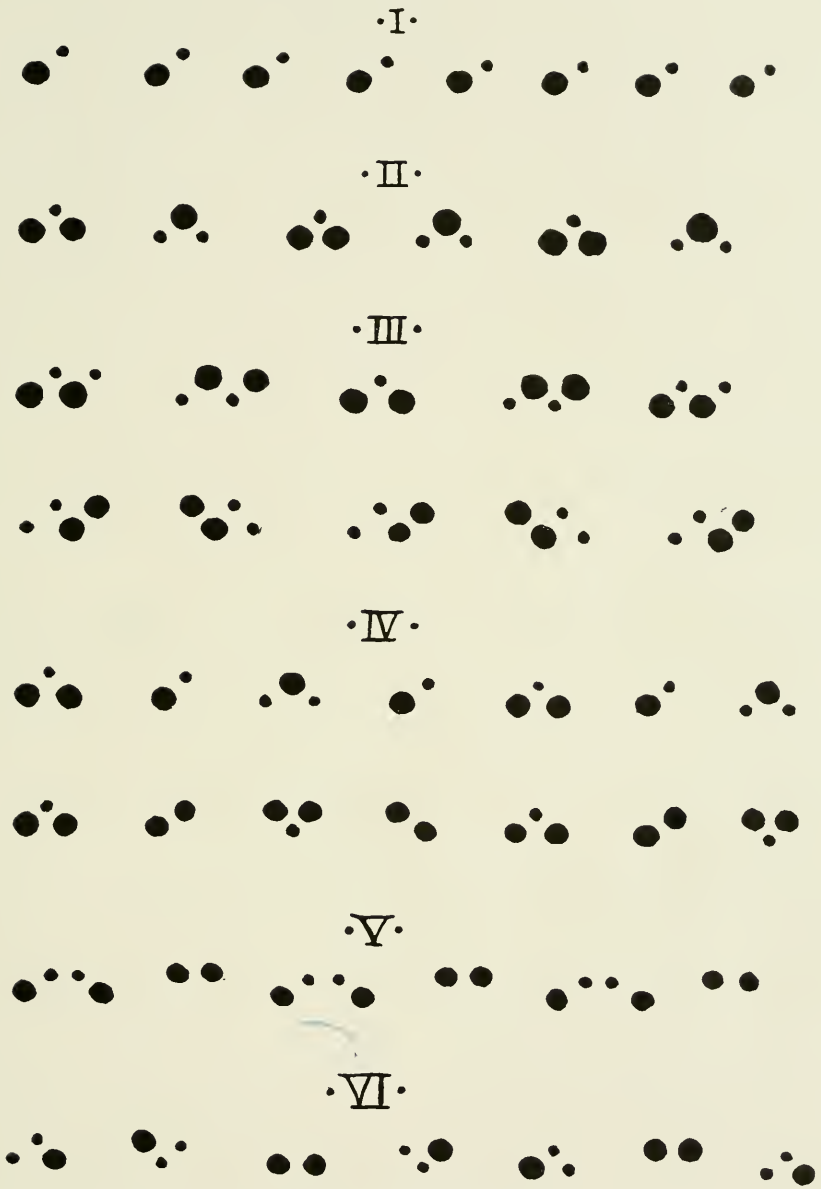


FIG. 14. SPOT REPETITIONS

·I·

·II·

·III·

·IV·

·V·

·VI·

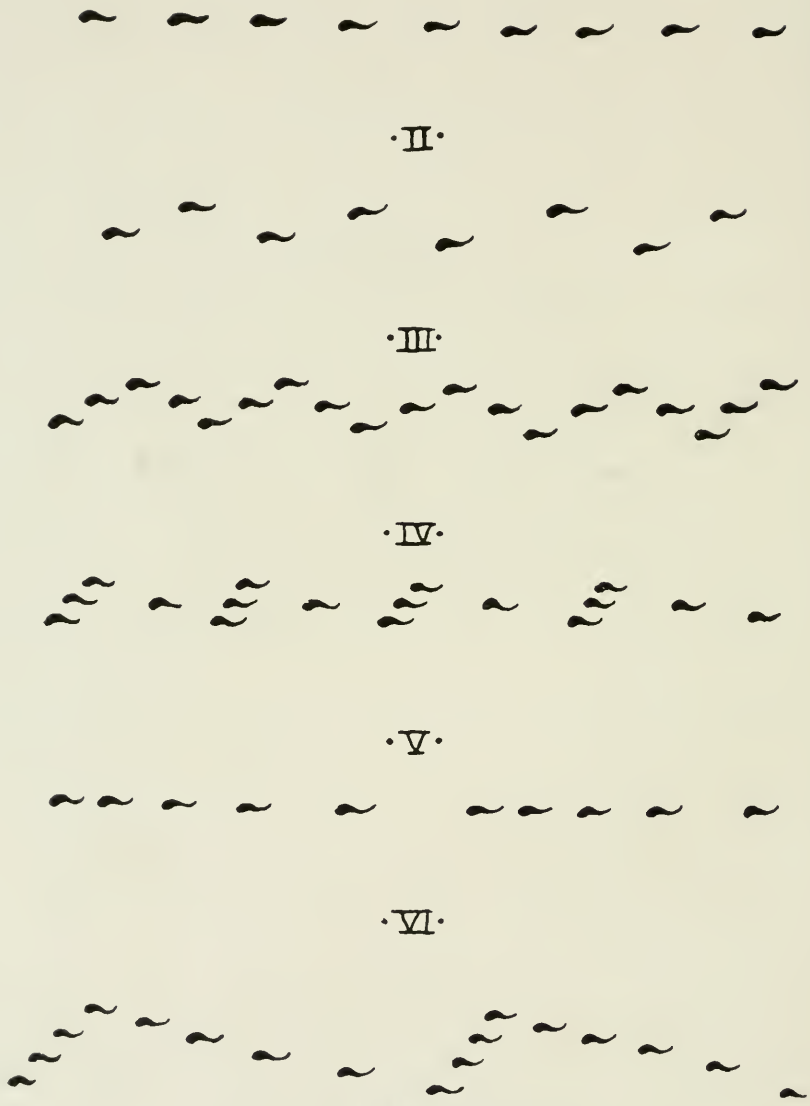


Fig. 15. RHYTHMIC REPETITIONS

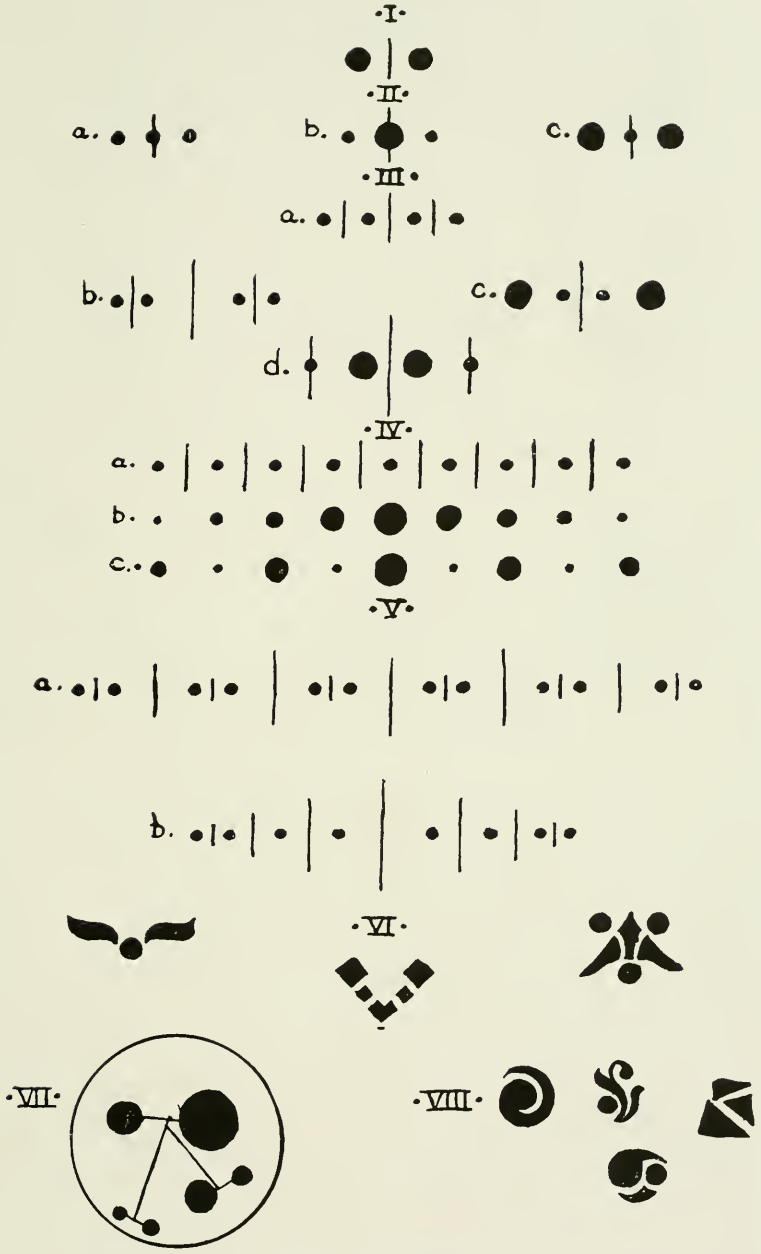


FIG. 16. BALANCES

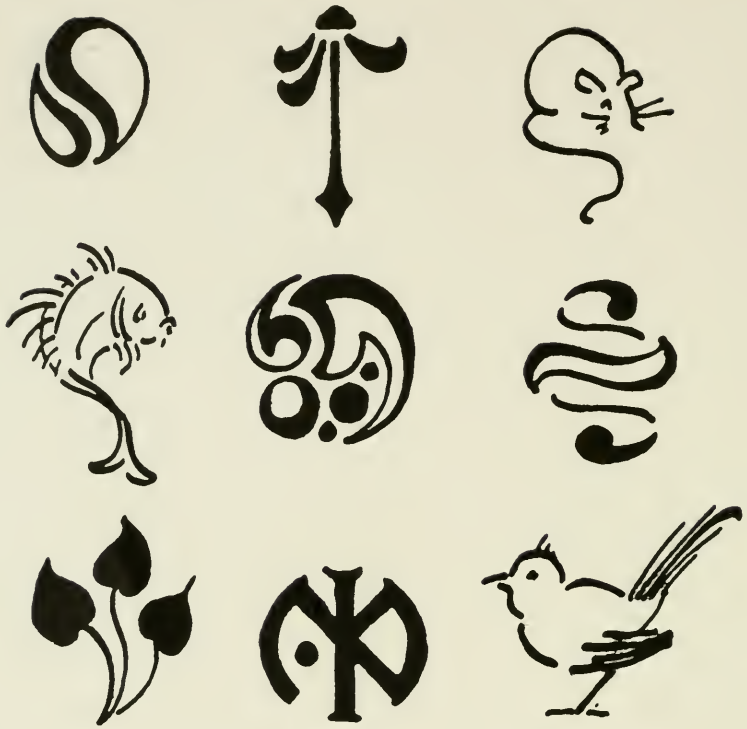


FIG. 17. UNSYMMETRICAL BALANCES

and the result is a balance about an axis between them. In Fig. 16, II, three units are used, equidistantly spaced. The axis here passes through the central unit which in *b* and *c* is emphasized by changes of measure. In III*a* the four units balance about the central space. There are three axes here, two of them subordinate to the principal axis. This is shown more clearly in *b*, where the units are grouped in pairs. The groups *c* and *d* have no secondary axes as their measure varies, but this change of measure serves to emphasize the center. In IV*a* the balance is not very apparent, but in *b* the center is emphasized by a progression of measure, and in *c* every other spot is subordinated which throws

the center of balance more prominently into relief. In v*a* a long series of units is grouped in pairs, making each pair count as one unit, which simplifies the fixing of the center. In v*b* the center is emphasized by progression of distances from either end, keeping the eye in the center of the composition. It is a balance of two counter-moving attractions. Number VI shows a few balanced symmetrical spot units; VII is interesting merely from a theoretical standpoint as illustrating occult balance; VIII shows a few unsymmetrical balances (Fig. 17).

CHAPTER IV

SPOT COMPOSITION — FIELD

THAT repetition is one of the most important ideas in design appears still more convincingly when a repetition is itself used as a unit of repetition. If a simple repetition of spots lying in one direction or in an alternation of directions be taken, perhaps in combination with equal or alternated spaces, and this line of repeated units be repeated in a direction more or less parallel to its extent, an all-over pattern is produced through which can be traced lines and schemes of design which would not otherwise have been easily discovered (Fig. 18). The interest of the result comes as a consequence of using orderly motives. Of course, if the repetitions be placed one under the other with no regularity of repetition, in a disorderly fashion, the result is only chaotic and confusing; if, however, some simple idea controls the placing of each motive, such as alternation, or progression, or both, the result will very probably be pleasing (Figs. 19 and 20). The distribution of positions by this method gives an all-over arrangement which may be termed a "field." Simple spot problems such as are found in the preceding chapter are good units to use at the outset. In the diagrammatic pure design fields (Figs. 18 and 19), illustrated below, it will be seen that the unit taken horizontally does not change in the different schemes, although, as the vertical scheme of juxtaposition shifts, the effects created are very different. The spots so far used are interesting chiefly on account of their position and not because of any

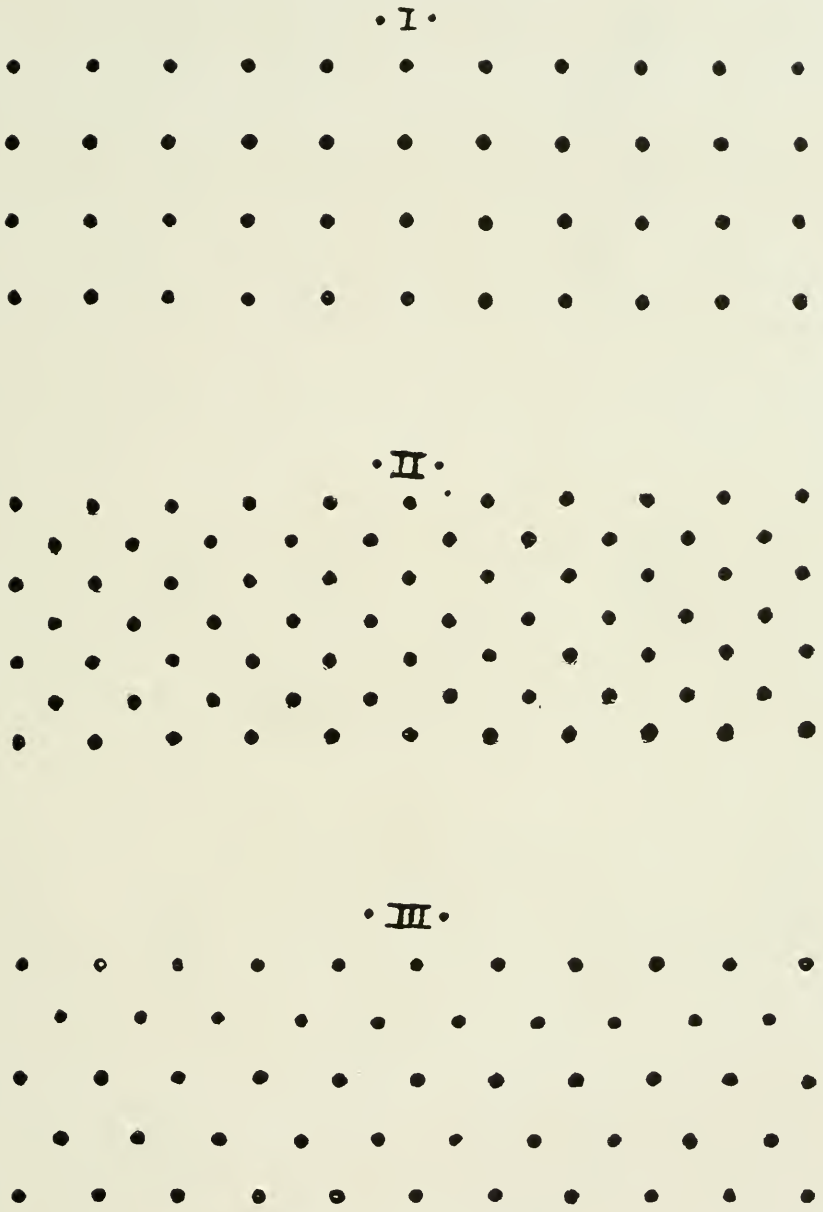


FIG. 18. FIELD DIAGRAM

FIG. 19. SPOTS IN "FIELD"

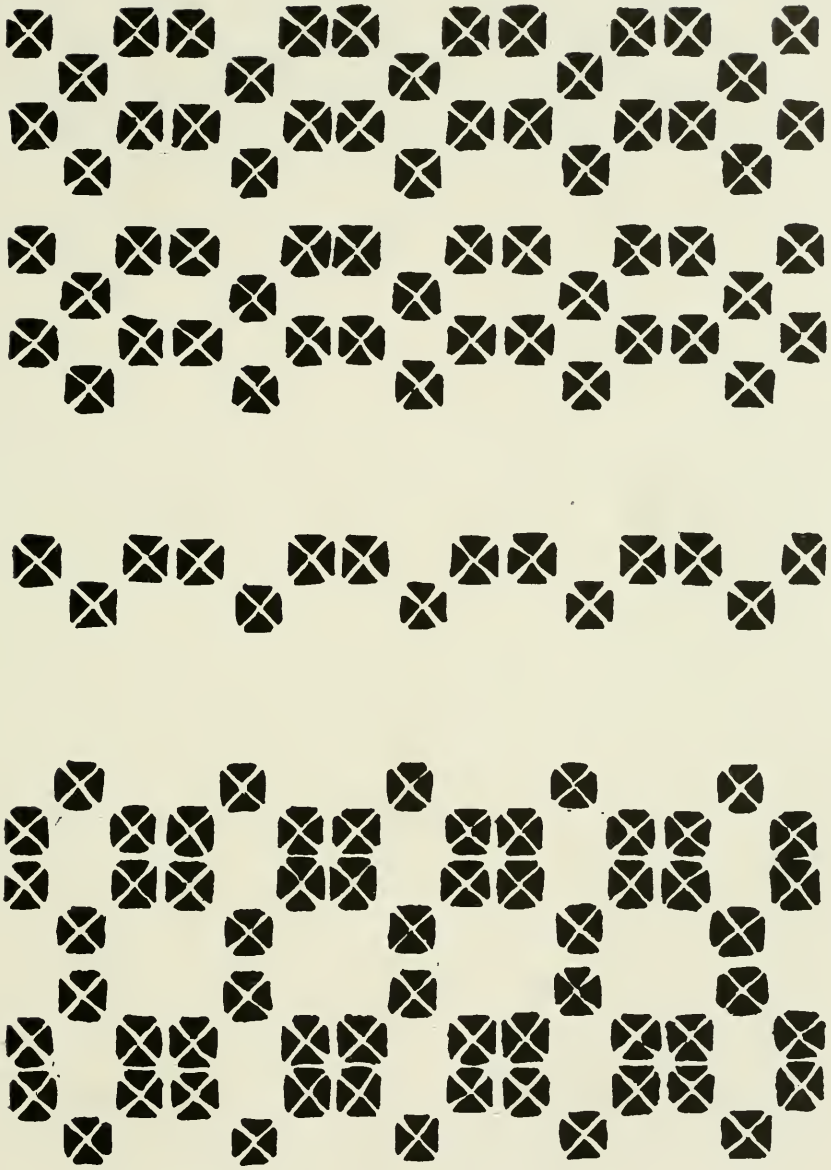


FIG. 20. SPOTS IN "FIELD"

individual beauty (Fig. 21). When spots are well distributed in a field the result is a number of agreeable space relations — the foundation of all good design.

For the positions in space which are defined by the spots so far used, agreeable shapes or groups of spots may be substituted with satisfactory results (Figs. 22, 23, 24, 25, 26, 27). When a group of spots is used as a single unit in a primary repetition it may have a fresh attraction by appearing in different attitudes (Fig. 28). Some forms which are familiar in their normal positions would not be easily recognizable upside down, or in some other unexpected pose. One simple unit may be taken as a basis and an intricate design composed by using it in different attitudes. While the repetition of the same form can be felt throughout, lending unity to the whole, the difference of attitude prevents monotony, giving a variety which adds fresh interest to the enjoyment of the design. There are four principal positions recognized by designers (Fig. 29). If an irregular form or group of spots be put upon a piece of paper and the paper be folded, a symmetrical replica of the form or the spots will be obtained, a repetition that looks exactly like their image in a mirror. This kind of repetition is called single inversion.

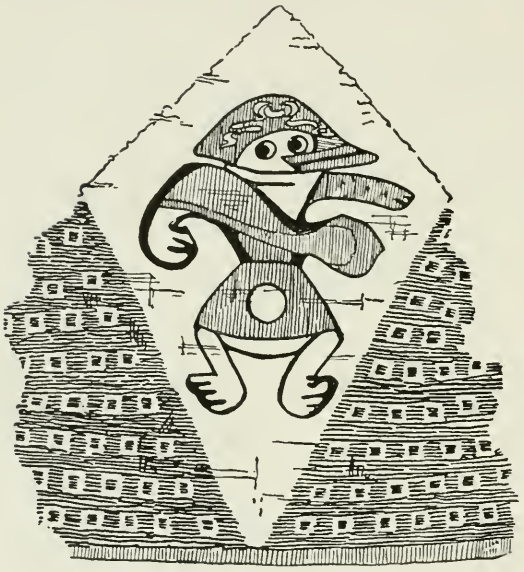


FIG. 21. SPOTS IN "FIELD" IN COPTIC FABRIC

FIG. 22. FIELD

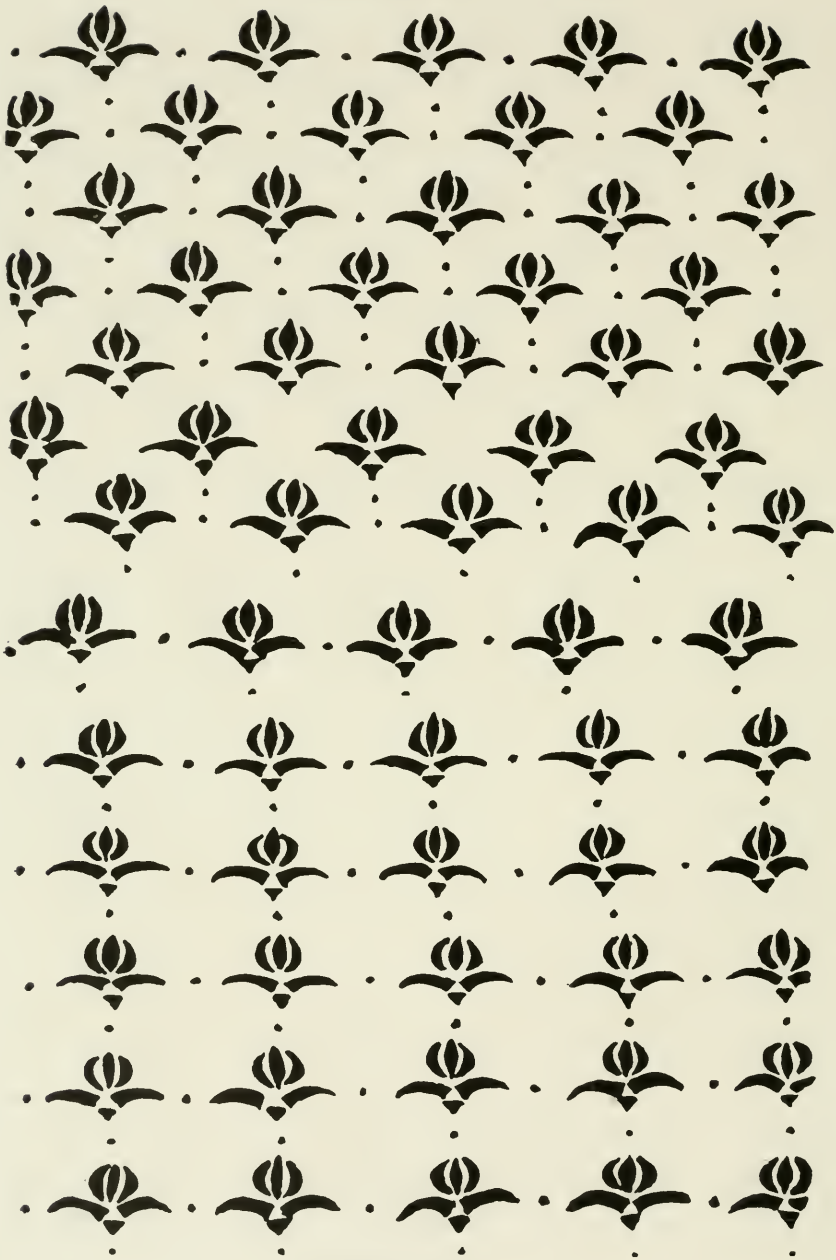


FIG. 23. FIELD

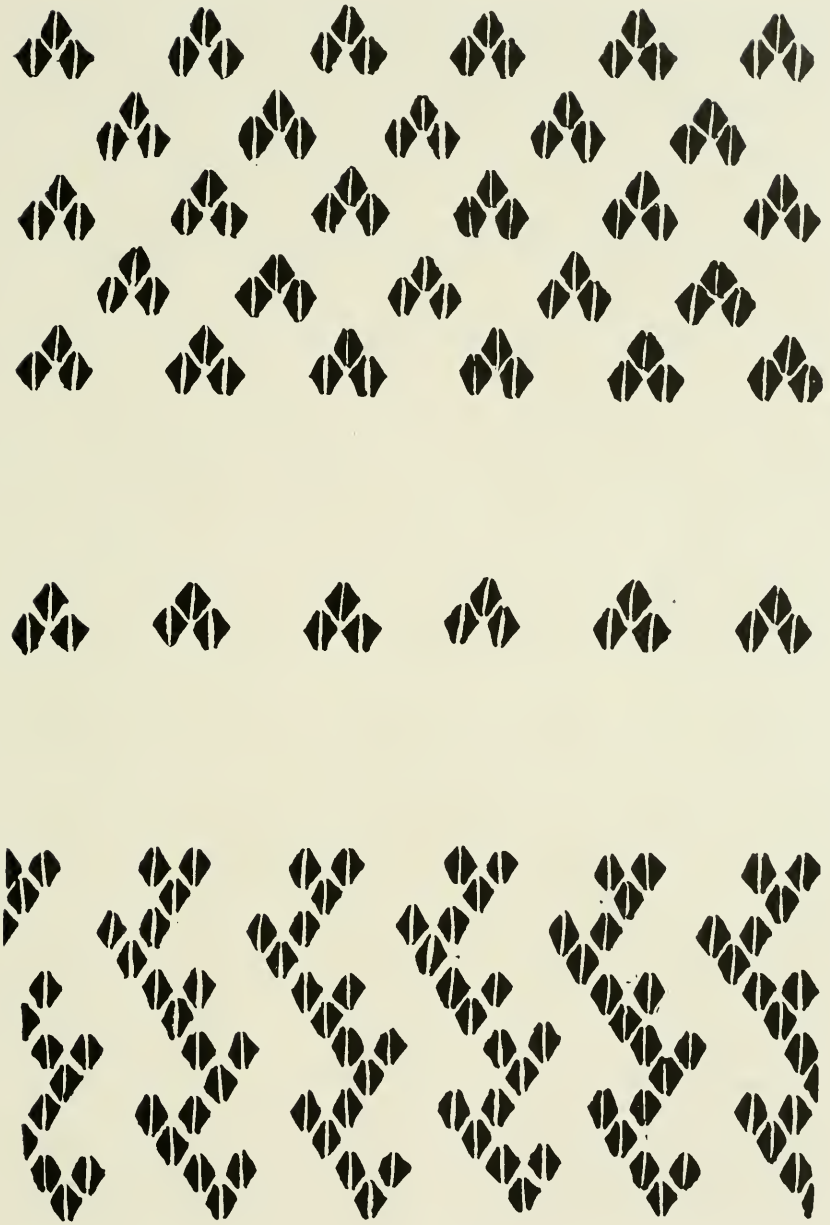


FIG. 24. FIELD

FIG. 25. FIELD

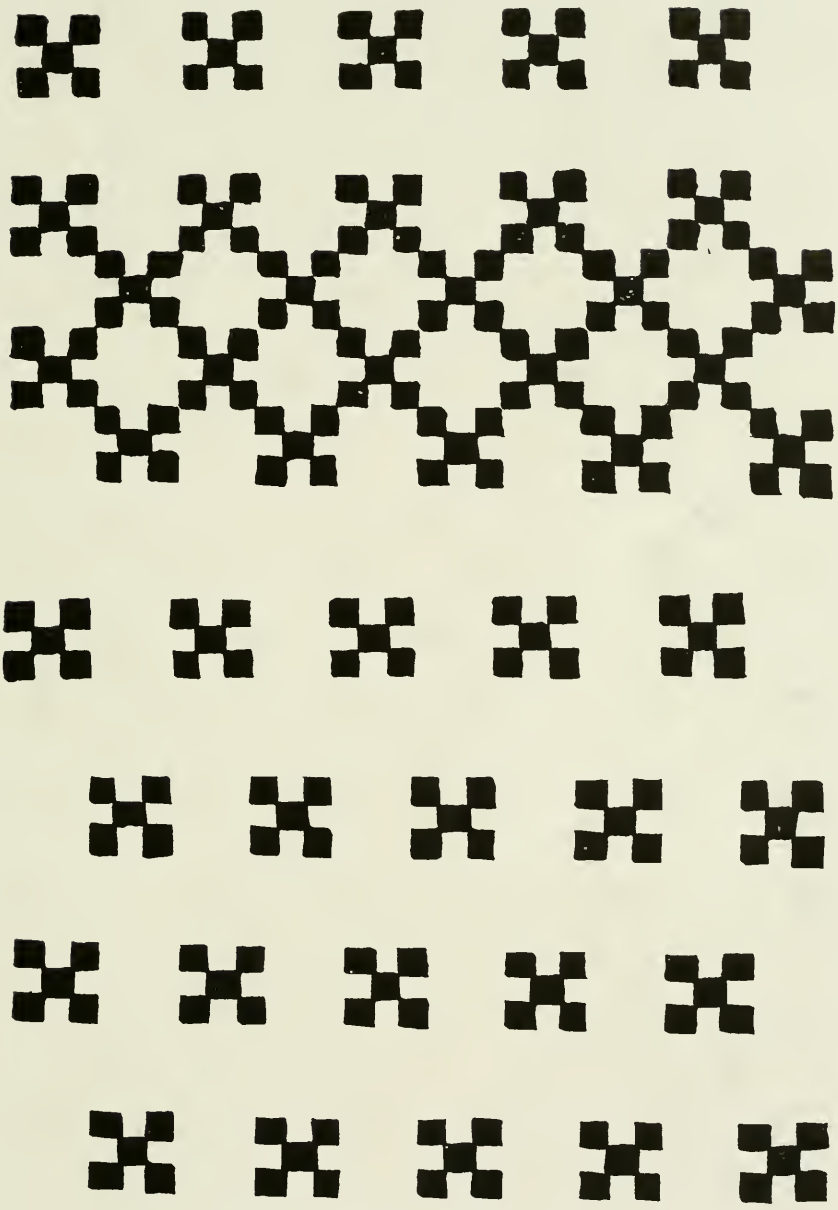


FIG. 26. FIELD

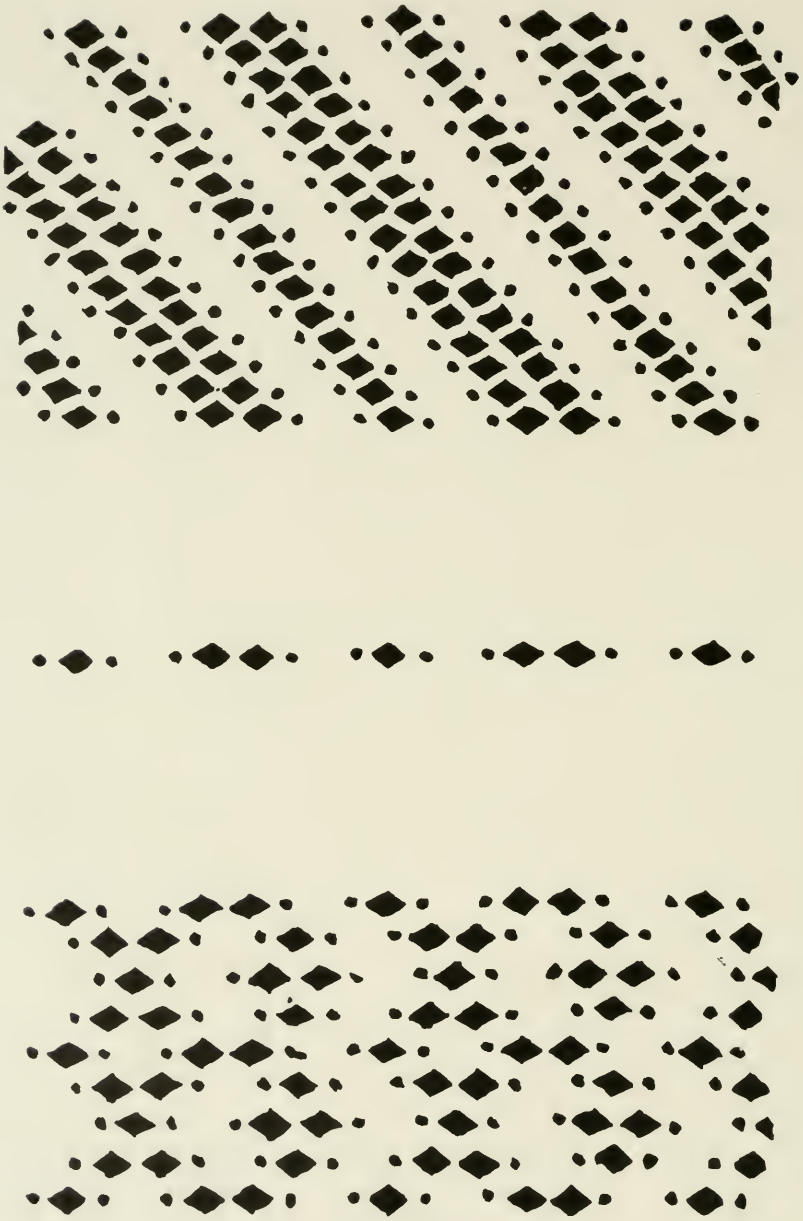


FIG. 27. FIELD

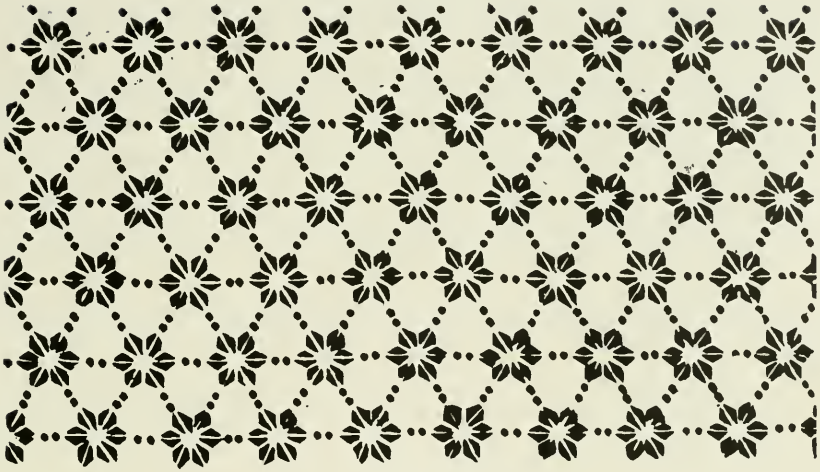


FIG. 28. JAPANESE STENCIL

If the paper be folded first down and then across, as shown in the diagram, a still different aspect of the form or spots appears which is known as double inversion. Groups of spots, or lines, or small areas, may be used in inversions the same as single spots or lines. In experimenting with inversions to build up new unit possibilities, the spots or lines used may be placed so that they leave varying distances between the component parts or so that they overlap, touch, or interlace. Thus a single unit used in interlacing

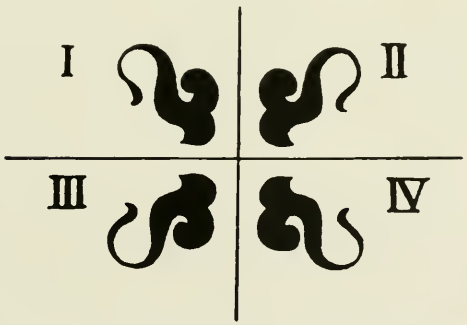


FIG. 29. SINGLE AND DOUBLE INVERSIONS

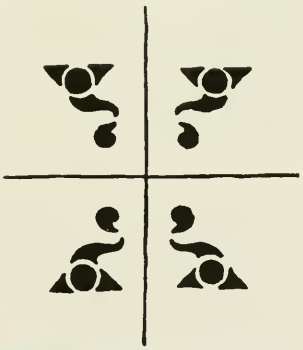


FIG. 30. THE CARDINAL POSITIONS

FIG. 31. MEDIEVAL KEY

will give a quite different appearance than when used singly. The interlacing of units, — especially units of outline — introduces areas by the intersections, producing a design of entirely different character. Each of these arrangements may introduce new elements of interest. In the medieval key shown in Fig. 31, the "bow" is decorated with a simple but graceful design which is merely a single inversion (Figs. 32 and 33). Single or double inversion in itself has nothing to do with proximity of spots or lines, however, but only with their relation to the horizontal and the vertical. It must be understood that while innumerable variations

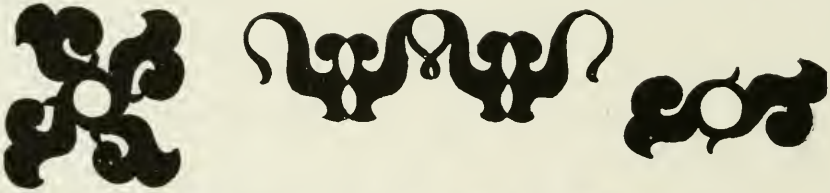


FIG. 32. DIFFERENT ATTITUDES OF SAME UNITS WITH INTERLACING

FIG. 33. DIFFERENT ATTITUDES OF THE SAME UNIT

of attitude are possible with an irregular figure, the whole idea of change of attitude may easily be comprehended by a study of the four cardinal attitudes (Figs. 34, 35, 36). Fig. 34 is a unit of decoration from a gorgeous Japanese brocade in black and gold. The four cardinal attitudes are shown here in almost diagrammatic simplicity. Fig. 35 shows a carved Gothic panel of the early flamboyant period. The rather elaborate design may be easily analyzed into different attitudes of two simple units. The Chinese box (Fig. 36), is still more direct in treatment.

FIG. 34. JAPANESE BROCADE UNIT

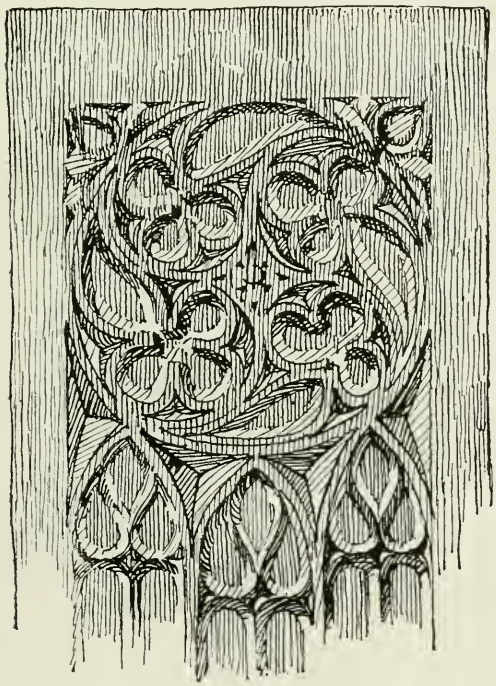


FIG. 35. CARVED GOTHIC PANEL

A group of spots such as is shown in the illustration (Fig. 37), may be used as a unit, and placed in relations indicated by the position of the spot repetition in the parent design. It is quite possible, as shown in the diagram, that the grouped unit will combine or overlap with its neighbor. The effect produced may destroy all idea of order in the repeat, or it may result in a much more beautiful

FIG. 36. CHINESE BOX OF CARVED LACQUER

design than had been conceived before. Any degree of elaboration is possible by such a method. The importance of trying each unit in a number of different ways and then eliminating the unsuccessful efforts cannot be over-emphasized. One of the chief purposes of pure design is the cultivation of discrimination.

The field method is a simple way of approaching pattern repeat. Probably the most frequently noticed and the most

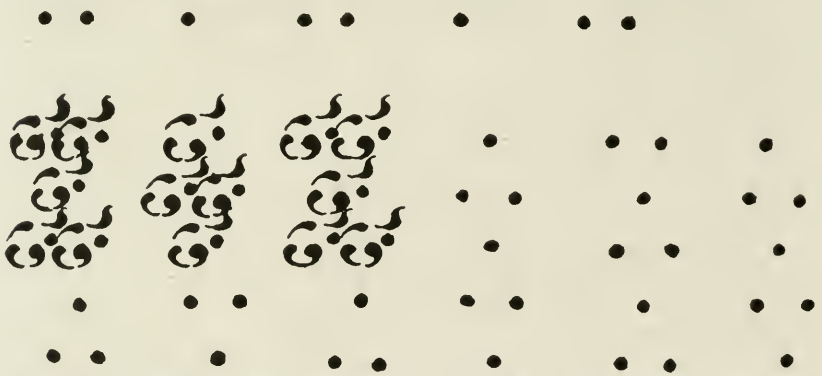


FIG. 37. SPOTS USED AS SKELETON FOR ELABORATION IN FIELD DESIGN

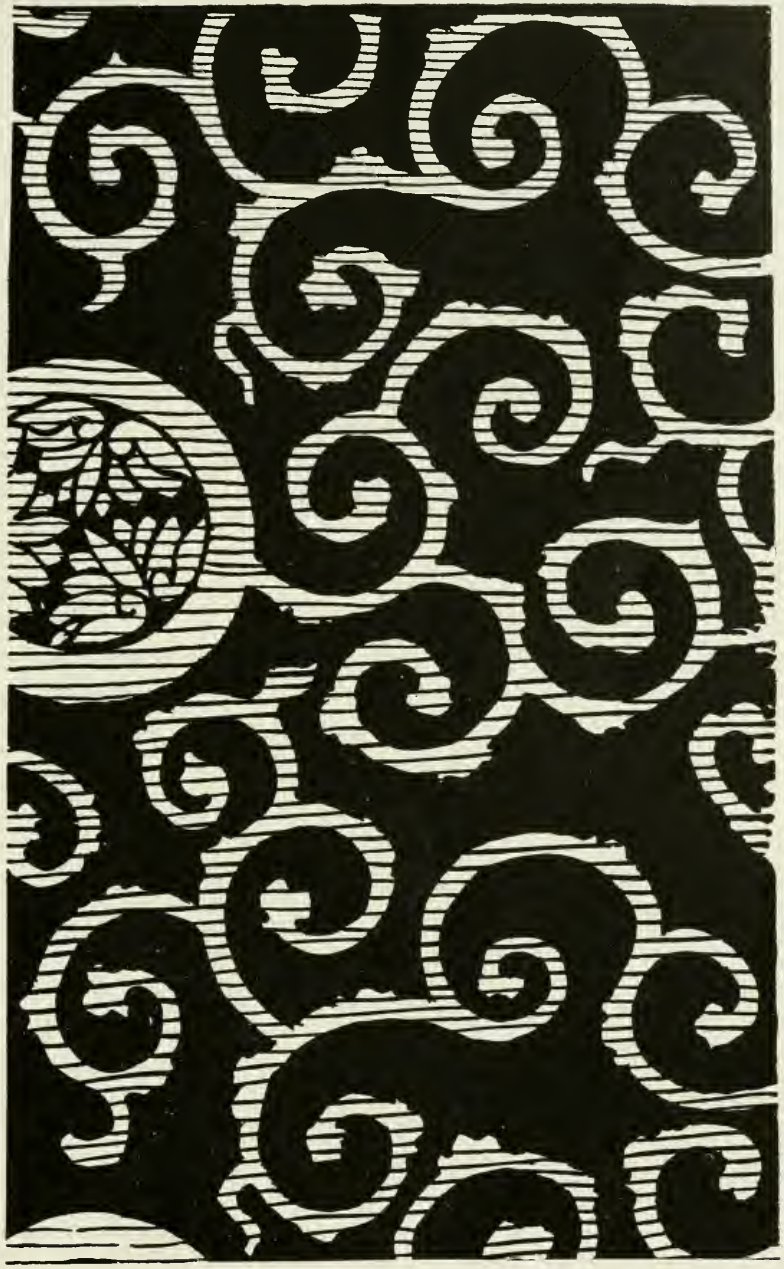


FIG. 38. JAPANESE BROCADE

familiar examples of pattern are wall-papers and carpets. Sometimes in a paper which has been poorly designed, a unit in the repeat protrudes from its fellows and gives a pattern that is evidently quite contrary to the geometrical scheme determined upon by the designer, the result being confusing and unpleasant. This counter-pattern has been allowed to persist either through carelessness or incompetency. A pattern must rule the scheme of repeat, without protest from any part of the design, in order to produce the unity which is essential to a satisfactory result. The motive repeated in field may be very subtle, but it is the dominating force in the design and should be recognized as an entity. Textiles show field design most clearly. The early Coptic (Fig. 21) and Peruvian (Fig. 41) motives constantly present repetitions of spots in field (Fig. 5). The later Javanese printed cottons show this in a wonderful way, and the results are more satisfactory than those obtained by the Copts, although the people of Java are not surrounded by products of a high civilization as were the Copts. The illustration (Fig. 40) shows a field in which the same units with slight variations are used in different attitudes. The mosaic pavement from San Miniato (Fig. 39) shows the same treat-

FIG. 39. MOSAIC PAVEMENT (SAN MINIATO)

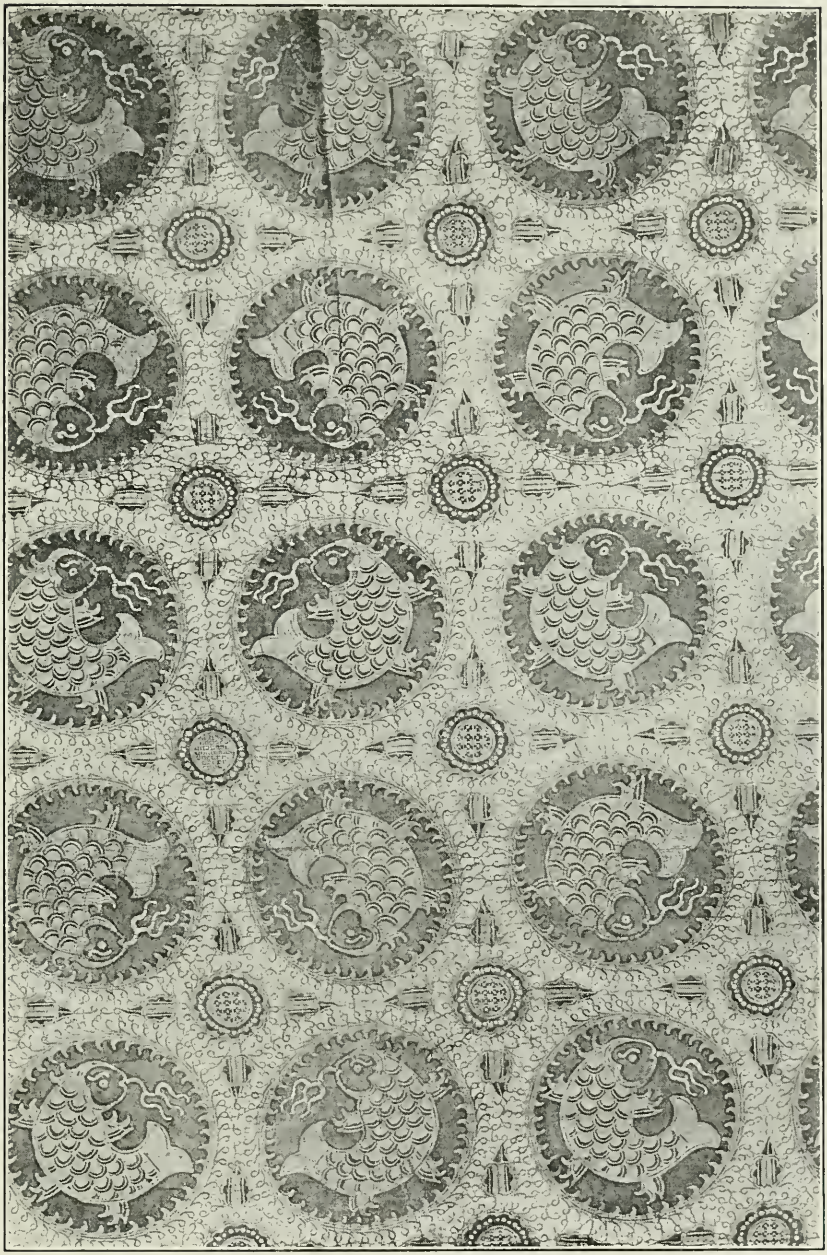


FIG. 40. JAVANESE COTTON

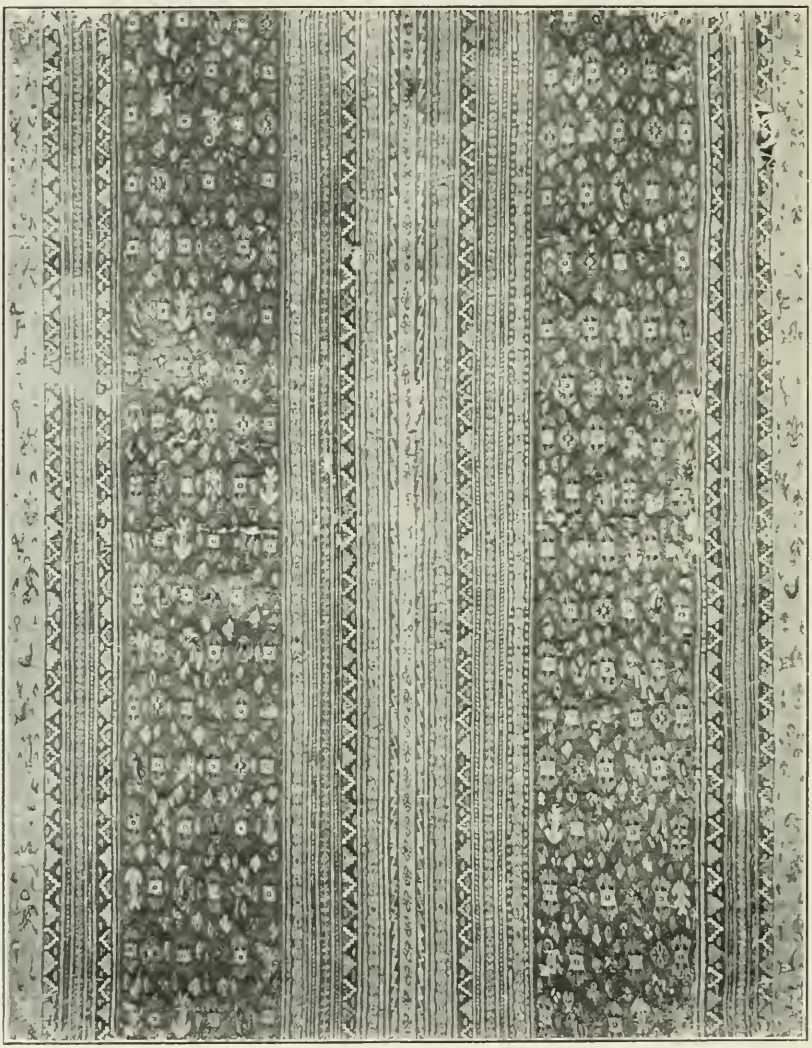


FIG. 41. PRE-COLUMBIAN PERUVIAN TAPESTRY

ment. A comparison of illustrations 39 and 40 will at once establish the universality of the laws of repetition which govern design.

CHAPTER V

LINE COMPOSITION

THE laws of Repetition, — Sequence, Rhythm, and Balance, — the operation of which has been shown by spots, may now be illustrated by lines, with some differences in detailed treatment. Spots, although said to be interesting chiefly for their position, have been considered as small areas rather than geometrically. Even in geometry, however, where position only is considered, position is represented by a spot of appreciable dimensions in order to simplify discussion. In design, moreover, the size of the spot adds to its interest rather than detracts from it. It may perhaps be interesting on account of the technique of the brush or other instrument with which it was shaped. The line now to be considered is not the geometrical line, but a drawn line of appreciable and variable width, which possesses interest on account of its width as well as because of its direction and extent. A spot is always used in connection with, or in definite relation to other spots or lines, the interest depending upon the distance and direction relations. A line is frequently used alone and covers more ground or extends over a greater distance than does a spot; therefore it has entirely different possibilities. (Fig. 42) A design composed of lines may be (*a*) an arrangement of lines within a given outline, (*b*) an arrangement of lines, balanced or unbalanced, in a sequence or field, with or without changes of attitude, as with spots, or (*c*) a single line may constitute an entire design, becoming of sufficient interest by means of

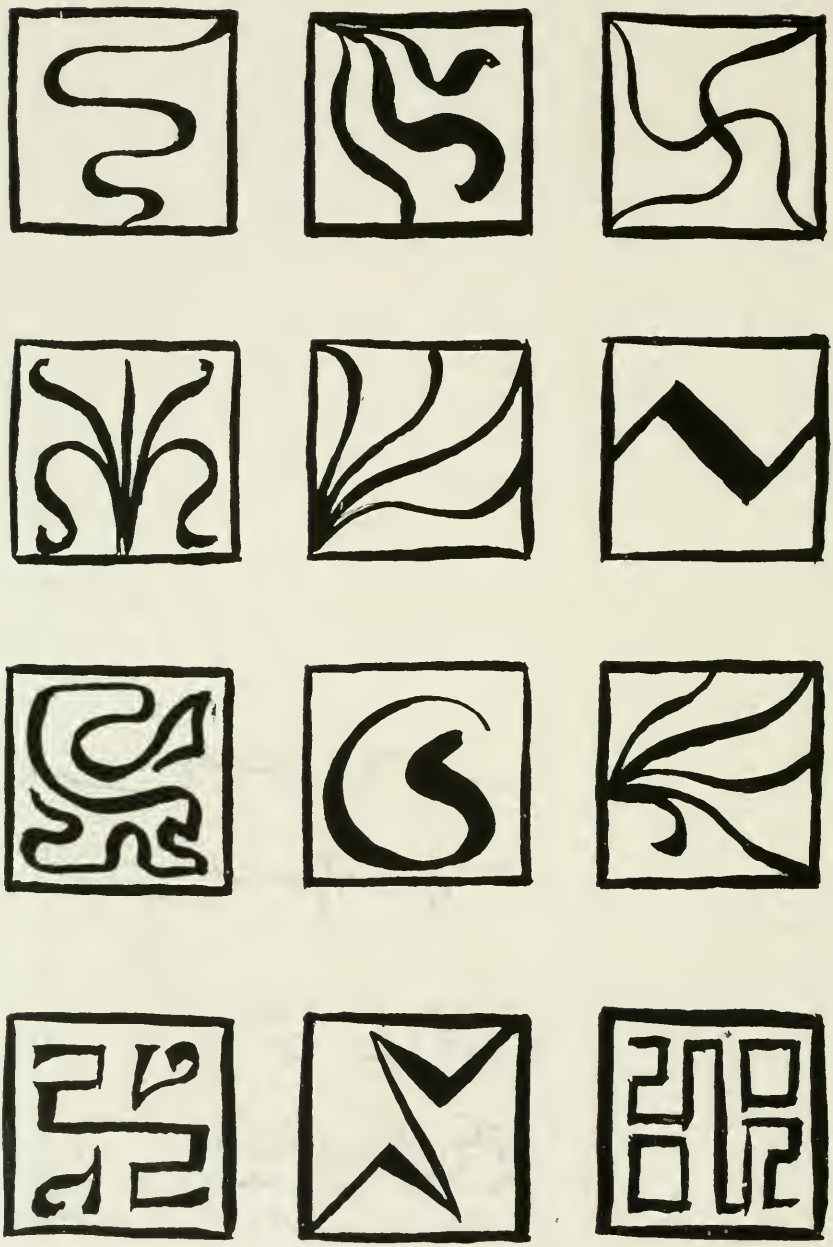


FIG. 42. LINES WITHIN A GIVEN OUTLINE

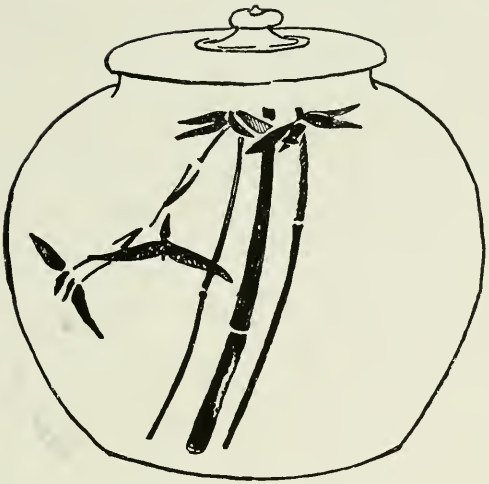


FIG. 43. JAPANESE JAR

the distance and direction relations of its own parts (Fig. 45). Line arrangements in a given area may be limited either by a line drawn on a plane surface, or by the contour of an object. This was doubtless the idea of the designer of the Japanese jar (Fig. 43). A line must of necessity be more or less continuous, and this tends to conduct the eye throughout its length. Its very continuity therefore gives the line an advantage over spots in contributing to rhythm, so that most rhythmic motives have the line as a controlling element (Figs. 46, 60). The adaptability of line to these types of arrangement has always contributed to make line a very important element in design.

The Japanese sword-guard (Fig. 44) shows the first of these possibilities. It is analyzable into line motives. The border consists of a repetition of symmetrical line motives with a possibly naturalistic origin; the area within the border is filled with

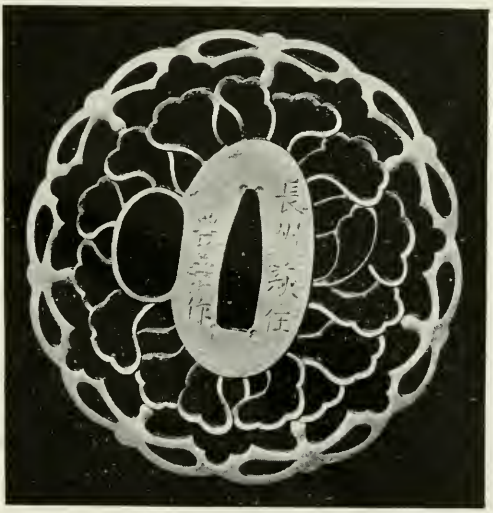


FIG. 44. JAPANESE SWORD-GUARD

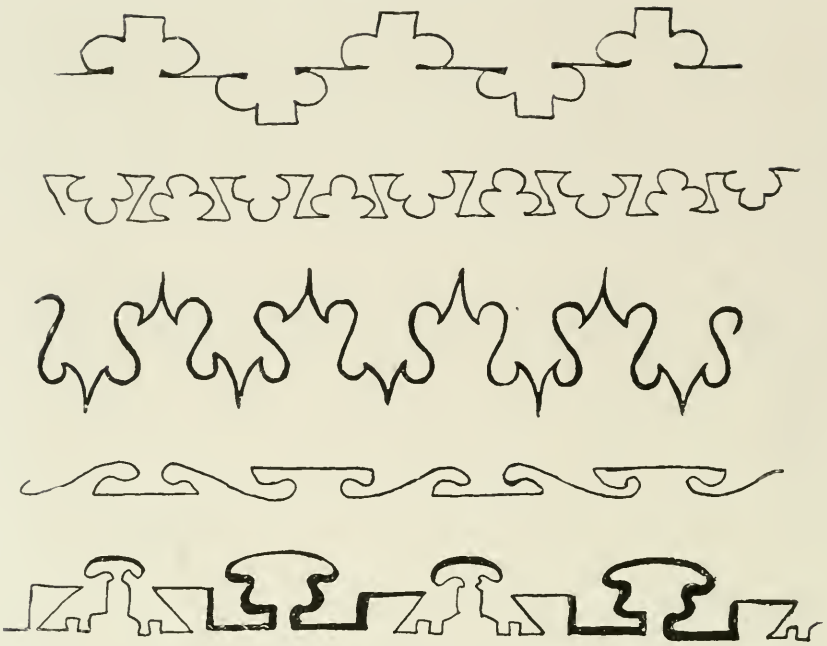


FIG. 45. BALANCED LINES

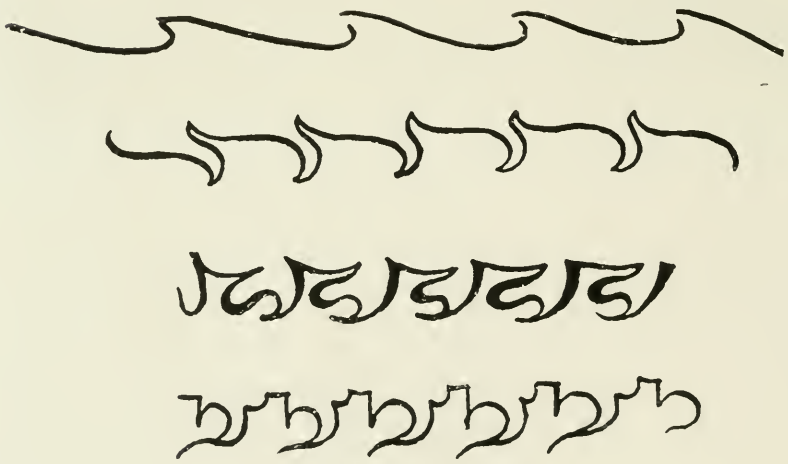


FIG. 46. RHYTHMIC LINES

Fig. 47. ITALIAN VELVET (XVI CENTURY)

discontinuous lines, which, while the lines themselves do not repeat, are harmonized by the repetition of similar curves.

The Italian velvet (Fig. 47) shows a field motive composed of discontinuous lines. It is also an interesting example of the organic ideal. Velvet is a rich stuff, beautiful because of the shimmer of its glossy surface. Any design which destroys that surface in large measure would spoil the very richness which velvet possesses, — therefore, lines, which occupy a very small area in themselves, are used for

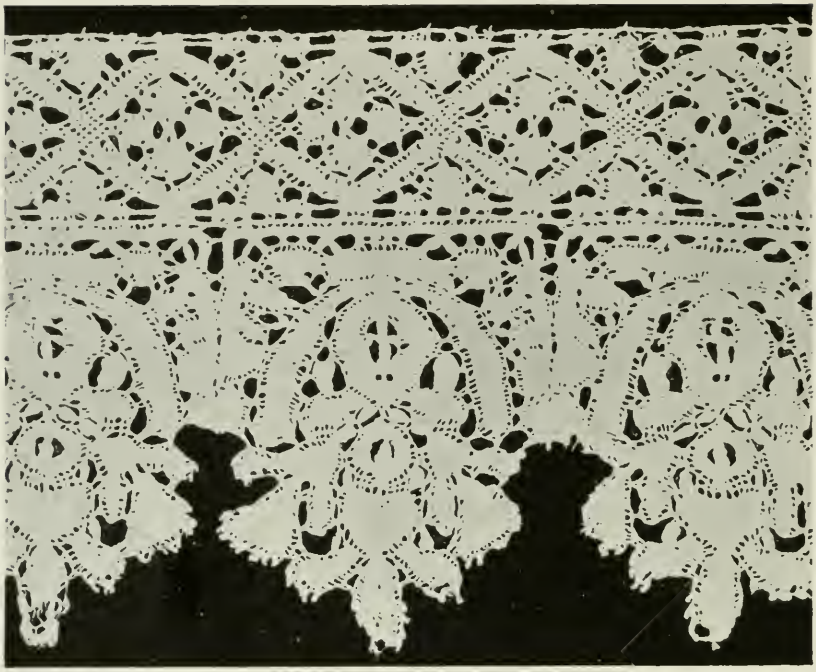


FIG. 48. PILLOW LACE (FLEMISH OR ITALIAN)

decoration. A design composed of a single line is admirably shown in the Flemish or Italian pillow lace (Figs. 48, 49, 50). The lace illustrated in Fig. 50 shows a further tendency, — that of the free spaces being considered as a potent factor in the final appearance of the design.

A line of even thickness is often used to define shapes, and in considering these shapes, if the outlines be beautiful, one is likely to consider the line on its own merits rather than the inclosed space as an area. This is clearly shown by contrasting the early geometric tracery of St. Lo with the rich flamboyant tracery of St. Vulfren's. We notice particularly the shapes of the openings in the first example, but the greater interest of the tracery of the later period makes the spaces of minor importance (Figs. 51, 52). A line may often

suggest an area without really surrounding and making one. A line of varying thickness is often more attractive than one which does not vary in width, especially if the changes are due to the quality of the instrument with which it is drawn. A line which sometimes asserts itself and sometimes retires from view is frequently more pleasing than a line of the

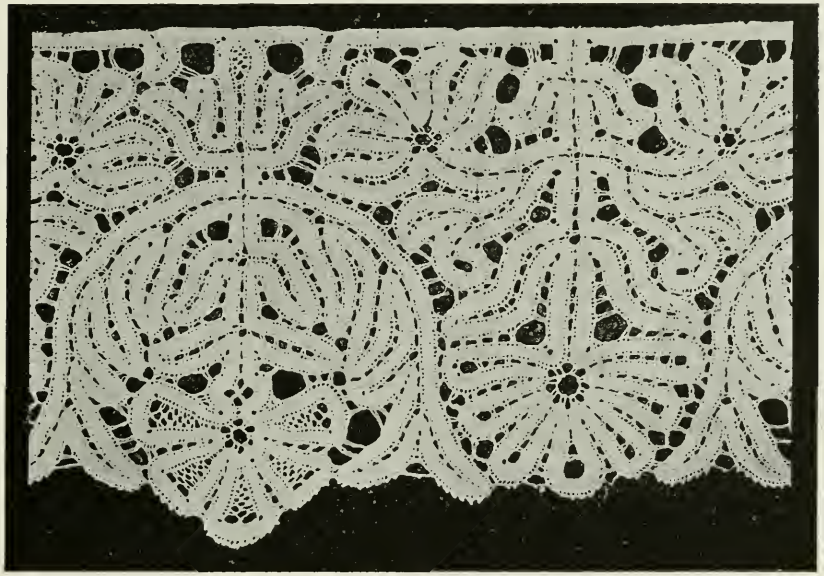


FIG. 49. ITALIAN PILLOW LACE

same studied thickness throughout, as may be seen both in the heading and lettering of the accompanying illustration (Fig. 53). Letters composed of lines of equal width are seldom seen. The shaded form, possibly having its origin in the pen or brush with which the early examples were drawn, has always been so attractive that, throughout the history of lettering, unshaded letters are rare.

If shapes are to be interesting their outlines must be beautiful. In constructing a design, even when the motive has a basis in representation, it becomes necessary to consider carefully the harmonizing of adjacent outlines as such,

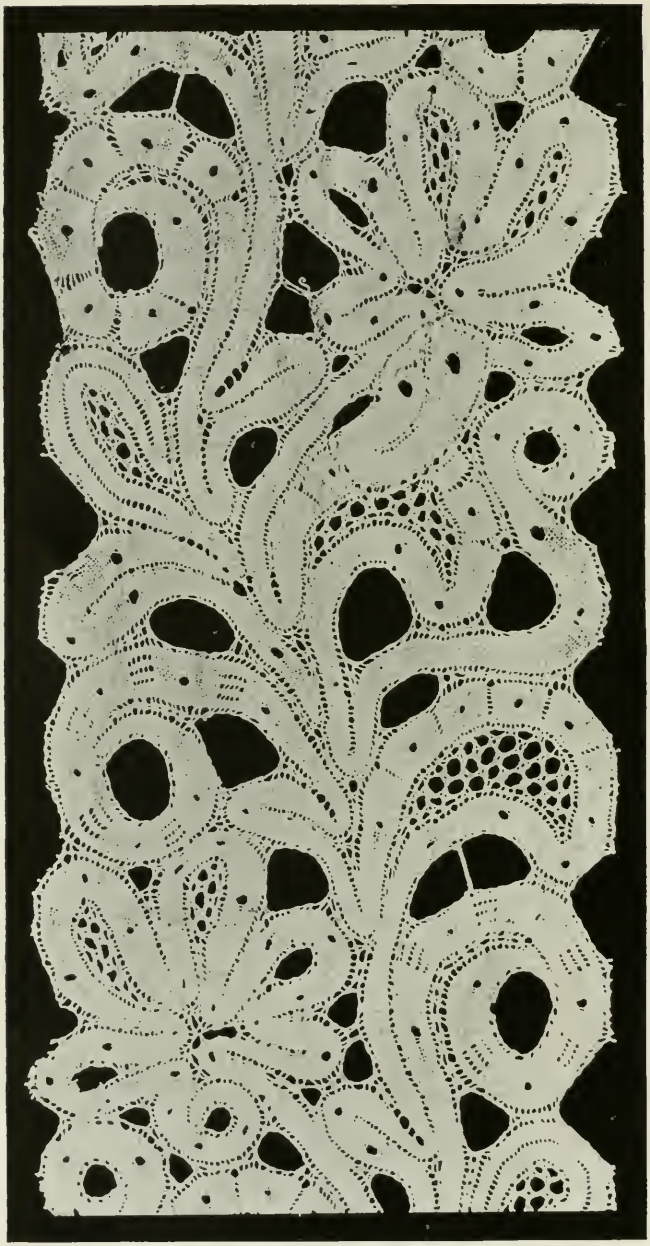


FIG. 50. PILLOW LACE

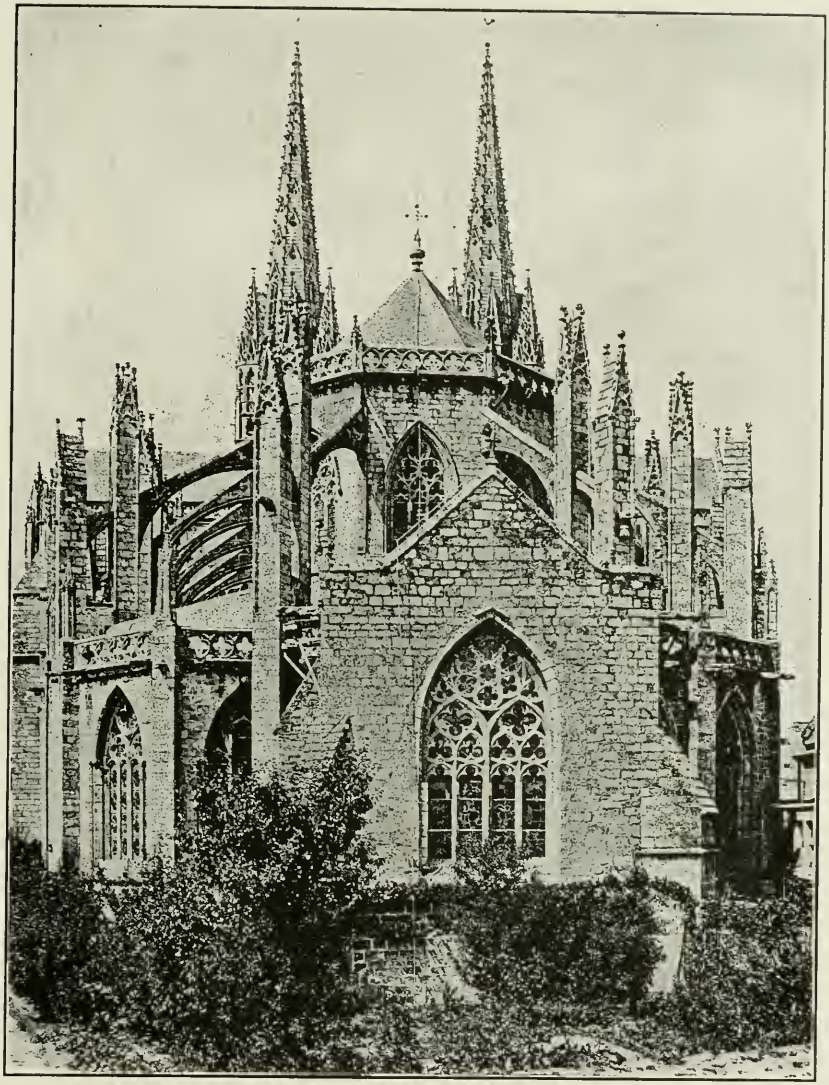


FIG. 51. GOTHIC TRACERY (GEOMETRICAL PERIOD)

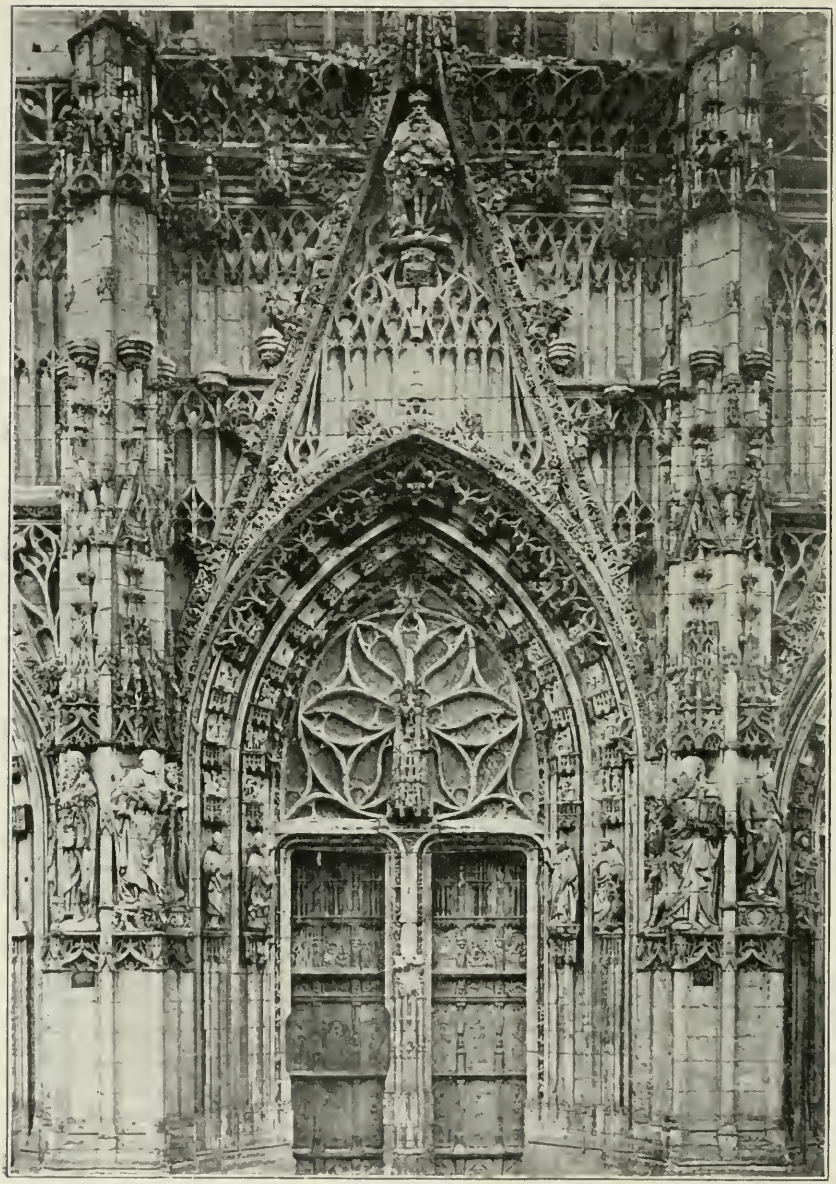


FIG. 52. GOTHIC TRACERY (FLAMBOYANT PERIOD)

ITY OF BOSTON PRE-APPRENTICE SCHOOL OF PRINTING AND BOOKBINDING

CERTIFICATE OF MERIT

THIS IS TO CERTIFY THAT

HAS FAITHFULLY PERFORMED THE REGULAR WORK OF THE PRINTING DEPARTMENT, AND HAS MAINTAINED A CREDITABLE STANDING IN THE REGULAR COURSE OF STUDY OF THIS SCHOOL. YEARLY RANK

JUNE XXI
MCMXI

PRINCIPAL

SUPERINTENDENT

FIG. 53. MODERN LETTERING

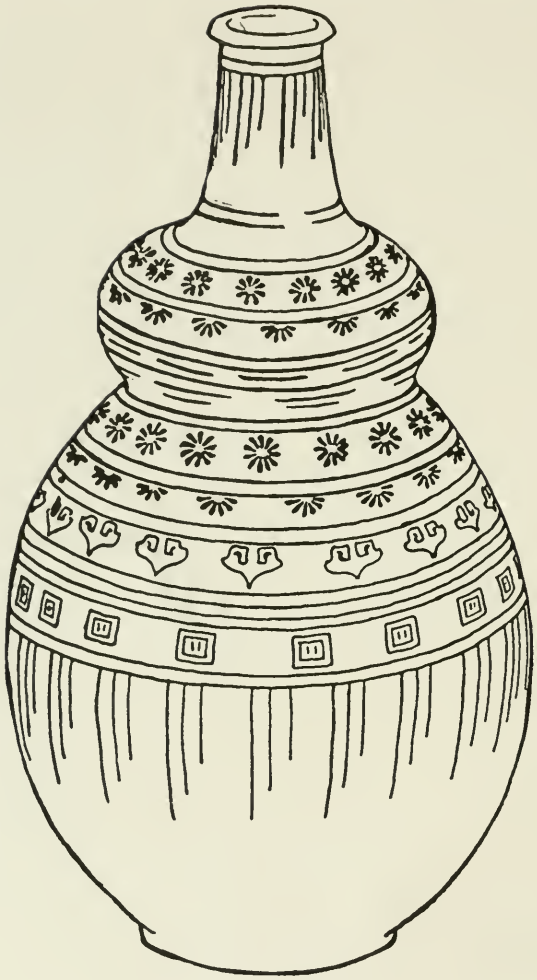


FIG. 54. SATSUMA JAR

which naturally leads to a consideration of the outline rather than the area inclosed.

Some materials are by nature particularly suited for line design. Gold and silver wire, as used in jewelry or in inlay and damascening, is necessarily considered as line pure and simple. Some kinds of embroidery and lace are interesting chiefly on account of line, for example, appliqué of cord or braid, and sometimes bobbin, or pillow lace, as has been illustrated. The incised or impressed line has been extensively used from earliest times in pottery decoration. In the Satsuma jar illustrated in Fig. 54, simple incised lines are used with striking effect in combination with spot repetitions. The bowl (Fig. 55) shows an interlacing of discontinuous line motives. The decorative sculptures of the early Egyptians were largely in outline. Chip-carving, used

by South Sea Islanders and among the Scandinavians, is mostly a matter of line (Figs. 56, 57, 58). Fig. 56 shows a Lapland flask decorated with inlaid reindeer horn, with rude incised lines. The reindeer-horn knife handle (Fig. 57) is a beautiful example of what may be accomplished by the use of straight lines and spots. Fig. 58 is a simple carved box cover, such as may be found anywhere among Scandinavian peoples. The relief is very slight; the design depends for its interest upon the graceful lines. The illustration (Fig. 59) shows an interesting decoration of a rough plaster wall by lines scratched with a three-pointed instrument before the plaster had set.

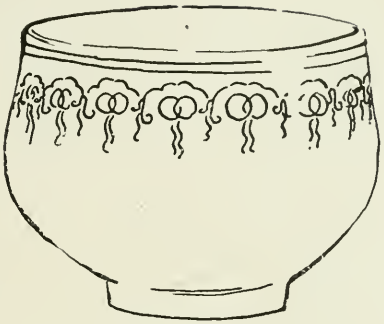


FIG. 55. JAPANESE POTTERY

Lines are not perceived as such in nature; the forms of objects are distinguished only on account of differences in color. Outline has come to stand for the edges of areas and is so used in the abstract representation of natural forms whether solid or flat.

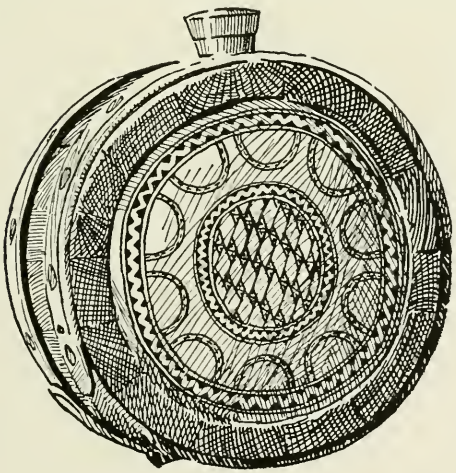


FIG. 56. LAPLAND FLASK

Where line is used to fill space it is generally employed as are spots in field, but it may be continuous as well as discontinuous (Fig. 45). Many variations are found in organic design due to the character of the material employed in execution

FIG. 57
REINDEER-HORN KNIFE HANDLE

(Fig. 60). In the Japanese sword-guard illustrated in Fig. 61, the motive seems one which would apply to a field of any size, but careful examination will show that the number of repetitions is very subtly changed to fit the spaces which were to be filled. Wrought-iron grilles and railings are essentially subjects for line design, as the units of material are rods and bands of iron. It is very seldom, however, that lines are used exclusively. Lines and spots are almost always used in combination (Fig. 62), and very few designs are composed exclusively either of lines or areas. The combination or alternation of spots and lines gives a less monotonous result than would either used alone. There are times of course when a design would better be monotonous and self-effacing, as in a wall-paper, for instance, against which other things should appear to advantage and without competition or distraction. If the wall-paper in itself were too attractive, pictures and other objects seen against it would lose in interest.

Except in damascening and wire inlay, practiced by the Eastern peoples, and in some simple Japanese pottery, continuous line motives are found almost exclusively in borders, which are used to define spaces and limit fields, and

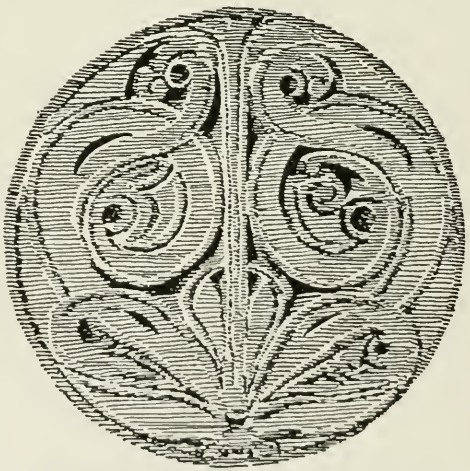


FIG. 58. SCANDINAVIAN BOX COVER. (CHIP CARVING)

when made up of lines have a finality for such purposes which is lacking in borders composed of spots only. A number of unrhythmical borders may be seen on the Chinese bell (Fig. 63). Some are of spots and some of discontinuous

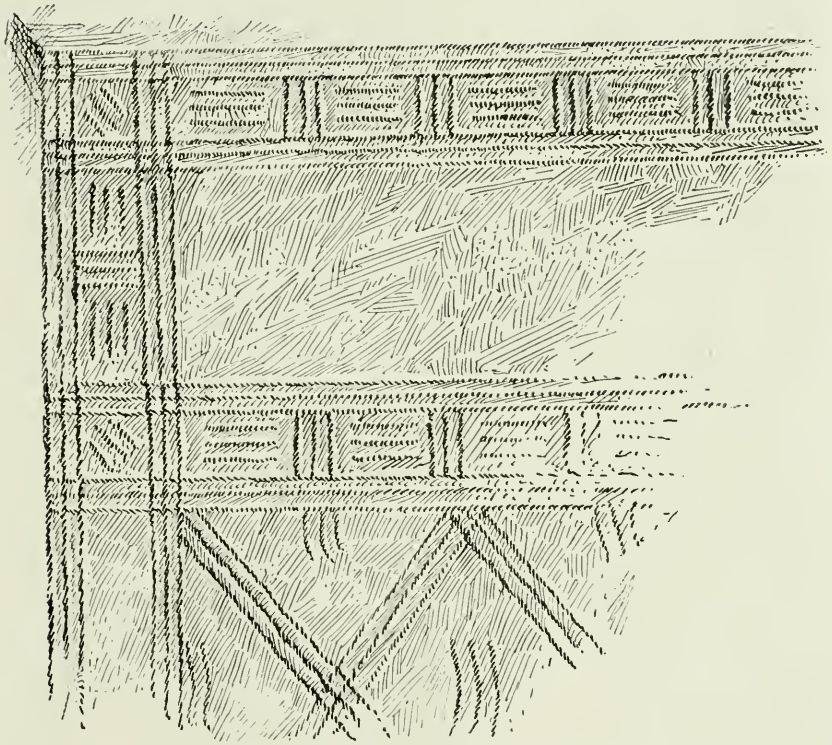


FIG. 59. INCISED DECORATION OF ROUGH PLASTER SURFACE

line motives, while others are composed of interlacing lines. A simple obvious balance is found in the rosette at the bottom, while the unsymmetrical balance of the dragon in the circle is admirably done.

A border should always have continuity, with or without rhythm. Borders seldom occur without straight and emphatic limiting lines on either side. Whether the principal

FIG. 60. ANCIENT JAPANESE JAR

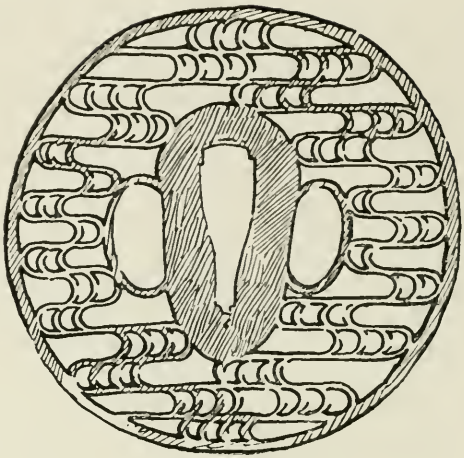


FIG. 61. JAPANESE SWORD-GUARD

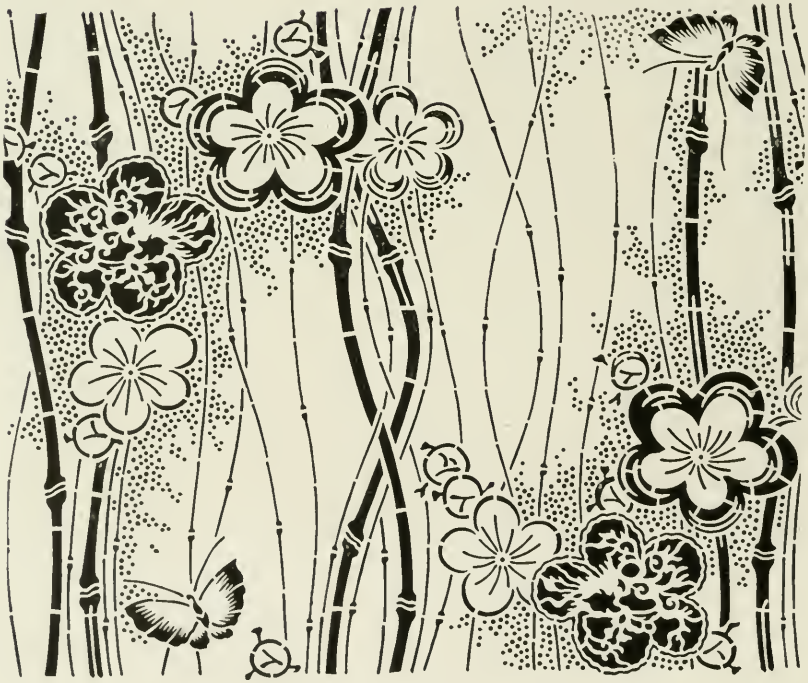


FIG. 62. JAPANESE STENCIL

FIG. 63. BUDDHIST PRAYER BELL

motive of the border be spot or line these heavy bounding lines contribute to the idea of continuity. Sequence always appears to some degree continuous whether rhythmic or not. Rhythm will compel the eye to follow the border in one direction only, while in sequence the eye may travel either way. Interesting variations of line repetition with and without rhythm may be found in the Greek fret or key pattern, which has been very elaborately developed by the Japanese (Fig. 64). The first example shows the original unit of unbalance with inversions used in continuous repetition and the result is unrhythmic. The second has a smoother continuity than the first, due to the added element of rhythm, but the general appearance of both borders is much the same. It is interesting to note the many developments of the same idea. This is a motive that is almost as old as design itself. It is found in Europe and Asia and, in cruder form, in the pottery of the North American Indians as well. Perhaps the ease with which an

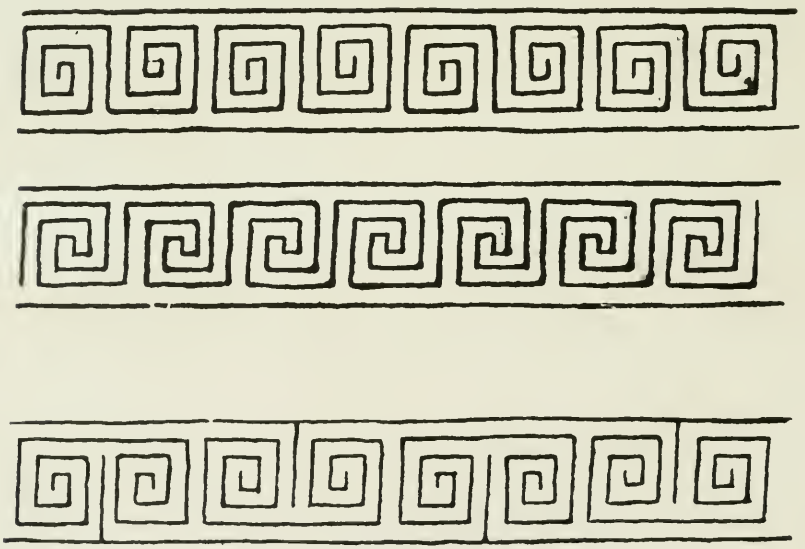


FIG. 64. KEY PATTERN

apparently complex result is obtained by means of such a simple unit may account for its popularity. Comparatively barbarous peoples rely upon very simple units, and yet this key pattern was a favorite with the highly cultured Greeks, and is frequently used at the present day by the complex Japanese civilization. It seems that there are many interesting possibilities of the continuous line motive yet to be worked out (Fig. 65).

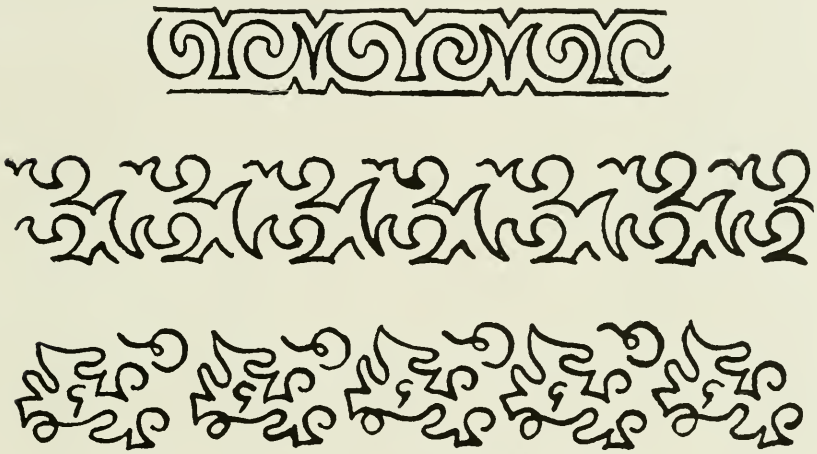


FIG. 65. CONTINUOUS LINE MOTIVES

CHAPTER VI

LINE COMPOSITION — FIELD

THERE are two principal methods of line composition, the continuous and the discontinuous. The composition of discontinuous line motives is more nearly related to spot composition, being therefore the next step in advance from

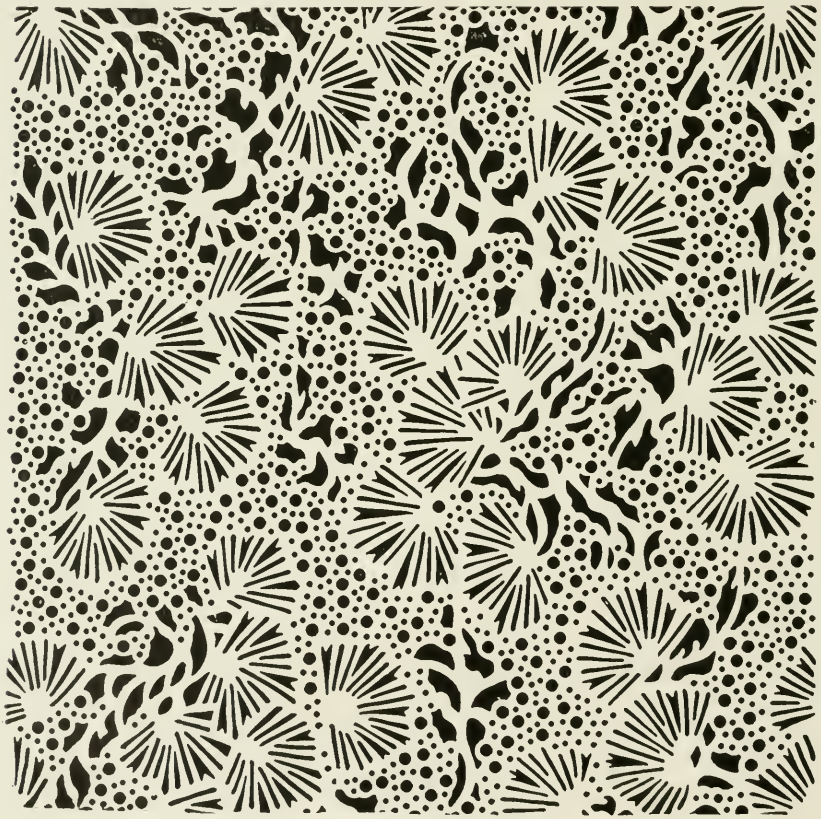


FIG. 66. JAPANESE STENCIL

the spots, while continuous line motives are more involved and have considerably different possibilities in field composition. All line motives are often used with spots (Figs. 66, 67, 68). Fig. 68 shows a discontinuous line motive in field, in combination with spots. This is taken from a Japanese textile. Line may be employed as the basis of distribution in spot or line composition (Fig. 70). This motive is very frequently seen in Javanese fabrics, and indicates a geometrical system of approach.

In distributing discontinuous line motives in fields, each unit is considered a separate thing, like a spot. Nevertheless a discontinuous line unit may cover a good deal of space (Figs. 71, 72) interlacing with other similar units and break-

FIG. 67. JAPANESE FABRIC

FIG. 68. JAPANESE STENCIL

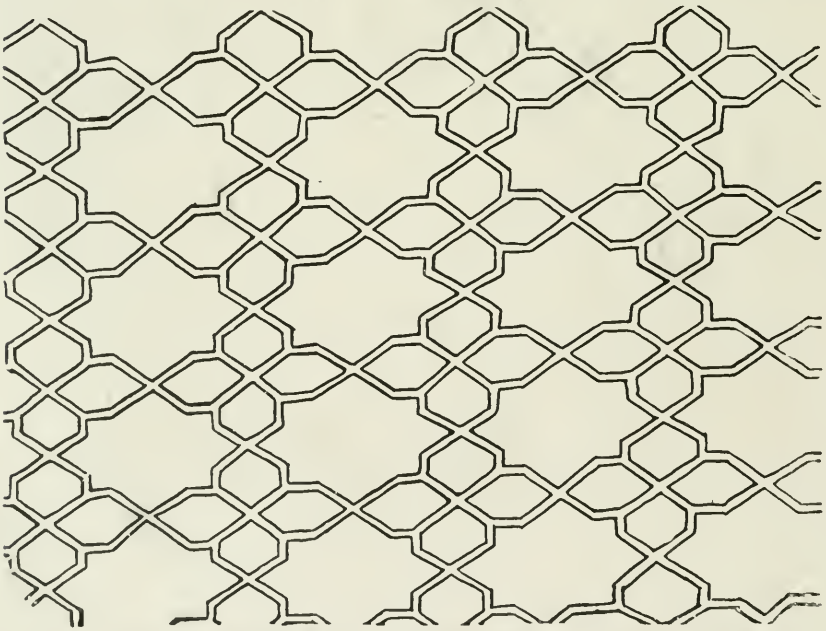


FIG. 69. ARABIC FABRIC SHOWING INTERSECTING CONTINUOUS LINE MOTIVE

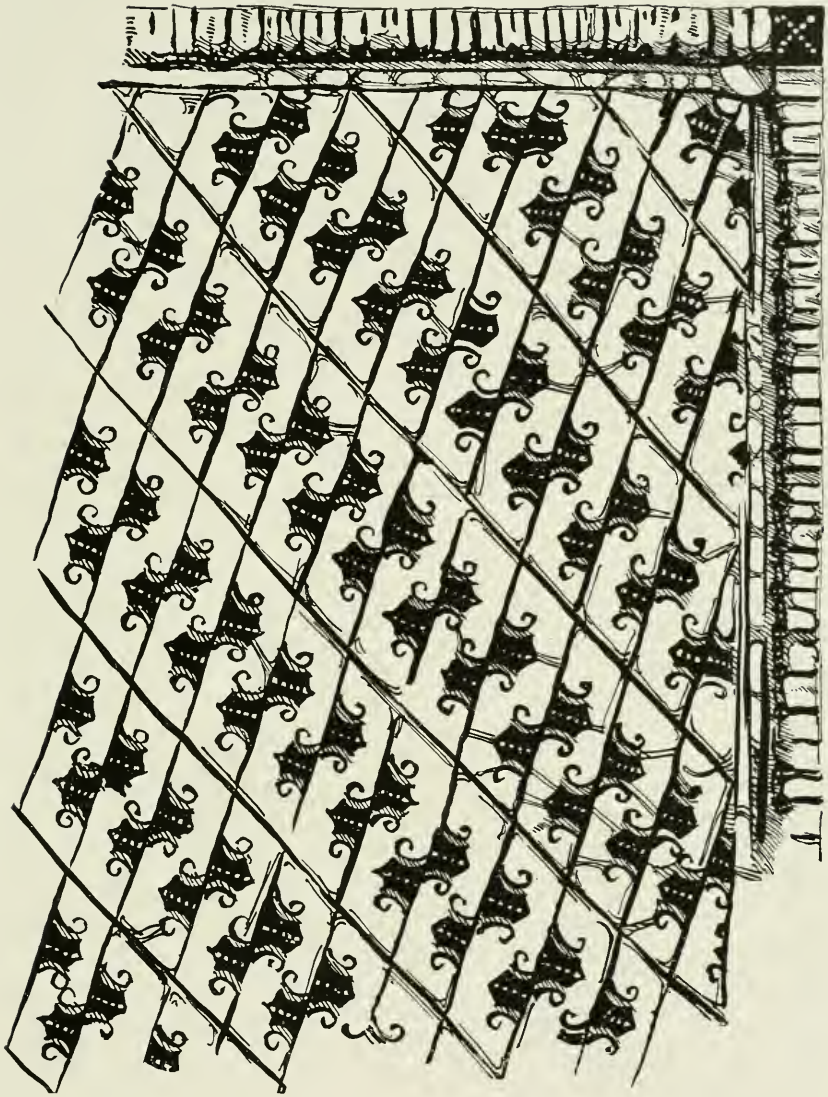


FIG. 70. JAPANESE PRINTED COTTON

ing the field up into small areas (Fig. 73). Generally the discontinuous line motives are used simply, without interlacing (Fig. 74), as were spots, and often they are used in combination with spots (Figs. 75, 76, 77). Fig. 76 is an example of organic design. Because of its similarity to design with spots, field design with discontinuous line motives will present few difficulties.

With continuous line motives in field, the problem of space division at once appears (Figs. 70, 78, 79). These beautiful Japanese stencils (Figs. 78, 79) show the space division admirably, as well as the importance of combinations of spots with lines. Parallel lines may be drawn across a square space in one direction only, in such a manner as to add interest and beauty to the space so treated. These lines will then appear to divide the space into a number of parts,

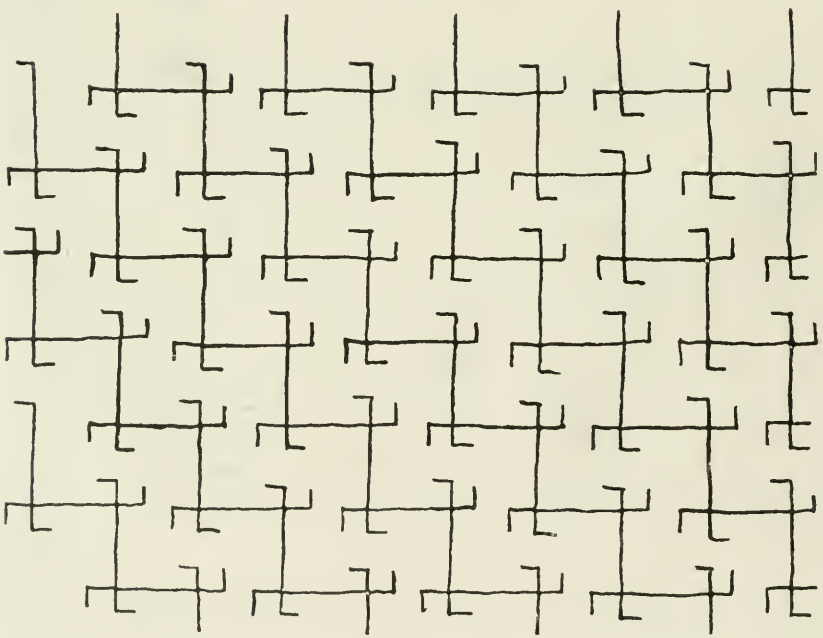


FIG. 71. INTERLACING DISCONTINUOUS LINE MOTIVES

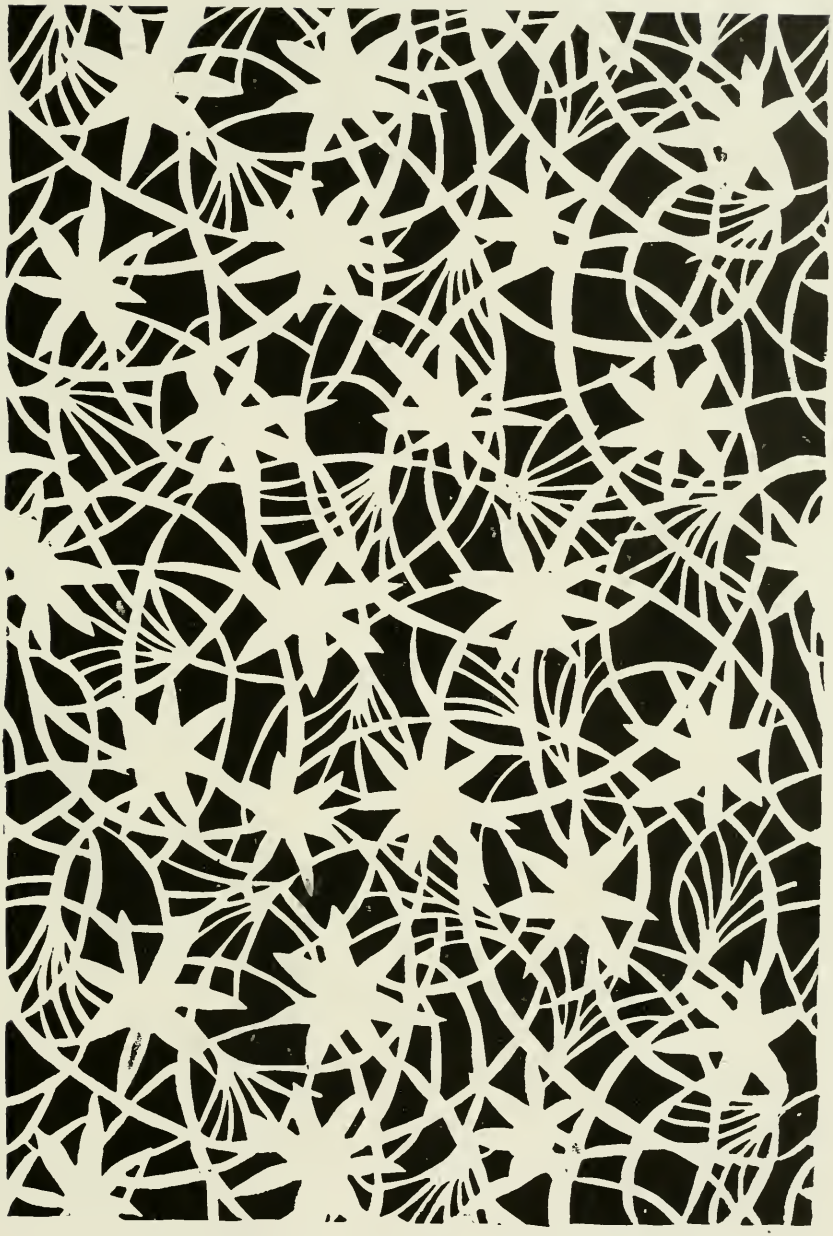


FIG. 72. JAPANESE STENCIL, SHOWING INTERLACING LINE MOTIVES

and the relative size of these resultant parts together with the agreeableness of their relations are an element contributing towards satisfaction (Fig. 80). The predominating tone is generally called the ground. According to the thickness of the lines the result will appear to be either a light

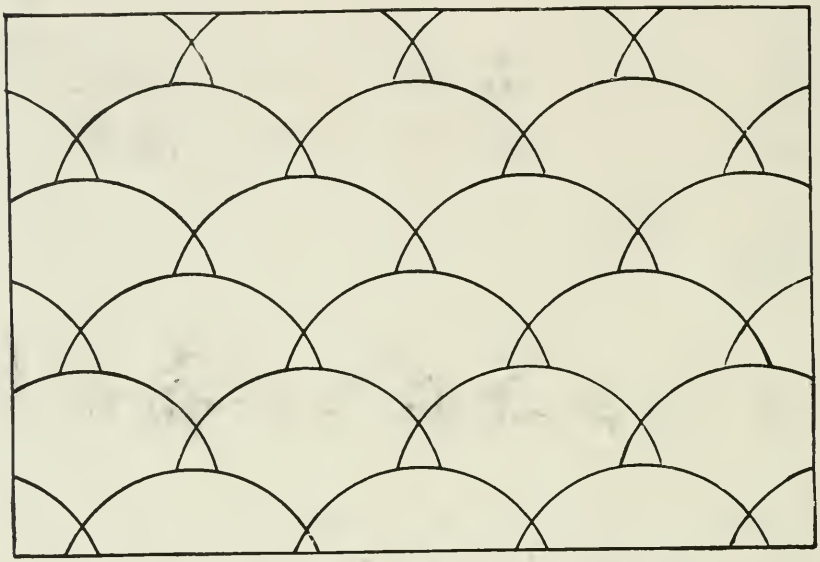


Fig. 73. INTERSECTING DISCONTINUOUS LINE MOTIVE

ground with dark lines upon it or a dark ground with light lines.

If a second area divided exactly as the first be superposed, with the lines running in a different direction, a number of rectangular or rhomboidal spaces appear (Fig. 81). This shows at once the tendency of lines to form areas, and in fact one is very apt to consider a line as the outline of an area rather than *per se*. This effect may be seen in all the Scotch plaids. One set of lines is formed in the warp and the other in the woof which intersects it at right angles. It is not at all necessary that the intersecting motives be the

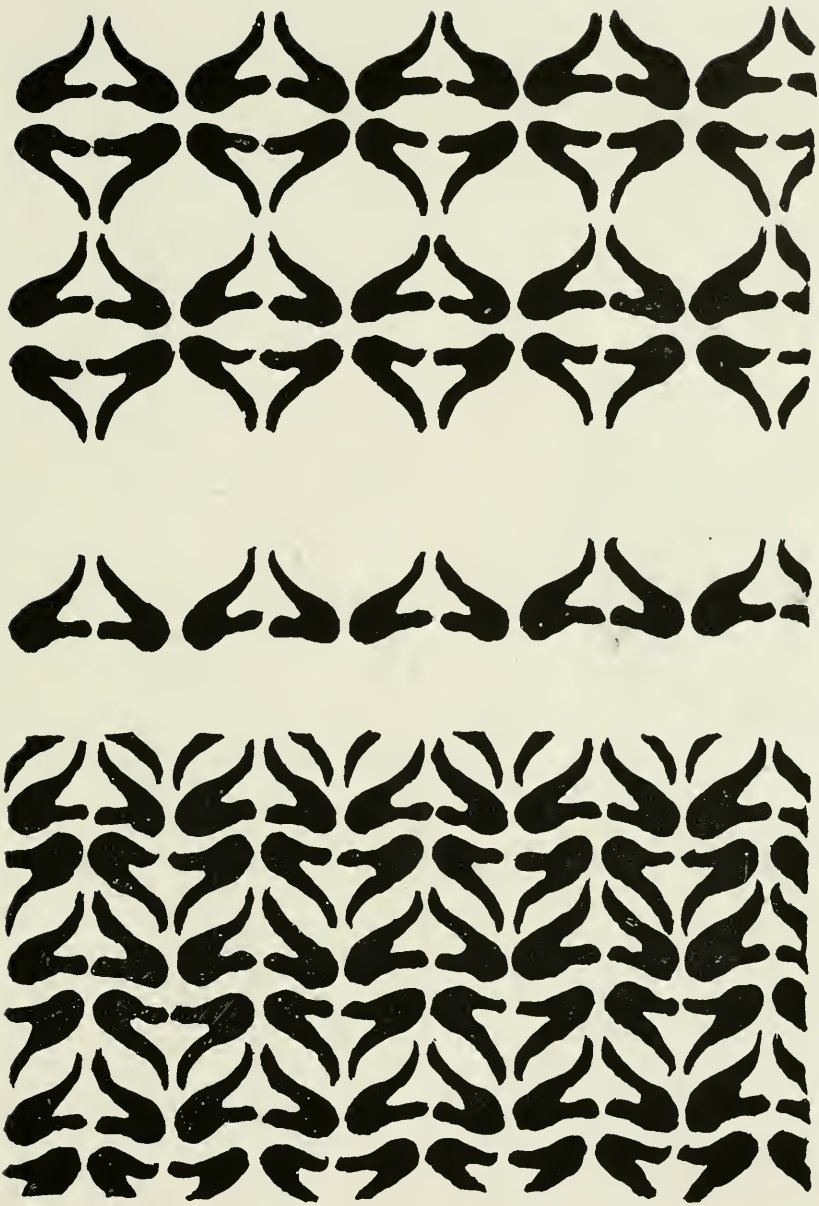


FIG. 74. DISCONTINUOUS LINE MOTIVES IN FIELD

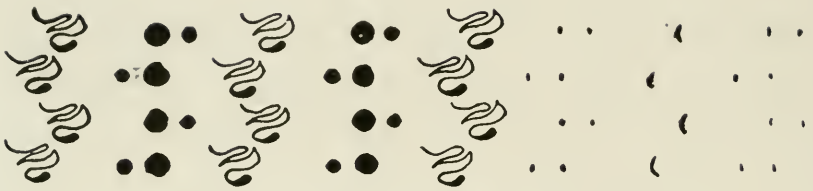


FIG. 75. LINES AND SPOTS IN COMBINATION IN FIELD

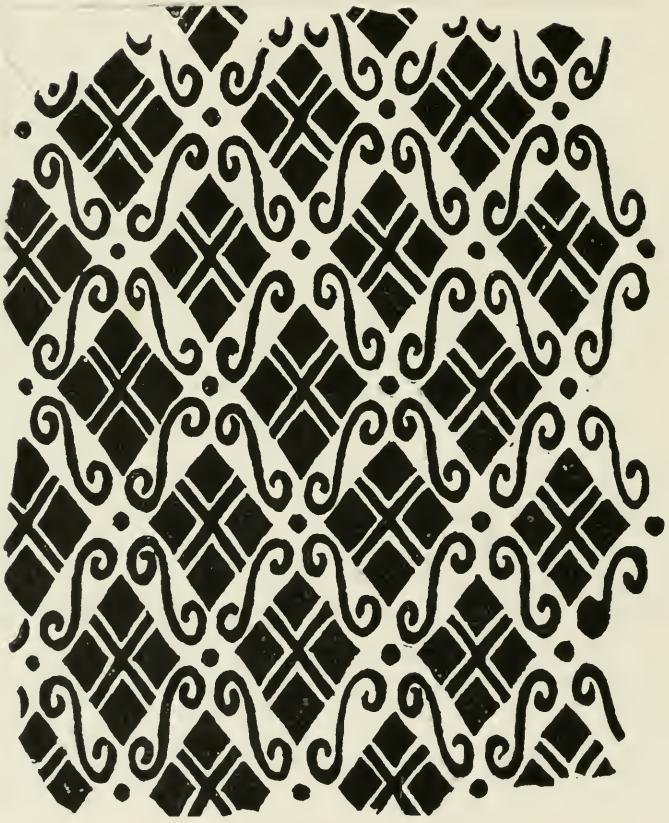


FIG. 76. JAPANESE FABRIC

FIG. 77. LINES AND SPOTS IN COMBINATION IN FIELD (FABRIC DESIGN)

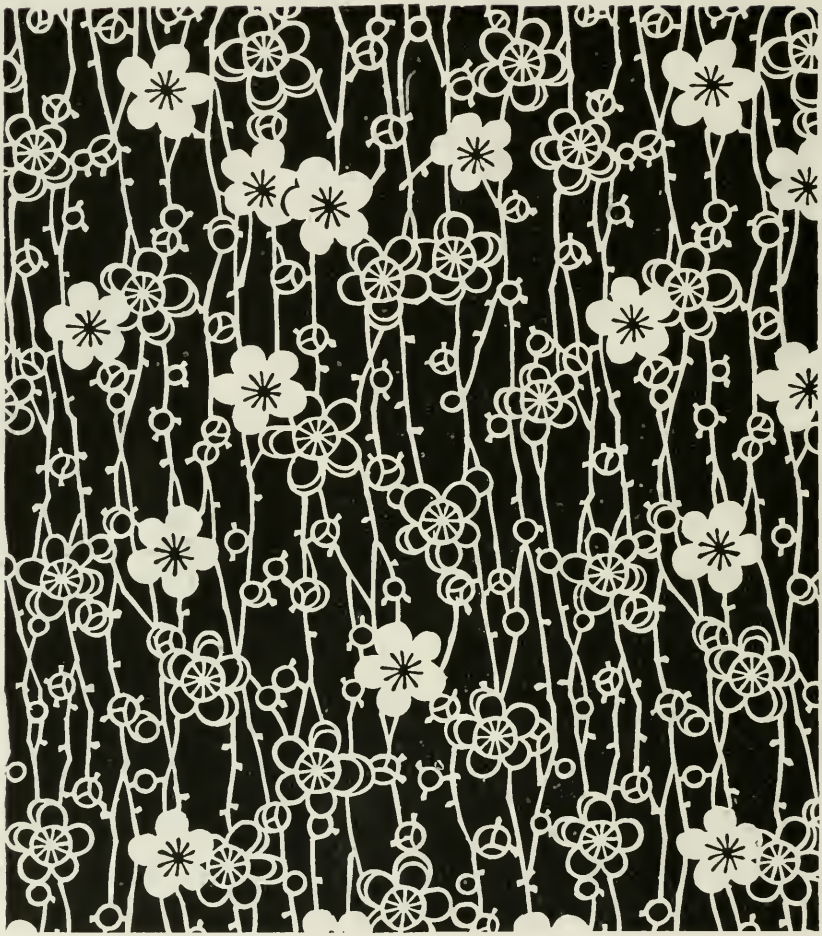


FIG. 78. JAPANESE STENCIL

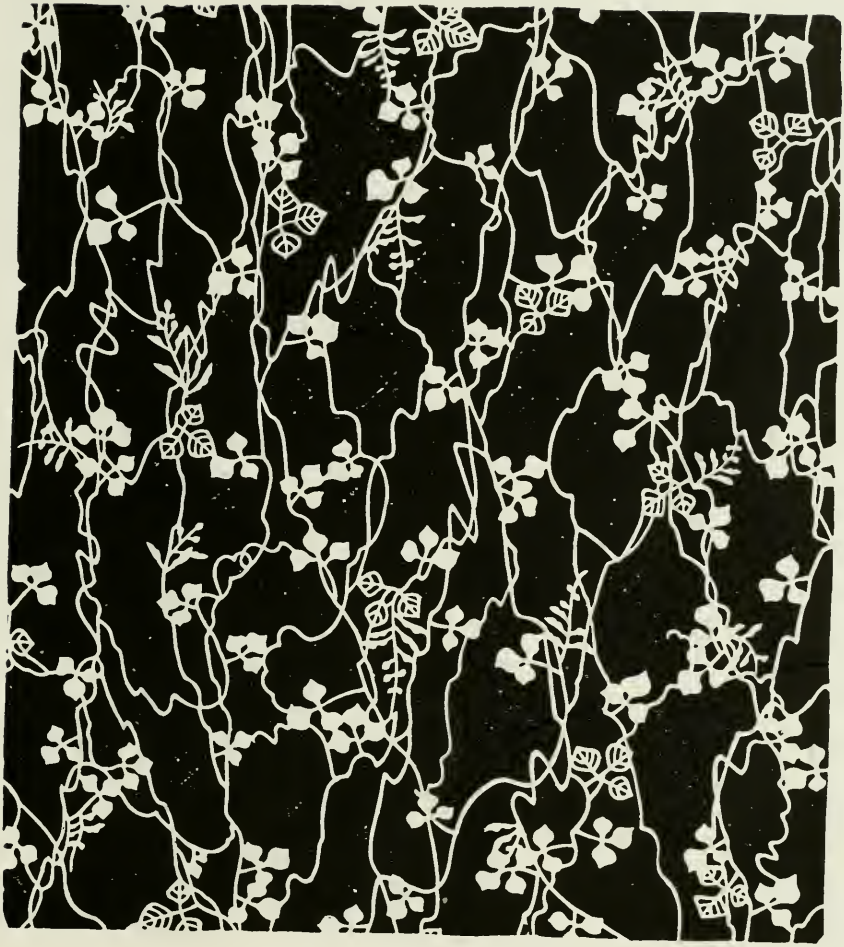


FIG. 79. JAPANESE STENCIL

same, for whenever continuous line motives intersect, areas result (Fig. 82). This is a beginning of the problem of space division which is most often dealt with in commercial design and architecture. In many fabrics, and in other organic designs, a great part of the interest lies in the subdivision of the surface by straight lines (Fig. 83). The interest of the whole in this case is due to the success of each repeat.

Alternation or progression of measure in the thickness of the lines may add greatly to the effect produced (Figs. 84, 85).

Now when the lines have made areas, their own individuality seems to decrease and their interest is merged in the greater interest of the areas which have been created. At once the possibilities of differing values and colors appear. The areas as first made are interesting only on account of agreeable space relations. They have repetition in that they are all rectangular, which lends harmony and unity to the design. Not being equal their dimensions and proportions give variety. The introduction of color and value will produce a more interesting design. Color and value are mentioned here merely to show that field design in continuous line motive suggests the use of color very strongly (Fig. 86). Fig. 86 shows a modern German "end-paper" which might have been worked out in this way. Byzantine and Moorish designs — all-over pattern-work on large plane wall surfaces — depend very largely upon interlacing continuous line motives for their effect, and they are invariably richly colored.

Panels of various sorts and many rectangular surfaces are enriched by line designs for the most part running parallel to the sides. If the surface be of a handsome material the lines will probably cling close to the sides taking the forms of borders, and not dividing the space very much in order

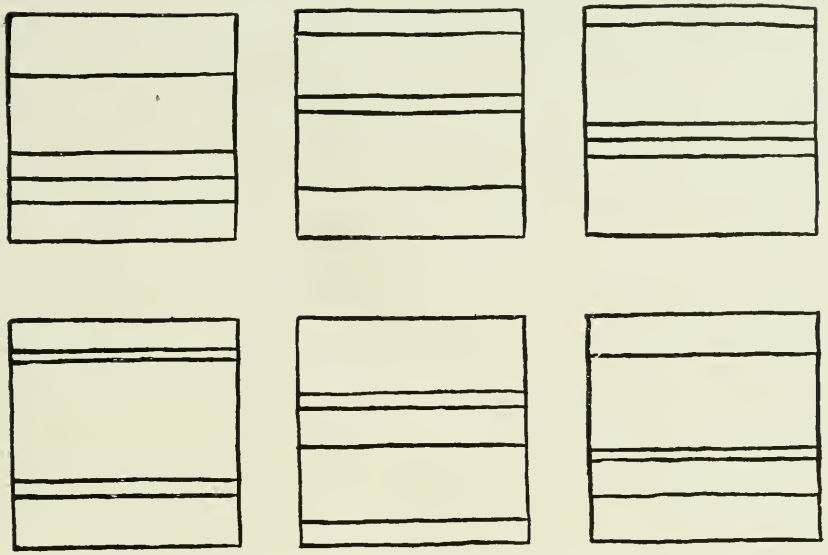


FIG. 80. PARALLEL SPACE DIVISIONS

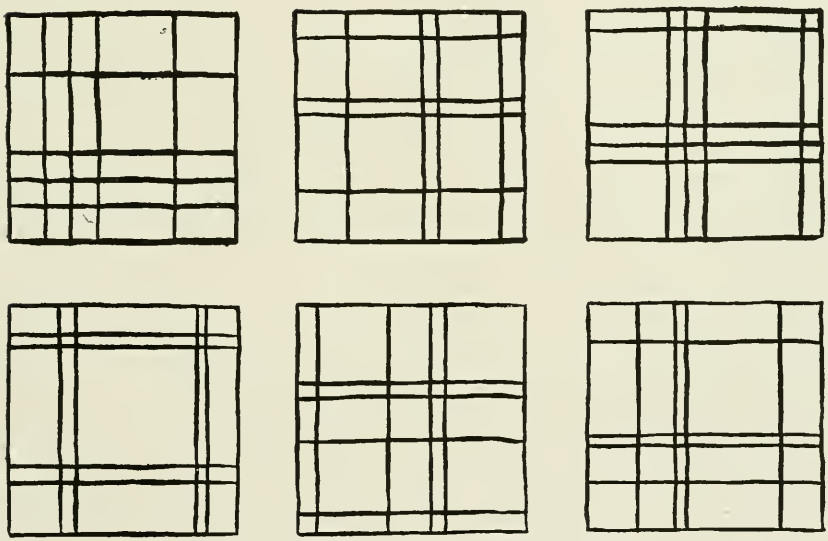


FIG. 81. SUPERPOSED SPACE DIVISIONS

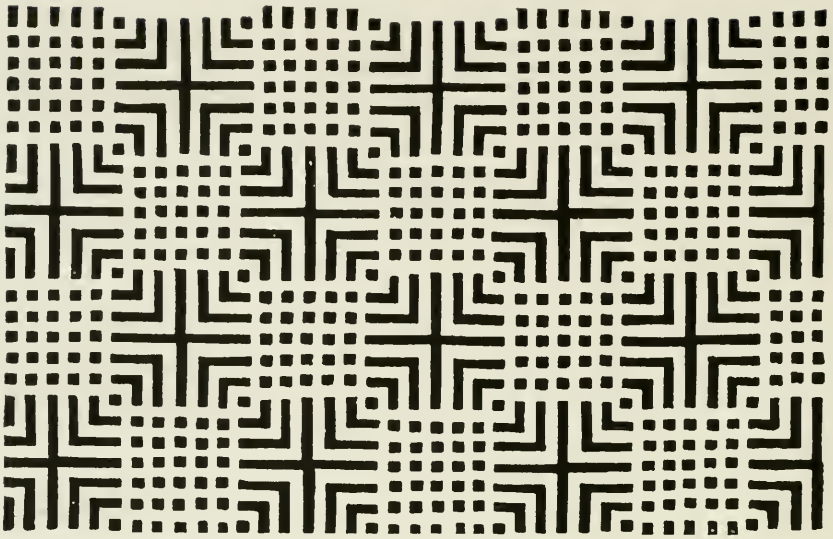


FIG. 82. JAPANESE STENCIL

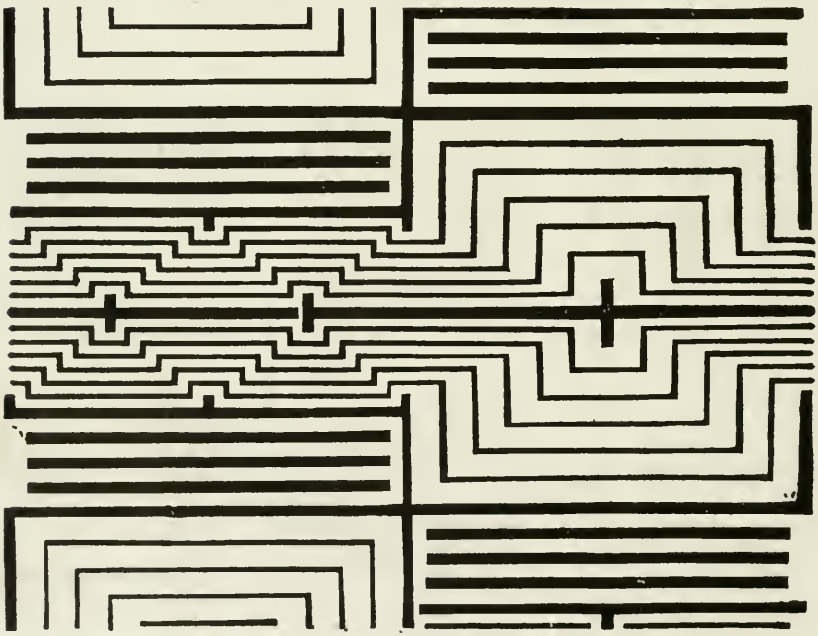


FIG. 83. JAPANESE STENCIL

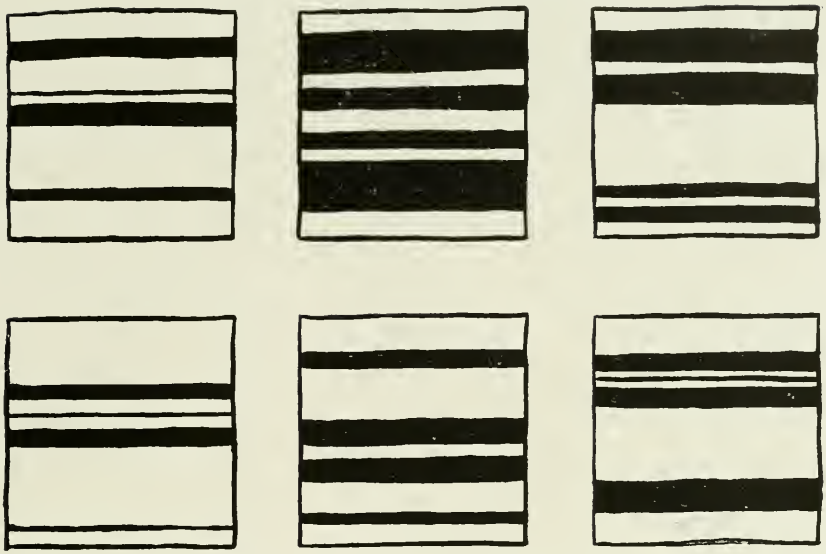


FIG. 84. MEASURE CHANGE INTRODUCED INTO FIG. 80

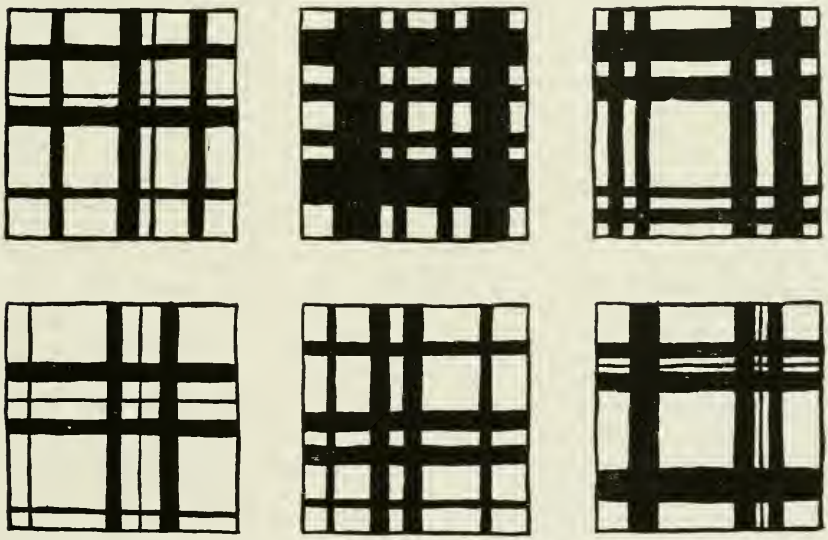


FIG. 85. SINGLE INVERSION OF FIG. 84

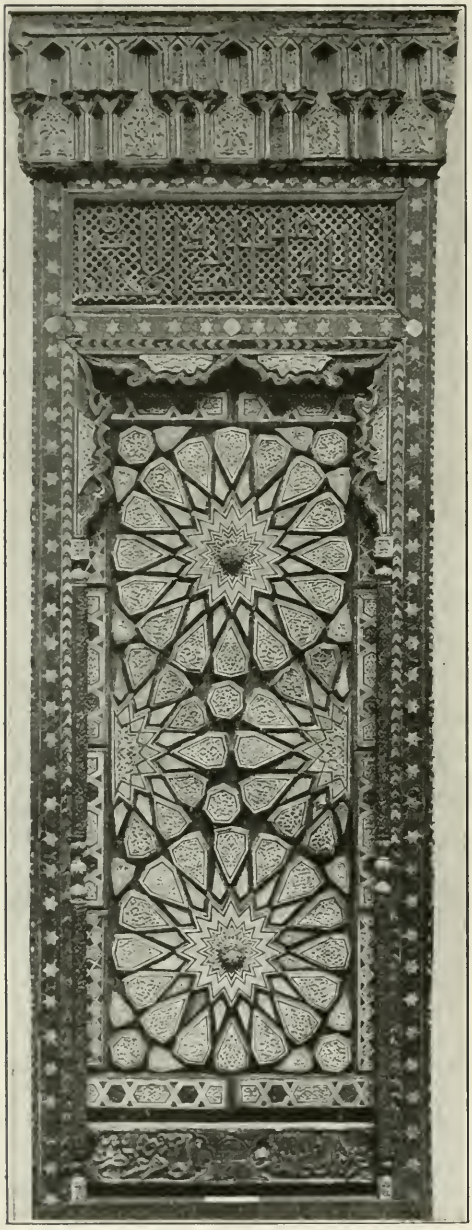


FIG. 86. MOORISH ORNAMENT (LINE INTERLACINGS)

not to obscure the surface. Chip-carving (Fig. 58) is primarily a division of space by lines which intersect, in which some of the areas formed by these intersections are enriched by slight modeling with the knife.

The rectangular motives resulting from the use of straight lines only, as shown in the first diagrams (Figs. 80, 81), are of course the simplest, and their simplicity restricts their use. In textiles they can be widely used, because when made into clothes and draperies they hang in folds and over rounded surfaces, thereby breaking up the too stiff formality of their appearance and adding curves and new angles. When irregular lines, or lines with angles and curves are employed, the problem is much more intricate and subtle (Figs. 88, 89).

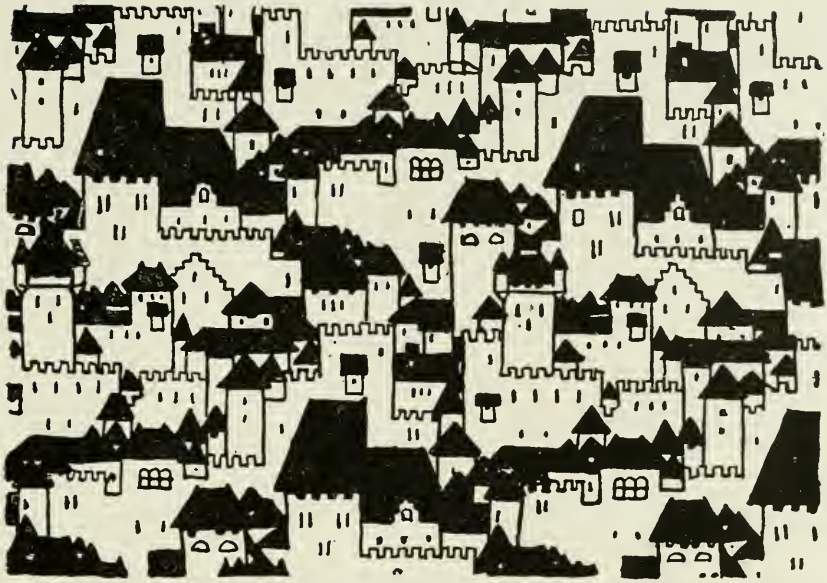


FIG. 87. MODERN GERMAN END-PAPER

FIG. 88. JAPANESE STENCIL

FIG. 89. COPTIC EMBROIDERY

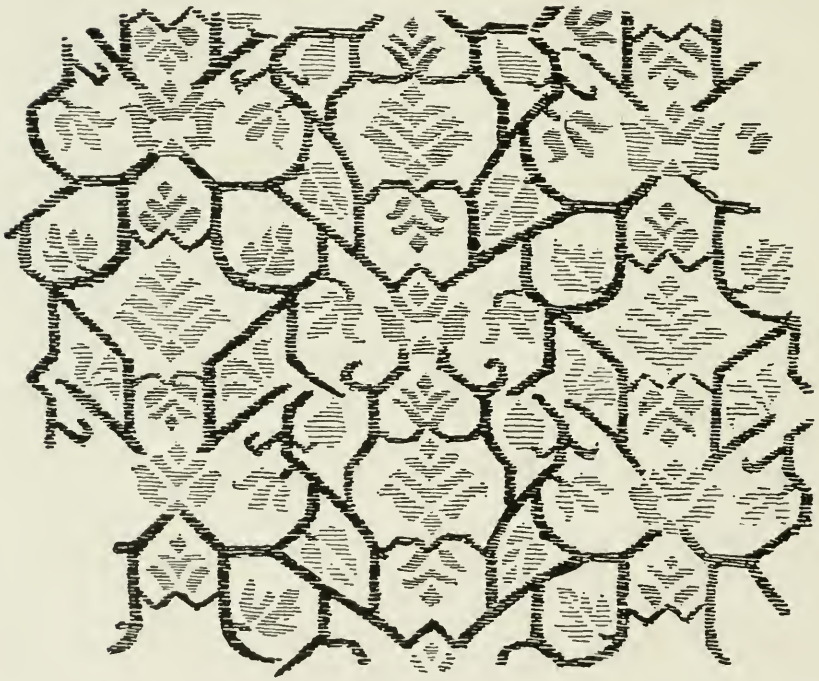


FIG. 90. PERSIAN BROCADE

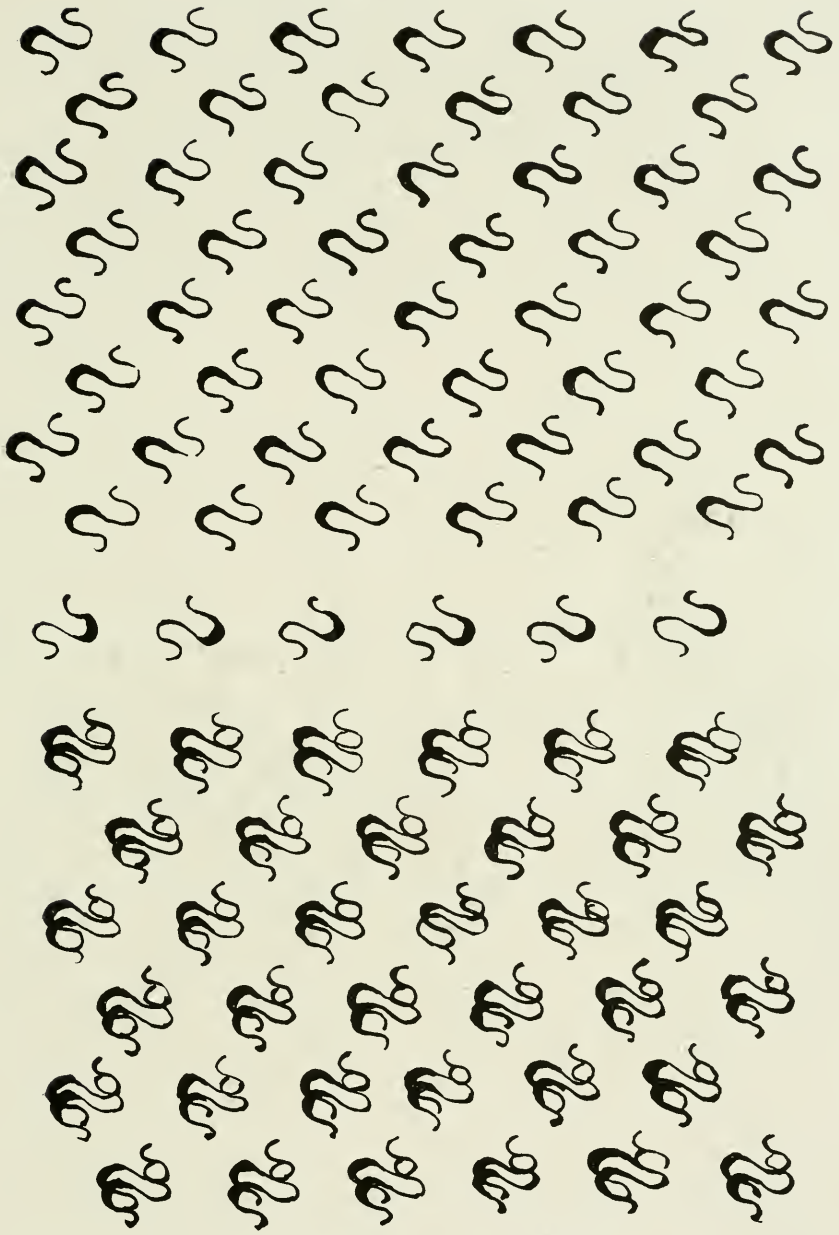


FIG. 91. INTERLACING LINE MOTIVES

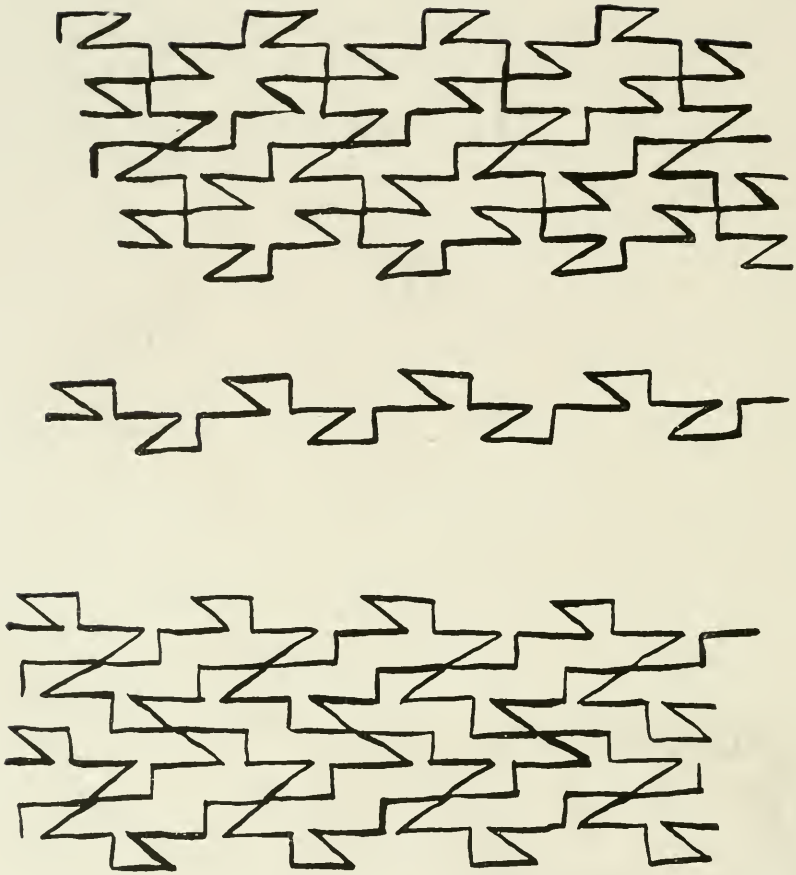


FIG. 92. INTERLACING LINE MOTIVES

The use of color is just as important here as in the other and simpler cases (Fig. 90). The examples in the following diagrams will show a few of the possibilities (Fig. 91, 92).

CHAPTER VII

AREA COMPOSITION

WHILE area balance is known broadly as "composition" in pictorial art, the areas with which the designer deals must assume more definite shapes than with the painter (Figs. 93, 94).

FIG. 93. JAPANESE BROCADE MOTIVE (DOUBLE INVERSION)

Spots have been considered as small areas; lines have been used in composition, and the tendency of a line to intersect itself or another line, thereby forming an area, has been pointed out (Fig. 95). The areas formed in this case are the spaces, or "background" of the design. The initial problems of area composition and balance should accord-

FIG. 94. JAPANESE BROCADE MOTIVE (UNSYMMETRICAL BALANCE)

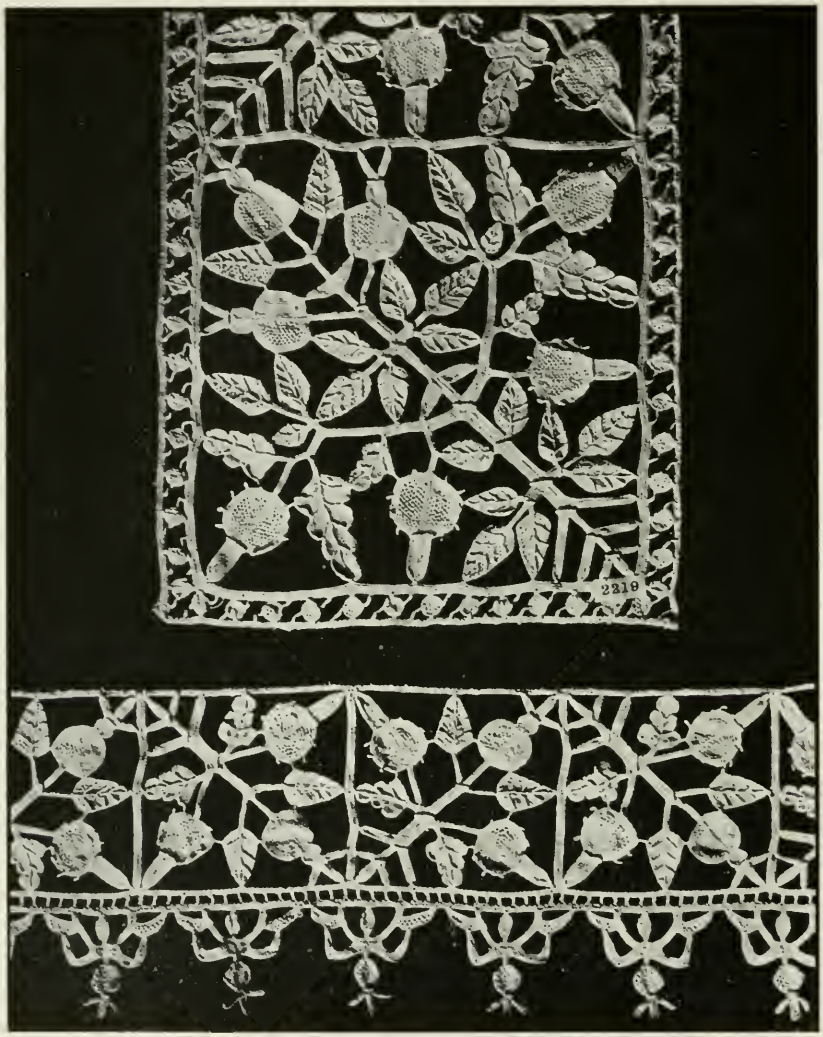


FIG. 95. VENETIAN LACE (PUNTO IN ARIA)

FIG. 96. ITALIAN WORKED TOWEL

ingly present few difficulties, as the principles underlying the juxtaposition of areas do not differ from those already considered. They are a little more difficult to work out, however, as there are more considerations involved. Though in spot composition shape is not important, and in line composition width or covering quality has little influence, in the arrangement of areas, the two most important fundamentals which must be considered are size and shape (Fig. 96). In placing these shapes in definite relations one to the other, new areas are formed by the spaces or "ground" of the design left between them, and in the careful adjustment of these spaces the problem acquires a new importance and a double significance (Fig. 97). Various theories have been advanced to establish a certain ratio between the ground and the design, but every one of these theories is constantly violated with pleasing

FIG. 97. JAPANESE SWORD-GUARD

come to mind in which the ground or surface is covered by very delicate patterns which hardly alter the general appearance (Fig. 47), and, on the other hand, examples in which the design is so rich that the ground seems to appear by accident. Every designer must determine the question for himself in view of the material to be used and the effect which he desires to create.

The easiest way to attain facility in the disposition of areas seems to be by Pure Design. If a number of irregularly shaped areas be placed in different relations one to the results. The truth is that the particular problem determines the ratio which should exist between the design and the ground, the latter itself being considered a part of the design. This ratio cannot be mathematically expressed, but must be determined by the canons of good taste (Figs. 98, 99, 100).

Designs will at once

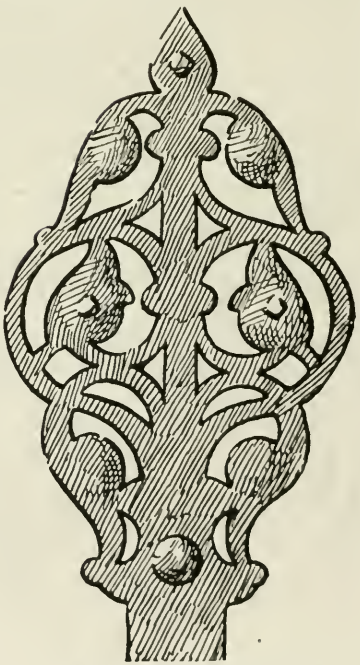


FIG. 98. MEDIEVAL WROUGHT IRON STRAP HINGE

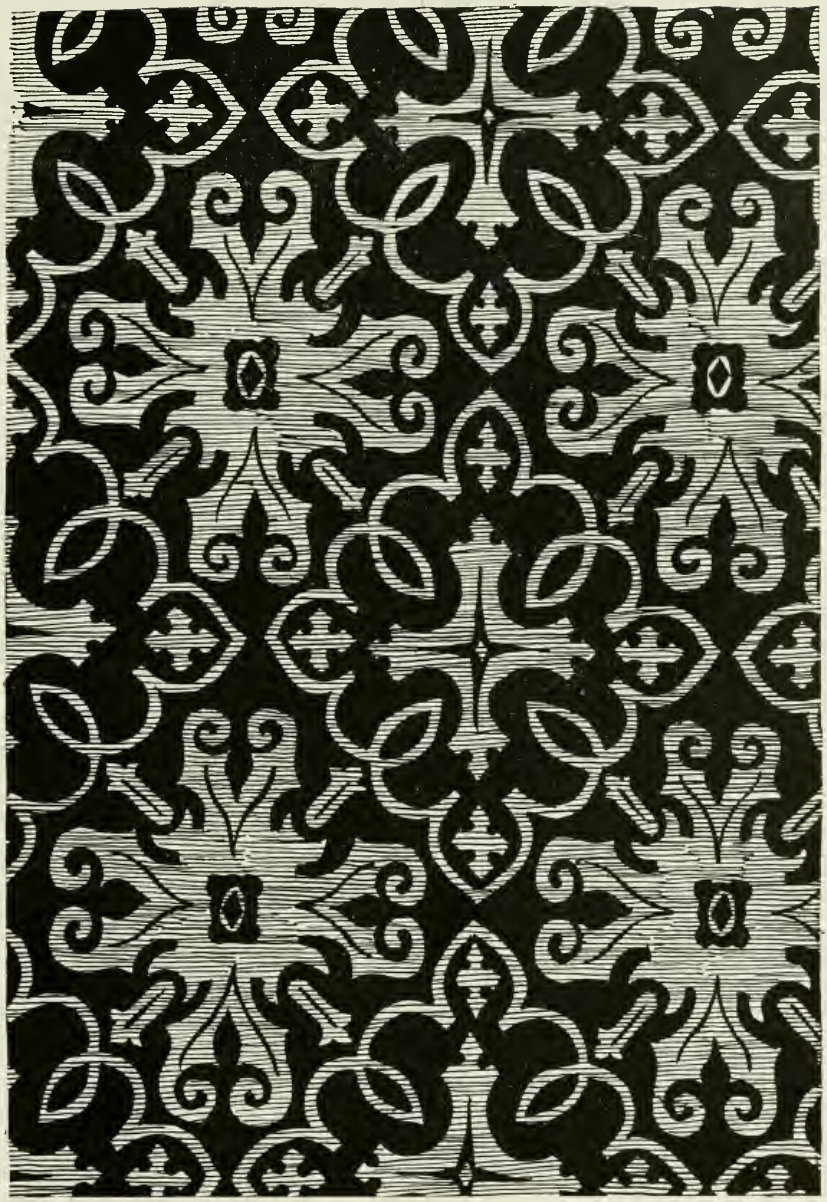


FIG. 99. PERSIAN BROCADE

other, some of the results will appeal to us at once as more interesting than others, more pleasing and more beautiful

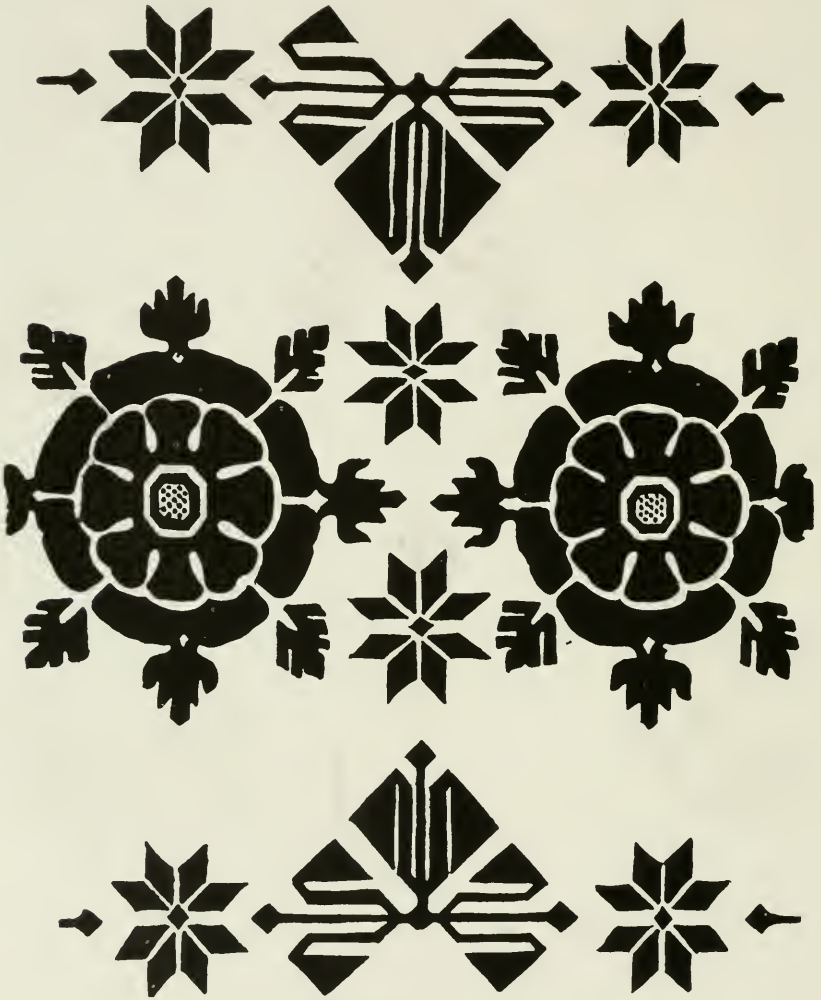


FIG. 100. PERSIAN BROCADE

(Fig. 101). These may be composed with or without a surrounding outline, each method having advantages of its own. Perhaps the best way to start is without the surround-

FIG 101. AREA COMPOSITION (INORGANIC). (V. C. AND M. K.)

ing outline in which case the relations of the forms to each other are paramount. After agreeable results have been obtained by this method the surrounding outline may be introduced (Fig. 102). The problem then assumes an entirely different aspect. It will seem to have a dual nature,

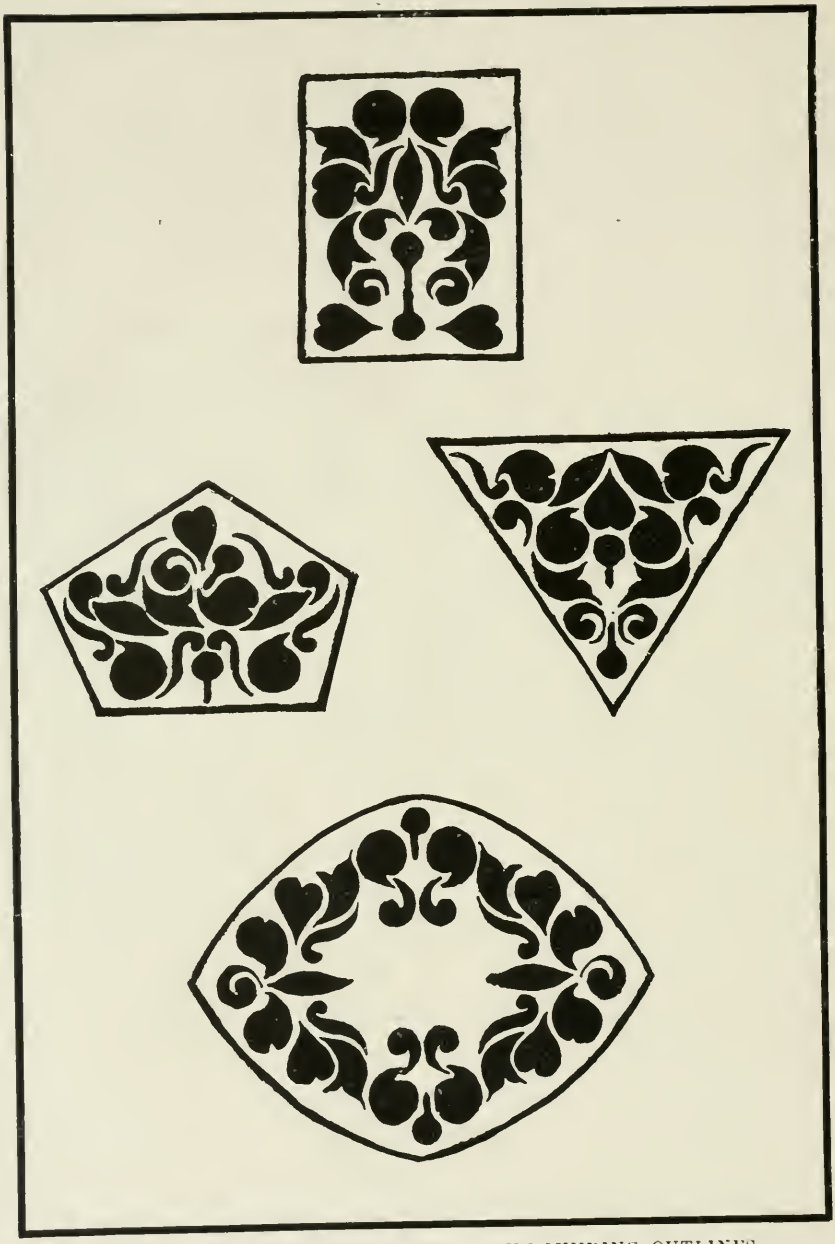


FIG. 102. AREA COMPOSITIONS WITH SURROUNDING OUTLINES

as the relation of the areas both to each other and to the surrounding outline must be taken into consideration (Fig. 103). This modern Scotch window shows a very subtle distribution of areas. The massing of areas in a line from the upper left comes down towards the right, and impels the eye in such a direction as to be balanced perfectly by the large area below. This is the sort of problem most frequently met in practical designing (Fig. 104); for designers are often called upon to fill spaces decoratively, and very frequently the shapes of the spaces are not of their own choosing (Figs. 105, 106, 107). The ground, as has been emphasized before, is of as much importance as the areas upon it. Fig. 108 shows a very interesting combination of lines and areas in field.

FIG. 103. MODERN GLASS (SCOTCH)

Areas attract or repel for very apparent reasons. They may be beautiful in form or ugly, large or small, distressing or pleasing in color. Some colors such as red or brilliant

FIG. 104. JAPANESE PRINT (HARUNOBU ?)

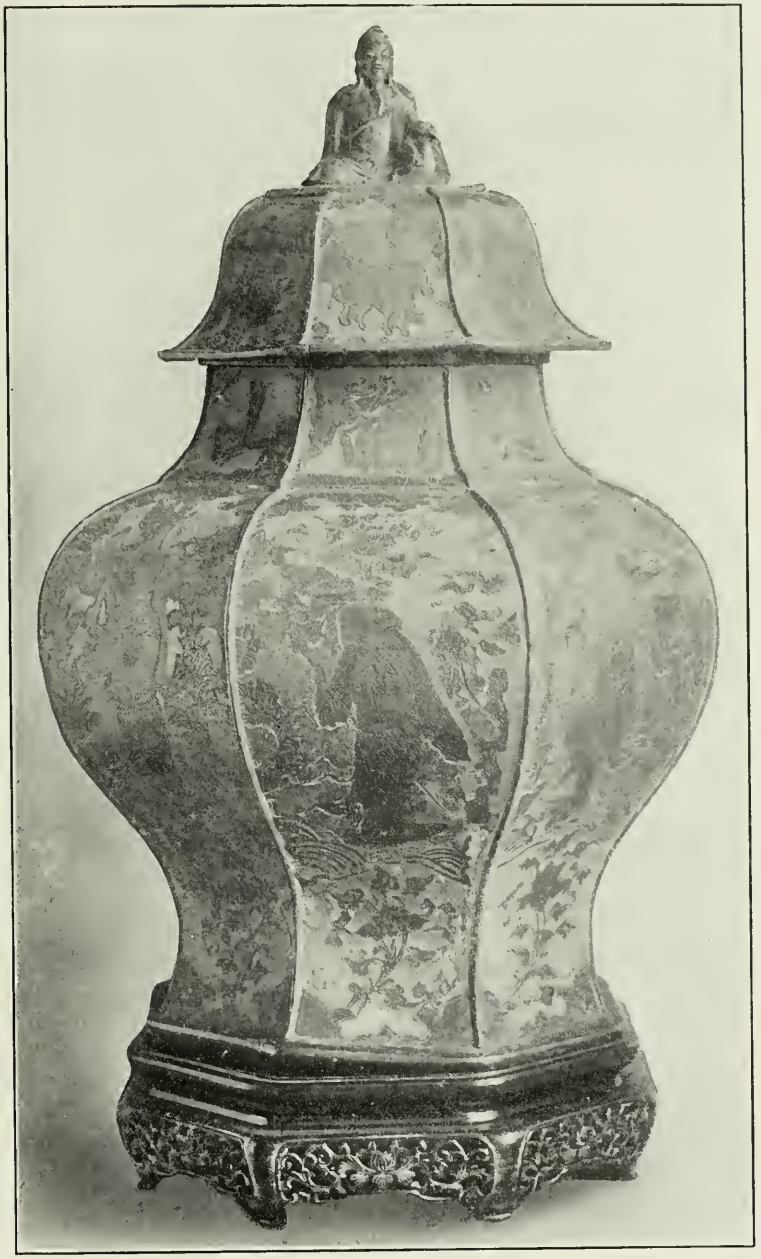


FIG. 105. CHINESE PEWTER JAR

FIG. 106. JAPANESE SWORD-GUARD

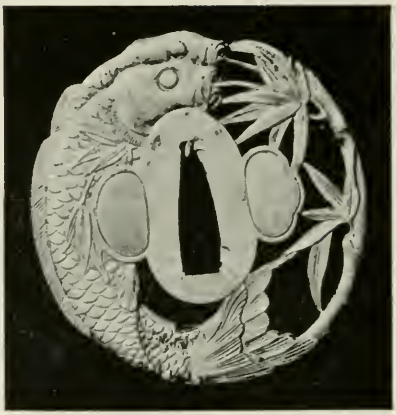


FIG. 107. JAPANESE SWORD-GUARD

orange attract the eye much more powerfully than quiet blues, greens, or violets. At this point it may be well to say that no color in itself can be considered ugly or beautiful. Its beauty or lack of it is the result of its combinations with and relation to its surroundings. A large area of light value may be balanced by a smaller darker area. As a rule, shapes are composed without first paying much attention to color or value. When the areas have certain agreeable space

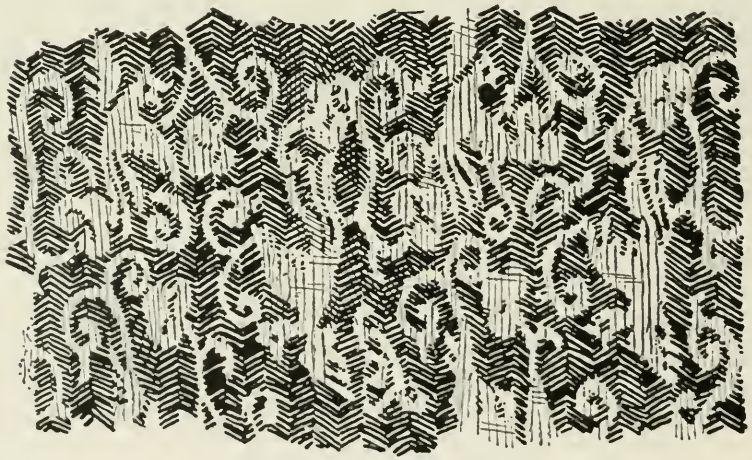


FIG. 108. JAPANESE BROCADE

relations, it becomes possible to emphasize or restrain certain parts of the design by using dark or light values, great contrasts or lack of contrast, quiet or brilliant color (Fig. 109). A design is valuable on account of the impression

FIG. 109. TILE FROM BLUE-JAY'S FEATHER (A. S.)

that it gives at first sight, and further on account of the maintenance of that good impression upon close examination. A number of varied and conflicting interests will result in confusion. No more ideas should be used than can be readily assimilated at a glance, for strength lies always in

simplicity (Fig. 110). The charm of the Coptic medallions is due as much to the beauty of the lines as to the disposition of the areas.

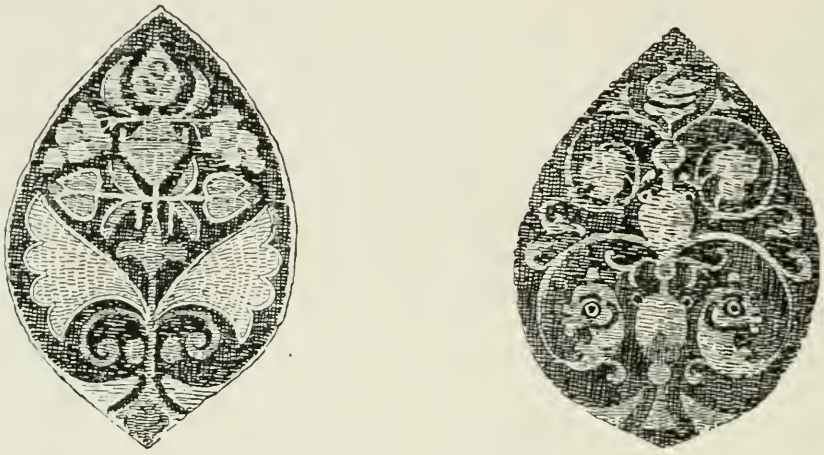


Fig. 110. MEDALLIONS OF COPTIC TAPESTRY

CHAPTER VIII

VALUE

THE compositions of spots, lines, and areas, so far considered, are capable of further very interesting possibilities if the units of which they are composed are of different values. It now remains to observe the application of the laws of Repetition to Values, by which name the different amounts of light and dark are known.

Owing to the restrictions imposed by pigment materials the range of values possible to the designer is limited. Because nature has much deeper blacks than the darkest pigments, — black ink or paint, — and much lighter and more brilliant lights than white paint or paper, it is impossible to reproduce the extremes of natural values accurately; and therefore, with the means at hand, the values are treated proportionally, with the hope that the accuracy of the relations of the arbitrary values will suggest the true values, which could not be reproduced. In painting from nature exact imitation is not attainable nor is it desirable, for many things can be left out to advantage, while others should be emphasized or restrained as the case may be. The artist works within certain definite limits, suggesting or interpreting.

If the use of color be restricted in painting, still more is it restricted in design. A great many different sensations go to make up an impression of nature. The artist, wishing to convey his impression of nature, reproduces, so far as he is able, the component parts of the impression as he experi-

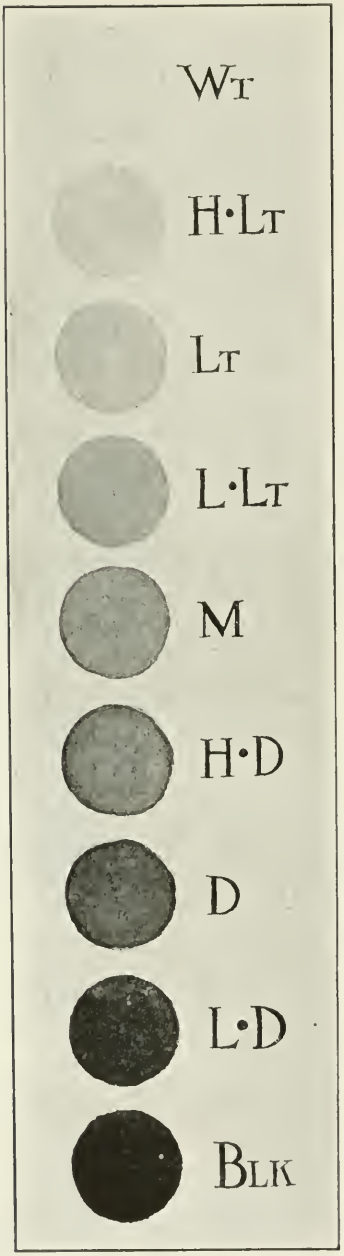


FIG. 111. VALUE SCALE

ences it. There may be an idea, however, behind the whole impression that can be suggested or expressed by a symbol, such as a word, for instance. The word "summer" conveys many very distinctly varying impressions to everyone. Just so may a design motive be replete with significance. Design may thus be a sort of symbolism, a short cut from impression to expression. The dominant idea should be represented in the most direct and sincere manner. The presence of meaningless or unimportant details of any sort will considerably weaken the impression which it is the aim of the principal idea to create. A considerable range of values may be suggested by a very few, for the mind readily completes abstractions, bridging the intervals with visual images aroused by associations. Reserve in contrasts characterizes the work of most of the best designers. Since the aim of design is the creation of definite impressions, any large number of dissimilar forms, which it is desirable to organize into a design, must be combined to produce their effect under the laws of

FIG. 112

FIG. 113

FIG. 114

FIG. 115

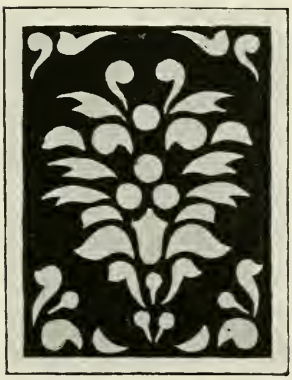


FIG. 116

FIG. 117

DIFFERENT COMBINATIONS OF THE SAME VALUES

Repetition previously stated, also by means of the further application of the law of repetition in values, which will now be taken up. Value deals with darkness or lightness, and is a consideration preliminary to color, which cannot be judged without an analysis of its elements, the first of which is value. A light gray or a light color is said to be high in value, while a dark color or a dark gray is called low in value.

In the study of value it is well to have clearly in mind certain standards by which the entire range of contrasts may be judged. For this purpose, a simple scale of nine equidistant values from black to white inclusive will suffice (Fig. 111). The black in this scale is the blackness of India ink, and the white the whiteness of clean paper. The values are called White (Wt), High light (HLt), Light (Lt), Low light (LLt), Middle tone (M), High dark (HD), Dark (D), Low dark (LD), and Black (Blk). Of course there are thousands of not easily distinguishable values between black and white. This value scale, committed absolutely to memory, increases the accuracy of discrimination, thus sharpening the powers of observation, and facilitating the acquisition of definite visual value-images. If alternations of value, or progressions of value, or both, be introduced into the problems which have been already executed in black and white, endless possibilities will result.

Perhaps this will be best understood by the execution of several area problems in different combinations and values. It must be understood that the values mentioned are not accurately represented in the reproductions; it is a mechanical impossibility, but the approximations will be suggestive. The first illustration represents the use of Wt, M, and Blk. In each case the border and the enclosed areas will be of different values. This will give six different possibilities which are worked out as follows: —

FIG. 118

FIG. 119

FIG. 120

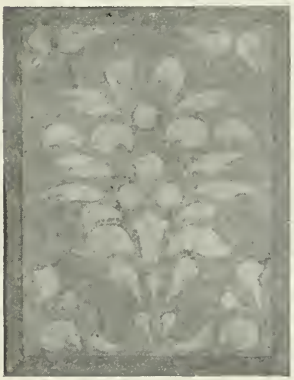


FIG. 121

FIG. 122

FIG. 123

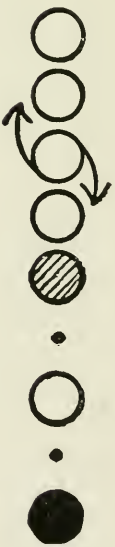
118

119

120

121

122



123

DIAGRAM OF VALUES IN THE PRECEDING PLATE

	Ground	*Border*	*Inclosed Area*
(103)	Wt	M	Blk
(104)	Wt	B	M
(105)	M	Wt	Blk
(106)	M	Blk	Wt
(107)	Blk	Wt	M
(108)	Blk	M	Wt

The other illustrations (Figs. 118, 119, 120) represent changes of value, from the Blk, M and Wt of Fig. 112 and 121, 122, 123, from the results obtained in Figs. 118, 119, 120. The values of Fig. 112 represent the maximum possibilities of contrast. Figs. 118, 119, 120 represent one half, and Figs. 121, 122, 123 one fourth of the total range.

CHAPTER IX

COLOR

COLOR may be analyzed into three elements, one of which, value, has been discussed. The two elements not already described are Hue and Intensity. Hue is the essential characteristic of the color, associated with its name, such as red, blue, or green; intensity, the amount or degree of color present, — the brilliancy or neutrality of the Hue. A color in its full intensity at a given value is as brilliant as it can be made at that value. Neutrality is the opposite of intensity; when one increases the other must necessarily decrease. Complete neutrality, the zero intensity of color at any value, is a gray, in that same value, which contains no trace of color. A color of one-half intensity is accordingly a color halfway between its most brilliant aspect and a gray of the same value. As a color loses intensity it gains neutrality, and *vice versa*. A color cannot be conceived of without taking into consideration value, hue, and intensity.

Colors are here named as follows: yellow (Y), yellow orange (YO), orange (O), red orange (RO), red (R), red violet (RV), violet (V), blue violet (BV), blue (B), blue green (BG), green (G), yellow green (YG), returning naturally to yellow as may be seen in the diagram (Fig. 124). This arrangement is a perfect cycle, each color being equally related to the adjacent three colors on either side.

The colors used in pigments are not nearly so bright as the colors of the spectrum, but they are all that can be obtained, and the problem is to use them to best advantage.

The following pigments will probably be as few as can be got along with conveniently. They are suggested because in common use: zinc white for oil, or Chinese white for water-color; cadmium yellow (light), yellow ochre or raw

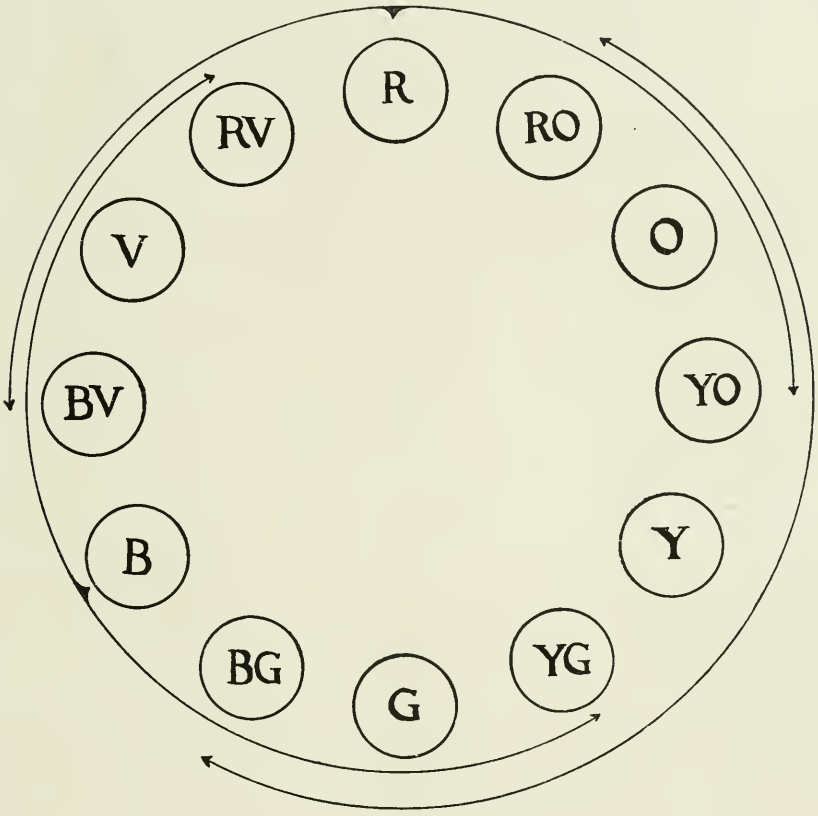


FIG. 124. COLOR CYCLE

sienna, orange vermilion, alizarin crimson, vert emeraud (viridian or transparent oxide of chromium), cobalt blue, new, French, or ultramarine blue, charcoal or lamp-black for water-colors, and blue black for oils. Burnt sienna, a deep orange brown is also very useful. With these pigments the color names will be fixed as follows, those colors which are

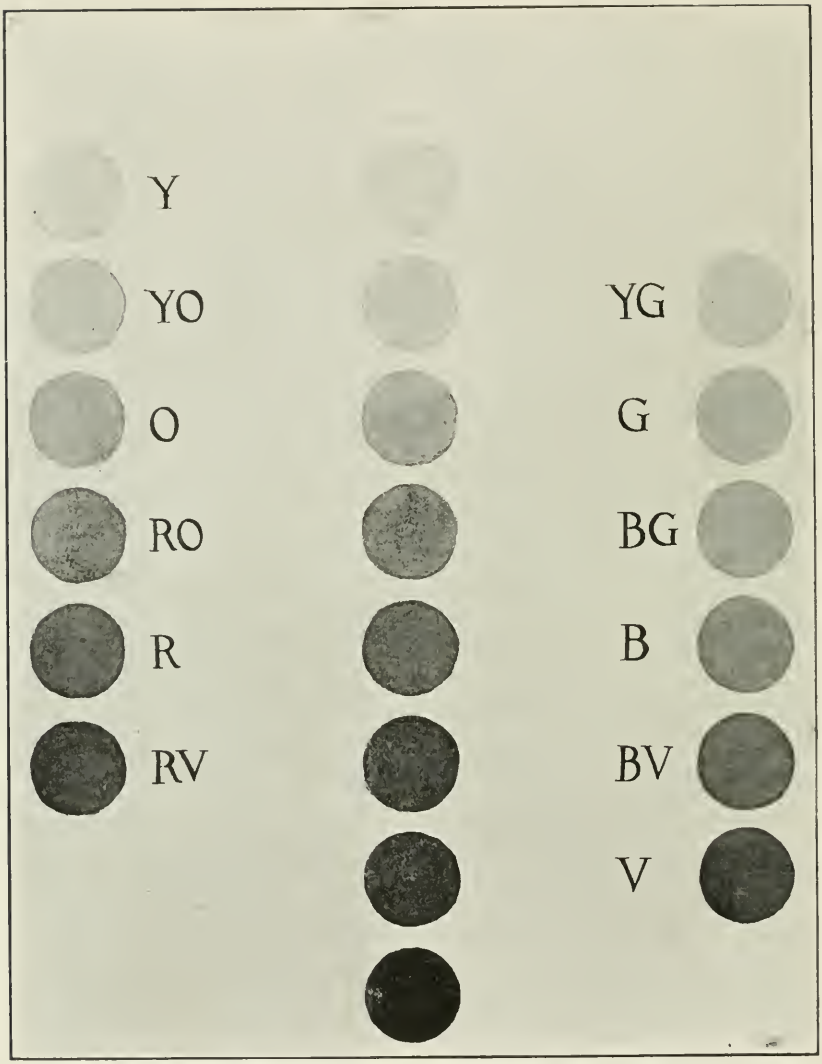


FIG. 125. RELATION OF COLORS AT FULL INTENSITY TO VALUE SCALE

not mixed being named first, Y, cadmium; RO, orange vermilion; R, alizarin crimson; B, cobalt blue; G, viridian. The other colors must be mixed. YG will be found by mixing cadmium and viridian until the eye feels an equality of yellow and green. This will not by any means follow from the mixture of equal quantities of the colors. BG is made by mixing cobalt and viridian until the two color ideas balance. V is a mixture of alizarin crimson and new blue, a balance between R and B. BV is a mixture of V and cobalt; RV a mixture of V and alizarin crimson. YO and O are made by mixing cadmium with orange vermilion; in one case the yellow should predominate and in the other the elements of red and yellow should appear to balance. Yellow ochre is very nearly YO. This cycle of colors once produced becomes the same sort of indispensable standard for the judgment of color that the scale of values is for neutral tones. The mixture must never be made mechanically, depending upon physical proportion to produce the hues, but with reference always to the color ideas, beginning with the primaries, R, Y, B, dividing and balancing these mentally, and then proceeding from the secondary colors, O, G, V, to the tertiaries, YO, RO, RV, BV, BG, YG. In following the cycle, equal steps or transitions should be felt as the eye moves from color to color.

It will be found that the colors, when mixed as brilliantly as possible, — that is, at their full intensity, — will occur in certain definite values of the black and white scale. These value-relations are shown diagrammatically (Fig. 125). The diagrams are not produced in colors because it is very difficult to produce the colors exactly in printer's ink. Even if that could be done accurately there would be danger of alteration. It will, therefore, be necessary for the reader to reproduce these color scales for himself, as suggested by the letters in the diagrams. It must be remembered that

these colors are at their full intensity. Every color is found at its fullest intensity in one value only. It nevertheless is often convenient to refer to colors as of full intensity in values other than those at which they naturally occur, but it must be understood that this intensity cannot be as brilliant as full intensity at the natural value. Take B, for instance. Blues lighter or darker than HD are often seen. In those cases the intensities of the blues are not so great as that of a blue of full intensity at the value HD. Nevertheless it does not necessarily follow that any blue found at HD is at full intensity. In fact, colors are very seldom seen or used in their full intensity. If a tone at the value HD be produced which is as nearly as possible an intermediate between B-HD-full intensity and the tone HD of the neutral scale, it will be called B-HD-one-half intensity. As in mixing pigments to produce the cycle of colors, this tone can only be reached by balancing the ideas of hue and neutrality in the mind, and producing a color to satisfy the idea.

RO occurs at M. It is, therefore, equidistant from Blk and Wt and will lose in intensity equally as raised or lowered in value (Fig. 126). The intensity of the RO occurring at HLt is to the intensity of the RO occurring at M as the distance RO-HLt is to the distance RO-M. If a plate of this sort be made in several colors it will be seen that many browns considered as separate colors are only deep and consequently neutral yellows and oranges.

As the most similar colors occur side by side in the diagram of the color cycle, those colors farthest apart must be the most dissimilar. Accordingly, if the color whose greatest contrast is to be found be counted as one, its greatest contrast will be seven, counting around the cycle in either direction. This color of greatest contrast is known as the complementary color. Every color has its complementary which is found on the cycle at the "interval of the seventh,"

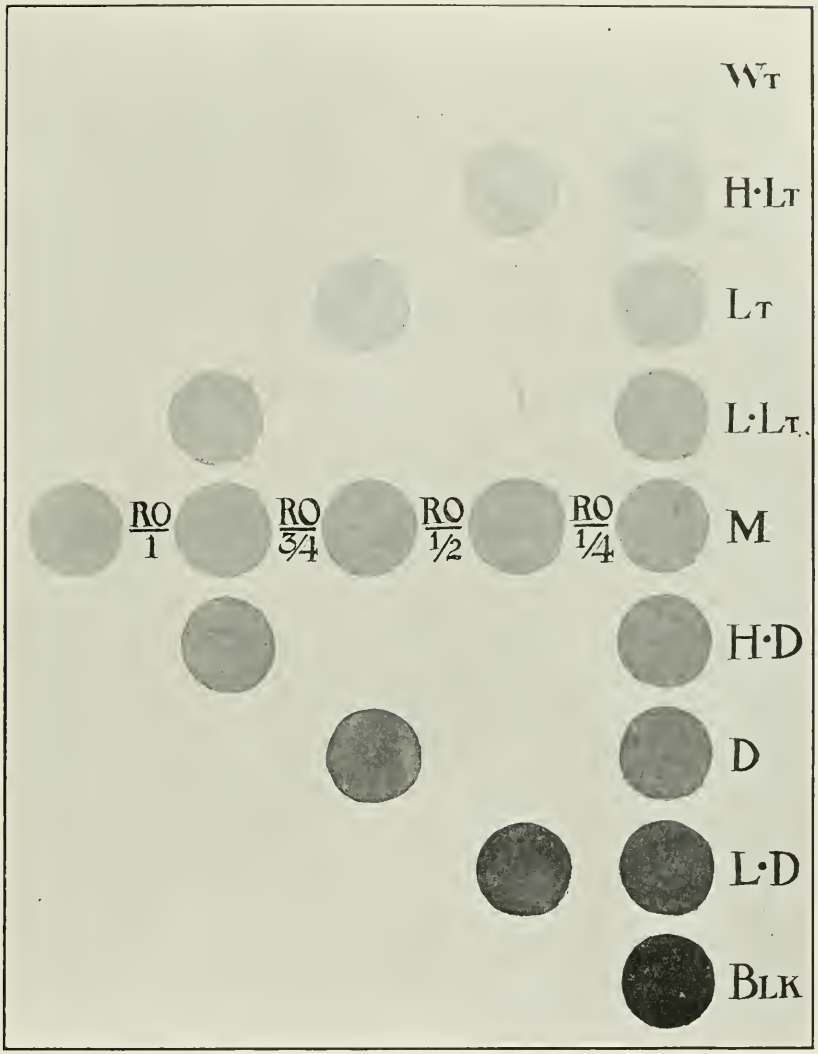


FIG. 126. VALUE AND INTENSITY POSSIBILITIES OF ONE COLOR

as Ross calls it. Thus R and G are complementaries, and so are Y and V (Fig. 127). If complementaries be mixed together, the result is neutrality.

Complementaries as used in design and representation are not like the complementary colors of physics and psychology. In color tests, physicists and psychologists use a rapidly revolving disc attached to an electric motor. Colored paper discs are put upon it so arranged that the proportion of one color to the other can be varied at will. When the apparatus is set in motion the sensations of the two colors following closely upon each other give the eye the impression of a third color not like either of the two colors used. The color, however, is always different from that which would have been obtained by a mixture of the two pigments. If blue and yellow be set in motion upon the "Maxwell discs" as they are called, they produce gray, but if yellow and blue pigments be mixed, the result is an unmistakable green. Blue and yellow are primaries for designers, but complementaries for the psychologist and the physicist. In short, the physicist and the psychologist deal with color sensations. The artist uses color pigments. When the parti-colored discs are revolved, the colors mix in the eye which beholds them. When the artist mixes the colors, the result is conveyed to the eye in one sensation rather than in a confusion of different sensations. It can, therefore, be seen that, instead of the physicist's point of view conflicting with the painter's, each is working out a different problem, and each is approaching it in a scientific manner.

Theoretically any color can be produced by using the three primaries, R, Y, and B, which appear at the interval of the fifth on the cycle of colors. This does not work out absolutely in practice, but it comes near enough to justify the theory and allow valuable deductions to be made. It will be found that any three colors on the cycle, taken at the

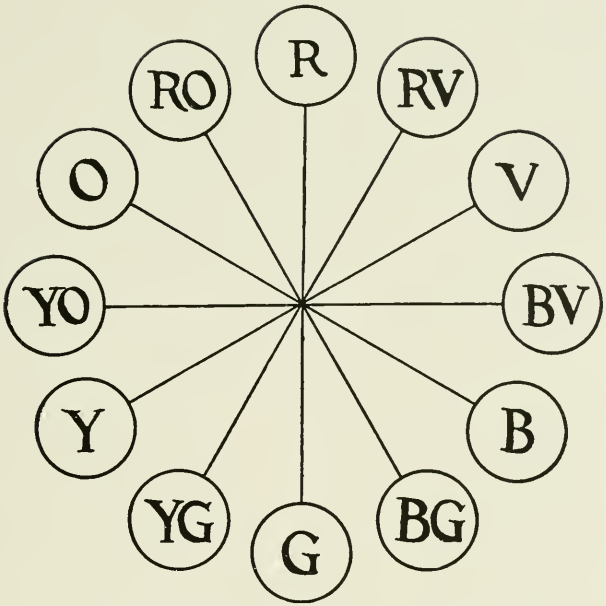


FIG. 127. COMPLEMENTARY COLORS

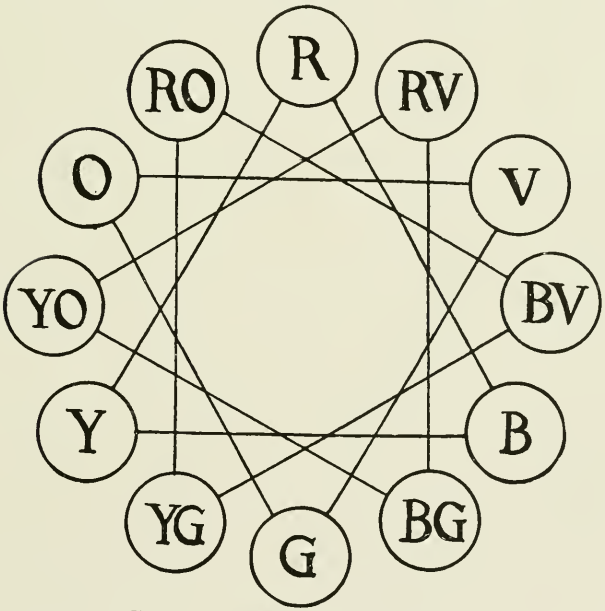


FIG. 128. PRIMARY RELATIONS

intervals of the fifth, as shown in the diagram, can be used fairly successfully as primaries, and that as many color approximations can be obtained by mixing these latter as by mixing R, B and Y (Fig. 128).

While it is very difficult to teach much about color in a text-book, there are certain laws and methods of working which may be set forth to aid the beginner in obtaining satisfactory results, particularly in the case of harmonization of colors. Perhaps an incorrect use of color will offend more quickly than any other one element of design. The wall-papers, rugs, and furnishings of one's house, and the dress of one's friends exhibit schemes of color which are not always pleasing. There are two or three simple methods of color harmonization that can be understood by everyone, and which will aid materially in obtaining satisfactory results. One of these is the use of a restricted range of values. If a number of different colors are to be used, let them be of slight contrast, — let either dark, or light, or intermediate predominate and the result will be better than if a greater range of values were used. Again, one color may be allowed to predominate. If several different colors are to be used let a tinge of blue, perhaps, run through them all, and at once they have some common element. Colors that appear too harsh when placed side by side may be toned down by increasing the neutrality or diminishing the intensity. This introduces another common element, that of a given degree of intensity or neutrality. It will be seen that the resulting harmonies are due to a sort of repetition, a process in which each color gains some element which is possessed by all the others.

In the diagrams for different methods of harmonization of color (Figs. 129–134), the distance to the left or right of the neutral scale represents the intensities. The results are easily seen without confusion so long as combinations with

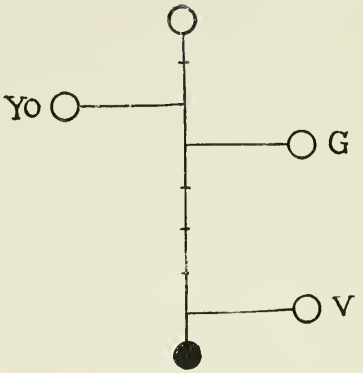


FIG. 129

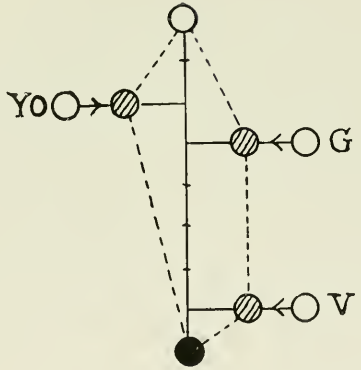


FIG. 130

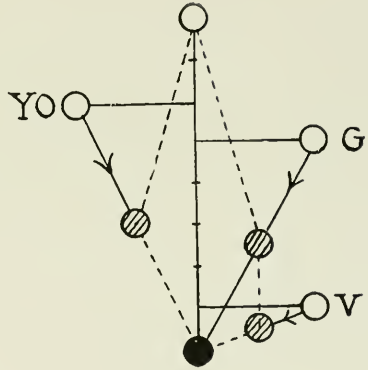


FIG. 131

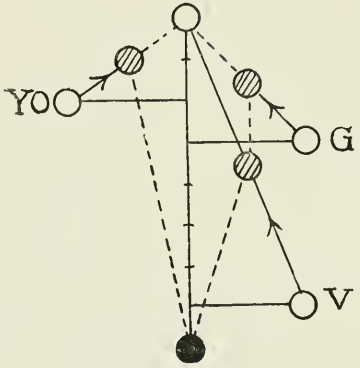


FIG. 132

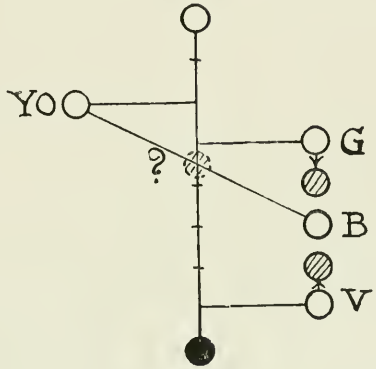


FIG. 133

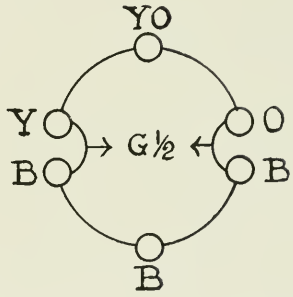


FIG. 134

DIAGRAMS OF COLOR HARMONIZATION

other colors are not attempted. YO, G and V at full intensity, — colors not as a rule harmonious, — are used in each case and each diagram shows a different method of harmonization.

Diagram 129 shows the colors as they stand on the scale without any attempt at harmonizing. In diagram 130 the intensities are halved, giving a harmony of neutrality. In diagram 131 harmony is obtained by lowering all the colors halfway towards Blk. In diagram 132 they are raised one-half towards Wt (this may be understood by reference to Fig. 126). In diagrams 133 and 134 another color is introduced, by mixture in equal parts, as the harmonizing element. In diagram 133, for example, B is mixed in equal visual proportions with the other colors. B plus G equals BG, B plus V equals BV. It may be somewhat puzzling to understand what will result from YO plus B, though the value is easily found. The YO may be divided into its component parts, O and Y. The B may also be halved giving two equal quantities of B. O plus B will neutralize making gray; and Y plus B will produce G. G and gray mixed give G-one-half intensity (Fig. 134). These problems have been worked out as if equal visual quantities were mixed each time, but this may not always be advisable in practice. The diagrams merely indicate some of the methods which lead to color harmony.

The chapter on Values mentioned the difficulties of reproducing the values of nature and the impossibility of getting more than an approximation or a suggestion of the real value conditions. This suggestion however should be such as will lead to a quick and accurate comprehension of the actual conditions as seen. This result has achieved the same end as the scientifically accurate reproduction of those conditions. Everyone, moreover, has different capabilities for the reception of suggestions. This difficulty in reproducing

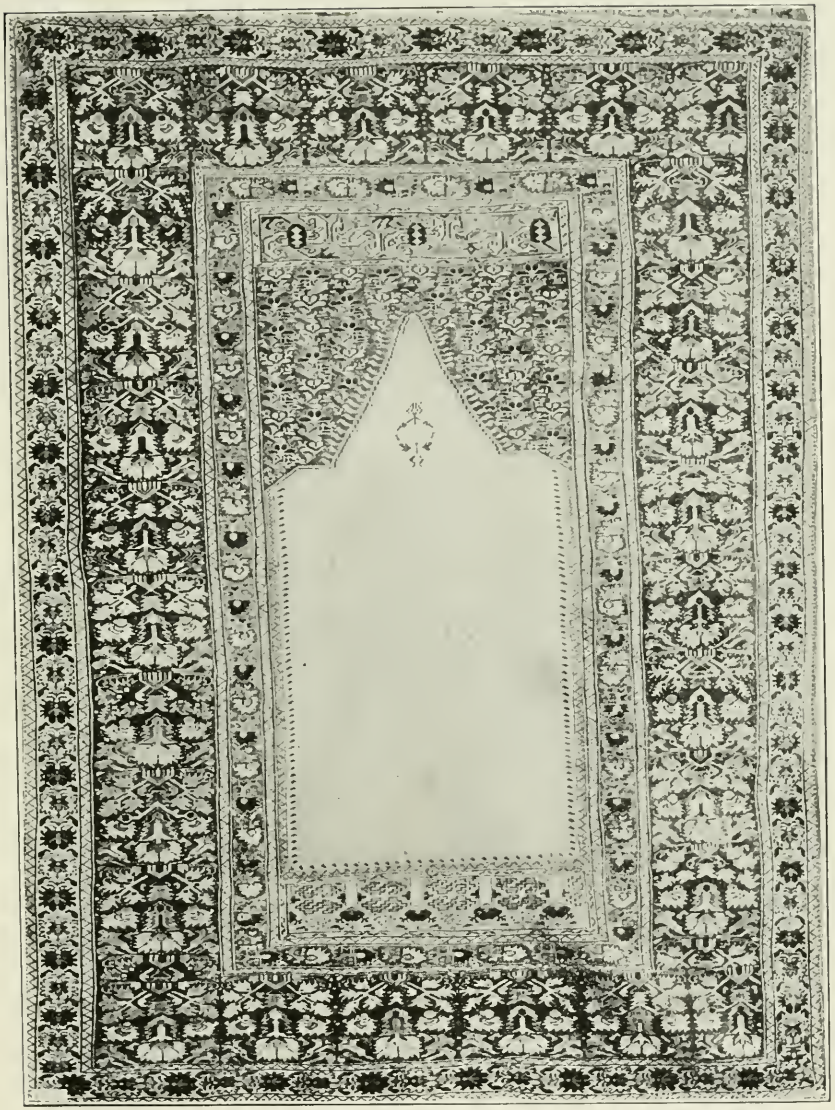


FIG. 135. GHIORDES RUG

the values of nature becomes greater when color is added to the problem. It is not the province of a designer to imitate nature, but he should understand the processes and fundamental principles in order to use color intelligently. The bright blue Italian sky at noon is much lighter than white paper, but it is nevertheless quite intensely blue. In reproducing it — suggesting it — color or value must be sacrificed, perhaps a little of both. The choice will depend upon whether the artist wishes to emphasize the fact that the sky was bright or that it was blue. Colors, therefore, are used to represent nature by suggestion, and to represent not only the literal facts, but the idea that lies beneath them, as it appears to the individual who is recording his impression (Fig. 135).

CHAPTER X

LETTERING

LETTERING is an exemplification of the principles which have been outlined in the preceding chapters, a combination of pure and applied design motives in varying degrees.

The primary object of type or lettering of any sort is to convey a series of ideas which are contained in the words of the printed page. The designer of an inscription, for instance, has a great number of alphabets, of different derivations, from which to choose the one most nearly suited to his purpose. The forms of lettering in common use, derived generally from Roman originals, are continually being modified. Every new font of type has a slightly different basis for the harmony of the symbols which compose it. The relation of the thick to the thin lines of each letter, the forms of the serifs, the curves of the rounded letters, the relations of the longer and shorter parts, and finally the relation between the black area of the letter and the white area of the page on which it is printed, are the factors which must always be considered (Fig. 136). The number of variables is so large that a limit to the possibilities cannot be set. In actual use, limits imposed by practical considerations appear on every hand. In a very large class of printing or lettering the ease with which the lettering may be read is a paramount consideration, the value of the statement contained being itself superior to any beauty or form of the letters. In such a case any unusual characteristics in the individual letters which tend to arrest the steady progress

of the eye along the lines is a repeated hindrance to the easy assimilation of the ideas which they represent, and is consequently a defect in the design of the lettering. In actual book printing the choice of type falls in a narrow range; attempts to produce variations upon a certain few standard types with which everyone is familiar have usually proved unsuccessful (Fig. 137).

With a change in the purpose of the lettering, however, a considerable latitude of choice becomes possible. In addition to clearness a prime consideration may be force, as in advertising. The problem then becomes the attraction of attention to a brief statement, which places a premium on the development of the elements of the letter so as to cause them to seize and hold the eye. A unique alphabet has become a by no means minor part of the stock in trade of certain firms (Fig. 138).

Again, in a quite different way, the legibility of lettering may become in varying degrees a consideration secondary to the beauty of the printed or written page. In some periods, for instance, at the time just preceding the invention and development of the art of printing, when beautifully illuminated manuscripts were produced, there occurred a combination of these elements in a degree never attained before or since (Fig. 139). The beauty of this page and of the individual letters is striking even to those to whom Latin is unintelligible. This appeal to the eye by line motives in pure design, which is what letters really are when they no longer convey meanings, is further illustrated by similar illuminated manuscripts in Arabic and Persian. In these it is not generally possible to recognize any familiar symbols at all, but only to take pleasure in position, measure, and shape repetitions. The decorative quality of the component letters may then be considered as of first importance, in which case the problem reverts to the arrangement

About this time I met with an odd volume of the Spectator. It was the third. I had never before seen any of them. I bought it, read it over and over, and was much delighted with it. I thought the writing excellent, and wished, if possible, to imitate it. With this view I took some of the papers, and making short hints of the sentiment in each sentence, laid them by a few days, and then, without looking at the book, tried to complete

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By my rambling digressions I perceive myself to be grown old. I used to write more methodically. But one does not dress for private company as for a public ball. 'Tis perhaps only negligence.

To return: I continued thus employed in my father's business for two years, that is, till I was twelve years old; and my brother John, who was bred to that business, having left my father, married, and set up for himself at Rhode Island, there was all appearance that I was destined to supply his place, and become a tallow-chandler. But my dislike to the trade continuing, my father was

FIG. 136. STANDARD TYPES

HENRY STEPHENS, 1470.

HENRY STEPHENS, II., DIED 1598.

ROBERT STEPHENS, SON OF HENRY, 1503.

CHARLES STEPHENS, SON OF HENRY, BORN 1504.

ANTHONY STEPHENS, 1594. PAUL STEPHENS DIED 1627.

A LATIN DONATUS, 1450.

WOOD PICTURES OF SAINTS, 1423.

PRINT OF ST. CHRISTOPHER, 1423, STILL EXISTS.

Engraving on COPPER, about 1440.

FIG. 137. MEANINGLESS ELABORATION OF LETTERING

WE THE PEOPLE OF THE
UNITED STATES

IN ORDER TO
FORM A MORE PERFECT UNION
ESTABLISH JUSTICE
INSURE DOMESTIC TRANQUILITY
PROVIDE FOR
THE COMMON DEFENCE
PROMOTE THE GENERAL WELFARE
AND SECURE
THE BLESSINGS OF LIBERTY
TO OURSELVES
AND OUR POSTERITY
DO ORDAIN AND ESTABLISH THIS
CONSTITUTION
FOR THE UNITED STATES
OF AMERICA

FIG. 138. MODERN ROMAN LETTERING

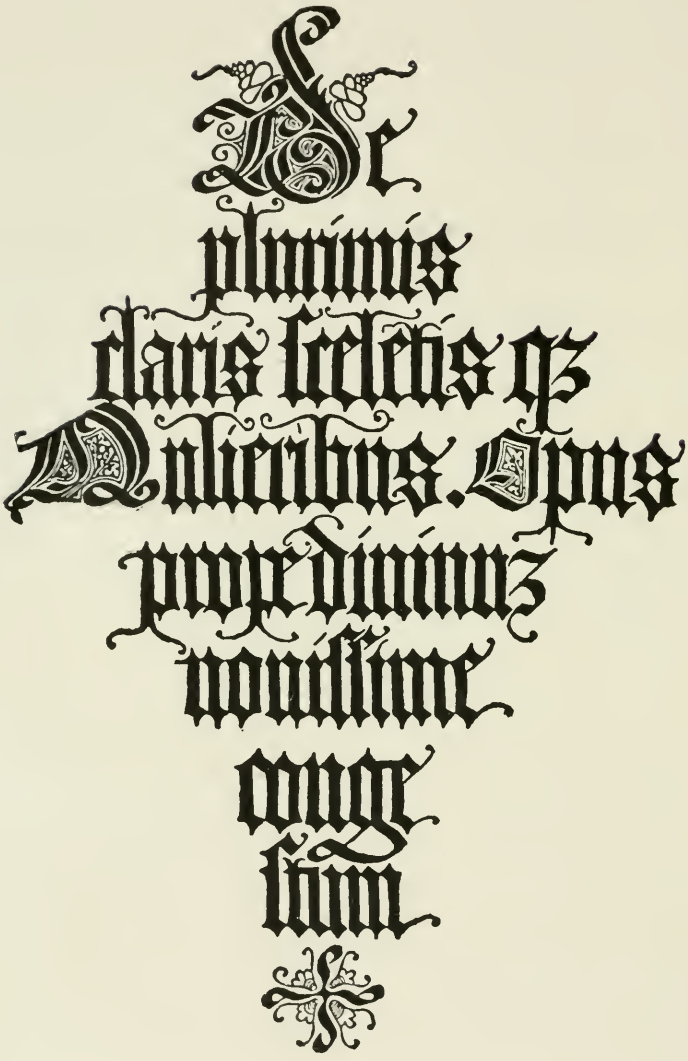

FIG. 139. ITALIAN TITLE-PAGE (JACOPO FORESTI, 1451)

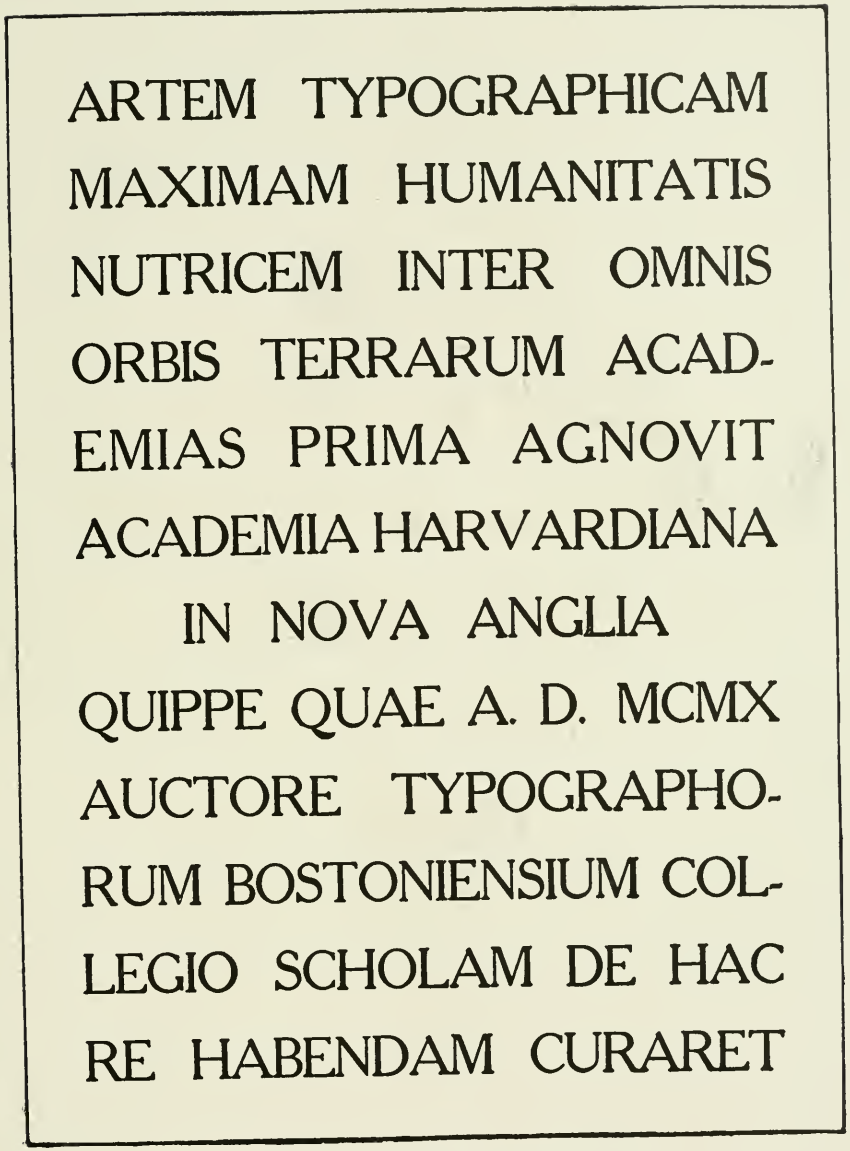

FIG. 140. MONUMENTAL LETTERING

of line or area motives so as to produce a pleasant general result.

In the printing of poems and brief books of certain character, it is often felt that some sacrifice of that maximum of ease indispensable to the usual book is permissible in order to allow of a study of the type itself. In this case the superior beauty is felt by the reader to be suitable to the peculiar character of the literature which it presents, and therefore the design of the pages and of the whole book is affected by similar considerations. In the book whose chief object is to convey information, the cover, the title-page, and the page of the text must all harmonize in brevity and clearness of statement and in the economical use of space. This should, moreover, be consistent with type large enough to be easily read and margins wide enough to bind and to hold at the edge without covering. In the special book, on the other hand, all these matters may become the subjects of study to attain the particular ideal fitness suited to the subject in hand. In such cases, with the presentation of comparatively few words on a page, margins, size and form of type, paragraphs with their initials, the placing of illustrations, and so on, all become matters for careful study of line and space relations.

An inscription is a limiting case, so to speak, of this kind of book. It is the briefest of books and so presents a crystallization of these elements. Its words, chosen with the maximum of care, must be presented with crystalline clearness and with the maximum of beauty (Fig. 140).

CHAPTER XI

DESIGN IN ARCHITECTURE

ARCHITECTURAL composition is the ultimate expression of design. Combinations of numberless elements have united to produce harmonious effects. The apparent complexity of its parts may be separated into groups in such a manner as to permit the application of the foregoing principles with less difficulty than is experienced in any endeavor to study the whole without such subdivision. Thus, among the elements of an architectural composition, the areas which serve the purpose of the structure, such as the rooms, halls, corridors, and so on, may be considered as the first group. These are satisfactory or not according to the manner in which they fulfill the practical functions for which they are created; but beyond utility, conformity to ideal necessities is as indispensable as in the poem or the symphony, and the canons of judgment are in no way dissimilar.

The second of the groups of architectural elements is that of construction, the means by which the first group is attained. Sufficiency here is first a matter of engineering and then of esthetic appeal. A great deal of the expression of an architectural composition is gained through the design of the dimensions and proportions of the pieces of material of which it is composed. These first two groups, essentially organic, are of paramount importance. The expression of an architectural composition is often, nevertheless, in a third set of terms which are relatively unfa-

FIG. 141. CHAPEL IN THE CHURCH OF SAN PIETRO IN MONTORIO

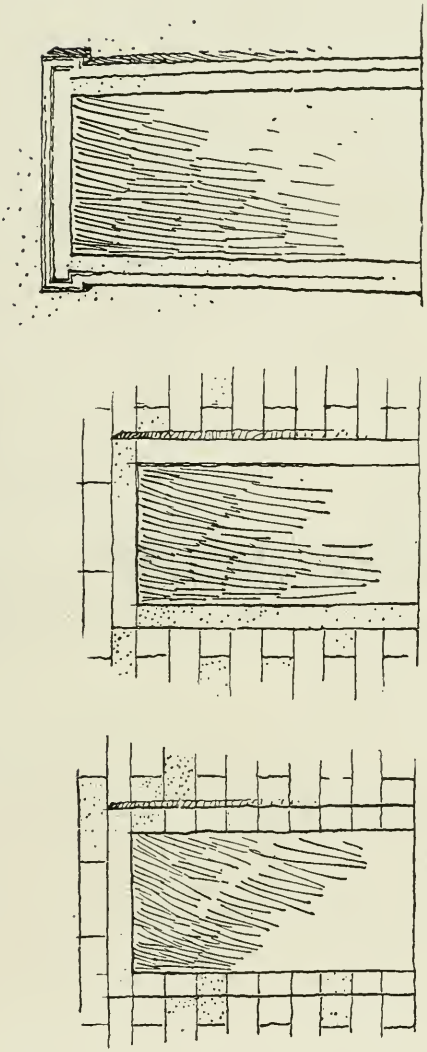

Fig. 144

Fig. 143

Fig. 142

DEVELOPMENT OF IDEALIZED DOORWAY

miliar to the layman. Stone, wood, iron, and a host of other materials are combined into structural forms which are intended to convey meanings, some specific and related to the construction, some abstract. Tradition and lack of inventiveness have imposed upon many of the details of this art forms which are not as keenly expressive to this generation as they have been to those of the past. An application, set forth in previous chapters, of the design ideas reveals the function of these architectural forms. This is nothing more than an extension of the foregoing principles to the study of design in three dimensions.

The doorway of the Church of San Pietro in Montorio (Fig. 141) presents a common type in use in Classical and Renaissance periods. It is, from the point of view of construction, built up of stone with stone joints and lintel. The set of moldings about the opening, in fact, all of the forms added to the mere opening in the wall, lend emphasis by providing contrasts which call attention to it (Figs. 142, 143, 144).

It is to be observed particularly that the design is balanced about a vertical axis, but not about a horizontal axis. The vertical lines of the jambs and the horizontal lines at the top were originally an emphasis of the three blocks of stone enframing the opening, although no longer having that special significance of cause in this example. This familiar arrangement has for design motive, first, the balance, to identify the opening, and second, the unbalance, with the major emphasis at the top, to gain a sense of movement, which from the world's earliest architecture has always been felt to be essential.

The balance is assisted by every detail. The inner frame of the opening is, on each half, unsymmetrical in itself, requiring the presence of the portion of the frame at the opposite side of the opening for its symmetrical completion. The

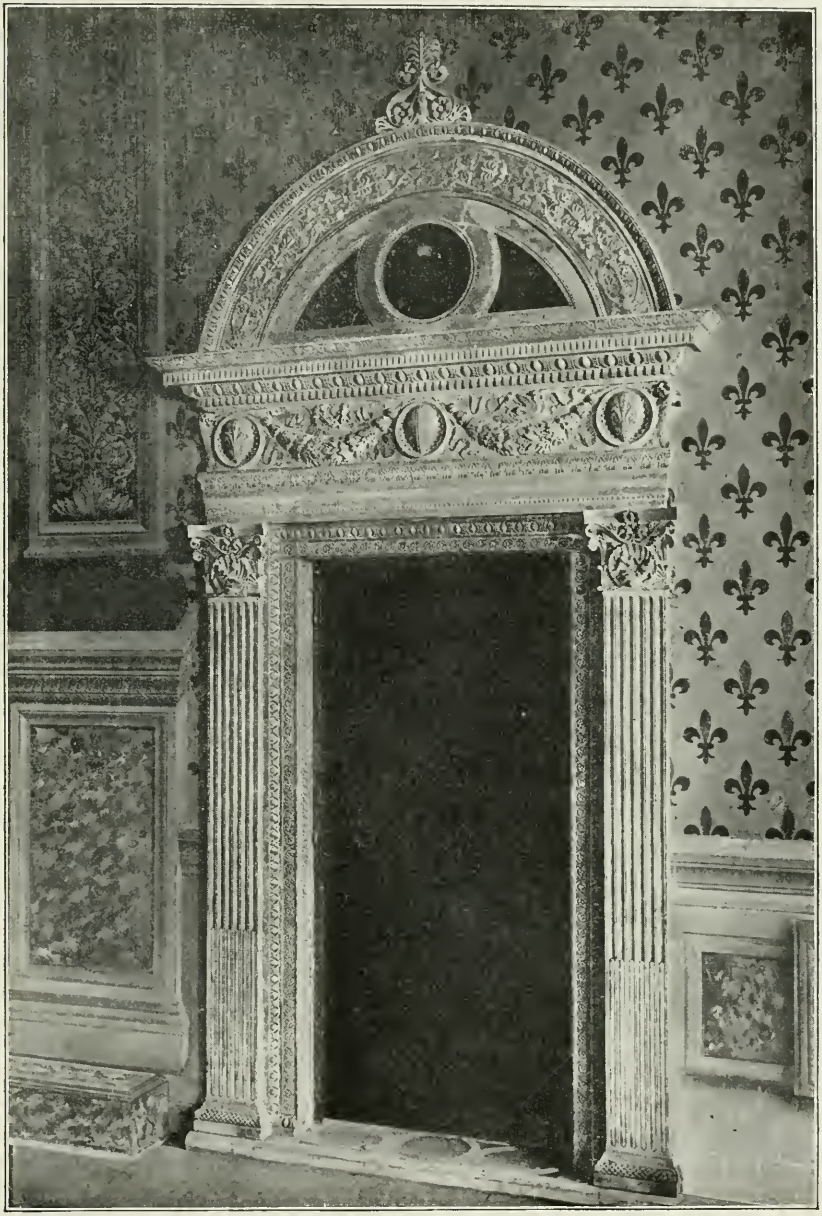

FIG. 145. DOORWAY IN THE PALAZZO VECCHIO

FIG. 146. JAPANESE TORII

absence of symmetry in these minor parts permits the ascendancy of the major axis of symmetry, that of the opening itself.

The unbalance is achieved by means of the cornice at the top and by the brackets which support it, and further by peculiar projections known as ears at the top of the inner enframement (Fig. 144). These ears have the same function as the capitals of columns, that is, the creation of a superior interest; and they accomplish it while still maintaining the unsymmetrical form of the architrave itself. The brackets of the cornice give a sense of support, not because they are essential to the construction, but because, like the unbalanced ear-motives, they impel the eye, in this case upward. The movement of architectural design is always upward. The difference of one architectural style from another is in degree and handling of its effects of movement.

The early Renaissance doorway shown in Fig. 145 has an inner enframement similar to that just discussed. The pilasters at the sides present axes of balance, which distract some attention from the balance of the opening itself. This effect is, however, minimized by the tympanum which, with its unquestionable axis, ties the sides together. The pilasters not only present the attractions at the top essential to vertical movement, but parallel vertical lines for the eye to travel upon up to the massed decorations placed above the opening to aid in this movement.

As far as the design arrangement of the forms is concerned the motive is in precise agreement with that of many Japanese gates (Fig. 146). In this arrangement the accents at the top correspond to the caps and cornices of the Classic door. The combined symmetry of the accenting forms relieves the attention from the objects themselves and allows it to come to rest at their axis of symmetry. These European examples and their Japanese relatives must be allowed to

stand as simple types of the expression of architecture, which may be found in every detail. The range of architectural expression proceeds from these forms, which had a purely practical genesis, to the tower, spire, and dome in which ideal necessity is alone the prompting motive. The emotion suggested by this art must be conveyed in terms of construction, just as in music all of the ideas must be carried in the tones of the available instruments. The construction may be glorified to accompany the height to which the architecture has risen, and other forms, not properly construction at all, may be introduced to symbolize those ideas short of which construction stops. Painting and sculpture thus enter as the assistants of the architect to convey related ideas.

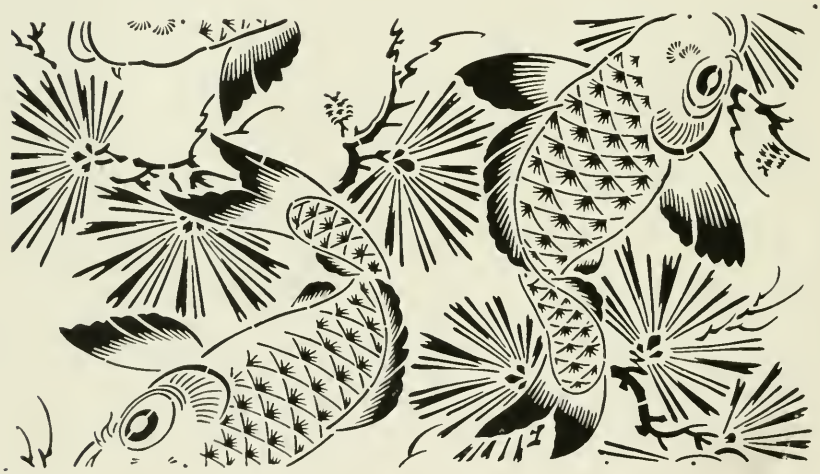

FIG. 147. JAPANESE STENCIL