



# HORNUNG'S HANDBOOK OF DESIGNS AND DEVICES

1836 basic designs and  
their variations

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# HORNUNG'S HANDBOOK OF **DESIGNS & DEVICES**



1836 basic designs and their variations

by one of America's foremost industrial and graphic designers

DOVER PUBLICATIONS, INC., NEW YORK

Dedicated to the memory of

A. D. F. HAMLIN

Professor of Architectural History in Columbia University and my first instructor in design, in recognition of his faithful service to art, and for his inspiring guidance in the appreciation of fundamentals that made subsequent studies a pleasure.

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# F O R E W O R D

IN a world of changing taste one thing remains as a foundation for decorative design—the geometry of space division. Certain common symbolisms seem also to retain their vitality through the flux. Historical ornament as a basis of modern design, and any philosophy of taste based upon historic style consistency, are alike dead; we have come, in the decorative arts, to a period primarily of individual invention.

Few books exist which show an appreciation of the full implications of this fundamental change. After all, the geometry of space division can be analyzed into a comparatively small number of systems—an alphabet, as it were—and some contemporary presentation of this alphabet has long been needed. The commercial artist, the book-designer, the architect, the decorative painter, the designer of textiles—time and again they have sought in vain for such a reference work. This does not imply the need of a compendium of forms to copy blindly, but rather a collection of decorative shapes to

stimulate the creative imagination. Necessarily, then, any such decorative alphabet must be of forms so abstracted and simplified as to be applicable to different types of design and susceptible of almost infinite variation. This alphabet Mr. Hornung has now compiled.

As a practical designer and for many years a student of decorative forms, the author is unusually well qualified. His well-known study of the trade-marks of the world has made him fully cognizant of the decorative potentialities of even the simplest forms, and given him as well a sure judgment in the choice, among the infinite number of geometric space divisions possible, of those most stimulating and most satisfactory. It is a pleasure to know that such a handbook has at last been made available.

TALBOT FAULKNER HAMLIN

COLUMBIA UNIVERSITY  
JANUARY, 1932

## PREFACE TO SECOND EDITION

A NEW FEATURE consisting of notes on the plates, has been included in this revised edition. This text has been purposely reduced to a set of brief references descriptive of some of the design elements that bear offhand resemblance to their neighbors. For instance, in the section treating of heraldic variants of the cross, these notes might easily be expanded into a full volume—in fact, entire books have appeared on this subject. But such an exhaustive study is not within the province of this book. The **Handbook** is essentially a source book for workers; those interested in further research will find the bibliography helpful in further pursuance of their studies.

It is obvious from the organic plan and arrangement of the plates, that the classification of designs is built upon the construction of the elements themselves, and not upon their symbolism. This approach may seem strange to many readers, but the author has chosen a geometric order deliberately. This, at least, is a known constant in a changing society where

symbols, like nations, rise and fall. Some few years ago a clergyman found great delight, upon examination of this book, to note the large number of religious symbols included. On turning the pages further, his delight turned to horror as he came upon the plates dealing with the swastika—to him as to millions of others, a sign of bad repute in modern times. But the swastika, like so many other age-old symbols, has been alternately the omen of happiness or the sign of tyranny, depending upon whether civilizations have moved forward or backward in their course.

Looking back over the fifteen year period since work on this handbook was first begun, one is impressed with the many changes that have taken place in every field of human endeavor and industry—the field of fine and applied arts naturally included. Throughout these changing years there has been a consistent and increasing demand among students and practitioners alike—a demand far greater than could be met by the limited size of the first edition.

Whether because of newly trained men and women who have entered the applied arts, the opportunities ahead, or a renewed interest and appreciation of fundamental source material on the part of those already engaged in the field, the need is clearly indicative of a trend that fully justifies the author's original labors and the present publisher's willing cooperation. Whatever it is, it is hoped that this revised edition will become available to larger numbers than in the past, through the publisher's readiness to offer the work at a reduced price.

C. P. H.

NEW YORK, N. Y.  
NOVEMBER 11, 1945

# I N T R O D U C T I O N

**H**UNDREDS of volumes devoted to the study and application of design have been published during the last few decades, and thousands have appeared since the advent of printed books. The student, scholar, or practitioner visiting any well-equipped library is amazed at the vast amount of material that claims his attention; but upon investigation he will be disappointed to find how few of these books really meet his requirements. He will familiarize himself with the few compendia of ornament, such as Owen Jones' "Grammar of Ornament" and the "Ornement polychrome" of Racinet. These are monumental reference works, displaying their color plates according to comparative styles in art history. Dolmetsch's "Ornamental Treasure" and Speltz's "Styles of Ornament" are also useful. Unfortunately for the student of meager means, most of these volumes, since they are beyond the reach of his pocket, must be consulted on library shelves at infrequent intervals. It is a real pity that their merit is partially destroyed by their costliness.

Of art histories dealing with ornament and design there are comparatively few to interest the practical designer, although a number of exhaustive works have been published whose appeal is largely to the academician and archeologist. Hamlin's "History of Ornament," in two compact volumes, successfully summarizes the historic styles from ancient to modern times, and is designed particularly for student use. A great number of treatises on the meaning of design, form, and pattern have been issued, and they vary greatly in presentation from the conventional interpretation of Walter Crane to the highly personalized version of Claude Bragdon, or yet the free, modernized approach of Best-Maugard. In each of these the eager prospector will find much if he will but dig below the surface. Quite indispensable is Meyer's "Handbook of Ornament," which follows the synthetic rather than the analytic method, offering the elements with which to construct and develop ornament. But some forty years have passed since its first appearance in Germany, and the modern worker in applied arts still clings to it in the absence of a worthy successor.

Is it not strange, therefore, in a subject such as the study of design, enriched a thousandfold with the contributions of artist, author, architect, and archaeologist, that no single volume has placed before the modern designer the pure elements of decoration systematically arranged for quick and convenient reference? In his interest, this present handbook is undertaken.



The language of the designer, like the language of the writer, is vast in scope and complex in its ramifications. The communication of our thoughts by means of a written language constitutes a peculiar art which, like other arts, cannot be acquired in any degree of perfection, but by a complete mastery of the fundamental elements and by long-continued practice of their use. Some there are more highly endowed than others with a facility of expression, and naturally gifted with greater powers in the field of literature; but to none is it at all times an easy process to embody, in exact and appropriate language, the various ideas that are passing so swiftly through the mind. However distinct may be our views, however vivid our conceptions, we cannot but be conscious that the phraseology we have at our command is inadequate to do them justice. We seek in vain the words we need to portray our thoughts and sentiments. The appropriate terms, notwithstanding our utmost efforts, cannot always be conjured up at will, and we are driven to the employment of a set of words and phrases either too general or too limited, too strong or too feeble, which miss the mark at which we aim.

To assist him in overcoming these deficiencies the writer has at his disposal the use of many aids—the grammar and rhetoric to correct his form and improve his composition, the dictionary to supply the true meanings of words, and the thesaurus to provide short-cuts to associated ideas and their means of expression. These, like the tools of any craftsman, are essential working instruments.

Let us consider the case of the designer. Let us observe how this analogy between writer and designer may be further

drawn, by noting some major differences between the two. Instead of the writer's "twenty-six soldiers of lead to conquer the world," the designer has to command a bewildering array of simple character forms, geometric shapes, signs and strokes. In place of set and arbitrary rules for the combination of letters into word-forms, the designer has the freedom to modify existing forms, no matter how basic or fundamental. Should he choose to disregard convention, creating new motifs out of the fertility of his mind, only the degree of his own intelligence and ingenuity can limit resulting forms.

In this boundless realm of multitudinous shapes the designer is apt to find himself at sea. If he possesses rare collective faculties, a legion of thoughts will serve him in his greatest need. Others, less fortunate than he, must struggle to recall those many characters that constitute the designer's vocabulary. But to both skilled artist and novice, some reference to outside sources will be of benefit. Where shall one turn for such a grammar, or thesaurus of kindred forms?



In any handbook for ready reference, classification of material is of prime importance. The author's aim in devising the present plan was to obtain the greatest practical utility. Accordingly, such principles of arrangement were adopted as appeared simplest and most natural for organizing a heterogeneous mass of illustration. A necessarily arbitrary grouping follows, in the absence of any previous scientific classification, proceeding generally from simple to higher forms as

indicated in the fifteen main divisions in the table of contents. Starting with the circle, for example, a number of examples are shown based upon variations in size, "color," subdivision, and combination. From the complete circle and its related arrangements, subdivisions into segments and sectors are next shown. And then follow devices in which circular forms are multiplied by integral relationship. This, broadly speaking, is the simple plan by which each element has been developed into a family of affiliated characters.

Certain designs, by nature of their construction, may be shown in one of several divisions. The triquetra, definitely tri-radial in form, is composed of circular arcs, and might be classified with circular variants. The guilloche, another rounded form, has been exhibited with the group of interlacements instead of circular variants. No hard and fast rule for these decisions has been followed except that of greatest usefulness. Such a procedure, while hardly scientific and open to much criticism, is nevertheless a safe guide where quick service is a consideration. The author has had to face the alternative of following a rigid academic outline, or a flexible one best suited to the purpose. Again, the designer's needs have dictated the author's course, and have controlled the final selection and sequence of plates.

In the selection of illustrations, it will be found that a greater variety of simple elements, such as the circle, square, and diamond, has been shown than of more complex forms. Essentially, the same principles of permutation and combination will govern the multiplication of these higher forms; but rather than approach infinity with the number of designs

shown, it has been deemed expedient to represent in greater variety only the simpler motifs shown in the earlier sections of the book. Repetition has been avoided, yet examples have been shown in sufficient number to stimulate thought and individual expression. Readers and critics may differ with the author in the judgment exercised; but he feels confident that if the lessons and principles of design which the many variations exhibit are studied diligently, the purpose of this volume will have been achieved.

Many of the examples may seem closely to resemble neighboring motifs. Where this is true it is suggested that the reader examine the respective devices, noticing particularly such changes in form as have been accomplished by an enlargement of one or another of its members, an outline treatment of some portion, or a reversal in "color" value. The author has treated of this last-named property at some length in the group of snow crystals. These pages are arranged in pairs, the right-hand side exhibiting a set of forms drawn black on white, the left showing its counterpart, white on black. The two groups show a negative and positive of the same motif and hence afford many interesting lessons for observation.

The use of over eighteen hundred illustrations appearing in this volume has resulted from a close study of those art cultures of the past wherein the geometric and abstract phase of design have been dominant. The arts of design in ancient Egypt, Greece, Arabia, and Japan have contributed liberally to the material upon which this work is based. Relatively few of the motifs are of the author's own invention. He has

endeavored to present common property in a strictly impersonal way, relying more upon the order of presentation and system of arrangement for whatever claims to originality this work may possess. His greatest debt he acknowledges to that splendid system of Japanese heraldry that inspired this study, and without whose basis this handbook would still have been in its formative stage.

The matter of correct nomenclature has presented many unsuspected difficulties. The author has sought to give the proper terminology by which the many elements are known. It has been found that not only is there a wide divergence of opinion depending upon books consulted, but that in many cases there were no accepted terms whatever. This has served to impose an added burden of responsibility upon a task undertaken for other purposes, and the author has attempted solution of a vexatious problem in a most direct manner. As an illustration typical of the confusion met with let us examine the names for the common swastika. This motif is variously called *sauvastika*, *tetraskelle*, *fylfot*, *gammadion*, and *gammata*. If one refers to Adeline's Art Dictionary, he will find no mention of *swastika*, since the popular English equivalent is the word *fylfot*. This condition becomes more trying as we seek to label forms of lesser usage. The *triskele*, *triskelion*, *triquetra*, *triquetrum* and *trinacria*, to cite one group, are hopelessly intermingled in their definitions in various books, and there is no final authority for the correct meanings. If the designations herein used do not meet with universal approval, it is hoped that some learned group will authorize a

new dictionary of art terms that will set at rest the common misunderstanding that has existed for centuries.



A number of friends have very graciously assisted in the production of this volume. The author is especially indebted to Alexander Lindey and Albert Schiller for invaluable editorial aid, and to Talbot Hamlin for his kindly cooperation in supplying the foreword. Ordway Tead and Arthur Rushmore, representing the whole-hearted support of the publishers, by their helpful suggestions and patient endurance, have shared faithfully in the production of this work. Ernest Clement and Ryusaku Tsunoda of the Japanese Culture Center, Columbia University, have assisted with textual transcriptions of Japanese motifs. To all these and a score of willing craftsmen who have labored to fructify this work, the author extends his sincere appreciation.

C. P. H.

NEW YORK, N. Y.  
OCTOBER 20, 1931

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## ABSTRACT DESIGN

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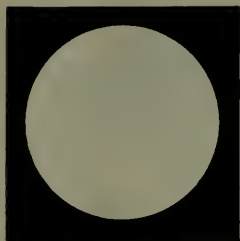
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Simpson, William, The Trisula Symbol  
Webber, F. R., Church Symbolism



## The Circle



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## The Circle



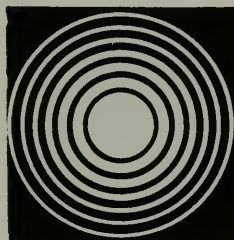
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# The Crescent and Its Combinations



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# The Sector and Its Combinations



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# The Sector and Its Combinations



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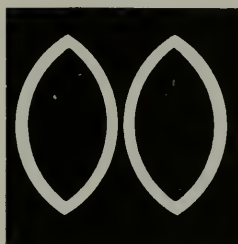


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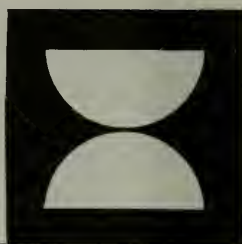
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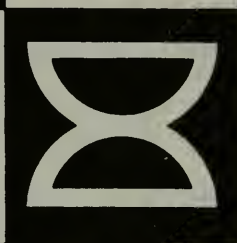
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## The Segment and Its Combinations



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## The Segment and Its Combinations



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## The Circle and Its Subdivision



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## The Circle and Its Subdivision



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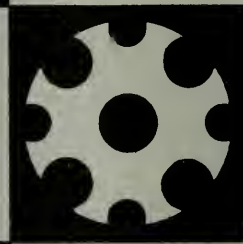
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## The Circle and Its Combinations



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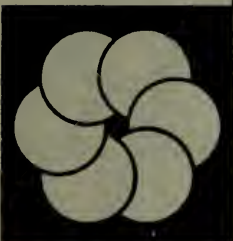
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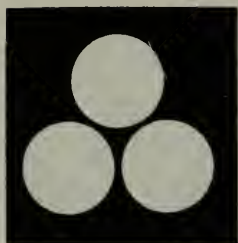


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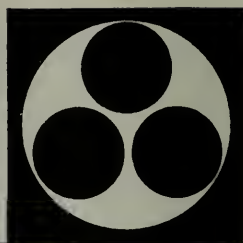
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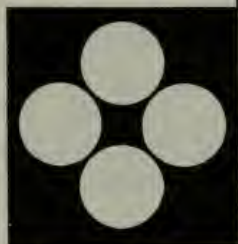
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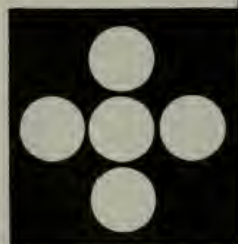
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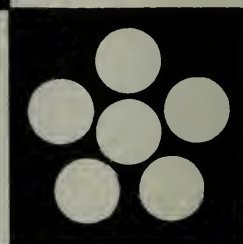
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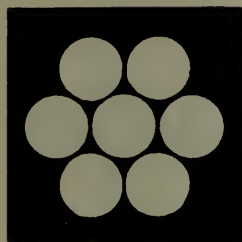


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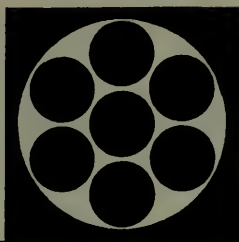
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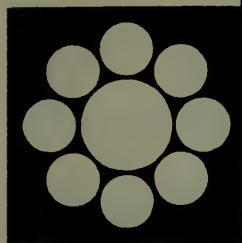
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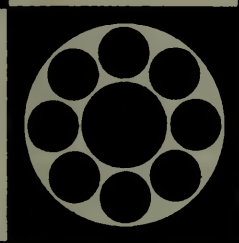
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## The Circular Variant



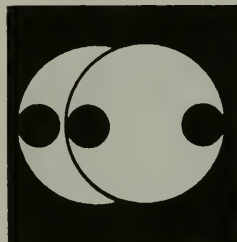
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## The Circular Variant



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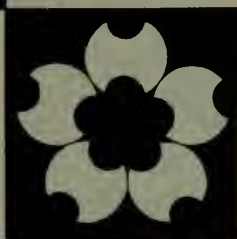
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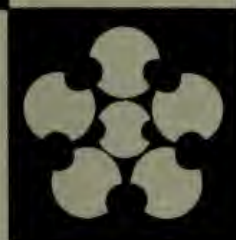
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## The Ring and Its Combinations



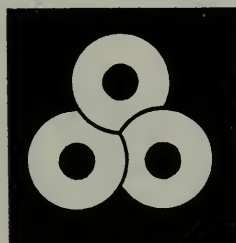
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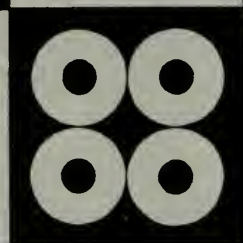
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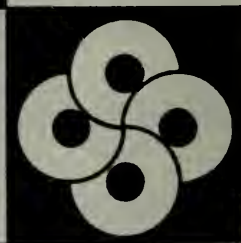
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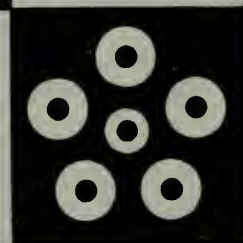
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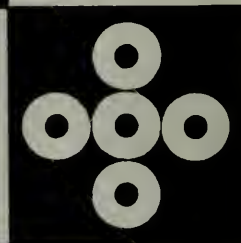
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## The Ring and Its Combinations



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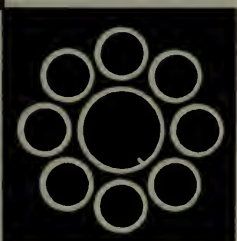
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## The Ringed Interlacement



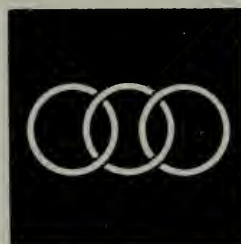
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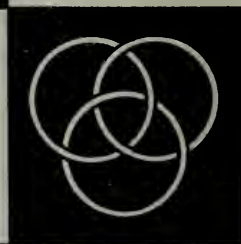
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# The Ringed Interlacement



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# The Ringed Interlacement



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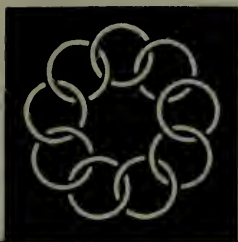


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## The Ringed Interlacement



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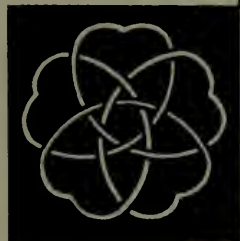
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# The Ringed Interlacement



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# The Trefoil, etc.



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# The Quatrefoil



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# The Quatrefoil, Cinquefoil, etc.



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# The Line and Band



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# The Band Encircled



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## The Band Encircled



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# The Band Encircled



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# The Band Encircled



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## The Band and Its Variants



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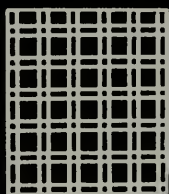
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## The Plaid



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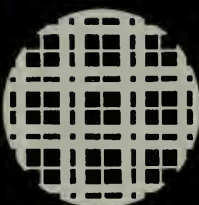
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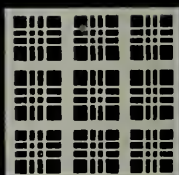
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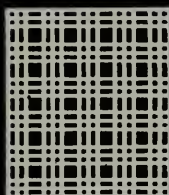
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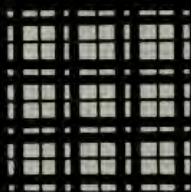
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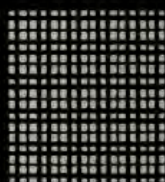
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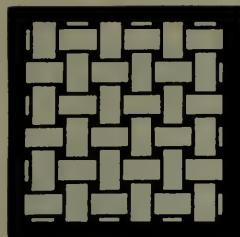
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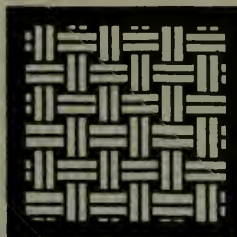
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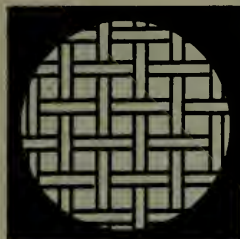
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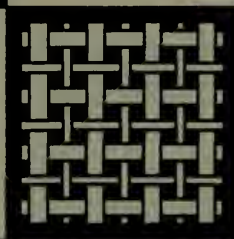
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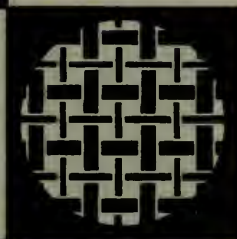
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# The Wavy Line



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## The Zigzag Line



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# The Triangle



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# The Triangle



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## The Triangle and Its Combinations



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# The Triangle and Its Combinations



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## The Triangle and Its Combinations



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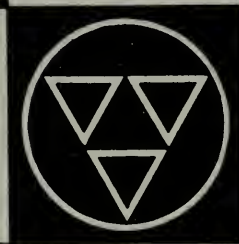
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# The Triangle and Its Combinations



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## The Triangle and Its Combinations



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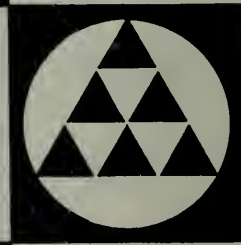
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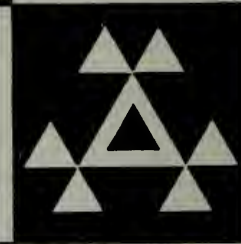
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# The Triangle and Its Combinations



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## The Triangle and Its Subdivision



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# The Triangle and Its Subdivision



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## The Triangular Variant



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# The Triangular Variant



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## The Double-triangular Variant



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## The Double-triangular Variant



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## The Arrow-head



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## The Arrow-head and Its Combinations



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## The Arrow-head and Its Combinations



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## The Arrow-tail and Its Combinations



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## The Arrow-tail and Its Combinations



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# The Chevron



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## The Chevron and Its Combinations



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# The Chevron and Its Combinations



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## The Chevron and Its Combinations



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# The Triangular Form



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## The Tri-radial Variant



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## The Tri-radial Variant



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## The Tri-radial Variant



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## The Tri-radial Variant



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# The Triquetra



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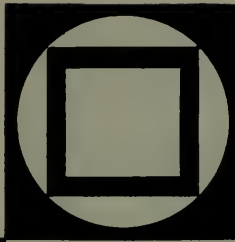


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## The Square



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## The Square



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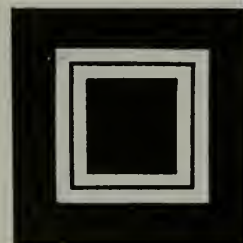
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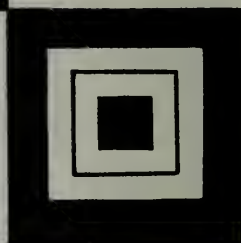
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## The Rectangular Variant



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## The Rectangular Variant



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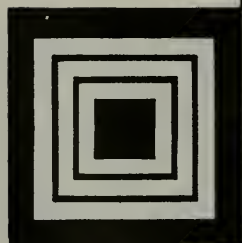
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## The Rectangular Variant



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## The Square and Its Combinations



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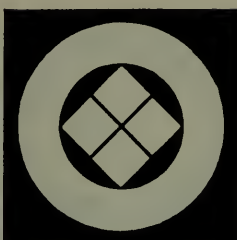
## The Square and Checker Combinations



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## The Rectangular Combinations



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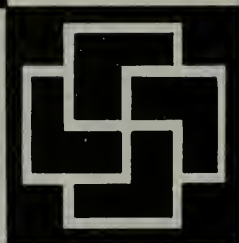
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## The Rectangular Combinations



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## The Rectangular Combinations



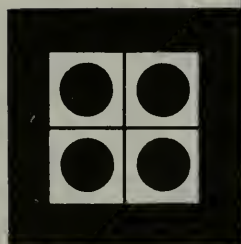
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## The Rectangular Combinations



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## The Rectangular Combinations



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## The Rectangular Interlacement



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## The Rectangular Interlacement



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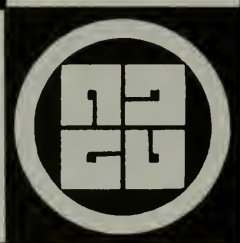
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## The Rectangular Group



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## The Rectangular Form



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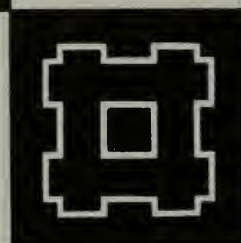
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## The Rectangular Form



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## The Rectangular Form



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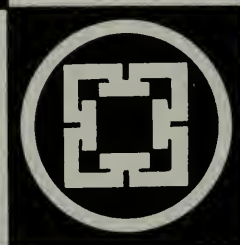
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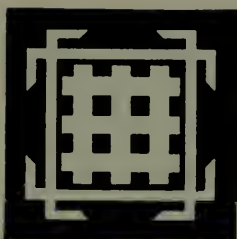
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## The Rectangular Form



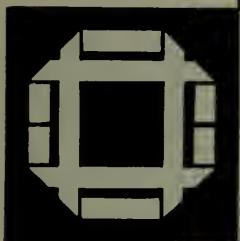
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## The Rectangular Form



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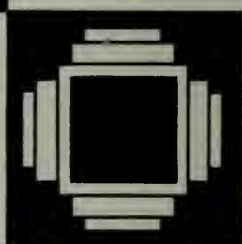
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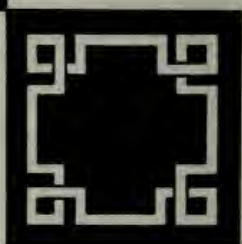
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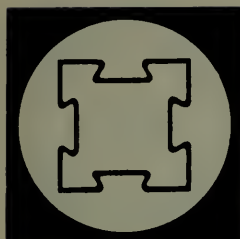


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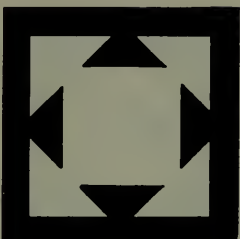
## The Rectangular Form



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## The Diamond



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## The Diamond and Its Variants



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## The Diamond and Its Combinations



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## The Diamond and Its Combinations



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## The Diamond and Its Combinations



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## The Rhombic Variant



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## The Rhombic Variant



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## The Rhombic Variant



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## The Rhombic Variant



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## The Rhombic Variant



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# The Cross



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## The Cross



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# The Cross



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## The Cross



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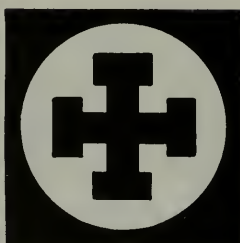


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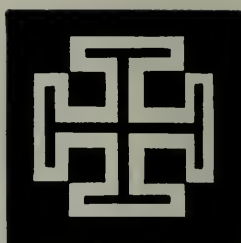
## The Cross and Its Variants



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## The Cross and Its Variants



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# The Cross and Its Variants



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# The Cross and Its Variants



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## The Cross and Its Variants



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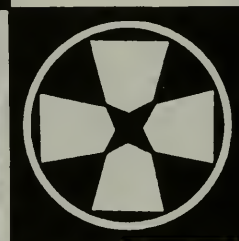
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## The Cross and Its Variants



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## The Cross and Its Variants



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# The Cross and Its Variants



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# The Cross and Its Variants



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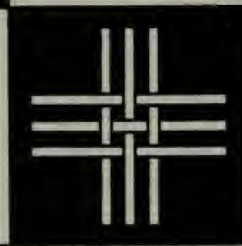
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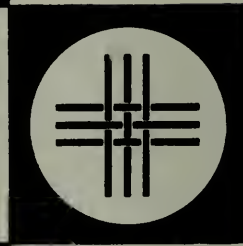
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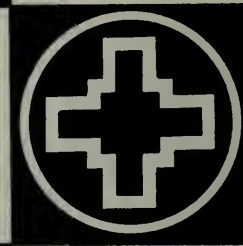
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## The Cross and Its Variants



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## The Cross and Its Variants



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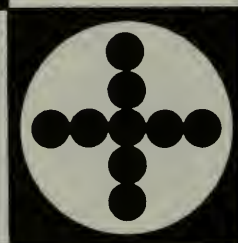
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## The Cross and Its Variants



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## The Cross and Its Variants



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## The Cross and Its Variants



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# **The Four-pointed Star, etc.**



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**1019**



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# The Four-pointed Star, etc.



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# The Swastika



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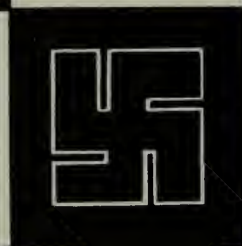
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# The Swastika and Its Variants



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## The Swastika and Its Variants



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# The Swastika and Its Combinations



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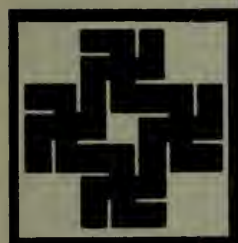
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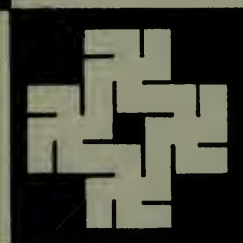
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## The Swastika and Its Oblique Variants



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## The Pentagon and Its Variants



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# The Five-pointed Star, etc.



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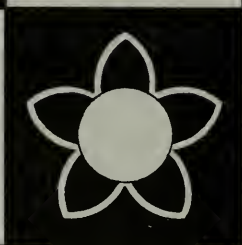
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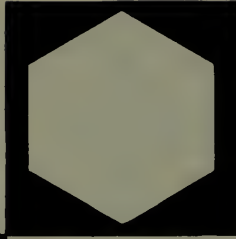


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# The Hexagon



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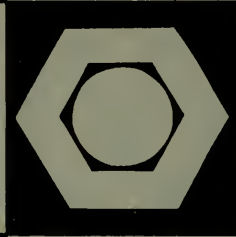
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## The Hexagon and Its Variants



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# The Hexagon and Its Combinations



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# The Hexagon and Its Combinations



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# The Hexagon and Its Combinations



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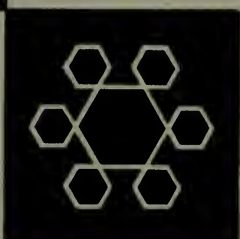
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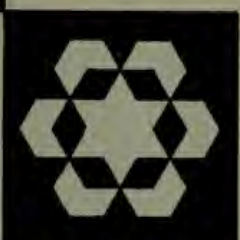
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## The Hexagonal Variant



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# The Hexagonal Variant



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## The Hexagonal Variant



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# The Six-pointed Star



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## The Six-pointed Star



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# The Six-pointed Star



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# The Seal of Solomon



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# The Hex-axial Variant



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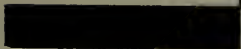
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# The Hex-axial Variant



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# The Hex-axial Variant



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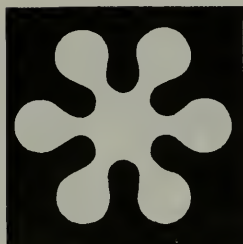
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## The Hex-axial Variant



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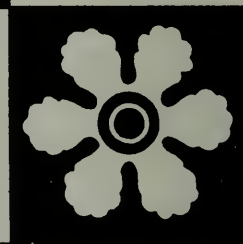
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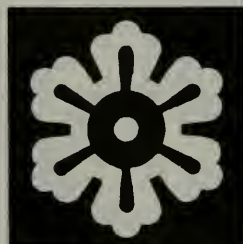
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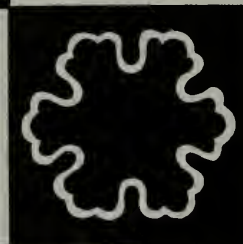
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**138**



# The Snow-crystal



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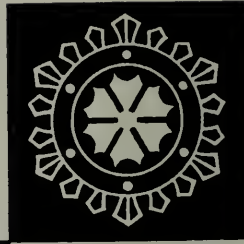
# The Snow-crystal



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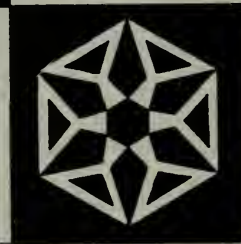
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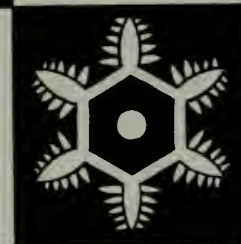
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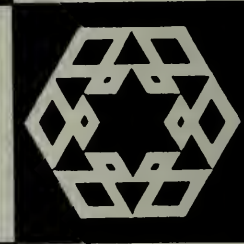
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# The Snow-crystal



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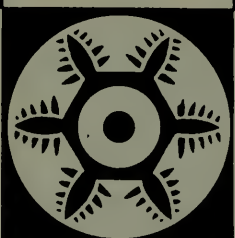
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# The Snow-crystal



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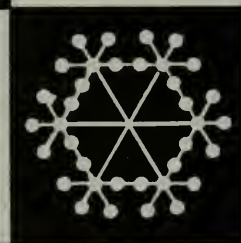
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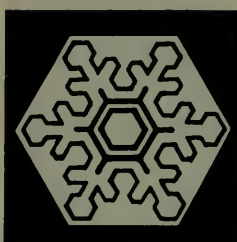
# The Snow-crystal



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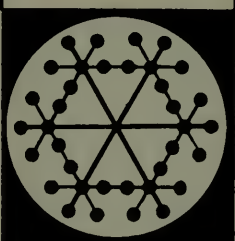
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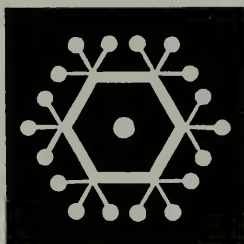


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# The Snow-crystal



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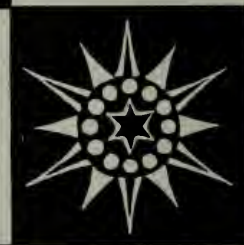
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# The Snow-crystal



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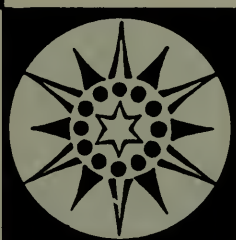
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# The Snow-crystal



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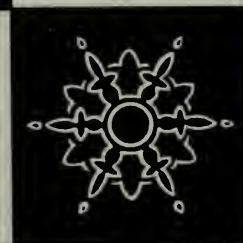
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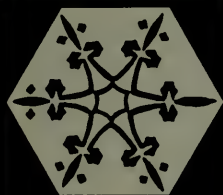


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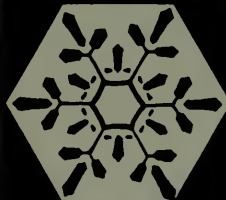
# The Snow-crystal



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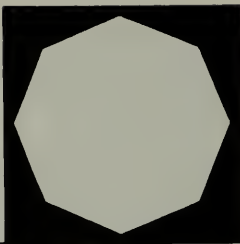
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## The Octagon



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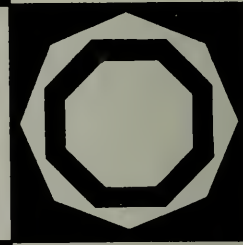
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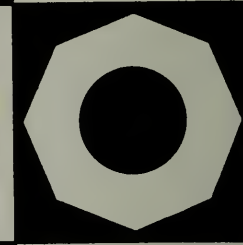
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## The Octagon and Its Variants



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## The Octagonal Form



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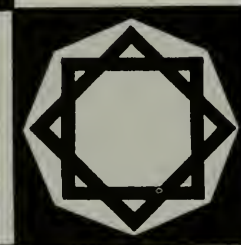
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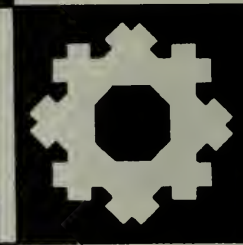
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# The Octagonal Form



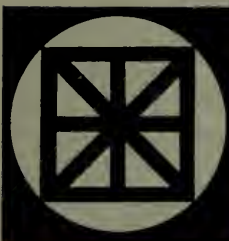
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## The Octagram and Eight-pointed Star



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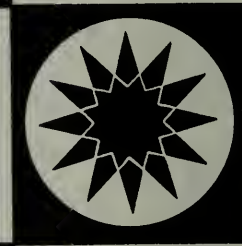
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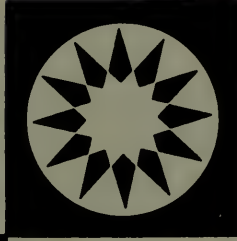


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# The Stellar Variant



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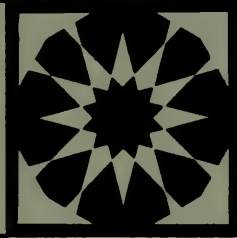
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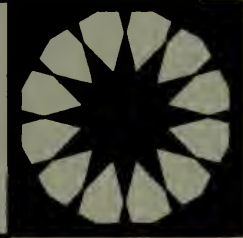
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## The Solar Variant



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# The Solar Variant



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## The Scroll and Its Combinations



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# The Scroll and Its Combinations



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## The Scroll and Its Combinations



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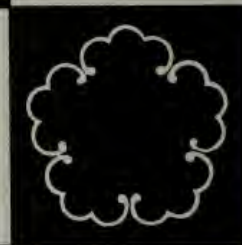
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# The Scroll and Its Combinations



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## The Spiral Scroll and S-scroll



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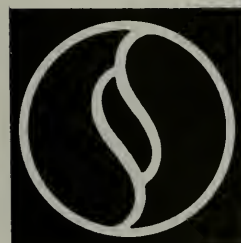
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## The Spiral Scroll



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## The Triskelion and Tetraskelion



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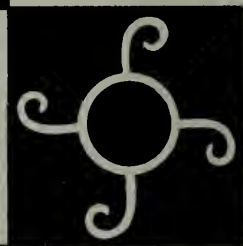
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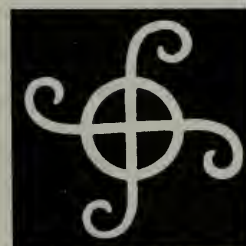
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# The Scroll-form and Its Combinations



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163

## The Wave Scroll



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# The Triskele and Its Variants



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## The Monad and Its Variants



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# The Triad and Its Variants



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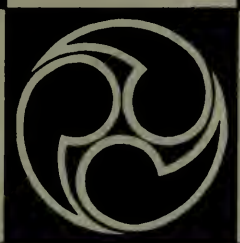
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## The Circular Enclosure



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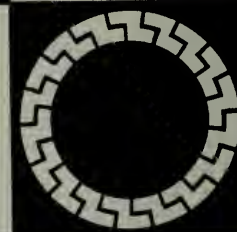
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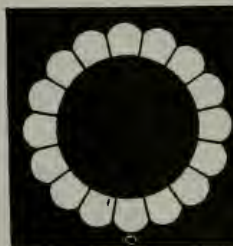
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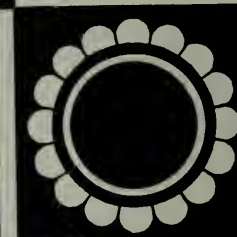
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## The Circular Enclosure



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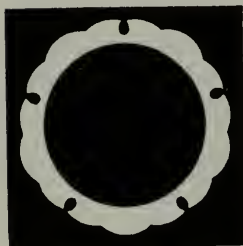


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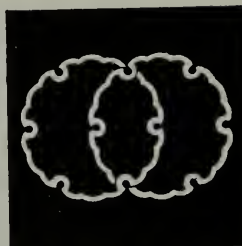


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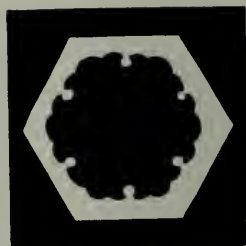
# The Curvilinear Variant



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# The Curvilinear Variant



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# The Loop and Guilloche



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# The Curvilinear Interlacement



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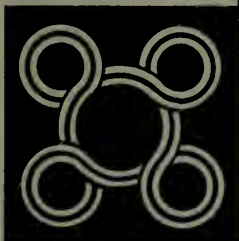
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## The Curvilinear Interlacement



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# The Interlacement and Its Variants



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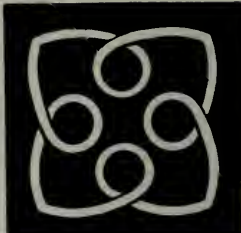
## The Interlacement and Its Variants



1576



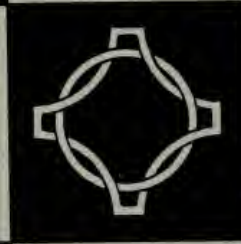
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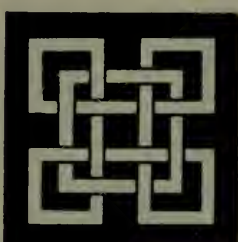
# The Rectangular Interlacement



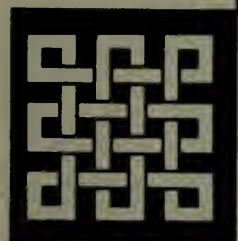
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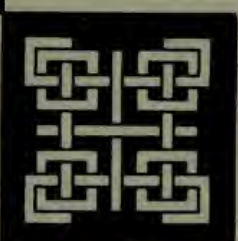
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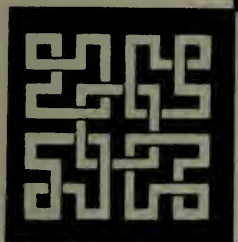
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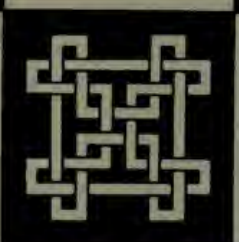
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## The Angular Interlacement



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# The Angular Interlacement



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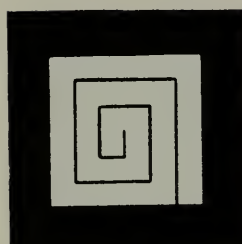


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# The Fret and Its Variants



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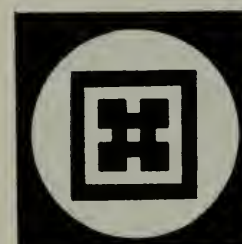
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# The Fret and Its Variants



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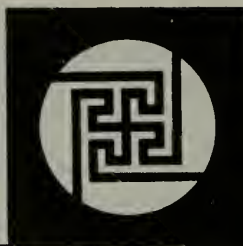
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# The Fret and Its Variants



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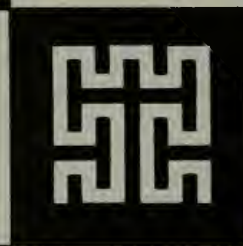
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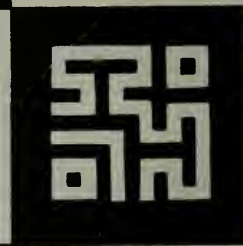
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# The Fret and Its Combinations



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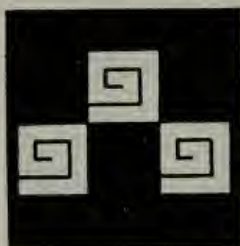
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# The Fret and Its Combinations



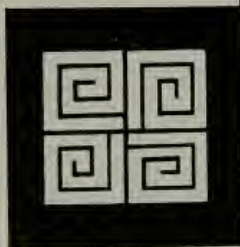
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## The Rectangular Subdivision



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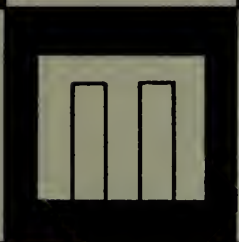
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# The Rectangular Subdivision



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# The Rectangular Variant



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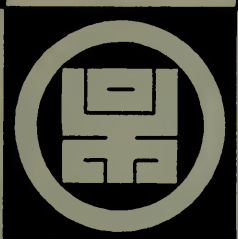
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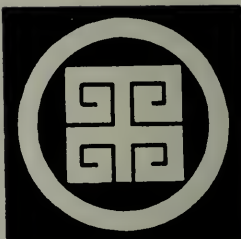
## The Rectangular Variant



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## The Shield and Its Variants



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## The Shield and Its Variants



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# The Shield and Its Variants



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## The Shield and Its Variants



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## The Shield and Its Variants



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## The Shield and Its Subdivisions



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## The Shield and Its Subdivisions



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## The Shield and Its Subdivisions



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## The Shield and Its Subdivisions



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## The Shield and Its Subdivisions



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## The Shield and Its Subdivisions



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## The Shield and Its Subdivisions



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# The Shield and Its Subdivisions



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## The Shield and Its Subdivisions



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# The Shield and Its Subdivisions



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## The Shield and Its Subdivisions



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## NOTES ON THE PLATES

**The Circle.** Plates 1-15. The circle is the simplest and most fundamental of all geometric shapes. Defined as a continuous, curved line, every point of which is equidistant from a central point, it forms the basis of an infinite number of shapes, forms, and patterns. By a process of multiplication, subdivision, and interlacement it is possible to produce devices in endless variety. These may well serve as a basis for combination with other shapes.

The subdivision of the circle is generally accomplished by the use of straight lines, or arcs, or any combination of these.

**The Sector.** The sector is that portion of a circle enclosed between two radii and the arc subtended.

**The Quadrant.** When the radii are at right angles the portion contained is called a quadrant.

**The Segment.** The segment is that portion of a circle enclosed between a straight line or chord, and the arc subtended.

**The Crescent.** When two circles intersect, as in Fig. 18, the exterior portions are called crescents, and the interior portion converging between two circular arcs is called a cissoid.

By describing circles that overlap one another, as in Figs. 91-97, and by describing circles to intersect each other, as in Figs. 73-90, 98, and 99, interesting variations can be obtained. In some cases the overlapped portions have been treated in black, resulting in a reversal of color called counterchange. Figs. 76 and 78 are simple examples of this device.

The circular form occurs frequently in nature. The sun, the moon in its varying phases, the constellations, the rainbow, annular rings, the pearl, the sunflower, the orange, the berry, and concentric ripples in still water are but a few of the most common manifestations.

Being without beginning or end, the circle has always symbolized eternity. It is also a symbol for the feminine principle in nature, completeness and perfection. In varying forms it is interpretative of the four elements: with a dot in the center it represents air; with a horizontal dividing line it represents water; with a cross dividing it into quarters it represents the earth; of itself it represents fire. From earliest times, because of its solar significance, it has been used by the savage and primitive to denote spiritual power. The Egyptian hieroglyph of the sun god was a point within a circle—Fig. 5. This most sacred device of the sun worshiper may have typified the seed within the egg, the "orphic egg," symbol of the universe, representing the globe of the sun floating in space surrounded by the enclosing vault of the heavens. A point within a circle is still in use today as the astronomical sign for the sun.

**The Ring.** Plates 16-22. The use of rings or annulets, either superimposed, interwoven, or interlaced, gives rise to an infinity of design. Common to most art cultures, their origin no doubt may be traced to the early use of ringed bracelets and anklets worn for personal adornment. The circular chain was also a source of inspiration for the fascinating combinations that have been handed down through the ages. Three circles, of equal size, but interlaced, as in Figs. 160-165, were used early in the history of the Christian church to symbolize the Holy Trinity. Each circle is complete in itself, and at the same time shares a common portion with the other two circles. This central point is the heart of the symbol of trinity, and suggests the divine essence.

As we multiply the number of circles involved, the effect is that of a rosette, or petular formation, as in Fig. 185. Some of the figures displayed, as Figs. 170, 171, 187-189, are not true ringed forms, but their development is so obvious that they have been included as interesting examples. The forms on Plate 22 also spring from the same sources.

**The Trefoil.** Plates 23-25. The cloverleaf, or club form, called the trefoil (from "trèfle" in French) is seen in Fig. 200. It is another symbol of the idea of trinity, and is formed of

three lobes of equal size, yet one figure. The rims of these three circles, one above and two below, suggest the threefold aspect of life. Another variant of the trefoil contains an equilateral triangle enclosed, Figs. 199, 201, and 202, and still another is seen in Fig. 204, resulting from the combination of the trefoil and triangle by eliminating the interior lines.

**The Quatrefoil.** The quatrefoil, or four-lobed figure, resembles the "lucky" shamrock. It is formed by the intersection of the arcs of four circles, which may also be tangential, as in Fig. 216. In Fig. 211 a square has been interposed, and the interior lines eliminated.

**The Cinquefoil.** The cinquefoil, or five-lobed figure, Figs. 221 and 222, is a common decorative form since it resembles the five-foiled flower so frequently found in nature. In Figs. 223, 224, and 225 the six-pointed forms result from a double trefoil interlaced.

**The Line and Band.** Plates 26-31. A line, theoretically considered, and defined, is the result of projecting a dot in a given direction. It may be long or short, broad or narrow. But as the line increases in width, according to definition, it ceases to be a line and becomes an area. It is then called a band or stripe.

We shall disregard the true line in our present consideration, and be concerned with the properties and possibilities of the band. Lines may vary in direction. If they change their direction abruptly they become angular; if they change gradually, they become curved. The line may combine both of these characteristics and assume shapes of infinite variety.

The relationship of bands shown in Plate 26 may be varied, depending upon number, size, position, and termination. By placing these line groups into enclosures, as in Fig. 230, the character of the device may further be changed. In Plates 27-30 the band is shown in conjunction with the circle. Note how these designs supplement the circular variants shown in Plates 4 and 6.

**The Plaid.** Plate 32. The plaid is a pattern created by regularly spaced bands at right angles to one another. The resultant checkered effects may be endless in variety, depending upon the relationship and intervals between lines and bands. Where color is available, an infinity of patterns are the result. In Scotland, by means of an elaborate heraldry in plaid patterns, also called tartans, the Highland clans are variously represented.

**The Lattice.** Plate 33. The lattice, or basket weave, is the result of bands crossing over and under one another, either rectangularly or diagonally. The interlaced, all-over pattern may be varied by width of band, spacing, and alternation of band members.

**The Wavy Line.** Plate 34. The wavy line, Figs. 298 and 301, is formed by a succession of undulating, or elongated S curves. Fig. 300, another form usually associated with the wavy line, is shaped by a continuous and concurrent series of small semi-circles, or scallops, conjoined to each other. In heraldry, the former is called wavy, or undy, the latter enrailed, or invected. Both forms are obviously derived from water movements and have long been symbolical of it.

**The Zigzag Line.** Plate 35. The zigzag line is a regularly broken line, formed by angles which alternately project and retreat. In heraldry it is called indented, or dancette. It is one of the oldest and most persistent forms known to the decorative arts, and has always been considered a conventionalization of water. In Egyptian hieroglyphics it is the character sign for water.

**The Triangle.** Plates 36-45. The triangle is a plane, geometric figure having three sides and three angles. The equilateral triangle, Figs. 316-318, has three equal sides and angles, and is most useful in the decorative arts. The isosceles triangle, Figs. 319 and 320, has only two equal sides and angles, and may, from the stand-

point of design, be considered as an equilateral triangle that has been extended in one direction. Only the equilateral triangle has been used in displaying variations and subdivisions. Obviously, in an isosceles triangle the same changes can be wrought. Resultant effects will then become a distortion of the equilateral variants.

While the characteristics of the triangle have been studied very precisely from the earliest times and many mathematical theorems expounding its properties have been proven, it is not easy to define its many complicated meanings and applications. It is so mysteriously involved as a potent life symbol that it is both complex and uncompromising. Basically it represents three things, one above two, the two lower uniting to produce the higher, and thus it symbolizes the union of positive and negative forces, the Law of Life. The ancients seem to have grasped the idea of trinity—the threefold nature of the universe—the divine, the human, and the natural world. The triangle, very naturally, was the simplest form to express this conception, although many variants have evolved from it. The persistence of the triangle, then, from the earliest scribbles of primordial man, may be ascribed to the growth and acceptance of the trinity concept: the family idea—father, mother, and child; or again, the metaphysical idea—body, mind, and spirit, which find their graphic symbol in the triangle. In Egypt the form signified the feminine principle, or maternity, and was also the hieroglyph for the moon. To the Pythagoreans it was the symbol for wisdom, and to the Babylonians it represented the triad division of the universe, heaven, earth, and air. The triangle has been used so extensively in all ages and countries that to catalogue its many interpretations would go beyond the scope of these brief notes.

Figs. 349, 350, and 355, consisting of three triangles touching at a central point, represent an ancient symbol for the Godhead. It has no authentic name, however. In Fig. 358, where three triangles overlap, the forms seem to project from the surface of the plane and take on a third dimension. Figs. 382 and 384, each consisting of five scalene triangles grouped about a central point, exhibit a definite suggestion of rotary motion; compared to these, notice how static the symmetrical devices appear. Fig. 386, consisting of six equilateral triangles arranged about a hexagon, resembles Solomon's Seal. (See Plate 134.)

Plate 44. When the triangle is divided into three equal parts by placing the Y fork, or furca, over the midway points of the sides, as in Figs. 388-393, three quadrilateral forms result. By placing the fork over the three angles, as in Figs. 391, 393, 394, and 396, three isosceles triangles result.

**The Triangular Variant.** Plates 46-49. An important triangular variant is produced in Plate 46 by making the sides convex, and in Plate 47, Figs. 415-417, by making the sides concave. In Figs. 418-421 the three-pointed star is produced by indenting the triangular sides.

In Plates 48 and 49, by placing two equilateral triangles end to end and overlapping the apexes slightly, a new form is produced with all the properties of the triangle. It resembles a conventionalization of the hourglass. In Figs. 427-429 it is seen with a crossbar through the center, a familiar figure to be found in Japanese family badges. Fig. 431 is an ancient Saracenic talisman in which the upper triangle represented the water triangle of kindness and nobility, while the lower one, the fire and the wrath of God.

**The Arrow-head.** Plates 50-52. The arrow-head, while not a pure geometric form, has all the characteristics and properties of the triangular motif. A number of variants are shown on Plate 50, and combinations of these on Plates 51 and 52. The arrow-head has been in use since early times, in decorations by the savage and his civilized successor. Originally it was associated with the idea of warfare, or to mark direction, but in later usage its pictographic significance was lost.

**The Arrow-tail.** Plates 53 and 54. The arrow-tail, or feather-tail, like the preceding motif, does not strictly conform to the triangular classification, but has, for practical uses, an interest in its present position. The arrow-tail is an irregular polygon derived



from a conventionalization of the feather-tail. It also resembles the semaphore signal. The examples shown are based upon Japanese family crests.

**The Chevron.** Plates 55-58. The chevron is a simple, symmetrical V shape that may be regarded as an equilateral or isosceles triangle in which the third side has been removed. The chevron, repeated, bordered, interlaced, and diapered has always been a useful motif in surface decoration. In British and French heraldry it is the ordinary most popularly used, and has many variant forms. The term is derived from the French word, *chevron*, meaning a rafter, or gable. Most generally, the angle of the chevron is between 60 and 75 degrees, although there is no definition to prevent freedom in its shape. Since the Middle Ages, when house and holding marks developed so extensively, the chevron, because of its ease in marking and application to material, has been used to designate ownership and rank. Its military significance on uniforms, Fig. 520, is probably an outgrowth of this early usage.

As a form frequent in Japanese heraldry, Figs. 492, 493, and 496, it represents a mountain in profile.

**The Triangular Form.** Plate 59. These figures represent but a few simple variants built upon a triangular basis, whose number and possibility of variation are endless. The conforming shape is triangular, as are most of the resultant parts. Rhombic and star forms are produced in the details, as in Figs. 529 and 531, where the triangular forms overlap.

**The Tri-radial Variant.** Plates 60-63. Three is the smallest number of radiating axes by which an area or enclosure can be divided. It gives rise to a number of devices, shown on Plate 60, similar in form to those already encountered in Plates 44, 52. On Plate 61, is shown another tri-radial group possessing a strong suggestion of rotary motion. The triquetrum, Figs. 541-543, achieves this by following the skirl form based upon a number of curved radii facing in one direction. The wheel is one of the oldest symbols of the occult power of the sun. Among the Hindus and Buddhists the turning of the wheel represented rebirth. The rays of the wheel uniting in a common centre symbolized divine unity.

On Plate 62, Figs. 550, 551, and 553, are shown variants of a form called the sign of Trinacria. Originally derived from three triangles whose third side had been removed, this figure is another excellent example of motion achieved around a central point. A later evolution of this ancient symbol develops three revolving legs, but it is interesting to note that the plain geometrical figure precedes the swing to realism.

**The Triquetra.** Plate 64. The triquetra is a mystical three-pointed motif derived from three equal arcs of circles arranged in continuous fashion. It is simple in form, ingenious in design and full of significance. It is a symbol of Trinity, expressing the unity of divine essence, eternity, and indivisibility. Each pair of arcs forms a vesica, the symbol of glory.

**The Square.** Plates 65-69. The square is a rectilinear figure having four equal sides and four right angles. It may be divided in many ways: diagonally, it yields either two or four right angle triangles; laterally, through the mid-ports of the sides, it yields four squares. It may be variously divided by means of arcs and angles. A study of the properties of the square is best obtained by a study of its component parts, principally, the triangle. For this reason, the square seldom enters into the theorems of plane geometry.

The square is the simplest form in which bi-symmetric arrangements can be observed; as such it is related to the most important of bi-axial motifs, the cross. The square inscribed within the circle, Figs. 578, 583, 585, etc., and the square circumscribing the circle, as in Fig. 582, gives evidence of a strong fraternity between these two primal geometric forms.

The variants to be found on Plates 67 and 68 are familiar to all. They suggest with what ease the quadrilateral form may be generated into figures of interest and

variety. These, as well as practically the entire group of rectangular variants and combinations, are derived from Japanese heraldry.

The applications of the square, and its manifold interpretations, are as varied as the form itself. It is a worldly figure and is emblematic of the four corners of the earth. Hence, in the Buddhist stupa, representing the elements of the universe, the square, or earth form, constitutes the base upon which all the others rest. Its host of meanings include: the elements, the heavens, the four Evangelists, the four points of the compass. It has entered into the colloquial language to a greater extent than any other geometric form. Thus, we refer to "four square," "fair and square," doing business "on the square," and "squaring up" one's accounts. The rigid uprightness of the square has become a beautiful symbol, much readier of comprehension than most other decorative elements.

On Plate 69, Figs. 616-618, and on Plate 76, Figs. 676, 677, and 679, are to be found squares that have been divided diagonally so that the triangular parts are quite obvious. These figures are based upon Japanese conventionalizations of the rice measure. On Plates 77 and 78 are a number of devices in which open squares are interlaced with one another. It is a characteristic of the interlacement that its line is continuous, and that in its successive overlappings it first goes over and then under the secondary member. Figs. 694, 695, 697, and 698 are worth special study for the variations that are obtained through weight of line or band. Fig. 698, while belonging generally to this group, is not so typical of the interlacement since its compact form destroys the usual properties of the interlacement.

On Plate 72 will be found a number of devices composed of rectangular forms. Figs. 640-642, each, consist of two rectangles placed over one another. Fig. 643 is derived from five squares of diminishing size, each inscribed obliquely within its next larger one. Figs. 646-648 result from four or eight squares overlapping and generating from a central point. In the four-combinations, a swastika is to be seen at the center.

On Plates 80-82 are some rectangular forms based upon an ancient Japanese device to be found in heraldry. It is a conventionalization of the well-frame, and is an excellent example of how well the Japanese can produce an abstract figure based upon common forms.

**The Cross.** Plates 96-113. When two lines cross each other at right angles, so that the four arms are of equal length, the resulting form is called a cross. This is the simplest geometric form in which the cross exists, but the variations both in structure and detail are so innumerable that a very broad view of the subject has been taken in the examples shown. Crosses are also formed by having two or three crossbars bisected by a vertical member, and in some rare instances these are not always at right angles, so that the definition of the term is quite elastic.

The cross (Latin *crux*, French *croix*) appears so extensively as the most important and holiest of symbols that we may well simplify the study of its varied forms by classification into three general historical periods. The first period, including all ancient and pagan uses of the cross, dates from about 4000 years before Christ. The very simplest and crudest forms are to be found in this period. The second, or early Christian era, continuing to about 900 A.D., is marked with many interesting variants; while the third period, the late Middle Ages and period of the Crusades, is notable for many richly decorated variations. The history of the cross has been the subject of some 300 volumes. It is not the province of this brief text to supply any small part of it, but merely to touch upon the general significance of the cross, and to identify some of the individual illustrations shown in the plates.

The cross appears in the most widely separated places and remote corners of the earth. It was used by primitive man as an emblem and reappears in the many civilizations that followed. Whether in China, Egypt, Peru, or Patagonia, its symbolism is always associated with reverence and spiritual power; but its greatest prevalence



appears with its adoption by Christianity as the exalted emblem of Life Everlasting.

As a cosmic symbol, the cross represents the four quarters of the earth or universe. It may have been derived originally from two crossed sticks, the figure of a bird in flight, or the human figure with outstretched arms. Its ancient source is pure conjecture—we only know it has always meant life. To the ancient Chinese the cross within a square formed the symbol for an enclosed space of earth, and the simple cross occurs as a sign for earth in certain ideographic groups. This device is handed down to us in many ways and appears on many real estate documents today. Also, as an indicator at crossroads, the traveler is familiar with the cross in signposts and railroad warnings. The illiterate, to this day, uses the cross to indicate his signature.

The ancient Tau Cross, an alphabetical sign, is explained by its resemblance to the Key of Life or Crux Ansata, known popularly as the Egyptian Cross. On all sculptures and reliefs, this sign invariably accompanies the Egyptian deities, and on tombs and sarcophagi it signified the immortality of the soul. The Tau Cross, among the ancient Irish, expressed wisdom, and the Mexicans used it to signify the Tree of Life, and fertility.

The heraldic cross originated during the period of the Crusades, when banners, standards, and shields were richly emblazoned with holy insignia, and accessories. The many variants may first have been born of geometric necessity in the partitioning of the shield, but doubtless this need was strongly associated with the Sacred Cross itself. Whatever its history and source, the heraldic cross and its many forms constitute one of the brightest spots in the study of decorative devices.

The following brief notes give the names of most of the illustrations shown in this section.

Plate 96. Figs. 856, 857, Latin Cross, or Crux Immisso.

In heraldry, the Passion Cross. Figs. 858, 859, similar to the Lorraine Cross, inverted. Figs. 861-863, Tau Cross, St. Anthony's or Egyptian Cross. Crux Commissa (in Roman times).

Plate 97. Figs. 864-866, Patriarchal Cross. Figs. 867, 868, the eight-ended cross of the Russian Orthodox Church. Fig. 870, Papal Cross, or Triple Cross of the Western peoples. Figs. 869, 871-873, Greek Cross, or Crux Immissa Quadrata, its four arms being of equal length.

Plate 98. These figures are taken from Japanese heraldry. The cross within a circle. Figs. 874-877, 879, and 881, are intended as a sign of the earth quartering in four directions. It is also the character denoting ten.

Plate 99. Figs. 883-891 are variants of the Cross Saltire, or St. Andrew's Cross, named after the patron saint of Scotland. Also called Crux Decussata. When the form appears, as in Figs. 886 and 887, it is called the Cross Voided; when, as in Figs. 888 and 890, it is called the Cross Interlaced.

Plate 100. Figs. 892 and 893, the Cross Potent, or Jerusalem Cross, formed of four Tau Crosses joined. Figs. 894, 895, variations of the foregoing, taken from Japanese heraldry. Figs. 897-900, Cross Crosslet, or Holy Cross; also called German Cross. Fig. 896, Cross Crosslet Saltire, or St. Julian's Cross.

Plate 101. Figs. 901, 902, Cross Degraded. Fig. 903, Cross Degraded, Quarterly-pierced. The latter phrase may be applied to any form of the cross with a square hole the full width of the arms at their intersection. Fig. 904, Cross Potent Quadrate, or St. Chad's Cross. Fig. 905, Crusader's Cross Saltire. Fig. 906, Crusader's Cross, or Jerusalem Cross—also called Cross Cantonnée, which phrase designates any large cross closely surrounded by four smaller ones of similar design. Figs. 907, 908, Cross Potent as central unit, Cantonnee. Fig. 909, Cross Potent Voided.

Plate 102. Figs. 910, 912, Cross Double-Fitchée. Figs. 911, 915, Cross Double-Fitchée Voided. Figs. 913, 914, 916, 917, Cross Aiguisée.

Plate 103. Figs. 919, 920, 921, Maltese Cross variants. Also called Cross of Eight Points. Figs. 922, 923, Cross Patée. Fig. 924, Maltese Cross, the indented ends

representing a heraldic version. Figs. 925, 926, Cross Patée Convex. Fig. 927, Cross Patée Convex Voided.

Plate 104. Figs. 928, 930, Cross Potonce. Fig. 929, Cross Fusilée. Figs. 931, 932, Cross Fusilée Voided. Figs. 933, 934, Cross Barbée. Fig. 936, Cross Barbée Voided.

Plate 105. Fig. 937, Cross Patée. Figs. 938, 942, Cross Patonce Voided. Fig. 939, Cross Vair. Figs. 940, 941, Cross Patée Fitchée. Figs. 943-945, Cross Fleurée.

Plate 106. Figs. 946, 947, Cross Moline. Fig. 948, Cross Moline Voided. Fig. 949, Cross Pommée. Fig. 951, Cross Pommée Voided. Figs. 952, 954, Cross Bottonnée, or Cross Trefflée. Fig. 953, Cross Recerclée.

Plate 107. Fig. 955, Cross Cercelée. Figs. 958, 959, Cross Fourchée. Figs. 960, 963, Cross Millrine. Fig. 962, Cross Potent Convex.

Plate 108. Figs. 964, 966, Interlaced Cross. Figs. 965, 967, Cross Voided. Figs. 968, 969, Triparted Cross. Fig. 970, Cross Wavy Voided.

Plates 109 and 110. Miscellaneous forms. Figs. 974-984 derived from Japanese heraldry. Fig. 985, 986, Cross of Four Fusils, or elongated lozenges. Figs. 988, 990, Cross Demi-sarcelled. Fig. 989, Cross Bezant.

Plate 111. Figs. 992, 993, Cross Lambeau. Figs. 994, 996, Celtic Cross, Irish Cross, or Cross of Iona. Fig. 995, a device resulting from the double crosses, Greek Cross and Cross of St. Andrews, superimposed. Figs. 997, 998, The Double Cross, or Chrismon.

Plates 112 and 113. Figs. 1000, 1001, Egyptian Cross, or Crux Ansata. Figs. 1002-1008, variants of the ancient Anchor Cross. Fig. 1012, Cross Entrailed. Figs. 1016, 1017, Cross Cramponée. Similar to the swastika, except the arms are shorter.

**The Four-pointed Star.** Plates 114 and 115. The four-pointed star, or Cross Etoile, is the simplest of the stellar variants. It is bi-axial in construction, and, like the cross, is capable of innumerable variations. Fig. 1018 is the simplest of the variants shown, and it is easy to see why the four-pointed star is generally used to indicate the points of the compass.

**The Swastika.** Plates 116-120. The swastika is generally considered a form of the cross whose extremities are bent back at right angles. This popular device is known by many names, probably because of its widespread distribution throughout the ancient world. From the Sanskrit word, it may be freely translated into "it is well" or "so be it," implying acceptance and denoting life, movement, pleasure, happiness, and good luck. The Anglo-Saxon name is *fyfot*, from "fower-fot," or "four or many-footed cross." It is also called the gammadion, and Crux Gammata, owing to its being composed of four Greek gammas. The word *tetraskelos* refers to a particular rounded form, Figs. 1063, 1065. In heraldry the swastika is variously known as "Croix Gammée" and "Croix Cramponnée." Theories and speculation as to the origin of the swastika are conflicting. To trace its checkered career would involve a geographical and historical survey of the many countries of the world. This mystic symbol, common to both eastern and western peoples, seems to appear and reappear consistently, yet always is its significance one of happy omen. Reverenced in India some 3000 years before Christ, as a charm against evil, its influence has lasted to this day. In China it has meant perfection, infinity, many blessings. In Japan, where it is called the *manji*, it represents the number ten thousand, which symbolizes that which is infinite, perfect, and excellent. It is employed as a sign of felicity. It has been found in Persia, Italy, Greece, Cyprus, England, France, and Scandinavia. In America it is found in prehistoric burial grounds in such distantly separated lands as Mexico, Yucatan, Paraguay, and the United States. From the earliest times this famous sign undoubtedly indicated the rotation of the heavens, expressed the power of the sun gods, sky gods, and rain gods, and symbolized all harmonious movement springing from a central source. It is not unreasonable to imagine it as an early ideograph of the sun's disk as a circle with axial motion achieved by the direction of the arms, Fig. 1058. Thus it indicated the daily movement of the sun, and perhaps also the annual change of the seasons.

The many interpretations assigned to the swastika are indeed bewildering. The scholar may trace its history in order to comprehend the power of ancient symbolism. But for the sake of brevity we may conclude by saying that in modern times it is best known as a symbol of motion, good fortune, health, and long life.

Plate 119. Figs. 1066 and 1068 show a device consisting of two facing swastikas. Note the Latin Cross formed in the central axis. Figs. 1069 and 1071, consisting of four swastika forms joined around a central square, are interesting for the complex axial motion produced.

**The Pentagon.** Plate 121. The pentagon is a plane figure having five equal sides and angles. It is not so frequently used in design as the even-numbered polygons because of the difficulty of construction. However, owing to the prevalence of five-pointed forms in nature, it has served as the basis for a number of designs.

**The Five-pointed Star.** Plate 122. The five-pointed star is a regular plane figure, formed by joining the alternate points of five points placed at equal distances on the circumference of a circle. As a continuous interlacement, shown in Fig. 1091, it is called the pentacle, or pentagram, and becomes an important element in the history of magic and witchcraft, with many mystic interpretations. It is an ingenious development used in ancient times by the Pythagoreans and others as the pentalpha, an emblem of perfection. This sign was also regarded as a protective fetish, and was frequently worn as an amulet.

**The Hexagon.** Plates 123-130. The hexagon is a plane, geometric figure, containing six equal sides and angles. It is important because of its occurrence in nature, manifested by the honeycomb, mineral crystals and snow crystals, and its consequent preponderance in design.

By a combination of pure, hexagonal units, as in Plates 125-127, one can see the limitless possibilities of allover patterns that can be produced. In Fig. 1118 an overlapping or interlacing of hexagons produces a supplementary hexagon, whereas in Figs. 1120 and 1121 overlapping results in diamond forms. Figs. 1122-1125 follow the principle of honeycomb structure. Figs. 1126, 1128, and 1131—each consists of three interlaced hexagonal forms, but the resultant designs possess marked variations.

Plate 127, Figs. 1135 and 1143, show clearly that three component elements are generally recognizable in designs whose bases are hexagonal combinations: the hexagon, the six-pointed star, and the diamond. On Plates 128-130 a number of designs are shown whose relationship to the hexagon is easy to see. These are either hexagonal in their enclosing form (Figs. 1144-1149) or those whose sides are varied from the simplicity of the pure hexagon. These designs have been classified as hexagonal variants, as differentiated from a group, subsequently shown, called hex-axial variants.

**The Six-pointed Star.** Plates 131-133. The six-pointed star is a regular, plane figure formed by joining the alternate points of six points equally spaced on the circumference of a circle. It may also be derived as the result of superimposing two equal-sized equilateral triangles with apices respectively pointing upwards and downwards. According to definition, Figs. 1173, 1174, and 1176 will be the resulting form. The more pointed stellar forms, Figs. 1171 and 1172, satisfy the general conception of a star since they give more of the true, characteristic sparkle associated with the celestial star. Besides its occurrence in many celestial and crystalline forms, the six-pointed star and shape may be abundantly found in the flower world.

**The Seal of Solomon.** Plate 134. This special form of the six-pointed star, also called the hexagram, is especially interesting both from a structural and symbolical viewpoint. It is formed by the interlacing of two equilateral triangles. In ancient times Solomon is said to have worked many miracles with the aid of this device and hence

it has been adopted as the most sacred symbol of the Hebrew race who refer to it by the name, Star of David. This figure represented an ancient notion of deity, since it combined the triangle with apex upward, typifying the masculine, and the triangle with apex downward, the feminine principle.

**The Hex-axial Variant.** Plates 135-138. This group may logically be considered a further development of the hexagonal variant. However, as the forms become more complex they begin to resemble the snow-crystal and consequently lose their original simplicity and purity of form. The author has called these variants hex-axial because of their construction upon a radial plan of six axes. In the construction of the hex-axial variant it will be seen that the central element is generally a six-pointed star or a hexagon. On Plate 138 the forms shown contain but a few suggestions of the infinity of design based upon radial flower forms. However, this type of design has not been detailed further, since the subject would involve organic forms beyond the scope of this volume.

**The Snow-crystal.** Plates 139-147. The snow-crystal, one of the most popularly known of all natural motifs, and one of the most exciting demonstrations of the universal laws of geometry, has been highly useful as a source of design. Two essential forms are the elements of which all crystals are formed: fascies of slender, needle-like particles and thin hexagonal plates. There is, generally, greater variety in the interior construction than in the perfect, simple geometric arrangements of the exterior descent to earth as the forces of cohesion, adhesion, gravity, and temperature act upon the six radii and change their resultant forms. The vast infinity of designs which are revealed by a minute study of these crystalline details forms one of the most fascinating experiences any designer can discover in the entire realm of nature.

The plates of snow-crystals have been arranged in pairs so that each design is shown in both negative and positive forms. Close observation of the two counterparts should reveal valuable points of study.

**The Octagon.** Plates 148-151. The octagon is a plane, geometric figure containing eight equal sides and angles. Of the many-sided polygons, it is next to the hexagon in importance. Polygons of odd numbered sides, like the heptagon, seven-sided, and nonagon, nine-sided, are seldom used in design, and so have been omitted from this volume.

On Plates 150 and 151 various designs are shown whose bases are either octagonal, or along an eight-axial plan. Fig. 1349 is formed by two squares of equal size superimposed diagonally upon one another. The result, an eight-pointed star, bears a relation in construction to Solomon's Seal, consisting of two superimposed triangles. Fig. 1355 is a device called the octagram, and is formed by a continuous pen stroke describing an eight-pointed star. Fig. 1354 is an ancient classic form of eight radii enclosed within a square, while Fig. 1356 is a variant in which alternate radii have been extended to form an eight-pointed star.

**The Eight-pointed Star.** Plate 152. Here are shown a number of eight-pointed stars and also stars of a greater number of points. Fig. 1364, formed by the interlacement of two four-pointed stars, is also called an octagram. On Plates 153-155 are shown a number of designs related by their radial construction. Those star-like in character, as in Figs. 1369-1377, have been called stellar variants. Most of these contain twelve points and are derived from Arabian sources where these devices are widely used. These designs, radiating from a circular center, employing either bands or spurs, have been called solar variants. Designs on Plate 154 are derived from Japanese heraldry. Fig. 1388, a device whose rays are wavy, is known in heraldry as an *étoile*. It is frequently shown with a sun in its center, and as such is called "sun in splendor." Designs on Plate 155 show conclusively that the greater the number of rays, the more dazzling is the solar effect produced.



**The Scroll.** Plates 156-159 and 163. The most elemental of the many curvilinear motifs is shown in various combinations on Plates 156 and 157. It is basically a C curve or arc of a circle or ellipse whose ends are turned inwardly to form a terminal blob. The examples shown, Figs. 1399-1413, are derived from Japanese heraldry. Plate 158 shows a group of curvilinear motifs, each based upon a triple curve with terminal blobs. These forms are related to the quatrefoil shown on Plate 24. Plates 159 and 163 show additional combinations and designs of curvilinear forms, all based upon Japanese family crests.

**The Spiral Scroll and S-scroll.** Plates 160 and 161. The spiral is a plane curve describing several or more revolutions around a fixed point, its distance from this point becoming greater at each revolution. It is also called the evolute-spiral and volute. The latter term is more usual in architecture, specifically in such spiral forms as identify the Ionic capital. When the spiral contains a great number of revolutions it is called a whorl. Many ancient forms of the whorl resemble concentric circles and are a decadent and false form of the spiral. A curve whose both ends consist of spirals diametrically opposed in direction, as in Figs. 1435-1437, is called an S-scroll, or S-spiral scroll. A scroll consisting of a slight undulate curve, Figs. 1438 and 1439, is also called an S-scroll. In architecture this undulate curve is called an ogee, or, as applied to moulding forms, a cyma recta or cyma reversa, depending upon the position of alternate curves. Plate 161 shows pairs and groups of spiral forms, and it is easy to see how important and useful these motifs become in the field of decoration. The origins and history of the spiral have been the subject of much conjecture, but it is clear that its frequency in nature has had much influence on its adoption by many savage and primitive peoples, and its subsequent development. Whether the spiral is of animistic or technomorphic origin, whether it was of flexible vegetable origin before it became formalized, or whether it was first inspired by familiar marine forms, will remain an open question. The ram's horn, the nautilus shell, the spiral nebulae, and the vine tendril are but a few of the most common occurrences of the spiral in nature. The spiral has little symbolical interpretation, but in the East the spiral denotes thunder from which issues a flash of lightning.

**The Triskelion and Tetraskelion.** Plates 162 and 165. The triskelion is a tri-radial figure whose three arms may be simple curves, scrolls, or angular lines. The tetraskelion consists of four arms, and is similar to the swastika. The triskelion is of ancient origin and has been found to exist in many variants. In its earliest appearance the triskelion is a simple geometrical figure, but later the three radial elements become revolving legs and, in still another Roman version, they develop into dragon's heads. It appears on the coins of ancient Lycia and, later, as the three-pointed symbol of the land of Trinakria, i.e., the "Three Capes," the ancient name of Sicily. Figs. 1477, 1478, 1480, and 1481 are forms in which volutes conjoin with one another to produce interesting variants.

**The Wave Scroll.** Plate 164. The wave scroll, or evolute scroll, also called by the ancient Greeks the Vitruvian scroll, is a special form of the scroll previously observed in Plates 156-159. It generally takes the form of a border, or succession of curves each being terminated at one end by a volute from which the next curve springs. When scrolls from opposite directions meet at a central point, the two central scrolls unite to produce forms as in Figs. 1471 and 1473.

**The Monad.** Plate 166. The monad is a plane, geometric figure of a circle divided by two equal tangential arcs with opposite centers. Fig. 1486 is its most familiar form, being the two comma-shaped halves usually contrasted in black and white. This device (variously called "yang and yin" in Chinese, "futatsu tomoe" in Japanese, "tah-gook" in Korean) is one of the most familiar figures in Japanese and Chinese art, and finds wide application in the decorative arts.

The Chinese diagram, yang and yin, represents the dual principles in nature: yang—bright, yin—dark; yang—the principle of heaven, yin—the earth; yang is the sun, yin, the moon; yang is the active, masculine principle, yin, the passive, feminine principle; yang is positive, yin, negative.

**The Triad.** Plate 167. The three-comma-shaped figure, called in Japanese "mitsu tomoe," is shown in Figs. 1492 and 1494-1497. It expresses the universal idea of trinity and bears some similarity to the triskelion, or "three-legged symbol," previously noted. The forms shown are derived from Japanese family crests.

**The Circular Enclosure.** Plates 168 and 169. Here are shown a few simple types of circular design upon which ornament may be further developed. Figs. 1504 and 1506 show concentric or zonal subdivisions. Figs. 1505, 1507, and 1509 show rectangular and interlocking units. In Figs. 1508, 1510, and 1512, radial divisions are indicated. The undulating curve is noted in Fig. 1511, and designs based upon it in Figs. 1516, 1518, and 1519. The skirl, or whirling curvilinear motif, Figs. 1513-1515, produces a restless, rotary motion. Fig. 1517 shows the circular wave band. Figs. 1520, 1521, and 1522-1525, continuing on Plate 170, are familiar Oriental forms of the curvilinear enclosure.

**The Loop and Guilloche.** Plate 172. The loop is the simplest form of the twist or interlacement, and consists of a continuous line forming a figure eight. The guilloche is a full-rounded circular form of the loop, and is usually employed in continuous border patterns. It is common to many ancient art cultures, especially the Egyptian, Assyrian, and Roman, and is probably of technomorphic origin. Fig. 1541 is the mathematical sign of infinity.

**The Curvilinear Interlacement, etc.** Plates 173 and 176. The triple-looped interlacement, similar in construction to the triquetra (Plate 64), except that its ends are rounded. The four-looped interlacings, Figs. 1552 and 1554, and the quatrefoil, Fig. 1553, may be considered among the simpler devices upon which an elaborate system of interlacings can be built. Very often curvilinear interlacings will contain pointed or arched members, constructed of segments of circles, as in Figs. 1561-1563. Fig. 1568 is derived from a composite of three triquetrous forms, centrally joined. Figs. 1576 and 1581 are somewhat similar in outward appearance, but the former has a continuous thread of design while the latter consists of three separate quatrefoils interlaced. Interlacings are found in many styles of decoration but in some they become the predominating background, especially in the Celtic and Scandinavian decorative arts.

**The Rectangular and Angular Interlacement.** Plates 177-179. Of the various forms of interlacings, the rectangular, with its rigidity and formality, appears to a lesser extent than do other forms. As the crossbands become more numerous and the designs more complex, the character of plaiting and weaving from which these motifs undoubtedly spring, is more obvious. Compare Fig. 1607 with 1571, on Plate 175; the former, angular, and the latter, curvilinear, offer counterparts in varied treatment.

**The Fret.** Plates 180-184. The fret is usually considered in terms of a border or pattern, rarely as an isolated, elemental device as shown here. The fret, or meander (derived from the name of a winding river in Asia Minor, now called Menderes), is a plane, rectangular motif taken from early Greek ornament. It is also, in some instances, known as the key pattern, the simplest forms of which, like Fig. 1623, are reciprocal forms and T-shapes in which the interspaces are of the same character as the solid between them. Fret patterns are the angular or rectangular counterparts of the spiral or wave pattern, noted on Plate 164. The serpentine, or meandering, characteristic may best be observed in Figs. 1614, 1621, 1622, etc. The rectangular variants, Figs. 1618 and 1619, are often associated with the fret, and are interpolated

between alternate motifs. On Plate 181, Figs. 1624-1626 are of Japanese origin, the remainder, Greek. Fig. 1635 is the corner motif corresponding to Fig. 1634. Fig. 1637, as well as all examples on Plates 183 and 184, are derived from Japanese heraldry. The sharply angular and curvilinear variants are rarely found in Occidental designs.

Plates 184-188. The simple division of the square or rectangle may be achieved in many ways, and is frequently based upon a bi-symmetrical arrangement along the two intersecting diameters, or diagonals. But in the examples shown on Plates 185 and 186 a mon-axial plan has been followed, and a number of variations, not entirely symmetrical, have been given. From these simple variations develop the more complex devices utilizing Japanese characters. All the examples shown are based upon Japanese heraldry.

**The Shield and Its Subdivisions.** Plates 189-193. In introducing examples of the variant shapes and ordinaries of the shield, no attempt has been made to involve the subject of heraldry in this work, but merely, insofar as these forms may possess names and terms, to utilize the nomenclature of heraldry, wherever possible, to identify them.

The shield is a most important form in heraldry for on it are exhibited the many signs and elements that constitute the complex language of heraldry. The simpler forms of the shield are derived originally from articles of defensive warfare dating back to ancient times, but in later periods a fuller freedom and more artistic imagination accounted for innumerable fantastic shapes. The prevailing styles of architecture and decoration doubtless left their impress, as seen in the rounded and pointed or Gothic arch forms, inverted, of course. Figures on Plate 189 show the half-round forms which first appeared during the Fourteenth Century. Plates 190 and 191 exhibit the pointed form. The oldest shape is the triangular or "heater-shaped" shield, Figs. 1708, 1710, and 1720-1722, used as early as the Twelfth Century. Figs. 1729-1734, Plate 193, show forms popular during the Italian Renaissance. Figs. 1735-1737 display the keystone, so called because it is the central stone in an arched construction.

Plates 194-204. The various subdivisions of the shield produce geometrical figures called, in heraldry, the ordinaries. The shield is divided into different fields by the use of straight or curved lines extended to the margins of the shield. Very often the lines used for these divisions take on decorative form, such as the wavy and zigzag lines, and many others, called lines of partition. A description of the figures, or blazoning, gives the heraldic terms. For further detailed study of these forms, it is suggested that books on heraldry listed in the bibliography, be consulted.







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