APPLIED DESIGN FOR PRINTERS

A HANDBOOK OF THE PRINCIPLES OF
ARRANGEMENT, WITH BRIEF COMMENT
ON THE PERIODS OF DESIGN WHICH
HAVE MOST STRONGLY INFLUENCED
PRINTING

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FOREWORD

This primer of design is an earnest effort to make intelligible to the apprentice student certain fundamental principles of arrangement and of ornamentation whose use is instinctive to the accomplished typographer.

It has been often written that there are no rules in Art, and equally often that the master artist (or craftsman) is he who can skillfully break all rules. It must be inevitable that the apprentice shall adhere too closely to each newly observed principle before his work can be a well-rounded embodiment of them all. To him is commended this exact procedure, recognizing, as his perception grows, that there are good reasons why traditions are emphasized here and all-embracing rules and formulae are not to be found.

Due credit must be paid to Mr. Ernest Allen Batchelder, who first devoted his pen and brush directly to the printer's problem in design, and who in turn gives honor to the influence of Mr. Denman Ross. Neither has expressed a method but has graphically analyzed the attitude of mankind during successive epochs toward those matters which deal with beauty.

It is to be hoped that this little book may serve as a simple guide and as a stimulant toward an extended study of the larger attributes of printing which are not concerned with utility alone. H. L. G.

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Introductory

Raw materials may be made into finished product which will have the quality of usefulness as one. Utility is the first purpose of most of the works of man. Durt. when the maker is moved by pride in his work and desire for beauty to make his hand work pleasing in appearance as well as useful a second purpose is fulfilled. All civilization and most forms of swaggering demand that the equipment of routine life shall be pleasing to the eye as its prime purpose of usefulness has been developed.

If any article be pleasing in appearance it's making will have involved some of the elements of design. The relationship of it's parts, the lines of it's construction, it's colouring, the manner in which it is ornamented will depend first upon it's purpose, but will be guided by a group of recognizable traditions which we call the principles of design.

Design governs the arrangement of masses, lines, and dots to secure the qualities of beauty and fitness.

Any piece of work which is deliberately arranged with consideration for its various parts and their relationship is called, in the abstract, a design. Thus we speak of a poster, a decorated wall, a building, or a printed page as a design.

Any successful design will have the qualities of fitness and beauty. Fitness to purpose is largely a mechanical factor. An ugly building may protect it's occupants from the weather, and an ugly printed page may be entirely legible. Beauty depends upon aesthetic qualities, that is, upon the character of the design which will appeal to the eye and mind through the consideration of—

- Harmony (of shape, tone, colour, and concentration)
- Balance and proportion (of mass, shape, and colour)
- Rhythm (of shape, line, tone, and colour)

This concentration of the elements of design covers all of the many things that make buildings, or railroad tracks, or sculpture, or paintings, or pottery, or furniture, or the printed page alike. In each, differently though they be, the purpose of design is to relate the various surfaces, masses, and structural lines and to decorate or ornament the finished whole. Continuities may be used and all the varied

purposes of the equipment of mankind must be satisfied, but the application of the principles of design will be similar throughout. This point is emphasized so that the student of printing may find a common ground with the workers in all the fine and useful arts.

The Surface

In the printed page, design is concerned with the arrangement of masses and lines on a flat surface---the face of the sheet of paper. Hence design in printing considers two dimensions only, width and length. The third dimension, depth, which must be treated in all but flat surfaces, can only be represented on the printed page and the means of showing depth is really an illusion by which the eye sees various colors and tones which convey a pictorial impression.

It is important to note that design and pictorial representation serve each a different purpose in printing. Yet they are similar mechanically in that each requires a printing surface (type, borders, ornaments, and engravings) which may be prepared by the same mechanical procedures. The picture exists for its own interest or as an illustration for the text. As such it is merely an element in the design of the page. Decoration or ornament may be used to embellish the page, as a pattern on its flat surface, and may be related to the text, but need not serve as an illustration to it.

[Illustration: Fig. 1. A design of flat surfaces and a realistic pen sketch of the same subject.]

As an example: Much of the material devised for the decoration of the printed page (ornaments and borders) is derived from natural forms; i.e.,
leaves, flowers, etc. The leaves, stems, and flowers which are adapted to
form the ornament shown in Fig. 1 are a flat pattern of black and white. The same material is rendered pictorially in the pen sketch accompanying the ornament. It will be observed that the flat treatment of the ornament depends upon arrangement of interesting flat masses for its significance. The pen sketch not only conveys an impression of the form of the natural objects, but it also suggests depth. A photograph of the natural objects, reproduced by a printing plate, would be still more realistic.

The preceding points have been given emphasis as a warning against a tendency to use pictures, however pleasing, as decorative material; or to allow design in printing to be concerned with a representation of depth. The same masses of shadow and light which express roundness or

depth in a picture may be formed into decorative flat masses and thus embodied in the design of the page. In Fig. 2, A is a picture which might be used as an illustration for its own interest. B is a flat rendering whose arrangement of masses suggests the pictorial interest of A without denying the flat surface upon which it is printed.

The Materials of Design

Since design is a matter of arrangement, its materials are the masses, lines, and dots which make up the whole form.

A dot theoretically has no dimensions. And a line (being the path of a dot in motion) theoretically has length but no width. While if a line be moved sideways it produces a mass which has area and shape.

Practically, a dot may be larger than a pin point and may have definite shape--a square dot or a round dot. Also in the common terms of design a line may have width (often called weight). Thus we speak of a narrow or light line as contrasted with a wide or heavy line.

[Illustration: Fig. 2, A. Halftone engraving from a photograph, retaining full pictorial effect of depth, expressed in various gray tones and soft edges. This is an illustration.]

[Illustration: Fig. 2, B. Decorative pen drawing from the same subject, telling the story of the photograph in flat surfaces of black and white. Suitable to decorate a type page.]

A mass will have shape, which is the impression conveyed to the eye by its general contour. It will have size or measure, which will be its actual or relative area. It will further have tone or color, its general relation in appearance to black and white or to the colors of the spectrum. Embodying these terms in an example: We may specify a mass square in shape, having an area of four square inches, and being gray in tone. These three characteristics, then, will identify and describe any mass.

In printing, the successive lines of type which form a paragraph, block, or connected series of paragraphs or blocks, are considered as a mass. An initial letter may be another mass; a head-band still another; and ornaments or illustrations may form other masses. All must be considered as mass elements in the design of the page, with rule borders as surrounding lines, or heavier designed borders as surrounding masses.

Thus all the component parts of the printed page are reduced to elements or materials of design, and with these materials an arrangement is to be

made, for the sake of beauty, which will have the qualities of harmony, balance, proportion, and rhythm.

The Qualities of Design

The dictionary defines harmony, in art, as a normal state of completeness in the relation of things to each other. This state of completeness in a harmonious scheme is such that we have no desire to change or modify any detail or characteristic.

Balance is defined as the state of being in equilibrium. In design this refers to the equilibrium or balance of attraction to the eye between the various masses.

Proportion is the comparative relation of one thing to another with respect to size.

Rhythm, in design, is a movement characterized by regular recurrence of accent.

Let us discover the embodiment of these qualities of design with a simple experiment. Cut from black, dark gray, and light gray cover paper a miscellaneous assortment of small pieces as shown in Fig. 3. This group of squares, oblongs, triangles, diamonds, circles, and whatnot has none of the qualities of design as it appears in Fig. 3.

[Illustration: Fig. 3. A group of miscellaneous masses having various measures, shapes, and tones. Arranged without thought of design.]

Choose from Fig. 3 certain pieces which seem to have a definite similarity of shape. Combine them with another rectangle, as in Fig. 4, and the result is certainly more orderly and pleasing than the unrelated tangle in Fig. 3. In Fig. 4 we have developed the quality of shape harmony.

But we note that in spite of the harmony of shapes in Fig. 4 some of the pieces of paper seem unduly prominent because of their blackness. They do not seem harmonious with the gray tone of the others. If we replace them with other pieces gray in color, as in Fig. 5, the result will be a more pleasing relationship of tone throughout the design. Thus we have made a simple demonstration of tone harmony.

If our pieces of paper were of various colors we could make another arrangement to express a color harmony. The problem of color, however, has so many phases that it is considered separately in this series.

If rhythm is to give us a regular recurrence of various features of a design, it will be possible to choose a combination of pieces of paper which will show a rhythmic arrangement, Fig. 6. It will be noticeable here that the shapes occur in successive groups which repeat an idea.

We may also arrange a series of pieces in which the tones are rhythmic, progressing from light to dark in repeated groups. This will be a simple example of tone rhythm, Fig. 7.

Summing up the experiment thus far the following definitions may be noted:

Shape harmony will exist when masses similar in contour or shape are used to form a design.

Tone harmony results from the use of tones in a design which carry a feeling of relationship.

[Illustration: Fig. 4. Units selected from Fig. 3, having a common similarity of shape. But they are not harmoniously related in tone.]

[Illustration: Fig. 5. The same shapes used in Fig. 4, substituting equal tones of gray as needed to produce harmony throughout.]

[Illustration: Fig. 6. Simple development of shape and measure rhythm such as might occur on a printed page. Masses should be related in measure as well as in shape.]

[Illustration: Fig. 7. Simple illustration of tone rhythm as it may occur on a type page. The tones progress from the white of the margins through the light gray masses of type, to the darker grays of decorations.]

Shape rhythm is the regular recurrence of similar shapes in a design or a rhythmic increase or decrease in the size of shapes used in a design.

Tone rhythm is a recurrence of similar tones or a regular progression of related tones from light to dark or the reverse through a design.

The four qualities above are so closely related that there is often no definite dividing line between them; indeed, a successful design will embody them all.

Proportion

Our definition of proportion as a comparative relationship of size is so broad that any sizes may be in proportion. The quality of proportion in design is always assumed to be a pleasing relationship of sizes. It thus becomes necessary to determine what relationship of sizes will be most pleasing.

The use of equal masses in a design is monotonous. The eye finds variety of size more interesting. But to determine what form of variety is most interesting we must find, if possible, the ideal area relationship between masses in a design. This problem has of necessity been solved by the designers of all nations and all periods, and it is interesting to note that the result has everywhere been practically the same.

Let us arrive at the expression of good proportion by the simple means of dividing a rectangle into two parts which will have the most interesting relationship. This rectangle is A in Fig. 8. B shows a division into equal parts, the result being uninteresting and monotonous. In C the division gives a feeling that the lower part is too large; it is crowding the upper and the result is not pleasing. The relationship in D is so nearly equal that the division seems to have been an inaccurate effort to locate the center. Somewhere between the division point in C and that in D will probably be the best point. Repeated trials will locate the point about as in E, which will be found to lie about two-fifths of the distance down from the top. This will give the upper area in E an area of 2 and the lower an area of 3. Hence the relationship or proportion is said to be as 2 is to 3. By the term good proportion, or merely the word proportion, in speaking of design this ratio of 2 to 3 is assumed.

[Illustration: Fig. 8. The division of a rectangle, A, to secure spaces of interesting relationship. Equal division in B. Overbalanced effect in C. Too nearly equal in D. More interesting in E, where the relationship of spaces is as 2 is to 3.]

It is interesting to note that when a space has been divided into the ratio of 2 to 3, the relationship of the smaller to the larger is practically the same as the relationship of the larger to the original whole. Or, mathematically, if the original, having an area of 5, is divided into parts of 2 and 3, then 2 is to 3 as 3 is to 5,--a ratio which is approximately true.

The student of architecture finds the most careful consideration of proportion in the relationship of spaces throughout all the architectural orders. In printing, the designer must be guided by the same traditions.

[Illustration: Fig. 9. Spotting a single line on a page so that it makes an interesting division of space. There are 2 parts of white space above and 3 parts below.]

[Illustration: Fig. 10. Placing a single line so that it will appear to be centered. The dotted lines show the mathematical center of the vertical side. The straight lines show the center of the type line.]

The most simple application of proportion to the division of a printed page occurs when a single type line or compact group of lines is to be placed on the page (Fig. 9).

It is unfortunate that it is so easy to divide space mechanically in a type page by using identical measures of furniture or slugs above and below. When, in certain instances (as in a business card), tradition demands that a line be centered vertically, it will be found that the exact centering of the line will make it appear a bit low. An optical illusion demands that such a line be raised slightly if it is to appear in the vertical center (Fig. 10). This apparent center is called the optical center.

The same condition makes it necessary when an apparent square is to be used that the width of the square be slightly greater than the height. (Fig. 11.)

[Illustration: Fig. 11. A true square above and an optically corrected square below. Psychologists explain that the eyes find it more difficult to judge the length of vertical lines, hence are inclined to exaggerate them.]

Balance

The physical equilibrium which exists in the balanced seesaw of our childhood and the optical balance which is the result of the proper adjustment of masses within the confining edges of a design are similar, in that each is an equalizing of forces of attraction. In the former the force is gravity; in the latter, the attraction to the eye, which varies with the size and tone of the mass. While the force of gravity usually brings balancing masses to a horizontal alignment, optical balance may bring the masses in a design into equilibrium on any desired line, horizontal, vertical, or diagonal.

The attraction which a mass possesses varies directly with its size and tone. Thus a mass of four square inches, solid black, will be twice as strong in attraction value as a mass of two square inches, solid black. It will also be twice as strong in attraction value as a mass of four

square inches, neutral gray (the gray being half the value of black). The attraction value of gray tones particularly affects the consideration of blocks of type which vary in depth of tone according to the blackness of the type face, closeness of spacing, etc.

Since the seesaw must have its sawhorse and the weighing scale its point of support, it follows that any condition of equilibrium, physical or optical, demands a point of balance. In design, this point will determine the location of the related masses. It will be apparent upon further thought that the point of balance should have some relationship to the edge or confines of the design.

The confining edge of the design is usually a rectangle, on the printed page. The location of a point of balance within this rectangle tends to divide it. How shall it be divided in the most interesting way? By applying the ratio of good proportion. So the point of balance may be located usually on a line which divides the page into parts of 2 and 3.

When equal masses are to be balanced it is obvious that they will be equidistant from the point of balance. (Fig. 12.)

[Illustration: Fig. 12. Equal masses balanced at equal distance from the center point.]

When the masses are unequal the point is at unequal distances from the centers of the masses. These unequal distances have the same ratio as the masses themselves, but the larger mass is always the shorter distance from the point. If 1 pound is to balance 4 pounds it is obvious that the 1-pound mass must be 4 times as far from the point of balance as the 4-pound mass.

[Illustration: Fig. 13. Mass of 4 units balanced by 1 unit.]

Hence, to balance two masses in a rectangle, the point of balance will be found by proportion, placing it on a line which divides the rectangle into parts of 2 to 3. The balancing of the masses across this point will then be a matter of determining their relative distances from it. It is apparent that the larger of two masses may be far enough from the point of balance so that it will force the smaller entirely out of the rectangle. It is of course easy to move the larger closer to the point which automatically brings in the smaller. What constitutes a proper distance from the edge of the rectangle will be discussed under "Margins," in the book on Typographical Design.

[Illustration: Fig. 14. Mass of 3 units balanced by mass of 1 unit, taking the point of balance upon the line which divides the space in good proportion.]

[Illustration: Fig. 15. Measures of 3 and 1 balanced by a measure of 2, the point of balance dividing the space in good proportion.]

The balance of three or more masses within a rectangle involves the consideration of two at a time, balancing the pair or pairs with the remaining mass or masses.

In Fig. 15, masses 1, 2 and 3 are to be balanced within the rectangle. Balancing 3 with 1 gives the balancing point P. Taking 3 plus 1 from the point P, we locate the mass 2 to balance them across the line AD which divides the rectangle in good proportion. The point p then becomes the balancing point for the entire group. Mathematically, 3 plus 1 equal 4; 4 is twice 2; therefore the mass 2 must be twice as far from the point p as the balanced masses 3 plus 1.

Two other combinations might have been worked out with the masses in Fig. 15: 3 plus 2, balanced by 1, the mass 1 being placed five times as far from the point p as would the point P. Or 2 plus 1 might have been balanced by 3, in which case the distances would have been equal.

The application of these principles of balance to the problems of typography is largely a matter of influence. The typographer should be guided by them but he need not make mathematical calculations if his eyes be trained to judge relative attraction values so that he can arrange his various masses to secure balance.

Symmetry

When two parts of a design are equal in every respect so that if the design were folded over one-half would superimpose in every detail with the other half, then a state of symmetry exists and the design is said to be symmetrical. The line upon which such a design would be folded, or, in other words, the line which bisects a symmetrical design, is called its axis.

The printed page is often symmetrical with respect to its vertical axis (Fig. 16).

In Fig. 16 the line AD is the vertical axis of the page.

[Illustration: Fig. 16. Type page, symmetrical with respect to its vertical axis.]

[Illustration: Fig. 17. Page arranged for variety. Not symmetrical on either axis. This arrangement is frequently used in advertising display, but is rare in book work.]

It is rarely possible that the printed page can be symmetrical with respect to its horizontal axis. Such a state would involve a division of the page below its optical center and would also have an uninteresting division of its spaces, with equal masses above and below. It should be noted that symmetry on the vertical axis permits full variety in the size of the masses used.

Variety

The absence of symmetry in a design gives it the character of variety, which may be defined as a state of inequality in the arrangement of the parts of a design.

In Fig. 17, neither the horizontal axis nor the vertical axis divides the page so that its units are symmetrically arranged.

Motion

In any arrangement, pictorial or decorative, the eye of the observer is attracted to various parts in succession, depending on their character and position with respect to each other. This quality, called motion, will be more pronounced as the several units tend to lead more definitely from one to another. Fig. 18 shows the path which the eye follows as it looks at the ornament. In pictorial composition the same quality is employed to emphasize the story to be told or the character of the arrangement used by the painter. Then it is called line. This quality of design is not to be confused with action, which is the depiction of a figure in motion, as shown in Fig. 19.

[Illustration: Fig. 18. The diagram shows the motion of the eye as it perceives the design above. This motion is due to line entirely, not to accents of tone.]

[Illustration: Fig. 19. Showing action in the figure depicted, without motion in design.]

On the printed page the eye may be definitely directed from one unit to another through this quality of motion, which forms a very valuable resource for the printer. Fig. 20 is a diagram of a simple use of motion, the eye progressing as indicated by the arrows through the

motifs which make up the plate.

¶ Illustration: Fig. 210. Diagram of motion as employed in adjusting to lead the eye progressively through a plate. ¶

Ornament.

While the elements of design conform all the parts of a proposed scheme (on the printed page, its motifs, type, decoration, headband, initial letters, tailpiece, etc.) certain parts will be used solely to beautify the whole design. These ornament, or decorative, its... Ornament is a means by which Beauty or Significance is imparted to Utility.

Ornament may be either Symbolic or Esthetic.

Symbolic ornament consists of elements or forms chosen because they are significant of the purpose of the design.

In Fig. 212, the ornament is symbolic in its close connection with the message conveyed by the type.

Esthetic ornament consists of forms chosen for their beauty only. In Fig. 213, the headband and initial are pleasing in design and they beautify the page without showing the slightest relation to the text of the page.

Esthetic ornament characterizes periods of design which have had the most important influence in the development of printing: the Greek, Roman, and Renaissance.

Symbolic ornament is found in Egyptian, Assyrian, Byzantine, Scandinavian, Celtic, Persian, Indian, Gothic, Chinese, and Japanese design. For intimate study of these various styles and periods the reader is referred to the various books listed in the bibliography.

¶ Illustration: Fig. 211. Ornament designed with natural forms. ¶

¶ Illustration: Fig. 212. Headpiece-organ tower design by Mr. F. W. Goudy, in which the ornament is symbolic of the message of the page. ¶

¶ Illustration: Fig. 213. Typical page decorated with esthetic ornament. Much of the decorative material available to printers is of this character. Since the printer intends strudly its symbolic significance he may choose such decoration for its qualities of tone and good drawing. ¶