MASTER WEAVER

BI-MONTHLY BULLETIN FOR HANDWEAVERS

Z-HANDICRAFTS - FULFORD - P. Q. - CANADA

May, 1957 No.33

DESIGNING MADE EASIER

PROPORTIONS.

When one tries to write just a few articles about a subject as complicated as Designing, one is at aloss as to which elements and principles of designing are the most important ones. To discuss all of them would require more space than is available in a periodical. Therefore we shall limit ourselves to the problems which are likely to interest a handweaver. This and nothing more.

For the same reason we shall not speak too much about designing tapestries where the weaver has a complete freedom of expression, and where the same rules or lack of rules apllies as in painting.

We shall start with the easiest subject viz. proportions, or mathematical relationship between different dimensions of the project, or of its part.

When only two elements of different length are in question, as for instance two sides of a rectangle, the ratio which is "best liked" by everybody seems to be around 1.5 (3 to 2). This number is purely statistical i.e. obtained by a sort of Gallup poll, and so far cannot be explained in any way. There are also other, more precise numbers, which have some sort of a theoretical background. For instance the famous "golden mean" - 1.62, or a square root of two - 1.41. What is so peculiar about them?

Let us take first the golden mean. When we have two numbers "a" and "b" which give us the ratio 1.62 (really it is 1.61803 etc.) then also the ratio: a+b to b will be 1.62.

If we build a rectangle with sides in ratio 1.62 as in fig. 1 and divide its longer side in the same way, we shall get inside of our rectangle two figures: one square (ABCD), and one rectangle (BEFC) exactly similar to the large rectangle (AEFD). By "similar" we mean that the ratio of its sides is again 1.62. We can subdivide this second rectangle again into a square (BEHG) and a still smaller rectangle (GHFC). If we keep on doing this long enough we shall have an infinite number of squares getting smaller and smaller. This of course does not "explain# why we should like them, but it is something at any rate.

Now for the Square Root of Two. Let us build another rectangle as in fig.2 so that the ratio of the long and short side will be 1.4 (it is really 1.41421 etc). This rectangle (ACDB) has a different peculiarity: if we divide its longer sides by two we shall

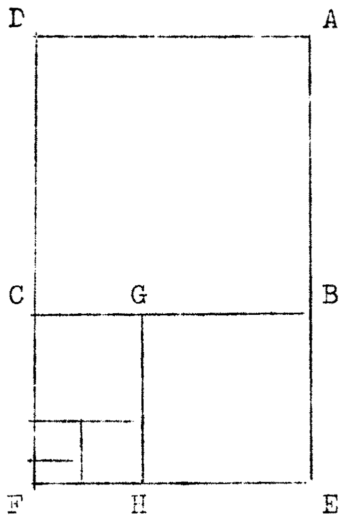

Fig.1

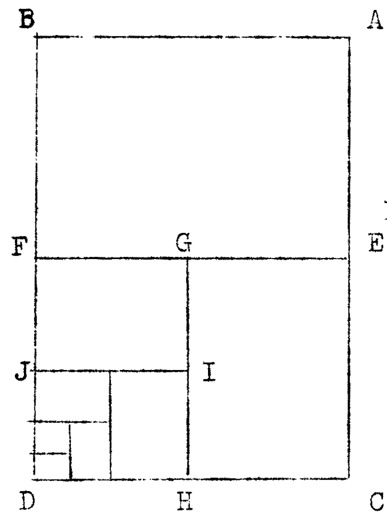

Fig.2

get two new rectangles (AEFB and ECDF) similar to the large one. If we agin subdivide on of these, e.g. ECDF into two, we shall get two more, still smaller rectangles GIJF and IHDJ of again the same shape. We can go on like that indefinitely getting more and more rectangles, all of them of the same ratio.

But you may ask: What of it?

And "what of it" indeed? Neither the first or the second rectangle can be proved to be beautiful, or to posses any practical properties which could explain why it should be liked better than any other shape. Still the fact remains that the public opinion favours a ratio somewhere between these two. And it is not only our present opinion: it persists for quite a few thousand years.

What can we deduce from these facts?

First of all that for unknown reasons most people do not like a square and comparatively few like a very long rectangle. And second that it is not necessary to accept a very precise number for the proportions of a rectangle.

Thus when making aproject where we are not limited by other considerations (as in case of scarves, runners, head-squares etc.) we may as well keep close to one of these numbers, the golden mean being perhaps the most popular one. Of course the right ratio between the width and the length of the fabric is important only when the whole piece is displayed lying flat on the floor or on a table, or hanging on the wall. Otherwise the proportions are of little importance and practical considerations must prevail.

****

The same proportions may be observed in simple patterns. When the pattern divides the woven piece into two areas or when there are two elements of the pattern of similar shape but different size - then the two areas or the two elements may form the ratio 1.62. For instance in fig.3 we have a project in Turned Swivel (MW 16, and 25). First of all the rectangle ACEG has the ratio

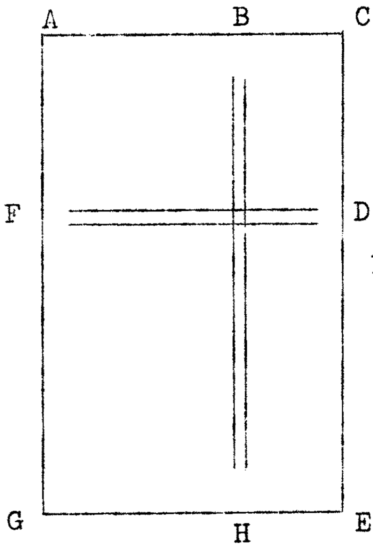

Fig.3

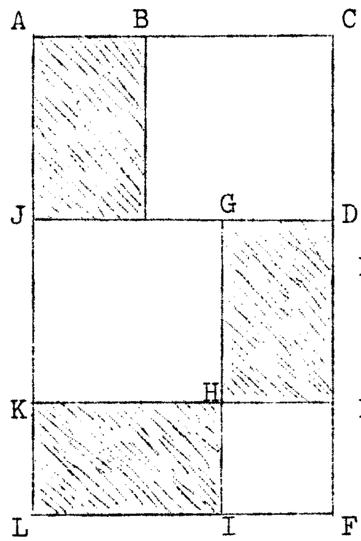

Fig.4

1.62 (e.g. 12" x 19"). Then the horizontal lineDF divides the rectangle in the same way - DE : CD = CE : DE = 1.62. Also the vertical line BH divides the sorter side of the rectangle so that again AB : BC = 1.62.

Fig.4 is based on the same principle: CF:CA, DF:CD, CF:DF, DE:EF, CA:BC, CB:BA etc., have all the same ratio

****

The same rule can be applied to the Areas occupied by different colours. We know from the previous article that the Dominant takes the largest area. Then the ratio between the dominant (D) and the sub-dominant (W) can be 1.62. Again - the ratio between W and A (accent on the dominant) may be 1.62, and finally the ratio between A and Z (accent on the subdominant) also 1.62. This gives us the following sequence: Z = 1; A = 1.6; W = 2.6; D = 4.2.

For instance when we make a project for plain stripes in 4 colours we shall have about 11% of colour Z, 17% of A, 28% of W, and 44% of D. These numbers are also numbers of picks in one repeat if the repeat has 100 picks of weft. If the number of picks in one repeat is different - multiply the numbers by the number of picks in one repeat and divide by 100.

In the table below we give other practical sequences in full numbers of picks:

2, 3, 5, 8	3, 5, 8,13	4, 6,10.16
5, 8,13,21	6,10,16,26	7,11,18,29
8,13,21,35	9,14,23,38	10,16,26,42
11,18,29,46	12,19,31,50	13,21,34,55
14,22,36,59	15,24,39,63	16,26,42,67.

Of course the order in which the colours will follow each other has nothing to do with this proportion. The rule gives us only the total number of picks in one repeat. For instance if we have a repeat with 47 picks we can take the sequence: 5,8,13,21 and arrange our colours as follows:

WWAAWAAWWWWWWWAAWAAWWDDDZZDDDDDDDDZDDDDDDDDZZDDD

Here we too D 22 times instead of 21, otherwise the right band would not be symmetrical. In the next example:

WDDWWDWWWAWAAAAAAWAWWWDWWDDWDDDZDZDDDZDDDZDZDDD.

we had to change the number of picks both in col. D and W for the pattern,s sake. We have now 5,8,14,20. We would probably do better to make it 5,8,14,22 which would be closer to the original ratio.

****

We must repeat once more that this is only one way of figuring out the ratios or proportions. The fact that proportions of a project do not follow this particular rule does not condemn it, and cannot be used even as a base for criticism.

****

R U G S

I N B O U N D W E A V I N G -

What we mean here by "bound weaving" is such a method of weaving which does not require any binder, even with the traditional pattern weaves. The weave is then "bound" by itself and this explains the name. Although in theory any pattern weave can be woven in this way, there are practical considerations which make many "higher" weaves unsuitable for this purpose. We shall discuss here only the simple weaves such as Overshot, Crackle, and Summer-&-Winter on four frames.

In bound weaving we have no tabby. This is replaced by a shot of weft of the same weight as the pattern weft, but of a contrasting colour, and made on an opposite shed.

Since this is important we shall remind our readers that "the opposite shed" is one which reverses the positions of all harness-frames. A frame which has been sunk is raised now, and one which has been raised is sunk. Thus shed 1,2 is opposite to 3,4 etc. Thus there is no such thing as an opposite shed in inself. It must be always opposed to the last one. We shall see later that the opposite shed does not even need to follow the pattern shed