

The background of the cover is a collage of various weaving charts and patterns. These include grid-based diagrams with different symbols and colors (like blue and green) used to represent weaving instructions. Some charts have handwritten notes in Finnish, such as 'lainni- ja kudel...' and 'moltaitte pomsia yhälistä y...'. There are also some printed labels like 'Thread from A to B', 'Thread from B to C', and 'Thread from C to D'. The charts are arranged in a layered, overlapping fashion, creating a rich, technical texture.

MASTER WEAVER

BI-MONTHLY BULLETIN
FOR HANDWEAVERS



Z-HANDICRAFTS
FULFORD, QUE., CANADA

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DESIGNING MADE EASIER

C O L O U R .

Here is our problem: there are honest craftsmen who not only enjoy weaving, but also achieve a very high technical level. At the same time their designing is puzzling, and can not be justified by any accepted standards. It is not only that their weaving is not "contemporary" as we wrongly put it (anything made now is contemporary), not in keeping with our present requirements, and therefore useless. This would not be so bad.

A perfect colonial coverlet, even if woven now, is still a good piece of weaving, and it may find application for instance in reconstruction of colonial crafts for educational purposes, in supplementing pieces of interior decorating in musea, and in still existing houses with colonial furniture. When we speak about "bad" designing we mean that it is bad regardless of time and place to which it could be referred. The pattern as well as the colour scheme may be all wrong without being original enough to deserve any attention, the texture may be dull or exaggerated, and the yarns unsuitable.

On the other hand the craftsman, should this be pointed out to him, may be quite willing to learn to do better. But he may be simply unable to follow one of the methods described so far, because of the time involved.

The obvious solution of our problem would be to learn at least some designing by means which would not require long years of study. Are such means available?

In our opinion they are not. But ...

There are craftsmen, artists, authors, and teachers who have different convictions. And we feel that it is our duty to report, regardless of our personal bias, such modern methods of designing which claim that by following certain sets of rules one can reach a comparatively higher level of skill in designing. This will not change a layman into an artist, but will at least make him avoid the worst blunders, the most common pitfalls.

The following articles should interest teachers first of all. Then the craftsmen unsure of their designing, and finally those weavers who do not feel any need of help in making their projects, but would not mind comparing their methods with so called "objective" standards.

We shall start with colour, because the problem of colour is the easiest one to be formulated in nearly mathematical terms, and because it concerns most of us. In the second article we shall speak about pattern, and in the third - about texture.

Colour is defined by its three components: Hue, Value, and Chroma (or Intensity, or Saturation).

Hue is the position of the colour in the rainbow (or solar spectrum), and for our purposes we shall distinguish 10 hues: Red (R), Yellow Red (YR), Yellow (Y), Green Yellow (GY), Green (G), Blue Green (BG), Blue (B), Purple Blue (PB), Purple (P), and Red Purple (RP).

Value is the lightness or darkness of a colour. We shall have also 10 values, but the darkest is always black, and the lightest - always white. In practice a colour may have values only from 2 to 8.

Chroma means the purity of the colour. The higher the number - the purer the colour. Thus chroma 0 means that there is no colour, just gray. Chroma No.1 - a trace of colour, but mostly gray. No.2 - more colour, less gray. And so on, until we reach chroma 6, 8, 10, 12, or even 14. In practice it is unavoidable to have the colour mixed with some gray, and the highest chroma available depends on what sort of yarn, and what kind of dye was used.

A complete description of a colour must contain all these three factors, and it has always one or two letters followed by two numbers, e.g.: R 4/8. The letter or letters mean Hue; the first number - value; the second number - chroma. Therefore R 4/8 means Red, value 4, chroma 8. It is a sort of Dull Red. But we can not depend on such descriptions as "dull red", or "pale green", or "burned orange", or "navy blue". They mean a different thing with different manufacturers, and can give only a very approximate idea of the actual colour.

Therefore, before we can go any further, we must have sample cards of colours. As far as we know the only readily available and not too expensive samples are made by Munsell Color Co., Baltimore, Md. A so called "student set" of 10 hues (about 250 colours in all) may be had for about \$ 5. The samples are not mounted, but they are easy to assemble on sample cards supplied with the set.

There are certain rules which govern the selection of colours for each project. We shall not describe here the theory behind these rules. However, we advise the reader to get acquainted with a book by Maitland Graves "The Art of Color and Design". The method of selection described here is based on the theory of Graves and Munsell, but adapted to the requirements of a handweaver.

We suppose that we have 4 colours in our project. We shall explain later what happens when the number of colours is larger or smaller. The first rule is that the spaces taken by our colours should be widely different. The colour areas do not need to form any definite sequence however.

We shall call our colours: A, D, W, and Z. These letters were adopted simply because two of them come from the beginning and two from the end of the alphabet, and they indicate that we have two pairs of similar colours, but that there is a marked difference between the two pairs. Incidentally it helps to remember that D is the Dominant colour (it occupies the largest space). W is the next in size, and if D is light - W is dark, and vice versa. "A" means Accent and should take much smaller space than either D or W. If D is light A is still lighter. If D is dark, A is still darker. Finally Z has the smallest area of all and follows W in the same way as A follows D. In other words A is the lightest, then comes D, W, and Z which is the darkest. Or alternatively A is the darkest, then we have D, W, and Z - which is then the lightest. This must be remembered when making selection of Hues.

In the table I are given 80 different combinations of Hue. The first 20 will produce very contrasting effect (major), the next 20 - a medium one (moderate), and the last 40 - very little contrast (minor).

Table I

A -	R	YR	Y	GY	G	BG	B	PB	P	RP	R	YR	Y	GY	G	BG	B	PB	P	RP
D -	YR	Y	GY	G	BG	B	PB	P	RP	R	RP	R	YR	Y	GY	G	BG	B	PB	P
W -	G	BG	B	PB	P	RP	R	YR	Y	GY	B	PB	P	RP	R	YR	Y	GY	G	BG
Z -	BG	B	PB	P	RP	R	YR	Y	GY	G	BG	B	PB	P	RP	R	YR	Y	GY	G
A -	R	YR	Y	GY	G	BG	B	PB	P	RP	R	YR	Y	GY	G	BG	B	PB	P	RP
D -	YR	Y	GY	G	BG	B	PB	P	RP	R	RP	R	YR	Y	GY	G	BG	B	PB	P
W -	GY	G	BG	B	PB	P	RP	R	YR	Y	PB	P	RP	R	YR	Y	GY	G	BG	B
Z -	G	BG	B	PB	P	RP	R	YR	Y	GY	B	PB	P	RP	R	YR	Y	GY	G	BG
A -	R	YR	Y	GY	G	BG	B	PB	P	RP	R	YR	Y	GY	G	BG	B	PB	P	RP
D -	R	YR	Y	GY	G	BG	B	PB	P	RP	YR	Y	GY	G	BG	B	PB	P	RP	R
W -	Y	GY	G	BG	B	PB	P	RP	R	YR	GY	G	BG	B	PB	P	RP	R	YR	Y
Z -	GY	G	BG	B	PB	P	RP	R	YR	Y	GY	G	BG	B	PB	P	RP	R	YR	Y
A -	GY	G	BG	B	PB	P	RP	R	YR	Y	GY	G	BG	B	PB	P	RP	R	YR	Y
D -	Y	GY	G	BG	B	PB	P	RP	R	YR	GY	G	BG	B	PB	P	RP	R	YR	Y
W -	R	YR	Y	GY	G	BG	B	PB	P	RP	YR	Y	GY	G	BG	B	PB	P	RP	R
Z -	R	YR	Y	GY	G	BG	B	PB	P	RP	R	YR	Y	GY	G	BG	B	PB	P	RP

Which of the 80 combinations of colours we shall adopt, depends entirely on the project we are weaving. In other words we have a free choice. When making the selection we must remember that the most important colour is D. Thus for instance if we intend to have a prevailing effect of red we have the following combinations in the table I to choose from: RP,R,GY,G; YR,R,PB,B; RP,R,Y,GY; YR,R,P,PB; R,R,Y,GY; RP,R,Y,Y; YR,R,P,P; and R,R,P,PB.

We must not worry at this stage about the apparent incongruity of our colour schemes. So far we have only the Hues, but we are not going to use them in their purest form. Let us suppose that we have selected from the above list the combination: RP, R, Y, GY. The dominant colour is Red, but as we shall see later it won't be pure red. The Accent (A) will be red-purple of a different Value than the Red. It will be darker if the Red is dark, and lighter, if the Red is light. As a contrasting colour we have Yellow, with another accent in Green Yellow.

To find the Values of our 4 colours we shall use table II.

Table II.

A -	9	8	7	6	5	9	8	7	6	9	8	7	9	8	9	1	2	3	4	5	1	2	3	4	1	2	3	1	2	1
D -	8	7	6	5	4	7	6	5	4	7	6	5	7	6	7	2	3	4	5	6	3	4	5	6	3	4	5	3	4	3
W -	6	5	4	3	2	5	4	3	2	4	3	2	4	3	4	4	5	6	7	8	5	6	7	8	6	7	8	6	7	6
Z -	5	4	3	2	1	4	3	2	1	3	2	1	2	1	1	5	6	7	8	9	6	7	8	9	7	8	9	8	9	9
	minor			moderate			major			minor			moderate			major														
	light dominant colour						dark dominant colour																							

Here we have a choice of 30 values combinations. First of all we must decide whether the dominant colour is to be darker or lighter than W. Then whether we intend to have strong contrasts in value (major), moderate, or weak (minor). Table II is divided accordingly into 6 groups. Each group has several combinations of values. For instance in the same group we can have all colours dark (1,2,4,5), or all colours light (5,6,8,9). When making the choice of values we must remember that No.1 value means always black, and No.9 - white. Thus if we select the combination: 1369 (the last one), we shall have black instead of RP, and white instead of GY. This is of course permissible provided that we realise what happens.

Let us continue with our example. We have decided on the combination of colours: RP, R, Y, GY with red dominant. Our next step is to decide whether we want this dominant to be dark or light (compared with W). If it is dark, then we must look for the values to the right of table II. If we like rather weak contrasts without either white or black then we have the following choice: 2356, 3467, and 4578. Let us take the group: 3,4,6,7. Then our colour scheme looks so far as follows: RP 3; R 4; Y 6; GY 7.

The last step is to find the Chroma of these four colours. We shall find them in table III.

The first two columns from the left have very weak chromas, The second two - moderate chromas, and the last two - very strong chromas. The chroma number for the dominant colour is the highest possible, but we can always use a smaller number. For

Table III.

A -	4	6	8	10	12	14
D -	2	2	4	6	8	10
W -	2	4	6	8	10	12
Z -	2	4	6	8	10	12

that matter we can go down to zero, which means that any dominant colour can be replaced by gray of the same value.

To finish with our example we shall select the fourth column from the left as our chromas. Now the complete colour scheme will be: RP 3/10; R 4/6; Y 6/8; GY 7/8. To describe the same colours in other terms would be a very difficult proposition. For instance RP 3/10 in textiles alone has four different names (harvard, crimson magenta, ruby), and the same terms are used to describe several other colours not always closely related. Our R 4/6 has not less than 150 different names; Y 6/8 - only fifteen; and GY 7/8 - about fifty.

This last operation seems to be extremely simple, but it is not. Because when we have selected the desired chromas we discover

only too often that one or more of the four colours does not exist at all - or at least that we can not find it in our samples. In our example we were lucky to select such hues, values and chromas, as to have a colour scheme which can be used in practice. But this is not always the case. Most colours have a poor selection of chromas for both very dark and very light values, with the exception of blue and yellow where the highest chromas correspond respectively to the darkest and the lightest values.

Let us take another example. From table I we choose the following combination of hues: YR, R, PB, B. From the second table: 8, 6, 3, 2 for the values, and from the third table: 12, 8, 10, 10 as chromas. The resulting colour scheme is: YR 8/12; R 6/8; PB 3/10; B 2/10. Of these four colours two are impossible: YR at value 8 cannot have higher chroma than 4, and B at value 2 reaches only chroma 2.

What can we do in such a case? Strictly speaking we should reject this particular scheme and try another, but there are easier ways. First we can keep the original combination of hues, and values and try other combinations of chromas. If this also does not work, we can change the values, not at random, but by selecting another combination from table II. This will work although it may mean quite a lot of work. There is never any need to change the Hues.

Another way consists on taking the nearest chroma found in the sample cards, provided that the discrepancy is not too great. In our second example we would have YR 8/4 instead of YR 8/12, and B 2/2 instead of B 2/10. Both are too far from the original scheme. Even changing the chromas according to table III would not really help because the only combination which would fit (4,2,2,2) would be rather dull. But if we try a less contrasting plan of values, e.g.: 7,6,4,3, and also a little less contrasting selection of chromas, as for instance: 8,4,6,6 - then the colour scheme becomes practical: YR 7/8, R 6/4, PB 4/6, B 3/6.

So far we have been speaking about 4 colours. If we do not want more than three, then we simply eliminate Z from any colour scheme. If on the contrary we are going to use more than four, we can subdivide any of the basic four in the following way: 1-st: the area taken by the two new colours should be equal to the area of the basic colour; 2-nd: both should be of the same hue, but one of a lower value and chroma, and the other of a higher value and chroma. For instance in our last example we can replace R 6/4 by R 7/6 and R 5/2; or PB 4/6 by PB 5/8 and PB 3/4. There are also other ways: one colour of higher chroma and lower value, and the other of lower chroma and higher value, etc. This however becomes a little too complicated.

We must also remember that we can always change D into gray of the same value, and that we can replace either A or Z, or both by white and/or black by selecting very contrasting values from table II. Finally we can make the whole project in one hue (monochromatic) with different values and chromas taken from tables II and III.

REP

Rep is an old English word, spelled also Repp, or Repps, and probably has the same root as "rib". Still for some unknown reason Rep Weave is seldom called by this name. More than that, although it is one of the simplest (if not the simplest) of all pattern weaves, it is not too well known in this country.

Recently it has been rediscovered or re-imported from Sweden and called... "mattor" of all the things! How could such a mistake be ever made? Mattor in Swedish is plural of Matta, and matta means a mat (it may be a place-mat). Thus "mattor" means "mats". This has absolutely nothing to do with the weave. Rep Weave is called Repp in Swedish, which seem to indicate that it came to Sweden from England rather than the other way around.

Rep Weave produces corded fabrics, but it has a peculiarity which distinguishes it from many other weaves which are used in making similar fabrics. The ridges (or ribs) running along the weft are made by alternating two wefts: one very heavy, and one very fine. The warp is set very closely so that it covers the weft. Therefore Rep Weave is also a warp-face weave.

It is useless to make a draw-down of the draft for Rep, because the weft does not show, and therefore the whole surface of the draw-down would be blank. But fig.1 shows the cross-section of a fabric woven in Rep. One warp end goes above the fine weft, and then below the heavy weft, thus most of it will show on the lower side of the fabric. Another warp end will go below the fine, and above the heavy weft - showing mostly on the upper side.



Fig.1

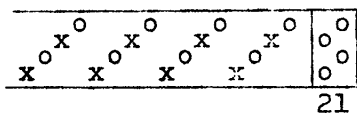


Fig.2

We can take advantage of this fact, and make easily a double-face fabric, as in fig.2. All warp ends on harness-frames 1 and 3 will be, let's say, black, and all ends on frames 2 and 4 - white. In the draft on fig.2 "x" means black, and "o" - white. If we use heavy weft on treadle No.1 and fine weft on treadle No.2 - one side of the fabric will be mostly black, and the other - mostly white. The black side will have fine white lines along the weft, and the white side - fine black lines.

The number of harness-frames does not matter so far. It can be done not only on four, but also on two, six, eight or more frames as in fig.3. It is better to use more than two frames, because the warp must be set very closely, and in case of only two frames it would be rather crowded, so that it might be difficult to open a shed particularly with sticky yarns. But plain Rep can certainly be woven on two frames only.

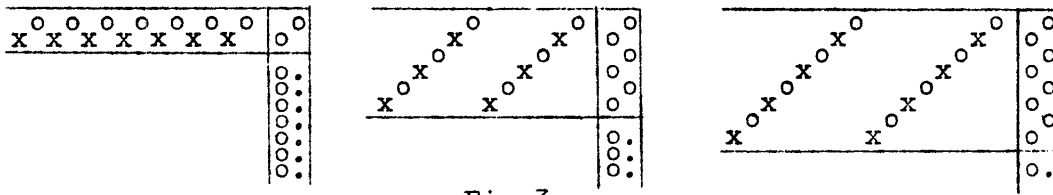


Fig.3

The fabrics made in this way must be comparatively heavy. Fine fabrics can be and are woven in Rep, but this requires extremely fine warp, and very heavy setts. For instance a beautiful silk Rep can be woven with No.100 silk (45,000 yds/lb) but it would have to be set at not less than 180 ends per inch. This certainly could not be done on 2 or even 4 frames. Therefore we shall limit our discussion to standard yarns.

Two-Block Patterns.

Strangely enough when we go from a uniform fabric to one with a simple pattern, we do not need to increase the number of frames. Two-block patterns can be still woven on two harness-frames. What distinguishes the two blocks is not the threading but the order in which the colours come. Let us go back to fig.1. If we want to change the colour of the fabric, we do not need to change either the threading or the treadling. We simply change the colours of the warp ends. In other words in fig.2 we would have the same threading: 1,2,3,4, but one block would have the colours: oxox, when the other: xoxo.

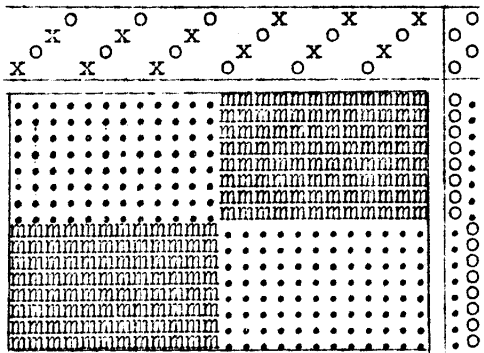


Fig.4

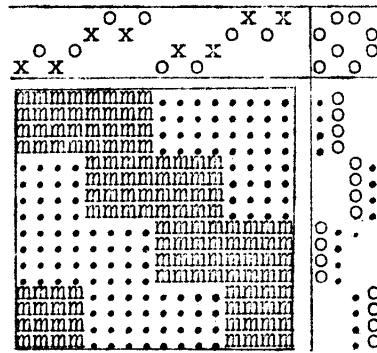


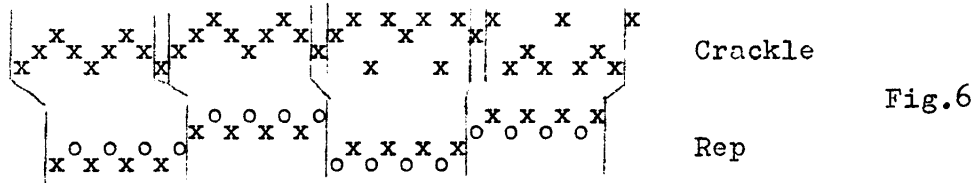
Fig.5

If we use both orders of colours in the same draft then we shall have two colours on the same side of the fabric side by side. When we want to reverse the colours during weaving i.e. have black where we had white before, and white where we had black, all we have to do is to use heavy weft instead of the fine one, and the fine weft instead of the heavy one. Fig.4 shows the complete draft. The usual draw-down is replaced here by an approximate picture of the fabric.

Any draft for a two-block pattern, such as traditional drafts for Summer-&-Winter can be easily transcribed for Rep Weave. Whenever the original draft calls for one block of S+W, we use the first block of Rep (white, black, white, black), and instead of the second block of S+W - the opposite order of colours: black, white, black, white. When all other conditions are the same, the pattern

in Rep will be smaller because of the closer sett of warp.

We can have also 4 blocks of pattern in about the same way as in Crackle weave, i.e. that the blocks will overlap. But here we need all 4 frames (fig.5) not for convenience's sake as before, but because the draft requires both: colour combinations and blocks in threading. The first block is threaded on frames 1 and 2 (reading from the left) with order of colours: black - white. The second - on frames 3 and 4 with the same order. The third - on frames 1 and 2 with reversed order, and the fourth - on 3 and 4 also with reversed order. Any traditional crackle draft can be transcribed into 4-block Rep. We simply replace each unit of crackle by one unit of Rep, as in fig.6.



We can also have a single block on a plain background, as in fig.7. But this requires a special threading with only two blocks of pattern threaded on 4 frames.

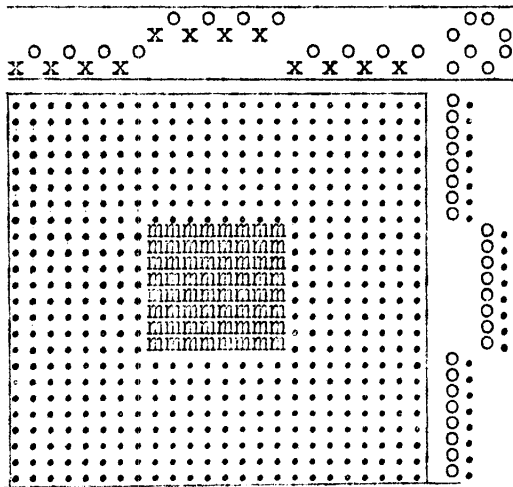


Fig.7

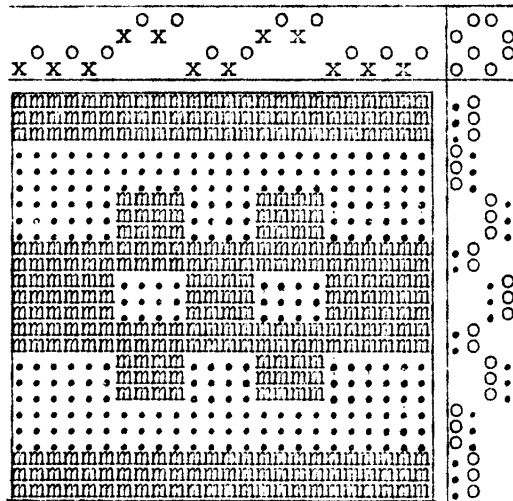


Fig.8

The same kind of threading with the same tie-up will give us also: both blocks together, no blocks, the first block alone, and the second block alone (fig.8).

Here we are not bound any longer by the necessity of weaving either one block or the other as in fig.4, or by the overlapping of blocks as in fig.5. Therefore this particular way of drafting the Rep Weave is the best for modern patterns, when drafts in fig.4 and 5 are more suitable for traditional weaving.

In fig.9 on the following page we give a few suggestions as to the patterns which can be woven with two-blocks-on-four-frames arrangement. Above each threading pattern we have a profile which can be easily developed into a threading draft.

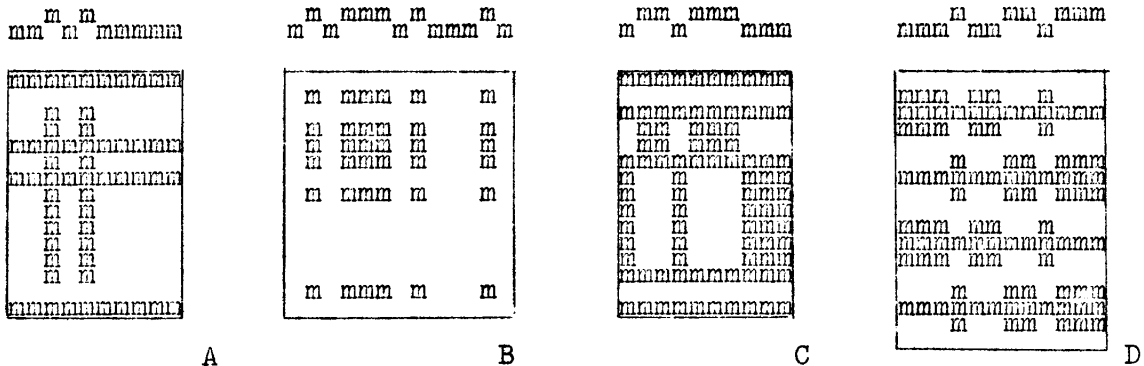


Fig.9

Finally there is another way of threading which will give us still more possibilities, but with one reservation: the weft will go not over one and under one warp end, but (at least part way) over two and under two. This means that either the weft will not be completely covered by warp, or that the sett of warp must be still closer than for ordinary Rep Weave, with four warp ends sleyed through the same dent of the reed. It means also that we shall have three different areas of colour in the woven piece. For instance in case of white and black in the warp we shall have: 1-st mostly black, 2-nd mostly white, and 3-rd half and half white and black or gray. Fig.10 shows how this happens.

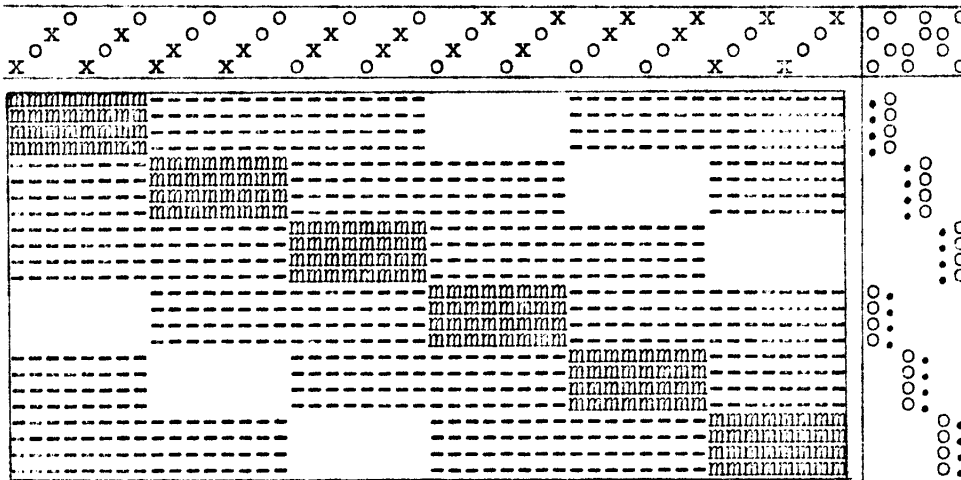


Fig.10

We have here 6 blocks of pattern, which is rather unusual with 4 frames. Two third of the fabric is gray; one sixth - black, and one sixth - white.

The six black and six white blocks make the designing anything but easy. When we follow a pattern in black blocks, then the white ones appear in most unexpected places, therefore we must take both into account. We consider this to be a rather special topic, and we shall not pursue it unless requested to do so by the readers.

ANALYSIS . 10 .

The analysis of weaves or fabrics by the method explained in MW 28,29,30 can be also applied to small patterns such as Diamond Twill, Miniature Overshot etc., but it becomes too long when larger patterns are analysed. For instance a pattern in Damask, Summer-&-Winter, or even Overshot several inches long may have as many as 500 warp ends. This would require a draw-down of some 50 by 50 inches which is obviously impracticable.

Therefore we make our analysis in two steps. First we analyse a small piece of fabric taken from a place where two blocks of the pattern meet (S, fig.1). This should give us an idea as to the weave used. The second step consists on analysing the pattern alone without paying any attention to the weave.

An experienced weaver may dispense entirely with the first step, because in most cases he will recognise the weave at a glance. In any case this first part of the analysis is in all respects identical with the method described previously.

The second step is based on the same principle as the analysis of fabrics, but instead of a threading draft we get the Profile (C, fig.1), instead of a Tie-Up we have a Short Tie-Up Draft (B, fig.1) and instead of treading - a Short Treading Draft (A).

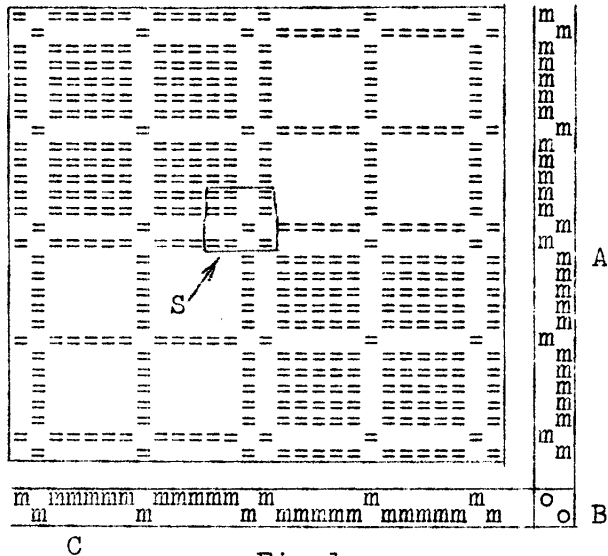


Fig.1

One square of the Profile does not mean one warp-end, but a group of them which makes one Unit of the weave. One square of the treading draft corresponds to one Unit of treading, and one circle in the Short Tie-up designates a group of ties necessary to weave one block of the pattern.

One square in the draw-down (or rather Short Draw-down, or Block-Out) represents one group of floats produced by one unit of treading and one unit of threading. The floats do not need to be reproduced accurately as to their number or length. Only the number of groups in each block of pattern must be accurate.

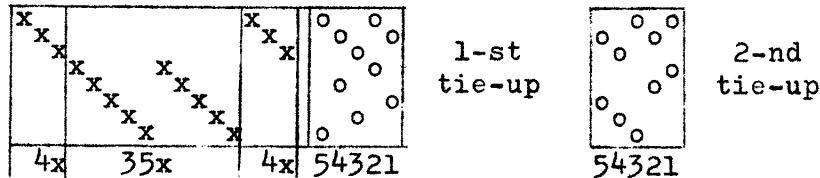
Let us now follow the analysis of the fabric shown in fig.1. The weave looks very much like Crackle with only two blocks of pattern. To make sure we take a small sample (S, fig.1) and analyse it in full (fig.2).

PROJECTS IN SATIN.

In the last issue of the Master Weaver we have discussed the theory of Satins. Now we shall describe two practical applications.

1-st Project. A traditional scarf in Sateen.

Warp: 10/2 mercerized cotton, black. Sett: 24 ends per inch, reed no.12; 2 ends per dent. Width of warp: 15½". Total No. of ends: 374. Threading draft:

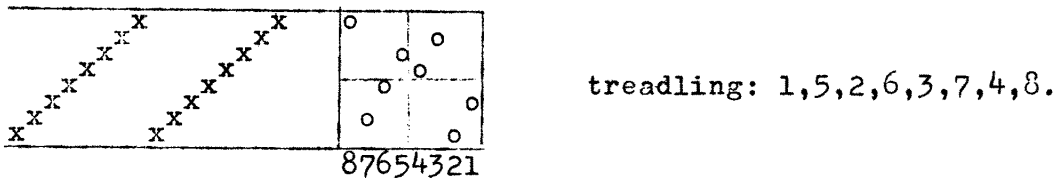


Weft: 10/2 rayon, loose twist, black, green, rust, old gold. If available silk of the same count (4,200 yds/lb) may be used. Treadingling with the 1-st tie-up is: 1,2,3,4,5; and with the 2-nd: 1,5,2,4,3. The latter is more convenient for weavers who are used to alternate their feet when weaving, but it is not perfect either.

Weave 3" of black, then a border: (B - black, G - green, R -rust, M - old gold) 2R,3G,2B,2M,2B,3G,2R,8B,2G,6R,2B,2M,2B,6R,2G,2R,12G,2B,2M,2B,6M,2B,2M,2B,12G,2R,2G,6R,2B,2M,2B,6R,2G,8B,2R,3G,2B,2M,2B,3G,2R. Then the whole length in black, repeat the border, and finish with 3" black.

2-nd Project. Experimental 3D fabric.

Warp: 20/2 cotton, ecru, or ivory. Sett: 36 ends per inch. Redd No.12; 3 ends per dent. Width of warp: 24". Total No. of ends: 864. Threading draft:



Weft: A - 20/3 merc.cotton, beige; B - very heavy nubby cotton, cream. Experiments should be made with this weft, because the success of our project depends on proper choice of yarn. If nothing suitable can be found, we can make a good substitute by twisting together either on a spinning wheel or a Doubling Stand beige rug filler with a dull metallic, or with yellow mercerized linen.

In weaving alternate A and B in an irregular order. E.g.: AAABABAAAABAABABAAAABAAAAABAAB etc.
