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MODERN COUNT OF YARN

What is wrong with our methods of measuring or "counting" the yarn? Well, for one thing they are not efficient, but this should not bother us too much - one can get used to anything. On the other hand however they are so confusing that we do not understand each other - which is a more serious matter. For instance in some English speaking countries 3/2 cotton means three plies of No.2, and in the others - two plies of No.3. But cotton and linen are not as bad as wool, because you can find in the same locality a different order of numbers for cotton than for wool. For instance: two plies of No.16 cotton are written: 16/2, but two plies of No.16 wool are: 2/16. Rayon is often numbered in the same way as cotton, but it also follows the count of silk.

There is still more confusion with basic numbers. No.1 cotton is always (in English speaking countries) 840 yards per pound, and linen - 300 yds/lb, but who knows what is No.1 wool? It may be the same as cotton or the same as linen, or 560 yds/lb. Silk can be counted in 5 different ways (see "Facts about Silk" in the same issue of MW).

Thus the only way of being sure of the grist of our yarn is to express it in number of yards per pound. This seems like an excellent idea. Why not use it for all the yarns? For instance we could call No.1 of any yarn such grist which would give 1000 yards to the pound, or any other round number for that matter. Then No.2 would have 2000 yds and so on.

Well, this good idea is known and used all over the world with the exception of United States and British Commonwealth. It is difficult to understand why we do not adopt it.

But if we are dissatisfied with our system of measuring the yarn, and find it too complicated and not sufficiently uniform, let us have a look back to the beginning of the 19-th century in England. How did the weavers then figure out the amount of yarn needed for any particular project in weaving?

First of all they would hardly ever speak about yards. For large amounts of yarn there were "Spyndles" which had for instance 14.400 yds for linen, but 15120 for cotton and wool. Because of imported French yarns there were also "Pences" of 16.800 yards. These were subdivided into smaller units: "carr" = 4200 yds, "hank" or "hesp" = 3600 yds, "number" = 840 yds, "heer" = 600 yds, "cut", or "slip" = 300 yds, "port" = 280 yds, "shift", or "skeen" = 120 yds, "knot" - 60 yds, "thread" or "split" = 54, or 90 inches, "seventh" (used only in warping = 7.715", or 12.86", and finally "quarter" = 9 inches.

Most of these units were used at the same time in the same place. In Colonial times some of these measures were adopted in America, some (fortunately) forgotten, but there was never any serious attempt to create a uniform system which could be applied to any yarn whatsoever.

Why do we want such a uniform system? For one thing, to be able to order yarn from any place on the globe, and have an idea of what we are going to get. Or read a Scandinavian draft and be able to use it in practice. Or write to a Mexican friend about our latest achievements in weaving.

Since such a system exists and is old news in most of the countries of the world, it would be a good idea to get acquainted with it. I do not mean that we should change our methods. Not at all. They are very romantic and go very well together with our quarts which are not quarts across the border, degrees of Fahrenheit based on the personal aversion to cold of the inventor, "gauges" of wire, and daylight saving time - which saves about the only thing we can afford to waste.

But why not learn both systems at the same time, so that when we are in a serious trouble we still can explain what we mean?

The system about which we are talking, is a part of the metric system of measures. Granted that it is not perfect - in most cases it is decimal though. This means not only that one unit of measure is ten times smaller or larger than the next one, but also that one does not need to remember more than one unit in each case - all other units being derived automatically from the basic one, both as to the size and as to the name.

In weaving we need only one such unit. It is called just No.1 and it contains always 1 meter of yarn per one gram, or one kilometer per one kilogram regardless of the nature of the yarn. It may be silk, or binding twine, nylon, or metal.

No.2 means two meters per gram. No.10 = 10 meters per gram, and so on. Not only it looks simple, but it is simple.

By a strange coincidence the conversion of metric numbers into yards per pound is extremely easy. Number 1 (metric) is about 500 yds per pound. Therefore to find yds/lb corresponding to <u>any</u> metric number, we multiply the latter by 500. Thus No.32 metric has 16000 yds/lb, No.28 - 14000, No.7 - 3500, and so on.

The coefficient 500 is not quite exact. It should be really 496, but in practice the difference of less than one per cent is negligible. The variations in size of yarn even on the same tube or skein are greater than that.

Now what do we do, if we know the English number but would like to express it metric system? First we find the number of yards per pound, and then divide it by 500. For instance: cotton No.16/2 is the same as No.8, and has therefore 8 x 840 = 6720 yards per pound. This divided by 500 gives roughly No.13 (or 13½). Linen No.28 will have (28 x 300) 8400 yds/lb, and its metric number is about 17.

If you like better to work with formulas, here are four: for cotton, linen, wool, and silk (in deniers).

Cotton: $M = \frac{Nc \times 840}{500}$; or $M = 1.7 \times Nc$.

Linen: $M = \frac{Nl \times 300}{500}$; or $M = .6 \times Nl$.

Wool: $M = \frac{Nw \times 560}{500}$; or $M = 1.1 \times Nw$.

Silk: $M = \frac{9000}{d}$;

where: M - metric number, Nc - number of cotton, Nl - number of linen, Nw - number of wool, and d - number of silk in deniers.

If we convert the metric number into the conventional English number, then we may use the following formulas:

$$Nc = .6 \times M; \quad Nl = 1.7 \times M; \quad Nw = .9 \times M; \quad D = \frac{9000}{M}.$$

The coefficients are only approximate but nothing would be gained by figuring them out with more accuracy.

The metric system of measuring the yarn has one more advantage. It simplifies the analysis of yarn. When we have yarn of unknown count, we cut off one meter of yarn and weigh it in milligrams on a small scale which must be very sensitive but not very accurate. Such a scale can be easily made at home. The weights (a set from 10 to 500 mgs) can be purchased in any store carrying school or laboratory supplies.

To find the metric number we divide 1000 by the weight of our sample. Thus if one meter of yarn weighs 25 mgs it is No.40. If the yarn has more than one ply (find out by untwisting) then this number is multiplied by the number of plies exactly as in the English system. If in our case of 25 mgs per meter there were 3 plies, then we multiply 40 by 3 and then mark the number of plies at the end, thus: 120/3. If we want to stress the fact that the yarn is single, we write it: 40/1. Otherwise the number alone (40) does not give any information as to the way the yarn was spun.

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FACTS ABOUT SILK.

Silk is a product found exclusively in cocoons of silkworms. There are several species of these worms, but the most important is Mulberry Silkworm (Bombyx Mori). The fiber of silk (filament) must be unwound from the cocoon a few days after it has been made. Therefore wild cocoons are of little use, as the proper timing is hardly possible. The cultivation of silk-worm has as its aim simultaneous production of a large number of cocoons. This requires special conditions in which temperature and humidity are under control. One cycle of production lasts about half a year.

History. Silk originates in China and we cannot even guess how old its cultivation is. When mentioned for the first time about 5000 years ago, it seems to have already reached a very high stage of development. China had practically a monopoly for production of silk until the 3-rd century AD. Neither the cocoons or the yarn were ever exported from China. Silk fabrics woven in the Near East at the beginning of our era were made by unravelling the imported Chinise cloth.

There are several legends which explain how the "secret" of silk has been smuggled into foreign countries. At any rate silk appears about the 3-rd century in Japan, and shortly after in India. It takes 3 more centuries before it reaches Europe. Until then silk fabrics were so tremendously expensive that according to Rodier, they were one of the factors which speeded up the economical collapse of the Roman Empire.

Now about 80% of silk is produced in Asia - the rest in Southern Europe.

Physical properties. Silk fiber when unwound from the cocoon is always double, i.e. two filaments are glued together with so called sericin. The thickness of the filament is from .001" to .008", and its length varies from 4 to 1500 yards. The filaments are very uniform in thickness and from this point of view they can be compared only with synthetic fibers.

Silk is one of the strongest fibers - as strong as ramie for instance but more elastic (up to 5%). But its most remarkable property is that it can be made into extremely fine yarn. In this respect it surpasses all natural fibers.

Raw silk is not very shiny and has a yellowish colour. This is however due to the presence of sericin, and when the latter is removed, the yarn becomes lustrous and white.

Chemical properties. Raw silk is composed of about 65% of fibroin, 23% sericin, and 12% water. Fibroin contains about 48% carbon, 26% oxygen, 19% nitrogen, and 7% hydrogen.

Sericin is removed by boiling in soap or mild alkalis, either before or after weaving.

Fibroin dissolves both in concentrated acids and alkalis (hot), but is more resistant to alkalis. It burns slowly in about the same way as wool.

Silk is highly absorbent particularly when the sericin is removed. Therefore it can be saturated with metallic salts (iron, tin). This process is called Weighting of silk. Its only purpose is to increase the weight, and slightly - the volume. If the amount of chemical compounds does not exceed the weight of the sericine in raw silk, it does not injure the yarn. Unfortunately industrial weighting aften adds as much as 150% to the weight of pure fibroin. This makes the fabrics much less resistant to wear. Heavily weighted silk will break easily if left folded for any length of time, and even desintegrate in storage.

The only safeguard against using weighted yarn is to work with raw silk, and dissolve the sericin later.

Reeling and Throwing. The cocoons are first sorted and then soaked in warm water to soften the sericin. Then the reeling starts. Several filaments are wound together on reels. When one of them ends another is substituted, so that the number of fibers remains constant. The second operation produces the yarn by collecting a sufficient number of fibers and twisting them together. However here the twisting does not play the same role as in spinning of other fibers. The length of silk filaments makes twisting of them optional, when with short fibers of cotton or wool twisting is necessary to build a thread. This second operation is called therefore Throwing and not spinning.

Count of Silk yarn. This is a little confusing. In United States we have still "drams". They designate the weight (in drams or drachms) of 1000 yards of yarn. But there are two "drams": one is one eighth and the other one sixteenth of an ance (and not of the same ounce). So it does not help very much. Then there are "deniers" - another obsolete unit of weight. In both systems high numbers indicate heavy yarn. For instance No.1 has 4500000, and No.100 - 45000 yards per pound. But unfortunately there are 4 deniers: legal, international, new, and old. There is not much difference between them (about 10%). To clear a little this confusion we give in the following table the numbers of silk in: deniers, drams, metric numbers, and yards per pound.

Deniers:	Drams:	Metric:	Yds/lb:
1	.03	9000	4500000
10	.3	900	450000
33	1	270	135000
66	2	135	67500
80	2.4	113	56500
90	2.7	100	50000
100	3	90	45000
165	5	55	27500
200	6	45	22500
300	9	30	15000
400	12	22	11000
500	15	18	9000
800	24	11	5500

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HOW TO WEAVE SILK.

In handweaving silk belongs to the "superior" class of fine craftsmanship. This opinion seems to be without ground if one uses very heavy silk yarn. Heavy silk is as easy to weave as mercerized cotton or even easier. The difficulties arising when we weave fine silk are not inherent in the nature of the yarn itself, but in its size. Therefore, what we have to say here about silk, may be applied with certain reservations to other fine yarns as well.

The subject of our discussion will be then not silk in general but such yarn which must be woven with 50 or more ends per inch.

Without even going back to the Oriental origins of silk and the finest fabrics ever woven, we may find in the 19-th century in England - handwoven satins, damasks, and tissue fabrics with an average sett of warp from 300 to 600 ends per inch. Such close setts would be too difficult to start with, particularly that they require special weaving equipment, not only different weaving methods.

We can begin with silk which can still be woven with standard equipment, i.e. with steel heddles, and normal reeds. For four frame looms about the limit of setting the warp is around 100 ends per inch. With 8 frames it can be increased, but not much. Beyond that special heddles are required.

Let us take as an example silk No.150 (deniers) or No.60 (metric). It will be set at 70 to 80 ends per inch. Therefore a warp 15 inches in width will have from 1050 to 1200 ends.

The first stage of course will be warping. If the yarn is in skeins then it must be first wound on bobbins. Even before this we must decide (when we work with raw silk) whether to boil it off now or after weaving. Boiling off may be done either in skeins (but not on bobbins) or when the fabric is finished. Since during the process of boiling the skeins must be stirred, it is perhaps wiser to leave this operation until later. Otherwise the yarn may get tangled and very difficult to wind on bobbins.

Making bobbins from skeins does not present any serious difficulties except for the time involved. The skein should be placed on a good swift, flattened out, and stretched out as much as possible. Then only they can be untied. The winding can be done by hand, or (faster but not easier) on an electric winder. The latter should have a speed control, because the yarn breaks easily if the start is too fast. The bobbins are of the type used for warping (½ lb), and should be wound in even layers. The winding must be tight, and the layers cross each other at a slight angle. This in case of breakage prevents the broken end from cutting into the already wound yarn. In practice this means a constant oscillatory movement of the hand guiding the thread, as if the hand were shaking. If the yarn breaks the ends should be tied with large, conspicuous knots, but with short ends. During the warping we may decide either to shift these knots to one of the ends of the warp, or to replace them with proper, small and tight ones. Since knots have a tendency to untie or to break, it is always advisable to shift them to the end of the warp.

As usual we have here a choice between the weaver's knot and the square one (reef). The first does not slip but breaks easily, the second is smaller and therefore passes easier through the reed but slips unless it is made very tight.

Warping can be done on a warping frame for short warps, and for long ones - on a warping mill, or at least on a horizontal warping reel. Chaining of the warp should be avoided. The warping must be very accurate and consequently slow. Try to maintain a very low tension, not to cross the ends, and not to pile them up.

Whichever warping method is used, it is advisable to make a lease (cross) at each end of the warp. Otherwise the beaming will have to be done through the lease rods, which means a lot of attention and consequently - slow work.

It is very important to have all the warping equipment very smooth. The wood must have no splinters or cracks. Even the hands (particularly the fingernails) must be smooth, since silk catches on any rough surface. Use smooth gloves if necessary.

The low tension during warping (lack of friction) must be emphasised here again. Even for a very narrow warp there will be a thousand or more of warp ends. If we use only as much as 4 oz of pressure on each warp end, the total tension will amount to hundreds of pounds, which may twist or bend the warping equipment. This is of no importance in sectional warping, but then we must make sure, that all sections of the warp have exactly the same tension, or we shall have stripes parallel to the warp in the texture of the fabric.

Beaming is done best through a raddle with at least 4 dents per inch. The raddle is fixed to the slabstock, and it should be made of highly polished wood.

It is time to say a few words about the loom itself. Again, all the wooden parts where the warp or the woven fabric touches the loom must be very smooth. The type of the loom is important too. The best will be counterbalanced one with a shed regulator for weaves requiring 4 harness-frames, and a double-tie-up jack-type for higher number of frames. A single tie-up (plain jack-type) may be used on the condition that the shed may be adjusted so that there is no friction between the yarn and the moving parts of the loom.

The lease rods must be left in the warp at about the same distance from the harness as the distance from the harness to the woven fabric, so that the front and the back sheds are of about the same size.

The heddles can be the standard steel wire type of good quality for warps set at 100 or less ends per inch. For finer weaving the heddles must be made of silk or possibly nylon.

The reed must be very clean. Old rusty reeds are out of the question.

The beaming is done as usual, but unless the warp is perfect, it must be slow. Sagging ends will wrap around the blades of the raddle, and break eventually. Therefore one must watch the raddle (or the lease rods if only one cross has been made) all the time.

Moderate combing does not seem to harm the warp. The layers of warp must be separated by smooth paper. Do not use here the building paper, but rather wrapping paper in rolls.

The threading is not a problem, but it is very annoying to make a mistake in the middle of a 3000 end warp. Therefore it is better to thread and sley at the same time, with all repeats of the weave or pattern marked in pencil on a piece of paper attached to the reed. Another trouble may be expected when free hanging warp ends twist around each other. It does not matter when they are in large groups, but just a few threads are very difficult to untwist, and this operation must be done very gently.

When selecting a reed, there is no need to go into very high numbers. Just the contrary, since we must avoid the friction, a comparatively open reed will be preferable. For instance No.15 with 5 ends per dent, or 18 with 4 ends per dent. We do not need to worry about the marks left by the blades of the reed in the fabric. If the sett of warp is properly chosen, i.e. if it is close enough, these marks will disappear completely in washing. This is one reason for making rather closely set warps. The other is that with open warps there is too much take-up on the weft, and consequently the edges are drawn in to higher degree tahn the fine yarn will stand. One must remember that such compensatory methods as leaving plenty of weft in each shed are impossible here, because they slow down the weaving which is slow anyhow.

Tying-in (attaching the warp to the apron) must be done very carefully. First comb out each bight (group of warp ends) and tie it to the steel rod in such a way that the tension can be corrected easily. Or use the alternate method of making a knot at the end of each bight, and lacing the bights to the apron with a long cord. The tension of warp must be uniform at the beginning, because slack warp ends will show later on as bright, vertical lines or stripes in the fabric.

Now comes the "gating", or adjusting of the upper and the lower tie-up. Let us suppose that we have a counterbalanced loom. First we must get all sheds very widely open. This is done when the "fell",last pick of weft, is about 8 inches from the reed. The fully open shed should fill nearly the whole height of the reed, but its lower layer should not touch the batten. We start by adjusting the ties between the lamms and the treadles. These should be just long enough to bring the warp close to the lower shaft of the reed, when the treadle is in its lowest position. In most cases it means that the treadle touches the floor. If such a position of the treadle is too low for the weaver, then a piece of wood (2" by 3") may be laid on the floor under the ends of the treadles. This is done so that the shed can not be opened more than necessary, in which case the warp would rub on the reed or the batten.

When all the lower ties are thus adjusted we try to rise the upper part of the shed by shortening the cords of the upper tie-up, until each shed is fully open. If the tie-up is not balanced (not the same number of frames tied to each treadle) then we must use a shed regulator. In this case the only cords which must be adjusted are the ties between the shed regulator and the treadles.

If the number of heddles on any of the frames is very small it is better to prevent this frame from rising too high -- it would result in stretched if not broken warp ends. Either wooden stops on both sides of the loom frame, or cords can be used. The latter are of course much easier to install. A cord is tied first to each end of the harness-frame, and then to the lower part of the loom. Its length must be such that the frame cannot rise more than other frames.

We shall avoid most of these difficulties if we select for our first project a plain twill, or diamond twill with fairly regular distribution of warp ends on all frames. Rosepath will give a too small design, but a similar pattern with longer repeats as in fig.1 will give good results.

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  x     x x    x    x       x   x     x x    x
 x  x  x    x   x    x    x   x   x  x    x   x
x  x    x    x   x    x x   x   x   x   x   x   x     Fig.1
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In this case we do not need to use the shed regulator, or any additional ties. The pattern will be about ½" long, and will pro-duce two diamonds of different size.

Now we are ready to start. Or not quite. We must first select the shuttle or shuttles, quills, and finally wind the weft. Shuttles should be inspected very carefully. They must be smooth, even, highly polished, and the points sharp, without any notches which usually appear when a shuttle strikes a hardwood floor. The shape, size and weight of the shuttle are not very important. But the shuttle must be deep enough to hide completely the quill when full.

The quills may be of paper or anything at all as long as they turn freely on the spindle. Their length must be about 2/3 of the length of the spindle. The diameter (outside) rather large; it helps when winding the weft, and the unwinding is easier too. Cardboard tubes on which small quantities of yarn are sold are quite satisfactory. Light wooden bobbins can be also used provided they are short and very smooth.

Winding does not present any problems. Since the quill is short, it will unwind easily in any case. But it should be tight, and it is advisable to cross the yarn when winding (the hand guiding the yarn moves back and forth).

Now comes the weaving, and it is the only really hard part, at least at the start. When working with fine silk for the first time we meet a completely new phenomenon which makes our life miserable. The gum in the silk makes some of the warp ends stick together. The point at which they stick may be anywhere from 1/8 of an inch to 2 inches from the cloth. In each case the weft instead of separating the ends, gets around the obstacle, and later on forms loops, not outside but inside the fabric. The effect would be charming if properly distributed all over the fabric, but it is not. It usually follows the same pair or pairs of warp ends.

To separate the stuck ends we use a very widely open shed. High tension of warp produces the same effect, but unfortunately it results in too much friction at the edges, and finally broken ends. Therefore we weave at a moderate tension and as wide shed as possible.

Since it is really not the size of the shed but the angle which matters (fig.2), therefore we work very close to the batten.

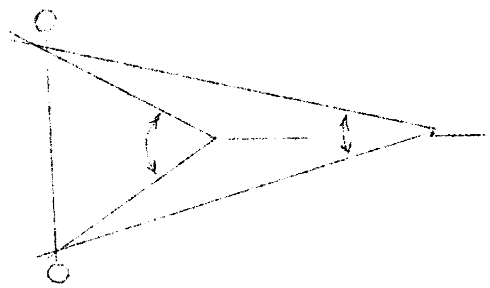

Fig.2.

The stuck ends are about the only major difficulty in weaving fine silk, and it would be worth while to find the best method of separating them. It seems that when we open the shed fast the separation is easier than when we do it slowly. For very slow weaving a perfect solution is to insert a flat stick (picking stick) into eabh shed and press it down to the cloth before throwing the shuttle. But this method is much too slow. Dressings do not seem to help, at least the ones we have tried. What helps however is to have the warp ends as smooth as possible. Ends worn out by friction stick together much easier, and are sometimes difficult to separate. Thus we may repeat once more that each part of the weaving equipment which the warp touches should be smooth and clean. The bobbins, warping reel, lease rods, raddle, and slabstock, heddles, and reed should be all carefully inspected for roughness, dirt, rust, sticky varnish etc.

The rhythm of weaving is here the same as usual. Change the shed at the moment of beating, not before or after. Beat only once but hard. One must be extremely careful how to throw the shuttle. It must get through the shed without striking any warp ends with its point. All such ends will be broken and tying them is not a pleasure.

Twill is much easier to weave than tabby. The sheds are much cleaner and there is hardly any trouble with sticking ends. But the sett of warp good for the twill is too close for tabby. Then if we set the warp for tabby and still would like to have the diagonal in the twill at about 45°, we must use heavier weft or double it.

What happens here is, that after a few yards of weaving, the difficulties seem to be easier to overcome, although apparently nothing changed in the method. This is probably the effect of higher speed and more uniform rhythm.

Once we get over the initial troubles with loops in weft due to the sticking ends, there are two minor problems. One is what to do with knots in warp. The other are broken ends.

The answer to the first is: do nothing. Just weave them in. You may try all other standard methods, but they do not work very well. Broken ends are more annoying. If the same end keeps breaking without any apparent reason, inspect the heddle. It may be rusty or it may "pinch" the thread. Replace with cord heddle. Or it may be the thread itself. If it looks uneven, tie another thread instead, and see what happens. Knots result often in broken or untied ends. Usually the trouble may be spotted well before the end breaks. A loose end shows on the uniform surface of the fabric as a bright line.

Too many ends breaking at the edges indicate too high tension of warp. Two ends breaking at the same time were certainly stuck together behind the harness. Inspect from time to time the warp behind the frames. More than two ends broken at once may have the same origin, or they may have been struck by the shuttle. This is often the result of a too fast weaving.

This is about all. Now comes the final disappointment. We take the fabric off the loom, and if it was raw silk, we do not like it too much. It is dark, yellowish, and it does not shine at all. Therefore we wash it in mild soap and iron. What we get is cardboard, and a very dirty-looking cardboard too. We wash it and iron it again and the result is the same. If not, that is if the fabric is soft and shiny, it was not raw silk. This is because raw silk contains up to 25% of gum, which should be removed before washing and ironing.

The proper way to "boil-off" the gum is to prepare first a very strong solution of mild soap. We take about 5 ounces of soap (Lux) to one gallon of soft water, bring it to the boiling point and boil or simmer our weaving for about one hour. The best temperature is about 200°F, if we can keep it at this point, but boiling does not injure silk in any visible manner. The weaving must be stirred all the time. Then it is rinsed in hot water to get rid of the gum and of the soap.

All these remarks concern comparatively heavy silk. With still finer yarn we must have special heddles, and be still more careful when warping, beaming and weaving.

We advise the reader to look up the article "Skill in Handweaving" (MW 12), where many of the operations mentioned here are described fully.

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PROBLEMS IN TEACHING — 8-th LESSON

DRAFTING.

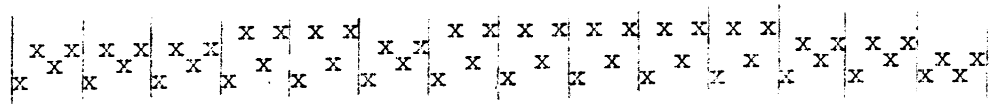
There is a whole group of weaves, wich are alike in one respect, even if the fabrics they produce are entirely different. These weaves have so called units of threading, and usually also of treadling draft. This means that the drafts are composed of groups of heddles which occur always in the same number and order. When we make short drafts each group is represented by one square of the graph paper. If there are several identical groups one after another we may also indicate their presence by a number. E.g.:

mmmmmmmmm = 9

As an example of this kind of a weave can serve Summer-and-Winter. It has two different units in drafts for 4 frames:

1-st unit: $_{x}{}^{x}x^{x}$;   2-nd unit: $_{x}\overset{x\ x}{x}$;

In making a short draft we shall mark the first unit on the lower line and the second unit on the upper line. Thus a draft:



will be represented by a short draft: $mmm^{mm}m^{mmmmm}mmm$ or: $3^{2}1^{5}3$

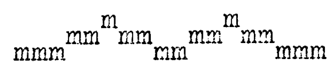
In the first case we call it a Graphical short draft or a Profile; in the second - a Numercial short draft, or just Short draft.

Profiles are always longer than the numerical short drafts, but they are more useful in finding the patterns which can be woven with a given threading. We shall discuss the variations of patterns woven from the same profile in one of the coming lessons.

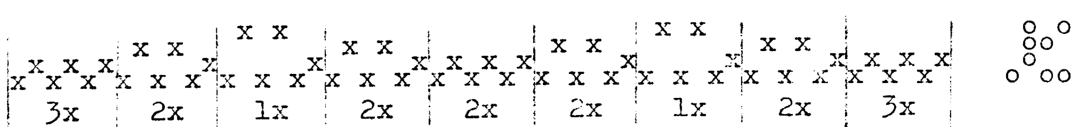
Thus for making notes and keeping records we use numerical short drafts, but for working out patterns, and in general for experiments on the graph paper the profiles are more indicated.

Since the same profile or numerical short draft may be used for many weaves, it does not in itself contain enough information for the weaver. Therefore it should be accompanied by a short note as to the weave. Otherwise it is a short draft of a <u>pattern</u>, and not of a threading draft.

As an example let us take the following profile:



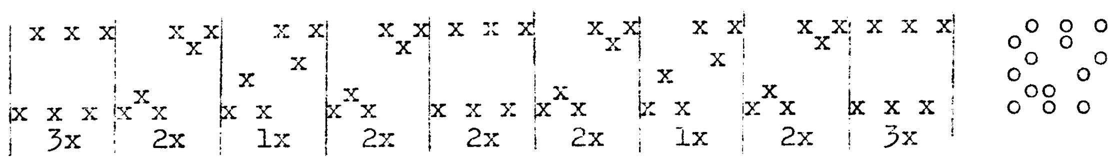
It can be developped into Bronson Lace (condensed draft):



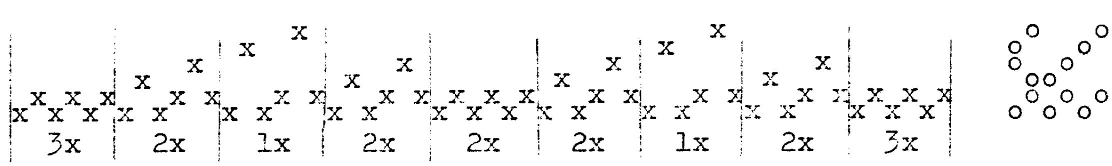
where the units are: 1-st: $_{x}x_{x}x_{x}x$; 2-nd: $\overset{x\ x}{x\ x\ x}x$; 3-rd: $\overset{x\ x}{x\ x\ x}{}^{x}$;

The first unit is really tabby, and one might argue that a unit of tabby has only 2 and not 6 heddles. But in a profile all units must be of the same length. Since other units have 6 heddles, the ground must have 6 heddles also. Otherwise the pattern would be distorted.

The same profile may be used for Huckaback-lace:



which can be written also:



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Beginners: plain weaving, basket, twills, overshot, free weaves; draft reading, developping, squaring.

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Seniors: turned twills: dimity, dornick, damasks; satins; fancy twills, swivel weave, clasped wefts; double weaves: double cloth, patterns in d.w., quilt weaves; pile weaves: weft pile (corduroy, chenille, tufted weave), warp pile (velvet), patterns in chenille rugs; cross weaves: gauze, leno, pickets; free weaves; pattern harness; draw loom; analysis of fabrics, composition of patterns.

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