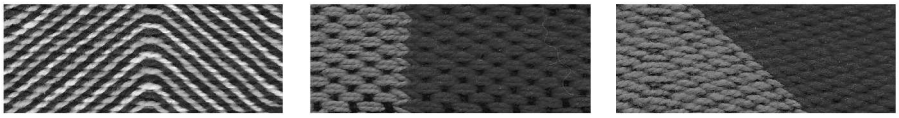
How does *that* work?

Understanding tablet weaving in only five steps.



Sarah Goslee
http:/www.stringpage.com
Presented at Textilforum 2009, Eindhoven, NL

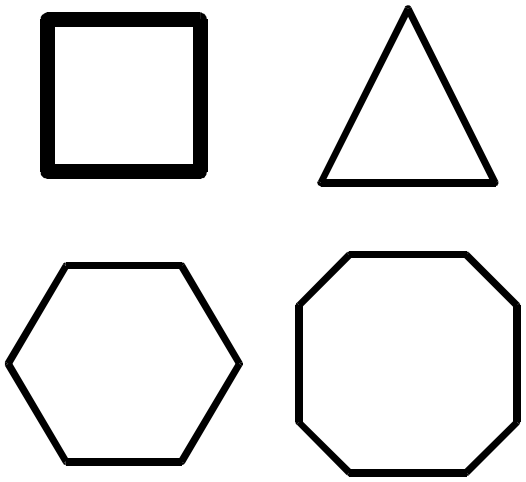
The Five Things

1. The shape or number of holes in the tablet, and the shed used.
2. Which of the holes contain warp threads.
3. The threading direction of the warp.
4. The turning pattern.
5. Tablets aligned (at same point in turning pattern) or not.

You only need to know five things to describe the way a tablet-woven structure is produced. That's enough to cover both the way the tablets are set up, and the way they are manipulated to create a fabric. By "structure" I mean something like warp-twining, or double-face, or 3/1 twill. Making color patterns is another area, but even then the color patterns depend on the underlying structure.

I'm gong to go through each of the five in more detail.

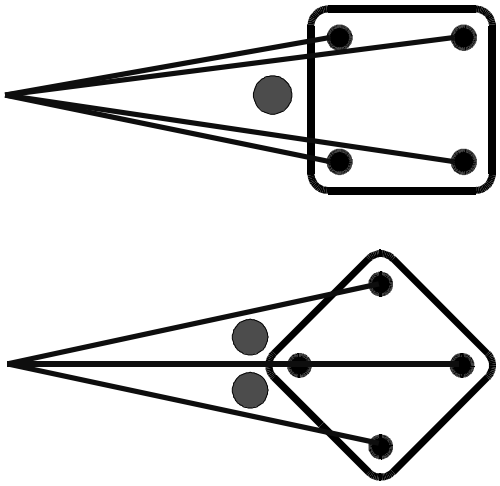
1. Tablet Shape



3

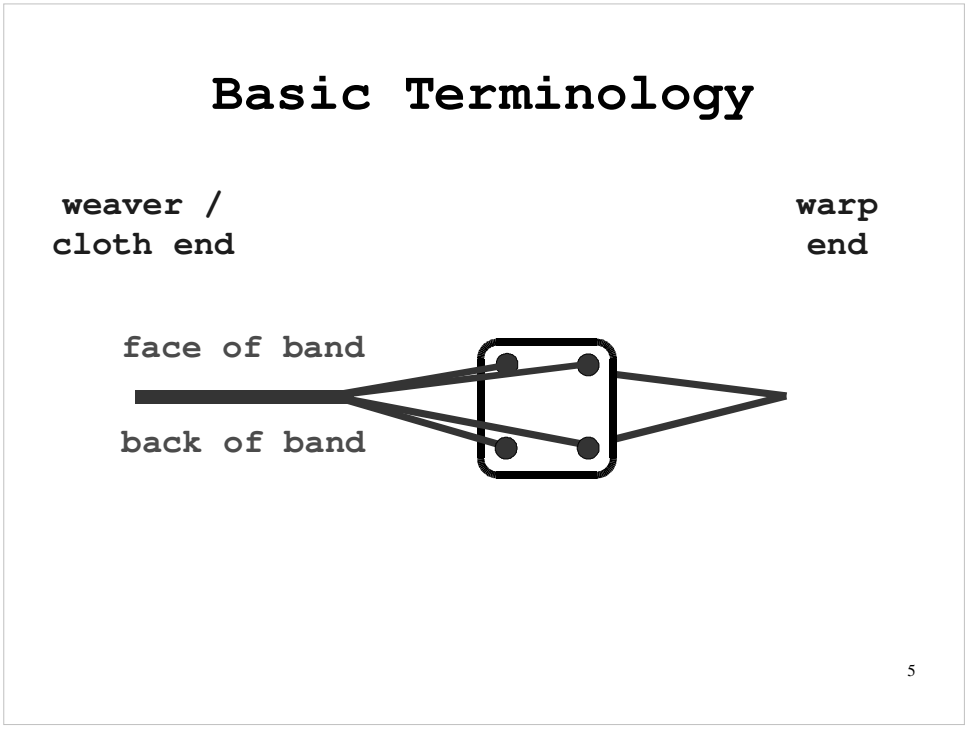
All sorts of regular polygons have been used for weaving tablets: triangles, hexagons, even octagons. To keep it simple, I'm only going to talk about the basic square tonight.

1. Weaving Shed



4

Even with a square tablet, there are two different sheds, places where the weft can be passed. The upper single shed is more common, but you can also create a double shed by placing the tablet on its point.



It's important that everyone understands, and hopefully uses, the same terminology to describe the way the tablets are warped.

I think labeling the corners in any way is an abomination – that ABCD stuff you see in most books and patterns. It's confusing, and everyone does it differently. It's one of the biggest sources of confusion for new weavers.

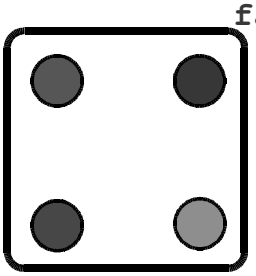
Instead, the corners of a tablet can be labeled unambiguously according to warp end, cloth end (just like loom weaving), and face and back of the band – two planes is enough to label all four corners.

All diagrams in this talk are in that same orientation.

Basic Terminology

1. Cloth/face

4. Warp/face



2. Cloth/back

3. Warp/back

6

This method of labeling is relative to the weaving, not to the tablet itself. The cloth/face hole is always on the top nearest the weaver, so it won't always be red.

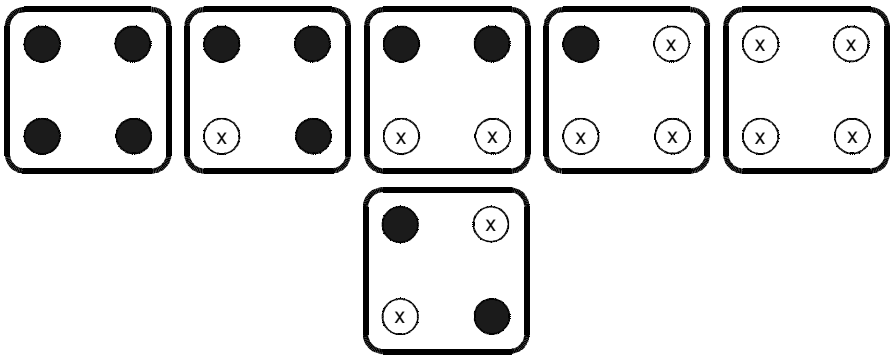
Instead, if you turn the tablet forward repeatedly, it will be red, then green, then yellow, then blue. Those colors will appear in the weaving in the same order too, moving away from the end of the warp.

You can use this to draft your patterns, because the way the tablet is threaded can be directly related to the way the woven band appears.

You can't do that unambiguously with ABCD labeling.

Yes, I think this is very important!

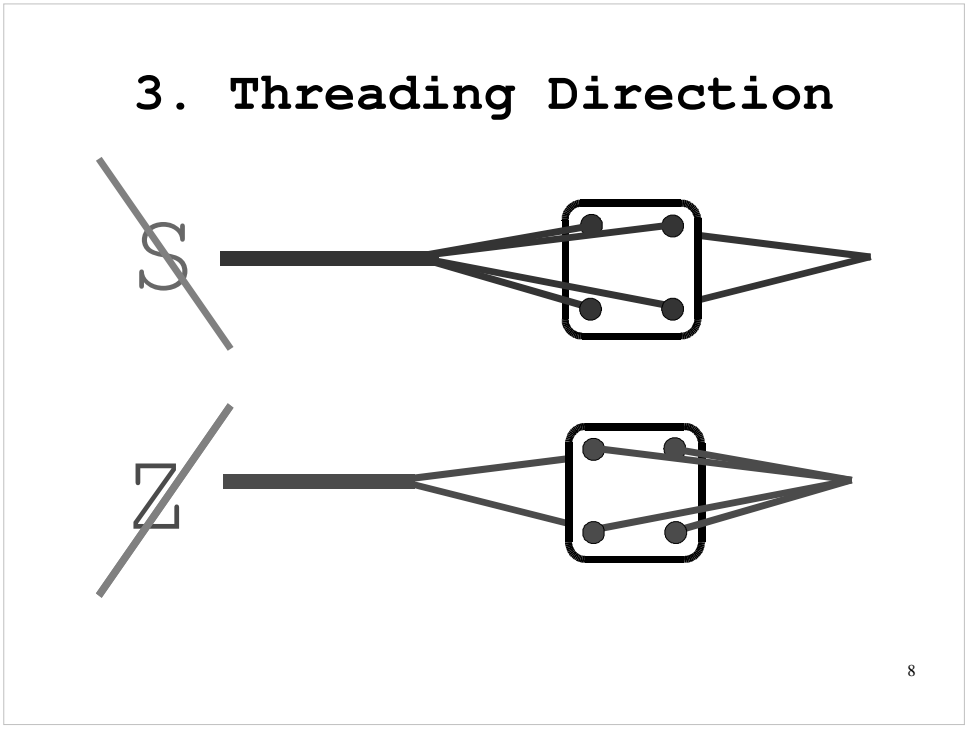
2. Which Holes Threaded?



7

Not all holes in a tablet must be threaded. Bands can be woven with three, two, one warp thread per tablet, though not with none of course.

With two threads per tablet, there are two different possible arrangements, the only number for which that's true.



The third point is whether the tablets are threaded S or Z. Again, these are shown with the cloth end to the left and the warp end to the right, with the face of the band to the top.

3. Threading by Block

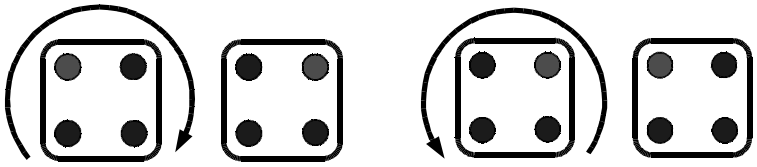
- **SSSS – **
- **SZSZ – \/\/\/\/\/\/**
- **SSZZ – \\//\\//\\//**

While it's by no means necessary, it's common to have the tablets threaded in blocks. The three most common arrangements are shown here.

4. Turning Pattern

Forward quarter turn

Backward quarter turn



10

The first three points cover set-up. With the fourth we finally get to some weaving.

The most common way to turn a square tablet is a quarter-turn. Forward: the cloth edge of the tablet moves to the face. Backward: the warp edge of the tablet moves to the face.

Tablets can be turned any other possible partial-rotation: eighth, half, even an entire rotation.

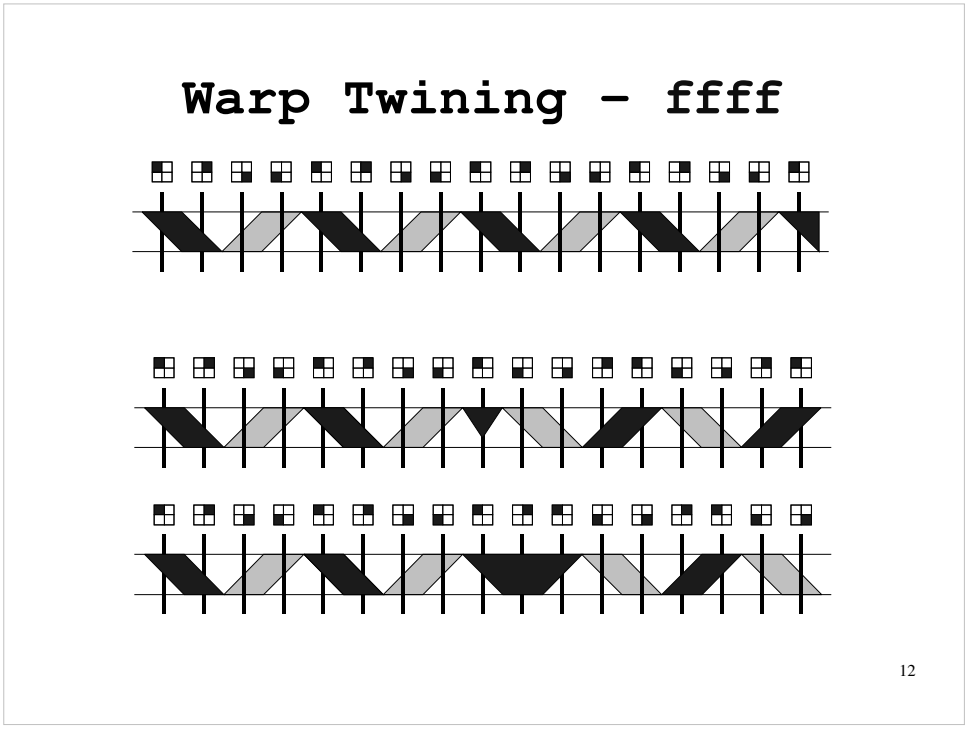
4. Turning Pattern

- **ffff – warp twining**
- **ffbb – doubleface or 3/1 twill**
- **fbfb – tabby or floats**

- **Can also use F or B half-turns**

11

A single tablet is usually turned in a rhythmic and repetitive pattern. Three of the most common are shown here.

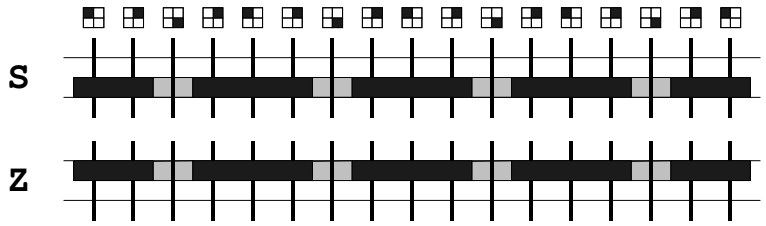


These diagrams show an exploded view of weaving done with one tablet, with one hole threaded.

The top diagram is of warp twining with the tablet turned all forward. A thread is on top for two picks, and underneath for two picks. After four quarter-turns, it's back where it started.

The second two show the effect of a reversal at two different points in the turning sequence. A thread can end up being on top for one or three picks.

Turning Sequence – ffbb

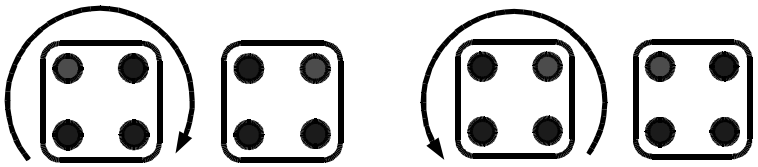


No warp twining!

13

With a ffbb turning sequence, there's no warp twining because of the frequent reversals. Each warp thread also stays on its own side of the cord made by that tablet. Which side depends on the S or Z threading.

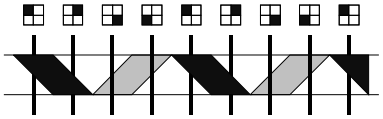
First Law of Tablet Weaving: The warp thread that *crosses the face of the band* when the tablet is turned (either forward or backward) is the thread that will be visible in the band.



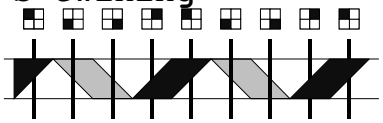
This is such an important point that I've named it the "First Law of Tablet Weaving".

Second Law of Tablet Weaving: An S-threaded tablet turned forward is structurally equivalent to a Z-threaded tablet turned backward.

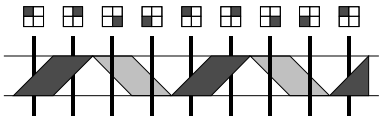
S-threaded, F
Z-twining



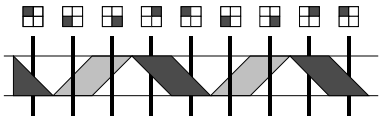
S-threaded, B
S-twining



Z-threaded, F
S-twining



Z-threaded, B
Z-twining



15

And then the Second Law.

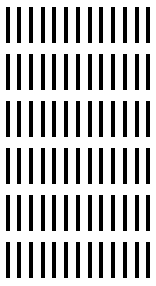
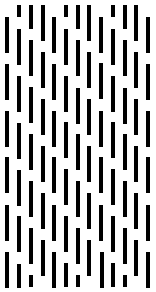
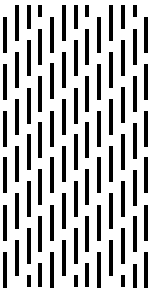
I think there may only be two Laws. These two cover the most crucial points.

5. Turning by Blocks

- **Are adjacent tablets doing the same thing?**
- **With a turning sequence like ffbb then tablets can be at different places.**

With Point 5, we go from having one tablet to having a whole pack of tablets. They can be moving together, or all doing their own thing.

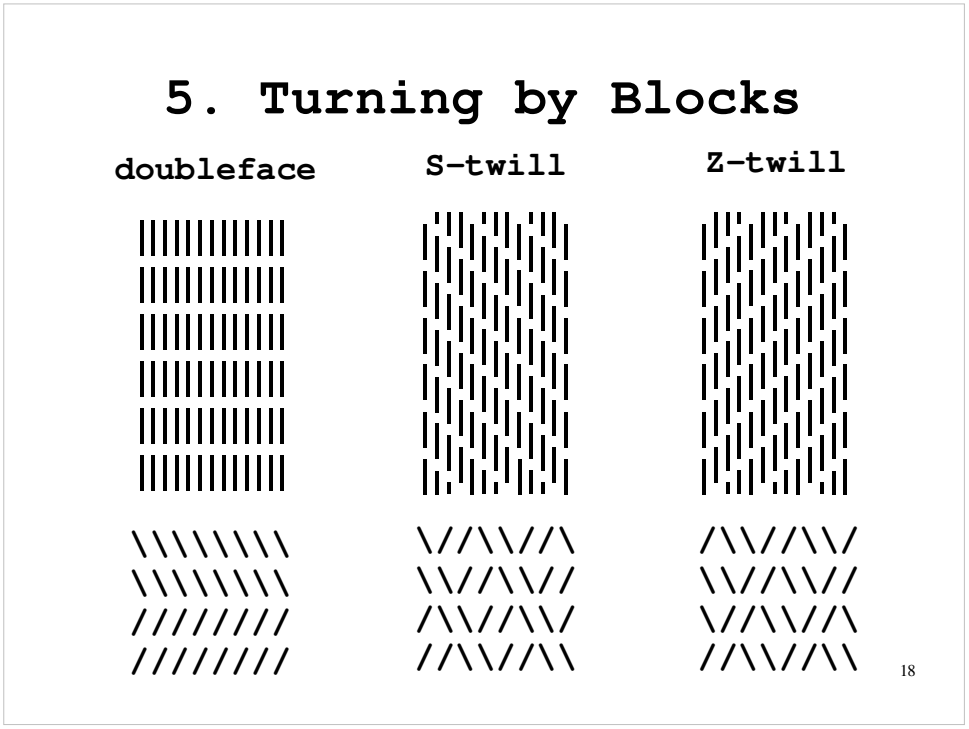
5. Turning by Blocks

doubleface	S-twill	Z-twill
		
bbbbbbbb bbbbbbbb ffffffff ffffffff	bffbbffb bbffbbff fbbffbbf ffbbffbb	fbbffbbf bbffbbff bffbbffb ffbbffbb

17

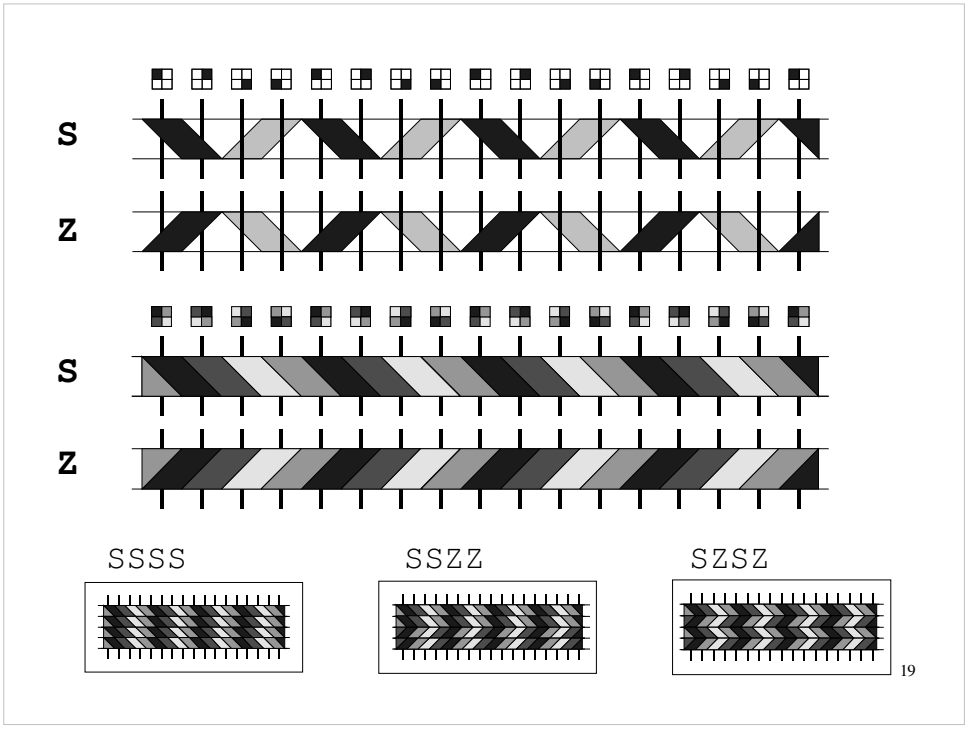
The behavior of adjacent tablets is the only thing that separates double-face from 3/1 twill. In the former, the tablets are all doing the same thing, while in the latter each tablet is one step off from those on either side.

One step in which direction? That's what distinguishes S and Z twills.

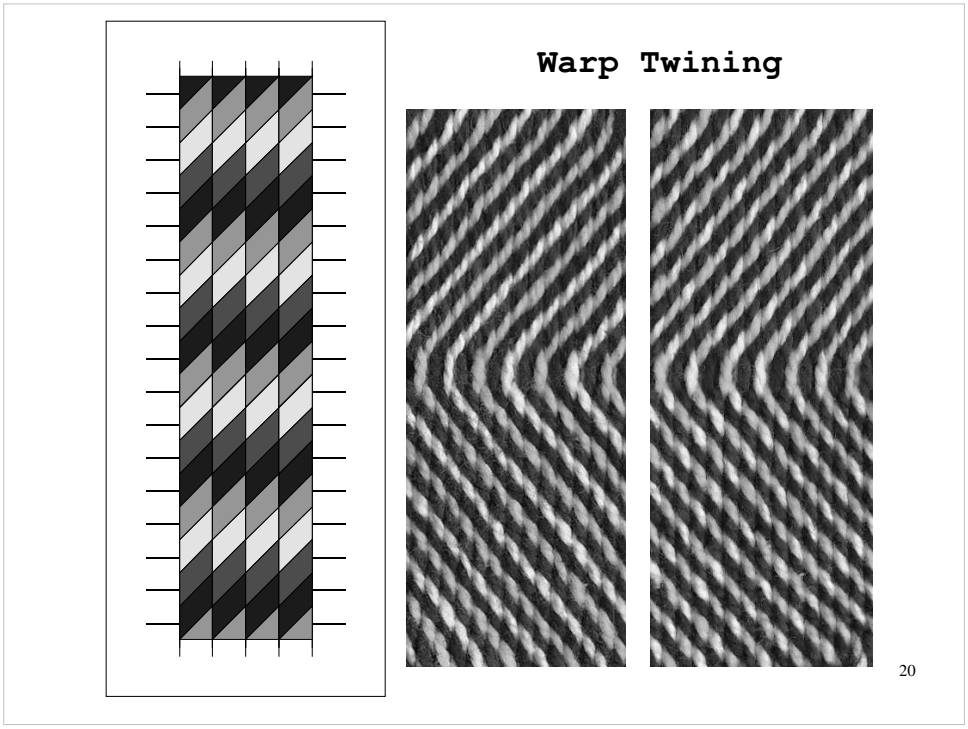


This is the same thing, but with a forward slash / substituted for the f and a backward slash \ substituted for the f.

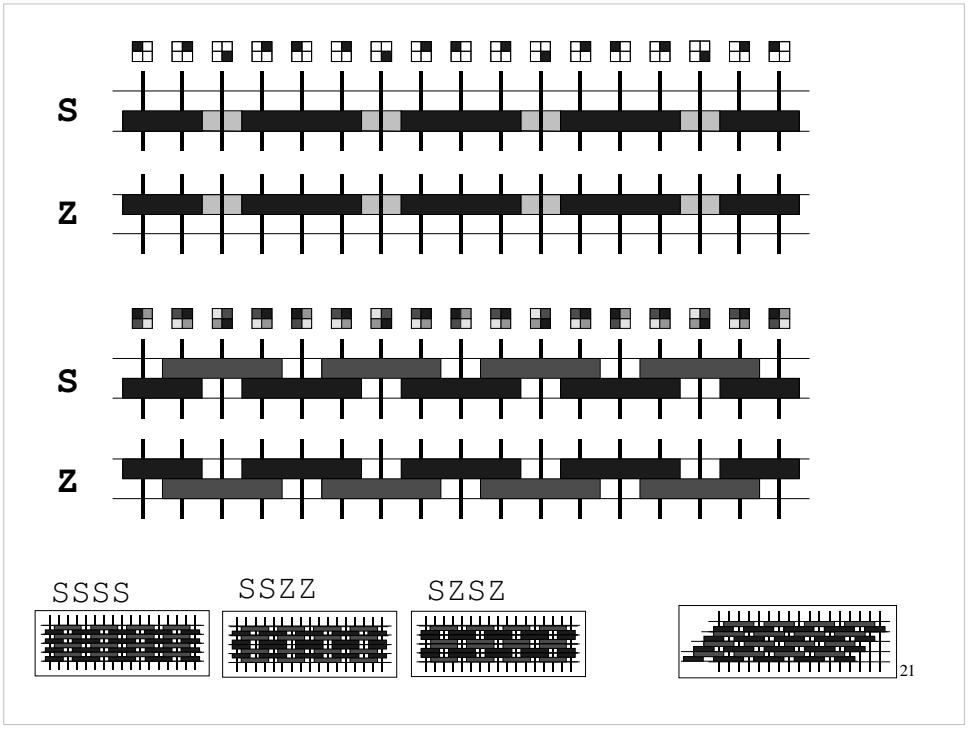
These slashes are accurate representations of the twist created by forward and backward turns as long as the tablet is S-threaded.



Warp twining: a single tablet with one thread, then with all four warp threads. This diagram illustrates how S and Z tablets twist differently when turned all forward, and how they lead to different warp-twined structures when combined in blocks.



Front and back of a woven sample that matches the diagram.



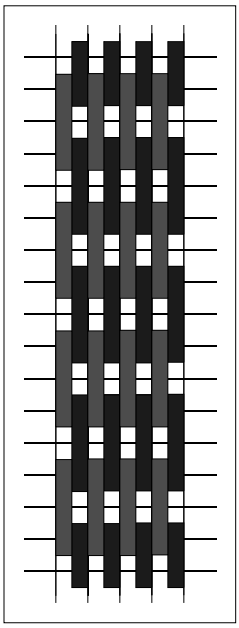
Here's the same diagram, but for ffbb this time.

Take a good look at the three figures on the bottom left. They're all doubleface, but illustrate what happens when the threading direction changes. Most importantly, you get little gaps in the cloth surface where the weft can show through.

A common beginner question: "But why am I getting weft showing?"

Answer: because that's how doubleface works.

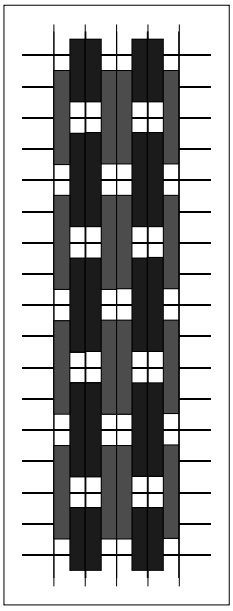
Doubleface – SSSS ffbb



22

Here's a real-life example of the structure in the diagram.

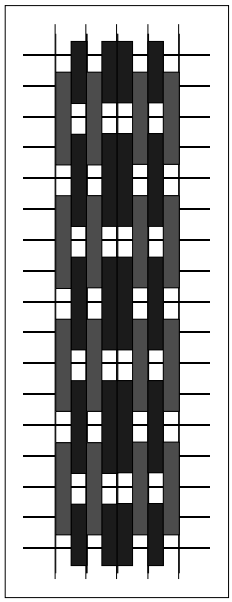
Doubleface – SZSZ ffbb

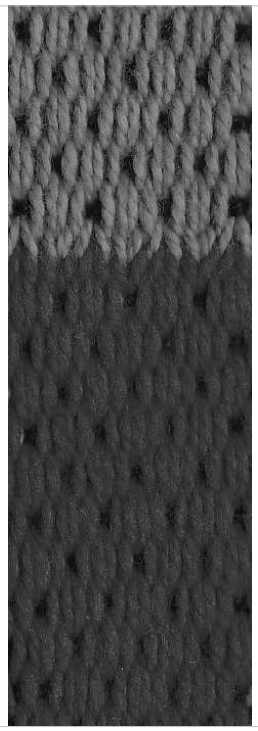


23

And again, but with a different threading pattern.

Doubleface – SSZZ ffbb



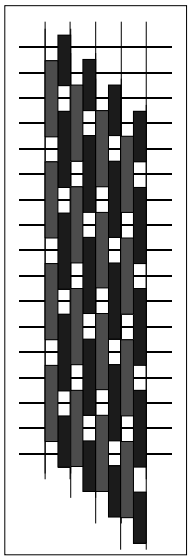


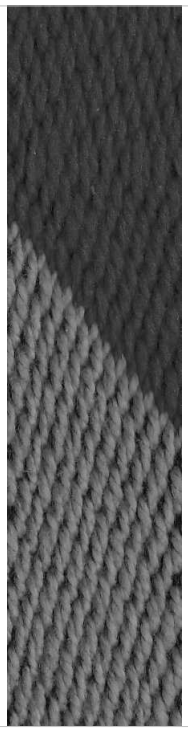
24

And the third possibility. Note how different the surfaces can look, while still being all doubleface.

Choice of threading block also affects the appearance of color changes – you can see that if you go back and look at each example carefully.

3/1 Broken Twill
SSSS ffbb
sequence 1234





25

Here's an example of 3/1 broken twill with both a color change and a change in twill direction that doesn't change the color.

Putting it All Together

Taking only basic combinations:
- **Square tablets**
- **Holes** – 4, 2 adjacent, 2 opposite
- **Threading** – SSSS, SSZZ, SZSZ
- **Turning** – ffff, fbfb, ffbb, fffbbb
- **Alignment** – 1111, 1122, 1212, 1133, 1313, 1234

4-hole tablets: **31 unique structures**
2-hole tablets: **118 unique structures**

Only five points can give rise to a tremendous number of structural variations.

Even with the limited number of options I used, you can produce 31 different structures with 4-hole tablets. Most of these have never been seen in the archaeological and ethnographic material, and may not ever have been woven by anyone other than me.

Tablet weaving is a fascinating and complex craft. Even basic structural knowledge can improve your understanding and enjoyment of the process, and help you to design and weave anything you can imagine.