THE LAY

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With the lay / **Against** the **lay**

I is by a long chalk, in my opinion and experience, the easiest of the traditional expressions :

First two words typed in broad characters don't pose any problem usually.

'With' here means ' doing as **it is doing '**

'Against' means 'opposing what **it is doing'**

What on Earth is the **LAY ?**

LAY can be taken to mean **anything of three things** ! That does not really help to clarify !

All three are the direct consequences of a process : 'le commetage' or the laying up, which is :
The **laying** of the individually **twisted** strands into a hawser-laid cordage or the laying of hawser-laid cordages into a cable-laid cordage.

-- **1/** One complete wrap, a full revolution of the strand running around the core or the axis.
The 'pitch' , the 'step' / le pas in French.

-- **2/** The linear direction of a small segment of a strand : right lay or left lay, rather, better, 'Z' & 'S'

-- **3/** The direction the strands are winding in the rope. Clockwise (CW) / counter-clockwise CCW).

All over the making of a cordage, at different phases, a torque, a twist is applied.

Due to the very particular phenomena (physics) that happen *only* when individually twisted stands are twisted again but together, as a bunch, a particular name was given to that stage : laying up.
During the twisting of fibres into yarns, of yarns into strands this particular phenomena is not seen.

There exist no 'laying' before working on strands.
Up to assembling strands together it is just 'twisting'.
To jest with words the laying up is a twist with a twist ;-) and that change the physics involved.

That is why using the words 'a laid cordage' is better expression than saying 'a twisted cordage' ; it recognise the particularities of this phase in the making of a hawser or a cable. This was outstandingly explained by Henri Louis Duhamel du Monceau 1700-1782 in L'Art de la Corderie.

We will not address the 1/ meaning at this moment and will keep to 2/ and 3/

- ' linear direction…' and 'direction… winding' are in fact referring to the same thing :
the direction toward which strands are apparently moving in an 'oriented' cordage.

What do I mean by an 'oriented' ?

An 'oriented' something is a thing about which it was decided arbitrarily but in a reasoned and coherent manner that it will have a head and a tail, a a back and a front, a right and a left…or a North and a South and/or a West and an East , may be Zenith (Up) and Nadir (Down) too….

Just putting reference marks, creates a 'difference' somewhere in an environment that had previously no particular feature allowing one to know where one is standing.

So first you 'orient' the cordage, you dispose it in a 'reference attitude'.

Usage and logic put the orientation as the one in which the rope maker see its work going away from him ; from here to over there, receding in the distance as the rails of a rail road do. (it is equivalent to see the cordage as hanging vertically, going from the floor to the ceiling.)

Observer is always facing the cordage, no 'in the back' observation unless you have eyes at the back of the head (Parents and Teachers tend to have this mutation ;-)).
With the orientation done it remains to make the choice of the 'observation or sampling unit' .

--1--- It can be a small strand segment.
In this case, despite its true nature, it may be assimilated, with an excellent approximation, with a segment of straight line.

In the reference attitude : the segment of strand is seen as having a direction :
- either from here-left to there-right (following the general direction in which the whole cordage is receding)
- or from here-right to there-left.

Here-left to there-right = going, receding to the right hence it is a RIGHT LAY (note that it is lay and not laying. It is the final state, the fixed structure and not the dynamic process which has only a momentary temporal existence)
Here-right to there-left = going, receding to the left hence a LEFT LAY

Easy to see why this depicting mnemonic was officially chosen for international standardisation in textiles (well before anyone thought about creating IGKT, the members of which generally superbly ignore it) by the BISFA - Bureau International pour la Standardisation des Fibres Artificielles - is an association producers of of man-made fibres founded in 1928. Fibres cordages are textiles.

In this particular situation each of the two letters, becomes an **ideogram** embodying a full concept in one sign

Do I have to point that in 'Z' there is a part that goes from here-left to there-right making it the symbol for RIGHT LAY. In S' there is a part…..I will let you guess after all.

--2-- 'winding direction' : no artificial isolation of a small segment here, it is a whole strand that is followed along the cordage.
Think that the winding is the 'integration' of the segmenting.

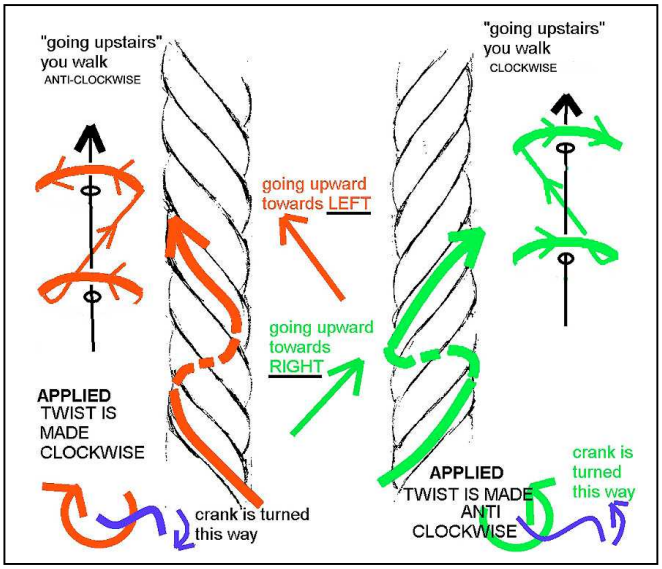
This winding away can be in a **clockwise** or in a **counter-clockwise** direction of **rotation.**

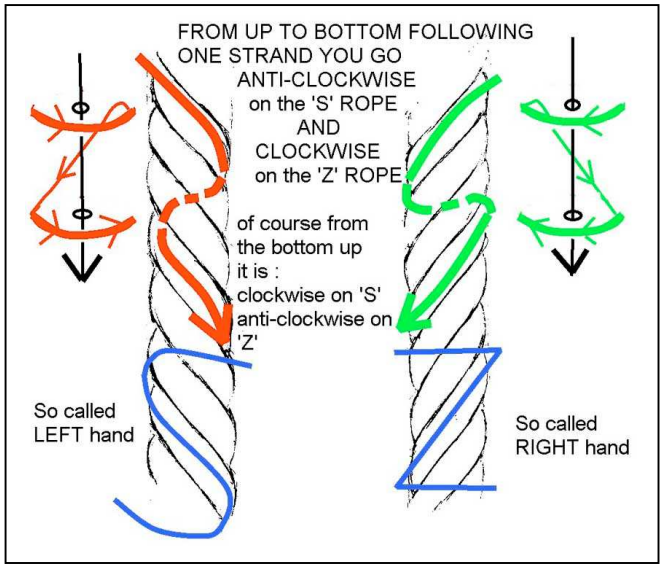
Again a bit of 'orienting' : the cordage receding in the distance is like a snake : it has a belly, a back, a left side and a right side (please refrain from saying or thinking it has handedness this would be utterly inappropriate, IMO it is an egregious practice to think that knots may have 'handedness').
Tail near you, Head away from you.

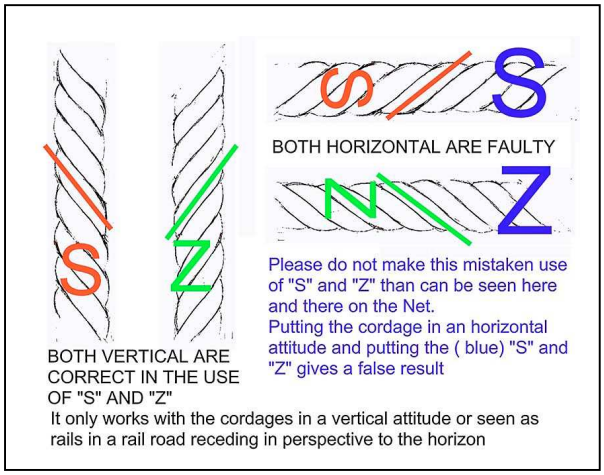
Clockwise = starting on the back, going to the belly passing by the right, and returning to the back passing by the left.
That is as the hands of a mechanical clock move. 12 – 3 – 6 – 9 – 12 again.
Counter-clockwise is just the opposite way : back-left-belly-right-back again.12-9-6-3-12

Now some illustrations.
Some may be a bit obscure till we know how to sign a crossing and are adept at analysing an oriented cordage as if we were tiny mite-like creatures able to go at will on all its component parts.

It is enough for now to feel the obscurity of old expressions and feel the light shed by modern standardised notions such as '**Z**' & '**S**', commonly used to code the description of textiles , in archaeology for example

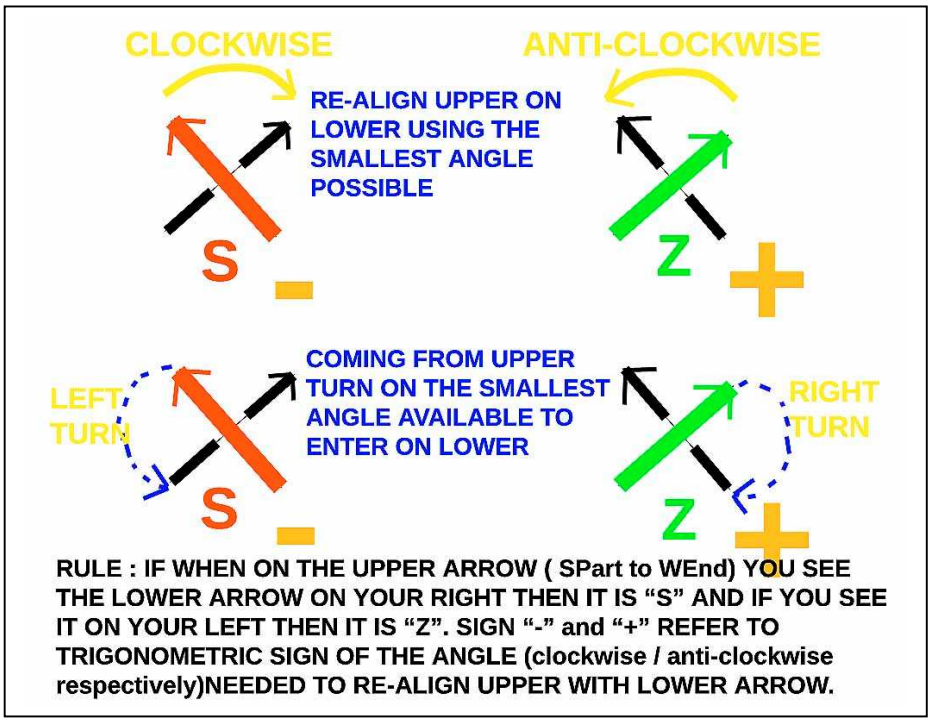


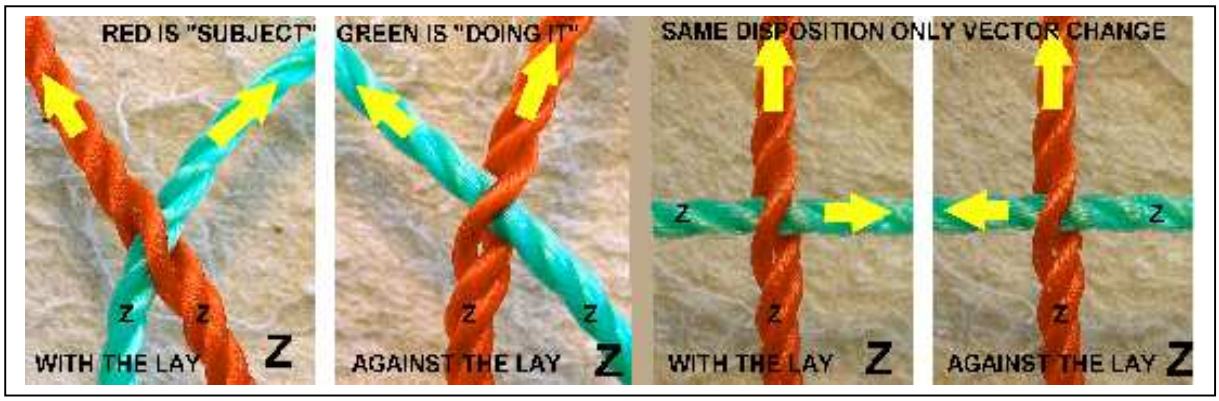


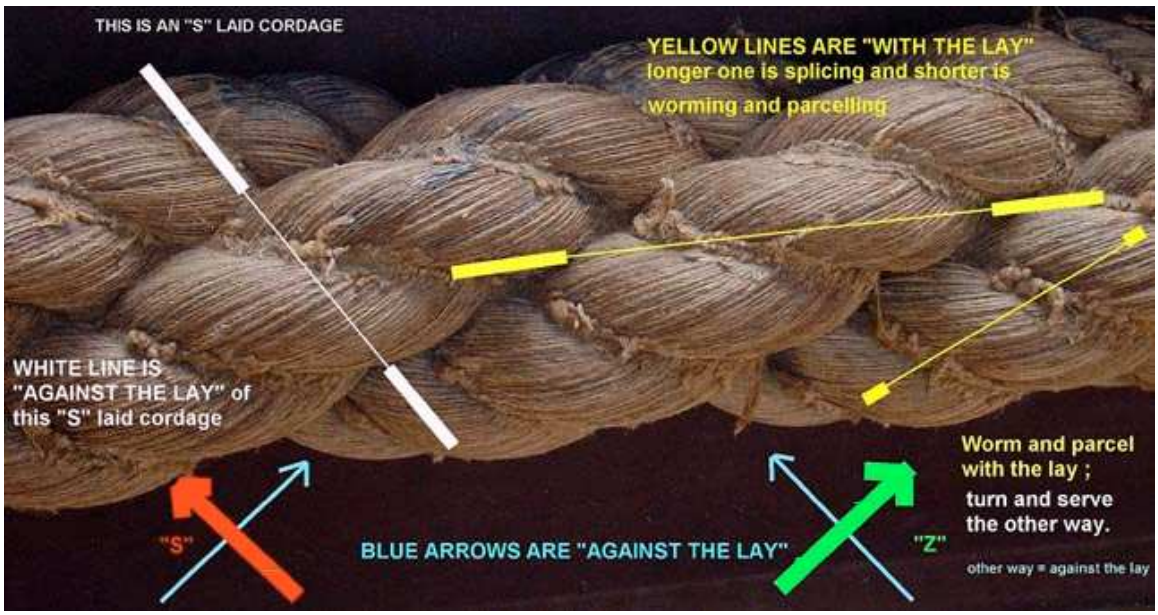


See the orientation of the rotation while following the vector of progression.
Vector = Arrow = Notch and Point, it fly point first !

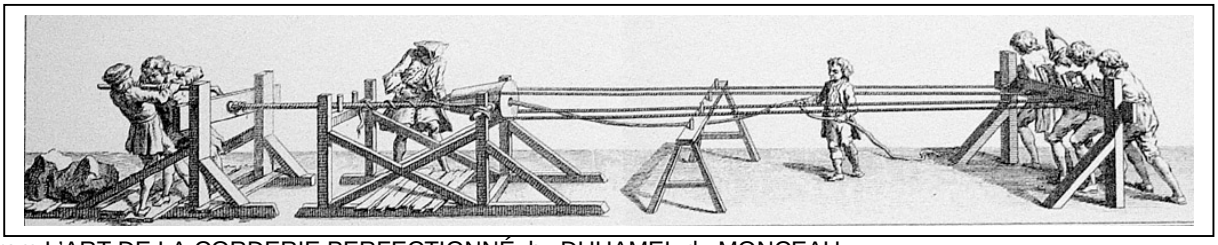
Once we know how to 'sign' a crossing it will be useful to study anew the illustrations above using the newly acquired tool.







French historical cordage in Le Musée de la Marine (Paris) : An ‘S’ cable made with ‘Z’ hawsers



From L'ART DE LA CORDERIE PERFECTIONNÉ by DUHAMEL du MONCEAU

WORM, PARCEL and SERVE

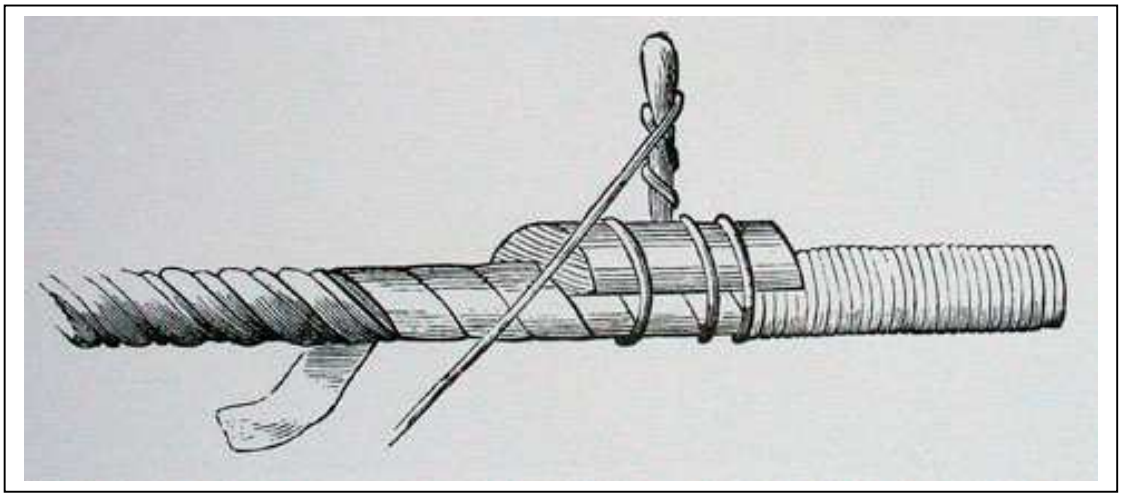
[Begin quote p 44]
WORMING a rope , is filling up the divisions between the strands, by passing spunyarn along them, to render the surface smooth for parcelling and serving.

PARCELLING a rope is wrapping narrow strips of canvas about it, well tarred, in order to secure it from being injured by rain-water lodging between the parts of the service when worn. The parcelling is put on *with* the lay of the rope.

SERVICE is the laying on of spunyarn, or other small stuff in turns round the rope, close together, and hove taut by the use of a serving-board for small rope, and serving-mallet for large rope. Small ropes are sometimes served without being wormed, as the crevices between the strands are not large enough to make the surface very uneven ; but a large rope is always wormed and parcelled before being served. The service is put on *against* the lay of the rope.
[End quote]

Taken straight from *The Seaman's Friend : A Treatise on Practical Seamanship* by Richard Henry DANA, Jr First published in 1879.

This under if from NARES's book



ROCHEFORT (France) LA CORDERIE ROYALE (the longest rope walk known in its time)