

**CLOCKWISE / ANTI-CLOCKWISE (UK)
COUNTER-CLOCKWISE(US)
and
WITH THE SUN / AGAINST THE SUN**

Muddled muddle can appear here. ;-)

Those expressions are unnecessary complications with ISO standardisation in "Z" and "S" having been in existence since several dozen of years and still superbly ignored by the vast majority of knots tyers.

In an external frame of reference, meaning a reference taken outside the observer left/right, in an

trigonometry : the measurement of 3 angles)

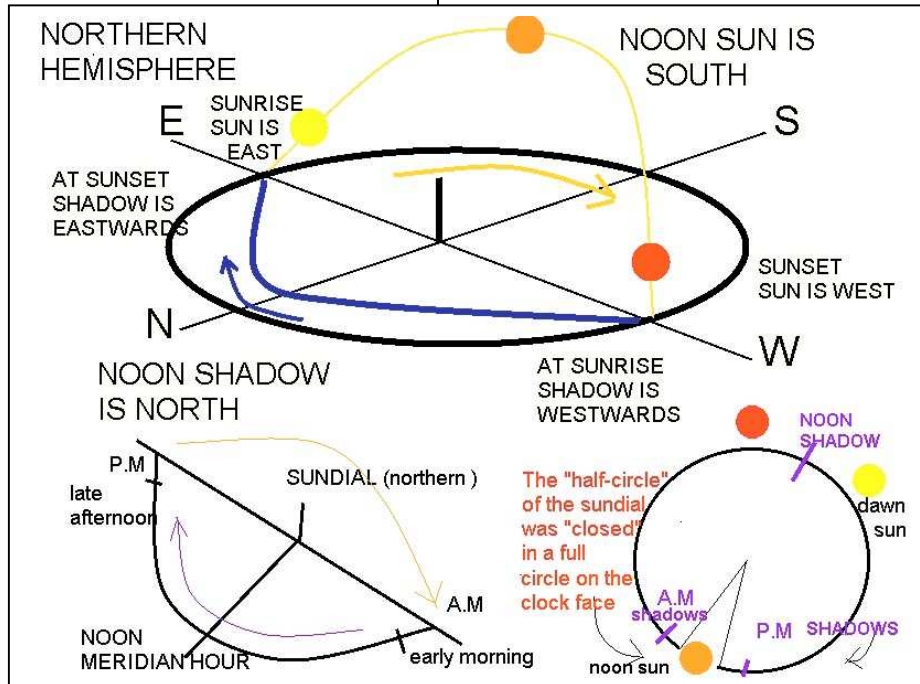
An observer is facing the Sun if he is looking :

- - - toward South in the Northern hemisphere. (sundials are pointed North)
- - - toward North in the Southern hemisphere. (sundials are pointed South)

That is so because Sun is *apparently* 'wandering' between the two Tropic lines.

North : Cancer 23°27' South : Capricorn 23°27'

Of course in both hemispheres Sun is rising in the East and setting in the West (external reference).



oriented plane or space it can clearly stated.:

- - clockwise is the way 'les aiguilles' / the 'needles' ('hands') move. It is 'Indirect' too
 - anti-clockwise is the contrary way.
- It is 'Direct' or 'Trigonometric' too.

Undoubtedly some or many will think pedantic or finicky to evokes Direct and Trigonometric, not an opinion I can share.

Any thing is good to jump at in order to put, even for a second, minds out of the ruts setting them in a fixed way.

The 'direct' indication of time passing is the apparent course of the Sun .

It "directly" warms your right side, then you back, (Northern hemisphere), then your left side when you face the traditional "Seat of Power" which is in the North.

In that orientation, not seeing the Sun itself, the 'indirect' indication is given by the shadows, seen by the observer moving from his left to his right along the day.

'Trigonometric' is what is used in Astronomy.
(Hipparcus: unit of one degree of 60 minutes each minutes being 60 seconds -

Things get complicated when the observer facing the Sun is using self-referencing : right / left.

In that case, and facing Sun position at mid-day :

- - - in the Northern hemisphere Sun in rising on the Left and setting on the Right.

- - - in the Southern hemisphere it is just the other way : rising on the Right and setting on the left.

Muddled muddle!

I have read all sort of interpretations on the Net about 'with and against the Sun'. This diversity is IMO stemming from imprecision about what it is applied to : winding of the strands, rotation of the crank, coiling a rope.

When the first weight-driven clocks appeared in the 14th (in the Northern hemisphere mind you) the way hands rotate was made identical to the way the shadows moves on the sundial : West, North, East (or 09 , 12, 03 on a mechanical clock face), it is the rotation the Sun itself apparently moves : East to South to West (03, 06, 09 on the face of a mechanical clock).

That is 'clockwise'.

Only if you think "straight lines" instead of arc of circle will you think that the 2 numerical sequences are absolute opposite.

On the clock face the almost half-circle of the sundial was closed on itself, the 6 A.M mark rejoining the 6 P.M mark and 12 where the noon shadow is

(Sun was then South : that is why when orienting yourself with your watch you point the small hour hand to South in the Northern hemisphere and North in the Southern hemisphere)

Noon or 12 mark on your watch or clock is where the shadow would have been if watches had a miniature meridian pillar. (Note that on a vertical sundial noon shadow is pointing downwards, rather towards the centre of Earth , and on an altitude sundial only the length of the shadow is taken in account to do the markings they can be horizontal or small pocket cylinder as in the Pyrenean models or sheep keepers had. This just show how things

- - - in the Southern hemisphere is :
- sunset shadow : in the direction of 03
- sunrise shadow: 09
- Noon culmination shadow in the direction of 06

those are numbers for the face of a mechanical clock.

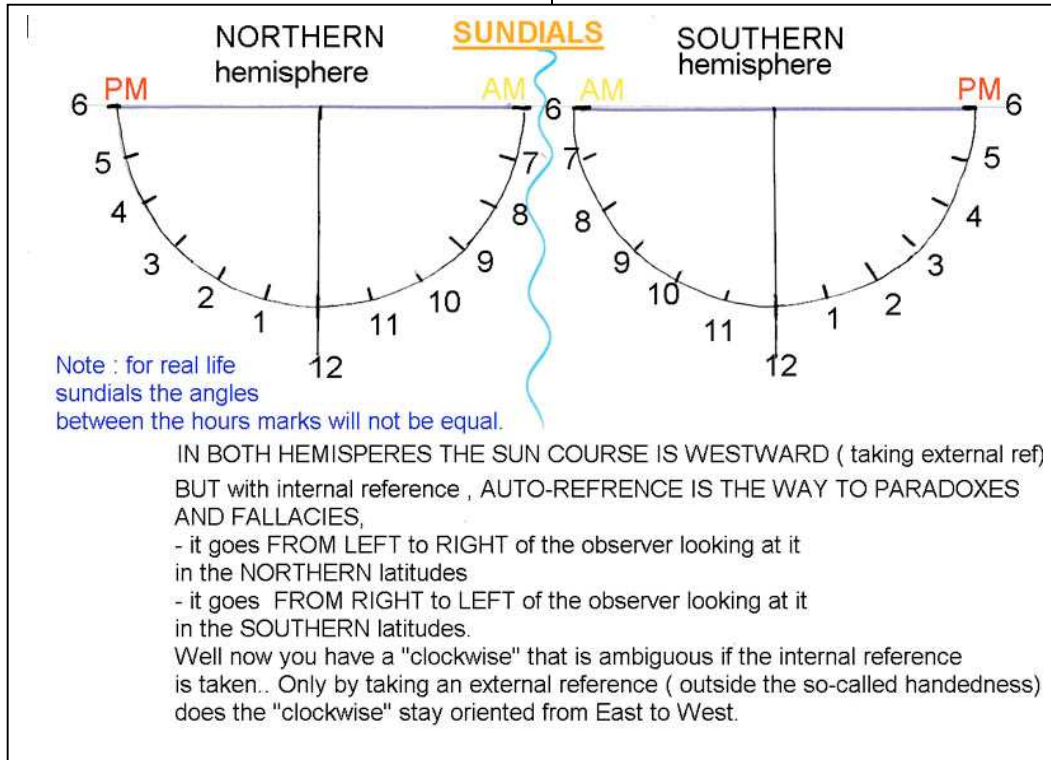
They are coming from the sundials which had the extremity of the gnomon pointing North in the Northern hemisphere.

Our clocks faces and movement of hands are "Northern".

Clocks are "models" of sundials, both were first developed in the Northern hemisphere (never forget that point as it is "the reason why").

Sundials faces are marked differently in Northern and Southern hemisphere.

Hour marks on the sundial faces in the Southern



can apparently change, *apparently only*. Think that an horizontal sundial for a given latitude will be a vertical sundial for the 'complement' altitude e.g : 35° - 55. All this just to show the necessity of *always carefully EXPLICITLY stating what is your frame of reference* or you will lose the other person : imagine you are speaking horizontal the other is thinking vertical !)

So reporting the travelling direction of index shade of a sundial on a watch face, when you are :

- - - in the Northern hemisphere is :
- sunset shadow : in the direction of 09
- sunrise shadow : 03
- Noon culmination shadow in the direction of 12

hemisphere are disposed in mirror image of what they are in the Northern hemisphere. External reference 'oblige'.

All is in the perspective when reference are not 'external' but 'localised conditions':

A given entity can look quite like it is another one just by changing the point, physical or psychological, from which it is look at.

This is the famed Diamond Sutra : what is perceived as being a snake in the shadows light show as being in fact a rope. Illusion? Mistake ?

Difference between the two ?

When you are shown how the error was made you are less prone to fall into it.

Knowing an illusion - think about so many of the visual illusions we are physiologically plagued by - does not make you less prone to have it !

An oriented circle viewed from above has an opposite orientation when seen from under.

Think about this quite ancient spiritual symbol the cross in the shape of the svastika/swastika (Navajo Tribe has it, Hindus, Celts.....) : the one in the sky made by the apparent rotation of the stars when projected on the ground of Earth has another orientation when both are seen by a man standing on Earth.

That is the symbolic signification attributed to the so called svastika (correct appellation is Cross in the shape of the svastika) one is celestial / polar the other is Solar/viewed from Earth :

That is so for an observer walking the Earth but an Extra-Galaxy observer will see two similar entities. Imagine drawing the Earthy projection of the celestial cross on a transparent glass.

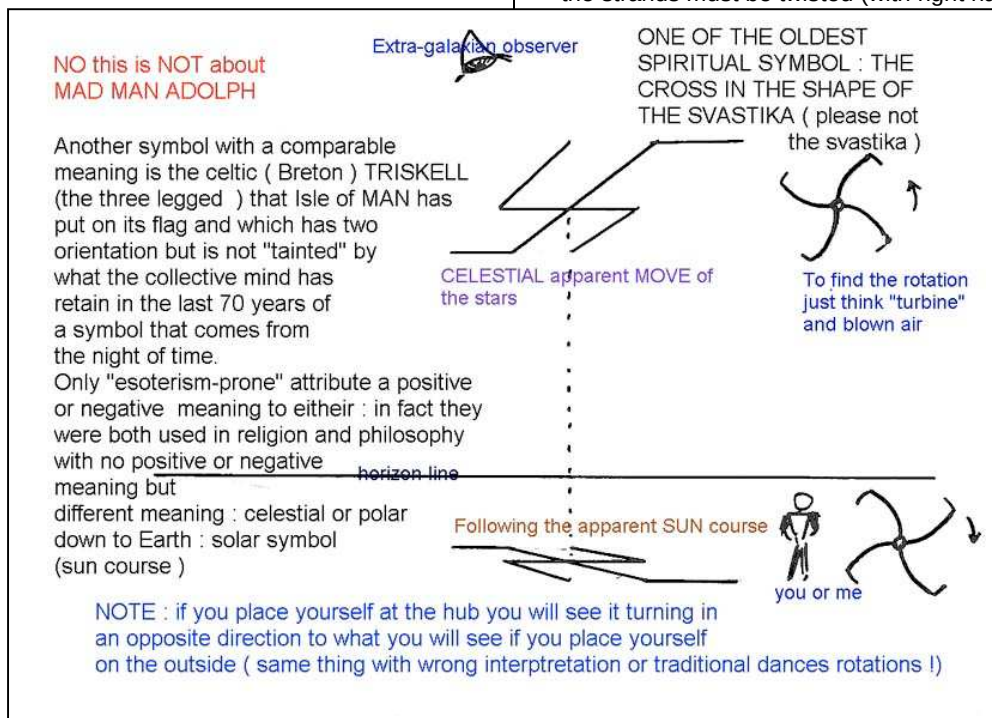
the coiling change a clockwise to and anti-clockwise.)

I really am a bit shy about "clockwise" and "anticlockwise" around cordage except in a clearly delimited mental and physical environment! All this is the source of too much potential ambiguity.

Problems arise when one tries to apply this clock or anti-clock 'rotation' to what is considered as a "straight line", the strand -which in fact is spiralling-, a small portion of which is then isolated and assimilated to a straight line.

Consider three strands suspended together from the same fixed point on the ceiling.

To get strands giving the visual appearance of an oblique line going to the right in an upward direction the strands must be twisted (with right hand or with



Put it horizontal on the ground, then dig underneath just enough to slide under it so that you will look both of the crosses, the one on the glass and the one on the celestial dome, along the same vector of perspective : you will then see they have the same orientation. It was your different perspective that created a distortion of what was 'real'. Great care is to be given to choice of frame of reference and to 'perspective' as this will modify what is to be easily perceived.

Put yourself immobile at the centre of an horizontal circle turning clockwise on itself.

You will see a mark on it border travelling from *your* left to *your* right. Go outside and face it, then the mark will appear to be going from *your* right to *your* left.

(that is the problem with coiling a cordage : whether you are centripetal or centrifugal in the progress of

left hand depending on twister's manual preference) in a clockwise rotation.

The strand is then a 'right hand' one by result ; but by procedure it is a 'clockwise' . This is what you must keep in mind.

Now take the strands between both your hands : one extremity in left hand and the other in right hand.

To get 'right-hand' result you have to twist 'counter-clockwise' with left-hand and 'clockwise' with right hand.

A left-handed person will give predominance to his lateralization and say it is a 'right' strand so 'counter-clockwise' obtained. Muddled muddle.

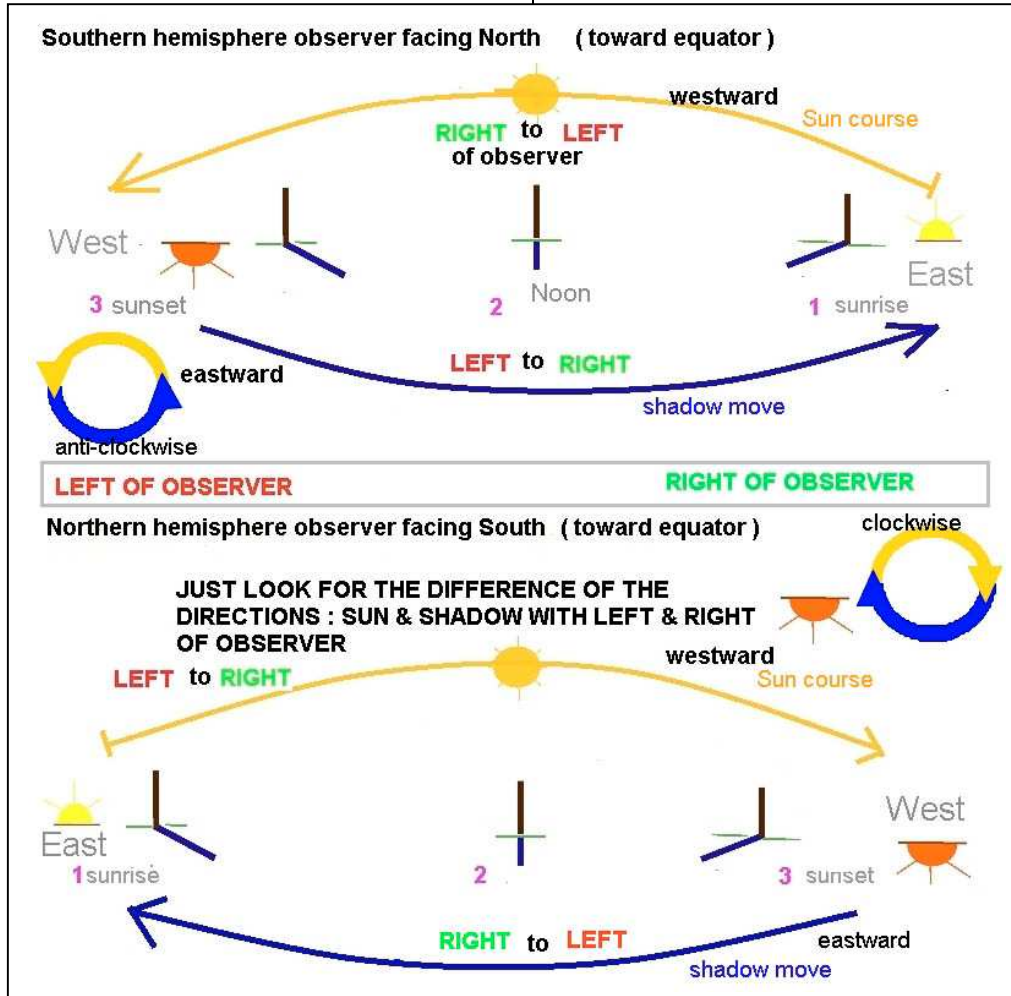
Not only clock and anti-clockwise is the result of the domination of the Northerner hemisphere but it is also the result of the domination of the right-handed.

We tend to look at things from the perspective of a being standing up and walking the Earth, never forget to put yourself in the correct position for the chosen frame of reference.

Taking a "convention" made in one domain into another domain can lead to muddle.

Another the wrong result of using clockwise / anticlockwise in some unguarded circumstances is :

--- states that the "cyclonic" winds (Low pressure) are clockwise and "anti-cyclonic" winds (High pressure) are anti-clockwise and you will be correct in the Northern hemisphere but mistaken in the Southern hemisphere.



So beware of unguarded 'natural observation' and adhere to **EXPLICIT** conventions, how arbitrary they may be in appearance and always 'think' about the absolute and relative position of the observer in the chosen frame of reference.

My counsel is as far as possible avoid using 'clockwise' and 'anti-clockwise' with laid cordage and use Z/S instead.

CLOCKWISE = West to East apparent move of shadows viewed back to the Sun in Northern hemisphere, that gave the way needles / hands move on the clocks faces. (upper half of the clock face)

It is too the East to West apparent course of the Sun as observed from the Northern hemisphere looking towards it. (lower half of the clock face)

ANTI-CLOCKWISE = the other way.

WITH THE SUN / AGAINST THE SUN

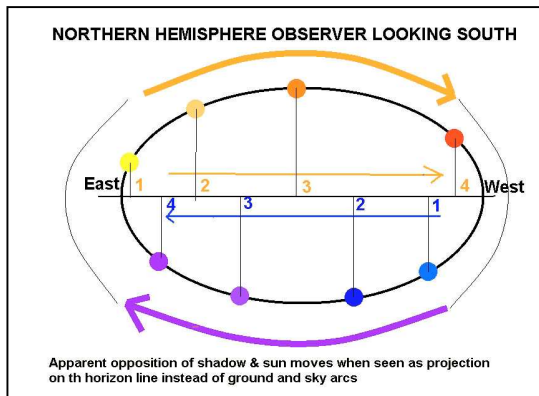
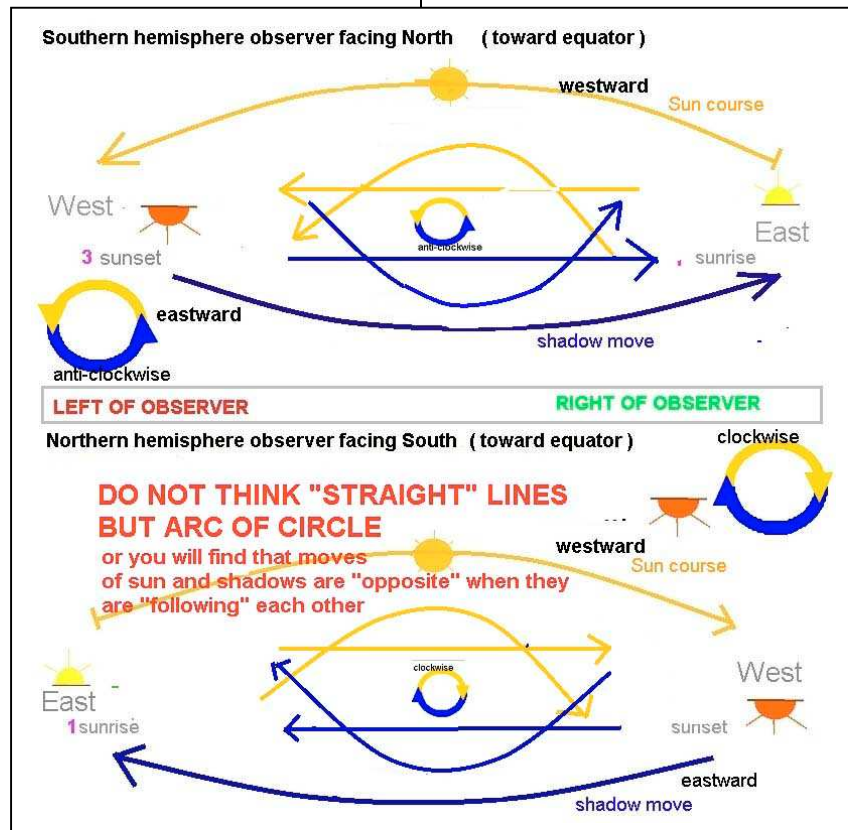
This is more of a depiction than a description. Too much occasion for ambiguity, keyed ambiguity first time. Is that a revelation ?

I have read all sort of contradictory interpretations on these expressions.

WITH THE SUN

(indirect or clockwise)
that is from West to East what the shadows created by the Sun are doing under its apparent command, particularly the shadow on the sundial ! It is too the course of the Sun in the sky when you are facing it.

Like the gnomon shadow move on a sundial. That dictated the orientation clock hands were made to move.



AGAINST THE SUN

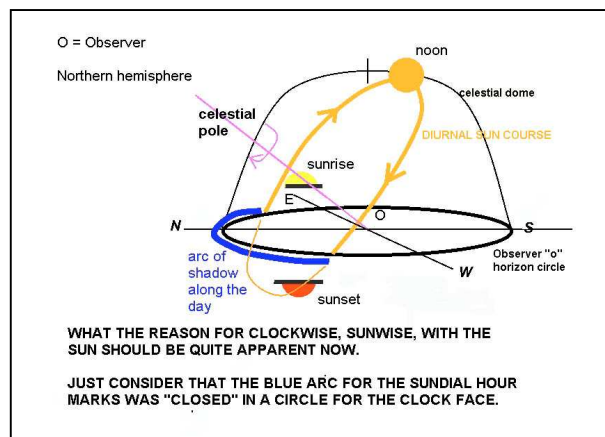
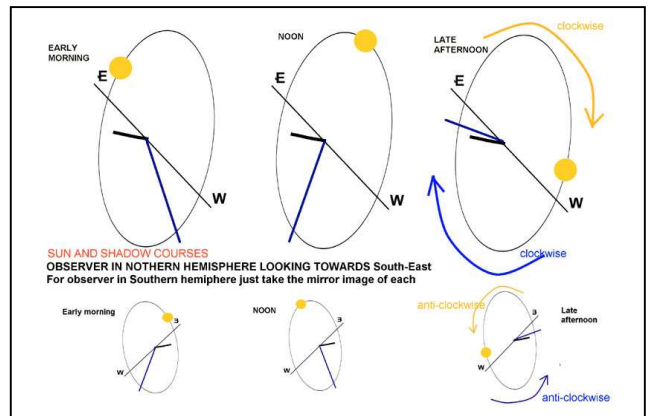
(direct or trigonometric or anti-clockwise) in opposition to what the Sun command the shadows to do, or fighting the course of the Sun itself in the sky *when facing it*.

Mnemonic : it is same word that is used :

"with the" sun is "with the" clock
"against the" sun is "against the" clock

Note that this apply ONLY TO THE NORTHERN HEMISPHERE and ONLY FOR MECHANICAL CLOCKS as sundials in the Southern hemisphere are marked "in what is our nowadays anticlockwise" way !

Indeed I am sure that those expressions about cordages or knots coming from another time are best relegated to the 'antiquities department'.



Local sphere summary of : clockwise, sunwise, with the sun.

Vitry-sur-Seine Oct 2007