Seamanship – Measuring the World Since Ancient Times in Ancient Ways

SOUTHAMPTON, NY (By Vincent Pica, Flotilla Commander, 18-06 1SR, United States Coast Guard Auxiliary)

If there is any discipline that has more ancient roots than voyaging over the seas, and whose ancient ways still work today, I'd like to know. Since time immemorial, even in an age of GPS and knowing where you are on the planet within feet, the ways of the ancient mariners still are useful today – especially when your GPS fails on a dark and rainy night…

From the Shores of Ancient Babylon

If you measured the time from when Julius Caesar walked the Earth to today, and doubled it, you wouldn't be within a 1,000 years of when the Babylonians were inventing, among many things, astronomy and the "sexagesimal" counting system – a numbering system that uses 60 as its base instead of 10 (the way we count.) Ten is a pretty good "base" when you come along with 10 fingers – unless you are dealing with things that come in a circle. Time and angles (circles) are actually ideally suited for "base 60" – 60 seconds, 60 minutes, 360 degrees…

Whether the Babylonians used latitude and longitude like we do today is an open question. Without question though, about 3,000 years after the Babylonians invented the sexagesimal system, a Greek named Hipparchus, knowing the Earth was round (yes, Columbus, round) divided the world into latitude and longitude in 130 BC. Thus were born degrees, minutes and seconds. One minute of latitude (not longitude!) equaled one nautical mile and sixty of them became one degree. 360o got you all the way around the world in nautical miles.

In that we live in a digital age, we can express a location today in any one of 3 equivalent ways, depending on how numerical intensive you are. The Moriches Inlet can be said to be at any of these three lat/lon coordinates:

40o 45' 49" N x 072o 45' 18" W
40o 45.817' N x 072o 45.3' W
40.76317o N x 072.755o W

It is exactly the same place – just expressed in varying forms of math. Converting one to the other is either dividing by 60 (18 seconds is 3/10ths of minute) or by multiplying by 60 (.817 of a minute is 49 seconds.) If you are giving, or getting, latitudes and longitudes from someone (as in a favorite fishing spot), be sure you are able to convert the form they give you to the form you use on your boat. And thank the Babylonians!

By King Henry's Foot

As school children, we were often taught that the foot was (roughly) the size of a Roman soldier's foot. A lot of empires came and went since the Roman Empire so the foot actually changed size through history as nutrition and health created new average "foot sizes…" So, around 1100 AD, King Henry the First set what was the foot for the next 766 years. Congress set the foot as 1,200/3,937th of a meter in 1866.

But what does that have to do with seamanship? Hard to fathom…? No, that is exactly why it matters…

Take a line in one hand, stretch your arms fully out and grab the line now with both hands – and you have

the ancient fathom… Lay that line on the ground and go heel-to-toe along it and you will find it pretty close to six of your feet…

It Is All Greek to Me!

About 100 years before Hipparchus divided the world into latitudes and longitudes, Eratosthene did some pretty clever geometry with wells in his home town of Alexandria and an Egyptian town named Syene – that happened to be on the Tropic of Cancer. In 240 BC, he calculated that the Earth was 25,000 miles around. Divide that number by 360o and further by 60 minutes and you get the ancient nautical mile – 6,100 feet. With space-age advances, we now know that, using the WGS84 Ellipsoid in your GPS, 1 minute of latitude at the WGS84 equator is 6,087 feet and at the poles is 6,067 feet. Not bad for Greek mathematician nearly 2,500 years in the past…

Want to sound seamanly? When someone next asks, "How fast are we going?" and the GPS is measuring miles per hour, quickly multiply that MPH by .85 (85%) and you'll be pretty close to "spot on"… 25mph *.85 = 21.3 knots… "We're doing just better than 21 knots. At this rate, we'll be in Montauk by …"

Or, if your GPS is in knots, and someone says, "So, how fast are we going in MPH?", just multiply that by 1.15 and you'll be pretty close to "spot on" again… 20 knots x 1.15 = 23 mph…

And why do we call speed through the water (or via a plane for that matter) a "knot"? Well, ancient sailors counted how many knots, tied in a line exactly 47.25 feet apart, went through a counter in 28 seconds… Sorry you asked? Don't be. The ratio of 47.25 feet to the nautical mile is equal to the ratio of 28 seconds to an hour… nautical miles per hour… a knot…

BTW, if you are interested in being part of USCG Forces, email me at JoinUSCGAux2008@aol.com or go direct to MaryJo Cruickshank, who is in charge of new members matters, at FSO-PS@emcg.us and we will help you "get in this thing…"