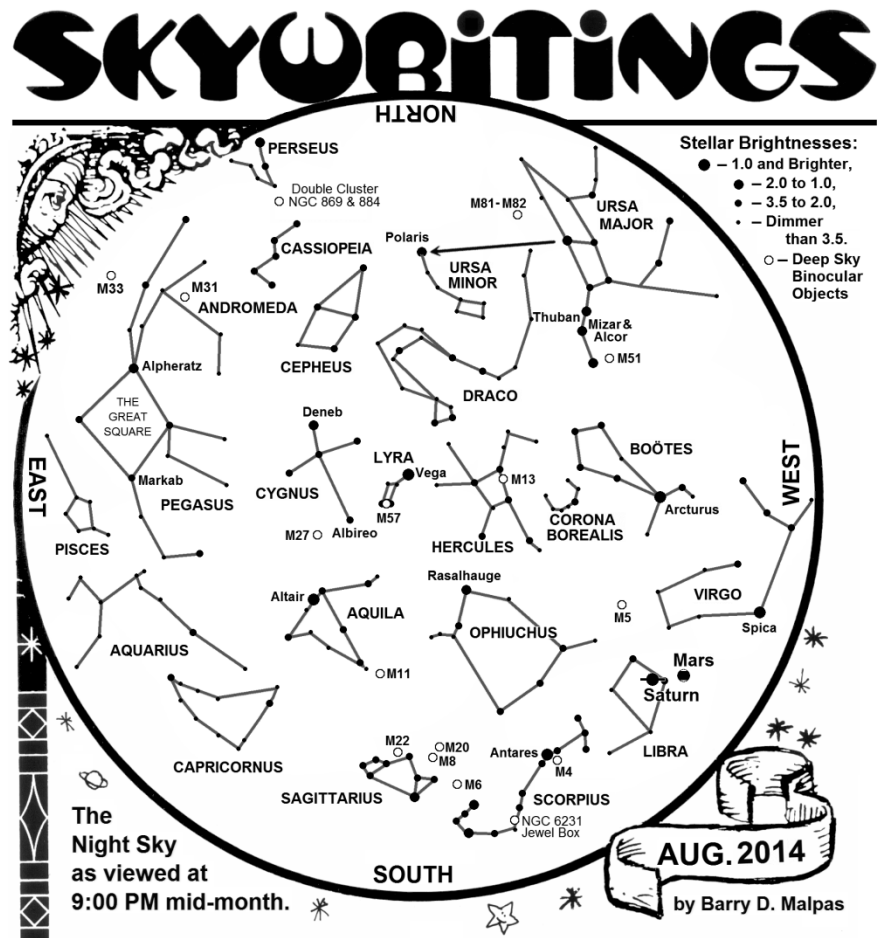


# It's About Time – The Calendar

By Barry D. Malpas – Special to the Williams-Grand Canyon News – 2014 August

Years, months, days, hours, minutes and seconds are all terms we are familiar with and take for granted since today we can look at our cell phones and determine these units of time with great precision. But, where and how did we begin to determine the concept of time? It is a distinctly human construct that has evolved over the millennia. Prehistoric people, thousands of years ago, who were hunters and gatherers, then later farmers, needed ways to determine when the herd animals migrated, or when it was the best time to plant. Because they believed that life, nature and things celestial were all intertwined, they looked to the sun, moon and constellations for guidance. By observing the changes in positions of the sun and moon, and the seasonal changes in stars and star patterns in the night skies they were able to develop methods of measuring time that allowed for the planning of nomadic activities, farming, and the celebration of sacred events. Groupings of stars, or constellations, were identified and intermingled with their local cultural stories which allowed group members to easily identify when certain important events took place, and how they corresponded with the natural world around them.



Most constellations in the many human cultures do not correspond one-to-one. Some overlap, and some, we consider as one, may be identified as several individual groupings, depending on what the ancient observers envisioned when the dots were connected. All are based on the animals and objects that existed in their local environments. For instance, to the sea faring Polynesians, the curling tail of the constellation Scorpius is a fish hook, and to the Navajo, the Big Dipper asterism and the constellation Cassiopeia, are a man and woman sitting around the central home fire (Polaris).

For seasonal changes, many prehistoric peoples from around the world have aligned rocks that, when sighted against other rocks, or natural features such as mountain peaks, would identify the northern, midway, and southern most positions of the sun marking the winter solstice, spring and autumnal equinoxes, and the summer solstice which were important to growing and harvesting crops, as well as determining migration periods of certain game animals. Constructions like the well-known Stone Henge, in England, and the numerous rock alignments in adobe buildings with the San Francisco Peaks, made by the ancestors of the Hopi here in Arizona, are good examples.

There have been many “calendars” used over the millennia by varying peoples, usually based on the sun or moon, or both. The origin of the calendar as we know it began with Julius Caesar in 45 BCE, which accounted for 365¼ days in each year by designating three years of 365 days and one “leap year” having 366. However,

the Julian calendar has an error of about three days every four centuries. The change which created our current Gregorian calendar was first introduced in 1582 CE by Pope Gregory XIII which re-synchronized the date of the celebration of Easter, which is tied to the spring equinox, back in line with its original definition given in 325 CE at the Council of Nicaea. Over the 13 centuries, the discrepancy between the  $\frac{1}{4}$  day used in the Julian calendar and reality, the date of Easter had migrated back 10 days. The Gregorian corrections made were to first skip the 10 days (the day after October 4 became October 15) and by having only century-years divisible by 400 being leap years, while the others would not be so (i.e. the years 1600 and 2000 were leap years, but 1700, 1800 and 1900 were not.) The Gregorian calendar was not immediately adopted internationally. In protestant England (including the American Colonies) the change was not made until 1752 CE, when the correction needed was then 11 days, and September 2 was followed by September 14. This also caused some confusion for individuals as most people tended to honor their birthdays on the Julian month-day designation, while others, such as George Washington who supported use of the Gregorian calendar, moved his birthday from February 11<sup>th</sup> to the 22<sup>nd</sup>.

A year, for most calendar systems, is broken into twelve parts because our moon makes about twelve orbits around the earth in one year. In fact, the term "month" is directly derived from "moon." Our week has seven days because there were seven celestial objects that moved across the sky: the sun, moon, Mercury, Venus, Mars, Jupiter and Saturn and their names are derived from both Norse and Roman gods: Sonn (sun); Mon (moon); Tiw (Mars); Woden (Mercury); Thor (Jupiter); Freja (Venus); and Saturn.