

THE ATMOSPHERIC RESERVOIR

Examining the Atmosphere and Atmospheric Resource Management

A Solar Calendar

By Mark Schneider

Our sun is the keeper of time. Not only does the Earth revolve around it, but our scheduled lives do as well. Our modern calendar, the Gregorian calendar, serves as the international civil calendar and is derived by arithmetic. Each of our days is called a solar day because Earth makes one rotation about its axis as the sun's position moves from a starting and ending point at the Prime Meridian. A year is one full orbit of the Earth around our sun and is 365.2425 days in length during an average Gregorian year. A solar year is technically about six hours longer than a Gregorian year and this necessitates a leap year every four years, which adds one 24-hour day to the calendar (Feb. 29th).

The image here is a comparison of the Gregorian calendar and the June Solstice. Each dot on the chart represents the date of the solstice between the years 1750 and 2250. It's very apparent that between the years 1900 and 2100 the date of the solstice varies from June 20th to June 23rd. The year-to-year variation is approximately equal to six-hours, requiring leap years every four years for correction.

An additional rule adopted by the Gregorian calendar states that,

“Centurial years are ordinary years, unless they are divisible by 400, in which case they are leap years. This causes a correction on years 1700, 1800, 1900, 2100, 2200, and 2300.”

The history behind the modern Gregorian calendar is quite interesting. It is actually a reform of the

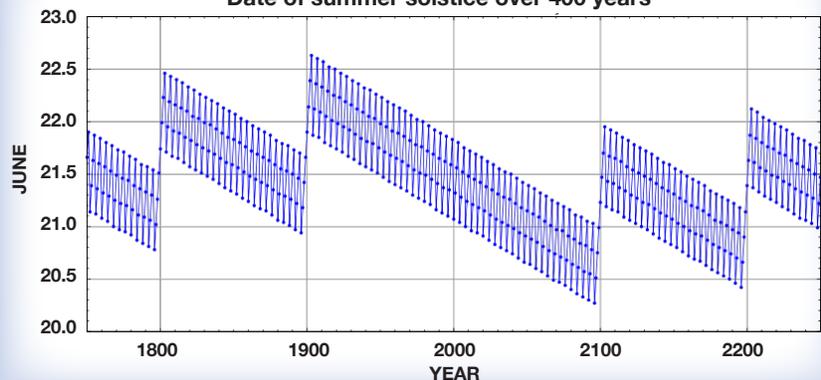
In fact, the dates of the Paschal full moon and the actual full moon may vary by up to two days. Orthodox churches still use the Julian calendar, and for this reason there are two dates on which Easter is observed annually. For example, this year the Western celebration of Easter was April 12th and the Orthodox celebration occurred on April 19th.

Reform from the Julian to the Gregorian calendar didn't happen overnight, and many countries including England held out for many centuries before making the switch. Up until 1752, England was technically 12 days behind the rest of Europe because it still

followed the Julian calendar. When the British finally adopted the Gregorian calendar on Sept. 2nd, they went to sleep that night and awoke on Sept. 14th!

The use of calendars worldwide wouldn't be possible without referencing our sun. Whether you use the Gregorian, Julian, or other form of calendar, you have a constant guide in the sky.

LEAP SHIFTING OF THE GREGORIAN CALENDAR
Date of summer solstice over 400 years



Julian calendar, which is a reform of the Roman calendar. The reforms or changes between calendars were made primarily for religious reasons.

The Catholic Church modified the Julian calendar in 1582 under Pope Gregory XIII, creating the Gregorian calendar in hopes that all Christians would celebrate Easter on the same day. In reality, Easter Day ended up being decided by a lunisolar calendar. Christians use March 21st as the reference date for the vernal equinox (even though it varies between March 19th and 21st) and then use the next Paschal full moon to determine the date for Easter each year. The Paschal full moon represents the 14th day of the lunar month and not the true astronomical full moon.

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