SHENANDOAH ASTRONOMICAL SOCIETY
February 2009

THE RIDDLE OF GEORGE WASHINGTON'S BIRTHDAY

This month we will celebrate the anniversary of the birth of George Washington, which by our calendar happened on February 22, 1732. But on the day our first president was born, the local calendar declared it to be the eleventh day of February 1731. Because March was the first month of the year under the old Julian Calendar back then, the months beginning with Sept-, Oct-, Nov-, and Dec- were, just as their prefixes suggest, the 7th, 8th, 9th, and 10th months of the year.

This old riddle about Washington's birth date is a reminder of the historic astronomical struggle to come up with a calendar which stayed in sync with the Sun and the seasons. Today we know we can depend upon noon shadows to be longest in December, and shortest in June. However, it didn't always work out that way. Julius Caesar, on the advice of the astronomers of his day added 80 days to the Roman Calendar year 709 AUC (which our calendar identifies as 45 BC) to give the Sun a chance to catch up with the calendar. At the same time he proclaimed that henceforth a leap day would be added to the calendar every fourth year. Thus with a 365+1/4 day year it was hoped that Sun and calendar would stay closer together, which they did. But while this number was closer, it was still not quite right.

In the sixth century, Dionysus Exiduus (Ex-id'-ju-us) came up with the idea for a new calendar based on the birth of Christ (the date for which we now know he miscalculated) rather than the reign of some infamous Roman ruler. But he adopted the Roman leap year system and the 365+1/4 day year. Mathematicians still had no system of numbering that could accurately calculate or even express the true length of the solar year, which is now recognized to be something like 365.2422 days.

But Caesars better calendar fell behind the Sun which was 11 days ahead of the local calendar on February 11, 1731. Two centuries earlier, most of Europe had adopted the new Gregorian Calendar which corrected this error of about three days every 400 years with the new Century Year Rule. Any century year not divisible by 400 would no longer be a leap year. But England, as *Isaac Asimov* puts it in his book *The Clock We Live On*, would rather be wrong all by themselves than to be right with the Pope, and was still resisting the inevitable changeover to the new calendar.

Finally, when George was 21 years old, England relented, and her colony of Virginia in the New World was swept into this new system of date keeping. Two new rules changed the numbers of both of the day and of the year of the soon-to-be-famous birth date. 1) The year was now to begin with January, not March, so February of 1731 of the old calendar was now to be February of 1732 on the new, and 2) eleven calendar days had to be dropped, so the 11th now became the 22nd. George, like many others, wisely changed his birthday to

correctly reflect his true age under the new system.

Our present calendar is so accurate that it will not be until roughly three thousand years from now that it will need to be adjusted again, and then by only a single day, to keep our Sun and our calendar together. So, it looks like your birthday and mine are safe for posterity.
- Bill Devlin

Note:

The Gregorian calendar replaced the Julian calendar in most of Europe in 1582 but England did not adopt it at that time. That year, 10 days were dropped from the calendar so that the day after October 4, 1582 became October 15. Also, the new leap year rule was instituted to prevent adding too many leap years. Thus 1900 was not a leap year but 2000 was.

- **Bill Devlin**

If you felt a tinge of déjà vu, it is because this is a reprint of Bill Devlin's article for the 2002 February newsletter and some of you probably read it then.
– James Adkins

Program for February 11

7:00 PM at LFCC
Room 160

Member David Reese will be bringing one of his videos of astronomy for the program at this meeting. We have seen the first in the series in November and this will be the next. I do not know the topic at this time but I am sure it will be good.

Astronomy Celebrated

The International Astronomical Union has designated 2009 as the International Year of Astronomy celebrating the 400 years of telescopic observation. Galileo Galilei started it with his home-made telescope in December 1609.

Also, 1609 was the year that Johannes Kepler published the first two laws of planetary motion. He stated that the planets go around the Sun in elliptical orbits. He also said that the radius vector swept out equal areas in equal time periods.

The second law means that the speed of a planet varies over time. When nearer the Sun, a planet moves faster than when farther from the Sun. The third law stating the relationship between the distance from the Sun and the period of the orbit was published later. - JA
