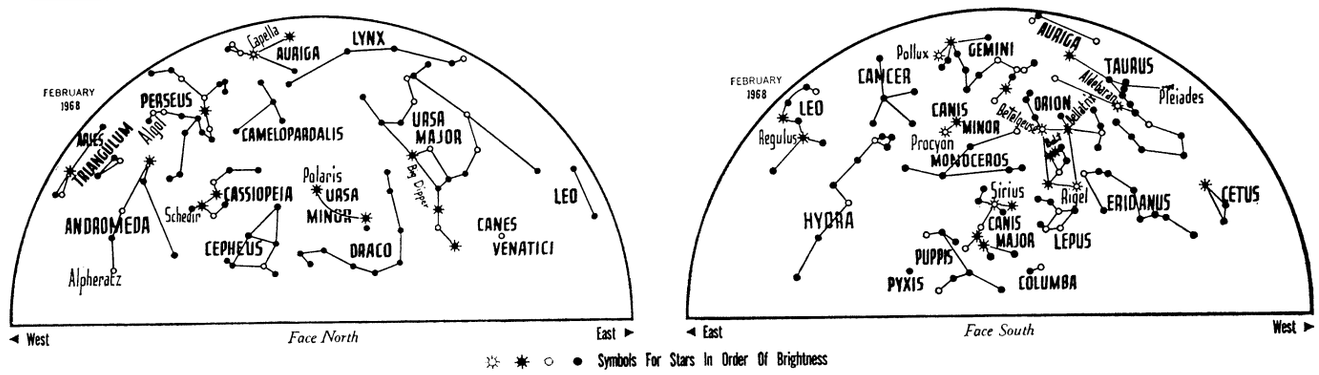

Jupiter shines in the east

by James Stokley

Only one naked eye planet is easily visible during February evenings. Shining in the eastern sky is brilliant Jupiter, which joins the bright stars that are so prominent at this time of year.

However, if you look to the west in the early evening, you may see three other planets. Saturn, low in the west as the sky darkens, is considerably fainter than Jupiter although equal to a star of the first magnitude. It sets about four hours after the sun.

Mars, distinctly red, is below Saturn and a little fainter. It sets about an hour earlier.

During the first few days of February you may also get a glimpse of Mercury. Low in the southwest just after sundown, it sets about an hour later—before the sky is completely dark. Rapidly moving westward, Mercury will be in the same direction as the sun by midmonth.

The accompanying maps, which do not show Saturn, Mars or Mercury, depict the skies as they look about 10:00 p.m., local time, at the beginning of February. They appear similarly at 9:00 p.m. around the 15th and about 8:00 p.m. on the 29th.

Easily recognized in the south is Orion, the warrior, generally considered the finest constellation in the sky. It has two stars of the first magnitude: Betelgeuse above, and Rigel below. Between them is the row of three fainter stars that supposedly form the warrior's belt. Above the western end of the belt is Bellatrix.

Orion is surrounded by five more bright stars, i.e., stars of the first magnitude. Lower and toward the left stands Canis Major, the larger dog, with Sirius, the brightest star we can see in the nighttime sky. Above it is the smaller dog, Canis Minor. Procyon is its brightest star. Still higher are the twins, Gemini, in which Pollux shines.

Farther west is Auriga, the charioteer. Nearly overhead, this is shown partly on each map. Capella is the bright star. Below Auriga, toward the southwestern horizon, is Taurus, the bull. Ruddy Aldebaran marks his eye.

No other part of the sky contains as many bright stars in one area as this. That is why the winter evening skies are so brilliant.

In addition, an eighth bright star shines in the east. This is Regulus, in Leo, the lion. It is just above Jupiter, and a good deal fainter.

Toward the northeast is the familiar Big Dipper, part of Ursa Major, the great bear. Cassiopeia, the queen, appears in the northwest, as a "W" on its side. Between these groups stands Ursa Minor, the little bear, with Polaris, the pole star.

This year February brings us the rarest of all dates: Feb. 29. For 1968 is a leap year, with the extra day that Julius Caesar introduced in 46 B.C. to help the calendar stay in step with the seasons.

To keep track of time, we have two principal natural periods. One is the day—the time it takes the earth to turn once on its axis. The other is the year. This is the time the earth requires for one revolution around the sun.

There is also the month, originally the time for the moon to go through its complete cycle of phases. This is 29 days, 12 hours, 44 minutes and 3 seconds.

Unfortunately, these three periods do not fit evenly together, and that fact has been mainly responsible for the difficulties men have encountered in devising a workable calendar.

Before Caesar's time, the Roman calendar had 12 months. Originally they kept in step with the phases of the moon, like the Jewish calendar. But the year, 365 days, 5 hours, 48 minutes and 46 seconds long, contains about 12.4 lunar months. Therefore, in

CELESTIAL TIMETABLE FOR FEBRUARY

Feb. 1	9:00 am EST	Moon passes south of Mars
Feb. 2	11:10 pm	Algol (variable star in Perseus) at minimum brightness
Feb. 3	3:00 am	Moon passes north of Saturn
Feb. 5	8:00 pm	Algol at minimum
Feb. 6	5:00 am	Moon farthest, distance 251,200 miles
	7:21 am	Moon in first quarter
Feb. 14	1:43 am	Full moon
	noon	Moon passes north of Jupiter
Feb. 15	10:00 am	Mercury between earth and sun
Feb. 18	11:00 am	Moon nearest, distance 229,200 miles
Feb. 20	6:00 am	Jupiter in opposite direction from sun
	10:28 pm	Moon in last quarter
Feb. 23	1:00 am	Algol at minimum
Feb. 25	2:00 pm	Venus passes south of moon
	9:50 pm	Algol at minimum
Feb. 28	1:56 am	New moon

Subtract one hour for CST, two hours for MST, and three hours for PST.

order to keep the correct relations to the seasons, the Romans inserted, when necessary, an extra month between February and March. When they did this, five days were omitted from the end of February.

This sounds quite complicated—and it was. The College of Pontiffs, responsible for regulation of the calendar, sometimes used their power dishonestly and manipulated it for their own personal or political interests.

Thus they allowed the months to drift from their proper seasons. By 47 B.C. January was coming in the autumn instead of winter.

On the advice of an astronomer named Sosigenes, Caesar made a drastic reform. He decreed that the year we know as 46 B.C. should have three extra months: 445 days in all. Quite appropriately, this was called the Year of Confusion.

Told that the length of the year was 365¼ days, he made ordinary years 365 days long. Every fourth year had 366 days; this took care of the four extra quarters when they had accumulated to a full day.

He divided the year into the twelve months we use today, and ignored completely the phases of the moon. February was to have 28 days except in leap year when the extra day was inserted as Feb. 29. Essentially, this is the calendar we use today, but with some further changes that Pope Gregory XIII made in 1582.

Actually, 365¼ days is 11 minutes, 14 seconds longer than the average year length. This is a small error, but it caused the seasons to drift gradually backward in the calendar by one day every 128 years. Easter, and other religious festivals, were beginning to come at the wrong time of year.

The papal bull setting up the Gregorian calendar, the one we use today, ordained that the day after Oct. 4, 1582, would be Oct. 15 instead of Oct. 5. This brought the vernal equinox, the beginning of spring, back to March 21. That was its date in 325 A.D. when the Council of Nicaea set the rules for determining the date of Easter.

To keep the calendar in step with the seasons, the Pope decreed that three leap years would be dropped every 400 years. Every year divisible by four is a leap year, unless it ends a century (like 1800 or 1900). Then it is a leap year only if divisible by 400. Thus, 2000 will be leap year, like 1600, but unlike 1700, 1800 and 1900.

This shortened the mean length of the year by only 10 minutes, 48 seconds, which still leaves an error of 26 seconds. But no one seems very worried about that. Not until about the year 4900 A.D. will the accumulation amount to as much as a day.