ASTRONOMY

Spring Comes

March 21, Officially Considered First Day of Spring, Was Also New Year's Day to Peoples of Antiquity

By JAMES STOKLEY

MARS, namesake of the month of March, is the only planet visible through the month this year. And even its ruddy light disappears early in the evening, so that it is not shown on the accompanying star maps. In the last few days of the month it will be possible to get a glimpse of Mercury, closest to the sun of all the solar family. Mercury will appear low in the western sky just as it is getting dark. Venus and Saturn are now too near the sun to be seen at all, while Jupiter rises an hour before the sun.

Among the distant stars, which appear this month, are the conspicuous groups of winter, now sinking in the southwest. These are depicted on the maps, as at 10:00 p. m. on the first, 9:00 p. m. on the 15th, and 8:00 p. m. on the 31st. Chief among them is Orion, with three stars in a row to form the warrior's belt.

Taurus High in West

Taurus is high in the west, with Aldebaran to indicate the eye of this bull. In the southwest is Sirius, in Canis Major, the great dog. Still higher is the lesser dog, Canis Minor, with the star called Procyon. Nearly overhead are the two stars of similar brilliance marking the twins, Gemini, or Castor and Pollux. The latter, the brighter, is to the south. High in the west, above Taurus, is Auriga, in which Capella shines.

To the northeast is the great dipper, which is part of Ursa Major, the great bear, swinging up much higher than it has been in recent months. The pointers, which are marked, show the direction of the Pole Star, itself at the end of the little dipper's handle, and part of the little bear. Low in the northwest is Cassiopeia, the queen, a constellation which now has the shape of a W turned on the side, the top to the right.

By following the curve of the handle of the great dipper to the south, we are easily led to Arcturus, in Bootes, and still farther south to Spica, of the virgin, Virgo. To the right of Virgo is a characteristic little group of four stars in Corvus, the crow, sometimes referred to as "the cutter's mainsail," which they much more nearly resemble.

If the line from the pointers is drawn southwards instead of northwards, we come to Leo, the lion, which has two characteristic sub-groups. One, to the left, is a right triangle; the other is shaped like a question mark in reverse. It is called the Sickle, and Regulus stands at the bottom of the handle.

Mohammedan New Year

When the moon is new on March 2, it will, for Mohammedans, mark the beginning of a new year, 1357, counted from the Hegira, or Mohammed's flight from Mecca, in 622 A. D. Unlike ours, the Mohammedan calendar is a lunar one, and that explains why 1357 added to 622 does not equal 1938, but 1979.

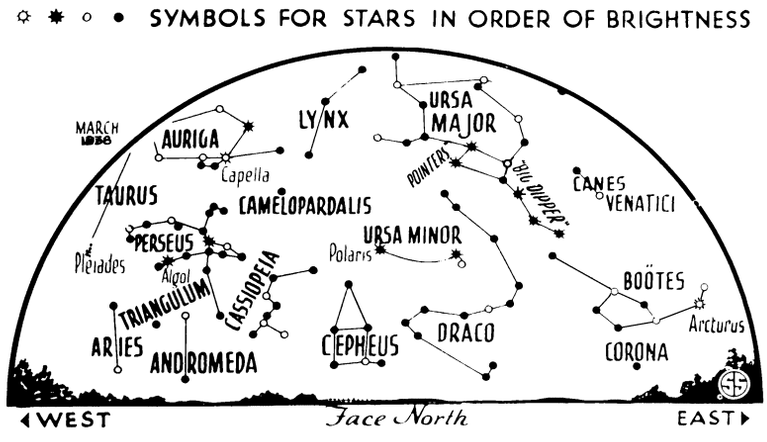
If you count the time it takes the moon to return to any particular phase, you will find that it is 29½ days, known as the "synodic," or often merely the "lunar" month. Many calendars have used this period in their reckoning, because the changing phases of the moon in the sky afforded a convenient means of telling the days. The Mohammedan year has twelve months, alternating between 29 and 30 days, making the average the correct length. Every month starts with the new moon, as it first appears in the west after sunset. Then first quarter, full moon and last quarter mark the four weeks of the month.

But twelve 29½ day months total only 354 days, which is 11 days short of the year. Consequently, this means that Mohammedan dates shift around through the seasons. For instance, in 1939, the Mohammedan year will commence eleven days earlier, on Feb. 20. In 1955 it will come early in the autumn, and in 1971 it will again come at the time it does this year. Thus, their calendar gains a whole year on ours every thirty-three years. No doubt we should find this very inconvenient, not knowing what season a certain date might be in, but in Moslem countries it is often very arid, with little change between the seasons.

Thirteenth Jewish Month

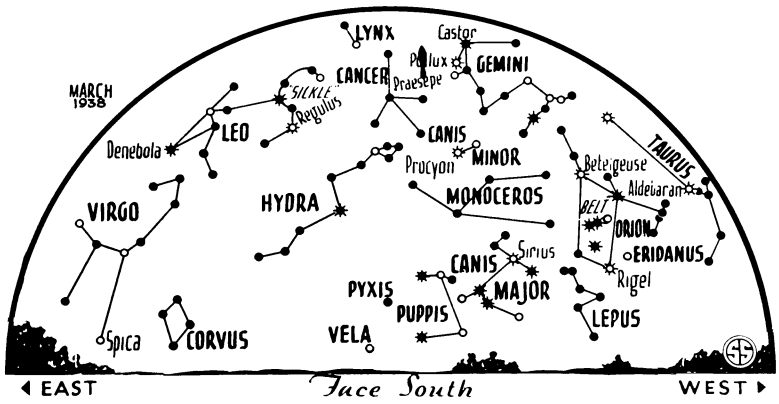
The Gregorian calendar, which we use, keeps step with the sun and ignores the moon, but it is possible to have one that will keep in step with both. A good example is the Jewish calendar. Ordinarily the Jewish year is practically the same as that of the Moslems, but after approximately three years, when it has lagged a month behind, an extra month is inserted which brings it up again. Actually, there are seven of these thirteen-month years every 19 years.

In the Jewish calendar, the present year, 5698, is a leap year, and the thirteenth month, Adar Sheni, coincides



THE DIPPER INVERTED

If we have heavy rains, there will be those who will say that the water poured out of that upside-down bowl.



SPRING STARS APPEAR

In a sky without planets, the Hunter descends the western sky, while in the east the Virgin follows the Lion.

closely with March. It starts with sunset on March 3, when it should be possible to get a first glimpse of the narrow crescent moon low in the western sky.

The early Roman calendar was a lunar-solar one, very similar to that used today by the Jews. But instead of having regular rules governing the insertion of the extra month, it was left to the officials to have one when needed. Thus it became a very convenient tool for graft, as extra taxes might be collected, to fill the collector's pocket, by the simple expedient of having a leap year. Abuses such as this led to the reform of the calendar by Julius Caesar in 45 B. C., with the aid of an astronomer named Sosigenes.

Regulating the Calendar

After all, the calendar is a time-keeping instrument, like a clock. When a clock is fast, or slow, it is necessary to set the hands, so that they will indicate the correct time, then to adjust the pendulum, making it run faster or slower, in order that it will keep better time in the future. Caesar did these two things. To set the calendar he decreed the "Year of Confusion," which, with 445 days, brought the beginning of spring back to March 25, where it had been formerly. He ignored the moon and divided the year into the twelve months we have today.

Being advised that the correct length of the year was 365¼ days, he introduced the leap year. With three years of 365 days, the fourth of 366, the average was the desired figure. But, actually, 365¼ days is about 11 minutes 14 seconds too much, and over the ages this accumulated until after the year 1500 the equinox came on the 12th instead of the 25th.

In 325 A. D. the council of Nicaea had set the rule for determining the date of Easter—"The first Sunday after the first full moon after March 21"—that date being chosen because it was then the equinox. But as the equinox came earlier in the calendar, March 21 came later in the season, it would eventually have come at the beginning of summer, and Easter would have been celebrated in summer-time, even though it is essentially a festival of spring.

Accordingly, in a papal bull issued Feb. 5, 1582, Pope Gregory XIII decreed further changes. To set the clock, October 4, 1582, was immediately followed by October 15. This dropping of ten days returned the equinox to March 21.

To regulate it, the leap year rule was amended. Up to then, every fourth year, or every year divisible by 4, had been a leap year. By the Gregorian rule, however, an exception is made in the case of century years (e. g., 1900) which are leap years only if divisible by 400. This was a great improvement, for now the average length of the year is only 12 seconds in error, which will not amount to a day until 7200 years have passed.

New Year's Day Shifts

Under a Roman practice which was changed about a century before Caesar but which was revived for a time several centuries ago, the year began in March, at time of the vernal equinox, instead of in January. That is the reason for the names of such months as "November," which really means the ninth month, though it is the eleventh.

Under this old practice, therefore, we would be starting 1938 on March 21, at 1:43 a. m., eastern standard time, which is the equinox this year. At that moment the sun will be vertically over the equator. But for us it is not the beginning of the year, but only of spring, an event which is doubtless equally welcome to many.

Phases of Moon

		E.S.T.
New	Mar. 2	12:40 a. m.
First Quarter	Mar. 9	3:35 a. m.
Full	Mar. 16	12:15 a. m.
Last Quarter	Mar. 23	8:06 p.m.
New	Mar. 31	1:52 p.m.

Moon in perigee (nearest earth), March 11, 3:00 a. m., 229,500 miles away.

Moon in apogee (farthest away), March 23, 4:00 p. m., 251,100 miles away.

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ILLUMINATION

New Lamps Join Familiar Bulbs to Brighten Life

GLOWING vapors and gases are painting our night life with new splotches of colored light. And illuminating engineers in their laboratories are devising new kinds of electric lamps that may soon emerge to usefulness, just as sodium's yellow glow and neon's reddish luminosity have become familiar.

Familiar incandescent lamps remain the backbone of our artificial lighting. But glowing vapor is much more efficient than incandescent metal filament.

The mercury lamp with its greenish blue has long been familiar in shops where detailed work is done and color is no concern. The sodium lamp with its one yellow colored light is coming into use for highway and other outdoor illumination.

And this strange monochromatic illumination, under which most objects lose their colors and human faces take on a corpse-like pallor, has the greatest possibilities of high efficiency, just because the sodium vapor spends all the energy given it upon one wavelength of light. A sodium lamp of 180 watts gives as much light as a tungsten filament incandescent lamp of 500 watts, or nearly three times as much light per watt.

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