ASTRONOMY

Saturn Shines in Southeast

Jupiter, more brilliant than Saturn, is the only other planet now visible but it rises much later at night. Orion is among the most prominent star groups visible.

By JAMES STOKLEY

➤ THOUGH only one planet appears in the evening skies during March, that one —Saturn—is visible through most of the night. As the sun sets and darkness falls, it is already well above the eastern horizon. As shown on the accompanying maps (which depict the heavens at 10:00 p.m. March 1; an hour earlier on the 15th and two hours earlier at the end of the month) Saturn is in the constellation of Leo, the lion. It stands just alongside the star Regulus, but is about 2.3 times as brilliant.

Leo, which Saturn now makes particularly conspicuous, is itself a prominent constellation, with a sub-group called the sickle, of which Regulus marks the end of the handle. The star Denebola, farther to the east, is in the lion's tail.

Though the evenings now find them lower in the west than they were a few months ago, Orion and his neighbors continue to be the most prominent star groups visible. Orion, the warrior, is in the southwest and can be recognized because of the three stars in a row which form his belt. Below this is Rigel and above is Betelgeuse, both of the first magnitude.

Prominent Star Groups

Lower than Orion, and to the left, we find Canis Major, the great dog, with brilliant Sirius. Higher is Canis minor, the lesser dog, in which Procyon shines. And still higher are the twins, Gemini, with Castor and Pollux, the latter of the first magnitude, the former of the second. To the right of Orion, Taurus, the bull, may be observed, with first magnitude Aldebaran. Higher than Taurus is Auriga, the charioteer, with Capella.

Looking toward the east we find three more stars bright enough to be classified under the first magnitude. One is Regulus, near Saturn. Below Leo is Virgo, the maiden, a group containing Spica. Though this also is of magnitude one, it looks much fainter in the position indicated. Its light has to shine through so great a thickness of the earth's atmosphere that it is appreciably dimmed. Later in the night (or in the evening later in the year) we will see it shining higher and of full brilliance. To the left of Virgo (shown on the map of the northern half of the sky) we find Bootes, the bear driver, with brilliant Arcturus.

Swinging high into the north, the great dipper, part of Ursa Major, the great bear, now comes into a conspicuous position. The pointers are shown, the two stars which show the direction of Polaris, the pole star, which is part of Ursa Minor, the lesser bear. Winding between the two bears is Draco, the dragon.

Still more brilliant than Saturn, is Jupiter, the only other planet now visible, but it rises much later at night. In the constellation of Capricornus, the sea-goat, it appears in the southeast a few hours before the sun. On March 17 Mars is directly beyond the sun, and hence not visible during the month. Similarly Venus and Mercury are also too nearly in the sun's direction to be visible.

With Saturn now so prominent, it is somewhat unfortunate that a telescope is needed to see its most conspicuous feature. This is the system of rings attending the planet. These are thin and flat, standing directly over the Saturnian equator, the inner edge 6,000 miles above the surface. The width of the system is about 41,500 miles, and the outside diameter of the outer ring is 171,000 miles, so they are well over twice the diameter of the planet itself, which is 75,060 miles.

Saturn takes about 29.5 years to make one revolution about the sun. As the ring system always remains parallel to its previous position, twice in the Saturnian "year" the earth is in line with the plane of the rings. Halfway between, they are spread out to the fullest. In February, 1937, they were last seen edgewise, and it was in December, 1943, that they last appeared with the widest opening. Since then they have been closing, but with a telescope they can still be easily seen. In another year or so, they will be on edge again, and when the earth is exactly in their plane they disappear, even through large telescopes. This shows that they are very thin, less than 100 miles and perhaps as little as 10 miles in thickness. If a model of the rings were made with a scale of 10,000 miles to the inch, they would be 17 inches in diameter, and even the thinnest tissue paper would be too thick in proportion.

Obviously, they cannot be solid, for no such structure could hold together with these dimensions. They are not liquid, either, but have been shown to consist of a vast swarm of tiny moonlets, of which the smallest may not be larger than grains of sand. The system is divided into several sections, and usually astronomers speak of three main rings. Sometimes a star passes behind them, and though its light is dimmed, it is not completely hidden.

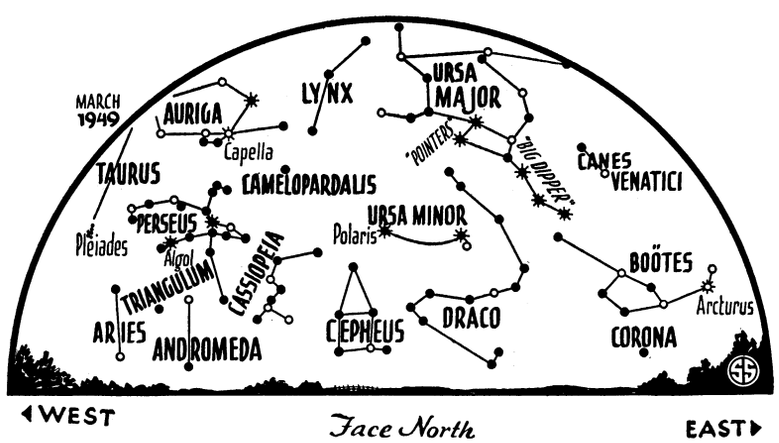
Probably the rings originated untold ages ago, when a previous moon of Saturn was drawn to close to the planet and was smashed to fragments by the forces of gravitation. There is, indeed, a theory that in the distant future our own moon will similarly approach too near the earth, and then the rings of Saturn will lose their uniqueness.

Time Table for March

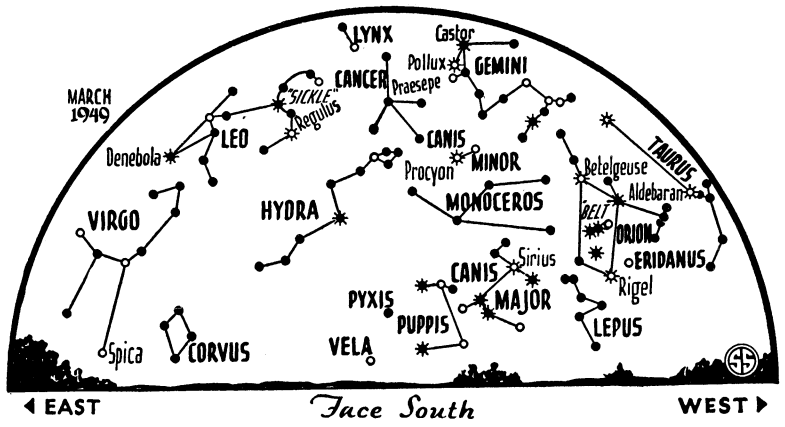
March	EST	
1	7:00 a. m.	Moon farthest, distance 252,500 miles
7	7:42 p. m.	Moon in first quarter
13	12:54 a. m.	Moon passes Saturn
14	2:03 p. m.	Full moon
	4:00 p. m.	Moon nearest, distance 221,700 miles
17	6:00 a. m.	Mars behind sun
20	5:49 p. m.	Sun crosses equator, spring begins in northern hemisphere
21	8:10 a. m.	Moon in last quarter
23	8:54 a. m.	Moon passes Jupiter
28	8:00 a. m.	Moon farthest, distance 252,600 miles
29	10:11 a. m.	New moon

Subtract one hour for CT, two hours for MT, and three for PT.

Science News Letter, February 19, 1949



Science Service, Inc. is collaborating with JSTOR to digitize, preserve, and extend access to The Science News-Letter. www.jstor.org



GENERAL SCIENCE

Scientists on U. S. Jobs

➤ LESS red tape and better administration and management—not more money—are needed to attract more scientists to government service. This is the finding of an informal survey of scientists made by Dr. Eric A. Walker of the Ordnance Research Laboratory of Pennsylvania State College.

He wanted to find out why some scientists seem to feel there is an "inherent stigma" to government service.

Comparing the pay of scientists in the government, industry and colleges, Dr. Walker found that a few scientists in top industry jobs get higher salaries than any government scientists. Government scientists, however, tended to get more money than those in the schools.

He concluded that "salary alone is not the reason that scientists are reluctant to enter government service."

On the other hand, Dr. Walker charges that the "administration and management of some of the civil service laboratories is not all it should be."

Red tape came in for some attack from scientists he talked to. An example was the government scientist who said if he needed a tube not available in his stockroom, it took two days to get it from a supply house only 10 miles away.

Another complaint was the division of authority and responsibility in military laboratories. Under this system, a uniformed officer has the authority, but the responsibility lies with a scientist.

"The system appears to be predicated on the assumption that the scientist, being a queer sort of individual, cannot be trusted with such authority," comments Dr. Walker in his report to the AMERICAN JOURNAL OF PHYSICS (Jan.).

A system where scientists may have authority over uniformed officers has been successfully used in other countries, says Dr. Walker. "There is no reason why it should not be adopted by our Armed Services," he declares, adding, "if it were adopted more scientists would be less reluctant to accept government service."

Dr. Walker's investigation found few scientists who objected to security regulations. "However, many have objected to the method in which security matters are enforced."

Charges made against Dr. Edward U. Condon, director of the National Bureau of Standards, did not help the government find scientists, Dr. Walker points out.

"Such things as the recent Condon inquiry can only make scientists reluctant to accept Government service. Up to the present time no disloyal act has been proved against Condon, and most scientists feel that if they had been in Condon's shoes, they would have done exactly as he did," Dr. Walker asserts.

Higher salaries for government scientists may help solve the government's scientific personnel problems by bringing better management, the scientist concludes. The new P-9 rating with a top salary of $15,000 per year may attract administrators who can cut through red tape, he suggests.

Science News Letter, February 19, 1949

ENGINEERING

Metals Strengthened by Glass Toughening Process

➤ STRENGTH and durability are added to metals used in automobile shafts and levers by a process employing principles similar to those used to make safety glass stronger than ordinary window glass, the Engineers' Club in St. Louis, was told by Robert Schilling of General Motors Research Laboratories.

The toughening process includes the controlled use of so-called trapped or residual stresses within the very texture of the metal itself. Many of these modern processes were used, without benefit of scientific explanation, by swordsmiths, blacksmiths and old time mechanics who improved the life of swords, buggy springs or engine parts by cold hammering them after they had been shaped or fashioned.

In toughening glass, the panes are subjected to a blast of cooling air when they are close to the point of solidification, he said. The outer layer therefore solidifies and cools first, while the core is still soft.

When the interior solidifies and cools later, it contracts and tends to compress the cold outer layers. The finished product is then under compressive or squeezing stresses at the vulnerable outer surface, and under a tension in the interior. These trapped stresses increase the load capacity by several hundred per cent.

Brittle metals, such as through-hardening steels, act in a manner similar to the glass. Some types of heat treating, or mechanical processes such as cold hammering, surface rolling, presetting or shot-peening, can make hard, brittle materials, he said, superior to anything else for severe service by protecting the surfaces with trapped compressive stress.

Science News Letter, February 19, 1949

Get out and look at the Stars!

MAKE THIS AMAZING

Astronomical Telescope

FOR AS LITTLE AS $6.00

Same Principle as Mt. Palomar Telescope

See the mountains of the Moon, Saturn's rings, Jupiter's moons, nebulae, clusters, the companion of Polaris, and other heavenly wonders.

WITH ALL THE DIFFICULT AND TEDIOUS WORK ELIMINATED you can make a large-size high-powered, reflecting telescope for little money. Two years of intensive research gave us the secret of **Machine Processing** a reflector to a perfection equalling or better than the average hand-finished mirror of this size. This reflector is absolutely optically centered. The surface is accurate to better than ¼ wavelength of light as indicated by test against a master plate. Aluminized with **Hard** aluminum coating of high reflectivity and long life, guaranteed against peeling or blistering for 1 year. Glass is annealed, strain-free. The complete telescope can be built in four hours as described in a recent national scientific magazine. Reprint free with each kit. Reprint alone 10c.

This easily built telescope guarantees success for the beginner. It gives contrasting, sharp, clear images without rainbow effects or fuzz.

Material for tube, etc., can be found around every home or purchased for a few cents.

3" REFLECTOR (39 F.L.) A "FLAT" AND 3 EYEPIECE LENSES ALL READY FOR YOU TO ASSEMBLE INTO AN ACHROMATIC (COLOR FREE) DISTORTIONLESS INSTRUMENT—COST $6.00

For 4" Reflector Kit—56" F.L. send 10.00
For 5" Reflector Kit—67" F.L. send 15.00

For your first telescope make a 3" or 4". Advanced workers 5".

HARRY ROSS

MICROSCOPES—TELESCOPES

Scientific and Laboratory Apparatus

70 West Broadway, Section S, N. Y. 7, N. Y.