

ASTRONOMY

Saturn Shines in the Evening Sky

Approach of Winter is Heralded by Return of Taurus With His Red Eye, Aldebaran, to the Eastern Heavens

By JAMES STOKLEY

THE RETURN of the constellation of Taurus, the bull, to the evening skies in October comes as a warning of the approach of winter. Low in the east at about 10 p. m. on the first, 9 p. m. on Oct. 15 and 8 p. m. on Oct. 30, as shown in the maps, you can see a red star, Aldebaran, which marks the animal's eye, and the V-shaped group of stars—the Hyades—that outline his face. Above is a little cluster of faint stars which forms the Pleiades, the famous seven sisters of song and story. Auriga, the charioteer, shines in the northeast, with the brilliant, creamy white Capella.

Low in the south appears Fomalhaut, in Piscis Austrinus, the southern fish. Considerably higher, nearly overhead, are four stars forming the "Great Square in Pegasus." Only three, however, are in this constellation. The fourth, to the northeast, is in the neighboring constellation of Andromeda. Still farther north can be seen the W-shaped group of Cassiopeia, the queen, seated on her throne.

In the Southwest, the Eagle

Also in the south, higher and west of Fomalhaut, is the planet Saturn, not a star at all but a member of the family of bodies, including the earth, which revolve around the sun, forming the solar system. In the southwest can be seen a bright star, attended on either side by fainter stars, Altair, in Aquila, the eagle. Farther to the north is the brightest star of the northern hemisphere, Vega, in Lyra, the lyre. Above can be seen the northern cross, or Cygnus, the swan. The bottom of the cross, which is the swan's head, points to the southwest. At its top, in the bird's tail, is the star Deneb.

The Great Dipper, part of Ursa Major, the great bear, is seen during October evenings low in the north, at nearly its farthest position below the north pole of the sky, about which it circles like all the stars. The dipper, however, is closer to the pole than the northern

horizon, and so it can never get below it, as seen from the United States. Therefore, it belongs to the group of circumpolar constellations, which never set, but can be seen on any clear night, when one has a view to the north. Cassiopeia is another circumpolar constellation.

Although the world's greatest observatories are to be found in the United States, and American astronomers lead the world, until recent years there has not been so much opportunity for the public to appreciate the wonders of the heavens as on the other side of the ocean, particularly in Central Europe. Most of our observatories have regular nights, perhaps as often as once a week, when visitors are admitted to look through one of the telescopes, and at the Allegheny Observatory in Pittsburgh one telescope has been put aside for them every night. However, in Europe there are a number of "Urania" observatories, each in a central location in a large city. The entire institution is dedicated entirely to the public, and for a small admission charge visitors may come and see, and hear explained, the celestial sights shown by the telescope. In the last decade, the work of the observatories has been supplemented by the remarkable Zeiss planetarium, which reproduces in a realistic manner the

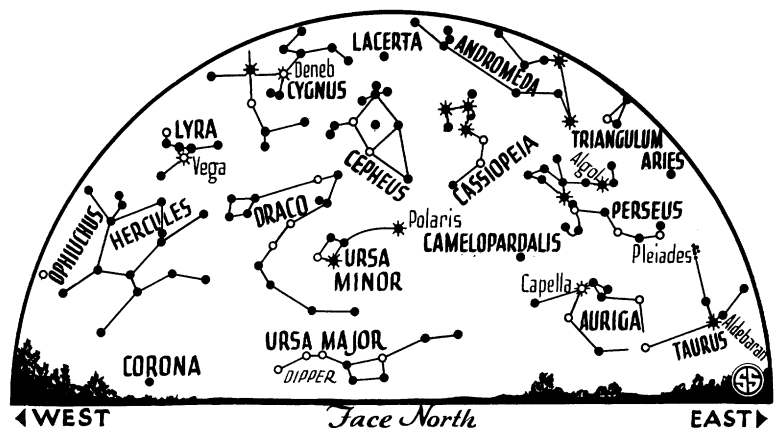
night skies as seen from any part of the earth at any time, and with their motions speeded up at will.

After eighteen such instruments had been set up in as many European cities, the first American planetarium opened in Chicago in 1930, and the second a year ago in Philadelphia. The third is nearing completion in Los Angeles, the fourth is under construction in New York, and still other American cities have them in contemplation, so that before long we may have nearly as many in this country as they have in Europe.

At the Adler Planetarium

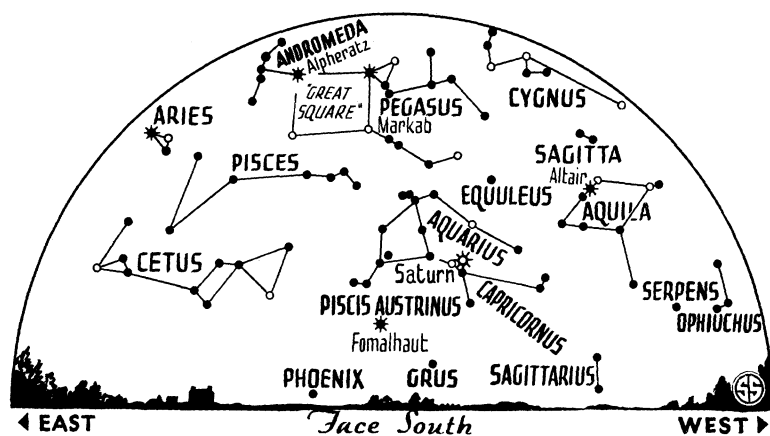
At the Adler Planetarium in Chicago, to which many visitors have been attracted during the past two summers as a result of the World's Fair, several small astronomical telescopes are regularly used on the roof; through them the visitors can see, greatly magnified, the actual objects that they saw reproduced in the synthetic sky inside. At the Franklin Institute Museum, in Philadelphia, of which the Fels Planetarium is part, there is an observatory that is open to the public every clear evening. This is equipped with two large telescopes, a refractor, with a lens ten inches in diameter, and a reflector, in which a concave mirror brings to a focus the rays of star light, with a mirror two feet in diameter. This is the largest telescope in the country primarily for public use. The Griffith Planetarium in Los Angeles will have a

☼ * ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



THE DIPPER COMES TO EARTH

Too close to the pole ever to descend below the northern horizon, this familiar figure in the sky is now almost as low as it ever reaches.



THE GREAT SQUARE

High overhead on these first fall evenings rides the winged horse, Pegasus, marked by the familiar square of four stars, one of which is in the neighboring constellation, Andromeda.

twelve-inch refractor for visitors, and the Hayden Planetarium in New York will also have some telescopic equipment. Probably with all these precedents, any other American planetarium will have to provide an observatory in addition, and so there is every prospect that in a few years Americans will have as many opportunities for enjoying telescopic observations of the stars and planets as have our European cousins.

College Observatories

But in the meantime, if you do not happen to live near one of the cities already equipped, there is probably some college observatory not far from you, where you can look through their telescope at certain times. And then, of course, in many cities there are itinerant "astronomers" who set up their telescopes on some prominent street corner, where you can see the stars for a dime a look. More can be seen through even a small telescope than most people realize, so you can often get a pretty good view through one of these instruments, although the explanation that accompanies it is not always of the highest degree of scientific accuracy.

And also, when looking through such a telescope, do not be too much impressed by the assortment of gadgets with which the telescope may be equipped, for probably most of them are there solely for the purpose of making an impression. Such telescopes are often not as large as they seem. I remember seeing one, in a certain large city, with a tube at least twenty inches in diameter, so that the lens might have been 18 inches across, which would be large even for a college observatory. As

a matter of fact, such a large instrument could not possibly have been used on the rather rickety tripod that was under it. A little later, I was able to get a look into the front of the telescope, and found, as I had expected, a small telescope, not more than four inches in aperture, way down inside. The big tube was pure camouflage.

Later I saw this same system in use in a very large observatory equipped with one of the world's largest telescopes, but here there was a good excuse for doing so. The mounting of the telescope, a reflector, was completed some time before the optician had finished the mirror. Having a perfectly good mounting, the director wanted to use it for photographing the sun, so he put a six-inch lens in the tube which was intended for a mirror many times as large. Then, when visitors came to the observatory they were allowed to look through the telescope and had all the thrill of seeing a really big instrument in operation. The six-inch lens had the same focal length as the big mirror, so it magnified just as much and when it was turned on the moon or a bright planet there was plenty of light, so for such things the big glass was really unnecessary. However, this telescope, and the large mirror, were finally completed some years ago, and the visitors that have been admitted since then have been able to see all that it will show.

Rain No Handicap

There is another dodge sometimes perpetrated by the proprietors of the street corner telescopes. The skies are sometimes cloudy, and occasionally many days may go by without having

the moon or any bright planet properly placed in the sky. But these gentlemen may show them anyhow. They make a small picture of the object, painted on glass and colored, like a stereopticon slide, and place it in the eyepiece. Then the telescope is turned in the general direction of a street light, so that the light shines down the tube. A more elaborate arrangement is to place a small electric lamp inside the telescope, operated by a flashlight battery. When you look through the telescope you think you are looking at the object in the sky, millions of miles away, instead of at a picture just alongside your nose. It is easy to tell whether this is the case, however. Push on the eyepiece and jar the telescope. If the object is in the tube, it will stay right in the center of the field, but if it is in the sky, the jar will move it out of the field or at least to one side.

Good Precedent

This trick has good scientific precedent, for it was used by no less a person than the great Sir William Herschel, discoverer of the planet Uranus, and one of the greatest astronomers of all time. It is related that after he became famous, and was given a pension by King George III, of England, the Queen expressed a desire to look through his telescope. He brought one around to Windsor Castle and all was set for the royal observations that evening, when the weather was disrespectful enough to turn cloudy. Unwilling to disappoint the Queen, Sir William prepared a picture of Saturn, set it up behind a lamp in the garden, and pointed his telescope toward it. The Queen looked through it, and apparently never detected the fraud!

Luckier Than the Queen

But if you can get to an observatory this month and look through the telescope, you will probably be more fortunate than the Queen and will see the genuine Saturn. In the evening now it is in the south, as well placed for observation as it will be at any time this year, so it is now the most popular object of the observatory visitors. They will see the famous rings of Saturn, a vast, thin cloud of myriads of tiny moonlets, perhaps no larger than baseballs, each revolving around the globe of the planet in its own orbit, but so crowded together that from the distance of the earth they look like solid rings. Saturn's globe is 72,000 miles in diameter, a little smaller than Jupiter, with 87,000 miles, but far greater than

Phases of the Moon

		E. S. T.
New Moon	October 8	10:05 a. m.
First Quarter	October 15	2:29 p. m.
Full Moon	October 22	10:01 a. m.
Last Quarter	October 30	3:22 a. m.

the 7,900 miles of the earth. The rings, however, are far larger than any planet, for the outer one is 170,000 miles in diameter, and the entire system is about 43,000 miles wide, so that five earths might roll about on them, side by side, without touching. So if you have any

opportunity at all, look at Saturn through a telescope and you will be sure of an interesting sight. Perhaps, like many observatory visitors, you will be surprised to find that it "really does look like the pictures."

Science News Letter, October 6, 1934

PATHOLOGY

Filterable Virus Activity Ruled by Host Cell

WHEN a filterable virus invades a living cell and starts its disease-causing activities, it apparently enters into a very close relationship with its involuntary host. For the rate of activity of the virus depends to a large extent on the rate at which the cell is conducting its own life activities.

This was among the points discussed in a recent address on these strange invisible disease-causing agents by Dr. R. Manninger, director of the State Institute of Veterinary Hygiene at Budapest, Hungary, before the Twelfth International Veterinary Congress in New York. These filterable viruses can not be seen with any microscope and can

pass through the pores of a fine porcelain filter. However, since it has been recently discovered that many quite familiar, microscopically visible bacteria have the power of "dissolving" themselves into an invisible, filter-passing phase, Dr. Manninger suggested that the name "filterable virus" has lost its original significance, and he proposed instead the name "ultravirus" for the permanently invisible, filter-passing agents of disease.

At the same meeting, Dr. F. Gerlach, director of the State Institute for Animal Hygiene at Mödling, Austria, called attention to the seemingly greater activity by these viruses in provoking liv-

ing tissue to form defensive "antibodies" of the nature of anti-toxins. These anti-viruses, he said, are formed more certainly, and confer longer and stronger immunity on animals recovering from virus diseases, than is the case with the corresponding process in animals recovering from bacterial diseases. The reason for this phenomenon, he added, is still quite unknown.

Although the filterable viruses, or ultraviruses, have been known for a long time as the causes of a great variety of plant and animal sicknesses, their real nature is still in doubt. In some respects they act like non-living enzymes or digestive ferments, in others, like genuinely living organisms. For this reason the non-committal name "virus-enzymes" has been proposed for them.

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also the possession of positive and desirable qualities is increasingly necessary to measure the desirability of future immigrants.

When we analyze our recent immigrant groups in regard to assimilability and inborn quality, is it primarily the matter of race or of the individual worth which counts? The answer is "both"; race for general assimilability, hence the quota-allotment of numbers of immigrants annually admissible for each of the several foreign countries; and individual quality to make sure that the applicant for admission is no criminal, or potential inadequate who would become a member of any of the socially incompetent groups, but above all that the family-stock which produced the particular would-be immigrant is sound physically, mentally and in character—a stock which has produced many other individuals of the sort which the best Americans would like to see marry their own near-kin—for this is what will happen in the long run.

If the responsible American citizen, who decides American immigration policy today, could look only a few generations into the future he would find that his own great-great-grandchildren would, very likely, trace back in their ancestral tree not only to the distinguished gentleman who helped to determine present immigration policy but also to the immigrant whom he admitted.

It is sound biology to fight for American ideals.

Science News Letter, October 6, 1934

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