

ASTRONOMY

Venus Now Most Prominent

Its increase in prominence culminates at end of June when brilliant planet will remain the longest in the evening sky. Planet Jupiter also comes in view.

By JAMES STOKLEY

► EVER SINCE it first appeared in the evening sky last January, the planet Venus has been getting more and more prominent. This development culminates on June 25, for then the planet will be farthest east of the sun, and will remain visible for the longest time after sunset—nearly three hours, as seen from Washington. After that it will rapidly approach the sun again and will be out of the evening sky by the end of August. It will reappear in September as a morning star, visible in the east before sunrise.

Not until the end of July will it be at its greatest brightness, about a third more than on June 25, but during June it is so brilliant that it far exceeds other planets and the stars. Even at the beginning of June its magnitude is minus 3.7 on the astronomical scale, about 76 times as bright as a typical star of the first magnitude. Thus, one has no difficulty finding Venus. Indeed, it shines in the southwest during twilight, long before darkness has fallen.

Its position in the constellation of Cancer, the crab, is indicated on the accompanying maps. These give the sky's appearance at about 10:00 p. m., your own kind of standard time (or an hour later for daylight saving time) at the beginning of June, and about 9:00 o'clock at the middle of the month.

Saturn Also Visible

There is, however, another planet which is visible these evenings, though it shines only about a hundredth as brightly as Venus. This is Saturn, in the constellation of Virgo, the virgin. In the same group is the star Spica, of magnitude plus 1.2, just the same as Saturn. Regulus, in Leo, the lion, lower and farther west, is slightly fainter.

The brightest star now visible is Vega, in Lyra, the lyre, over in the east. This has magnitude 0.1, or nearly three times as bright as Spica. Just below it is Cygnus, the swan, in which we find Deneb. Altair, in Aquila, the eagle, is a little to the right.

High in the south, nearly as bright as Vega, we see Arcturus, in Bootes, the bear-driver. Near the southern horizon, just coming into view for its summer appearance, is the constellation of Scorpio, the scorpion, where shines the ruddy star Antares. Actually of the same brightness as Spica, it looks much fainter because of its low altitude, and the resultant greater

absorption of its light by the atmosphere of the earth.

The same effect is responsible for the faintness of two other stars, actually of the first magnitude, which can be seen low in the northwest. These are Pollux, in Gemini, the twins, and Capella, in Auriga, the charioteer. During the winter months they were prominent in the south but now they are about to disappear from view for a while.

Jupiter Appears Late at Night

Later on June nights another planet comes into view, namely Jupiter, which is in the constellation of Pisces, the fishes. Though only about a seventh as bright as Venus, it is many times the brilliance of the other planets and stars. At the beginning of June it rises about 2:00 a. m. and at the end around midnight, standard time.

The other naked eye planets, Mars and Mercury, are now too nearly in line with the sun to be visible.

As the moon moves about the sky, it comes occasionally in front of the sun, as it did on March 7 and will again on Sept. 1, producing an eclipse of the sun. But in the part of the sky through which the moon travels there are many stars, and much more frequently one of these is hidden. Such a phenomenon is called an "occultation." But while occultations of faint stars are common, one of a star of the first magnitude is much more rare. However, such an occultation occurs this month—on the evening of June 10, when the moon passes in front of Regulus, in Leo.

Unfortunately, at this occultation things are not as well arranged as the enthusias-

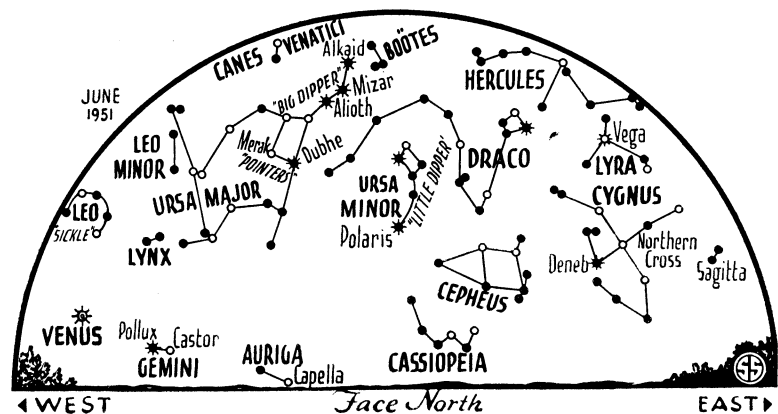
tic amateur astronomer might wish. First of all only the middle and eastern parts of the country will see it at all. Even in the eastern states it will occur mostly during evening twilight, though the ending will occur after it is dark. In the Midwest, it will begin just about as the sun is setting, though the ending will occur with a considerably darker sky. A pair of binoculars, or even of opera glasses, will help show the star close to the moon.

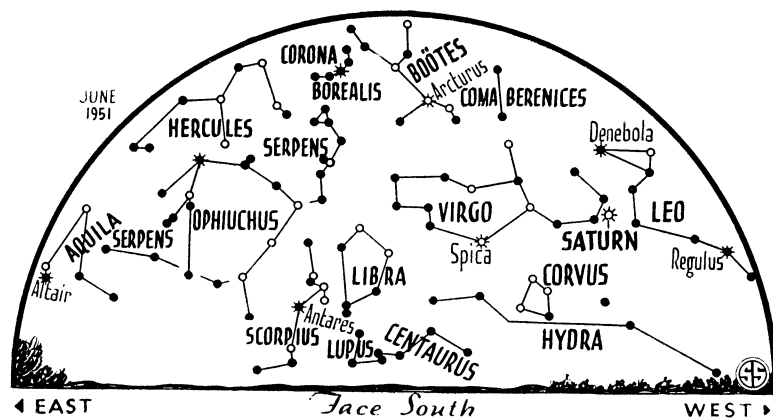
Since the moon travels across the sky in its monthly journey from west to east, it is the eastern edge of the moon that first covers the star. At the time, the moon will be about six days past new, that is, nearly a first quarter. The bright part of the moon will be toward the sun, that is, toward the west, and hence the invisible edge of the dark side of the moon will hide Regulus. It is interesting to watch such an event, as the star seems to be snuffed out instantly. There is no gradual decline in brightness, as would occur if the moon had a layer of atmosphere which gradually absorbed more and more of the star's light. This, therefore, is considered an excellent proof that the moon has no appreciable air layer above its surface.

Naval Observatory Calculations

The times of occultations are calculated in the U. S. Nautical Office at the Naval Observatory in Washington for that city and four other locations in the United States, and are published in the annual "American Ephemeris." Incidentally, beginning in 1952, they will also be given for Vancouver, B. C., a fine example of international cooperation.

The occultation on June 10 will be visible from the capital, as well as two of the other points for which data are given. One is in western Massachusetts and the other in southern Illinois. Following are the times for these locations:





◊ * • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

| | Star hidden PM | Star uncovered PM |
|-----------------|-------------------|----------------------|
| Washington..... | 8:26 EST | 9:29 EST |
| West. Mass..... | 8:20 EST | 9:25 EST |
| South. Ill..... | 7:20 CST | 8:13 CST |

For other parts of the country, it will be interesting to see Regulus very close to the moon on the evening of the tenth. And there is the consolation that there will be another occultation of Regulus on Oct. 25, which they may be able to see, in the early morning hours. This will also be visible from Washington, but there it will end after sunrise, so it will not be as good for residents of that city as the one in June.

Occultations have considerable scientific value. They permit a very accurate check of the movements of the moon which are difficult to predict with great precision. This is because of the "perturbations" produced by the gravitational pull of many other bodies in the solar system. The positions of the stars are known very ac-

curately, so a close timing of an occultation permits us to tell just where the moon was at that moment at least.

Celestial Time Table for June

| June | EST | |
|------|-------------|--|
| 4 | 11:40 a. m. | New moon |
| 5 | 8:00 p. m. | Moon farthest, distance 252,600 miles |
| 8 | 12:58 p. m. | Moon passes Venus |
| 10 | evening | Regulus occulted by moon, visible in middle and eastern parts of U. S. |
| 12 | 1:52 p. m. | Moon in first quarter |
| 14 | morning | Earliest sunrise |
| 19 | 7:36 a. m. | Full moon |
| | 9:00 a. m. | Moon nearest, distance 221,800 miles |
| 22 | 12:25 a. m. | Sun farthest north, summer commences in northern hemisphere |
| 25 | 12:00 noon | Venus farthest east of sun |
| 26 | 1:21 a. m. | Moon in last quarter |
| | 7:34 p. m. | Moon passes Jupiter |
| 27 | evening | Latest sunset |

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

Science News Letter, May 26, 1951

ENGINEERING

Better Fuels From Shale

➤ **BETTER GASOLINE** from crude shale oil, and more valuable other liquid fuels, are expected from experimental work in purifying crude at the Brucetown, Pa., laboratories of the U. S. Bureau of Mines, the American Institute of Chemical Engineers meeting in Kansas City, Mo., was told.

The crude shale oil as obtained by thermal retorting of oil shale is a high gravity oil, only partially distillable, somewhat asphaltic in nature, high in nitrogen and sulfur content, and meets the specifications of residual fuel only, the engineers were told in a joint paper by three chemical engineers of the Brucetown staff. They are Dr. M. G. Pelipetz, M. L. Wolfson and E. L. Clark.

Crude shale oil from the Bureau's pilot plant at Rifle, Colo., was used in the study. The purpose, they stated, was to investi-

gate the conversion of crude shale oil by high pressure hydrogenation over a solid catalyst to more valuable liquid fuels or to a material more suitable for further processing by petroleum refining methods. The Brucetown laboratory was selected for the work because it has equipment in use in the hydrogenation of coal.

This conversion requires a sufficient reduction in nitrogen content to permit the use of commercial cracking catalysts. A reduction in molecular weight of the crude shale oil is also necessary to decrease the amount of residual fuel oil which would otherwise be produced by further processing. The production of more valuable liquid fuels from crude shale oil requires that the products of hydrogenation contain sufficient quantities of separable materials to

meet the specifications of diesel fuel or gasoline.

The results of the work seem to be successful. The preparation of a suitable raw material, or synthetic crude, for subsequent processing by conventional petroleum refining methods seemed quite feasible, they stated.

Science News Letter, May 26, 1951

● RADIO

Saturday, June 2, 1951, 3:15-3:30 p.m. EDT
 "Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Karl Lark-Horovitz, head of the department of physics and director of the Physical Laboratory, Purdue University, Lafayette, Ind., will discuss "New Advances in Electronics."

BORDERLANDS OF SCIENCE

By ALFRED STILL

This unusual work considers critically those "borderland" phenomena—rarely investigated by the scientist—that lie on the wavering and elusive boundary between what the scientist claims as his own rightful territory and the lands where he can not or will not venture.

The author discusses the contributions of science to the distinguishing of reason from belief and reviews the life and work of men like Paracelsus, Cornelius Agrippa, Copernicus, Fracastoro, Cardan, Ramus, Galileo, Kepler, Newton and numerous others who helped to end more than a thousand years of bigotry. He then deals penetratingly with those phenomena for which the scientist has failed to provide a reasonable explanation or has been unable to look for one. He explores the phenomena of the divining rod; levitation; poltergeist evidence and telekinesis; body, mind, and memory; the subconscious mind; instinct, intuition, and genius; automatic writing; hypnotism and clairvoyance; psychometry and telepathy.

Provocative, yet profoundly absorbing, this meticulously documented work will fascinate scientist and layman alike.

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