

ASTRONOMY

Four Planets Visible

Venus, Mars, Saturn and Jupiter will all be visible in the September evening skies, although Mars may be confused with the star Antares because they are both red.

By JAMES STOKELY

► FOUR PLANETS are visible in September evenings, although only one is shown on the accompanying maps.

You will see Venus first since it is already in the sky before the sun sets. Soon after sunset, as the sky begins to darken, it appears low in the southwest and remains on view for about an hour.

Mars is a little higher and farther south (i.e., to the right), but it is less than one-eighth as bright as Venus so you will not see it until the sky is quite dark. And do not confuse it with the star Antares, in the constellation of Scorpius, the scorpion, a little farther south.

Antares is about the same brightness as Mars is at present, and both are red. In fact, the name of this star means "rival of Mars," conferred because of their color resemblance.

Both Venus and Mars set before the times for which the maps are drawn: 11:00 p.m., your own kind of daylight saving time, at the first of September; 10:00 p.m. in the middle of the month, and 9:00 p.m. at the end.

However, the map of the southern sky does show Saturn. It is in the southeast, in the constellation of Aquarius, the water carrier. It is brighter than Mars, and outshines the nearby stars. On Sept. 6 Saturn is directly opposite the sun, so it is visible all night, rising at about sunset and setting at sunrise.

Jupiter Easy to Locate

The fourth planet is Jupiter, which rises in the east about 1:00 a.m. on Sept. 1 and 11:00 p.m. on the 30th. Thus it is not until the end of the month that it actually gets into the evening sky. As it is almost one-fourth as bright as Venus, it is easy to locate after it has risen high enough to be visible.

The brightest star is Vega, in Lyra, the lyre, high in the west. Directly overhead is the constellation of Cygnus, the swan, with another first magnitude star, Deneb. Below Cygnus, toward the southwest, stands Aquila, the eagle, with Altair. These three stars—Vega, Deneb and Altair—form a characteristic figure known as the summer triangle. (Vega and Deneb are shown on the map of the northern sky, Altair on the southern half.)

Three other stars of first magnitude appear on the maps, but they are all near the horizon, a position in which atmospheric absorption dims their light considerably.

You will see Fomalhaut to the south, in Piscis Austrinus, the southern fish. Low in the northwest is Arcturus, in Bootes, the

herdsman. Capella, in Auriga, the charioteer, stands in the northeast.

If you look toward the north, below Cygnus, you will see those constellations that never disappear from the northern hemisphere sky. Constantly wheeling around the north pole of the sky (directly over the earth's North Pole), they are sometimes high, sometimes low, but always above the horizon. Ursa Major, the great bear, is the best known, with the familiar big dipper. It is low in the sky on September evenings.

High in the northeast is Cassiopeia, the queen, whose stars now form a letter W on its side. Higher is the king, Cepheus, and to the left and below you find Ursa Minor, the lesser bear. Here stands the pole star, Polaris, near the center around which the stars seem to rotate. Draco, the dragon, winds around it, with its tail extending down toward the dipper.

In September we have the best evening view of the Milky Way, so beautifully described by Milton in *Paradise Lost*:

"A broad and ample road, whose
dust is gold,
And pavement stars . . .
. . . that milky way
Which nightly as a circling zone
thou seest
Powder'd with stars."

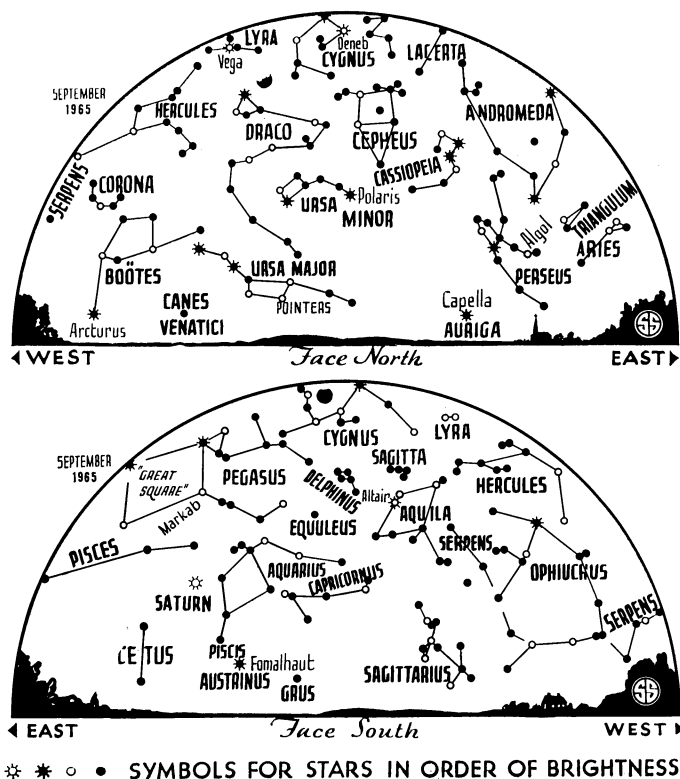
Indeed it is "powder'd with stars." As we look at the Milky Way with the naked eye, it appears to be a continuous band of light extending from Sagittarius in the southwest, up through Aquila and near Lyra to Cygnus, and then down to the northeast through Cepheus, Cassiopeia and Perseus.

But, as you can easily see by looking at it with a pair of binoculars, the Milky Way is made up of a swarm of stars, each one too faint to be seen without optical aid. There are so many stars that their light combines to form this glowing band—most prominent when the sky is very dark, away from the glare and light of a big city.

Milky Way Has Shape of Lens

Actually the whole Milky Way galaxy has approximately the shape of a convex lens of magnifying glass. Its diameter is about 80,000 light years. That is, light traveling 186,000 miles per second takes 80,000 years to cross it. The thickness at the center is about 15,000 light years. The sun, with the earth and other planets, is perhaps 30,000 light years away from the center.

However, we are near the central plane. Thus, when we look toward the center of the lens, we see a great many stars forming the brightest part of the Milky Way. The center is in the direction of Sagittarius, where the stars are most numerous. Looking toward the top or bottom of the lens, the stars are far more widely scattered.



The total number of stars in this system, the Milky Way galaxy, is about 100 billion. Out in distant space beyond its limits, as far as any instruments have yet probed, are millions of other galaxies. These are other stellar systems similar to our Milky Way.

Celestial Timetable for September

SEPT. EDT		
1	9:00 p.m.	Mercury farthest west of sun
2	3:28 p.m.	Moon in first quarter
	8:50 p.m.	Algol (variable star in Perseus) at minimum brightness
6	noon	Saturn at opposition (opposite sun)
	midnight	Moon farthest, distance 252,000 miles
7	9:00 a.m.	Venus passes north of Spica (brightest star in Virgo)
10	8:00 a.m.	Moon passes south of Saturn
	7:32 p.m.	Full moon (harvest moon)
17	5:00 a.m.	Algol at minimum
18	7:59 a.m.	Moon in last quarter
	4:00 p.m.	Moon passes north of Jupiter
20	1:50 a.m.	Algol at minimum
22	7:00 p.m.	Moon nearest, distance 225,600 miles
	10:30 p.m.	Algol at minimum
23	2:06 a.m.	Sun over equator, autumn commences in Northern Hemisphere
24	11:18 p.m.	New Moon
27	11:00 a.m.	Mercury behind sun
28	3:00 a.m.	Moon passes north of Venus
	9:00 p.m.	Moon passes north of Mars

Subtract one hour for CDT, two hours of MDT, and three hours for PDT.

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PSYCHOLOGY

Mothers of Slow Readers May Need Psychotherapy

► CHILDREN who are backward readers might benefit if their mothers were treated by psychotherapy.

That is the suggestion of Dr. E. Tuckman, a general practitioner in the London dormitory suburb of St. Mary Cray, Kent. He studied 32 backward readers, otherwise intelligent, aged eight and nine, and chose 25 children of similar age and sex at the same schools as controls.

In almost every respect the parents of the two groups were similar, but there was evidence of a greater degree of maladjustment in the families of the backward readers. Only two of the control families had ever been visited by the school attendance officer and only two had ever thought it necessary to have contact with a psychiatrist.

But in the backward readers' families seven had been visited by the school attendance officer and a further five parents had consulted a psychiatrist. Three other parents in the backward readers' group had sought advice from a marriage guidance counsellor or a probation officer. In half the families containing a backward reader, therefore, there was evidence of a problem of family mental health. In addition, Dr. Tuckman said he found more mothers in the backward readers' group with apparent neurotic tendencies.

Backward reading has been regarded as an index of psychological disturbance within the family. Dr. Tuckman's study confirms the belief.

Dr. Tuckman suggested that it may be

that a prediction of backward reading could be more easily made by studying the mothers rather than the children and this might provide the opportunity for preventive action before school entry.

He said he has also found that psychotherapy given to mothers of children who are bed-wetters has been shown to be effective in curing the child. The same, he thinks, may be true of mothers of backward readers.

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EDUCATION

New Alphabet Eases Job Of Learning to Read

► A 44-LETTER ALPHABET will be used to teach reading to all first graders this fall in Bethlehem, Pa.

The new system is being adopted for this because it was successful in turning out first-rate readers in a two-year experimental program. The system is known as ITA, or Initial Teaching Alphabet.

ITA was developed in England five years ago and introduced into the United States by Lehigh University, Bethlehem. It is rapidly reforming the teaching of reading across the nation, according to Dr. Albert J. Mazurkiewicz of Lehigh and director of the Bethlehem program.

He estimates that 10% of American six year-olds will be using ITA in September.

About 25% of England's beginning readers use the ITA alphabet now.

The new alphabet is longer but simpler. Of its 44 letters, 24 are normal Roman symbols. The rest are added to sounds not covered in the regular alphabet.

Advocates of ITA point out that their system eases the initial task of learning to read and reduces the ambiguity of conventional spelling.

Normally, they say, a child must learn hundreds of alternate spellings for various sounds. The words *do*, *zoo*, *true* and *shoe* have a sound that can be spelled in 18 different ways. With ITA there is only one spelling.

Moreover, ITA characters do not blanket an army of sounds but have the same value wherever found. Readers do not have to learn, for instance, that the "c" in *cat* is not the same "c" in *chat*. Vowels, a particular problem with their broad and erratic range of sounds, are robbed of complexity.

Dr. Mazurkiewicz reports that conventional reading and spelling are both improved with ITA.

Originally, trouble was anticipated as children switched from the new to the traditional alphabet, he said. However, last year 80% of Bethlehem children in the study transferred to normal English with no obvious trouble and by the end of the first grade were reading third-grade material. Dr. Mazurkiewicz said spelling is similarly improved. Second graders, given the Stanford Achievement test at the end of the year, showed substantial gains over control groups taught by a conventional system.

The simplified alphabet can also be used to attack the problem of remedial reading, Dr. Mazurkiewicz said. San Quentin prison has a program and non-English speaking groups are learning the language with it.

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