

ASPECTS OF THE PLANETS FOR AUGUST.

VENUS

is evening star, and takes the first rank on the planetary annals of August, for two reasons. She has entered upon her period of visibility, and she figures as chief actor in the incidents that diversify the month. She will be the most interesting star in the heavens, from the present time until the end of the year, the distance between the queen of the stars and the sun increasing all the time as she moves on her eastward course until the 8th of December, when, reaching her eastern elongation, she commences to retrace her steps toward the sun. Therefore, one of the most charming pages of planetary lore, written in characters of gold, on the blue vault that encircles the earth, is unfolded on moonless nights for the observation of the student of the stars.

Unfortunately, our sister planet does not take on the most favorable aspect, on account of her increasing southern declination. It is well known that the farther south the sun is, the shorter is the path he describes in the heavens, and, consequently, the shorter the day. For the same reason when Venus is far to the south of the equator, her path in the heavens follows the same law, and her stay above the horizon is correspondingly lessened. The result is that though the distance between Venus and the sun is constantly increasing, she sets only about an hour after the sun, through August, September, and the first part of October. On the 1st of November, she sets two hours after the sun, and on the 1st of December she shines with bewitching grace for three hours after the disappearance of the sun. As however, the twilight shortens with the shortening days, and her brilliancy and size increase with her approach to the earth, she will be more easily visible and far more beautiful as the autumnal months fulfill their course.

There is only a difference of ten minutes on the 1st of the month in the time of setting of Venus and Jupiter. On the 6th the former overtakes the latter, the conjunction taking place at 2 o'clock in the morning, Venus being 26' south. The planets will be below the horizon when at their nearest point, but they will be near enough together on the evenings of the 5th and 6th, to form a lovely picture in the glowing twilight. On the evening of the 6th the planets will have changed places, Venus being on the east.

On the 8th, at 10 o'clock in the evening, Venus is in conjunction with Mercury, being at the time 3° 42' north. It will be remembered that, on the 17th of July, the same planets were in conjunction. They were then both moving eastward, and Mercury, the swift-footed, overtook and passed his fair rival in the race. He has since reached his eastern limit, and, retracing his steps, again meets and passes Venus as he draws nearer to the sun. Hence the two conjunctions with so short a space of time.

On the 24th, Venus, still traveling eastward, encounters a third planet. Uranus is the fellow actor in the scene. They meet at 9 o'clock in the morning, Venus being 13' north. The fair evening star then proceeds unmolested in her course without meeting a brother planet for the rest of the year.

Venus, not contented with paying her respects to Jupiter, Mercury, and Uranus, draws near on the 19th to Beta Virginus, a star of the 3d magnitude in Virgo, the planet being at the time 24' north.

The right ascension of Venus on the 1st is 10 h. 24 m.; her declination is 11° 35' north; her diameter is 11'6"; and she is in the constellation Leo.

Venus sets on the 1st a few minutes after 8 o'clock in the evening; on the 31st she sets at half past 7 o'clock.

JUPITER

is evening star. We award to him the second rank, as this is the last month he will hold the place of evening star during the present year. Before the month closes, his bright presence will be missed among the starry throng, for he will be eclipsed in the sun's rays. He must therefore be left to pursue his invisible course, while his belts, spots, and clouds will be hidden from terrestrial telescopes. He does not bid goodby to the earthly domain without mingling in the events of the month.

On the 4th, at 4 o'clock in the afternoon, he is in conjunction with Mercury, being 2° 32' north. Bright eyed observers may be fortunate enough to pick up the largest and the smallest of the planets in near vicinity, for mercury should be visible about this time to the naked eye, and Venus follows closely on the track of both. The conjunction of Jupiter and Venus on the 6th has already been described.

On the 27th, at 6 o'clock in the morning, Jupiter is in conjunction with Mercury for the second time in the month, being then 6° 1' north. The explanation is the same as in the case of Venus. For Mercury having arrived at his eastern goal, on retracing his steps, overtakes the more stately and slower moving planet.

The right ascension of Jupiter on the 1st is 10 h. 41 m.; his declination is 9° 25' north; his diameter is 30"; and he is in the constellation Leo.

Jupiter sets on the 1st about a quarter after 8 o'clock in the evening; on the 31st he sets about half past 6 o'clock.

MERCURY

is evening star, and is a near neighbor to Venus and Jupiter during the month, making one conjunction with the former and two conjunctions with the latter planet, as has been stated.

On the 6th, at 3 o'clock in the morning, he reaches his greatest eastern elongation, being 27° 23' east of the sun. He is then so situated as to be visible to the naked eye, although not under the most favorable conditions. He is indeed at his maximum distance from the sun, but like Venus, is moving too rapidly southward to present his best aspect. Southern observers will enjoy a fine view of the fiery little planet at the time of his elongation. Observers who succeed in finding Venus and Jupiter, will find Mercury on the evening of the 6th, a little east, and about 3° south of the larger planets. They all set not far from 8 o'clock.

The right ascension of Mercury on the 1st is 10 h. 31 m.; his declination is 8° 23' north; his diameter is 7", and he is in the constellation Leo.

Mercury sets on the 1st a few minutes after 8 o'clock in the evening; on the 31st he sets soon after 6 o'clock.

URANUS

is evening star. Venus overtakes and passes him on the 24th, as he travels westward, approaching conjunction with the sun.

The right ascension of Uranus on the 1st is 12 h. 1 m.; his declination is 0° 35' north; his diameter is 3'4"; and he is in the constellation Virgo.

Uranus sets on the 1st about 9 o'clock in the evening; on the 31st he sets soon after 7 o'clock.

SATURN

is morning star, and is by far the most interesting of the three planets that precede the sun. He rises on the 1st about 2 o'clock, and at the close of the month makes his appearance soon after midnight, and is a lovely object to reward the gaze of the observer in the small hours in the morning. The mysterious rings are now open to their widest extent, the planet is drawing near perihelion, and is also approaching the earth. By the last of September Saturn will be above the horizon at half past 10 o'clock, and will not only be delightful to behold with the naked eye, but will afford a rare opportunity for telescopic research.

On the 5th, at 3 o'clock in the afternoon, Saturn is in close conjunction with Mu Geminorum, a star of the 3d magnitude in Gemini, passing 4' south.

On the 6th, at 3 o'clock in the afternoon, he overtakes Mars. The planets are in conjunction, Saturn being 1° 20' south.

The right ascension of Saturn on the 1st is 6 h. 14 m.; his declination is 22° 30' north; his diameter is 16"; and he is in the constellation Gemini.

Saturn rises on the 1st 10 minutes before 2 o'clock in the morning; on the 31st he rises a few minutes after midnight.

MARS

is morning star. Besides being in conjunction with Saturn on the 6th, he also is in conjunction with Mu Geminorum, being at the time 1° 16' north. Thus, Mars, the star, and Saturn are almost in line, the star almost touching Saturn. The double conjunction is invisible as it occurs at 3 o'clock in the afternoon, but though the actors in the scene will have changed places on the morning of the 7th, they will still be near enough to make an interesting celestial picture that will amply repay an early riser for making the required effort. A small telescope or opera glass will aid the observer, who will find the planets in favorable position at 3 o'clock in the eastern sky.

The right ascension of Mars on the 1st is 6 h. 1 m.; his declination is 23° 49' north; his diameter is 4'8"; and he is in the constellation Gemini.

Mars rises on the 1st about half-past 1 o'clock in the morning; on the 31st he rises about 1 o'clock.

NEPTUNE

is morning star. On the 18th, at 4 o'clock in the morning, he reaches quadrature with the sun on his western side, and thenceforth he is nearer to the earth than he is to the sun, that is, he appears to be.

The month closes with Neptune, Saturn, and Mars on the western side of the sun as morning stars, and with Mercury, Jupiter, and Uranus, and Venus on his eastern side as evening stars.

The right ascension of Neptune on the 1st is 3 h. 34 m.; his declination is 17° 27' north; his diameter is 2'5"; and he is in the constellation Taurus.

Neptune sets on the 1st at half past 11 o'clock in the evening; on the 31st he sets at half past 9 o'clock.

THE MOON.

The August moon falls on the 25th, at 25 minutes after midnight. The moon is in conjunction with Neptune on the 4th at 3 h. 49 m. P.M., being at the time 2° 45' south. On the 7th, at 9 h. 5 m. A.M., she is in conjunction with Saturn, being 4° 18' south. Also on the 7th, 43 minutes later at 9 h. 48 m. A.M., she is in conjunction with Mars, being 5° 33' south. The conjunction is invisible, but the waning moon will be near the two planets on the morning of the 7th. On the 11th, at 9 h. 2 m. P.M., the new moon of the 10th

is in conjunction with Jupiter, being 2° 31' south. On the 12th, at 3 h. 36 m. A.M., the moon is in conjunction with Mercury, being 1° 55' north. On the same day, the 12th, but nearly four hours later at 7 h. 12 m. A.M., she is in conjunction with Venus, being 2° 13' south. The crescent moon and evening star, though not near each other, will be fair to see on the evening of the 12th. On the 13th, at 5 h. 49 m. A.M., the moon is in close conjunction with Uranus, being 17' north. On the 31st, our satellite again commences her round. She is in conjunction with Neptune for the second time during the month at 10 h. 6 m. P.M., being 2° 52' south.

AUGUST

presents a full chapter of planetary incidents. There is an unusual stir among the members of the sun's family of worlds. The fairest of the stars pays her respects to her august brother Jupiter, to the swift-footed Mercury, and to the slow moving Uranus, while she fills out her portion of planetary work by a close conjunction with Beta Virginus. The prince of planets pays his court twice to the smallest of his brethren, who at least can outrun him in the race if he can do nothing else. The ring-girdled planet and the god of war meet and change places on the celestial road, and both planets pay their respects to the small star Mu Geminorum, at nearly the same time, the approach in Saturn's case being an appulse, for 4' of arc is in celestial mathematics a small space to intervene between two visible heavenly bodies. As the month passes, the light of Jupiter grows dim and fades away, Venus slowly advances to easy visibility and will soon put on her queenly apparel, Saturn is superb with his wide open rings and the beaming light he borrows from a nearer approach to the sun, while the day of Martian importance nears the dawn.

Oxidation and Bronzing of Metals.

In the National Armory, Springfield, all the metallic parts of small arms, except those requiring to be case-hardened, and those colored in tempering, are oxidized by immersion in melted niter mixed with a few pounds of peroxide of manganese. A cast iron pot or vessel, built into a furnace, contains the mixture heated to such a point that a pinch of sawdust thrown on to the surface takes fire. The objects to be treated are suspended from hooks above, and are lowered into the fluid, when they are moved about until they attain the desired color. They are then lifted out and left suspended until the niter has dropped off and they have cooled to the temperature of boiling water, when they are washed and finally dipped in a bath of sperm oil. All articles that are likely to be injured by distortion are dipped vertically, and the mixture is allowed to penetrate the inside of the rifle barrels. The result is the formation of a coating of magnetic oxide of iron which has a very fine color, and withstands the action of moisture. It is necessary that the niter should be refined. The crude salt of commerce does not give a satisfactory color or uniform results. The best effect is gained when the metallic surface is smooth and free from the markings of the polishing material, but not highly polished. A smooth polished surface of cast iron treated with niter is given a good bronze color. There is no danger of explosion from the process if the objects be clean, and even if the pot of niter be upset on the fire nothing worse occurs than the evolution of a suffocating gas. The process has been worked out by Lieutenant-Colonel A. R. Buffinton.

Light House Construction.

A tapering round tower of cast iron, weighing 200 tons, rises from the floor of the Colwell Iron Works foundry to the roof. It is the shell of the iron light tower to be erected on the Delaware Breakwater. For three months a large force of workmen have been casting the 150 plates that compose the shell. This novel and expeditious method of constructing lighthouses, has but recently been put in operation by the United States Lighthouse Board. This shell sets the light 80 feet above water, and has a circumference of 66 feet at the base and 54 at the top. The lighthouse is all made, tested, and inspected at the works, and on arrival at its concrete foundations will receive an interior lining of brick. This new variety of lighthouses can be built very rapidly and at comparatively small cost.

Samuel Irenæus Prime, D.D.

Rev. Dr. Prime, the well known senior editor of the *New York Observer*, died on Saturday, July 18, at Manchester, Vt., from a stroke of paralysis. Dr. Prime was born in 1812 and graduated at Williams College 17 years later, after which he took the theological course at Princeton. Dr. Prime was a charming, easy writer, who carried his readers along with him in a most delightful and familiar way. He was a conspicuous figure in the religious and charitable world, a pleasant, easy talker, with the ability of making a stirring and interesting impromptu address at a moment's notice, genial and kindly in his ways, with jolly, sparkling eyes. Dr. Prime will long be missed by a large circle of friends and admirers.