## ASPECTS OF THE PLANETS FOR AUGUST.

### JUPITER

is evening star until the 7th, and morning star the rest of the month. On the 7th, at 1 o'clock in the afternoon, he is in conjunction with the sun. He makes his bow to his evening audience, where he has been a shining light during the winter, spring, and summer months. As the curtain falls that hides him from view on the sun's eastern side, it rises on the sun's western side, and our giant brother soon emerges from the sun's eclipsing rays in a new character, that of morning star, a part that he will play faithfully and well, as those can testify who watch his rising in the eastern sky, and note his advent with increasing radiance a few minutes earlier each morning as the months roll on.

If we had eyes to see the position of the huge planet at conjunction, we should find that a straight line drawn from the earth, through the sun, would reach Jupiter, showing that he is then beyond the sun, and at his greatest distance from the earth.

If we could be transported to the vicinity, there would be startling things to behold in this vast sphere that almost make the hair stand on end even to think of.

Our staid planet, the earth, rotates on her axis once in 24 hours. As her circumference is about 24,000 miles, her axial velocity at the equator is about 1,000 miles an hour, or 16 miles a minute. Jupiter rotates on his axis, with a volume nearly 1,400 times as great as that of the earth, in a few minutes less than 10 hours. As his circumference is about 266,000 miles, his axial velocity, at the equator, is about 26,000 miles an hour, or not far from 433 miles a minute. When the planet was in a plastic state, this rapid rotation produced an effect that is plainly perceptible in the present outline. It caused a bulging out at the equator and a depression at the poles more marked and much greater than that of any other planet, so that his polar diameter is one-seventeenth less than his equatorial diameter, or in the neighborhood of 5,000 miles, more than half the earth's entire diameter.

And yet the Jovians, when in the passage of millions of years the planet becomes the abode of animate life, will no more feel the rapid movement of the monster planet than those who live at the earth's equator feel the more moderate speed that carries them around with the earth, and gives the sun a comparatively slow circuit in his diurnal course, instead of the rapid march that rules in the Jovian sky.

Matters must be rather mixed there, according to our ideas, with a day not half as long, only five hours from sunrise to sunset, and with a year nearly twelve times as long; for these are the conditions that hold sway in the domain of our distant neighbor. We like better the more dignified length of the earthly day, the more stately axial rotation of our little planet, and the quicker return of the revolving seasons. But the earth and all the other planets are results of the great nebulous mass that once extended far beyond the system's remotest bounds. The huge mass quickened into life, and threw off concentric rings that condensed into the sun and planets, and became the solar system. No man of science has yet been able to explain, in all its bearings, the law which ruled in the arrangement of the sun and the worlds that round him roll, to tell where the fuel comes from that keeps up the sun's fire, to show the reason why four giant spheres still holding portions of their primeval fires were established on the outposts of the system, or why four small planets roll on in their swifter course nearer to the great central orb. Theories are plenty on all these points, but conclusions are not convincing. We are prone to think that the earth holds a favored place among the planetary brotherhood. It is well to think so, and the position will not be disputed in the present attainments of astronomical science.

Jupiter has deigned to give little information concerning himself in his last synodic circuit. Even the red spot, the peep hole into his glowing nucleus, is but a ghost of its former self. The cloud atmosphere has closed over it, and there will be no more tidings until another rift shall open, and show further glimpses of the chaotic mass, cooling and condensing into form and shape. We must wait until 1892 for Jupiter's next perihelion, when, being 46,000,000 miles nearer the sun than at aphelion, we may hope that the improved telescopes of the day will pick up something worth knowing. The process of world making will be a slow one on this princely planet, and the earth may have cooled down to desolation before the process takes perceptible form on this distant outpost.

The right ascension of Jupiter on the 1st is 9 h. 7 m.; his declination is 17° 11′ north; and his diameter is 29·6″.

Jupiter sets on the 1st about half-past 7 o'clock in the evening on the 31st he rises at a quarter before 4 o'clock in the morning.

### VENUS

is morning star during the month, and is a charming object in the eastern sky during its course. On the 17th she reaches her period of greatest brilliancy as morning star, and observers who wish to behold the most lovely star that gilds the morn will find our celestial neighbor worth getting up early to see. She makes her appearance on the 17th, soon after 2 o'clock in the morning, nearly three hours before sunrise, casts shadows on objects illumined by her rays, and holds her visible presence in the sky, even in the noon-day radiance of the King of Day, to those who know where to look for her.

Venus has two periods of greatest brilliancy. One of them occurs thirty-six days before inferior conjunction, when she is evening star, as was illustrated on the 3d of June. The other takes place on the 17th, thirty-six days after inferior conjunction, when she is morning star. At this portion of her course she is 40 degrees from the sun, and about a quarter of her surface is illumined. After her first period, and before her second, she is nearer to the earth and larger in dimensions. But the illumined portion of her disk is less, and the loss of light more than counterbalances the increasing size. This is the time for the most satisfactory view of the Queen of the Stars. She is rapidly receding from our neighborhood, and many months will wax and wane before the favorable conditions will return.

The right ascension of Venus on the 1st is 6 h. 49 m.; her declination is 16° 26′ north; and her diameter is 49·4″.

Venus rises on the 1st at 3 o'clock in the morning; on the 31st she rises a few minutes before 2 o'clock.

### MERCURY

is evening star during the month. On the 23d, at 5 o'clock in the evening, he reaches his greatest eastern elongation, when he is 27° 21′ east of the sun. There is a moderately favorable opportunity for seeing him about that time, on an exceptionally clear evening after sunset in the west. His southern declination will, however, make him a difficult object, although his elongation is nearly as great as possible. Mercury must be looked for on the 23d in the constellation Virgo, about 20° northwest of Spica and 12° south of the sunset point.

A few hours before elongation the swift footed planet overtakes Uranus, passing 3° 5′ south of his slow plodding brother.

The right ascension of Mercury on the 1st is 10 h. 5 m.; his declination is 12° 55′ north; and his diameter is 5·6″.

Mercury sets on the 1st a few minutes after 8 o'clock in the evening; on the 31st he sets about a quarter after 7 o'clock.

### NEPTUNE

is morning star, and leads the planetary choir in being the first to make his appearance above the horizon. On the 14th, at 11 o'clock in the evening, he reaches the half-way house between conjunction and opposition, being then in quadrature, or 90° west of the sun.

The right ascension of Neptune on the 1st is 3 h. 25 m.; his declination is 16° 53′ north; and his diameter is 2·6″.

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

### SATURN

is morning star, and is growing brighter and more conspicuous as he approaches the earth. It is however the day of small things in his history. On the 17th, when Venus is brightest, he may be found about 30° northwest of the fairest of the stars.

The right ascension of Saturn on the 1st is 5 h. 19 m.; his declination is 21° 43′; and his diameter is 16·2″.

Saturn rises on the 1st at a quarter after 1 o'clock in the morning; on the 31st he rises at half past 11 o'clock in the evening.

### URANUS

is evening star. His course is uneventful, except for the conjunction with Mercury on the 23d.

The right ascension of Uranus on the 1st is 11 h. 45 m.; his declination is 2° 24′ north; and his diameter is 3·5″.

Uranus sets on the 1st not far from a quarter past 9 o'clock in the evening; on the 31st he sets a quarter past 7 o'clock.

### MARS

is evening star. He is of little account as he slowly travels toward the sun, his increasing southern declination being the only noteworthy event in his course.

The right ascension of Mars on the 1st is 12 h. 10 m.; his declination is 0° 45′ south; and his diameter is 5″.

Mars sets on the 1st at twenty minutes past 9 o'clock in the evening; on the 31st he sets at a quarter past 8 o'clock.

### THE MOON.

The August moon fulls on the 6th at six minutes after 6 o'clock in the evening, standard time. She is in conjunction with Neptune on the 13th, the day of her last quarter, and with Saturn on the 16th. On the 17th she makes a close conjunction with Venus, at 4 h. 37 m. in the afternoon, being then 23′ north. Although the nearest approach is invisible, the waning crescent and the radiant morning star will make a beautiful celestial picture on the morning of the 17th. The moon on the 20th, the day of her change, will be at her nearest point to Jupiter. The two days' old moon will pass 32′ north of Mercury on the evening of the 22d, an event that sharp eyed observers may behold. She will pass Uranus on the same evening, and close the circuit by a very close conjunction with Mars on the 24th, at 10 h. 28 m. in the morning. She will be at that time 10 north of Mars, but as the conjunction takes place in daylight, it can only be seen in the mind's eye.

It will be noticed that the moon passes very near Venus on the 17th, Mercury on the 22d, and Mars on the 24th. She will occult these three planets to observers whose places of observation are in line with her geocentric position; that is, as seen from the earth's center. These fortunate observers will see the moon, if the hour be favorable, hide Venus, Mercury, and Mars from view on the dates mentioned, the three occultations occurring within the limit of seven days.

## Photographic Items.

*Starched Glass.*—At a recent meeting in this city of the Society of Amateur Photographers, Mr. H. J. Newton gave the following recipe for making starched glass as a substitute for the ground glass of the camera, should the latter be accidentally broken:

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| Water | 3 ounces. |
| Starch | 30 grains. |

The starch is well mixed and incorporated with the water, all large particles being reduced by pressure. The solution is now cooked or boiled very thoroughly for five minutes, strained through muslin, such as a handkerchief, and when cold is applied to the glass plate. The plate is leveled, the starch poured on and spread over to the edges and corners by a glass rod, and the plate is then drained and dried.

*Silvering Paper.*—Mr. Newton makes silvered paper which requires no fuming with ammonia, and yields fine purple tones, as follows:

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| Water | 1 ounce. |
| Nitrate of silver | 40 grains. |
| Nitrate of ammonia | 30 " |
| Liquid ammonia | 3 minims. |

Upon this solution the plain or albumenized paper is floated for three minutes, and is then drawn off from the bath over the edge of the dish next to the operator. The wet paper adheres strongly to edge of the dish as it is drawn off. Bubbles are thus prevented from injuring the surface.

The bath should register from 54 to 56 by the hydrometer, and its strength may be reduced by usage to 25 grains of silver to the ounce before brown tones will be made. It is extremely important to keep it alkaline; it should be tested occasionally with red litmus paper, and if acid, more ammonia should be added.

*Potash Developer.*—Mr. F. C. Beach gave a formula for a potash developer, with which he had had much success. It is well adapted for instantaneous plates.

#### NO 1. PYRO SOLUTION.

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| Warm distilled or melted ice water | 2 ozs. |
| Chem. pure sulphite soda (437 grs. to oz.) | 2 ozs. |
| When cool add: sulphurous acid | 2 ozs. |
| And finally add: pyrogallol (Shering's) | ½ oz. or 218 grs. |

which is done by pouring the sulphite solution into the pyro bath, repeating the pouring until the pyro is dissolved. The solution, which will now measure five fluid ounces, should be filtered, and will contain 44 grains of pyro to each ounce.

#### NO. 2. POTASH SOLUTION

is prepared by making two separate solutions as follows:

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| *a* | Water | 4 ozs. |
| | Chem. pure carbonate of potash (437 grs. to the oz.) | 3 ozs. |
| *b.* | Warm water | 3 ozs. |
| | Chemically pure sulphite soda (437 grs to oz.) | 2 ozs. |

*a* and *b* are next combined in one concentrated solution, a small quantity of which when mixed with the pyro will be sufficient to develop 3 or 4 plates. The strength of the solution will be uniform, and it will measure between eight and nine fluid ounces.

Supposing a plate to have been greatly overexposed, or properly timed, or the length of the exposure is unknown, to develop a 5x8 plate take 2 ounces of water and add thereto 3 drachms of No. 1 and from half to 1 drachm of No. 2, or the potash solution. Then pour the solution upon the plate; after a minute's interval, should no part of the image appear add a second drachm of No. 2, putting it into the graduate first and then pouring the developer from the tray into the graduate. The solution is again flowed over the plate, and if after a minute's interval no image appears, repeat by adding a drachm of No. 2 at a time until development commences. In this way the picture will be brought out very gradually, the development will be under perfect control, and can be prolonged until all details appear, without the slightest danger of fogging the plate. The principle involved is to add sufficient pyro at first to give proper density, and then add minute quantities of the alkali at stated intervals until the right strength is reached to commence the development.

In place of the No. 1 or the pyro in solution, dry pyro may be used with good effect, 6 to 8 grains being sufficient for 2 ounces of water.

If a plate has had what is termed a drop shutter exposure, or in other words an instantaneous exposure, to 2 ounces of water add 3½ drachms of No. 1 and 3 drachms of No. 2, increasing it a drachm at a time, in case the shadows fail to come out, up to 5 drachms.

The sky will appear rapidly, but the dark portions will develop gradually.

Brilliant, clear, bluish-gray quick printing negatives are produced with this developer on almost any brand of plate, the necessity of using clearing solutions is avoided, and all chance of stain to the negative disappears. The developing solution remains clear, and from 4 to 8 plates may be developed successively in it at one time. Should the negatives be too dense, the amount of No. 1 may be decreased a third to a half.

Among the advantages claimed for the developer are simplicity, certainty of uniform action, and production of clear negatives. The solutions being in concentrated form may be kept in small bottles, convenient for handling.