

ASPECTS OF THE PLANETS FOR JANUARY.

MERCURY

is evening star until the third, and morning star for the rest of the month. He comes to the front among his brethren on the January record, for he contributes three important incidents to diversify the annals of the month, including his inferior conjunction with the sun, greatest western elongation, and conjunction with Venus.

On the 3d, at 5 o'clock in the evening, he is in inferior conjunction with the sun. Our brother with the winged feet then passes between us and the sun, making the passage above the luminary, and therefore leaving no tiny black spot on the sun's shining face to mark the transit. Indeed, he is at that time far away from one of his nodes, where only transits can occur, nor will our eyes be gladdened by the sight of a transit of Mercury until the year 1891. Through these intervening years he must pursue his appointed path, before he is near one of his nodes, when his inferior conjunction occurs. Only under those conditions, will he be projected on the face of the sun as a black point so small that a telescope is required to reveal its presence on the solar orb.

On the 26th, at 8 o'clock in the morning, Mercury reaches his greatest western elongation, when he is 24° 53' west of the sun. He will be visible to the naked eye as morning star at that time, and for a week or ten days before and after the elongation. Although he is at the present elongation nearly at his maximum distance from the sun, he will be difficult to pick up on account of his great southern declination. He rises on the 26th about an hour and a quarter before the sun, and may be looked for 3° 30' south of the sunrise point. Fortunately for observers, the fairest of the stars is in his near vicinity, where he is most easily seen.

On the 24th, at 5 o'clock in the morning, Mercury and Venus are in conjunction, Mercury being 1° 6' north, a distance a little greater than twice the apparent diameter of the sun. On that morning, the two planets will rise nearly at the same time, a few minutes before 6 o'clock. Venus is so brilliant that she will be seen at a glance in the southeast, and, not far to the north, keen-eyed observers will find the shy planet, so difficult to discover when its place is not known, so easy to pick up when one knows just where to look. Mercury and Venus continue their companionship during the rest of the month, rising on the last day with only a difference of six minutes.

Astronomers thus far have been able to find out very little about Mercury, for his nearness to the sun makes him a difficult object to observe with accuracy. The period of his rotation, supposed to be nearly twenty-four hours, is not considered as established with certainty, neither is the position of his axis. Schroeter, at the beginning of the present century, observing Mercury in crescent form, either saw, or thought he saw, the southern horn of the crescent blunted at certain intervals. He interpreted the phenomenon as due to the shadows of lofty mountains, which, according to his measurement, were twelve miles in height. But the more powerful instruments of the present day fail to confirm these observations. Nothing is considered "proven" in regard to the planet's atmosphere, its deviation from a spherical form, or many other phenomena perhaps due to the imagination of observers.

A more important problem is now puzzling the brains of the men of science. Leverrier, after profound and exhaustive examination of records, announced that the perihelion of Mercury's orbit moves round the sun more rapidly than can be explained by the action of the other known planets, the acceleration amounting to 40" in a century. The French astronomer searched diligently for the cause, and finally concluded that the effect was due to an unknown planet or planets revolving between Mercury and the sun. He died in this belief, and in confident expectation that one or more planets would be added to the system, and the Mercurial perturbations be accounted for. The incorrigible planet, however, refuses to come under the rules, while the fact that the perihelion point of his orbit moves round the sun faster than it ought to is considered as established beyond question. The cause of the anomaly is no nearer discovery than it was in the beginning. It would seem as if, from its present standpoint, the science of astronomy had here a question to deal with beyond its capacity to grasp.

No problematical Vulcan, no unnamed planets, no group of asteroids, have been seen beyond question to pass over the sun, and restore harmony to the system. Unskilled observers have noted little bodies crossing the sun that had the appearance of planets. Their observations have not been confirmed by observers who for fifty years have never allowed a clear day to pass without scanning or mapping the sun's face. The transit of a planet no bigger than a pin's head would not escape their vigilant watch.

During total eclipses tiny stars have been noted that it was hoped might prove to be the much desired planets. But the preponderance of evidence is against the existence of the unseen wanderers; the problem remains unsolved. The best observers with the finest instruments and the most favorable opportunities have thus far found no clew. Mercury defies the host of terrestrial astronomers and mathematicians, and spins on his course, his perihelion point advancing with an accelerating pace that is incomprehensible to those best versed in the laws that hold in place the sun and his family of worlds.

The right ascension of Mercury on the 1st is 19 h. 16 m., his declination is 20° 24' south, his diameter is 9'6", and his place is in the constellation Sagittarius.

Mercury sets on the 1st soon after 5 o'clock in the eve-

ning; on the 31st he rises a few minutes before 6 o'clock in the morning.

VENUS

is morning star during the month. She is slowly approaching the sun, and her superior conjunction, which does not occur until May. But she is still very beautiful in the morning sky, as any one may see who commands a view of the southeastern heavens, and makes an observation an hour before sunrise.

She contributes an interesting incident to the planetary annals of the month by her conjunction with Mercury on the 24th, when she acts as guide for those who desire a glimpse of the sparkling planet, who, however, will not deign to show his face unless atmospheric and cloud conditions are the very best. Although Venus and Mercury, as we see them at conjunction, are apparently very near each other, they are in reality far apart. Venus is approaching the sun and moving eastward, being, when in conjunction with Mercury, 22° west of the sun. Mercury is receding from the sun, moving westward, and is, when in conjunction, at the same distance from the sun. The former is approaching superior conjunction, the latter is very near western elongation; and yet they seem, as viewed from the earth, to be projected on the sky side by side.

The right ascension of Venus on the 1st is 16 h. 40 m., her declination is 20° 53' south, her diameter is 12'4", and she is in the constellation Scorpio.

Venus rises on the 1st at a quarter after 5 o'clock in the morning; on the 31st she rises at 6 o'clock.

JUPITER

is morning star throughout the month. Although thus ranked in astronomical classification, he will be near enough to opposition to be a superb object in the evening sky, being visible nearly the entire night. He now makes his appearance above the eastern horizon at 9 o'clock in the evening in the northeast, and on moonless nights shines forth with exceeding splendor. He remains almost stationary during the whole month, moving a little farther north, and being carried westward for the same reasons that the stars are, that is, by the earth's eastward motion in her orbit. This makes him appear to rise earlier every night, so that, when January closes, he comes looming majestically above the horizon shortly before 7 o'clock. No lover of the stars can help feeling the imposing presence of this leader of the planetary host.

The right ascension of Jupiter on the 1st is 10 h. 31 m., his declination is 10° 23' north, his diameter is 39'6", and he is in the constellation Leo.

Jupiter rises on the 1st about 9 o'clock in the evening; on the 31st he rises about 7 o'clock.

URANUS

is morning star. He pursues his slow course without making the least contribution to planetary records. He is leaving the neighborhood of the sun, and consequently drawing near to the earth. He makes slow progress among the stars, for it takes him seven years to pass through a zodiacal constellation.

The right ascension of Uranus on the 1st is 12 h. 12 m., his declination is 0° 28' south, his diameter is 3'6", and he is in the constellation Virgo.

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

NEPTUNE

is evening star. He pursues his snail-like course just now far away from any of his brother planets. He is thirteen years in passing through a constellation, and therefore it is easy to keep the run of his place in the heavens.

The right ascension of Neptune is 3 h. 15 m., his declination is 16° 14' north, his diameter is 2'6", and he may be found near the border line of the constellation Taurus.

Neptune sets on the 1st at half past 3 o'clock in the morning; on the 31st he sets at half past 1 o'clock.

SATURN

is evening star. He is second to Jupiter in brilliancy and size, and moves serenely on his celestial path with nothing noteworthy to record concerning his progress. When Jupiter rises in the early part of the month, Saturn is nearly on the meridian, and when Jupiter has reached the zenith, Saturn is sinking below the western horizon. Nothing new has transpired in regard to this fascinating planet, but we have faith that something worth knowing will be revealed concerning the complex Saturnian system before the 27th of September ushers in the long anticipated Saturnian perihelion.

The right ascension of Saturn on the 1st is 5 h. 13 m., his declination is 21° 34' north, his diameter is 19'2", and he is in the constellation Taurus.

Saturn sets on the 1st at a quarter before 6 o'clock in the morning; on the 31st he sets about a quarter before 4 o'clock.

MARS

is evening star. He is very near the sun, and completely hidden in his rays.

The right ascension of Mars on the 1st is 19 h. 30 m., his declination is 22° 51' south, his diameter is 4'2", and he may be found in the constellation Sagittarius.

Mars sets on the 1st about half past 3 o'clock in the evening; on the 31st he sets about half past 5 o'clock.

THE MOON.

The first month of the new year holds two full moons in her bountiful hand. The moon falls on the 1st, 26 minutes after midnight; and also, on the 30th, 19 minutes after 11 o'clock in the morning. On the 4th, the moon is in conjunction with Jupiter, and on the 6th with Uranus. On

the 13th she pays her respects to Venus, and on the 14th to Mercury. On the 16th she is at her nearest point to Mars, and as this is the day of her change it shows how near Mars is to the sun. Those who watch the course of the moon will find it easy to keep in mind the relative position of the planets.

On the 24th, the moon is in conjunction with Neptune, and on the 26th, with Saturn. She thus completes her circuit, and, at the same time, gives the order of succession of the planets, drawing near to the morning stars Jupiter, Uranus, Venus, and Mercury, and after her change to new moon swinging her ponderous sphere near the evening stars, Mars, Neptune, and Saturn. There are compensations in things celestial as well as terrestrial. One of these is the full-orbed winter moon as she "runs high" in the heavens, and pours over the ice-bound earth a flood of silvery light that makes the winter nights beautiful as a dream.

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Opening of the New Orleans Exposition.

On December 16, according to previous announcement, the great World's Industrial and Cotton Centennial Exposition was formally opened, the ceremonies attending the occasion being of a striking character. The attendance was estimated as high as 25,000 people when Major Burke, the Director-General, turned over the buildings and grounds to President Richardson. The latter, in a felicitous address, in the name of the Board of Managers, then presented the Exposition to the President of the United States, the address of presentation being simultaneously telegraphed to the President at Washington. While this was being done at New Orleans, about two hundred officials and distinguished guests, including representatives of foreign powers and committees of the Senate and House, assembled in the East Room of the White House, to be participators, as it were, in the ceremonies going on at the Crescent City, fifteen hundred miles away. The little assemblage in the White House was kept informed by the telegraph of the progress of the exercises at New Orleans: and at 2:45 P. M., when President Richardson's address of presentation was thus received, President Arthur made an appropriate speech in reply—which was likewise simultaneously telegraphed to New Orleans—congratulating the promoters, and officially declaring the exposition open. At the conclusion of his address, President Arthur touched a key at the table before him, ringing a little electric bell near the great engine in the Exposition, which was the signal for the engineer in charge to turn the throttle valve and let on the steam. A cheer followed the tinkle, then the 27 foot fly wheel of the 650 horse power Harris-Corliss engine began to move, with the long lines of shafting; but the big wheel had scarcely made a revolution before four other engines were started, and began to work in unison, and the Exposition was in fact actually under way.

Although the management state there is not in all the buildings 100 feet of space unappropriated, not more than about one-half of the exhibits are really in place. There are some 2,000 car loads of goods not unloaded, as well as many on vessels not arrived from Europe, so that the Exposition will probably not be in complete order till early in January.

In another column, J. Pierrepont Edwards, Esq., British Consul in this city, announces the last day that inventors have to apply for space for the International Inventors' Exhibition, to be held in Loudon next year.