ASPECTS OF THE PLANETS FOR FEBRUARY.

MARS

is evening star; though exceeded in size and brightness by Jupiter and Venus at the present time, he wins the first place in the monthly presentation on account of the occurrence of the most interesting epoch in his course, his opposition with the sun. This event takes place on the 1st at 6 o'clock in the morning. Mars then turns to us his broad, round face, the earth directly intervening between his ruddy disk and the sun, thus bringing the two planets to their nearest approach to each other. This is true in general terms, but not strictly accurate. If Mars and the earth revolved in circular orbits, fixed with respect to each other, the distance between them at opposition would be the same. But the orbits of both planets are elliptical and not fixed in regard to each other, while no two following oppositions happen in the same part of either orbit. Therefore, the distance between the planets varies greatly at different oppositions. When Mars at opposition is in perihelion, or nearest to the sun, and the earth at the same time is in aphelion, or farthest from the sun, they are as near together as they can be, or about 35,000,000 miles distant. When Mars at opposition is in aphelion, and the earth at the same time is in perihelion, the two planets are at their greatest distance, or about 62,000,000 miles. The former was the case at the opposition of 1877, for it occurred nine days after Mars had reached perihelion. The grand appearance of the fiery red planet at that time will never be forgotten by those who witnessed it. A great event also immortalized its passage—the discovery of two moons, moving with wonderful speed about their primary, and measuring probably less than ten miles in diameter, the smallest known worlds that belong to the solar system. At an opposition in 1719, when Mars was only two degrees and a half from perihelion, he shone with such awe-inspiring brightness as to cause a panic among the superstitious, who had firm faith in his malignant influence.

The present opposition is one of the most unfavorable for a near prospect of our celestial brother. As the earth is one month past perihelion, and Mars near aphelion, they are nearly as far apart as possible. It is not expected that Deimos and Phobos, the two moons, will be visible even in the most powerful telescopes.

Oppositions that occur in August or September bring the earth and Mars to their nearest point of approach, while those that occur in February or March find them most widely separated. The most favorable oppositions for observation of the planet take place at intervals of fifteen years. The last one was in 1877. Therefore we must wait until 1892 for another.

Who can tell what the great telescopes in 1892 will reveal under more experienced hands, in the clear air of mountain observatories, and with the gigantic refractors that will then be in operation? Continents, islands, seas, canals, atmosphere, clouds, morning and evening twilight, raging storms, clear skies, and polar ice may then be eclipsed by discoveries as unexpected and as permanent as the twin satellites that were brought into existence by the Washington telescope under Professor Hall's skillful manipulation.

Meantime, the present opposition of Mars must not be neglected. He is now, and will be during the month, a conspicuous object, shining with a fiery red light unlike that of any other planet, so striking in its character as to suggest to the poetic Greeks the distinguishing epithet of the God of War. He may be found on the 1st in the northeast, rising about sunset, and making his transit at midnight. Jupiter is 15° west of him, and the first magnitude star Regulus, the Lion's Heart, about the same distance southeast.

When Mars is in opposition as seen from the earth, the earth is in inferior conjunction as seen from Mars. If observers could be transported to his domain before the event, they would behold the earth dwindled to a beautiful star, shining in the Martian sky as evening star like Venus in our sky near her inferior conjunction, and, unlike Venus, accompanied by a moon, to make the celestial picture more beautiful. Bright as Mars appears, his diameter is not much more than half that of the earth, and about double that of the moon. The ruddy planet has a peculiar interest for terrestrial observers, as he possesses the most intelligible features of any celestial object within our reach, for the moon is dead, and Venus is hid in a blaze of light that the eye can hardly fathom.

It takes Mars 780 days to revolve from opposition to opposition again, or to complete his synodic period. During this time, the earth makes two revolutions in her orbit, and then it takes her fifty days more to catch up with him. Oppositions of Mars occur at this average interval, and may be approximately calculated. The present opposition occurs on the 1st of February, 1884. Three more occur in succession in March, 1886, April, 1888, and May, 1890, when will follow the much desired occultation of 1892.

The right ascension of Mars on the 1st is 9 h 2 m.; his declination is 21° 37′ north; and his diameter is 15″.

Mars sets on the 1st about half past 7 o'clock in the morning; on the 29th, he sets a quarter after 5 o'clock.

JUPITER

is evening star. Although he has passed opposition, he is increasing his distance from the earth and approaching the sun; as we follow his course in the heavens, he is a magnificent object in the star spangled canopy that nightly unveils its glory to our admiring eyes. He is now more than an hour high at sunset, and traverses the sky with stately step till about an hour before sunrise, when he slowly sinks below the western horizon. He is still *facile princeps* among the bright twinklers that surround him. He wields his starry scepter from a point of the sky nearly between Castor and Pollux on the north and Procyon on the south, Mars follows his lead at a respectful distance, while brilliant Orion and glittering Sirius precede him toward the southwest.

Jupiter is a most desirable tidbit for the telescopists. Mr. Denning of Bristol is a special student of the Jovian alphabet as exhibited in incongruous symbols on his disk. Just now, efforts are directed toward the exact determination of his rotation period, for an irreconcilable difference is found between the time of the rotation of the red spot and that of the white spot. It is considerate in our big brother to put forth these diverse symbols from time to time on his shining surface, in order to whet terrestrial curiosity. Like figures on a blackboard, they form the data for the solution of great physical problems that at present baffle the ingenuity of terrestrial brains.

The right ascension of Jupiter on the 1st is 8 h. 0 m.; his declination is 21° 11′ north; and his diameter is 43·8″.

Jupiter sets on the 1st at half past 6 o'clock in the morning; on the 29th, he sets at half past 4 o'clock.

VENUS

is evening star, and by far the loveliest of the brilliant quartet of planets that shed their radiance upon the winter nights. She possesses a charm that surpasses the majestic bearing of Jupiter, the warlike aspect of Mars, or the serene glow of Saturn. She is increasing in radiant beauty, while her three rivals have passed their culminating point, though the diminishing brilliancy will scarcely be discernible during the month. Observers who watched her course in January did not fail to admire the bewitching grace of her presence in the glow of twilight. Sometimes she hung on the dark edge of sunset clouds, shining through the rifts that revealed the clear sky; sometimes she challenged admiration in a twilight of molten gold. But she was surpassingly lovely when her light of "purest ray serene" was seen amid the crimson afterglow that lit up the western sky on some of the unaccountably beautiful sunsets that have shed a glory not of earth upon the path of the departing sun.

Venus is moving rapidly north, coming into northern declination on the 11th, and, at the end of the month, being 14° north of the sunset point. Her apparent approach to Saturn is another pleasing feature of her course, while still another is found in the fact that at the close of the month she will be above the horizon for three hours after sunset.

The right ascension of Venus on the 1st is 23 h. 5 m.; her declination is 7° 19′ south; and her diameter is 12·8″.

Venus sets on the 1st a few minutes before 8 o'clock in the evening; on the 29th, she sets about 9 o'clock.

SATURN

is evening star. He has not made so fine an appearance for fifteen years, and may be easily known as the bright star nearly half way between the Pleiades and Aldebaran. He is near his greatest northern declination, near perihelion, and near the point where his rings are most widely open, these favorable positions all culminating next year. Nearly thirty years must pass before the same conditions are repeated. Saturn is in quadrature on the eastern side of the sun on the 22d at noon-day. He then rises at noon-day, is on the meridian at 6 o'clock in the evening, and sets at midnight. Half his course from opposition to conjunction is completed, half his race as evening star is ended.

He is now a superb object in the telescope, and astronomers are diligently at work to see what may be learned from the markings on his disk. Mr. Ranyard of the Royal Astronomical Society observed in November a narrow belt on Saturn's surface of a bluish brown-color not quite twice as broad as the Cassini division of the ring. Such narrow belts are rarely seen on this planet, though not uncommon on Jupiter.

The right ascension of Saturn on the 1st is 4 h. 6 m.; his declination is 19° 2′ north; and his diameter is 18″.

Saturn sets on the 1st at half past 2 o'clock in the morning; on the 29th, he sets about a quarter before 1 o'clock.

NEPTUNE

is evening star. There is nothing noteworthy in his present course, excepting his quadrature with the sun on his eastern side on the 7th, at 9 o'clock in the morning, preceding the arrival of Saturn at the same goal fifteen days.

The right ascension of Neptune on the 1st is 3 h. 5 m.; his declination is 15° 35′ north; and his diameter is 2·6″.

Neptune sets on the 1st a quarter after 1 o'clock in the morning; on the 29th, he sets at half past 11 o'clock in the evening.

URANUS

is morning star, and pursues his monotonous course without any incident worth recording.

The right ascension of Uranus on the 1st is 11 h. 52 m.; his declination is 1° 37′ north; and his diameter is 3·8″.

Uranus rises on the 1st at 9 o'clock in the evening; on the 29th, he rises at 7 o'clock.

MERCURY

is morning star throughout the month. He reaches his greatest western elongation on the 31st at 11 o'clock in the evening, and is then 26° 12′ west of the sun. He would at that time and for a week before and after be favorably situated for observation as morning star were it not for his great southern declination. Sharp eyes may pick him up about an hour before sunrise, for at elongation he rises an hour and three-quarters before the sun. He will be found 1° 30′ south of the sunrise point in the constellation Capricornus. The sky and atmosphere must be exceptionally clear to lure him from his hiding place.

The right ascension of Mercury on the 1st is 19 h. 30 m.; his declination is 19° 17′ south; and his diameter is 8·4″.

Mercury rises on the 1st not far from 6 o'clock in the morning; on the 29th he rises about 6 o'clock.

THE MOON.

The February moon fulls on the 10th at 48 minutes after 11 o'clock, standard time. As she swings her ponderous globe between us and the other planets, she first draws near Neptune on the 4th, the day of her first quarter, passing 11′ south. She approaches Saturn on the 5th, passing 1° 18′ south. She is at her nearest point to Jupiter on the 9th, to Mars on the 10th, to Uranus on the 13th, and to Mercury on the 24th. She celebrates the additional day in February by a close conjunction with and in many localities an occultation of the planet Venus. Unfortunately, the rare and beautiful phenomenon occurs at a quarter after 10 o'clock in the morning, when it can only be seen in the telescope.

Life Saving Appliances at Sea.

Every little while some terrible calamity on the ocean deeply stirs the public mind, and awakens the apprehension of all who "go down to the sea in ships," as did the fearful disaster which occurred off Gay Head, on the coast of Martha's Vineyard, just east of Long Island, on the morning of January 18. Here was one of the stanchest of the iron steamers engaged in our coastwise trade, with seven life boats, a life raft, and several hundred life preservers, and yet, when the vessel struck the reef and sank in sight of land, 100 lives were lost to only about 30 saved. The life saving appliances were abundant and of approved kind, but the circumstances were such, on a rough coast in a high sea, that they were of comparatively little use, most of those saved having been rescued by help from outside of the ship. As touching the insufficiency of present means, and the need of a better equipment for such emergencies than has yet been devised, the *Tribune* says:

"In the appliances for rescuing people from stranded vessels near enough to the shore to establish communications, and also in the models of life boats, and in the projection of signals and life lines from shore stations, there have been important practical improvements during the past twenty years. But when we come to the problem of saving life in disasters at sea or under any circumstances where the wrecked ship must furnish the appliances to be utilized, it does not seem that much progress has been made. The boats are always of doubtful availability, to begin with. It is necessary, in carrying boats on a sea-going vessel, so to place and secure them as that they shall be at once accessible in case of need and safe from the accidents arising from stress of weather. Of course, this is very difficult, for if they are too accessible they are liable to be carried away in a storm; and if they are secured too firmly, they may not be available at a critical moment. As a rule the davits are swung inboard, the boats secured by canvas covers and bands, the plugs and oars removed, and the fall tackle rove. In theory only a few minutes are required to cut off the bands and cover (which is laced), put in plug, oars, and crew, swing the davits outboard, and lower away. But nine times out of ten the plug and oars have to be searched for, and then the blocks of the fall tackle are jammed, and then the patent clip which ought to release the boat when it touches the water fails to work. Sometimes one end is released only, and then of course the boat's crew are pitched overboard.

This accident has often occurred. And when a vessel has struck and has a heavy list, as in the case of the City of Columbus, the boats on the lower side become useless, while it is doubly hard to launch those which are on the side out of water. Should a vessel founder in a gale at sea, the chances are that it will be impossible to launch any of the boats, even if they have not been stove or carried away before the crisis comes. And even if one or two can be launched, the danger of their being dashed against the vessel before they can get away is so great as to leave little prospect of escape. As to life rafts, while many ingenious contrivances of the kind have been invented, we do not remember an instance of the preservation of life through their means at sea. The truth is that as a rule neither boats nor rafts will live in the seas in which ocean steamers founder, and even in the case of life boats which cannot sink, they could only keep their occupants above water long enough to let them perish from exposure. As to life preservers, they may help a cool swimmer, but it is doubtful whether in a seaway they can ever preserve from drowning for any length of time persons unable to swim, and delicate women. For when the sea is high it is difficult even for an expert swimmer to keep his head above water. He must watch his chances to take breath, and must constantly dodge the heavy waves, or he will have the life literally beaten out of him. This is what happens to he majority of those who trust to life preservers in a high sea.

"What is wanted is some life saving appliance which needs no preparation; which is always in full working order; which will float its occupants high out of water; which can be got clear of a stranded or foundering vessel without swamping or staving. It is clear that none of the life saving apparatus at present in use on sea-going vessels fulfills these requirements, and equally clear that no apparatus which does not fulfill these requirements can be of much practical service in emergencies. It is a difficult problem to solve, no doubt, but there ought to be enough inventive genius in this country to solve it, and it ought to be taken in hand more earnestly than ever, seeing what is at stake."