

ASPECTS OF THE PLANETS FOR APRIL.

VENUS

is evening star, and the only one among the planets whose movements excite a marked interest during the month. She has now advanced far enough in her eastern course to be seen in the west soon after sunset, and to allow the observer to obtain a glimpse of the beauty to be revealed during her nearly ten months' course as evening star. She will soon be the brightest in radiance, the largest in size, the softest in color of the myriad golden points that glitter in the celestial archway. Neither is she to be considered alone in an æsthetic light. The Queen of the Stars has unwittingly a mission to perform, when, closing her career as evening star in December with the grand event of the transit, she furnishes the inhabitants of the planet that shines so brightly in her sky one means for measuring the unapproachable, the much-desired solution of the problem—the earth's distance from the sun.

No better time than the present can be found for a careful study of the laws that rule the movements of Venus. To an observer on the earth, as she passes from superior conjunction round to superior conjunction again, she seems to oscillate in straight lines east and west of the sun like a golden bead strung on an invisible wire. Since her superior conjunction with the sun on the 20th of February she has been advancing on her eastward track. This she will continue to do until the 26th of September, when she reaches her greatest eastern elongation or extreme distance east from the sun. She then reverses her course, drawing nearer to the sun until her inferior conjunction on the 6th of December, when her rôle of evening star is ended, half her synodic revolution is completed, and, passing to the sun's western side, she repeats the same phases in reversed order as morning star.

Any intelligent observer can verify the process for himself, and will find the beautiful star a little farther east and a little longer above the horizon every evening until the eastern elongation. If he once keep track of her movements during an entire revolution he has learned the lesson for a lifetime, for every five hundred and eighty-four days the same succession of events occurs. Thus the aspects of our nearest planetary neighbor may become as familiar as those of the sun and the moon.

Venus commences this month the series of charming celestial scenes in which she will appear as chief actor. On the 19th she is in conjunction with Saturn. As Saturn is moving westward and approaching the sun, and Venus, in his near vicinity, is moving eastward and receding from the sun, it is inevitable that they should meet and pass each other. This event, known as their conjunction or nearest approach, occurs at 2 o'clock on the afternoon of the 19th, Venus passing nearly two degrees north of Saturn. If the night be clear the two planets will make a charming picture on the twilight sky. Venus sets on that evening a few minutes before 8 o'clock, Saturn about five minutes earlier than Venus, and both of them about an hour after sunset. On the evening of the conjunction Venus must be looked for about four and a half degrees north of the sunset point, and Saturn nearly midway between Venus and the sunset point. Both planets will be found about fifteen degrees east of the sun. An opera-glass or a spyglass will be a valuable assistant in picking up the planets, for they are too near the sun and too far from the earth to appear under favorable conditions.

On the 21st Venus is in conjunction with Neptune, passing about a degree and a half north of him. The conjunction is invisible, as Neptune is never seen by the naked eye, but it proves how near Neptune and Saturn are to each other, as seen from the earth, Venus passing the one two days after the other.

Venus reaches her descending node on the 26th. As her orbit or path round the sun is inclined to the ecliptic or sun's path she must be above or below it except at the crossing points, called ascending and descending nodes. One of these points, her descending node, she reaches on the 26th. When she comes round to the same node again, after passing her ascending node in the intervening time, she will be directly between the earth and sun, and the transit will occur. Venus sets now at seven minutes after 7 o'clock; at the close of the month she sets about eighteen minutes after 8 o'clock in the evening.

SATURN

is evening star, and drawing so near his conjunction with the sun that he will fade into invisibility in the latter part of the month. He is in conjunction with Venus on the 19th; we have already called attention to this, his farewell appearance as evening star. Saturn for a season will no longer be seen among the stars, but we are reconciled to his temporary absence, for when he reappears to grace the summer morning sky he will don a more brilliant aspect than he did last year at the same time, for his northern declination will be increasing, his rings opening more widely, and his perihelion drawing nearer. All these phases will culminate between the present time and 1885. Saturn passes the meridian now two minutes before 2 o'clock in the afternoon; at the end of the month about eighteen minutes after midday. He sets about a quarter before 9 o'clock in the evening; at the end of the month he sets a few minutes after 7 o'clock.

NEPTUNE

is evening star, and gains upon Saturn as they travel toward conjunction. On the 1st of the month he passes the meridian eleven minutes after Saturn; on the last of the month he is only four minutes behind him. He is in conjunction with

Venus on the 21st, but the event is not of much importance, as it is invisible. In imagination, however, Saturn and Neptune can be seen rolling their vast spheres toward the sun, while Venus, receding from the sun, passes them in her course. In reality the planets as well as the earth are revolving in elliptical orbits round the sun, while their positions in the sky result from the fact that the earth from which we view them is a moving observatory, complicating their apparent movements.

Thus Neptune is one hundred and sixty-five years in making a single revolution round the sun, while to an observer on the earth he seems to complete the circuit of the heavens in about three hundred and sixty-seven days.

Neptune now sets a few minutes after 9 o'clock in the evening; at the end of the month he sets about a quarter after 7 o'clock.

JUPITER

is evening star, and remains third on the list of the outer planets traveling to the same goal. He lags behind his brother planets, passing the meridian more than an hour behind them at the end of the month. Though departing and shining with diminished size and luster, he still leads the starry host and sinks majestically toward the west as if conscious that he is first and foremost among the sun's family of worlds.

Jupiter sets on the 1st of the month at 10 o'clock in the evening; at the end of the month he sets at forty minutes after 8 o'clock.

MARS

is evening star, and, like the trio that precedes him, making slow progress on the same road. He is in quadrature with the sun on the first day of the month, being half way between opposition and conjunction, or ninety degrees from each. He is now on the meridian at 6 o'clock in the evening, and looks down from this high elevation as soon as it is dark enough for him to be visible. He is not of much account among the planets, for he has lost the martial air he assumed when in opposition, and now takes on the aspect of a red star, shining more serenely than his neighbors, Procyon and Aldebaran, of the same color. He has passed into the sign Cancer, and after the 5th his extreme northern declination will decrease.

Mars sets now not far from 2 o'clock in the morning; at the close of the month he sets a quarter before 1 o'clock.

URANUS

is evening star and the fifth and last on the list of planets traveling to conjunction with the sun. He still shines in the reflected radiance of his last month's opposition and perihelion, and may be found by careful observers nearly in the position then indicated, in the constellation Leo. His right ascension is now 11h. 7m., and his declination 6° 29' north.

Uranus sets about a quarter before 5 o'clock in the morning; at the close of the month he sets a few minutes before 3 o'clock.

MERCURY

is morning star and worthy of mention simply from the fact that he is sole representative of the brotherhood in the morning sky, for he is too near the sun during the month to be seen by the unaided eye. He is traveling from his western elongation to superior conjunction, rising later every morning until the goal is reached.

Mercury rises about 5 o'clock in the morning; at the end of the month he rises a few minutes after 5 o'clock, about five minutes before the sun.

THE APRIL MOON

fulls on the 3d. She is the most distinguished moon of the year, and exerts indirectly a mighty influence on human affairs, for she determines the time when Easter Sunday shall fall and thus rules the movable feasts and fasts of the Church. The law that regulates the festival, simply stated, is that Easter shall fall upon the first Sunday after the full moon which happens upon or next after the vernal equinox. The April full moon carries out these conditions and secures this pre-eminence.

The new moon of the 17th commences her course with a brilliant record. On the 18th, the day after her change, she pays her respects to three planets—Venus, Saturn, and Neptune—on the same evening. It is difficult to see the moon when a day old, for the crescent is but a slender thread, still it can be done. If the evening be exceptionally clear, the keen-eyed observer may behold the lovely picture, the moon passing about two degrees north of Venus and three degrees and a half north of Saturn. But the loveliest exhibition of the month will occur on the 19th, when the two days' old crescent will be in conjunction with Jupiter, and only forty minutes north of him. As the moon does not set until after 9 o'clock there will be ample opportunity for seeing the show, if the clouds are kind.

Telescopic observers will not find abundant material for study among the planets that play their parts on the April sky. Uranus still displays to advantage his sea-green disk; Venus retains her gibbous phase, and Mercury takes on the form of an evening moon. The outer planets have had their day. A small telescope will be of great assistance in showing the conjunction of the moon with Venus and Saturn, and also the conjunction of Venus and Saturn with each other.

April is not a field-day on planetary annals, but there are incidents enough to reward close study. Three planets, Saturn, Neptune, and Jupiter, are clustering closely around the sun. Venus, moving eastward, passes Saturn and then

Neptune in her unswerving course. Six planets are evening stars, and only one represents the brotherhood in the morning sky. Two conjunctions of planets, and the moon in conjunction with three planets on the same evening, take rank as specialties. Perhaps the most marked feature of the month is that Saturn, Neptune, Jupiter, Venus, and the moon are all in the sign Taurus. According to astrologers the conjunction of the moon with Saturn, Neptune, and Venus in this sign has an ill-boding influence for the countries ruled by Taurus, and earthquakes may be looked for in the east of Europe at the time of the conjunction. But the modern astronomer looks serenely upon these portents of ill, secure in the faith that the planets in their courses have a higher mission to perform than that of ruling the destinies of this planet and determining the horoscope of those whose little lives are rounded by a few short years as we count time.

MISCELLANEOUS INVENTIONS.

An improved regulator for electric store boxes and lights has been patented by Mr. Henry B. Sheridan, of Cleveland, Ohio. This invention relates to a system of lighting by electricity, and designed to keep the lamps alight by shunting into the circuit automatically a box stored with electricity. The storage box can be charged with electricity directly from the generator, and by an automatic mechanism made to supply the lamps in circuit with sufficient electricity to keep them alight; or the storage box can be connected with the generator and the circuit in such a manner as to receive and retain the surplus electricity when more is generated than required to support the lights, and give out the stored electricity when less is generated than is required to support the lights.

Messrs. Robert M. Mason and George M. Wooster, of Bristol, N. H., have patented an improvement in the manufacture of board from wood pulp. The object of this invention is to manufacture wood pulp boards of desirable thickness and with the fibers or grain distributed equally in every direction, similar to paper and paper boards. This is accomplished by the adaptation of the Fourdrinier machine and process to such manufacture.

Mr. Gustav Speckhart, of Nuremberg, Germany, has patented a new and improved case for watches which will keep out dust and moisture and prevent damage to the glass and works in case the watch is accidentally dropped. The invention consists in a soft rubber case adapted to receive the watch, and provided with an aperture surrounded by a bead for the pendant, and an aperture surrounded by a bead for the dial, and with a circumferential bead.

An improvement in swivel buttons has been patented by Mr. Silas O. Parker, of Littleton, N. H. The object of this invention is to prevent the bar of a swivel button from sliding in the head and to hold it in any desired position, and to prevent the lower edge of the swiveled eyelet to which the head is attached from chafing and scratching the wrist. The swivel button is constructed with a tubular shank containing a spiral spring which presses upward against the bar passing through the head of the shank, which spring rests on a series of studs formed by pressing part of the shank inward. The shank is held to the material by an outer washer provided with a raised part and by an inner washer provided with a recessed part, whereby the tubular shank will be held properly, and its lower outwardly turned edge cannot chafe and scratch the wrist.

An improvement in beehives has been patented by Mr. Hugh L. T. Overbey, of Subligna, Ga. The hive is ventilated through openings in the cover, which are covered at their inner ends by wire gauze to prevent moth-millers and other insects from entering the hive. The hive is constructed so that the surplus honey frames and their combs can be readily removed and replaced by empty frames by taking off the cover.

An improved prospecting tool for miners, patented by Mr. James B. Thornton Chase, of Pueblo, Col., has the curve of an arc of a circle, and constructed with its pick portion tapering on all sides to a sharp point, and its heel made with a central projecting point.

An improved apparatus used for medical purposes, combining mechanical manipulation and electrical treatment, has been patented by Mr. John Butler, of New York city. The object of the invention is to allow of using a galvanic battery for such purpose in connection with a manipulating roller. The invention consists in an apparatus combining a roller and induction coil.

An improvement in heddle-frames has been patented by Mr. John Ashworth, of Wetheredville, Md. The invention consists in the combination with the heddle-frame having slotted side bars, the heddles, and the ordinary bars upon which the heddles are strung, of additional outer bars or rods and links and hooks or eyes for uniting the bars and connecting them with the frame, whereby the ordinary inner bars upon which the heddles are strung are prevented from bending and twisting, and the heddles are rendered easily changeable.

Mr. Henry H. Whitcomb, of Bridgeport, Conn., has patented a toy pistol provided with a figure adapted to be displayed before firing, and to entirely disappear upon pulling the trigger.

An improvement in universal joints has been patented by Mr. Edmund Garrigues, of Massillon, Ohio. This invention consists principally of a universal shaft connection, joint, or coupling, the ball of which is formed with an oil chamber, of casting the yokes upon the ball, and of the method of casting the ball and yokes whereby the journals and bearings of the coupling will be chilled.