ASPECTS OF THE PLANETS FOR APRIL.

MERCURY

is evening star, and holds a front rank among the sun's family during the month; for he deigns to appear in a position where he may easily be picked up by the pains-taking observer. He not only reaches his greatest eastern elongation, but is high in the north at the same time, thus presenting the most favorable conditions for visibility as evening star to the unaided eye that will occur during the year.

Mercury reaches his eastern elongation, or most distant point from the sun, on the 25th at 9 o'clock in the evening, being then 20° 32′ east of the sun. At that time, and for a week or ten days before and after the epoch, he is visible to the naked eye. He sets on the 25th an hour and three-quarters after the sun. Those who wish to behold this interesting planet will find the present an unusually favorable opportunity for the purpose. They should, about the 25th, commence the quest three-quarters of an hour after sunset, and, first finding the familiar cluster of the Pleiades in the northwest, scan the sky a degree and three-quarters south of the cluster and a very slight distance west. "The Sparkling One," as the planet was called by ancient observers, from the wondrous brilliancy of his light, will suddenly dart into being, shining with a peculiar luster on the glowing twilight sky. When once found, the observer will be surprised that he could ever fail in his search, and will be able to follow the planet's course till his approach to the sun hides him from view. Astronomers of the present day devote little attention to this member of the planetary family, for his nearness to the sun renders him a very difficult object to observe with accuracy. The time of his rotation on his axis, his lofty mountains, his supposed atmosphere, his deviation from a spherical form, and other phenomena described by observers are now considered as doubtful, at least as "not proven." The great Copernicus never succeeded in finding Mercury, though he often looked for him. But in this locality, he may always be found as evening star at the spring elongation if the observer knows where to look. The Pleiades will point the way at the present elongation, while Venus and Saturn will be in the vicinity.

On the 21st, at two o'clock in the morning, Mercury is in conjunction with Neptune, but as both planets are then below the horizon, the event is without interest except as an illustration of the movements of the two planets, the former traveling eastward toward elongation, and the latter westward toward conjunction with the sun.

On the 10th, at 9 o'clock in the morning, Mercury is in perihelion, or at his nearest point to the sun.

The eccentricity of his orbit is greater than that of any other of the large planets, as he is 15,000,000 miles nearer the sun at perihelion than at aphelion. When he is nearest the sun he is farthest from the earth, and the great variations in distance produce a corresponding variation in brilliance. Therefore Mercury must be in aphelion to take on his brightest aspect as seen from the earth.

This swift-footed brother planet has a busy time during April, in the number of incidents he contributes to the monthly record. He is in his ascending node on the 5th; in perihelion on the 10th; in his greatest heliocentric latitude north on the 20th; in conjunction with Neptune on the 21st; at his greatest eastern elongation on the 25th; and in conjunction with the moon on the 26th.

The right ascension of Mercury on the 1st is 0 h. 56 m.; his declination is 5° 13′ north; and his diameter is 5″.

Mercury sets on the 1st at half past 6 o'clock in the evening; on the 30th, he sets not far from half past 8 o'clock.

SATURN

is evening star, and honors the month by appearing with Venus in a charming tableau. On the 12th, at 11 o'clock in the evening, the two planets are in conjunction, Saturn being 4° 13′ south. At the time of nearest approach, Saturn and Venus will be below the horizon, but they will be near enough together in the early evening to form a lovely picture.

No directions will be needed to point out the chief actors in the scene. Venus will be known at a glance, and four degrees south of her beaming presence a bright star of a pale, golden hue serenely shining amid the twinkling mysteries around will point out the presence of Saturn. Aldebaran will be about four degrees south of Saturn, and the Pleiades will be less than half a degree west of Venus; planets, star, and cluster combining as elements in the celestial picture. Before the conjunction, Saturn will be east of Venus; on the evening of the 13th, he will be west of Venus, showing that the planets have changed places.

The right ascension of Saturn on the 1st is 4 h. 18 m.; his declination is 19° 48′ north; and his diameter is 16·2″.

Saturn sets on the 1st a few minutes before 11 o'clock in the evening; on the 30th, he sets shortly after 9 o'clock.

JUPITER

is evening star, and does not fail to contribute his quota to the events of the month. On the 14th, at 7 o'clock in the evening, he is in quadrature on the sun's eastern side. There is always something majestic in this aspect of the regal planet. Rising at noonday, looking down from the zenith at 6 o'clock, and sinking below the horizon at midnight, he is even more glorious than when at opposition he comes darting above the horizon at sunset, while his brilliancy seems scarcely to have diminished. He will be splendid to behold throughout the month, outrivaling every other shining point except Venus, to whom he is unwillingly obliged to yield the supremacy, though he holds the scepter of sovereignty for a short time after her setting.

The right ascension of Jupiter on the 1st is 7 h. 47 m.; his declination is 21° 47′ north; and his diameter is 37·8″.

Jupiter sets on the 1st at half past 2 o'clock in the morning; on the 30th, he sets about a quarter before 1 o'clock.

MARS

is evening star, and follows closely in Jupiter's train, rising about three-quarters of an hour later, and affording by his proximity a fine study of the contrast in color and general appearance of two of the major planets. The telescopists have been diligently observing this planet both before and since his opposition, though no noteworthy results have yet been recorded. Probably the tiny moons have refused to appear under present unfavorable conditions, and Schiaparelli's "canals" have shared the same fate.

The right ascension of Mars on the 1st is 8 h. 31 m.; his declination is 21° 54′ north; and his diameter is 9·8″.

Mars sets on the 1st soon after 3 o'clock in the morning; on the 30th, he sets about a quarter before 2 o'clock.

NEPTUNE

is evening star, and performs his part on the planetary record by coming into conjunction with Mercury on the 21st, when the nearest and the most distant of the sun's family seem to hang side by side.

The right ascension of Neptune on the 1st is 3 h. 9 m.; his declination is 15° 56′ north; and his diameter is 2·5″.

Neptune sets on the 1st about half past 9 o'clock in the evening; on the 30th, he sets at half past 7 o'clock.

URANUS

is evening star, and is nearly stationary during the month.

The right ascension of Uranus on the 1st is 11 h. 44 m.; his declination is 2° 33′ north; and his diameter is 3·8″.

Uranus sets on the 1st soon after 5 o'clock in the morning; on the 30th, he sets about 3 o'clock.

VENUS

is evening star. Though last on the list, she is the largest, fairest, and most brilliant in the grand array of planets playing the same role, that of evening star. All the planets are on the 1st grouped on the sun's eastern side in the following order of nearness to the great luminary—Mercury, Neptune, Venus, Saturn, Jupiter, Mars, and Uranus. Before the month closes, the order will be changed, for Mercury meets and passes Uranus, and Venus changes places with Saturn. It is unusual that all the planets should continue to be evening stars through the entire month; but planetary movements, like those of a kaleidoscope, forever present aspects, and never repeat the programme. The exact configuration of stars that this night sparkle in the firmament can never be reproduced.

Well do the planets deserve the name of wanderers, from their unceasing movement over the celestial track, a blind mark to the unscientific observer, a wondrous exemplification of harmony and obedience to physical law, clear as the daylight to those who hold the key of the forces that rule the solar family. Little do the stars deserve to be called fixed stars. Though they look motionless and imperturbable, they are in a state of constant change. Some of them are rushing toward us; some are receding from us. Stars are dying, stars are being born. Nebulæ are quickening into life; systems are passing away, their mission ended, their work accomplished. The sun with his attendant worlds is speeding through space around some unknown center. A few thousand years hence, the familiar constellations will have changed their forms, and the present polar star will no longer hang above the pole of the earth. And yet how peaceful is the picture that on starlit nights is unrolled before our eyes! How fixed and immovable the stars appear! How serenely in her present aspect the fairest of the stars treads her mazy path, just now so rarely beautiful, as she oscillates eastward of the sun, while so accurately have the men of science mapped her course that the moment when she turns her steps toward the sun is as reliably computed as the increase of the days or the changes of the moon.

The right ascension of Venus on the 1st is 3 h. 29 m.; her declination is 20° 59′ north; and her diameter is 18·4″.

Venus sets on the 1st a few minutes after 10 o'clock in the evening; on the 30th, she sets about 11 o'clock.

THE MOON.

The April moon fulls on the 10th at 44 minutes after 6 o'clock in the morning, standard time. On the 3d, the day after the first quarter, she is in conjunction with Jupiter, on the 4th she is at her nearest point to Mars, and on the 8th to Uranus. She then proceeds on her way without encountering a single planet until the 26th, the day after her change, when she is in conjunction with Neptune and Mercury. On the 27th she is in conjunction with Saturn and on the 28th with Venus.

TOTAL ECLIPSE OF THE MOON.

A total eclipse of the moon will occur on the 10th, partly visible in this vicinity, and visible as a total eclipse in portions of North America, the Pacific Ocean, and Asia. The eclipse begins at 4 h. 3 m. standard time. The total phase commences at 5 h. 11 m., about the time the moon sets, when the exhibition closes for this longitude, and observers farther west enjoy the total obscuration.

ECLIPSE OF THE SUN.

A partial eclipse of the sun occurs on the 25th, invisible in the United States, but visible in the Southern Pacific Ocean. The greatest magnitude of the eclipse is 0.764 of the sun's diameter.

Fire Risks and Underwriters' Watchfulness.

The underwriters nowadays have a good deal of authority in determining the kind of buildings which shall be erected. In any structure that is to be leased—for offices, store, factory, or other business purposes, or for dwellings—the rate of insurance that the companies will fix for the lessees has much to do in governing the rent to be obtained. Their standards as to safety make a law which, with few exceptions, is now generally recognized, and the insurance companies must, for their own protection, make the most careful study and the closest analysis of all causes which increase fire risk, or give comparative immunity therefrom. The old ideas about safety in building were greatly changed by the Chicago and Boston fires. The modern five and six story store, with marble or granite front, a flimsy roof, and an inside full of combustibles, proved a great deal worse fire risk than the two or three story brick warehouses of fifty years ago, and the ruin which those fires caused to the insurance companies has made them exceedingly careful ever since. For this reason, in all our recently erected high buildings, lath and plaster partitions, wood joists and floors, stairs and roof, are invariably ruled out, stone, brick, and iron being used instead, with as little wood veneering as possible. The insurance companies also keep very close watch of the means provided for the extinguishing of fires, the abundance and convenience of the water supply, the equipment of the fire department, etc., and, with all this care, it is said that the fire insurance business, as a whole, has been unprofitable for the past two years.

For factory insurance, the leading mutual company of the country has formulated a very complete system of what might almost be called self-protection, to be adopted in any establishment to be insured, before it will issue a policy thereon. The water supply must be abundant, and pumps, pipes, hydrants, and sprinklers supplied *ad libitum*. In this way the actual cost of insurance to its members has been reduced to a minimum, or about 20 cents on each $100 for 1883. Against this saving in the cost of insurance should be placed the expense to which the insured were put for changes of construction and fire extinguishing apparatus, but such expense has been incurred mainly within the past six years, and constitutes of itself a permanent investment for safety. Under such conditions, the average of *unavoidable* losses on factory property insured by this company is given as less than one-tenth of one per cent upon the risks taken, although they actually were $123,137 on $69,000,000 of risks written. These losses were occasioned by 94 fires, attributed to the following causes: Friction, 21; unknown, or not reported, 17; spontaneous, 13; foreign matter in stock, 13; gas, 7; matches, 6; steam pipes, 3; lamps, 2; defective chimneys, 2; boiler furnaces, 1; mice, 1; sparks, 3; spark from emery wheel, 1; petroleum, 1; gasoline vapor, 1; lamp dropped from lantern, 1; flashing powder, 1. In 18 of these cases the automatic sprinklers—made to sprinkle a room or apartment on a very slight rise in the temperature—put out the fires entirely, or held them in check.

Keely Nearing the End.

It was announced from Philadelphia on the 17th of March that the Keely motor was practically completed. All the workmen had been discharged, and Mr. Keely was immediately to begin "focalizing and adjusting the vibrators"—a delicate operation, but easy for him—and as soon as he obtained "one perfect revolution, though ever so slow," the great invention would be complete. The news called forth several funny paragraphs in the newspapers and quite a flutter among the stock holders and directors, who have been for several years investing money to back up this nineteenth century discoverer of "perpetual motion." It is difficult, indeed, to consider seriously this alleged invention, or justly characterize the inventor, who, in this age, not only assumes to get something out of nothing, but would hide all his methods and processes and affect more than the mystery of the alchemists of the early ages. Yet it is a serious matter to those who have been sinking their money therein. Now, however, we seem at last to have reached the "beginning of the end," and the attention of the investors can, at an early day, be "focalized" on their profit and loss accounts.

Ice on the Trees.

We seldom have a winter in which rain, freezing as it falls on the trees, loads them with such a weight of ice as was the case from the 8th to the 10th of March this year. Great numbers of fruit and shade trees in New England and New York and New Jersey were thus broken down or badly damaged, but the glistening of the silvery lace-work of the frost was, while it lasted, indescribably beautiful. Prof. Hall, of Trinity College, Hartford, in order to gain something like an accurate idea of the amount of ice which had frozen on the trees, made measurements of a number of twigs taken from the extremities of branches, in order to compare their diameter in their natural state with that they had when covered with ice. One twig 0·11 of an inch in diameter was enlarged to 0·73; another of the same size to 0·84; one of 0·12 inch diameter measured 0·84 with its ice-covering, and another of 0·12 inch measured 1·03; one of 0·18 diameter had become 1·21; and one of 0·31 had become 1·07. He made another estimate of the quantity of ice on the trees by breaking the ends of some branches from an apple tree and weighing them with and without the ice that coated them, when it appeared that wood which weighed ten ounces was carrying ice which weighed sixty-nine ounces.