

ASPECTS OF THE PLANETS FOR DECEMBER.

VENUS

will be evening star until the 6th, and morning star the rest of the month. On the 6th, the great events of her inferior conjunction and transit take place. Such is the importance attached to the phenomena that the planetary interest of the month culminates around the fairest and brightest of the solar brotherhood. Few are the persons of ordinary intelligence who will not do as much toward the celebration of the rare event as, with the simple aid of a piece of smoked glass, to follow the course of the planet across the sun's disk at some time during the passage.

The transit will commence over the whole United States at nearly the same minute of absolute time, although owing to errors in the tables of Venus, the prediction for the time of beginning may vary a minute. The principal phases are as follows, in Washington mean time:

First contact.....	8 h. 55 m. A.M.
First internal contact.....	9 h. 16 m. A.M.
Second internal contact.....	2 h. 33 m. P.M.
Last contact.....	3 h. P.M.

Observers must ascertain the longitude of their places of observation from Washington, and the local time will easily be found, remembering that every degree of longitude makes a difference of four minutes in time; if the place be east of Washington, the time will be later; if it be west, the time will be earlier. Thus the transit will commence in New York twelve minutes later than at Washington, at 9 h. 7 m. A.M.; in Boston and all New England, twenty four minutes later, at 9 h. 19 m. A.M.; in Cincinnati, twenty-nine minutes earlier, 8 h. 26 m. A.M., and so on.

It is to scientific observers that the transit has the deepest significance as one method of determining the sun's distance with more reliable accuracy. Never in the history of the world were such preparations made for the observation of a scientific event. The governments of the most enlightened nations have furnished the means, the best astronomers direct the expeditions, and the whole world watches the result. Stations dot the western hemisphere and a portion of the eastern, where Russian, German, French, Italian, British, and American observers vie with each other in attempts to solve the vexed problem. The money appropriated will reach millions, the scientific observers will be numbered by thousands, and the labor and painstaking employed cannot be computed in numbers. Unless the whole sky is curtained with clouds on the eventful day, there will be good fortune for some of the transit observers.

But the transit is not without its drawback. In consequence of the inferior conjunction of which the transit is an effect we lose the most beautiful of the planets from the evening sky. For Venus will then pass to the sun's western side, and play the role of morning star for 292 days to come. In a week after the transit, she may be seen in the east, close to the sun, and, at the end of the month, she will be a superb object in the morning sky, rising two hours and a half before the sun, and sharing with the comet, if the erratic visitor has not vanished from sight, in the grand attractions of the celestial sphere.

The right ascension of Venus is 17 h. 5 m.; her declination is 24° 15' south, and her diameter is 63.8".

Venus sets a few minutes before five o'clock in the evening; at the end of the month she rises about a quarter before five o'clock in the morning.

JUPITER

is morning star until the 18th, and evening star the rest of the month. On the 18th, at 2 o'clock in the morning, the grand epoch in his career occurs, for he comes into opposition with the sun. Our little earth lies then directly between the sun and the member of his family most resembling him in size and chaotic condition. The giant planet is then at his nearest point to us, and appears in his brightest phase, rising at sunset and continuing visible the entire night. He has found many admirers during November among those who have wakened from their slumber to look at the comet. The prince of planets is a great comet disturber, and has introduced several comets into the system. For the attraction of his huge mass, when they unwittingly came near him, has bent their orbits into an ellipse, and will compel them to travel within the boundaries of the solar system until they come under some other influence, break in pieces like Biela's comet, or dissolve in meteoric showers, the probable fate of comets and meteors.

This superb planet will be in excellent condition for observation for several months. Near opposition he casts a shadow in a darkened room, and instances are on record where he has been seen with the naked eye in high, clear sunshine. It is a good time too for the telescopist, who will find one of the most diversified scenes the heavens present pictured before him, in the noble planet, with his belts and spots, and in the incessant changes taking place among his satellites as they overtake, pass, meet, hide, and recede from each other in endless masses. The bright star rising in the east as soon as the sun has set will be a beautiful object through the month. At its close, Venus will rise an hour before Jupiter sets, and the two planets, one in the east and the other in the west, will be rival attractions in the morning sky.

The right ascension of Jupiter is 5 h. 53 m., his declination is 23° 3' north, his diameter is 45.2", and he is in the constellation Gemini.

Jupiter rises about a quarter before six o'clock in the evening; at the end of the month, he sets at twenty-one minutes after six o'clock in the morning.

SATURN

is evening star during the month, and wins the third place on planetary records. He pursues the even tenor of his way as a serene beaming star of great brilliancy, and still maintains his position in the vicinity of the Pleiades, being thus easily recognized. He is now a splendid object in the telescope as he lies cradled in his widely open rings, surrounded by his moons. Our sun may shine as a star, a dot in the Milky Way, to worlds revolving around other suns, but the pride of the solar family, the ringed planet Saturn, can never be visible to any system of worlds outside our own.

Saturn's right ascension is 3 h. 18 m., his declination is 15° 48' north, his diameter is 19", and he is in Taurus.

Saturn sets at half past five o'clock in the morning; at the end of the month, at twenty-three minutes after three o'clock.

NEPTUNE

is evening star during the month, and is very near Saturn, making his transit fourteen minutes earlier.

Neptune sets at a quarter after five o'clock in the morning; at the end of the month, at eleven minutes after three o'clock.

URANUS

is morning star during the month, and reaches his quadrature or half way house on the western side of the sun on the 15th, at 1 o'clock in the morning. He is far away from the other three members of the outer planetary group. His right ascension is 11 h. 35 m., his declination is 3° 28' north, his diameter is 3.6", and his place is in Virgo.

Uranus rises about thirty seven minutes after midnight; at the end of the month, he rises about a quarter before 11 o'clock in the evening.

MARS

is evening star until the 10th, and morning star the rest of the month. On the 10th he is in conjunction with the sun, and commences the long path leading to his opposition in January, 1884, for the earth has to revolve twice around in her orbit, and then travel fifty days more, to come into line between the sun and Mars. On the 5th, the day before the transit, Mars is in close conjunction with Venus, passing 6' south, but both planets are too near the sun to be visible.

Mars sets now about half past four o'clock in the evening; at the end of the month he rises a few minutes after seven o'clock in the morning.

MERCURY

is morning star until the 16th, and evening star the rest of the month. He is a busy member of the solar fraternity at present. On the 9th he is in conjunction with Venus, passing 1° 12' south. On the 14th, at midnight, he is in conjunction with Mars, passing 39' south. On the 16th, at midnight, he is in superior conjunction with the sun, passing to his eastern side and becoming evening star.

Mercury rises at half past six o'clock in the morning; at the close of the month he sets at ten minutes after five o'clock in the evening.

THE MOON.

The December moon falls on the 24th, at fifty-seven minutes after 10 o'clock in the morning. The old moon passes near Uranus on the 3d, near Venus on the 9th, near Mercury and Mars on the 10th. The new moon of the 10th is in conjunction with Neptune and Saturn on the 21st, and with Jupiter on the 23d, the day before the full. Planet and moon will be at their nearest point about half past nine o'clock, Jupiter passing 2° 39' north. Once more our neighbor, the moon, tries to prove that she is not a member of the dead world brotherhood to which she has been ruthlessly consigned. Trouvelot, a keen observer, and one of the most reliable astronomers of the day, adds his weighty testimony to the theory that there are signs of life on the lunar surface. He has detected something like thin clouds floating over the moon's disk, and rendering portions of it indistinct, the semblance of a rare vapor slightly tinged with purple rising around the crater Kant, and still another large crater glimmering with a faint purple light.

Sensitive Gas Flames.

In the *Journal de Physique*, M. Neyreneuf also describes an arrangement for producing a sympathetic flame. He remarks that the sympathetic flame of Count Schaffgotsch only gives one tone, having a determinate relation with that of the pipe which envelops it. It is possible, as M. Neyreneuf has shown, to obtain a naked flame capable of giving a series of sounds, and consequently of repeating an air whistled at a great distance. It will suffice for this purpose to cause two flames to strike against each other, or even a flame against a current of air. This takes some time to regulate, in order to obtain the best results; and it is better to have recourse to the following arrangement, which fulfills all the necessary conditions:

A copper tube, 0.25 meter long and 33 millimeters in diameter, is to be fixed vertically. By the lower opening must now be introduced, almost horizontally, the flame of a jet having a hole 2 millimeters in diameter. A shock is thus produced against the side of the tube opposed to the jet, at the same time that a draught of air is drawn into the tube, which thus acts as a chimney. By this means may be obtained, as with the older arrangement, spontaneous tones of great purity, or echoes of remarkable intensity. The two series of sounds may even coexist, and in this case the phenomenon is complicated by the formation of resultant sounds possessing great energy.

Curious Patents.

Some investigating person has furnished the *New York Times* with a brief list of patents on small things which in many instances have proved great mines of wealth to the lucky discoverer. The list might be extended to a much larger number, but we only state those given in the *Times*. Among these trifles is the favorite toy—the "return ball"—a wooden ball with an elastic string attached, selling for ten cents each, but yielding to its patentee an income equal to \$50,000 a year. The rubber tip on the end of lead pencils affords the owner of the royalty an independent fortune. The inventor of the gummed newspaper wrapper is also a rich man. The gimlet pointed screw has evolved more wealth than most silver mines, and the man who first thought of putting copper tips to children's shoes is as well off as if his father had left him \$2,000,000 in United States bonds. Although roller skates are not so much used in countries where ice is abundant, in South America, especially in Brazil, they are very highly esteemed, and have yielded over \$1,000,000 to their inventor. But he had to spend fully \$125,000 in England alone fighting infringements. The "dancing Jim Crow," a toy, provides an annual income of \$75,000 to its inventor, and the common needle threader is worth \$10,000 a year to the man who thought of it. The "drive well" was an idea of Colonel Green, whose troops, during the war, were in want of water. He conceived the notion of driving a two-inch tube into the ground until water was reached and then attaching a pump. This simple contrivance was patented after the war, and the tens of thousands of farmers who have adopted it have been obliged to pay him a royalty, a moderate estimate of which is placed at \$3,000,000. The spring window shade yields an income of \$100,000 a year; the stylographic pen also brings in \$100,000 yearly; the marking pen for shading in different colors, \$100,000; rubber stamps the same. A very large fortune has been reaped by a western miner, who, ten years since, invented a metal rivet or eyelet at each end of the mouth of coat and pants pockets to resist the strain caused by the carriage of pieces of ore and heavy tools.

Value of Government Property.

Probably but a very few persons realize the aggregate value of the Government property located at our capital. A correspondent of the *New York Tribune* communicates from Washington a transcript from the official assessment, in which it appears that the Capitol building is assessed at \$15,699,556, and the grounds at \$7,907,595; the White House at \$734,590, and the Executive stables at \$28,500. The Treasury Department building and grounds are assessed at \$7,008,454; the State, War, and Navy Department buildings, \$6,211,161; the Agricultural Department building, \$331,825, and the grounds, \$689,086; the Smithsonian, \$492,651, and National Museum, \$250,000, and the grounds, \$2,553,378; the National Monument grounds, \$1,815,781, and the Washington Monument, \$300,000; the National Observatory grounds, \$125,861, and the building, \$255,284; the Patent Office building and grounds, \$3,754,883; the Arsenal buildings, \$233,324, and grounds, \$1,231,607; the Marine Barracks ground, \$31,235, and buildings, \$329,637; the Naval Hospital, \$7,198,128; Bureau of Engraving and Printing, grounds, \$27,612, building, \$327,537; Windor's building, used by Engineers' Bureau of the Army, \$214,367; United States Medical Museum, \$96,280; General Post Office, ground, \$312,492, building, \$2,124,500; Government Printing Office, \$236,000; Judiciary Square and City Hall, \$1,399,713; United States Jail, \$525,550; United States Navy Yard, ground, \$1,413,500, buildings and wharves, \$3,615,838; Botanical Gardens, grounds, \$1,463,251, buildings, \$556,676, hot houses, \$58,598. The Aqueduct is valued at \$3,847,547, and water pipes and plugs, \$172,276. The intersections of streets, circles, and spaces are put down at \$4,682,942. The Department of Justice, ground, \$150,000, and building, \$150,000; the Government Insane Asylum, \$1,349,775; the Reform School, \$221,056; the Soldiers' Home, grounds, \$333,947, buildings, \$350,000; Naval Magazine, \$95,000; the Georgetown Post Office and Custom House, \$63,767.

Imitation of Glycerine.

In the *Union Medicale et Scientifique du Nord-Est*, Prof. Lajoux points out a fraudulent substitute for glycerine, which has been introduced into the French market. The ordinary physical character of the liquid closely resembles a fine specimen of glycerine; it, however, has a bitter taste, due to an impure sulphate of magnesium, and contains glucose. Quantitative analysis showed that the preparation was simply a saturated solution of sulphate of magnesium, with 160 grammes of glucose to the liter, to disguise the taste of the salt.

An Aerial Electric Light.

An interesting experiment has been made in Paris by M. Mangin, a member of the Académie d'Aérostation. A small balloon, measuring about 100 cubic feet, and filled with pure hydrogen, was sent up, being held captive by a rope containing two copper wires. A Swan incandescent light having been placed in the gas and attached to the top of the balloon, was lighted, and the whole aerial machine was splendidly illuminated. It was shown by systematic interruptions that the dots and dashes of the Morse system could be imitated for giving military signals at a great distance.