

POSITION OF THE PLANETS IN JUNE.

SATURN

is evening star. He holds the place of honor on the June records, but when the month closes will be compelled to retire into comparative obscurity, for more brilliant rivals will enter the field. Saturn is in quadrature with the sun on the 27th, at 3 h. 2 m. P. M., being 90° east, and is then on the meridian about sunset, and sets at midnight. He will be found in the west after quadrature, and is still in good position for observation. This interesting planet, after a long season of retrograding or moving westward, becomes stationary on the 9th, and then turns his course eastward or in direct motion, continuing to move in this direction until the end of the year. He has receded from Gamma Virginis since the time of their conjunction on April 8th, when planet and star were but 6' apart, but after the 9th will approach the star, coming again in conjunction on August 9th, when he will pass by his neighbor and not be found again in its vicinity for thirty years. The star apparently keeps the same place in the sky, the planet makes the circuit of the zodiac before they meet.

The moon, one day after the first quarter, is in conjunction with Saturn on the 21st, at 10 h. 16 m. A. M., being 48' south. The conjunction, occurring in the day time, is invisible. The resulting occultation is visible only in the southern hemisphere.

The right ascension of Saturn on the 1st is 12 h. 26 m., his declination is 0° 3' south, his diameter is 17".2, and he is in the constellation Virgo.

Saturn sets on the 1st at 1 h. 43 m. A. M. On the 30th he sets at 11 h. 46 m. P. M.

MERCURY

is morning star until the 4th, and then evening star. He is a busy member of the planetary brotherhood during the month, although the incidents in which he plays a part are of the class that are seen only in the mind's eye. The swift-footed planet is in superior conjunction with the sun on the 4th, at 11 h. 30 m. P. M., when he joins the ranks of the evening stars. He is in conjunction with Neptune on the 3d, at 11 h. 23 m. A. M., being 2° 1' north. He is in conjunction with Venus on the 14th, at 9 h. 39 m. P. M., being 0° 59' north. He is in conjunction with Mars on the 27th, at 11 h. 19 m. A. M., being 0° 25' north.

The moon, on the day of her change, is in conjunction with Mercury on the 14th, at 8 h. 16 m. P. M., being 2° 53' north. The conjunction takes place soon after sunset.

The right ascension of Mercury on the 1st is 4 h. 21 m., his declination is 21° 40' north, his diameter is 5".0, and he is in the constellation Taurus.

Mercury rises on the 1st at 8 h. 15 m. A. M. On the 30th he sets at 8 h. 58 m. P. M.

NEPTUNE

is evening star for about eight hours and then morning star. He is in conjunction with the sun on the 1st, at 8 h. 26 m. A. M., making his appearance after that time on the western side of the sun. Neptune and Mercury are almost as close to the sun as possible during the early part of the month. Neptune is in conjunction on the 1st, and when only a two-days-old morning star encounters Mercury, who then takes his turn, being in superior conjunction with the sun on the 4th. Venus and Jupiter are not far away, having lately emerged from their eclipse in the sunbeams. The sun, after the 4th, has Mercury and Venus on his eastern side and Neptune and Jupiter on his western, four planets and the great day star being in near neighborhood. Miss Clerke says that "the stars are gregarious." It seems oftentimes as if the same term might be applied to the planets.

The moon, the day before her change, is in conjunction with Neptune on the 13th, at 7 h. 9 m. A. M., being 5° 7' north.

The right ascension of Neptune on the 1st is 4 h. 38 m., his declination is 20° 38' north, his diameter is 2".5, and he is in the constellation Taurus.

Neptune rises on the 1st at 4 h. 45 m. A. M. On the 30th he rises at 2 h. 47 m. A. M.

JUPITER

is morning star. He is now far enough west of the sun to be easily visible, rising on the 1st 1 h. 8 m. before the sun, 2 h. 14 m. on the 19th, and 2 h. 48 m. on the 30th. The prince of planets makes a fine appearance in the morning sky, and will reward the enterprise of observers who rise early enough to behold the Star in the East, who has but one rival in size and brilliancy in the star-studded firmament. The satellites, invisible from April 1st to May 25th, on account of the planet's close approach to the sun, may now be seen. Jupiter is moving eastward or in direct motion and continues this course until some time in September. His northern declination is increasing, his diameter is increasing, and he will soon be the chief object of interest on starlit nights in the small hours of the morning.

The moon, three days before her change, is in conjunction with Jupiter on the 11th at 6 h. 41 m. P. M., being 2° 57' north.

The right ascension of Jupiter on the 1st is 2 h. 55 m., his declination is 15° 41' north, his diameter is 31".9, and he is in the constellation Aries.

Jupiter rises on the 1st at 3 h. 14 m. A. M. On the 30th he rises at 1 h. 39 m. A. M.

VENUS

is evening star. There is little to be said about her while she is so close to the sun, but next month she will speak for herself. Observers who wish to obtain the earliest view of her presence should scan closely the western sky on the last of the month a quarter or a half hour after sunset, when the beautiful star may be seen for a short time near the sunset point.

The moon is in conjunction with Venus on the day of her change on the 14th, at 8 h. 21 m. P. M., being 3° 52' north.

The right ascension of Venus on the 1st is 5 h. 14 m., her declination is 23° 55' north, her diameter is 10".0, and she is in the constellation Taurus.

Venus sets on the 1st at 7 h. 58 m. P. M. On the 30th she sets at 8 h. 31 m. P. M.

URANUS

is evening star. He is still retrograding, but moves at so slow a pace that his position has changed little from that of last month. He may be found between Alpha Librae on the east and Lambda Virginis on the west, shining as a star of the sixth magnitude. The surer way to find the planet is with the aid of a small telescope, which will bring him to view as a small disk of a delicate green color.

The moon is in conjunction with Uranus, three days after the first quarter, on the 23d at 11 h. 22 m. P. M., being 1° 40' north. The conjunction is visible with the aid of a telescope or marine glass, for the moon light will put out the light of the small planet, if looked for by the unaided eye.

The right ascension of Uranus on the 1st is 14 h. 21 m., his declination is 13° 33' south, his diameter is 3".8, and he is in the constellation Virgo.

Uranus sets on the 1st at 2 h. 49 m. A. M. On the 30th he sets at 0 h. 54 m. A. M.

MARS

is evening star. Although he does not reach conjunction with the sun until September, he is so small and so far away that he has disappeared from view. His diameter is but 40".0, and he will be looked for in vain by the unaided eye for the rest of the year. His conjunction with Mercury has been alluded to.

The moon, one day after her change, is in conjunction with Mars on the 15th at 7 h. 57 m. P. M., being 3° 54' north.

The right ascension of Mars on the 1st is 6 h. 52 m., his declination is 24° 6' north, his diameter is 4".2, and he is in the constellation Gemini.

Mars sets on the 1st at 9 h. 38 m. P. M. On the 30th he sets at 8 h. 49 m. P. M.

Mercury, Venus, Mars, Saturn and Uranus are evening stars at the close of the month. Jupiter and Neptune are morning stars.

Underground Temperature.

In answer to a question as to the method of taking temperatures of rocks at different depths in mines, a description may be given of that adopted by Charles Forman in determining the temperatures in the Forman shaft some ten years ago. The temperatures were taken from the surface to a depth of 2,300 feet. They were ascertained by drilling holes not less than three feet deep into the rock and inserting into the hole a Negretti & Zambra slow-acting thermometer of the pattern adopted by the Underground Temperature Committee of the British Association and standardized at Kew. These holes were closed with clay and the thermometers were left in for 12 hours, not less than three holes being tried at each point. The following are the depths in feet and the temperatures in degrees Fahrenheit:

Feet.	Deg.	Feet.	Deg.
100.....	50½	1300.....	91½
200.....	55	1400.....	96½
300.....	62	1500.....	101
400.....	60	1600.....	103
500.....	68	1700.....	104½
600.....	71½	1800.....	105½
700.....	74½	1900.....	106
800.....	76½	2000.....	111
900.....	75	2100.....	119½
1000.....	81½	2200.....	116
1100.....	84	2300.....	121
1200.....	89½		

It may be stated that more accurate results might have been attained had the holes been filled with water, the thermometers put within a foot of the bottom, the holes then plugged, and the thermometers left for 12 hours. In the dry state the average heat of the rock is not so well ascertained as it is when equalized by the water. However, the results would not differ very greatly. Of course, higher temperatures than this are experienced in certain drifts and close places in a deep mine, but it was the actual temperature of the rocks which was desired. In the record quoted, no mention is made of the varying characters of the rock itself.—*Mining and Scientific Press.*

Correspondence.

Curious Tree Growths.

To the Editor of the Scientific American:

In your issue of May 13 I saw a communication from J. T. Morey. The tree growth illustrated may have been a case of abrasion and the natural result, or it may have been caused by some one who, like myself when a boy, delighted to make trees assume unnatural shapes.

In Guilford, Vt., are two beech trees that have grown into one. About twenty years ago I cut the top from one and made a slit in the other. I then united the two trees.

It proved a successful graft, and when I saw them last fall they were about eight inches through at the base, distance apart about three feet, place of union about seven feet from the ground. Near this tree on the bank of a small stream stood a willow. I trimmed it, cut off the top, bent it over the stream and planted the top of the tree in the opposite bank. It rooted and in summer the stream flows under a beautiful green arch. Another has its branches bent down and planted in a circle about its base. Another was twisted about an old fence rail, and, as the rail has decayed, the tree resembles a giant cork screw. Another tied in a knot has grown so large that it would be no easy matter to untie it. On this same farm is an apple tree whose fruit is a union of the golden sweet and greening, or, in other words, the same apple is part sweet and part sour.

It was produced by grafting the buds of a golden sweet and greening into another tree, and the singular part of it is the sweet part is covered with the yellow skin of the golden sweet, while the sour part, like an Irishman, sticks to its green. H. B. B.

Waterbury, Conn., May 13, 1893.

A Borax Mine.

Nearly all the boracic deposits heretofore discovered have been found in the form of incrustations on the surface of marshlands, of nodules buried beneath the surface or of crystals embedded in the mud at the bottom of shallow lakes. In a few instances these deposits are found interstratified with layers of earth and rock, the entire formation being in a horizontal position, as seen at several points in Death Valley. But only in the Calico district, San Bernardino County, does one of these boracic deposits occur in the form of a regular vein, so uptilted that it requires to be exploited after the manner of a quartz or other ore-bearing lode.

This deposit, the property of the Pacific Coast Borax Company, is located on the southeasterly slope of the Calico mountains, or rather on a northerly spur of that range. This lode, which outcrops at intervals for nearly three miles, has an east and west course and a southerly inclination. The slate walls are inclosed in sandstone, superimposed upon which is a brecciated rock, evidently of volcanic origin. The crude material here consists of that variety of the borate of lime known as Colemanite. It is of a vitreous adamantine luster and exceedingly rich in anhydrous boracic acid. The contents of the fissure are six feet thick, and at a depth of over 200 feet hold this proportion, nearly pure mineral. The deposit has been opened by several shafts standing 100 feet apart, these being connected by drifts and levels. The material being easily broken down, but a small working force is required in the mine. All that is abnormal about this deposit of borax is easily accounted for. Originally, it was, no doubt, deposited at the bottom of a lake, where, later on, great floods brought down a quantity of sediment which covered it up. In course of time this sediment having been converted into rock, the whole was then lifted up by some great convulsion of nature and left standing at its present angle, this movement having been most likely of a seismic character. In the early history of the borax industry the works put up for the manufacture of this salt were of a very rude and primitive style. Owing to the great cost of lumber, this article had to be economized to the utmost, the crystallizing vats and other portions of the plant being left uncovered. But in the hot and desiccated atmosphere that for two-thirds of the year prevails in that region, this was no detriment so long as the workmen could be protected in part, at least, from the rays of the sun, which here strike down with a killing heat the whole day long.—*Mining and Scientific Press.*

A Counterfeit Equal to a Genuine.

Since dollars are coined out of sixty cents' worth of silver, it is no wonder that counterfeiters have turned honest and are getting out dollars containing the same amount of silver as the genuine, and undistinguishable from the mint issue. In former times, when a silver dollar was worth 100 cents, counterfeiters had to use baser metals, which soon led to their detection. But when the government itself gives a fictitious value to its coinage, who is there to deprecate the acts of individuals who issue a dollar of the same value as the government?