

## ASTRONOMICAL NOTES.

BY BERLIN H. WRIGHT.

PENN YAN, N. Y., Saturday, November 9, 1878.

The following calculations are adapted to the latitude of New York city, and are expressed in true or clock time, being for the date given in the caption when not otherwise stated:

PLANETS.	
H. M.	H. M.
Venus rises . . . . . 6 10 mo.	Saturn in meridian . . . . . 8 35 eve.
Mars rises . . . . . 5 14 mo.	Uranus rises . . . . . 0 29 mo.
Jupiter sets . . . . . 9 41 eve.	Neptune in meridian . . . . . 11 00 eve.

## FIRST MAGNITUDE STARS, ETC.

H. M.		H. M.	
Alpheratz in meridian . . . . . 8 46 eve.	Procyon rises . . . . . 9 57 eve.	Mira (var.) in meridian . . . . . 10 56 eve.	Regulus rises . . . . . 0 05 mo.
Algol (var.) in meridian . . . . . 11 44 eve.	Spica rises . . . . . 4 42 mo.	7 stars (Pleiades) in merid. . . . . 0 27 mo.	Arcturus sets . . . . . 6 06 eve.
Aldebaran in meridian . . . . . 1 16 mo.	Antares sets . . . . . 5 26 eve.	Capella in meridian . . . . . 1 54 mo.	Vega sets . . . . . 0 14 mo.
Rigel rises . . . . . 8 21 eve.	Altair sets . . . . . 10 58 eve.	Betelgeuse rises . . . . . 8 07 eve.	Deneb sets . . . . . 3 19 mo.
Sirius rises . . . . . 10 22 eve.	Fomalhaut in meridian . . . . . 7 35 eve.		

## REMARKS.

The third magnitude star, *Eta Tauri*, will be occulted by the moon immediately after rising on the evening of November 10. This star is also called "The Light of the Pleiades," being the brightest member of that cluster, and near its center. The star will disappear at the moon's eastern limb, 37° from the north point, and reappear about 90° from the north point toward the west.

Venus is moving eastward among the stars of the constellation *Libra*, and is very near the second magnitude star *a Libra*. Mars is very near the eastern limit of the constellation *Virgo*, being 10° east of *a Virginis* (Spica), and, having an eastward motion nearly equal to the earth's, he rises now at nearly the same time he did one week ago.

## The Satellites of Mars.

The authorities of the National Observatory have lately published in pamphlet form Professor Hall's "Observations and Orbits of the Satellites of Mars, with Data for Ephemerides in 1879." As many different accounts of the Professor's discoveries have been given, some of them very wide of the truth, we think that the following condensation from the discoverer's own account, now just published in the above pamphlet, together with such description of the satellites as can be obtained from the observations so far made, will be interesting to our readers:

It appears that in the spring of 1877, the idea of availing himself of the then approaching favorable opposition of the planet Mars struck the Professor as a good opportunity to make a search with the large Clark reflector for a satellite of this planet, but on examination the literature of the planet showed such a mass of observations of various kinds by the most skilled astronomers that the chance of finding a satellite appeared to be so slight that but for the encouragement of his wife the Professor would probably have abandoned the search. But a more thorough examination of the observations showed that hardly any astronomer of note had made any special search for satellites since the time of Herschel. Professor D'Arrest, of Copenhagen, had, however, made a search about 1863 or 1864, but failed to find any satellite, and his failure was a further discouragement to Professor Hall; but remembering the power and excellence of the Clark instrument, he thought there was still a slight chance, and began a thorough search early in August, at which time the geocentric motion of the planet would make the detection of a satellite easy. His attention was first directed to several faint objects at some distance from the planet; but all these proved to be fixed stars, and on August 10 he began to examine the region close to the planet within the glare of the light surrounding it, by sliding the eye piece so as to keep the planet just outside of the field of view and then turning the eye piece so as to pass completely around the planet. This night nothing was discovered, as the satellites were very near the planet, but on the night of the 11th, after several sweeps around the planet, a faint object was discovered that afterward proved to be the outer satellite, but fog from the Potomac prevented any further observation at that time, and it was not until the 16th that the satellite could be seen again, owing to unfavorable weather. On that night sufficient observations were made to show that it was moving with the planet, and on the succeeding night, while the Professor was watching for the outer satellite, the inner one was discovered. The observations of the 17th and 18th put beyond doubt the character of these objects, and the discovery was publicly announced. The peculiar motion of the inner moon puzzled the Professor, as it appeared on different sides of the planet on the same night, which made him think that there were two or three inner moons; but a close observation throughout the nights of August 20 and 21 showed that there was but one inner moon, but that its frequent appearance was caused by its rapid motion around the primary, which is in less than one-third the time of the primary's rotation—a case unique in our solar system.

Of the various names proposed by different parties the Professor has chosen those suggested by Mr. Madan, of Eton, England, namely, Deimos for the outer satellite, and Phobos for the inner one, after the names of Mars' chariot horses, or his sons or attendants, as some translators have it.

The Professor gives an exhaustive review of the observations of these minute bodies at the observatories of Washington, Greenwich, Oxford, Cambridge, Glasgow, Paris, Pultowa, and other places, from which it is deduced that Deimos revolves around Mars in 1.262429 mean solar day, and Phobos in 0.3189244 of a day, both moving very nearly

in a plane of the equator of Mars. The hourly areocentric motion of Phobos is 47.033°; and on account of its rapid motion and its nearness to the planet, this satellite will present a very singular appearance to any inhabitants of Mars, if such there be. It will rise in the west and set in the east, and will pass the outer moon, whose hourly motion is only 11.882°. The distances of these satellites from the center of Mars are: for Deimos 14,500 miles, and for Phobos 5,800 miles. The semi-diameter of the planet being 2,100 miles, the horizontal parallaxes of these satellites are very large, amounting to 21° for Phobos. The nearness of this satellite to the surface of the planet will produce apparent eccentricities of its motion and cause it to appear as a variable star. Its nearness to its primary will make it the most difficult to see, although the brightest of the two.

The size of the satellites is not well known, although it is certain they are very small. From comparative measurements of their light, Professor Pickering, of Harvard, estimates Deimos to be six miles in diameter and Phobos seven miles, but other observers have been led to place them at from ten to fourteen miles in diameter.

Professor Hall gives considerable data for calculating ephemerides, which will be found useful in facilitating observations of the satellites in 1879, but the matter is too long for the space we have at command, and we must therefore refer our astronomical readers to the pamphlet itself, which may be obtained by sending to the National Observatory at Washington.

## CALIFORNIA MINING VS. FARMING.

A conflict of interests has arisen in California between the hydraulic miners and the farmers of the neighboring valleys, in which a most important principle is involved, and which is likely to seriously affect mining interests throughout the West.

In all communities founded on mining interests those interests naturally take precedence of all others, and are, it is well known, pursued without much consideration for any rights that are opposed to their absolute rule. So it has happened that for many years the hydraulic miners, constantly increasing in numbers and in the extent of their operations, have carried on their work regardless of all results but those which should bring profit to them. But, in the meantime, the agricultural interests of the State, which had held a secondary position, have been growing, until now they rank first in importance, and claim to have rights which even mining companies are bound to respect.

The farmers, especially of Sutter and Yuba counties, complain that the rich river bottoms, the most fertile portions of the land, are being ruined by the miners. "The debris from the mines chokes the rivers, raises their beds, diverts their currents, and is spread by the freshets over the alluvial valleys in layers of mud and sand that destroy tillage and cover the fruitful land with barrenness."

The citizens of Sacramento valley have formed themselves into an organization called "The Anti-Débris Association of the Sacramento Valley," and have adopted articles of agreement binding the members to prosecute to final adjudication in the court of last resort any case now pending or that may hereafter be instituted for the purpose of determining the right of miners to use channels of rivers and their tributaries as places of deposit for debris, thereby destroying large bodies of valley land, etc. And these organizations are extending throughout a great portion of the State.

Already the land owners on Bear river have formed a protective society, and have brought suit against the company whose mines the river washes, in behalf of one of their number whose lands have suffered.

The miners are naturally unwilling to give up a long exercised privilege, even though it is destructive to their neighbors' property, and are thoroughly united in defense of their prerogatives. Their organization extends the entire length of the State, and when one mine or company is attacked in the courts the expense of litigation is borne by all of them in proportion to their value; and their capital may be counted by millions.

We quote from one of our contemporaries that: "In the interest of the miners it is urged that they have for thirty years had the right of throwing their tailings into the streams, and that this right is part of the title of every mining claim; so that to take it away is to despoil the miners by wholesale, to destroy many millions of property, and to bankrupt whole counties."

What the law of the case may be the courts will decide; but as far as the permanent interests of the State are concerned, it can hardly be doubted that if it has come to a question between the two, agriculture is more important than mining. It is hard to believe that no way can be found of working the mines profitably without sending the tailings down stream, or that if this were the case the mines could be valuable enough to make their preservation a matter of vital importance. But in any case it is likely that another generation will exhaust the mines, and if in the meanwhile they are allowed to destroy the valleys below them, there will be nothing left worth preserving in the region in question. Under these circumstances few uninterested persons will doubt where the interests of the State lie.

To an outsider, moreover, it would seem that in a State where society is still somewhat inchoate, as in California, it was of no small importance to establish clearly the principle that one industry must not be practiced in such a way as to destroy another.

That the struggle will be a most severe and protracted one is certain, because of the important interests and the wealth involved, but it may reasonably be doubted if the defense of long and unopposed usance urged by the miners will, in the end, prevail.

A decision in favor of the mining corporations would be interpreted as giving to all miners privilege to encroach on other interests; while a contrary decision would encourage, we fear, such widespread litigation on the part of owners of lands anywhere adjacent to mines—for claims for damage will rest on other causes than hydraulic mining—that many valuable mining properties will cease to be worked unless the mining laws are modified for their protection.

## PROGRESS OF OUR FOREIGN TRADE.

In answer to inquiries with regard to prospects of foreign trade, a member of the largest dry goods house in this city said, recently, that in consequence of the increasing demand for American goods in England and abroad, English merchants were copying American labels and trade marks, and placing inferior goods upon the market as American products. His house had met this sort of competition in China and in South America, and had received frequent complaints from merchants who had bought such fraudulently marked goods. Their trade with South America and Australia was increasing and very satisfactory. Owing to the poor credit of merchants in Mexico caused by the unsteady government and the wholesale smuggling on the frontier, their trade was not cultivated. The demand for American cotton goods in China was growing, the exports from this port during the last week in September amounting to over \$200,000.

A prominent manufacturer said that a considerable part of the recent increase in trade was due to foreign demands. The trade with South America in his class of goods was steadily increasing, and now the markets of that country are largely supplied by America, whereas a few years ago they were almost wholly controlled by English and German houses. In England the American manufacturers of lamps, fixtures, and clocks were meeting with much success, owing to their superior designs and workmanship.

The head of a large furniture house said that the export trade in furniture was constantly increasing. A few years ago not more than three houses in this country shipped to South America; now there are over a hundred, and they have nearly driven out of that market the English, German, and Australian dealers, especially in the chair trade. Business with Australia and other countries was also increasing.

A large dealer in iron and general hardware reported an increasing export demand for American goods. American manufacturers are very popular abroad, and were being largely imitated. The use of American models, and the forgery of American labels, however, would not pay in the long run, he believed, nor would the imitations materially injure the sale of genuine American products.

## Explorations in Greenland.

The Danish Government, says *Land and Water*, have published a report from the three gentlemen whom they sent some time ago to explore the land between the colonies of Godthaab and Fredriksthal. The report, dated Fiskenas, August 9, states that the expedition has obtained very valuable results. M. Dalager, who in 1751 had reached the "Gunatak," a mountain which rises out of the ice north of Fredriksthal, reported that far to the east he observed a series of mountain peaks, which he supposed to be the east coast of Greenland, but although this was generally supposed to be an error, the question had not hitherto been solved. An exploring party, under the command of Lieut. Jensen, R. D. N., has now succeeded in reaching these mountains, which were situated about fifty miles from the border of the icefields, after no small amount of suffering. The expedition, consisting of three Danes and one Greenlander, entered the icefields on July 14. On the 24th, the foot of the mountain range, after much suffering, was reached, but all the toil and sufferings of the explorers appeared to have been useless, as it appeared impossible to ascend the mountains, the fog having again become intense. This was followed by a violent gale from southeast, accompanied by heavy falls of snow, which lasted six days, and as provisions and fuel began to run short, and several of the party felt symptoms of snow blindness, notwithstanding the snow spectacles, it was decided to return, when fortunately, on July 31, the weather moderated, and the sky became clear, and on this day the highest mountain was climbed. The height of this mountain was ascertained to be about 5,000 feet above the level of the sea, and on the other side of the mountain ridge the icefields were observed without interruption as far as the eye could see, the plateau apparently gradually rising higher and higher. It is now consequently proved that this mountain ridge is not the east coast of Greenland.

## Gold Amalgams.

M. Kazanoff has made several experiments on gold amalgams. It was found that apparently fluid gold amalgams, containing different quantities of gold at ordinary temperatures, on being squeezed through thin leather bags, give as filtrates amalgams containing the same amount of gold; during these experiments amalgams of different concentrations gave filtrates containing 0.126 per cent of gold. These facts show that amalgams filtered through thin leather are similar to solutions of solids in water, the concentration of which chiefly depends on the temperature of the solution.