ASTRONOMICAL NOTES.

OBSERVATORY OF VASSAR COLLEGE.

For the computations in the following notes (in which approximate places only are given), and for most of the observations, I am indebted to students. M. M.

Spots on the Sun.

A large group of spots can be seen at this date (March 15) near the center of the sun. It can probably be seen with the eye, protected as it always should be by smoked glass. The two principal spots of the group are of intense blackness. If this is the return of the cluster seen in February, it has changed its configuration.

Position of Planets for April, 1873.

Mercury.

Mercury can be seen at this date (March 15) shining beautifully bright in the evening twilight. It does not reach its greatest elongation from the sun until the 18th, when it sets at 7h. 43m.

On the 1st of April it rises at 5h. 48m. A. M., and sets at 7h. 4m. On the 30th of April it rises before the sun, being at that time on the other side of the sun, and sets at 4h. 32m. P. M.

Venus.

On April 1st Venus rises at 6h. 54m. A. M., and sets at 9h. 56m. P. M. On April 30 Venus rises at 4h. 58m. A. M., and sets at 7h. 46m. P. M.

At this time (March 15) Venus can be seen with the naked eye in the day time. When viewed through a glass, it presents the appearance of the moon as seen just before the first quarter.

Venus will not reach its greatest brilliancy until the 29th of March, and can be seen on that day with the eye, at about half past two in the afternoon, on the meridian at an elevation of 71° in this latitude.

Mars.

Mars sets at 7h. 18m. on the morning of April the 1st and rises again at 9 in the evening. On the 30th it rises at 6h. 26m. P. M., and sets about 5 in the morning.

Mars is becoming conspicuous now (March 15) in the late evenings, being known by its ruddy light. On the 1st it will be near the star *α Libræ*, but is moving westward among the stars, and will be further from it on the 30th.

Jupiter.

Jupiter rises on the 1st of April at 2 in the afternoon, and sets at 4 in the morning. On the 30th it rises a few minutes after noon and sets a few minutes after 2 in the morning.

On February 17th the 1st satellite of Jupiter was seen projected upon the planet, and also the dark shadow of the satellite. The satellite appeared like a snowy white disk upon the brilliant surface of Jupiter, while the shadow was an irregular dark spot, following the little moon it its transit.

On the 25th of February the second satellite was occulted, that is, Jupiter seemed to pass over it and hide it from us; on the 11th of March the first satellite was lost sight of in the same way. It was five minutes from the time when Jupiter's limb was seen to touch that of the little moon until the planet had completely hidden it from view.

These phenomena can be seen with a glass of moderate power.

In an occultation the little moons grow dimmer and dimmer as the great planet sweeps across them. In a transit the satellite seems to glide on to the disk.

Saturn.

On the 1st of April Saturn rises about 9m. before 3 in the morning and sets a little after noon. On the 30th it rises at 1 A. M. and sets at 10½ in the forenoon.

The apparent diameter of Saturn is increasing, but it is not well situated at present for observations.

Uranus.

On the 1st Uranus rises about 17m. after noon and sets before 3 in the morning. On the 30th it sets at 1 in the morning and rises at 10h. 25m. in the forenoon. It is among the stars of *Gemini*.

Neptune.

Neptune rises on the 1st at 6h. 26m. A. M., and sets at 7h. 26m. P. M. On the 30th it rises at 4h. 37m. A. M., and sets at 5h. 35m. P. M.

Auroras.

Auroral streamers were noticed on February 21, February 25, and March 10.

THERMOMETER AND BAROMETER.

At 7 A. M.,	February	23,	thermometer.....		—12·°5
"	"	24,	"	.....	— 5·5
"	March	2,	"	.....	— 0·5
"	"	5,	"	.....	—13·5
"	"	6,	"	.....	—16
The highest barometer, March 6, 7 A. M...					30·52 inches.

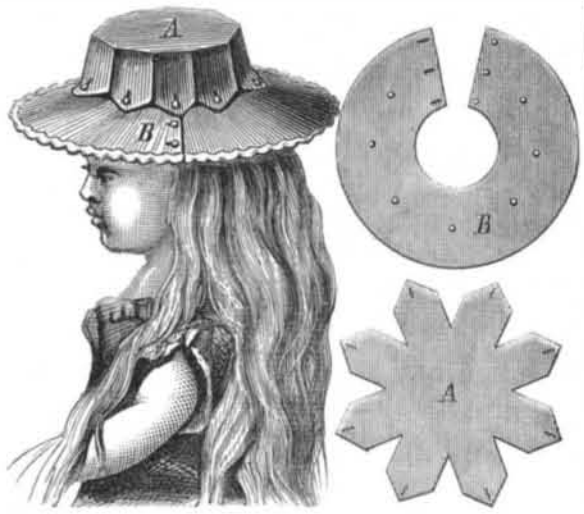
New Determination of the Velocity of Light.

M. Fizeau communicates to *Les Mondes* the results of a series of very elaborate experiments made with a view of the most accurate determination of the velocity of light. The source of the ray was a jet of oxyhydric gas, and the distance between the two stations, as found by careful triangulation, was 33827·1 feet, with a probable error of 0·001.

Six hundred and fifty satisfactory observations were made, the mean of which, multiplied by the index of refraction, 1·0003, gives 185,368 miles per second as the velocity of light to an approximation of 0·003. This result agrees with that determined previously by Foucault, and also confirms the value of the parallax of the sun (8″ 86) obtained by Leverrier. M. Fizeau considers that, with stations separated a distance of 12 miles, the velocity of light could be determined to an approximation of 0·001.

CHILD'S HAT.

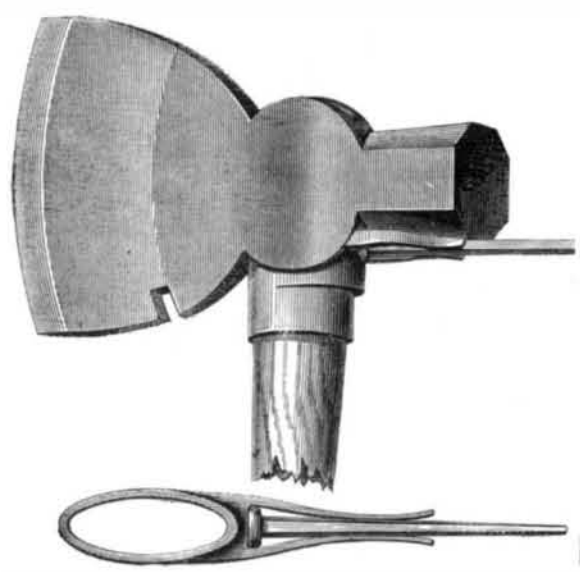
Mr. S. B. Pratt, of Boston, Mass., is the inventor of the novel form of child's hat represented herewith. The crown, A, is made of a single piece, somewhat in the shape of a star, and provided with a number of button holes by which it is attached to buttons on the rim. The latter is simply a circular piece, cut as shown at B in order to give it the necessary conical form. The arrangement of these two parts of



the hat when put together is seen on the head of the child in the engraving, and needs no explanation. When soiled, it is only necessary to unbutton the crown from the rim and wash the fabric in the ordinary manner.

NAIL DRIVING HATCHET.

Every one who has ever experienced the peculiar misery of fingers pounded while vainly endeavoring to hold a nail in an awkward position with one hand, while driving it in by means of a hatchet or hammer in the other, will welcome this invention with delight. All others, who have not undergone such affliction, will require but one trial to cause them to institute anxious inquiries for just such a device as we now illustrate.



It is nothing more than an ordinary hatchet, to the collar of which are secured two springs, the bases of which are at such a distance apart as to hold the head of a nail between them, while the outer ends grasp the body. A single blow starts the nail into the wood, when the hatchet is detached and the driving home proceeds in the ordinary manner, everything being done with one hand. To Mr. S. Daugherty, of Belle Vernon, Pa., is due the credit of this invention, which was patented, through the Scientific American Patent Agency, September 10, 1872.

WASHING MACHINE.

Mr. Samuel Berry, of New York city, has recently patented the ingenious laundry convenience shown in our engrav-

ing. The device consists in a tub or box, the bottom of which is made corrugated. A circular brush fits loosely within the tub, and is movable by the lever handle represented. A close fitting cover, held down by a bar and loops, covers the receptacle. The clothes are thoroughly washed by placing them between the brush and corrugated bottom, and rotating the former.

Economic Value of Science.

It is noticeable that scientific subjects have received more attention from the newspaper press of late than formerly. This is partly owing to the efforts of scientists towards popularizing their respective specialties, as exemplified in the recent course of lectures in this country by Professor Tyndall. But there is another and more potent reason for it. In the scramble for wealth or the conveniencies of life, the utility of knowledge is esteemed more than its speculative quality of abstract truth. It is becoming more generally known that discoveries, that seemed at first to be without any application to the wants of mankind, have at length, through the higher development of commerce by means of them, contributed to the general good. Experiments in magnetism and electricity, which led to the invention of the electric telegraph, were made from curiosity only. The modern chemist takes little note of the monetary value of his discoveries; but the practical man presently finds their application to some use that has its equivalent in dollars and cents. None could have anticipated the use of spectrum analysis to the arts, and yet it is found invaluable in the manufacture of steel.

Many other instances may be noted to illustrate the proposition that every addition that may be made to physical science is capable of an economic use, and that the practical value of all the knowledge we now have may appear with further discovery.

For such reasons, science is likely to receive increased attention from the practical, money-making world; but a real love of knowledge for its own sake is the characteristic of few, and we must not expect that a very large portion of mankind will pursue the truth merely for the purpose of knowing it.—*The Typographic.*

An Atlantic Cable Broken.

After nearly two years of uninterrupted operation of both the Atlantic cables of the Anglo-American Telegraph Company, the 1865 cable failed at twenty minutes past twelve o'clock P. M., on March 11. The tests at Heart's Content show that the fault this time is on the other side, probably not far from the Irish coast. The eminent English electrician, Mr. Willoughby Smith, left London on the evening of March 11 for Valentia, to verify the tests made on this side and definitely locate the fault.

The 1866 cable and the French Atlantic cable are both in excellent condition, and will be able to satisfactorily and promptly transmit all the business offering. Probably the only unfavorable result of the interruption will be the expense to the company of picking up and repairing the cable, and this they can well afford to do, being in a very prosperous condition. The new cable which is to be laid this season by the French Atlantic company is rapidly approaching completion, and within a few weeks New York will be in direct cable communication with Great Britain.

The project of laying a competing cable, by the Great Western Telegraph Company, has been abandoned.—*The Telegrapher.*

Small Fast Steamers.

Messrs J. I. Thorneycroft & Co., of Chiswick, Eng., near London, have built a number of vessels of this class, one of which, the Firefly, on a recent trial made the excellent speed of 18 miles per hour. Her dimensions are as follows: Length over all, 53 feet, breadth, 6 feet 6 inches, draught of water, 2 feet 6 inches. Inverted direct acting engines, two cylinders 6 inches diameter, 8 inch stroke. After the trial this boat was coaled and lifted on board a steamer and shipped to Ghent, Belgium, where on arrival she was lowered again into the water, fire lighted, and she steamed off to her destination near Ghent.

The same builders have lately tried another small craft of about same size, with similar results.

The Effect of Flat Wheels on Railroad Track.

A correspondent of the *Railroad Gazette* considers that the surface or tread of car wheels should be tested by the use of a hammer, and when blisters are found the wheels should be rejected because the blistered spot soon becomes flat and not only damages the rail but shakes the whole car so as soon to do as much damage to the car as the price of a good wheel. It is believed that these flat wheels making 200 revolutions per minute, with the flat spots making steam-hammer blows on the track at each revolution, are a frequent cause of broken rails.

A SINGULAR occurrence, illustrating the force of the wind and the mechanical effects of pneumatic power, recently took place at Kaighn's Point, N. J. While twenty-five men were at work upon a vessel in the great ship house of Wood, Dialogue, and Co., the wind suddenly lifted up the building and carried it away without injuring any of the men or the vessel. The building was 250 feet long, 80 feet wide and 80 feet high. Loss, $15,000.

APACHE TELEGRAPH.—The Apaches have a very simple and yet effective system of telegraphy, which has unquestionably been in vogue from time immemorial. Lookouts are stationed on every prominent peak, within the range of one another's vision, commanding a complete view of the entire country. No human being can enter the region under surveillance unnoticed. Anything happening necessary to communicate to his fellow watchmen, the lookout at once ignites a pitch pine brand, which he moves in a manner intelligible to his confederate on the adjacent eminence, each movement having a significance familiar to them. This is repeated with lightning rapidity from mountain top to mountain top, until it reaches the chief in his fastness. Instructions are conveyed to his scouts in a like manner.

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