Astronomical Notes.

OBSERVATORY OF VASSAR COLLEGE.

The computations in the following notes are by students of Vassar College. Although merely approximate, they will enable the observer to recognize the planets. M. M.

POSITIONS OF PLANETS FOR JANUARY, 1880.

Mercury.

On January 1 Mercury rises at 5h. 49m. A.M., and sets at 3h. 5m. P.M.

On January 31 Mercury rises at 6h. 58m. A.M., and sets at 4h. 12m. P.M.

Mercury will be near the waning moon on the morning of the 10th.

Venus.

Venus rises on January 1 at 3h. 56m. A.M., and sets at 1h. 53m. P.M.

On January 31 Venus rises at 4h. 47m. A.M., and sets at 2h. P.M.

Venus, although less brilliant than in December, will yet be very beautiful in the early mornings of January, and on the 8th may be seen north of the waning moon.

Mars.

On January 1 Mars rises at 7m. after noon, and sets at 3h. 10m. the next morning.

On January 31 Mars rises at 11h. 24m. A.M., and sets at 2h. the next morning.

Mars is easily known by its reddish tint; it is among the stars of Aries, and on the 20th will have the same right ascension with the moon, and be 2½° south of the moon in declination. The satellites of Mars are so small that only the largest telescopes will show them. They are exceeding difficult objects even with a glass of 12 inches diameter.

An ordinary telescope with an object glass of 3 inches diameter will show markings on the surface of Mars, and the whiteness of the polar regions.

Jupiter.

Jupiter sets early in January, and is farther from us than in the Autumn.

On January 1 it sets at 9h. 28m. P.M., and on the 31st it sets at 8h. 1m. P.M.

Observations upon it must be made between 6 and 7 P.M.

During that hour the first satellite will disappear on the 6th by going behind the planet; on the 7th, will reappear from transit; on the 14th, will be invisible, because in transit; on the 15th, will come out of shadow; and on the 30th, be seen to pass from the face of Jupiter. During that hour the second, or smallest moon, will reappear from transit on the 4th; will be in transit on the 11th; and behind the planet on the 27th.

On the 14th the largest moon will pass off from the face of Jupiter between 6 and 7 P.M.

On the 8th the most remote of Jupiter's moons will be in transit between 6 and 7 P.M. On the 25th this moon will pass from the disk.

On the 21st, between 7 and 8 P.M., the first satellite, or that nearest Jupiter, and the third, which is the largest, will enter upon the disk of Jupiter nearly together; if the planet is not too near the horizon this will be a very interesting sight.

Saturn.

The large planets are all becoming more distant.

On January 1 Saturn sets just before midnight; on the 31st it sets at 10h. 11m. P.M

Saturn will have the same right ascension as the moon on the 17th, and will be 8⅓° lower in declination.

Although small telescopes will show the two satellites, Titan and Rhea, when Saturn is in its best position, probably Titan only can be seen during January. It should be looked for early in January on the west of Saturn as seen in the telescope.

Uranus.

Uranus is coming into better position. It is very remote, and appears only as a very small greenish white moon, when seen in the field of the telescope. It is still near the star λ Leonis, but by a retrograde motion it passes that star and will be found late in the month west of it and 2° south of it in declination.

Neptune

On January 1 Neptune rises about 1h. P.M., and sets at 2h. 33m. A.M. of the next day.

On January 31 Neptune rises at 11h. 1m. A.M., and sets 35m. after midnight.

On the 1st Neptune passes the meridian about 13m. before Mars, and is 5° south of Mars.

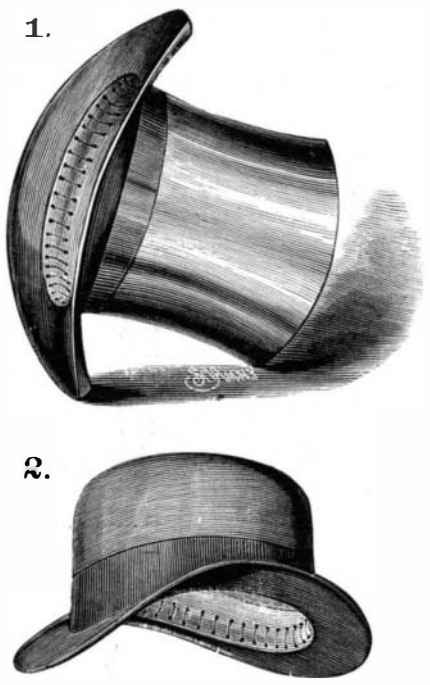
A Novel Theory as to the Origin of Diamonds.

One of Dr. W. B. Fletcher's frogs escaped from his frogarium some time ago, and was found the other day behind a register at his office starved to death and shrunk to half its former dimensions. The doctor dissected it, and coming to its lungs found these organs clogged with thousands of black crystals which looked like coarse gunpowder. Under the microscope those crystals presented regular facets with smooth surfaces, presenting the same angle of crystallization as the diamond. On burning they gave off carbonic acid gas, and they are pure crystals of carbon, as the diamond is. According to the Indianapolis *Herald*, the doctor ingeniously theorizes that in the ages gone by the huge reptiles of the antediluvian period, dying under circumstances similar to those under which the frog did, may have formed large crystals of carbon in their lungs which were afterward transformed into the hard and lustrous diamond.

NOVEL HAT SWEAT.

We give herewith an engraving of an improved hat sweat lately patented by Mr. Caesar Simis, of No. 10 Broadway, New York. The sweat has two rows of ventilating holes connected by transverse slits, and along the back of the sweat there is an elastic band which presses the slotted portion inward, making it convex and diminishing the size of the hat. The slits may extend entirely around the sweat, or they may be formed in the front part only, as may be desired.

By means of this improvement two important advantages are secured, which will be appreciated by both hat dealers



IMPROVED HAT SWEAT.

and hat wearers. One advantage is that of the most perfect and thorough ventilation of the hat; the other is the adaptability of the leather to any shape or to any pressure brought to bear upon it by the head. In fact it converts the hat into a perfect "conformator," avoiding the usual fitting and shaping of stiff hats, and saving a great amount of time, labor, and expense. A stiff hat provided with a sweat of this kind is much more comfortable to the wearer than an ordinary soft hat.

To the hat manufacturers this invention is of great importance, as it obviates the necessity of using so many different sizes of blocks, as the hat provided with this improved leather or sweat will answer for two, and in some cases three different sizes of heads. For the same reason it is of great value to the retailers.

IMPROVEMENT IN EYE-GLASSES.

The engraving represents an improvement in nose-clamps for eye-glasses recently patented by Mr. Alonzo C. Blethen, of Lynn, Mass.

BLETHEN'S IMPROVEMENT IN EYE-GLASSES.

The frame of the glass is of the usual form, and the attachment consists of a clip having at its ends hooks for engaging the projecting edge of the frame. A short piece of small elastic tubing is stretched over the clip, and forms a yielding surface, which affords a firm hold upon the nose without being uncomfortable to the wearer.

This improvement will be appreciated by those who have worn the ordinary glasses with ribbed or serrated edges, as it does away with the irritation and discomfort caused by a continual pressure of such a surface upon the nose.

Further information in regard to this improvement will be furnished by the inventor on application.

Moulding Mixture for Gelatine Photo-Plates.

For moulding the gelatine relief Leipold's mixture may be employed, and by the exercise of care very perfect results may be obtained. The following receipt for Leipold's mixture is taken from Husnik's *Heliographie:*

Seventy parts of bitumen are melted at a moderate heat, and to the melted bitumen there are added the following, each being melted previously: 425 of spermaceti, 200 of stearine, and 170 of white wax. All these being well incorporated, 70 parts of finely ground blacklead are stirred in. The plate to be moulded being thoroughly swelled, is removed from the water, dried with a cloth, and gradually raised to as high a temperature as it will bear without injury to any details of the device, this being generally about 35° C. A metal border being now fixed round the edges, the above composition, which ought not to be at a higher temperature than 40° C., is poured on, the composition being allowed to flow over the plate in one continuous wave. The thickness of the layer of composition may vary from half-an-inch to one inch in thickness, according to the size of the plate, and no attempt should be made to remove the cast until the next day, when it will generally separate with great ease. The mould is next made conducting with bronze powder, and electrotyped. The first electrotype cast obtained should be very slightly oiled, and a second cast made in it will be the required printing plate.

Curious Speculation Concerning Electrical Action in the Human Body.

At a recent meeting of the London Physical Society Dr. Shettle read a paper on the "Influence of Heat upon certain forms of Induction Coils, considered more especially in relation to the Inductive Power which the Blood Exercises on the Various Structures of the Body." The author found that when a copper and zinc wire were insulated from each other by parchment paper and paraffined silk, and wound in close proximity to each other, a (induced) current was indicated on a galvanometer whose terminals were connected to the neighboring ends of the zinc and copper wires respectively, the other ends being left free. When the latter were connected across the deflection was *nil*. On raising the temperature of the two wires by causing hot water to flow inside the coil into which they were wound, the deflection was largely increased. These experiments led Dr. Shettle to imagine that there is a similar action in the animal body. The heart is made up of nerves and muscular fibers winding spirally, and some of these wind round each other so as to form a spiral cord, round which the blood capillaries also wind. Dr. Shettle compares these nerve and muscle bundles to the coils of zinc and copper wire in his experiments, and infers that electric currents may be induced in them as in the wires. The flow of the warm magnetic blood would also tend to produce currents in them. Dr. Shettle further drew attention to the fact that animals live and move in a magnetic field, and that electricity must be generated in them by their movements, internal and external.

FAILURE OF THE IODINE TEST FOR STARCH.—Puchot noticed, in testing a sample of butter suspected of containing starch, that the iodide of starch reaction is impaired by the presence of certain nitrogenous organic substances, among them albumen, whether from milk or eggs.

The Solar System in Miniature.

The London *Times* describes an interesting if not useful invention by an Italian, Signor N. Perini, long a resident of London. For want of a better name it is called a planetarium, though vastly different from anything of that name hitherto constructed.

It is erected in the center of a room of "ordinary size," with a high ceiling. On entering the room one sees a high circular chamber, or box, standing on twelve wooden pillars. On entering underneath this chamber, and looking up, a dome is seen, deep blue, and sprinkled with stars, the chief northern constellations being in their proper places, and round the base of the dome the names of the signs of the zodiac. Pendent from the top of the dome by a narrow tube is an opal globe, lit inside by gas, and representing the sun. From wires, almost invisible, the planets are suspended around the sun, of sizes and at distances approximately proportionate to the real sizes and distances, and each having its proper inclination to the plane of its orbit. The various moons are in their places, and Saturn has his rings. The general effect on looking up at this arrangement from below is impressive, and this effect is increased when Signor Perini, by simply turning a key, sets the system in motion, rapid or slow, as he chooses. The sun turns on his axis and the planets in their orbits, all in time accurately proportionate, and on watching the movements for a short time one easily realizes the immense differences in length of the years of the earth and those of the outer planets. By an ingenious watch-work arrangement inside the earth, which is the size of a walnut, our world is made to revolve on its axis, the latter, by a special effort of ingenuity of Signor Perini, being always made to point to the same quarter of the heavens. The same arrangement causes the moon to revolve round the earth in its own proper orbit. Perhaps the great triumph of this invention is the fact that the planets revolve round the sun in proper elliptical orbits, which are traced around the inside of the dome. The dome is fourteen feet in diameter at its base and fourteen feet high. In the chamber above the dome the machinery invented by Signor Perini is arranged, the details being as yet