Correspondence.

Mammoth Tooth.

To the Editor of the SCIENTIFIC AMERICAN:

I notice in your issue for January 23 a description of a mammoth's tooth. I have recently received the tooth of a mammoth which was discovered at Austin, Texas, while a well was being dug. It was found 45 feet below the surface. The laborer struck it with his pick-ax, in excavating it, and broke it. The tooth weighs 12 pounds. It is 13 inches long, 7 inches broad at the center, and it is 4 inches thick. It makes an excellent curio. J. S. BROWN.

Galveston, Texas.

About the New Method of Gathering Turpentine.

To the Editor of the SCIENTIFIC AMERICAN:

I note in your issue of January 2 the article relating to the "new method of gathering turpentine," invented by Dr. Charles H. Herby, and by him "given to the public."

Eleven years ago I experimented with detachable receptacles to catch the "dip" in lieu of the ordinary "box" cut in the trees, trying a number of substances and forms of receptacles.

My experiments were made at the McQurre place at Adiel, Ga. The object which I sought was mainly to secure a better grade of rosin after the first year's working of the trees.

A "virgin" tree yields "window-glass," water-white rosin, which brings a high price. The second, third, and fourth year's working of trees yields poorer and poorer grades of rosin, because of the tannic acid, which accumulates in the old boxes in the trees, and the fourth year (the last in Georgia) rosin hardly more than pays for the barrels and handling.

By the use of the detachable boxes, I hoped to secure a high grade of rosin through the working of trees, and also save some "dip," which is lost in the usual way of gathering—dipping from the box in the tree into a large bucket with a wooden paddle.

While the theory seemed good, I found it entirely impracticable to apply it. It is impossible to construct a receptacle which will come anywhere near answering for the different forms and sizes of surfaces to which they must be attached.

The "dip" will run by and to the ground. I even tacked a metal basin to a specially-prepared surface, without entirely preventing the loss of "dip."

The "dip" or gum adheres to the inside and outside of such a receptacle, gets hard, and cannot be removed by any feasible process in the wood.

In short, this plan is impracticable. Moreover, I found that at least one man had made the same kind of experiments some three years before I attempted it. GEORGE W. COLLIN.

Bridgeport, Conn., January 8, 1904.

New Automobile Records on the Ormond-Daytona Beach.

As a beginning of the promised lowering of automobile speed records at the race meet in Florida last week, William K. Vanderbilt, Jr., lowered Henry Ford's record made on the ice by two-fifths of a second. Mr. Vanderbilt drove his recently imported 90-horsepower Mercedes racer, and he covered the mile in 39 seconds, or at the rate of 92.31 miles an hour. One of the fastest races that was run on the same day, January 27, was a 15-mile match between H. L. Bowden and S. N. Stevens, each of whom drove a 60-horsepower Mercedes car. Bowden beat Stevens by 11 seconds, covering the 15 miles in 10:18, or at an average speed of about 87 miles an hour.

The great feature of the second day was the mile championship race, consisting of three heats. There were seven machines in this race, but one of which—the Winton Bullet No. 2, driven by Barney Oldfield—was of American make. The other six were Vanderbilt's Mercedes, Bowden's Mercedes, Stevens' Mercedes, Brokaw's Renault, Shanley's Decauville, and La Roche's Darracq. The first heat was won by Vanderbilt in 48 4-5 seconds, with Bowden second in 49 3-5, and Shanley third in 55 4-5 seconds.

In the second heat, the Winton 8-cylinder machine forged to the front and made the fast time of 43 seconds (83.72 miles an hour). Mr. Stevens was second in 45 2-5 seconds, and Mr. Brokaw's Renault came in third in 48 3-5 seconds.

The third heat was also won by Oldfield in 46 3-5 seconds, while Mr. Vanderbilt finished second in 49 3-5 seconds. The mile championship for 1904 therefore goes to the American racing car built on distinctly American lines, i. e., with a horizontal motor instead of one of the vertical type.

The first heat of the five-mile invitation race for gentlemen amateurs was won in 5 minutes, 18 3-5 seconds, by Mr. James L. Breeze on his 40-horsepower Mercedes.

The second and final heats were not run off till the following day, when they were won by Mr. Vanderbilt in 4:38 1-5 and 3:34 3-5 respectively. The first heat of the five-mile free-for-all race was won by Oldfield in 3:48 4-5, but his machine broke down just as he finished. The second and third heats went to Mr. Vanderbilt in 3:40 and 3:31 3-5 respectively. The latter time is equal to an average speed of about 85½ miles an hour. Mr. Vanderbilt also won the one-mile race for gentlemen drivers in 47 3-5.

A one-mile motor bicycle race was a feature of the third day's sport, and was won by G. H. Curtis, on a machine of his own make, in 56 1-5 seconds. The concluding race, a five-mile handicap, was won by S. B. Stevens from scratch in 4 minutes and 2-5 of a second.

The races on the fourth and concluding day were over ten-mile and twenty-mile stretches. The times made will be given in our next issue.

THE HEAVENS IN FEBRUARY.

BY HENRY NORRIS RUSSELL, PH.D.

The finest part of the evening sky at this season lies south and west of the zenith, where we find several of the brightest constellations in the heavens.

At our accustomed hour of 9 o'clock in the middle of the month, Gemini is almost overhead, a little south of the zenith. Its two bright stars, Castor and Pollux, about 5 deg. apart, are the principal feature of the constellation, and two roughly parallel lines of fainter stars extend from them toward Orion.

Below Gemini lies Canis Minor, whose principal star, Procyon, sends us more light than Castor and Pollux combined. Still lower is Canis Major, with the magnificent Sirius, six times as bright as Procyon, and surpassing fourfold any other star that we ever see. Below Sirius and to the left is the rest of the constellation, which contains one star almost as bright as Castor, and two or three others not much fainter, though they do not appear nearly as bright to us as Castor does, on account of the great absorption which their light suffers in passing obliquely through our atmosphere.

Canopus, the brightest star in the heavens after Sirius, can be seen low on the horizon, a little to the right of Sirius, by observers south of latitude 35 deg.

To the right of Procyon, and a little below it, appears Orion, the brightest of all the constellations, with two stars of the first magnitude and several of the second. Higher up and farther west is Taurus, with the red Aldebaran, and the cluster of the Pleiades farther west. North of this, and west of the zenith, is Auriga, whose brightest star, Capella, ranks next to Sirius among those now in sight. Following down the Milky Way we come to Perseus, then Cassiopeia, and finally Cepheus, well down below the pole.

Aries lies below Perseus on the left. The southwestern sky is dull, being occupied by Eridanus and Cetus, which have few conspicuous stars.

East of the meridian the most prominent groups are Ursa Major and Leo. The former is coming up on the right of the pole, the latter is quite high up in the east. The long regular line of Hydra rises from the southeastern horizon, and extends almost to Procyon. Parts of Virgo and Boötes have risen, but their brightest stars are still invisible. Draco, below Ursa Major, is the only other prominent constellation in sight.

About 3½ deg. southwest of Capella (in the direction of the Pleiades) lies a star—Epsilon Aurigæ—which recent investigations show to be an uncommonly interesting object. It has been known for many years that the star is variable. It is usually a little below the third magnitude—fully as bright as the brighter of the two stars which lie 3 deg. south of it—but on several occasions it has been seen by competent observers to be of the fourth magnitude—decidedly fainter than either of them.

It has been supposed that these fluctuations in brightness were irregular. However, Dr. Ludendorff, of the Potsdam Observatory, who has recently made a careful discussion of all the available observations, finds that the epochs of minimum brightness have occurred at regular intervals of a little over twenty-seven years—in 1821, 1848, 1875, and 1902.

About a year before the epoch of minimum, the star begins to decrease in brightness, and in seven months it has lost about half its light. Then for about ten months it remains constant, and then increases again, recovering its original brightness in seven months more. During the remaining twenty-five years of the period there is little evidence of any change in the star's brightness.

This variation is exactly similar in character (though of very much longer period) to that of the well-known Algol variables, and it is natural to attribute it to the same cause, namely, the eclipse of one of a pair of binary stars by the other. This hypothesis is strongly confirmed by the fact that spectroscopic observations, also made at Potsdam, show that the star is a binary of long period, both of whose components are bright. The relative orbital velocity of the two stars appears to be at least as great as that of the earth around the sun.

Although not enough data have yet been published to enable the dimensions of the system to be calculated with any reliability, a rough estimate, based on the assumption that the true orbital velocity is a little greater than that of the earth, may be of interest.

It would appear that the system consists of two stars, about equal in brightness, one of which is more than twice the diameter of the other. When the small star is eclipsed behind the large one, all its light is cut off, and we have a minimum. When the small star is in front of the large one, it cuts off only a small fraction of its light, and there is not enough difference in the amount of light which reaches us to be noticeable.

The period of revolution of these two stars is about twenty-seven years, and their distance apart is on the average about equal to that of Neptune from the sun. The smaller star is about 350 million miles in diameter, and the larger one about 850 million miles, or about 400 and 1,000 times the sun's diameter. The combined mass of the two stars is, however, only about thirty-five times that of the sun, so that they must be of an excessively tenuous constitution.

It should be borne in mind that the above numbers can give at best merely an idea of the general nature of the system, and may be very far indeed from numerical correctness. However, this exceedingly interesting system is now under careful observation, and we may hope that in a few years it will be possible to say definitely whether this theory of its variation is correct, and, if so, how large the stars really are.

THE PLANETS.

Mercury is morning star in Sagittarius and Capricornus. On the morning of the 10th he reaches his greatest elongation, and is nearly 26 deg. west of the sun. He is, however, so far south that he will not be very easy to see, although he rises nearly 1½ hours before the sun. By the end of the month he rises only half an hour before sunrise, and can no longer be seen.

Venus is also morning star, in the same constellations as Mercury, but twelve or fifteen degrees west of him, so that she rises about an hour earlier. Though steadily growing fainter, she is still the brightest of the planets.

Mars is evening star in Aquarius and Pisces, and can be seen shortly after dark, as he sets about two hours after the sun. He is more than 200,000,000 miles from us, and is consequently inconspicuous, being only about as bright as the pole star. Jupiter is likewise an evening star. On the night of the 25th he is in conjunction with Mars, being half a degree south of him. The two planets can easily be seen just after dark, a little to the south of west. Saturn is in conjunction with the sun on the 1st, and is practically invisible throughout the month. At midnight on the 25th he is in conjunction with Mercury, at a distance of about three-quarters of a degree. By a singular coincidence, this conjunction takes place on the same day, and at the same hour, as that of Jupiter and Mars. In this case, however, the two planets are so far south, and so near the sun, that they can hardly be seen.

Uranus is morning star in Sagittarius, and rises at about 3 A. M. on the 15th. Neptune is in Gemini, and crosses the meridian at 8:36 P. M. on the same date.

THE MOON.

Full moon occurs at 11 A. M. on the 1st, last quarter at 5 A. M. on the 8th, new moon at 6 A. M. on the 16th, and first quarter at 6 A. M. on the 24th. The moon is nearest us on the 1st, and farthest away on the 15th. She is in conjunction with Uranus on the 11th, Venus on the 12th, Mercury on the 13th, Saturn on the 15th, Mars at 2 P. M. on the 18th, Jupiter at 10 P. M. the same day, and Neptune the 26th. The conjunctions with Jupiter and Mars are decidedly close. As seen from the northern United States, the moon passes north of both planets at a distance less than her own diameter.

Cambridge Observatory, England.

Another Mastodon Found in New York.

Near Hornellsville, N. Y., part of a skeleton of a great mastodon has been dug up. Some laborers were excavating near the village of Belvidere for the Pittsburg, Shawmut, and Northern Railway Company, and when about six feet down, one of the men struck what looked like a large bone. The foreman rescued the bone after it had been broken in two by the pick of a workman. Dr. Johnson, who is said to have been once connected with the Smithsonian Institution, pronounced it to be portions of a mastodon's rib. Further excavation brought to light three ribs and four vertebræ, making in all a section of the animal's back about eighteen inches long. Each of the vertebræ is 6 inches in width. These seem to be by far the largest mastodon bones of their kind ever discovered.

Curie's Refusal of the Medal of the Legion of Honor.

Prof. Curie has declined to accept the medal of the French Legion of Honor, despite the fact that the government offered it to him of its own free will, and not because of the solicitations of any friends of the Curies. The refusal comes all the more as a surprise, since Prof. Curie accepted the Nobel prize not so very long ago.