POSITION OF THE PLANETS IN FEBRUARY.

SATURN

is morning star until the 5th, when he becomes evening star. He is an interesting member of the solar brotherhood during the whole month, for he reaches and passes the great epoch that brings him nearest to the earth, and is seen under the best conditions for observation. This epoch is his opposition with the sun on the 5th at 5 h. 17 m. A. M. He then rises at sunset and is visible during the entire night. After opposition, he rises about four minutes earlier every evening. The beautiful planet may be readily found in the northeast, soon after sunset, a few degrees northwest of Regulus. Saturn rises on the 1st at 5 h. 23 m. P. M. On the 28th, he sets at 5 h. 38 m. A. M. His diameter on the 1st is 19″.2, and he is in the constellation Leo.

VENUS

is evening star. An important event in her course is her arrival at her greatest eastern elongation from the sun, on the 18th, at 2 h. 18 m. A. M. She is then 46° 36′ east of the sun, and, changing her course, retraces her steps toward him. Observers will soon perceive that she sets earlier, but at the same time her brilliancy increases as she approaches the earth, making her the peerless star of the February evenings. Venus sets on the 1st at 9 h. 2 m. P. M. On the 28th, she sets at 9 h. 43 m. P. M. Her diameter on the 1st is 20″.8, and she is in the constellation Pisces.

MERCURY

is evening star until the 14th, and then becomes morning star. He is in inferior conjunction with the sun on the 14th, passing between the sun and the earth, like the moon at new moon. This swiftly moving planet is visible to the naked eye during the first week of the month. He may be found in the west, three-quarters of an hour after sunset, about 7° north of the sunset point, setting on the 1st an hour and a half later than the sun. Mercury sets on the 1st at 6 h. 41 m. P. M. On the 28th, he rises at 5 h. 29 m. A. M. His diameter on the 1st is 7″.4, and he is in the constellation Aquarius.

JUPITER

is morning star, and is a conspicuous object in the morning sky, making his appearance in the southeast three hours and a half before sunrise, when the month closes. He will be recognized at a glance, for no neighboring star equals him in brightness. Jupiter rises on the 1st at 4 h. 31 m. A. M. On the 28th he rises at 3 h. 5 m. A. M. His diameter on the 1st is 31″.6, and he is in the constellation Sagittarius.

MARS

is evening star. Though near the sun, and far away from the earth, he is still visible, for he is moving northward, and on the 1st sets three hours after the sun. Mars sets on the 1st at 8 h. 5 m. P. M. On the 28th he sets at 8 h. 5 m. P. M. His diameter on the 1st is 4″.8, and he is in the constellation Aquarius.

NEPTUNE

is evening star. He is in quadrature on the sun's eastern side on the 17th at 6 h. P. M. Neptune sets on the 1st at 2 h. 7 m. A. M. On the 28th he sets at 0 h. 21 m. A. M. His diameter on the 1st is 2″.6, and he is in the constellation Taurus.

URANUS

is morning star. He rises on the 1st at 10 h. 56 m. P. M. On the 28th he rises at 9 h. 7 m. P. M. His diameter on the 1st is 3″.8, and he is in the constellation Virgo.

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

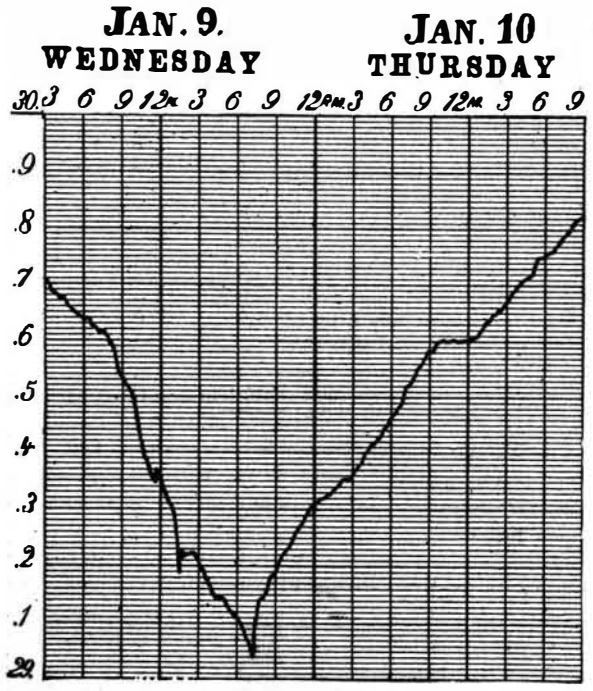
The Dread of Death.

Sir Lyon Playfair, in a letter to Junius Henri Browne, author of a paper in the New York *Forum*, for October, under the above title, says: "Having represented a large medical constituency (the University of Edinburgh) for seventeen years as a member of Parliament, I naturally came in contact with the most eminent medical men in England. I have put the question to most of them, 'Did you, in your extensive practice, ever know a patient who was afraid to die?' With two exceptions, they answered, 'No.' One of these exceptions was Sir Benjamin Brodie, who said he had seen one case. The other was Sir Robert Christison, who also had seen one case—that of a young girl of bad character who had a sudden accident. I have known three friends who were partially devoured by wild beasts under apparently hopeless circumstances of escape. The first was Livingstone, the great African traveler, who was knocked on his back by a lion, which began to munch his arm. He assured me that he felt no fear or pain, and that his only feeling was one of intense curiosity as to which part of his body the lion would take next. The next was Rustem Pasha, now Turkish Ambassador in London. A bear attacked him and tore off part of his hand and part of his arm and shoulder. He also assured me that he had neither a sense of pain nor fear, but that he felt excessively angry because the bear grunted with so much satisfaction in munching him. The third case is that of Sir Edward Bradford, an Indian officer now occupying a high position in the India Office. He was seized in a solitary place by a tiger, which held him firmly behind his shoulders with one paw and then deliberately devoured the whole of his arm, beginning at the end and ending at the shoulder. He was positive that he had no sensation of fear, and thinks that he felt a little pain when the fangs went through his hand, but is certain that he felt none during the munching of his arm."

THE RECENT TORNADO IN NEW YORK.

The accompanying illustration is a diagram from the Draper self-recording barometer in the SCIENTIFIC AMERICAN office. It shows the changes in atmospheric pressure during the tornado of January 9. I have compared this diagram with that of four other instruments located in different parts of New York City. They all substantially agree. These instruments were located at different points in a line nearly parallel to the course of the tornado and about a mile and a half distant from it. I had also four barometers directly before me in New York City at the time the tornado spent its fury in Brooklyn, and was observing one with a very large scale at the moment of the atmospheric disturbance—which was a sudden and violent squall, change of direction of wind, downpour of rain, and fall in temperature. The fall of the barometer was rapid, but the marked peculiarity was a sudden and instantaneous rise of six hundredths of an inch.

The fall of the mercury may be likened to the slow motion of cocking the hammer of a gun, and the rise to the motion of the hammer when the trigger is pulled. Or, to take what is probably an exactly parallel illus-



PHOTOGRAPH FROM THE SCIENTIFIC AMERICAN SELF-REGISTERING BAROMETRIC SHEET.

tration from another element, it is like the drawing away of the water from the banks of a narrow river before a large steamer, as shown in the upper Hudson, and the return of the big wave that follows. As far as I know, no observations have been made of the atmospheric pressure in the center of a tornado, and it is possible the ones we here refer to are the nearest that have ever been carefully observed. There must be an almost instantaneous change of pressure, and that such can occur is evident from the observation referred to.

Let us take the gas tank destroyed in Brooklyn as an illustration. According to the theory of Bernouilli, the difference of six hundredths of an inch would be equal to a wind velocity of forty miles an hour. This accords with the conditions at our point of observation.

A wind of eighty-two miles an hour, according to the same authority, indicates a difference of pressure equal to a quarter of an inch in the barometrical column.

Now this was about the progressive motion of the tornado that struck Brooklyn. When this rarefaction occurred over the gas tank, it exercised a lifting force of about eighteen pounds per square foot on the tank, which, with the lateral pressure of over thirty-three pounds to the square foot in a line with the direction of the storm, lifted, tilted, and overthrew the gas tank, allowing its contents to escape and ignite. We have omitted as an unknown quantity the rotary motion which ordinarily occurs.

Indications of such sudden rarefaction of the atmosphere have been noticed in Western tornadoes. Roofs have been lifted and the four walls all fallen outward. Buildings have also been lifted and moved without destroying them. Many reports that we know to be true seem to be almost incredible, but the greatest mystery is the tornado itself, for, as far as yet discovered, its central substance is simply air of less pressure than that which surrounds it. Yet it has a force of translation that moves it at a rate of over a thousand miles in twelve hours, holding it in a path of about one hundred yards in width, and destroying everything in its course.

It seems to have a self-generating power, and is not weakened by its own efforts, but becomes, like the Antæus of mythology, the stronger each time it touches the earth. When we consider the annual loss of life and property in this country by tornadoes, it is apparent that the subject is worthy of the deepest investigation. That people may be forewarned is evident by the fact that our own preparations for observation were made from reading the telegraphic reports in the afternoon newspapers; and by following these reports of its course, it was evident that the tornado was coming toward us at the rate of about eighty miles an hour, and that we had then over four hours to prepare for it.

JOHN C. GOODRIDGE, JR.

Edward Anthony.

In the death of Edward Anthony, which occurred on December 14, 1888, the photographic fraternity loses one of the oldest and foremost merchants in photographic materials in this country and city.

Mr. Anthony was born in New York City. He received a liberal education, graduating from Columbia College in 1838, with an excellent record for scholarship in all departments. Beginning active life, he chose the profession of civil engineering, and soon obtained employment in the corps engaged in building the Croton Aqueduct. Before the completion of the aqueduct, however, he was called to accompany Professor James Renwick on the survey of the northeastern boundary of the United States at the time of the dispute with Great Britain. When engaged in the construction of the Croton Aqueduct Mr. Anthony had amused himself as an amateur with the new art of making pictures by the aid of sunlight, then just introduced by the famous Daguerre. It occurred to Professor Renwick that Mr. Anthony's knowledge of this new discovery might be utilized on the survey, as England denied that there were any "high lands" on the line, as claimed by the United States. The testimony of the daguerreotype could not be controverted, however they might dispute that of the barometer and the spirit level. Mr. Anthony, accordingly, took with him the necessary apparatus and plates, and produced satisfactory images of the hills, which were forwarded to the State Department. This, it is said, is the first instance in which the art of photography was ever made use of by any government.

After finishing this survey, which occurred at a time of commercial depression, when most public works were stopped, Mr. Anthony took up the photographic business. Then after a short time he founded the house of E. & H. T. Anthony & Co., which soon reached the front rank of mercantile and manufacturing establishments in photographic goods.

He was one of the first to introduce commercially the daguerreotype in this country, and was very particular in supplying only the best materials for the purpose. It was but a short time ago that he showed us a daguerreotype made by himself in 1840, which was apparently as perfect and free from any sign of deterioration as when first made. The cause of his death was heart disease; he had reached the allotted age of three score and ten.

In stature he was a small, slim man slightly bent at the shoulders. It may be said of him that he was always a genial, affable, kind-hearted man, honest in all his business transactions, and ever ready to encourage those who sought to help themselves. His example will live in the memory of those who knew him as one to be patterned after.

Rats.

A writer in last month's *Chambers's Journal* repeats the method which is in quite general use here for the extermination of rats. These animals are the wisest of domestic vermin, and any means taken for their destruction is, as a rule, quickly discovered by them; if not, the terror alone engendered by the ever-diminishing tribe is sufficient to cause them to flee the mysterious power which haunts them. Taking advantage of this trait, the writer in question constructed a trap for the rats. This was a water barrel carefully concealed. On the top was a trap door (simply balanced by a pivot in the center), and beyond this some food was placed for which the rats had a strong liking. They could only get to this by walking over the door, and in order to entice them, the door was fixed for about a week; then the bolt was drawn, and for several nights a plentiful supply of drowned rats rewarded the ingenuity of the rat killer, and the remainder of the colony sought "fresh woods and pastures new."

THE relative hardness of woods is calculated by the hickory, which is the toughest. Estimating this at 100, we get for pignut hickory 96, white oak 84, white ash 77, dogwood 75, scrub oak 73, white hazel 72, apple tree 70, red oak 69, white beech 65, black walnut 65, black birch 62, yellow and black oak 60, hard maple 56, white elm 58, red cedar 56, cherry 55, yellow pine 54, chestnut 52, yellow poplar 51, butternut and white birch 43, and white pine 35.