dangerous excitement. One afternoon last week, when the doors were closed, Snider, the elephant keeper, unchained the biggest of the three, a monster elephant, standing 9 feet 1 inch high, weighing nearly five tons, and second in size only to the late Jumbo. This partiality so angered Tom, one of his mates, that he set up a vibrant trumpeting, jumping up and down angrily, and thrashing his trunk this way and that. A night or two before, he tore his iron-girdled, oak-framed cage to pieces, twisting and breaking the bars of inch iron as though only saplings. So ugly has he come to be, that it will probably be necessary to build an iron cage of double thickness for him.

POSITION OF THE PLANETS IN DECEMBER.

VENUS

is evening star, and heads the December list. Her size and brilliancy increase with every reappearance, as she treads her eastern path, and proves herself worthy of her title—the fairest of the stars. She will be near the moon on the evening of the 5th, star and crescent forming a charming celestial picture in the southwest. At the close of the month she sets more than three hours later than the sun. Venus sets on the 1st at 6 h. 46 m. P. M. On the 31st she sets at 7 h. 55 m. P. M. Her diameter on the 1st is 13".8, and she is in the constellation Sagittarius.

SATURN

is morning star, and takes the second rank on the monthly annals, for at the close of the month he will rise in the east about a quarter of an hour before Venus sets in the west. He may be known by his vicinity to Regulus, being on the 1st about 7° northwest of the star. Saturn rises on the 1st at 9 h. 44 m. P. M. On the 31st he rises at 7 h. 41 m. P. M. His diameter on the 1st is 18".8, and he is in the constellation Leo.

MARS

is evening star. The rapidly lessening distance between this planet and Venus is the interesting feature of his progress during the month. The two planets are 15° apart on the 1st, and only 1° apart on the 31st. Mars shins as a dim, ruddy star, northwest of Venus. He makes a close conjunction with the moon on the evening of the 6th, being 15' south. Mars sets on the 1st at 7 h. 59 m. P. M. On the 31st he sets at 8 h. 1 m. P. M. His diameter on the 1st is 5".6, and he is in the constellation Capricornus.

NEPTUNE

is evening star, and in his best position for telescopic observation. He may be found about 5° southeast of the Pleiades. Neptune sets on the 1st at 6 h. 16 m. A. M. On the 31st he sets at 4 h. 15 m. A. M. His diameter on the 1st is 2".6, and he is in the constellation Taurus.

URANUS

is morning star. A telescope will bring him into view about 3° north of Spica. Uranus rises on the 1st at 2 h. 54 m. A. M. On the 31st he rises at 1 h. 2 m. A. M. His diameter on the 1st is 3".4, and he is in the constellation Virgo.

MERCURY

is morning star until the 28th, when he is in superior conjunction with the sun, and takes rank among the evening stars. Mercury rises on the 1st at 5 h. 57 m. A. M. On the 31st he sets at 4 h. 31 m. P. M. His diameter on the 1st is 5".2, and he is in the constellation Libra.

JUPITER

is evening star until the 8th, and then morning star. He is in conjunction with the sun on the 8th, and so closely hidden in the sunbeams that he is of little account during the month. Jupiter sets on the 1st at 4 h. 46 m. P. M. On the 31st he rises at 6 h. 8 m. A. M. His diameter on the 1st is 30"., and he is in the constellation Scorpio.

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

PHOTOGRAPHIC NOTES.

Toning Blue Prints.—President C. W. Canfield, of the New York Society of Amateur Photographers, recently gave the following simple formula for toning blue prints, which he had taken from a French journal.

Make a solution of:

Borax	70 grammes.
Water	1100 c. c.

Add sulphuric acid in small quantities until blue litmus paper is turned slightly red.

Then add a few drops of ammonia until the alkaline reaction reappears and red litmus paper is turned blue. Lastly 10 grammes of red crude gum catechu is put into the solution and dissolved, occasionally stirring with a glass rod.

The prints should be printed a shade darker than is desired, and are then toned by immersing in the bath for about five to ten minutes, or until the color has changed. The blue changes to a dark olive green, which in the daytime has all the effect of black. The toning bath will keep indefinitely. Gum catechu can be had at any drug store, and in chemical composition is nearly 50 per cent tannin.

Toning Bath for Gelatino-Chloride Paper.—The following modification of a toning bath has been given by W. H. Stebbins, Jr., of the Amateur Photographers' Society of this city:

No. 1.

Acetate of soda (fused)	40 grammes.
Sulphocyanide of ammonia	20 "
Water	1000 "

No. 2.

Chloride of gold	1 gramme.
Water	1000 "

For use add to 200 grammes of solution No. 1, 60 grammes of No. 2.

Both solutions should be kept separate until used. Heretofore part of the gold solution has been mixed with the sulphocyanide solution, but the improvement consists now in keeping the gold by itself and adding the sulphocyanide directly to the acetate solution. The solutions keep better when prepared as described, and the toning commences as soon as the prints are put in the bath, producing in a few minutes —not over ten—beautiful purple tones.

Professor Tuson.

We regret to announce the death, at the age of fifty-six, of Prof. Richard Vine Tuson, who for the last twenty-eight years has held the post of Professor of Chemistry in the Royal Veterinary College, London.

Prof. Tuson began his scientific training under Prof. Graham, at University College, and was afterward assistant successively to Prof. Ronalds, in Galway, and Dr. Stenhouse, at St. Bartholomew's Hospital, in London. He was afterward elected Lecturer on Chemistry to the Medical School of Charing Cross Hospital, where he was universally popular with students and teachers. A few years later he tried for and obtained the professorship which he held until his death, which took place, in his house at Erith, on the 31st of October, 1888.

Prof. Tuson was a thorough chemist and an able teacher and experimenter. Various scientific papers stand in his name, but his most important literary labor was the new edition of Cooley's well known "Dictionary of Receipts," which he prepared with care and skill. He was a good and most amiable man, and his untimely death, from heart disease—which, it appears, had been making unsuspected progress in his system for years—will be lamented by a wide circle of friends. —*Chemical News.*

Electric Wires in New York.

In a paper read before the National Electric Light Association, Dr. Schuyler S. Wheeler, electrician of the Board of Electrical Control, says the total number of miles of underground wires already laid in New York is 3,697.

The number of miles of underground wire in Brooklyn is 2,100.

The number of miles of underground wire in Paris is 4,100.

The number of miles of underground wire in Chicago is 200.

The number of miles of underground wire in Boston is 400.

The number of miles of underground wire in Pittsburg is about 1,000.

There are already underground, in the city of New York, more electrical conductors than in any other city in the world (except Paris), while the capacity of the subway construction already finished in this city may be estimated fairly at something over 30,000 miles of conductors.

There are through lines completed from the Battery to the Park on the two principal thoroughfares of this city, Broadway and Sixth Avenue, and a gradual conversion of overhead lines to underground lines in the busy parts of the city may be confidently expected.

The Board of Electrical Control is not unmindful, however, of the magnitude of the labor and expense required in converting the present arrangements into underground systems, and does not contemplate either the hampering of the business of electrical companies by forcing unreasonable numbers of wires underground, or by attempting to compel the use of subways faster than is consistent with the efficiency of the various electric service to the public. If the great mass of overhead conductors are removed, and the remainder of the service brought to a condition which will insure the safety of the public, and, at the same time, the benefit of the companies themselves, it will be the result desired by the people of the city, and which the Board of Electrical Control is endeavoring to attain.

As to this matter of regulating the overhead service in the city, I may say that an investigation of all the wires overhead, instituted since I have been connected with the work of the authorities in charge of electrical matters here, by the inspectors appointed after a rigid examination, found competent for the purpose, has shown that a great deal of very bad and unnecessarily dangerous work has been done in New York, and that a reprehensible and inexcusable condition of overhead wires is the principal, if not the only, cause of the clamor for underground service.

In addition to this, an enormous quantity of wire and a large number of poles not in use at all exist, amounting, as has been variously estimated, to from a half to two-thirds of all the wire and poles in the city.

One has no idea of the aerial freebooting that is and always has been going on with overhead wires, until he spends some time seeing what there is overhead. The condition of wires in this city is simply outrageous.

The companies owning wires will not permit each other to make common use of the poles, but will chop off wires owned by others without notice. The telephone people object to the electric light wires on account of the induction. Where there is a line of light wires on their side of the street passing close to their poles, they will not allow them to be made fast. The result of the necessity thus made for extra poles is sometimes four lines of poles on one side of the street. Hence most of the wires swing close to or against the other poles to which they are not attached, and linemen, in climbing them, have to crawl through all the other wires which are not fastened to cross-arms.

Among the cases of dangerous wires and unnecessary obstructions found by the inspectors are full lines of large poles extending over miles of streets, filled with wires which are "open" and out of use, but left standing to save the expense of removal, long lines of poles left standing to preserve right of way, arc light day circuits within reach and with the insulation dropping off, and bunches of dead wires hanging from house tops, etc.

Testing Amber Varnish.

Commercial amber varnish is made by dissolving amber or colophony amber in linseed oil, varnish, and turps. In many cases it is made without the expensive amber, and an analyst is sometimes asked his opinion, whether a sample is genuine, viz., really made with amber. The best way is to try for succinic acid, although even a genuine article only contains small quantities of this substance, as a large quantity volatilizes during the heating of the varnish. The detection is, however, difficult, owing to the nature of the article. Neither boiling with hydrochloric acid nor treatment with alcoholic potash extracts any succinic acid. The author's plan is to treat the sample with nitric acid of 1·20 specific gravity.* He proceeds as follows:

Twenty grms. of the varnish are put into a flask of about 300 c. c. capacity, and heated on a sand bath with 50 c. c. of the nitric acid. When action sets in, the flask must be somewhat cooled to prevent a too fierce oxidation, when it may be again gently heated for about fifteen minutes. The acid, which holds all succinic acid in solution, is now poured off and the insoluble resinous mass washed with water. The acid is evaporated in the water bath, a little water being from time to time added. When the acid has been completely expelled, the remaining sirup is dissolved in about 10 c. c. of water, and this solution shaken with 100 c. c. of ether. After distilling off the ether, the residue is put in a watch glass and put under a desiccator. After about twelve hours, crystals of succinic acid separate out, and the amount gradually increases. The mother liquor being removed by means of blotting paper, the crystals may now be tried by the usual tests for succinic acid. It is thus possible to answer within twenty-four hours the question whether a sample of amber varnish is really deserving of the name.—*W. Sonne, Zeitschr. f. angew Chemie, No. 18; L. De K., The Analyst.*

Electro-Plating.

The following method for the electro-deposition of the heavy metals, such as platinum, iridium, palladium, etc., has recently been proposed by Professor Silvanus Thompson. The impure metal is first obtained as a chloride by the ordinary chemical processes. The excess of acid is evaporated off in a water bath, and the salt finally redissolved in distilled water and from ten to fifty times its weight of a solution of sodium phosphate either pure or mixed with borax. The solution is then raised to the boiling point, and sal ammoniac, common salt, or sodium bromide added. The solution is then reheated, and finally neutralized with either the carbonate or, if alkaline, with the bicarbonate of soda. In depositing the metal from a bath of the above solution, it should be heated to from 60 deg. to 90 deg. Cent., and the metal deposited in the ordinary way. In the case of platinum, a brilliant deposit can be obtained from a bath of the following composition:

	Parts.
Chloride of platinum	2
Sodium borate	16
" carbonate	16
Sal ammoniac	2
Water	150

* Note by abstractor.—May not some succinic acid be actually produced by oxidation of fatty matter?—L. De K.