volume, notwithstanding so much space is given to large illustrations. Many of the latter are extremely amusing. One of them (p. 85) represents a street in New York lighted by the Brush electric lamps. On the pavement are many mercurial New-Yorkers, waving their hats; and one is so much overcome with enthusiasm, that he turns his back upon the *fait accompli*, and walks away with bared head. Should not this engraving be entitled 'A street in Paris'?

Report on the International exhibition of electricity, held at Paris, August to November, 1881. By DAVID PORTER HEAP, major corps of engineers, U.S.A. Washington, *Government*, 1884. 287 p. 8°.

IT will be interesting to the visitor to the Philadelphia electrical exposition to compare his recollections of that exhibition with Major Heap's report of the Paris exposition of 1881. He will find in this latter work a short and concise account of the principal types of dynamo-machines, and will discover that the new forms which were exhibited at Philadelphia differ only slightly from those described by Major Heap.

The report does not pretend to contain any measurements or calculations, and was necessarily somewhat hastily prepared. The electrician, however, will find it a valuable addition to his library.

A B C de la photographie moderne. Par W. K. BURTON, C.E. Traduit de l'anglais par G. HUBERSON. Paris, *Gauthier-Villars*, 1884. 112 p. 12°.

As its name implies, this work is intended for the beginner in photography, but it contains many hints that those of longer experience might profit by. Beginning with the choice of apparatus, and the arrangement of the dark room, the whole process of photography is described, including both methods of development, to the production of the finished print. The most prominent defect of the work is that the chapters on printing are rather too brief: indeed, there is no description at all of the processes of mounting and burnishing. The chapters on the production of the negative, however, are excellent, as is the one on defects and their remedies.

NOTES AND NEWS.

PROFESSOR Mell, director of the Alabama weather-service, announces, that through the liberality of the chief signal-officer, and of several railways, daily weather-signals, predicting changes of weather and temperature, will be displayed at over one hundred telegraph-stations in that state. The predictions will be received by the director at an early hour every morning from the signal-office in Washington, and then promptly distributed along the railways. By paying for the cost of the signal-flags (about six dollars), any town or telegraph-station will receive free telegraphic warning of the daily weather-changes. Only about five minutes is required to set the flags. A similar system has been for some time in operation in Ohio and in part of Pennsylvania, and it will doubtless have farther extension.

— Herr Warburg has succeeded in electrolyzing glass by heating a piece of soda-lime glass to about 300° C., at which temperature it is a conductor, and placing it between mercury electrodes. It was necessary to use from fifteen to thirty Bunsen cells for a long period. He then found, that, at the anode side of the glass, he had a layer of silicic acid. This layer very quickly reduces the strength of the current, owing to its bad conductivity.

— We learn from *Nature* that a tunnel measuring about five thousand feet in length, and constructed at least nine centuries before the Christian era, has just been discovered by the governor of the Island of Samos. Herodotus mentions this tunnel, which served for providing the old seaport with drinking-water. It is completely preserved, and contains water-tubes of about twenty-five centimetres in diameter, each one provided with a lateral aperture for cleansing-purposes. The tunnel is not quite straight, but bent in the middle: this is hardly to be wondered at, as the ancient engineers did not possess measuring-instruments of such precision as those constructed nowadays.

— Heddebault has succeeded in separating rags of cotton and wool, mixed, by subjecting them to the action of a jet of superheated steam. Under a pressure of five atmospheres, the wool melts, and sinks to the bottom of the receptacle; while cotton, linen, and other vegetable fibres stand, thus remaining suitable for the paper-manufacture. The liquid mud which contains the wool thus precipitated is then desiccated. The residue, which has received the name of azotine, is completely soluble in water, and is valuable on account of its nitrogen. Moreover, its preparation costs nothing; because the increased value of the pulp, free from wool, is sufficient to cover the cost of the process.

— A Berlin correspondent of the *St. James gazette* writes that an engineer named Fisher is reported to have made an important discovery in aeronautics, by which he is enabled to condense or expand the gas in a balloon. The agent he employs is compressed carbonic acid, with the help of which he can ascend or descend at pleasure. This perpendicular movement puts it in the power of the aeronaut to go up or down until he finds a current of air moving in the horizontal direction he wishes. Military critics attribute great importance to this discovery, because in time of

war a balloon will be able to reach the enemy's territory, and ascend again, without requiring a fresh supply of gas.

— Weill, who has spent many years on his experiments, has, it is said, at last succeeded in coating instantaneously all the ordinary metals and their alloys with a thin film of brass, which can be varied in color. He uses only a single battery-cell, and obtains at will solid deposits of various hues and brilliancy. The tints are stated to be due to the formation of copper oxides, the composition of which has not yet been determined.

— *Nature* states that the *Globus* reports the discovery of the ruins of an ancient city near Samarkand. They are situated upon a hill which was doubtless a fortress formerly. Remains of utensils and human bones have also been found. According to Arabian sources, the large city of Aphrosiab existed there in the time of Moses: it was the royal residence; and the king's castle stood on the hill, and was provided with subterranean corridors. The result of the excavations shows that the ruins are indeed those of a very ancient city. The various depths, however, differ widely. In the lower ones fine glass objects are found, which are quite absent from the upper ones. The lowest layers contain remains of a very primitive nature, i.e., coarse implements of clay and flint. The excavations are being continued. News from Turkestan announces the discovery of another ancient city. Achsy, on the right bank of the Amu Darya. Remains of brick walls and other buildings are said to be visible in considerable numbers.

— The December number of the monthly meteorological charts of the North Atlantic, described in *Science*, iii. 654, was recently issued by the Hydrographic office, completing the set. It is announced that work in a similar direction has been begun for the South Atlantic.

The November number of the North Atlantic pilot chart is also just published. The bark Ethel Blanche continues its zigzag way across the ocean, being now reported for the sixth time. Two storm-tracks are charted, one of tropical origin, noteworthy in not advancing west of longitude 58° west, before turning to the north-east: the other storm seems to have left our shores near Charleston, and then spent four days in turning round a sharp loop, and recrossing its path, before finally moving away to the north-east.

— After thirty-three years of duty, Gen. Isaac F. Quimby has been compelled by ill health to retire from the professorship of mathematics and natural philosophy at the University of Rochester.

— Ensign J. J. Blandin, U.S.N., has been ordered by the navy department to the Johns Hopkins university, for a course of study in physics and chemistry.

— L. R. Hammersly & Co. of Philadelphia announce a work on Indian sign-language, by the late Capt. W. P. Clark, U.S.A.; and E. & F. N. Spon announce a practical treatise on the manufacture of bricks, tiles, terra-cotta, etc., by Charles Thomas Davis; also a new book by I. Lothian Bell, entitled 'Principles of the manufacture of iron and steel, with some notes on the economic condition of their production.'

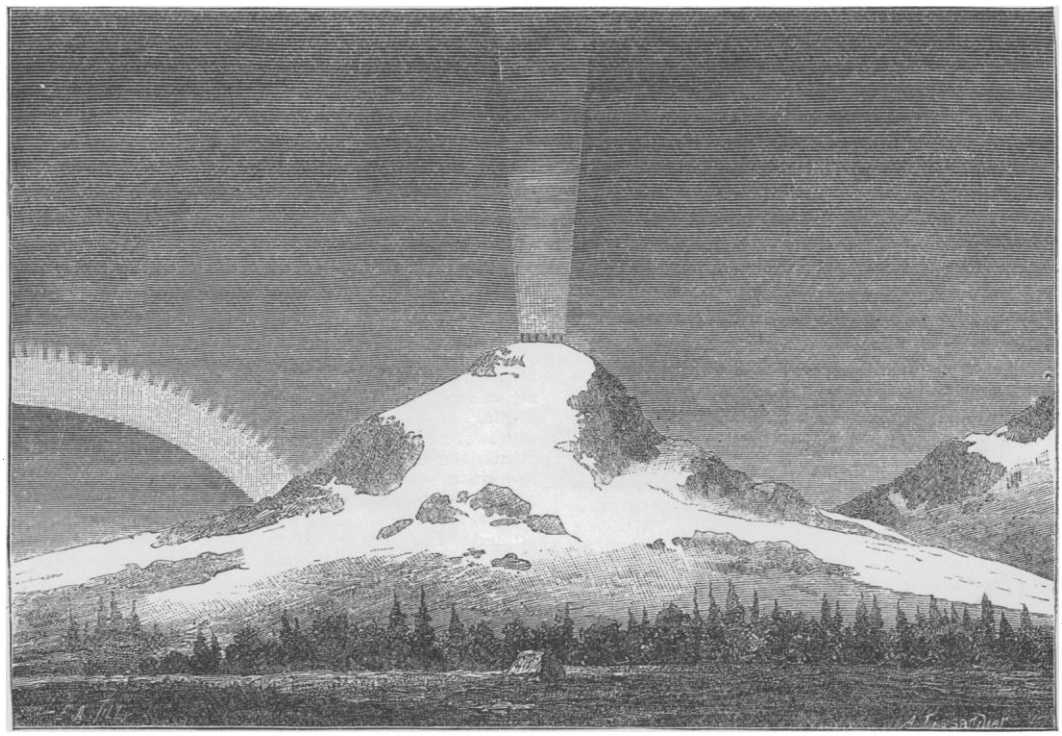
— Capt. Kostovich of the Russian navy proposes the use of a small captive balloon, to which an Edison lamp is suspended, for night signalling. By the aid of connecting-wires, the lamp may be lighted and extinguished at will, and the apparatus may thus be used with any of the codes in vogue.

— The report on the prizes offered by the Berlin royal academy of sciences was read at the July meeting. The Steiner prize for geometry was not granted, as no essay reached the required standard of excellence: the grant was therefore postponed until March 1, 1886, when it will be offered for the best geometrical treatise written in German, Latin, or French. One prize has, however, been accorded to Professor Fiedles of the Zurich polytechnic school, for his work in geometry. The subject for the Cothenius prize is, "By personal experiment and chemical research to ascertain the assimilation process of plants in light, and by direct proof show in the plant-fibres the primary assimilation products of the carbon in plants, distinguishing them from the similar products of transformation in the change of matter in the cells, and showing its chemical nature." As some approximate solution of the problem, a clear demonstration will be accepted of the present ideas on the assimilation process of plants, and the primary organic generations thereof by repetition of the series of observations and researches already made, and an important extension or limitation thereof. The Diez prize of the academy, of two thousand marks, has been granted to Professor Pio Rajna of Florence, for his work on the origin of the French epic.

— It is reported, says the *Engineer*, that the attention of the Indian government has been drawn to a tree in southern India, from which large supplies of caoutchouc can be drawn. This is the 'Teichmig' of the Chinese, or Prameria glandulifera of botanists. Unlike the South-American tree, from which the caoutchouc is tapped by piercing the bark, the gum is obtained from the new source by breaking the boughs, and drawing it out in filaments. If the new caoutchouc is at all equal to the old in insulating-properties, it will form a timely discovery; for the introduction of electric lighting has created an increased demand for india-rubber coated wires. Indeed, several inventors have lately been engaged in trying to manufacture a substitute for gutta-percha and india-rubber out of oxidized oils; that is to say, oils treated with chloride of sulphur, mixed with asphalt, ozokerit, and other insulating substances.

— The effect produced by Mr. Selim Lemström in his experiments on the artificial production of the aurora is well shown in the illustration on the next page, from a drawing by Mr. Lemström. On the top of the mountain a wire was stretched on poles, and furnished at every foot or two with brass points. This wire was several miles in length, and was carried over the top of the hill in the form of a spiral.

The poles were supplied with sulphuric-acid insulators in order to prevent, as far as possible, the creeping of electricity over their surfaces. From this insulated system of points a wire was run to a ground-connection at a lower level, perhaps from five hundred to a thousand feet below. If the ground-connection had been made on the same level, no current would have been observed; but when there was a difference of level, even if not more than thirty feet, a current was always observed from the higher point to the lower. The luminous effects portrayed in the cut



A VERTICAL SHEAF OF LIGHT OBSERVED, DURING A DISPLAY OF THE NORTHERN LIGHTS, ABOVE A SYSTEM OF WIRES ON THE TOP OF PIETARINTUNTURI, NEAR KULTALA, FINNISH LAPLAND. (Reproduced from *La Nature*.)

were only visible to the naked eye when there was a marked display of northern lights; although by the aid of the spectroscope, which would show the peculiar spectrum of auroral light, the existence of the streamer could often be proved.

— Balbiani, professor at the Collége de France, was commissioned a short time ago, by the minister of agriculture, to report upon the best mode of destroying the winter eggs of the Phylloxera, as it has been found that it is in this way the progress of the parasite is very materially checked. Professor Balbiani reports that three methods have been employed, — the mechanical destruction of the eggs by barking the vines, boiling water, and rubbing the vines with preparations calculated to burn up the eggs. The first-named of these methods has been tried in several vineyards near Bordeaux, the workmen rubbing the stocks with a chain-steel glove; but the results are not satisfactory, as it is only the old wood which can be treated in this way. The use of boiling water would produce excellent results but for the fact that it is open, more than any other process, to carelessness in application; and that neutralizes all its good effects. The rubbing of the vines with a preparation composed of nine parts of coal-tar to one of oil was open to the objection that the coal-tar got so thick in cold weather that it could not be applied, and the cost of heating it again was considerable. Several vine-growers tried to liquefy the mixture by adding fifteen per cent of turpentine; but this, when applied, killed the vines altogether. Balbiani tried several fresh experiments, among others a mixture of oil, naphtha, quicklime, and water. This mixture has been tried upon a very large scale in the vineyards of the Lot-et-Garonne and the Loir-et-Cher; and it possesses, according to Balbiani, the double recommendation of being effectual and cheap, as the cost is under a franc for a hundred stocks.

— A Washington correspondent informs us that it was the Mohave and not the Zuñi women whom Dr. Tylor mentioned, at a recent meeting of the anthropological society of Washington (see *Science*, p. 448), as wearing bark skirts.