

ELECTRICITY AT HIGH PRESSURES.

Prof. Elihu Thomson, of Lynn, Mass., gave an entertaining lecture on the above subject on March 29, before the New York Electrical Society, at the house of the American Society of Civil Engineers, in this city, and exhibited a new form of apparatus which was very effective in producing electricity of a high potential. He described how, years ago, he became interested in frictional electric machines; how, as a boy, the frictional electrical phenomena attracted his attention; and explained how the apparently inert electricity bound on the surface of a sheet of hard rubber is made to manifest itself by rubbing the surface with fur or silk. This peculiarity was still more marked by coating a smooth dielectric plate with varnish, letting the varnish dry, then stripping it from the plate. This film, in the act of being stripped, becomes electrified, disturbing the electricity bound on the surface of the plate.

The principle of the influence electrical machine was the same, only on a larger scale, the breaking of the cleavage being continuous. He described the hydro-steam method of accumulating electricity of high potentials, and showed that it was due to the friction of an aggregation of globules acting on one another. This led up to an explanation of the production of electricity in thunderstorms, wherein the circular forms of clouds, known as thunderheads, collect, and intensify their electrical tension much in the same way. They being of one electrical polarity discharge with high pressure to the earth or other clouds of horizontal formation of the opposite polarity.

The estimated voltage of a lightning discharge was from twenty to fifty million volts. Influence machines have come into much request since the X-ray discovery. A Prof. Williams, of Boston, had constructed one, the glass disks of which were 6 feet in diameter, and produced a spark 7 feet long. Using this machine in connection with an X ray tube, physicians were able, in an examination of the lungs, to detect the presence of the pneumonia microbes before any symptoms of that disease were felt or were indicated by the patient, and X-ray photographs could be taken in a fraction of the time ordinarily required.

The utility of high pressure currents was in the saving of copper in transmission lines; and as the price of copper was advancing, means for controlling and securing the most economical results in the use and disposal of such currents demanded the attention and consideration of electricians. Up to the present time it was practical to transmit high pressure currents a distance of 83 miles, using a pressure of 50,000 volts. If a voltage higher than that was used, the electricity would escape from the wires into the air in the form of small, luminous blue flames. If a conductor is put within two inches of such highly charged wires, a discharge will take place. These peculiarities of high pressure currents make it difficult to control and measure them. He described a special form of meter for measuring such currents.

He exhibited and explained a new form of induction coil for producing currents of high tension. It consisted of an inner copper cylinder having parallel glass tubes about a quarter of an inch in diameter longitudinally on the surface. Over this is wound the fine wire of a secondary coil in one layer, the ends being duly insulated at one end. The wire is thus insulated from the metal cylinder. The secondary coil and cylinder are then set on end into a glass jar containing oil. A primary coil of coarse copper wire, having a diameter of about one inch larger than the interior secondary coil, is next set into the jar surrounding the secondary coil. The oil insulates the two coils, and this Prof. Thomson found was very effective in using heavy currents.

One of the most interesting experiments of the evening was the exhibition of the new "Wehnelt Electrolytic Interrupter," invented by Dr. A. Wehnelt, of Charlottenburg, Germany, and how it may be utilized. The interrupter is inserted in the primary circuit of an induction coil, no condenser being needed in the latter. Briefly, it is made by suspending in an electrolyte solution a platinum wire, all except a half inch of which is insulated from contact with the solution, and a lead plate about a half inch or more below the platinum anode; one wire is carried to the platinum wire and the other to the lead plate.

When the current from a strong battery or one of 110 volts is sent through the primary circuit, immediately a peculiar high-pitched hissing sound is noticed coming from the glass jar holding the interrupter, and soon a peculiar-looking electric flame flows between the ball terminals of the secondary coil. It is evidently an interrupter of high frequency and remarkably simple. The theory of its action was explained as follows: On closing the primary circuit, a film of gas is formed at the platinum terminal, enveloping it like a wall, which breaks its contact with the electrolyte fluid; the gas then escapes, contact again occurs and vibrations of wonderful frequency continue.

By another arrangement, he was able to vary the strength of the current and produce different sound notes, enough to indicate a tune. Still another appli-

cation was the placing of a coreless electro-magnet in the center of a wood resonator in the form of a box.

The closing of the primary circuit caused this magnet, located in the secondary circuit, to vibrate rapidly the back of the resonator, and produce a sound almost as intense as a whistle. Prof. Thomson suggested that with a contrivance of this character the usual compressed air whistle of the present electric cars could be dispensed with. The audience was very enthusiastic over these experiments. His last experiment illustrated a combination of electrical machines or features by which a low voltage of 60 volts was intensified to several thousand volts. A motor dynamo was operated by the usual 110 volt current; this produced an alternating current of 60 volts, which went into a step-up transformer, and from that the higher induced current was led to a series of vertical Planté condensers. Under these was a revolving frame rotating with the speed of the motor which alternately put the condenser plates in series or parallel.

This frame came within a quarter of an inch of the lower ends of the condenser plates. The induced current was highly intensified as a consequence, and sparks two feet long were readily obtained. He remarked that it was a sort of "multum in parvo" arrangement for the lecture room, and by it he was able to secure the same results as if 1,000 storage battery cells had been used. It was the very latest device of the kind he had built. Altogether the lecture was highly instructive and interesting.

DEATH OF GENERAL FLAGLER.

Brigadier-General Daniel W. Flagler, Chief of Ordnance, United States Army, died at Old Point Comfort on March 29. He was born in New York in 1835 and graduated from West Point in 1861. He entered the army as a second lieutenant and served during the Civil War, first in drilling volunteers at Washington and then with the Ordnance Department. He became Assistant Ordnance Officer at the Alleghany Arsenal; later he became Inspector of Ordnance in fitting out the Mississippi River flotilla and Chief of Ordnance to General Burnside's expedition to North Carolina. He had charge of the transportation of siege guns and occupied other positions, such as inspector at the West Point foundry and as assistant to the Chief of Ordnance. His services were not altogether in the foundry and office, for he took part in the battles at Bull Run, Roanoke Island, New Berne, Fort Macon, Summit Mountain, Antietam, Fredericksburg, Chancellorsville, and Gettysburg. At the close of the war he was breveted Lieutenant-Colonel for distinguished services in the field. After the war was finished he made a tour of inspection of the Western arsenals with the Chief of Ordnance. He held important positions in various arsenals and armories until he was appointed Brigadier-General and Chief of Ordnance on January 23, 1891. He was regarded as one of the greatest ordnance experts in the country, and the reports of the Chief of Ordnance which were issued by his bureau are most valuable reference books. The army has suffered a distinct loss in the death of General Flagler.

THE AUDUBON SOCIETY.

The annual meeting of the Audubon Society of New York State was held in the lecture room of the American Museum of Natural History on March 23. An illustrated lecture on birds was given by Prof. A. S. Bickmore, and in the absence of President Morris K. Jesup, Mr. Frank M. Chapman, chairman of the executive committee, presided. An interesting letter was read from Governor Roosevelt, in which he stated that he sympathized with the purpose of the society, saying that he did not understand how any man or woman can fail to try to exert all influence in support of such objects as those of the Audubon Society. He said in conclusion, "When I hear of the destruction of a species I feel just as if all the works of some great writer had perished, as if we had lost all instead of only a part of Polybius or Livy." Rev. Dr. Henry Van Dyke sent a letter, in which he said the sight of an aigrette filled him with a feeling of indignation, and pity at the skin of a dead song bird stuck on the head of tuneless women made him hate the barbarism which lingers in our so-called civilization. The great singer Madam Lili Lehmann was introduced as a distinguished and loyal friend of birds, and she made an excellent address which was very much to the point. She said that in Europe there were many societies for the protection of birds, and they all worked in harmony, and any person could become a member of those societies upon the payment of a nominal sum, equivalent to two or three cents, the main purpose being to enlist all kinds of people in the movement for the protection of birds. She said that she was sorry to learn that there were no places in Central Park expressly for the purpose of feeding birds. She had eight such places in her garden where the birds may come and be fed. She said there were 25,000,000 useful birds slaughtered annually for use on women's bonnets, and that farmers were already suffering from it and that "women enjoy wearing feathers like savages." Flowers and ribbons were a thousand

times more beautiful and more becoming. It is the duty of every woman to battle against this gawsome folly. For years Madam Lehmann's hats have not had feathers. Mr. Chapman stated that the widespread use of the quills of the brown pelican for hat trimmings was fast bringing about the extinction of that species.

SOME NEW KITE EXPERIMENTS AT BAYONNE.

Mr. W. A. Eddy, of Bayonne, N. J., has recently tried some interesting kite experiments, and on March 25, at 4 P. M., he made partly ready a hot air balloon for an ascension, but the wind and snow increased so rapidly that the air pressure on the side of the partly inflated balloon broke the pole which was being held in position, so that the balloon experiments with an electric wire and Leyden jar had to be deferred. The cost of the balloon is defrayed by the Hodgson fund of the Smithsonian Institution, and its purchase was authorized by Prof. S. P. Langley, secretary of the Institution. A kite-sustained thermometer was sent up at 5:10 P. M., however, notwithstanding the mingled snow and rain. It was finally hauled down at 7:45 P. M., a test of temperature being made at heights of 200, 400 and 600 feet. The air at the 600 foot level was found to be 28° above zero as compared with 31° above zero at the earth. At 200 feet the air was found to be 1° warmer than at the earth. The experiments demonstrated that during mingled rain and snow there is an intermediate layer of warm air a short distance aloft, but higher up it is colder. The coolness was greater than the normal, indicating cooler weather.

TESTS OF WIRELESS TELEGRAPHY.

Signor G. Marconi, the inventor who recently obtained permission from the French government to establish a station on the French coast for the purpose of experimenting with wireless telegraphy between England and France, announces that he has conducted successful experiments between South Foreland, in Kent, and Wimereux, near Boulogne, France, the distance being thirty-two miles. Thus far the experiments have been highly successful and the messages have passed with ease. Signor Marconi personally superintended the test. The London Times received the first wireless press message across the Channel. The Morse code was used. The French government officials, who have been watching the experiments, have been very favorably impressed. The messages received were read at the South Foreland Lighthouse with no more difficulty than those transmitted by cable. In the SCIENTIFIC AMERICAN SUPPLEMENT, No. 1213, there is an important paper by Signor Marconi which gives some of the latest results of his experiments.

FOREIGN EXHIBITIONS OF 1899.

Usually the year before and after a great international exposition there are a number of smaller expositions. This is the case in the present year, and will also be the case in 1901. There will be an exposition in Western Australia, at Coolgardie, beginning in March, and intercolonial in character. On June 14, the Provincial Exposition of East Flanders will be held at Ghent. There will also be a department for foreign exhibits. The International Electrical Exposition and Congress of Electricians will be held at Como next summer, in honor of the birth of Alessandro Volta, the discoverer of the electric battery. The exposition will commence on May 15 and will continue until October 15.

CONGRESS OF LIFE INSURANCE DOCTORS IN BELGIUM.

The first international congress of doctors connected with life insurance will be held at Brussels from September 25 to 30, 1899. There will be representatives from all over Europe and the United States. It is proposed to establish universal formulas for the examination of persons desiring to be insured. As a result of the congress, it is hoped that permanent offices will be created in every country, composed of five medical members, who will see that the decisions of the congress are strictly observed.

AN UNDER-TROLLEY CAR BURNS UP.

A Sixth Avenue electric trolley car caught fire on March 28, in the Fiftieth Street car house of the Metropolitan Street Railway. The current had been shut off when the car was run into the car house, but the plow was still connected with the current, and this is supposed to have caused the fire. An alarm was turned in and Battalion Chief Binns, who was the first man to get aboard the car, received so severe a shock that he was unable to continue directing the work of putting out the fire.

SPAIN'S NEW CRUISER.

The cruiser "Rio de la Plata," the money for whose construction was subscribed by the Spaniards of South American countries, has been completed at Havre and will shortly be delivered to the Spanish government.