ELECTRICITY.

The Electrical Show which was opened last week in Boston was the first of its kind in New England. It was the result of co-operative action on the part of a number of large manufacturers. Unlike other exhibitions, there were no articles for sale. The decorations were unusually artistic, and the exhibition was an unqualified success.

The first single-phase electric railway in Norway has recently been built, connecting Thamshaven and Lokken. It derives its current from a hydraulic generating plant near Thamshaven, which generates three-phase current at 15,000 volts. This is converted into single-phase current at 6,000 volts for use on the electric railway. The line was built for the purpose of developing ore deposits in the region and for the convenience of tourists.

A novel electric arc lamp has recently been designed, in which the carbons are formed out of plastic material in the lamp itself. The lamp is provided with two receptacles in which the plastic material is placed, and this is fed through tubes to form the two electrodes of the arc. The ends of the electrodes are baked by means of electric heating coils, and the process is a continuous one. The gas generated as the material is heated is utilized to press the material into the electrode-forming tubes.

It is customary in Europe to place a netting under high-tension lines at railroads and important street crossings. As a further protection at such points, an inventor has recently devised a safety suspension in which the line is divided into three parts at the crossings and supported on three insulators, any one of which will bear the entire weight of the line at that point in case the others should be fused or broken. The German Post Office Department has approved of this system, and permits its use at crossings.

Governor's Island, New York, is to be provided with an electric fire-fighting plant. Heretofore there has been no apparatus for fighting fire except that carried by the small ferryboat that plies between the island and the Battery. Not long ago a fire took place while the boat was on its way to Manhattan, and before its return much damage was done. This demonstrated the necessity of providing the island with a fire engine of its own. The equipment that is to be installed consists of a turbine pump throwing a four-inch stream and operated by an electric motor.

The Canadian government has been petitioned to allow a Canadian power company to build a dam across the St. Lawrence River near Cornwall. This concern is associated with an American company. It is their plan to dam the South Sault channel at first, to obtain 65,000 to 70,000 horse-power. Later it is expected that a dam will be built across the main channel. This dam would not interfere with the Cornwall Canal. However, the plans provide for the building of a lock, through which at a single lift of 40 feet vessels could pass the rapids.

The work of extending the electric zone of the New York Central Railroad as far as North White Plains is proceeding quite rapidly, and it is expected that by the first of the year it will be in full operation. The temporary terminal at Wakefield, where steam and electric locomotives are interchanged, will then be abandoned. A new sub-station is being erected at Tuckahoe, and another one at White Plains. Each will be equipped with three 1,000-kilowatt rotary converters and nine single-phase transformers of 375 kilowatts capacity each.

Working on the theory that earthquakes are preceded by an electro-magnetic disturbance, an Italian scientist has devised an instrument which gives warning that an earthquake is about to occur a few minutes before the disturbance is felt. With this instrument the inventor, Padre Maccioni, received warning of two earthquake shocks that occurred about ten miles from his laboratory four minutes before the earth waves affected the seismograph. The instrument is connected to a clock, and is so arranged as to record the time elapsing between the arrival of the electro-magnetic wave and the seismic waves.

One of the drawbacks to using Roentgen rays to photograph living subjects has been the fact that a time exposure was required. In order to overcome this difficulty, a German inventor has devised an induction coil which produces one sudden and very intense spark, and this makes it possible to take an instantaneous radiogram. The effect is produced by using a fuse in place of the interrupter in the primary circuit, and this is melted when the proper intensity of the current is reached, thus very suddenly breaking the circuit and producing an intense discharge. The exposure is from 1/50 to 1/120 of a second; and as it is a simple matter to replace the fuse, a large number of exposures can be made in the course of an hour. The fuse consists of a small silver or copper wire.

SCIENCE.

The United States Geological Survey reports that in 1908 California produced $18,761,559 in gold, 1,647,278 ounces of silver valued at $873,057, and 706 ounces of refined platinum valued at $13,414. This platinum was all produced at placer mines in Butte, Humboldt, Siskiyou, Trinity, Calaveras, Sacramento, and Del Norte counties, three-fourths of it having been mined in Butte County.

On the suggestion of Prof. Tissot, of France, an international commission has been organized for the purpose of transmitting wireless time signals from stations suitably located on coasts and islands to vessels navigating all waters. The establishment of this system would make the determination of longitude at sea very accurate and independent of the errors of the chronometer, which, indeed, would become superfluous. For transmitting the time signals Tissot recommends the wave length of 1,800 meters, or about 5,900 feet, which is used at the Eiffel tower station.

Eusapia Paladino, the Italian spiritualistic medium, who recently arrived in this country, has given some evidence of her powers. The phenomena of her first *séance* were the familiar physical phenomena of spiritualism. That is, they consisted of table rappings and levitations. Although considerable skepticism prevails as to the honesty of the medium, it must be admitted that she has not been latterly detected in fraud. Many years ago she was caught in petty tricks, which have by no means thrown her into discredit, because they seemed to have been due to involuntary actions in the trance condition. Whether or not her more recent performances are genuine, we are not prepared to state. Certain it is, that her performances should be studied with scientific care.

Last year a small lot of shelled corn of a kind new to this country was sent to the Department of Agriculture from Shanghai. It proved to have qualities that may make it valuable in breeding a corn adapted to the hot and dry conditions of the Southwest. The plants raised in the test averaged less than six feet in height, with an average of twelve green leaves at the time of tasseling. The ears averaged 5½ inches in length and 4 1/3 inches in greatest circumference, with sixteen to eighteen rows of small grains. On the upper part of the plant the leaves are all on one side of the stalk, instead of being arranged in two rows on opposite sides. Besides this, the upper leaves stand erect instead of drooping, and the tips of the leaves are therefore above the top of the tassel. The silks of the ear are produced at the point where the leaf blade is joined to the leaf sheath, and they appear before there is any sign of an ear except a slight swelling.

It is not an uncommon thing for corrosion and oxidation of bright steel objects to be caused by the presence of injurious substances in paper. This may be due either to free acids or chlorine compounds, or more frequently, especially in the case of hard-sized paper, to the excessive use of aluminium sulphate, which is gradually dissociated by atmospheric influences. Another drawback associated with certain kinds of paper is the blackening (due to formation of sulphide) which it produces on articles of silver or copper. Owing to the growing use of paper of wood pulp prepared by digestion with sulphur compounds this blackening action is more prevalent now than formerly. In fact, it is asserted by Herr Klemm, in a recent investigation of this subject, that most, if not all, unbleached wood pulps of the sulphite and sulphate class contain traces of sulphur compounds that have a blackening action upon silver or copper; and that even bleached pulps may contain minute quantities of similar substances. Unbleached pulps prepared by the caustic soda process and mechanical wood pulps, however, are generally free from these sulphur compounds.

Capt. Roald Amundsen, the discoverer of the Northwest Passage, arrived in the United States recently. Capt. Amundsen has come here to make preparations for an expedition to the Arctic which he calculated would keep him away from civilization probably more than five years. His primary object will be to explore the ocean depths of the region, to study the currents and temperatures and the character of the ocean bottoms. He will start from San Francisco in July, 1911, in the 400-ton gasoline auxiliary schooner "Fram," which was used by Nansen in his trip to the North. The Norwegian government has put up $20,000 for the expedition and there have been many private subscriptions from well-to-do Scandinavians interested in polar exploration and desirous of having their own people win the glory of discovery. Capt. Amundsen says his calculations in regard to the drift of the "Gjoa" were verified by events, and that he believes that the "Fram" will take the course that he is confident the drift will force her to take. He can assist in making that course pretty nearly across the pole by the use of his gasoline engine at periods when the pack will permit him to steer.

AERONAUTICS.

On October 23d, M. Bleriot made two flights with his monoplane of 22½ and 17 minutes duration at Vienna. After the first flight he was presented to the Austrian Emperor, who was greatly interested in his machine. From Vienna M. Bleriot went to Bucharest, and made some flights before the King of Roumania.

Recognizing that in order to see flights by the daring French aviators substantial cash inducements must be offered, the people of Los Angeles, Cal., have raised $50,000 for prizes to be competed for by leading aviators of France and America at an aviation meeting to be held on the Pacific coast in January. Paulhan, Delagrange, and several other of the French aviators have agreed to compete, according to cable dispatches.

Before leaving New York for their home in Dayton, Ohio, a few days ago, Orville and Wilbur Wright entered the French consul's office in New York late one afternoon and received from France's representative crosses and diplomas of the Legion of Honor. Not until several days later did Miss Katharine Wright accidentally discover in one of her elder brother's pockets the decoration that is so much prized and sought after by distinguished men here and abroad. So engrossed was he in business relative to his aeroplanes that he had forgotten to mention it to his sister.

The flying of model aeroplanes for prizes, which has been done almost weekly for some time past at the meetings of the Aeronautic Society, has been taken up by quite a number of boys in New York city, who have made some excellent records at this interesting and instructive sport. Contests are held weekly under the auspices of the West Side Y. M. C. A., where Wilbur R. Kimball, E.E., is giving a course of lectures upon aeronautics. Cups have been given as prizes by Mr. Louis R. Adams and by Mr. Wilson Marshall, whose 12-year-old son, Wilson Marshall, Jr., has won two legs of the Adams trophy with a biplane model of the Wright type. Propelled by a rubber band motor, this model, the planes of which are about 3 feet long, covered 64 feet 9 inches in its longest flight.

Although Farman and Paulhan have quite frequently taken their wives on flights in their Farman biplanes, neither of these ladies has essayed to fly alone. It has remained for the Baroness de la Roche to become the first aviatress. After receiving several lessons from M. Chateau, the instructor employed by the Voisin Frères at Chalons, the Baroness made a short initial flight of about 300 yards. The following day this titled lady flew twice around the parade ground—a distance of about 4 miles—in a rather gusty wind. After the first few turns she was able to fly the machine without any trouble whatever, and seemed to have the biplane under perfect control. This flight gave a good demonstration of fairly good automatic stability secured in the Voisin machine by the use of vertical partitions between the main surfaces and in the tail. In America a Curtiss biplane is reported to have been sold to a wealthy lady in Florida.

The "Parseval III." airship, which has been at the Frankfort Aeronautical Exposition the past summer, made a grand tour above south Germany from October 12th to 16th, in the course of which it passed over Nuremberg, Augsburg, München, and Stuttgart. The 135 kilometers (83.8 miles) from Nuremberg to Augsburg *via* Treuchtlingen, Mannheim, and Donauwörth was covered in 3¾ hours at an average speed of 22 1-3 miles an hour. On the return journey in a straight line on October 14th, however, the airship is said to have covered about 37 miles in an hour. This very much greater speed on the return journey was perhaps due to more favorable conditions and to the forcing of the airship at its limit of speed throughout the shorter distance. That its speed is superior to that of the "Zeppelin" has been testified to by a well-known American aviator who took a trip in the latter last summer and said that the "Parseval" readily passed it; although the "Zeppelin" airship made but 25 miles an hour according to his timing.

Herr Hans Grade, the first German aviator to fly successfully with a monoplane of his own invention, and whose machine was shown in flight in our issue of October 23rd, has at last won the Lanz prize of $10,000 for the first kilometer flight by a German-built and piloted aeroplane. After first performing the required flight in 3 minutes 31 seconds above the Mars field at Bork on October 17th (besides which he made three other flights of 6 minutes 20 seconds, 48 seconds, and 2 minutes 20 seconds on the same day), Herr Grade took his monoplane to the aviation field at Johannisthal (where the flight for the prize was required to be made) and won the prize in short order on the 30th ultimo. The following day he made three flights of 3¾, 14½, and 5 minutes' duration respectively, and a fourth flight in which he made one circuit of the field. The motor used by Herr Grade is a 4-cylinder, V-type, air-cooled motor of his own invention, which develops 24 horse-power and weighs 77 pounds. It makes 1,200 to 1,400 revolutions per minute and carries the propeller upon its crankshaft.