

Franklin, partly by its own efforts, but largely through the relief expeditions sent out later. The Franklin party, consisting of 129 men in two vessels, wintered at Beechy Island near the beginning of Barrow Strait in 1845, and in 1846 reached King William Land, where the ships were beset in the ice. From the only record found it was shown that a land expedition under Lieut. Gore had demonstrated unquestionably the existence of the Northwest Passage, but on the return of this party to the ships they found that Franklin himself with twenty-three men had died. The vessels were abandoned in 1848, and the remainder of the party perished in an attempt to reach the Fish River. The numerous search expeditions were very successful in exploring the American Arctic region from Greenland westward. Collinson, particularly, succeeded in navigating his ship, the "Enterprise," from Behring Strait to Cambridge Bay, Victoria Land, where he wintered safely, accomplishing his return the following year. During this time he had seen, though unknown to him, the sea wherein Franklin's ships had been destroyed, and had even picked up relics of that unfortunate expedition.

This brings us to the first actually accomplished Northwest, or rather Northeast Passage, made by M'Clure in 1850-54. In his vessel, the "Investigator," he reached Banks Land, which he explored as well as Prince Albert Land. After wintering there for three years he was finally forced to abandon his ship in Mercy Bay. Learning of a Franklin search expedition at Beechy Island, he managed to reach one of its ships, the "Resolute," by an extremely arduous sledge journey to the eastward, and was later taken to England through Lancaster Sound by the "Phoenix" of the same expedition. He thus completed the first passage from the Pacific to the Atlantic northward of America known to the history of mankind. M'Clure was undoubtedly the first of the great multitude of explorers to accomplish this feat, and while he had encountered continuous waterways for the entire distance, the journey was performed under such difficulty and hardship that until to-day no other navigator has attempted to equal it.

But the present year has seen inscribed on the pages of the Arctic's history the record of a journey which not only equals but far surpasses the remarkable trip of M'Clure. To Capt. Roald Amundsen, of Norway, belongs the honor of being the first actually to force his vessel through the historic Northwest Passage, traversing the northern shores of the continent from the Atlantic to the Pacific, and incidentally pursuing highly important scientific investigations which included the definite location of the north magnetic pole upon King William Land. To us the story of the Northwest Passage is more or less historical merely, for since the Franklin search expeditions, half a century ago, it has fallen rather into the background. The voyage of the Norwegian captain with a crew of seven men in his 46-ton sloop, the "Gjoa," is the final culmination of four centuries of toil, hardship, and suffering, and it gives to our matter-of-fact age an adventurous deed that forms a link between these prosaic times of steam and iron and that splendid period, crude in the seaman's art, but unequaled in enterprise and courage, which began with the discovery of America, and lasted for nearly three centuries.

#### THE ELECTRICAL SHOW AT THE GARDEN.

The annual exhibition of electrical devices and apparatus now running at Madison Square Garden was opened with great *éclat* on the night of December 12 last. A special wire connected the exposition with a golden key in the White House at Washington, and immediately after an address of welcome by Prof. Seaver of Columbia University, President Roosevelt, at a signal from the Garden, touched the key, lighting the numberless lamps and setting the machinery in motion. A presidential salute of twenty-one guns was thereupon fired from the Garden tower to proclaim the official opening. In many respects the exhibition this year is a disappointment. It shows very little that is really new. The theaterphone exhibited by the New York Telephone Company has probably attracted the greatest popular interest. A number of telephone receivers are connected with three New York theaters, so that visitors at the Garden can follow the conversation and music of the various performances. The theater transmitter, which is still in an experimental stage, operates on the same principle as the ordinary transmitter, except that the diaphragm is made of wood instead of metal. In this way the metallic sound of the ordinary receiver is avoided, and a much sweeter tone is secured, which is particularly noticeable in the reproduction of orchestra music. No horn is used on the transmitter, as it is desirable to avoid all false or superposed vibrations. Even in its present unfinished condition remarkable results have been obtained, and the time may soon come when one can attend any performance or concert within reach of his wire without leaving his comfortable library chair.

A new electric elevator deserves more than passing

comment. A large drum below the floor of the elevator is turned by an electric motor under control of the elevator operator. A spiral rib is formed on the face of the drum, and this engages two racks on opposite sides of the elevator shaft. Thus, the elevator feeds itself up or down according to the direction of rotation of the spiral. To relieve the friction the rack is formed with a series of rollers in place of fixed teeth. The main advantage of this system lies in the safety of the elevator; for no matter if the power should suddenly give out, the elevator will not drop, owing to the low pitch of the spiral rib. The construction also affords a considerable economy of power.

The subject of individual motor drive of machine tools and other machinery, which is just now arousing so much interest in the mechanical world, is represented by a number of variable-speed motors, which claim high efficiency under extreme conditions. Considerable interest centers in the Poulsen telegraphone, which was described in our columns two years ago. This instrument, it will be recalled, automatically receives and records telephone messages on a steel wire. This record may be read at any time by running the wire through the transmitter of the machine. One of the oddities, though by no means a novelty, is the electric clock system, in which a single master clock operates electrically all the clocks of a building, district, or entire city. The master clock is operated by weights, and at the end of each minute sends an impulse through the circuit which correspondingly moves every clock hand in the entire system. Thus perfect accuracy is maintained. No batteries are used in the circuit, but the electrical impulse is produced inductively by the movement of an armature through a magnetic field. In this way sparking at contacts is avoided.

The man who has not kept up-to-date on the subject of electricity in the household will find much of interest in this department of the exhibition. Complete kitchen equipments, including every variety of electrically-heated utensil from a tea kettle to a griddle, are shown. The household devices also cover a vast number of novelties ranging from sad irons, milk warmers, curling irons to electric heating pads which are used in place of hot-water bags. In contrast to these heating devices may be mentioned the small ice-making plants which are operated by electric motors. These are suitable for small stores which carry perishable goods. A number of medical apparatus and appliances are shown, such as vibrators and the like. Other features of the exhibition are wireless telegraphy, the mercury vapor light and converter, flaming-arc lamps, and various high-tension apparatus.

#### THE DEATH OF EDWARD ATKINSON.

Edward Atkinson, the well-known social and political economist, of Boston, died suddenly on December 12. He was seventy-eight years old.

His education was secured in private schools and by his own efforts; his life, after the age of fifteen, being devoted to what he termed "work in a practical way."

After an extended experience in various branches of cotton manufacture he became interested in mutual insurance for manufacturers, and in 1878 was made president of the Boston Manufacturers' Mutual Fire Insurance Company, which he aided in establishing. He devoted much energy to the study of the prevention of loss by fire and the reduction of the cost of insuring, making an especial study of construction, occupation, and apparatus, the special hazards of textile factories, paper mills, cordage factories and machine shops, and the safeguards to make them better risks.

He regarded his invention of the "Aladdin Oven," a device for cheapening and simplifying cooking, as his chief life work, and the one designed to do most to carry down his name as a benefactor of the race. He gave the invention to the public freely, without patenting it. The efforts to push it were never especially successful.

As a pamphleteer Mr. Atkinson was prolific, and he contributed at various times to many magazines and newspapers. Among his published works are "The Distribution of Products," "The Industrial Progress of the Nation," "The Science of Nutrition," "The Margin of Profit," "Taxation and Work," "The Prevention of Loss by Fire."

#### THE PATENT OFFICE.

The report of the Commissioner of Patents on the business of the Patent Office for the fiscal year ended June 30, 1905, shows that there were received during that year 52,323 applications for letters patent, 749 applications for designs, 174 applications for reissues, 1,846 caveats, 11,298 applications for trade-marks, 1,236 applications for labels, and 448 applications for prints. There were 30,266 patents granted, including reissues and designs; and 1,426 trade-marks, 1,028 labels, and 345 prints were registered. The number of patents that expired was 19,567. The number of allowed ap-

plications which were, by operation of law, forfeited for non-payment of the final fees was 5,154.

The total receipts of the office were \$1,737,334.44, the total expenditures were \$1,472,467.51, and the surplus of receipts over expenditures, being the amount turned into the Treasury, was \$264,866.93.

The Commissioner states that the new trade-mark law of February 20, 1905, which took effect April 1, has caused an enormous increase in the trade-mark work of the Patent Office. The first three months that the law was in operation 9,710 applications for registration of trade-marks were filed, and it is apparent that the office will need to increase largely the force engaged on this work. Already the division of trade-marks has required the assistance of examiners and clerks detailed from other divisions from which they could ill be spared.

The Commissioner calls attention to the importance of the work of classifying patents, which is essential to the proper examination of applications, and invites attention to the necessity for an increase of force for this purpose. He states further that in view of the increased volume of work in the office, and its expected growth, there should be a corresponding increase in the number of employes and in the space provided for the transaction of the business, in neither of which particulars are the necessities of the office adequately supplied at the present time.

#### SCIENCE NOTES.

M. P. de Wilde, professor at the University of Brussels, has taken up the study of the gold which is contained in sea-water. He proposes a new method of extracting it. A ton of sea water is treated with 4 or 5 cubic centimeters of an acid and concentrated solution of chloride of tin. The whole of the gold is thus concentrated in the complex body known as purple of Cassius, which contains gold, tin and oxygen. It is found that the purple body is fixed very strongly upon the flaky hydrate of magnesium which is set free in sea water when we pour in lime water. The hydrate falls to the bottom with the gold attached to it. The gold is set free by a cyanide of potassium solution (about 1 in 2,000) thus forming a cyanide of gold. The metal can then be extracted by a number of well-known methods. Liversedge shows that when sea water is sent in casks, the wood causes the gold to precipitate, and thus none is found in the water. M. de Wilde made experiments at the seashore in France on the west coast and found traces of gold in the water. He considers that much of the gold is thrown down to the sea bottom, and thus it escapes us. It will be remembered that Liversedge, professor at the University of Sydney, found from  $\frac{1}{2}$  to 1 grain of gold per ton of sea water from the coast of New South Wales.

From time to time we hear of experiments made upon the effects which certain colors seem to have upon the human organism. A recent contribution to this subject comes from Prof. Redard, of Geneva, who has been making researches with a view of using the physiological effects of colored light in surgery. At the Swiss Dental Congress he described a new anæsthetic effect which is based upon the influence of the blue rays upon the nervous centers. A number of experiments showed him that he could obtain a deadening of the nerves which was sufficient to allow of making some local operations of short duration. According to Prof. Redard, each of the primary colors has a special and well-defined action on the organism. Red light is an exciting and an irritating agent. We are aware of its action in modifying the virulence of certain eruptions and how it has been applied in the variolæ. Yellow light seems to have a depressing action, while with blue light we obtain a sensation of calm and ease. To apply the anæsthetic method with blue light, the patient is seated on a chair at 10 inches from a 15-candle-power incandescent lamp. The bulb of the lamp is of blue glass and it has a nicked reflector. The head is covered with a thin blue veil and the patient directs his vision toward the lamp. After a few minutes the subject is found to be in an unconscious state, and on lifting up the veil we find that the pupil is dilated and the regard fixed. In this state a tooth can be extracted or other short operation carried out without pain. However, it must be understood that the effect succeeds better with some subjects than with others. Dr. Milliard, of London, used blue light for the same purpose. In twenty cases the success was complete. In eight others it did not succeed. The effect is not attributed to hypnotism, but to the direct action of the rays upon the nerve centers.

Limestone Island is the center of the New Zealand cement industry. It is about 100 square miles in area, and is wholly composed of hydraulic limestones. It was reported on originally by Sir James Hector for the New Zealand government as an island of hydraulic limestone of a quantity practically unlimited, and estimated to contain over 30,000,000 tons above water level. Beneath the limestone there is believed to be coal, and for this borings are now going on.