Street, and an electrical power station at 146th Street. The first three of these furnish power for the Broadway and the Lexington Avenue cable roads, and the last furnishes current for the Lenox Avenue underground trolley.

Work is now well advanced on the 55 miles of horse car lines which are being equipped with the underground trolley, and for the present the necessary electrical power will be furnished from the 146th Street and East Twenty-sixth Street stations, the generating capacity of the former station being increased and a new electrical equipment being added at the East Twenty-sixth Street station.

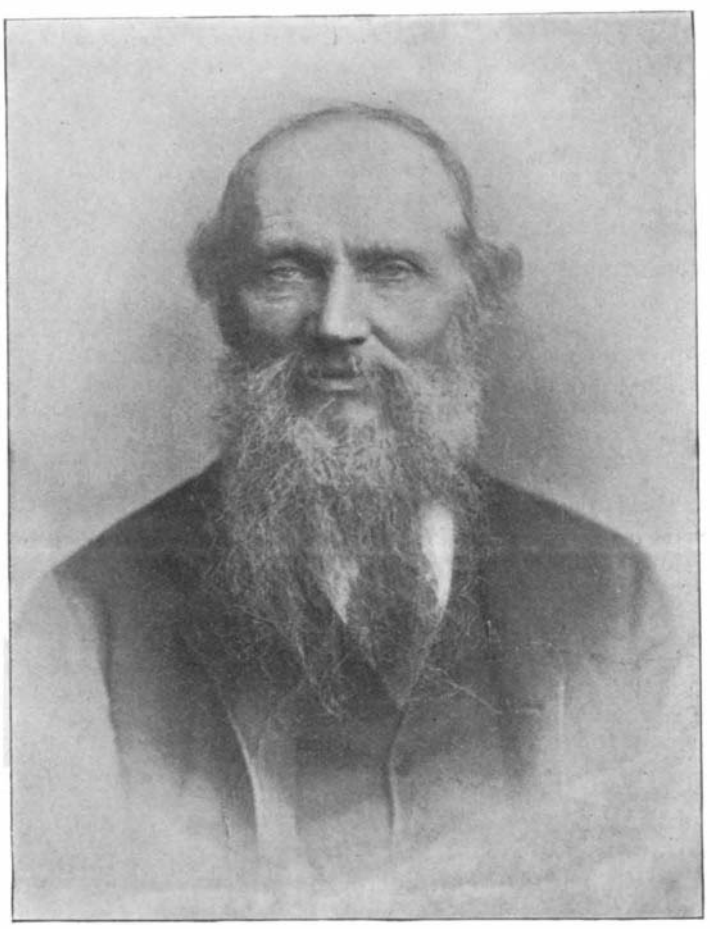
The many advantages to be gained by operating the whole of their vast system by one method of traction, and the uniformly good results which have been obtained on the experimental electric line on Lenox Avenue, have determined the company to make arrangements for equipping the whole 218 miles with the underground trolley. The advantages of economy to be gained by concentrating the power plant at one great central station are many and obvious, and it is this consideration that has led to the planning of the monumental power station which is now under construction near the East River between Ninety-fifth and Ninety-sixth Streets.

The economical distribution of current from one central station will be rendered possible by the use of a high potential in place of the 550 volt distribution which characterized the practice of a few years ago.

The building will cover a site measuring 201 feet by 270 feet. The foundation will consist of 8,000 piles, upon which will rest a five foot bed of concrete, which will extend over the whole area of the site. The building will be divided by a central wall into a boiler house and an engine room. The former will be four stories, and the latter two stories in height. The three lower stories of the boiler house will contain 87 water tube boilers, with a maximum capacity of 800 horse power each, and arrangements will be made for the use of forced draught. The upper third of the boiler house will be devoted to a set of huge storage bins, with a combined capacity of 9,000 tons of coal. The coal will be transferred from barges at the adjoining river dock to the bins by a system of elevators, and the ashes will be returned to the river scows by the same means.

In the adjoining engine room will be eleven cross compound condensing engines. They will be of the vertical type, and each will have a maximum capacity of 6,600 horse power. They will stand in two rows parallel with the dividing wall of the power house and each will be direct connected to a 3-phase alternating current generator. The current at 6,000 volts will be led to substations where static and rotary transformers will convert it to the 550 volt current used in the conduits.

We are informed by President Vreeland that the estimated time of construction is twelve months. The whole equipment will not, of course, be put in at once, but it will be set up contemporaneously with the demand created by the ultimate extension of the underground trolley to the Broadway and Lexington Avenue cable roads and to the various horse car lines owned or controlled by the company.



LORD KELVIN.

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Among the distinguished scientists who attended the recent meeting of the British Association at Toronto, Canada, were Sir John Evans, Lord Lister and Lord Kelvin, each great in a different line of work. Lord Kelvin is particularly notable, owing to the fact that he has been a professor for over fifty years, and during this time he has witnessed the wonderful progress in physics and chemistry to which his personal contribution is so important.

Lord Kelvin, though of Scotch descent, was born in Belfast, in 1824, and was so precocious that he, then plain William Thomson, entered the College of the University of Glasgow at the age of twelve. From Glasgow William Thomson went to St. Peter's College, Cambridge, and in 1845 he graduated with highest honors and was elected a fellow of his college. Even before his Glasgow student days came to an end, William Thomson's original work in science was commenced, and his first mathematical papers, written before he entered Cambridge as an undergraduate, are all worthy of attention. From 1842 to 1845 he published important papers on heat, electricity and mathematics. In 1846 Thomson was elected professor of natural philosophy in the University of Glasgow, and thus at the early age of twenty-two he was appointed to the chair which he still holds. Many offers have been made him by the great English universities, but he has preferred to remain in his northern professorship, and his constancy is appreciated by the university which he adorns. The dynamical theory of heat early engaged the attention of Thomson, and he published important papers upon the subject in 1849, and in 1852 more than one joint paper was undertaken by the life-long friends Joule and Thomson. In 1855, Thompson published a paper on "Electrodynamic Qualities of Metal," and it was while engaged in experimental work connected with this research that he began to make use of the assistance of his students; and this was the commencement of the physical laboratory of the University of Glasgow, which was, in fact, the first of physical laboratories. In 1855 and 1856 a new field opened itself to the genius of Thompson.

The problem of ocean telegraphy had presented itself to the world, and very soon he was practically called upon to solve it. When the cable was completed it was found that it required one minute to transmit one word over the cable. Thomson, experimenting with the reflection of the image of a candle thrown from his concave eyeglass on a sheet of white paper in a fairly lighted room, judged that the flame of a paraffine lamp reflected from a silvered mirror of one-tenth of that area would give an image bright enough for conveniently reading telegraphic signals. The mirror galvanometer was supplied for the 1858 cable. The directors of the Atlantic Company insisted that Thomson should go to sea with the expedition and also that he should take a patent for his instruments. To take out a patent was somewhat against his wishes, as he desired to give to the public the fruit of his labors, as he did with his sounding machine and his mariner's compass, but he found in each case that the only way to secure attention to inventions of importance was to patent them and work the patents. In 1867 the siphon recorder was invented and patented. On the successful completion of the Atlantic cable, in 1866, he received the honor of knighthood.

Sir Willam Thomson's other inventions can be only briefly referred to. They include electrical test instruments and the improved mariner's compass, to say nothing of the large number of minor inventions. Sir William Thomson succeeded Sir George Gabriel Stokes, Bart., as president of the Royal Society, in 1890, and was created first Lord Kelvin in 1892. The degree of LL.D. was conferred on him successively by the Universities of Dublin, Cambridge and Edinburgh, and that of D.C.L. by Oxford. He was a fellow of both the London and Edinburgh Royal Societies, and has been president of the British and other associations. He has also received various decorations from abroad. He is Grand Officer of the Legion of Honor, commander of the Order of Leopold, and has received the German Ordre pour le Merite. He is a member of a large number of foreign societies and has a multitude of medals conferred upon him for his eminent inventions and discoveries.

In 1876 Sir William Thomson was a judge at the Centennial Exhibition at Philadelphia, and in 1884 he visited America to attend the Montreal meeting of the British Association. On this occasion he delivered a course of lectures on "Molecular Dynamics," at Baltimore, to a class composed mainly of professors from different parts of the world, gathered together at the Johns Hopkins University.

During Lord Kelvin's present visit to the United States he traveled quite extensively and made a number of addresses. On September 23, accompanied by Lady Kelvin, Count di Brazza Savorgnan, Prof. Elihu Thomson and others, he visited the Schenectady works of the General Electric Company. The electric railway work most arrested his attention. He was particularly interested in the new "surface contact" electric road, of the type now being constructed for Monte Carlo. Another feature of railroad work shown was the handling of one of the cars equipped for the South Side Elevated, of Chicago, weighing 25 tons and carrying four 50 horse power motors underneath.

With these cars the rate of acceleration obtained is as much as 40 miles an hour in 15 seconds, giving a tremendous increase in quickness of service on elevated or suburban lines.

Lord Kelvin was much interested in the experiments which were shown him in high voltage currents. He carried a little green note book with him in which he jotted down formulæ, figures and autographs. It was easy to see in so much advance he was glad to recognize here, in America, the rapid fruition of ideas and suggestions which the slow pace of European advance would not have allowed him to test on this large and satisfying scale.

Coming away from the works, his indefatigability as an investigator was shown by his leaving a comfortable carriage to ride in a dusty trolley car equipped with magnetic brakes. Emergency stops were made along the road quite frequently, and Lord Kelvin hung over the open trap door of the car floor with an interest that might easily have resulted in his disappearance down it, but for the restraining hands of those who wished him to go back to Glasgow University safe and sound.

The recent awards to this country of important electric railway contracts for England and the Continent have awakened great interest among English electrical engineers, who see in these contracts a source of danger to the British electrical industry.

Lord Kelvin was asked by The Evening Post representative as to his views on this matter. He said: "I do not consider it out of the way or surprising that these orders should be placed here. England has not yet developed her electric railway work to as large an extent as you have, and hence is buying, as she always does, in the best market to save money. She has the engineering and manufacturing talent, but lacks the opportunity. Here you have towns of 10,000 population springing up in a year, and they naturally want the latest and best, making a good demand which renders easy production on a large scale and also stimulates the older communities near them. We have no such developments in England, and the areas of our towns are smaller, so that the necessity of city transportation is not so keenly felt as with you."

Asked as to the near outlook in England, Lord Kelvin said: "The predictions as to the resort in this country to electricity on steam roads in some parts of the country seem to me well founded. From my observation I do not expect, however, any change at present by our big railroad systems in England. They move slowly and with judgment, and things must be proved. I do believe that all our English tramways and all our city travel must soon become electrical. I do not see any alternative from that."

Archæological News.

F. Petrie, Honorary Secretary of the Victoria Institute, England, writes to the Rev. Alfred Putnam, D.D., President of the Danvers Historical Society, a letter in which he says: "It will interest you to hear that one of the Institute members writes home from upper Egypt to announce his discovery of a palace of Pharaoh of the sixth dynasty, with numerous valuable inscriptions. The wine jars of Pharaoh were found intact in a long cellar. All were hermetically sealed, but, on breaking the seals of one, the wine seemed petrified.

With the present year, the Archæological Institute of America will begin the uniform and regular publication of its papers, reports and other documents in a new periodical which will be styled the American Journal of Archæology, second series. The journal of the Archæological Institute of America will be conducted by an editorial board, the members of which will represent the several interests of the institute and the institutions in its care. The new journal will succeed the American Journal of Archæology, and the new periodical will be issued six times a year. It will include the archæological papers of the institute, the papers of the American School of Classical Studies at Athens; papers of the American School of Classical Studies in Rome; proceedings of the institute and other archæological societies; reports of the institute; summaries of archæological news, correspondence, notes and notices. The journal will be published in England and America by the Macmillan Company.