

electrical distribution finally adopted, the use of high-tension poly-phase alternating current of low periodicity, was only arrived at after protracted discussion. A great installation of 105,000 horse-power, delivering energy to local industries, mechanical and electro-chemical, was successfully created. It has been the type on which many hydro-electric installations, in various parts of the world, have since been constructed. At Niagara alone generating stations which, when complete, will supply 650,000 horse-power, are in course of construction.

A few words of appreciation must conclude this brief, and therefore, necessarily imperfect account of a great and versatile career. Lord Kelvin combined the highest mathematical ability and great originality and insight in physical research over a singularly wide field, with the power of applying his vast attainments to practical and industrial problems. He was a tireless worker and preserved to the end of his life a vivid interest in every advance in science and every new application of knowledge to practical needs. The noble simplicity and dignity of his character gained for him the affection and respect of his students, whilst all who had relations with him were impressed by the charm of his personality.

Lord Kelvin was elected a Member of The Institution of Civil Engineers on the 12th May, 1874, for eminence in the electrical and telegraphic branch of the profession. He served on the Council from 1879 to 1889, and was made an Honorary Member on the 21st May, 1889, "because of his distinguished attainments as a Physicist and of his researches on the sources of energy in nature, valuable to man for the production of mechanical effect."

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JOSEPH BERNAYS died in London on the 24th December, 1906, aged 71. Of German parentage, he was born at Mainz on the 26th May, 1835, and obtained his scientific training at the Polytechnic School of Karlsruhe. Subsequently he was employed for 2 years by Messrs. Sulzer Brothers, Winterthur, and in 1858 he came to this country to join the staff of Messrs. Gwynne and Company. As their chief designer, he was engaged principally in the design of centrifugal pumping machinery, and was responsible for the ingenious perfume fountain exhibited by the firm at the London International Exhibition of 1862. In 1863 he transferred his services to Messrs. Clinton and Owens, Hydraulic Engineers, as manager, and whilst in their service he brought out the "Bernays" centrifugal pump, designed to effect economy in working and in steam consumption, the manufacture of

which was taken up by his firm. In 1868 he engaged in practice on his own account. He was appointed Consulting Engineer to Messrs. Mason and Barry, Limited, proprietors of extensive copper mines in Portugal, and superintended for them the sinking of new shafts, the erection of winding and pumping machinery, and locomotives, and the construction of reservoirs, embankments, etc., in Portugal, as well as designing extensive works at Rainham, Essex, for the manufacture of sulphuric acid on a large scale. He also acted as Consulting Engineer to Messrs. Gilbert Lawes and Company, chemical manure manufacturers, Messrs. Brunner, Mond and Company, The Bischof White Lead Syndicate, the Brimsdown Lead Company, and other large firms. In 1877 he perfected a new type of twin-cylinder marine engine, which he subsequently patented. He was consulted in connection with several important arbitrations, where his expert knowledge of the chemical branch of engineering was especially valuable.

Mr. Bernays was a member of the Society of Engineers, and of the Society of Chemical Industry, and served the office of President of the former society in 1880.

He was elected an Associate of The Institution on the 10th April, 1877, was subsequently placed in the class of Associate Members, and was transferred to the class of Members on the 1st April, 1884.

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JOSEPH KINCAID was born in Dublin on the 12th November, 1834. His father, though not an engineer, was one of the early pioneers of railways, being a promoter of the Dublin and Kingstown Railway, the first line to be constructed in Ireland, and of the Midland Great Western Railway of Ireland. On account of delicate health, Joseph Kincaid's early tuition was entirely private, but he entered Trinity College, Dublin, in 1852, graduating in Arts in 1857, and subsequently proceeding to the Master's degree. On leaving college he obtained practical experience as assistant engineer on the Kingstown harbour works; in the construction of Mullaghmore harbour, co. Sligo, as Engineer-in-charge; and on other works. From 1860 to 1863, he served under Sir John Fowler and Mr. C. B. Vignoles, Past-Presidents, and was engaged at home and in Spain on the construction of the Tudela and Bilbao Railway and other undertakings. He also carried out independently the lighting of Bilbao and of Lograno with oil-gas. In 1864 he engaged in consulting practice, and was associated with many important undertakings at home and abroad. His name is more particularly