brightly and steadily, each having a carbon filament enclosed in a globe, exhausted to a very perfect vacuum, and claimed that he had solved the problem of electric light for internal illumination. Crompton agreed with him. Later in the same year (1881), the great German physicist Helmholtz lectured at University College, London, and for the illustration of his experimental work Crompton supplied him with one of his portable sets of generating plant. For the International Exposition of Electric Lighting held in Paris in the summer and autumn of 1881 in the Palais de l'Industrie, Cromptons sent over a fine exhibit, and were awarded the first gold medal ever given for electric lighting plant.

The great fire which in 1883 destroyed the Ring Theatre of Vienna with great loss of life so impressed on the Emperor Francis Joseph the dangers of gas that he asked the Imperial and Continental Gas Company, which then supplied gas for the lighting of Vienna, whether it could not arrange for the lighting of the Opera House and the other Imperial theatres by electricity as being a safer and better illuminant. The Gas Company, advised by Prof. Monnier of the École Centrale in Paris, suggested that Crompton should be called in for consultation, and so in June 1885 he went with Prof. Monnier to Vienna and spent some weeks in considering the Emperor's question. At this time a small central station had been started in Berlin in the Friedrichstrasse. In London, the original Edison Company had done the same at a point near the Holborn Viaduct, and the Grosvenor Gallery scheme was in its initial stage. At this time the Swan Company had succeeded in turning out satisfactorily 100-volt lamps. At Vienna the company designed from its central station in the Schenkenstrasse 440-volt generators and laid twin conductors to carry this pressure up to the Opera House. Babcock and Wilcox boilers were some of those used. Part of the Vienna plant was delivered in the spring of 1886, and when more plant was required, Crompton went to Witcowitz in Moravia to give instructions for the boiler work.

The old Emperor Francis Joseph showed great interest in the electrical work when in progress, and very frequently came to watch the workmen, generally accompanied by his son, the Crown Prince. He paid Crompton the high compliment of saying that he wished his son Rudolph to be a good deal with them as a sort of pupil.

As soon as new scenic effects were made possible by electric lighting, Crompton had to spend a good deal of his time on the stage of the Grand Opera. This threw him into the society of Richter, who had already made his name as the great conductor of opera in London and was then endeavouring to reconcile old-time opera with the Wagnerism that was then just commencing. At that time there were two directors of the Grand Opera, Richter, who stood rather for the old school, and Jahn, who was all for Wagner and the Wagner school. They used to have great arguments and ask Crompton for his opinion on musical points. Crompton disclaimed all pretence of being an authority on music, although his mother had known Mendelssohn well at the time of his apogee and was acquainted with very many of the musical world at that time.

In 1896, Dr. John Hopkinson, who had succeeded Colonel Crompton as president of the Institution of Electrical Engineers, discussed the possibility of forming a corps of electrical engineers. This was accepted by the War Office, and Hopkinson took command with the rank of major in the Royal Engineers, Crompton being the senior captain. Four or five men well known in the electrical profession, including Hopkinson's eldest son Bertie, also joined the corps as officers. After training at Alum Bay in the Isle of Wight, Dr. Hopkinson left the corps to join his family in Switzerland. But a few weeks later the sad news arrived that he and two members of his family had been killed when climbing on the Alps, and so the whole work of training and organization of the corps fell on Crompton's shoulders.

Throughout the years which followed his return from the Boer War until 1914, Crompton never ceased from his efforts to persuade the War Office to interest itself in the introduction of mechanical transport, not only for war material, but also for the haulage into position of guns of greater power than had been hitherto used.

In an epilogue to his book of reminiscences Crompton says, quoting from an address he delivered to the borough authorities of Chelmsford in 1900, at the time when that town received its first cheap electrical supply:

"England in future, instead of being spoilt by densely populated industrial centres, might be covered with cottages extending for miles over the present almost uninhabited rural districts, so that the population would be more evenly spread over the kingdom. The factory hands, instead of having to work under the shafting in factories, should be able by the electrical transmission of power to carry on industrial pursuits in their own cottage homes. That is the future which lies before electrical engineers if they have the pluck and energy to force their views upon the public to a sufficient extent. The thing has been done in Switzerland, in Sweden and elsewhere on the Continent, and if I can live to see it accomplished in our own country, I shall be proud to have contributed in some degree to the solution of all the greatest problems of distribution."

ALEXANDER RUSSELL.

Prof. Ludwig Hopf

THE death of Prof. Ludwig Hopf occurred on December 21 at Dublin, only a few months after he had been appointed lecturer in applied mathematics at Trinity College, Dublin. Dr. Hopf went as a refugee to Cambridge in April 1939, after having lost his position as professor of applied mathematics at the Technische Hochschule, Aachen, on racial grounds soon after the Nazis came into power. He had been on the staff of the Hochschule since 1914 and had become one of its most popular teachers.

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As one of the first pupils of Sommerfeld at Munich, Hopf graduated in 1909 with a thesis on the problem of turbulent flow in a river. He worked in particular on the influence of the roughness of the walls of a canal on the transition from laminary to turbulent flow. This work brought him into contact with the Mittlere Isar water regulation and drainage scheme, to which he was scientific adviser for several years. During the War of 1914–18, Hopf did valuable work on problems of stability of aeroplanes, and his collaboration with R. Fuchs led to their well-known monograph on aerodynamics. In the second edition (1934) the book was divided into three volumes, Hopf being responsible for the first, which dealt with general principles. This is still being used as the chief text-book for aeroplane designers in Germany.

In the early days of relativity and of quantum theory, Hopf collaborated with Einstein (1910–11). Several papers on radiation dating from that time, and a recent well-written popular account of matter and radiation (Springer, 1936) bear witness to his interest in this subject. More recently, Hopf studied the methods of solving linear differential equations in separate domains with the view of finding the relation between the corresponding solutions. A first paper appeared in 1935, and important applications to physical problems were to follow. The many friends of this genial and kind-hearted mathematician will deeply regret the loss they have suffered.

Prince Ginori-Conti

WHEN Prince Piero Ginori-Conti died on December 9, Italy lost one of her most energetic industrial personalities and international science a devoted supporter. His name will always be associated with the industrial utilization of the volcanic springs in the Lardarello district of Tuscany. Thanks to his 'drive' and business acumen, these waters were made to generate electric current for transmission to Florence and Pisa, and to yield boric acid, carbon dioxide, etc., for industrial use. In the chemical works connected with this great undertaking, he was much helped by Prof. R. Nasini, and on the engineering side his son, Dr. Giovanni, one of the three children by his first wife, was of great assistance. An article on the Lardarello development appeared in NATURE of January 14, 1928, p. 59.

Ginori-Conti was born in 1865 as a scion of two ancient Italian families, Ginori and Conti, and on the latter side he claimed relationship with the Scottish Mackenzies. His title of Prince of Trevignano was inherited; that of Senator was granted him later in life. His first wife was the daughter of the Count of Lardarel, the owner of the springs, and his second wife was a French lady. A charming personality, Prince Ginori-Conti came frequently to London where, as a member of the executive committee of the Union Internationale de la Chimie, and as an honorary member of the Society of Chemical Industry, his visits were much appreciated by numerous friends.

Prof. Alexandru Slatineanu

PROF. ALEXANDRU SLATINEANU, a leading Rumanian bacteriologist and hygienist, who died on November 27, 1939, was born at Bucharest on January 5, 1873. He studied medicine in Paris under Berger, Dejerine, Babinski and Metchnikoff, in whose laboratory at the Pasteur Institute he made the acquaintance of his compatriot Prof. Cantacuzène, with whom he was closely associated henceforth. He qualified in 1901 with a thesis on experimental *Bacillus pfeiffer septicœmia*, for which he received the university medal awarded for theses of outstanding merit.

From 1902 until 1912, when he was appointed professor of bacteriology at Jassy, Slatineanu acted as chief assistant to Cantacuzène at Bucharest in his work on experimental medicine and the reorganization of the Rumanian health services. At Jassy he founded an institute of hygiene of which he was made director, and also organized an isolation hospital for infectious diseases. In 1917 he took an active part in the campaign against typhus fever which was then very prevalent in Moldavia. In 1931 he was appointed general secretary of the Rumanian Ministry of Health under Prof. Cantacuzène, who was the minister of that office. He was the author of numerous articles on infectious diseases which were published in French in the *Comptes rendus de la Société de Biologie*, *Bulletin de la Société de Pathologie Exotique*, *Archives roumains de Pathologie*, or in Rumanian in the *Revista Stintelor Medicale*.

J. D. ROLLESTON.

Dr. E. M. Mikkola

DR. ERKKI MIKAEL MIKKOLA, geologist of the Geological Commission of Finland, was killed at Taipale on February 13. Mikkola, who was born in 1907, had become a leading authority in Pre-Cambrian geology, possessing an intuitive faculty of seeing through a geological formation, and picturing it correctly in space and time. His scientific studies led him from botany to geography, quaternary geology, tectonics and petrology. His three Lapland maps are given a foremost place among Pre-Cambrian sheets of the Finnish Geological Survey. Their description in English is a monograph of fundamental value.

When the Russian attack developed on November 30, Mikkola, as a lieutenant in the reserve, went to join his company, leaving the Geological Survey at Helsinki just one hour before it was destroyed during a bombing raid. Thereafter he spent all his time, two and a half months, in the front lines, taking a full share in the dangers of the heroic defence.

WE regret to announce the following deaths:

Prof. C. D. Marx, emeritus professor of civil engineering in Stanford University, on December 31, aged eighty-two years.

Mr. H. C. Newton, first chairman of Messrs. Newton and Wright, Ltd., London, manufacturers of X-ray equipment, on February 19, aged eighty years.

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