

## Helium in Canada.

By Prof. J. C. McLENNAN, F.R.S., University of Toronto.

IN 1916, at the request of the Admiralty, and in collaboration with my colleagues, Profs. Satterly, Burton, and Dawes, I investigated the natural gases of Canada with the view of ascertaining the amount of their helium content. The gases with the highest helium content were found at that time to be in Ontario and in Alberta. In neither Province was any considerable supply of gas located that contained more than 0.36 per cent. of helium. During the years 1917-1920, with the assistance of Mr. John Patterson, of the Meteorological Office, Toronto, I designed and successfully constructed and operated a semi-commercial plant for extracting helium from natural gas. The gas we worked upon was obtained from an extensive field situated near Calgary, Alberta. During the operation of this plant we extracted in all from 15,000 to 20,000 cubic feet of helium having a purity of 90 per cent. When the Cryogenic Laboratory was instituted in the University of Toronto in 1922, the helium extracted at Calgary became available, and we succeeded in liquefying helium early in January 1923.

Since 1916 many new gas fields have been opened up in Canada, and about two years ago the Dominion Mines Branch decided to make a re-examination of the Canadian natural gases for helium. Mr. R. T. Elworthy was invited to undertake this task, and has carried it through most thoroughly and expeditiously. He found that in Alberta, while some of the natural gases contained less than 0.1 per cent. of helium, a number of them contained so much as 0.25 per cent. In some cases in this Province the helium content ran so high as 0.34 per cent. In New Brunswick none of the natural gases investigated was found to contain more than 0.064 per cent. In Ontario the natural gases varied considerably in their helium content. The gases of Lambton, Kent, and Essex Counties were found to contain not more than 0.15 per cent., while those in the counties of Brant, Haldiman, Lincoln,

and Welland were found to have a helium content of from 0.25 per cent. to 0.35 per cent. In the County of Norfolk considerable supplies of gas were produced which ran from 0.4 per cent. to 0.5 per cent. in helium. The gas richest of all in helium was found in Peel County, the content being slightly more than 0.8 per cent. In this field three wells have already been sunk, and the gas is drawn from a horizon approximately 600 feet deep. The wells are consequently shallow, and though the gas supply is only moderate in amount, it has been estimated that the three wells will provide at least 100,000 cubic feet of helium per year.

With the view of rendering the supply of helium permanently available for research work in the University of Toronto, the Hon. the Premier of Ontario recently announced that, under an Order-in-Council, the Government of Ontario had secured, for the Crown, the products of the three wells mentioned, and the natural gas rights as well over a large block of land in the immediate neighbourhood of the wells.

The National Research Council of Canada has endorsed the policy adopted by the Government of Ontario, and is co-operating with the University of Toronto and other organisations in a scheme to establish a helium extraction station in the Peel County gas field, with the object of providing helium for research workers requiring the gas in Canada and probably in other parts of the British Empire as well.

It is fortunate that a supply of helium has been found in such a convenient locality—only some thirty-five miles from Toronto—for although the Government of the United States has extracted enormous amounts of helium from the natural gases of the Western States, its export from the United States is prohibited by law.

If we succeed in making the financial arrangements we have in mind, we hope to be in a position to provide, in the near future, ample supplies of helium for scientific investigations within the Empire.

## Obituary.

PROF. J. G. M'KENDRICK, F.R.S.

EMERITUS-PROFESSOR JOHN GRAY M'KENDRICK, who died in Glasgow on January 2, was born in Aberdeen in August 1841. By the death of his parents he was at a very early age thrown upon his own resources. When he was but thirteen years of age he was sent to spend a summer with his grandfather at Braco in Perthshire, where, herding sheep daily from 5 A.M. to 8 P.M., he learned to know and love the plants and the animals and Nature in all her moods. Zoology became M'Kendrick's first scientific study; and the youth of seventeen actually demonstrated his little marine aquarium at a conversazione of the British Association which met in Aberdeen in 1859. Here he saw for the first time Faraday, Owen, Murchison and Huxley; science had begun to call him to herself.

Some one suggested that M'Kendrick should qualify for the medical profession, and so, while still apprenticed

to a lawyer in Aberdeen, he would rise at five and study until ten, when the duties of the desk claimed him for the day. After passing the "Medical Prelim." at Aberdeen, he went to Edinburgh in 1861 to enter upon the serious study of medicine. Here he heard Goodsir lecture; saw Turner and Joseph Bell ("Sherlock Holmes") demonstrate; listened to Simpson with his European reputation, to Laycock who was a psycho-analyst sixty years ago, and to Christison who was making toxicology a science. M'Kendrick took Goodsir's medal in 1863, and was a prizeman in medicine, obstetrics and surgery. In 1864 he graduated M.D. with distinction at the University of Aberdeen. Years afterwards he summarised his medical course:—"no laboratories, no apparatus, no histology, no bacteriology, and seven different theories of inflammation."

After a few months at the Chester General Infirmary, M'Kendrick obtained the position of surgeon to the