

the radiations from uranium, thorium and radium have been most thorough, and the results which he has given to the world through the proceedings of the various learned societies and the scientific publications, have given him a place in the public estimation as one of the foremost scientists of the day. His observations have covered the period since 1897, and are no doubt being continued.

It is not necessary here to refer to the different steps taken and the points discovered severally, but to sum up the results: From uranium, thorium and radium there are emitted electrically charged particles which have been shown to be of three kinds. They are distinguished for convenience as Alpha, Beta and Gamma radiations. The Alpha radiation is easily absorbed by gases, such as the air, and by its deflection in a magnetic field it has been shown by Rutherford to consist of a stream of positively charged particles of matter of molecular dimensions; the Beta radiation is more penetrating than the Alpha, and consists of negatively charged corpuscles which are extremely small and not larger than about 1,000th of the atom of hydrogen; the Gamma radiation, resembling the Roentgen rays, is extremely penetrating.

There is also given off, in addition to these radiations, an emanation having the properties of a gas which itself possesses radioactivity. This emanation Rutherford has recently condensed by means of liquid air, which he was enabled to do through the kindness of a benefactor who installed a liquid air plant in the physical laboratory of McGill University.

The radiations and emanations exhibited so strongly by the rare metals, uranium, thorium and radium have been discovered by McLennan, of Toronto University, to be common to the metals generally. They are, however, very weak in comparison with those of radium, and an electrometer of extraordinary delicacy is necessary for their examination.

About two years ago it was discovered by Elster and Geitel that a negatively charged wire suspended in the open air became radioactive. This suggested the presence of a radioactive gas, and in seeking the origin of this phenomenon McLennan by making observations upon the air, at the foot of water-falls, which is known to be in a peculiar electrical condition, and by studying the variations in the phenomenon accompanying changes in the weather, concluded that the earth was the source of this radioactive gas, and by his subsequent investigations with such metals as tin, copper, zinc, lead, etc., established the existence, in varying intensities, of radiations and radioactive emanations in these metals precisely similar to those found associated with the elements, uranium, thorium and radium.

Of the many uses that may be made of these radiations it is too early to speak with authority. The cure of disease and the simplification of chemical processes by means of the very powerful radiation from radium have already been reported in the press. But no reports upon them have yet been made to any of the learned societies.

The effect upon the public health of residence in localities where very active radiations are generally present will be interesting to note. Has the well-known healthfulness of the sandy and rocky soils any

connection with the newly discovered force? If so the establishment of sanatoria in the neighborhood of pitch blende deposits should be considered. Such deposits are not general throughout Canada, but are chiefly confined as far as we know, to the neighborhood of the Gatineau Valley and to the region north of Lake Superior.

OUR NORTH LAND.

We have always felt that justice has never been done to the Hudson Bay region, either as to its land resources or the resources of this great inland sea and its navigability. It is satisfactory, therefore, to learn that the Canadian Government has chartered the Newfoundland sealing steamer "Neptune" to convey a scientific expedition to Hudson Bay. The expedition, which will winter at Chesterfield Inlet, is to determine the availability of the region for a Canadian grain route. Captain Samuel Bartlett, for several years navigator of the Peary steamers, is in command of the ship, the crew of which consists of Newfoundlanders familiar with ice work. The scientific party is composed of Canadians. The ship will also enforce the Canadian customs laws against American whalers who are operating in Hudson Bay. The expedition sent out by the Dominion Government some years ago gathered valuable information, but in view of what is known from other sources, it is now felt that that expedition hardly fulfilled that portion of its mission relating to navigation. The present one we hope will bring back a more hopeful report.

It is somewhat humiliating to find that we have to look to our United States neighbors for a proper appreciation of our own country to the north, and the following remarks from the Pulp & Paper Magazine on the subject of explorations in Northeastern Quebec and Labrador should set Canadian public men to thinking. "In business enterprise and in adventure into new and untried fields many of our United States cousins show a daring that compels our admiration. This daring has resulted in the exploiting of certain resources of Canada, which would to-day have lain dormant, had they been left to the chances of development by British or Canadian Investors. For the recent big development in the iron, steel, and coal trades of Nova Scotia we are indebted largely to Boston men; for the great works of Sault Ste. Marie to a man from Maine, and for some of our largest and most successful pulp and paper enterprises to capitalists from other quarters of the United States. And in exploration in the northern regions of Canada of recent years, United States scientific and commercial men have given evidence of their courage and perseverance. For example the two explorations of Labrador, about which we have learned most of late, have been made by United States parties, and now another party of American scientists is on its way to Labrador this month under the leadership of Col. Wm. Glazier. He is accompanied by Dr. S. A. Binion, a well-known Egyptologist, who will make collections in geology, etc., and act as physician to the expedition; E. A. Nelson, of Brooklyn; Dr. Frederick Martin, of Columbia University; R. E. Dahlgren, of the American Museum of Natural History, and A. W.