

THE WINNIPEG MEETING OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

(Written for the Canadian Mining Journal by Cyril W. Knight.)

The seventy-ninth annual meeting of the British Association for the Advancement of Science opened in Winnipeg on the twenty-fifth of August. The society has during the last quarter of a century, held three meetings in Canada. In 1884 Montreal was the centre, while in 1897 Toronto was its headquarters. At the Montreal meeting the people of Winnipeg took the opportunity to invite the members to visit Manitoba. Those who did this, and who also this year attended the Winnipeg meeting, have been profoundly impressed with the strides the West has made. As a matter of fact this was one object of the meeting being held in Winnipeg this summer; and the splendidly arranged excursions across the golden prairies of our North-West to the mountains of British Columbia and the Pacific Coast must surely have aided to dispel the false impression given to the British people in Kipling's "Our Lady of the Snows."

It was natural, perhaps, that physics should dominate the meeting in view of the fact that Sir Joseph Thomson was president. He gave his memorable presidential address in the Walker Theatre on the evening of the twenty-fifth, and those who heard it are not apt to forget the occasion for many years. Sir Joseph Thomson has a startlingly clear and deep voice for a man of his stature, and this, combined with a perfect enunciation, made all of the address a delight, even to the layman. The address was of necessity largely technical, but the personality of the man always seemed to hold attention even when the listener could not follow, and the simplicity of his literary style was another added charm. The previous presidents at the meeting of the British Association in Canada were Lord Rayleigh and Sir John Evans. Without attempting to give any complete resume for the Canadian Mining Journal of an address on physics the parts bearing only on geological matters are here stated. But, in passing, it is interesting to note his urging of the deeper study of mathematics on all physicists, and the plea that mathematicians study physics. The billiard player need no longer regard his expertness as the sign of a wasted life. One of Sir Joseph's first pupils was in the beginning utterly indifferent to mathematics, but was an expert billiard player. Sir Joseph showed his pupil that the collision of elastic billiard balls illustrated profound mathematical laws. "From that time he was a changed man. He never before regarded mathematics as anything but a means of annoying innocent graduates. Now, when he saw what important results it could obtain he became enthusiastic about it, developed very considerable mathematical ability, and, though he had already wasted two out of three years at college took a good place in the mathematical Tripos."

The recent advances made in the study of radio-activity, and their bearing on geological problems were particularly interesting, and the following paragraphs are given in full.

"The properties of radium have consequences of enormous importance to the geologist as well as the physicist or chemist. In fact, the discovery of these proper-

ties has entirely altered the aspect of one of the most interesting geological problems, that of the age of the earth. Before the discovery of radium it was supposed that the supplies of heat furnished by chemical changes going on in the earth were quite insignificant, and that there was nothing to replace the heat which flows from the hot interior of the earth to the colder crust. Now, when the earth first solidified it only possessed a certain amount of capital in the form of heat, and if it is continually spending this capital and not gaining any fresh heat it is evident that the process could not have been going on for more than a certain number of years, otherwise the earth would have been colder than it is. Lord Kelvin in this way estimated the age of the earth to be less than 100 million years. Now, though the quan-



Sir J. J. Thomson, and wife President of the British Association for the Advancement of Science.

tity of radium in the earth is an exceedingly small fraction of the mass of the earth, the average amount of radium in the material of which the earth's crust is composed, according to the valuable determinations of Professors Strutt and Jolly, only amounts to about five grammes in a cube of the material whose side is 100 miles, yet the amount of heat given out by this small quantity of radium is so great that it is more than enough to replace the heat which flows from the inside to the outside of the earth.

"This, as Rutherford has pointed out, entirely vitiates the previous method of determining the age of the earth. The fact is that the radium gives so much heat that we do not quite know what to do with it, for if there was as much radium throughout the mass as there is in the earth's crust, the temperature of the earth