tracted into the liquid mass of the sun. Such impact would cause a grand explosion, carrying with it the propulsion of liquid and gaseous masses thousands of miles upwards, and would account for the solar spots and the flames rushing out from the edge of the disk. Bodies leaving the sun with a velocity of 300 miles a second would get beyond his attraction and never return. Some of these strike the earth in the form of meteorites, and prove their solar origin, according to Graham, by the hydrogen contained in them. The fact that most meteorites fall in the day time, more especially at noon, when the sun is towards us, tends to confirm this opinion."

## CANADA PACIFIC RAILWAY.

Mr. Langevin, during a recent discussion in Parliament, read the following report from Mr. Sandford Fleming:—

"It was considered important that the main trunk line, from its eastern terminus near Lake Nipissing, should touch in its course the navigable waters of Lake Superior, at a point as near as possible to the Province of Manitoba. The explorations of 1871 were conducted with a view to this, but insurmountable difficulties were found to exist, in the section of the country extending along the North Shore of Lake Superior, south and east of Lake Nepigon. Measures were therefore taken, during the past year, to explore for a line further north, which, passing north of Lake Nepigon, and avoiding the unfavorable section of country above referred to, should connect with the previous year's work, in the neighbourhood of Moose River. A portion of the line ran between the Nepigon River and the Lake of the Woods also explored in 1871, proving impracticable and the country to the south not appearing more favourable, a line was explored last summer farther north connecting with that passing to the north of Lake Nipissing; and at the same time a survey was undertaken for a branch line to connect the main line with the navigable waters of Lake Superior at Nepigon Bay. The results of this survey may be briefly stated as follows:

"1 A chain of instrumental measurements has now been completed the whole way between the eastern terminus near Lake Nipissing, the Ottawa district and north of the Red River in the Province of Manitoba.

"2 A practicable and indeed a favourable route, from the prairies of the interior to Lake Superior, and also to the valley of the Ottawa.

"3. The route referred to will necessitate building the main trunk line past the north side of Lake Nepigon and a branch will be required to Lake Superior.

"4. The distance to the main line from the point where it will cross Red River to the Eastern terminus will be about 665 miles, and to Nepigon Bay and Lake Superior the distance will be about 445 miles.

"5. Adding to the length of the main line from Red River, to the Eastern terminus, the number of miles from the latter point to Toronto, Ottawa and Montreal, and comparing the Canadian Pacific route with other routes, we have the following interesting results. A common point on the Red River in Manitoba is more then 300 miles nearer Toronto by the Canadian Pacific route than by the most direct existing railway, viz: by St. Paul, Chicago, Detroit, &c., and it is fully one hundred miles less by the Canadian Pacific Railway route, from Red River to Toronto than by Duluth; and the shortest line that can be built along the south side of Lake Superior, Sault Ste. Marie, and along the north and east side of Georgian Bay, Red River is 570 miles nearer Ottawa and Montreal by the Canadian Pacific line than by the most direct existing railway. Red River is nearly 200 miles nearer Ottawa and Montreal by the Canadian route than by Duluth, and the shortest line that can be built along the south side of Lake Superior and the north side of Lake Huron coursing at Sault Ste. Marie. Not only is the distance nearly 200 miles less by this Canadian Pacific route to Ottawa and Montreal than by the route last mentioned, but the length of railway yet to be built east of Duluth is about 1,020 miles, while the whole distance between Red River and Ottawa is under 1,150 miles by the Canadian Pacific route. The distance from Red River to Lake Superior at Nepigon Bay is about 445 miles, while to Duluth it is 477 miles.

"The Western Section Surveys have been vigorously prosecuted during the past year between the Eastern slope of the Rocky Mountains and different points of the Pacific coast. A continuous chain of instrumental measurements has been completed from the Yellow Head Pass to tide water on the Fraser River as well as to Vancouver's Island via Bute Inlet. A practicable line across the Mountains and to the coast has been found, but the cost of some sections of it will be very heavy, and it would not be advisable to recommend its adoption, until more exhaustive surveys have been made with the view of discovering a more favourable route. No time whatever had been lost in connection with the surveys in British Columbia, and no efforts or expenditure have been spared to gain all the information necessary, to arrive at a decision with regard to the most eligible line for the railway. The field of enquiry is, however, a most difficult one, and it would be extremely unwise to decide finally as to the railway route, without fuller information than is yet obtained. In addition to the exploration referred to, in the Eastern and Western sections of the line, the writer travelled during the past season over the whole extent of country intended to be traversed by the railway, and made a personal examination of its general features. He also sent a branch expedition across the mountains by the Valley of Peace River to the Upper Fraser, and by the Steena River to Nassee Harbour, on the Pacific. A great deal of useful information has thus been obtained, but the distances are so great, and the means of communication so imperfect, that returns from all parts of the survey are as yet incomplete. When full information is received, the whole will be submitted in the form of a report."

A writer in an English paper says: By the way, speaking of waterproofs, I think I can give travellers a valuable hint or two For many years I have worn india-rubber waterproofs, but will buy no more, for I have learned that good Scottish tweed can be made entirely impervious to rain, and, moreover, I have learned how to make it so, and, for the benefit of your readers, I will give the recipe:

In a bucket of soft water, put half a pound of sugar of lead, and half a pound of powdered alum; stir this at intervals, until it becomes clear, then pour it off into another bucket, and put the garment therein, and let it be in for twenty-four hours, and then hang it up to dry without ringing it. Two of my party—a lady and gentleman—have worn garments thus treated in the wildest storms of wind and rain, without getting wet. The rain hangs upon the cloth in globules. In short, they were really waterproof. The gentleman, a fortnight ago, walked nine miles in a storm of rain, and wind such as you rarely see in the south, and, when he slipped of his overcoat, his underware was as dry as when he put them on. This is, I think, a secret worth knowing; for cloth, if it can be made to keep out wet, is, in every way, better than what we know as most waterproofs.

NEW NICKEL POP VALVE FOR BOILERS.—A trial of this newly-patented valve was made on the 14th inst., at the iron shipbuilding yard of Messrs. Harland and Wolff, Belfast, and was found to be very successful. It is styled the "pop valve," from the suddenness with which it springs open under the influence of the steam pressure from the interior of the boiler. It is composed of an alloy consisting mainly of nickel, which is almost as hard as steel, and possesses the additional advantage of not oxidising by moisture. The valve in ordinary use generally fails to indicate the exact degree of steam pressure on the interior surface of the boiler, as, from the moment it commences to open, the escaping gas renders the pressure on the valve surface less than that on the rest of the boiler, on which the pressure has frequently risen to a degree sufficient to cause an explosion, even when the valve remains open. In the pop valve the machine is so contrived as to equalise the pressure on the valve to that of the boiler. So effectually does this appear to have been secured that in the tests to which the invention has been subjected in America, where the limit of pressure on the boiler was fixed at 50, the utmost increase in the generation of steam failed to raise the pressure on the valve, and consequently on the boiler, to more than 51. The valve can be applied both to stationary and locomotive engines.