

the main industrial population lies between them at a great distance from either. Industrial Canada may be said roughly to extend from Quebec to Saint Ste. Marie with its chief centres at Montreal and Toronto. These cities are 1,000 and 1,350 miles respectively from Sydney, Nova Scotia, which is the chief source of coal in eastern Canada, while Toronto is but 100 miles approximately from the centres of the anthracite and eastern bituminous coal fields of the United States.

From May until November, Nova Scotia coal can be sent to Montreal in large sea-going ships at rates of transportation averaging approximately one-third of those charged for rail shipments; and from Montreal, by a single transfer to smaller vessels, water transport becomes practicable not merely to Toronto, but as far west as Fort William.¹ Similarly, although to a less extent, American anthracite coal reaches Montreal by barge at rates which compare favourably with rail rates, and tend to control the latter during the season of navigation.

For five months each year water transport is impossible and all fuel brought in has to pay the relatively high rates of winter traffic by rail. These rates from Sydney to Montreal for example are approximately two dollars per ton higher than rates by sea. The difference in favour of water traffic is sufficient to more than pay the cost both direct and indirect of shipping the great bulk of each year's supply in advance by sea and storing it until needed. The total amount so stored is immense; Montreal for instance being estimated to have had one million tons of bituminous coal and a very large amount of anthracite in store at the end of the season of navigation in November, 1913, while other cities and railway centres all similarly had great stores of fuel.

Canadian coals unfortunately do not differ from other coals of the same class in their liability to weathering, and while few if any of our coals are as troublesome as certain notorious coals in other lands, yet several of the best known and most valuable steam coals in eastern Canada are liable to spontaneous combustion, and large sums of money are spent each year in Montreal and other cities in guarding coal storage piles against fires, and still larger sums in fighting the fires which do occur, and making good the damage which results from the fires themselves, and that resulting from heating which does not quite reach the ignition point.

In view of the facts above set forth, it has seemed proper that a volume on the Weathering of Coal should be included in the general economic study of the Coals of Canada which was undertaken by the Department of Mines some few years ago, and entrusted, through the Director of Mines, to the senior author of the present work.

As already stated, the subject of spontaneous combustion has engaged the attention of several Royal Commissions, and there have been a very

¹ Very little sea-borne coal is actually shipped to Toronto and still less to Fort William, etc., because, under the present tariff Pennsylvania and Ohio coals can be sold in most parts of Ontario at more favourable prices than Nova Scotian fuel. These American coals are, however, themselves transported by water to a considerable extent, and the fact that water transport is possible for several months in the year has a very potent influence in keeping down rail freights to all competitive points.