of communication have conferred on the industries of the United States. But Canada has not lagged far behind her big neighbor, though the United States has 230,000 miles of railroad as against Canada's 22,000. If we go back to the year 1840, which is the starting point of active industrial life on this continent, aided by the railroad, we find that Canada had only a trifle over a million inhabitants, and the United States about 17,000,000. Multiplying these figures by five we reach approximately the present population of the two countries, and that despite the far greater advantages in climate and geographical position which the southern half of the continent has over the north.

We find that the value of the mineral mined annually in Canada to-day is about $80,000,000, which is $17.00 in value per head of the population, whereas the prodigious sum of $3,000,000,000 worth—produced last year in the United States—is after all only $25 per head of her population; but when we come to the value of mineral per mile of railroad, the Canadian railroads handled only $2,740 worth per mile, whereas the railroads of the United States handled $8,700 per mile of railroad.

From a statistical point of view, Canada in this respect is at a disadvantage, though from an economic point of view she possesses vast advantages over the United States. Her extensive eastern coal fields in Cape Breton and Nova Scotia are actually on the seaboard, whereas none of the really good coals of the United States are upon tide-water; and therefore the great bulk of Canadian mineral is handled by ship instead of by car.

What progress has been made in the development of her minerals is due to the railroad. Sudbury supplies not only this continent, but also the world, with nickel, for even the New Caledonian mines produce an insignificant quantity compared with these deposits in that inhospitable region on the Height of Land between the lakes and Hudson Bay. And now the railroad is bringing within the commerce of the world at Cobalt another mineral which heretofore, owing to its rarity, could find no place in the great industrial arts, but may prove even more valuable than nickel for the purposes of peace as well as of war. I refer, of course, to cobalt. The copper resources of British Columbia would have been unapproachable, and therefore useless to the world, unless reached by the railroad. If this has been the result of one line of railroad alone, developing after all only the fringe of the country, what will be the result when the great heart of the Northwest has been reached by the new lines now being so actively built, and others which will without doubt rapidly pass from the stage of promotion to that of construction?

Now, gentlemen, we as engineers in the various branches of our profession have two duties to perform: to make the most of the natural resources which we are responsible for finding and then handling, and looking to the future to provide substitutes for mineral resources which we know must in time be either exhausted or become costly from their increasing rarity. On this continent we are shamefully wasteful. Because nature has been prodigal, we are abusing her liberality. We are burning mineral oil instead of coal under our boilers, often because it is more convenient, as though we considered that it was inex-