

Heat derived from igneous intrusions and lava flows have also been effective in raising the rank of the coal in the immediate vicinity of the igneous rocks, the coal at the contact being commonly raised to the rank of Anthracite. Examples of this are to be found in association with igneous dykes as at Telkwa, Kathlyn Lake, and Groundhog coal areas in northern British Columbia.

### Estimated Coal Reserves

So many unknown factors exist pertaining to the nature and formation of the coal, the character of the associated sediments, and the folding, faulting and erosion to which the coal seams have been subsequently subjected, that it is impossible to make any accurate estimate of the amount of coal within any particular field without having made a thorough geological examination, supplemented by surface prospecting, systematic drilling, sampling of the coal seams or actual mining operations.

The estimate of Canada's coal resources as given in Geological Survey Memoir 59, Coalfields and Coal Resources of Canada—by D. B. Dowling, 1915, was compiled for the 12th International Geological Congress held in Canada in 1913. These estimates include all known coal seams 1 foot or over in thickness to a vertical depth of 4,000 feet and seams 2 feet or more in thickness lying between 4,000 and 6,000 foot cover. At the time the estimate was made, data pertaining to many of the coalfields of Canada were meagre and the estimates were based on certain assumptions that have since been found to be inaccurate. Since that date, geological investigations, drilling and actual mining operations have been carried on in many of the areas and have shown that the coal seams are not commercial or are not as extensive as Dowling assumed. The figures placed on the thickness of coal seams and the depth to which the calculations were carried made it obvious that these estimates could not be regarded as more than rough estimates of probable coal in the ground and not those representing available reserves. Under existing mining conditions no coal seam, 1 foot in thickness, can be profitably mined by itself at a depth of 4,000 feet, and therefore should not be considered as an economic asset. The minimum thickness at which a seam at this depth can be mined is placed at 3 feet. At present coal mining is being carried on at Springhill, N.S., in Carboniferous rocks at a depth of 3,820 feet but, due to the presence of "bumps" accompanied by fatal results, it is unlikely that coal mining in this Province can be profitably carried on much below this depth. Accordingly, 4,000 feet is here taken as the limit of mining in the Carboniferous measures of Nova Scotia.

There is no possibility, however, that such a depth can be reached in the mining of Lower Cretaceous coals of Western Canada. The deepest cover experienced in mining these deposits is at Coal Creek, Fernie, B.C., where mining operations in several seams had to be discontinued when the cover reached a thickness of approximately 2,500 feet, necessitating the abandonment of the workings and the opening up of a new colliery. Here, also, the minimum thickness of coal seams mineable at this depth should be placed at 3 feet, and estimates of available coal reserves are being made on this basis. Comparable figures may be taken for the Bituminous coals of Upper Cretaceous and Tertiary ages in the Foothills of the Rocky Mountains and Vancouver Island, but it is unlikely that the lignite deposits of Tertiary age could be profitably mined at a depth of more than 1,000 feet.