

tude that, in 1865, the provincial government appointed an inspector of mines (John Rutherford, M.E.)—the first on this continent.

In 1854 the government of the United States removed the duty on coal. This "open door" policy greatly increased the trade with the New England States; in 1866, the exportation of coal thereto amounted to 404,252 tons. In 1867, however, (year of Confederation) the United States once again discriminated against Canadian coal, imposing a duty of \$1.25 per ton. This duty was maintained at this rate until 1872, when it was reduced to 75 cents per ton; at which figure it remained until 1894. During this latter period, the exports fluctuated from 228,132 tons to 13,883 tons. During the period 1894-97, the tariff was reduced to 40 cents, but in 1897 it was advanced to 67 cents, at which figure it still remains. Notwithstanding the tariff barriers, the exportation of Nova Scotia bituminous coal to the New England States continued to increase, and in 1903 the shipments reached a maximum of 968,832 tons. There has been a gradual decrease since that date, and in 1912 the shipments were 412,531 tons. The total production has, however, increased enormously; in 1912 it was 6,802,997 tons (of 2,240 pounds). Of this production 5,197,601 tons are to be credited to the coal fields of Cape Breton.

This marked increase in the production is due in part to the increased market offered by St. Lawrence ports. In 1877 a select committee of the Dominion parliament, appointed to inquire into the condition of the coal trade, recommended the imposition of a duty on United States coals; this duty has had the desired effect of opening up the markets of the St. Lawrence to the Nova Scotia coal trade, and in 1912 the St. Lawrence market alone purchased 2,159,005 tons, most of which came from Cape Breton.

On February 1, 1903, the Dominion Coal Company was organized with a capital of \$18,000,000 by a special Act of the Legislature of Nova Scotia. This corporation amalgamated the principal interests in the coal areas on the south side of Sydney harbor, Cape Breton. These included the Caledonia, International, Gardiner, Old Bridgeport, Glace Bay, Reserve, Gowrie, Victoria, and Ontario mines, also the Sword areas, in all comprising 70 square miles; the areas controlled have now been extended to 142 square miles. With the advent of this great industrial organization, a new era in Nova Scotia coal mining began; new mine workings, railway extensions, new shipping and discharging facilities were developed, old coal markets were expanded, and new ones opened out, so that the whole coal trade was revolutionized. In the first year of its operations (1893) the coal mined was 834,019 tons; in 1912, the production amounted to 4,332,320 tons; or an increase of nearly 520 per cent. in 20 years.

In 1900, the Nova Scotia Steel and Coal Company acquired all the mining rights still held by the General Mining Association. In addition to operating the existing collieries, they have opened out new mines, erected iron and steel works, and built a modern coke oven plant, all in close proximity to the working collieries. Their Princess Pit—now known as Sydney No. 1—was, in 1873, the first submarine mine in North America, the coal being won from workings under the sea. The shafts are of unique construction, consisting of metal cribbing or tubbing. The total length of metal tubbing is 842 ft. 9 ins., weighing some 776 tons. Here, also, was erected the first Guibal ventilating fan in Cape Breton.

The most important of the Cape Breton coal fields is that known as the Sydney field. It is an extraordinarily rich tract of coal bearing rocks, having an area of approximately 250 square miles. It extends along the northern coast of Cape Breton island for a distance of about 35 miles. Geologically the coal bearing strata are bounded by the outcrops of the Millstone Grit, as seen at Mira Bay, and they terminate at Cape Dauphin, where the intrusive syenites of the Ste. Anne hills form the northern boundary of the Great Bras d'Or Lakes. The Sydney field is divided into four main basins, as follows:

(1) Cow Bay or Morien Basin, defined on the east by the Millstone Grit and on the west by an anticlinal fault that dips seaward at Cape Percy.

(2) Glace Bay Basin, bounded by the Cape Percy anticline on the east, and by the Bridgeport anticline on the west.

(3) Lingan-Barasois—Victoria Basin. This basin has not so well defined boundaries as the two preceding basins but it extends from Bridgeport anticline, passing the eminence known as David Head, to a submerged fault which exists midway in Spanish Bay and Sydney Harbor.

(4) Sydney Mines or Bras d'Or Basin. This basin extends from the submerged fault in Spanish Bay to the western termination of the coal measures at Cape Dauphin.

Mr. Richard Brown, the well-known author of "The Carboniferous System of Cape Breton," states that the thickness of the productive measures of the Sydney field will not exceed 6,000 feet. This measurement is taken from Burnt Head in the Glace Bay Basin, where the highest known bed occurs, down to the Millstone Grit. It is possible that the extended deep workings at this point may, in the future, accurately determine their actual thickness.

The bulletin includes a set of summary records of analyses of Sydney coals, and fifteen plates of sections of coal seams and strata, some of them representing a depth of over 1,500 feet. An index map of the fields is appended.

Logan Waller Page, Director of the United States Office of Public Roads, will read a paper at the Road Congress at Detroit on the "Selection of Road Materials." Before he was appointed to his present post Mr. Page assembled at Harvard University the first road material testing laboratory in America, following his studies at the French School of Roads and Bridges, and his name is now identified with some of the best-known apparatus for road material tests. The selection of road materials is an exceedingly important factor in the building of a road, and it is certain that Mr. Page's paper will receive the closest attention.

The world's largest power plant is projected to be located at Big Eddy, on the Columbia River, a few miles above the Dalles. The gorge at this point is of such a character that comparatively little work will be required to impound a great quantity of water, sufficient to develop 300,000 horse-power. The river can be entirely closed by the construction of a dam only 300 feet long and 180 feet above its foundations, and the construction of a canal 300 feet wide, 20 feet deep and a mile and a half in length. The head of water is 73 feet at low tide and 42 feet at high water, and the mean flow of the river throughout the year is 235,000 cubic feet per second. The hydro-electric units would be each of 32,000 horse-power. The total cost of the scheme would be about \$23,000,000.