

lodes, the Silver Cup claim, owned by Great Northern locators and others. These claims can be approached either from Trout Lake or the South Fork. At the head of the latter stream are claims known as the Gainer group. This is on the same contact as the Haskins, Wagner and Sevoy groups, only the latter are more easily approached from Haley Creek, at the south end of Trout Lake.

The Haskins group is a very remarkable exhibit and only confirms the general character of the ore bodies in Lardeau. The most interesting feature of the ores is the amount of gold which accompanies the silver. In some instances it amounts to as much as the silver product, and this of course adds greatly to the importance of the district. The average value will be from 50 to 100 per cent. in gold and silver. This is distinctly high grade and when taken in conjunction with the fact that the ore bodies are very large, we have a presentation which gives assurance of a great future for the district, without taking into account the discoveries which may be made next season. Another district of great promise, but as yet scarcely touched, is what is known as the Duncan River country. We may have to repeat, next year, about this district, what we have already said about the Slocan and Lardeau belts, but in addition thereto, we look forward to the discovery of a rich gold belt on the east slope of the Valley, as it is hereabouts that gold quartz lodes of great promise have already been found.

Along the line of the C. P. R. at Illecillewaet, and Fish Creek a large amount of development work has been done, and it is noteworthy of remark that many prospects are passing into the hands of good men, who have an abiding faith in the future of claims in the railway belt. The Lanark and Maple Leaf properties are still the most important, and it is a matter of regret that so much ore should remain in the mines when it can be sent to market. The Elizabeth claim, on Fish Creek, ranks first in importance among many good prospects, and the Dunvegan is expected to become a producer next year, after lying idle for too long a time. The country to the north, between Illecillewaet and Big Bend, is yet to be prospected, and will no doubt prove up good.

In Big Bend district we expect that good gold quartz will be found, as some very good ores were brought into Revelstoke this fall. The Consolation mine and other gravel diggings have done very well, and we hope will continue to do so, as much work has been done by those interested.

Some day the town of Revelstoke will wake up to find itself the centre of a great mining district, and then we hope to see its smelter in operation. In East Kootenay the mining situation remains much the same, except a most important discovery was made in Fort Steele district by Joseph Bourgeon, which will lift that portion of the country into great prominence. It is known as the North Star; is between 20 and 30 feet in width and assays 40 oz. silver. We are quite sure that the people who have taken over this property will be turning out bullion by next season.

The Thunder Hill, under Mr. Brady's management, is the most important enterprise in the district, and has passed the stage of exploration for the more solid one of production. The concentrating plant will be at work 1st March next. Mr. Fred. Wells marketed a carload of ore at Tacoma, which places Vermont Creek mine still at the front, and we understand that Messrs. Wells & Pollock intend to make continuous shipments of ore to Tacoma next year for treatment. If the average obtained will reach same as the last two cars, they will realize a handsome sum for the year's work.

The St. Mary's district gives greatest promise of any portion of East Kootenay, as so far the largest ore body yet discovered has been found there, and important gold finds have been made in the same vicinity late this season.

On Vancouver Island, a little placer mining has been carried on by Chinese on several streams heading into Barclay Sound. Some development work has been done on an extensive deposit of quicksilver, on Sechart Inlet. A number of ledges of gold-bearing quartz have been treated, samples of which have assayed very satisfactorily. Little has as yet been done towards their development, though there seems every reason to believe that gold-bearing quartz exists in considerable quantities in the hills adjacent to the West Coast. Iron of the finest quality has been located in immense bodies in several places along the west coast of Vancouver Island, and convenient to the water, in one or two cases on the water's edge.

**The Behavior of Coal during Combustion.**—Mr. B. Holgate, M.A.,\* describes the variations of the behavior of coal during combustion. Cannel coal contains a considerable quantity of fish remains, and was deposited under water. When coked the lumps retain their original shape. Most other coals are somewhat similar in composition to one another, so that analysis alone will not determine their burning qualities. The appearance of coal is a much better guide. Some coals require a high temperature and a strong draft to burn properly, such as the better bed coal of Yorkshire. As a general rule, coal which breaks naturally into small will not deliver its gas so freely and will not burn so readily, but it makes the best coking coal when it is soft and breaks up easily. When the coal breaks into large lumps the gas can get away more readily.

### Coal Exports From Canada.

Coal exports from Canada during the fiscal year ended 30th June, 1892.

Country.	Tons.	Value.
From Great Britain .....	22,920	\$53,101
" British Guiana .....	2,515	7,545
" British West Indies .....	7,081	18,511
" British Poss., Pacific Ocean ..	1,404	5,616
" Australia .....	1,102	4,408
" Hong Kong .....	9,915	37,170
" Newfoundland .....	99,972	202,607
" Belgium .....	400	800
" China .....	1,149	3,834
" Germany .....	150	450
" Holland .....	700	1,445
" Japan .....	1,226	4,571
" Russia .....	1,181	4,724
" St. Pierre .....	14,035	30,413
" Sandwich Islands .....	4,222	16,388
" United States .....	772,441	2,790,693
" South West Indies .....	4,712	12,691
Total .....	945,125	\$3,195,467

### The Cape Breton Coal Syndicate.

#### AN ENGLISH VIEW OF THE SITUATION.

During the past week, says a correspondent to the *Colliery Guardian*, several announcements have been made to the effect that American capitalists have acquired control of the collieries of Nova Scotia—lately described in these columns. As a matter of fact, this has been pending for some time. The semi-alarmist character attached to some of these announcements is misleading, and excites some mistrust of the insight into surrounding circumstances which Press correspondents are supposed to possess, especially as no mention is made of the fact that in purchasing the Canadian collieries the New England consumers have a length procured a source of supply for their 16,000 factories, independent of the capricious exactions of Pennsylvanian, Virginian, and Maryland producers and carriers. The rapid growth of the coal and iron industries of the south, and the more general distribution of centres of production over the states of the American Union have rendered some such independent source of supply absolutely indispensable to the north, if she is to hold her ground at all. Formerly coal, iron ore and all the allied raw materials were carried into New England as a matter of common usage, and manufactured into various articles for distribution all over America. In the natural order of things, however, this could not continue; manufacturing industries are now conducted, where neighboring and cheap supplies of raw material are obtainable, and from being the foremost manufacturing state, Massachusetts has now declined to third among the states of the Union. Notwithstanding this severe blow, many of the industries of the state have still survived, but of late, the ever-growing pressure of keen competition, allied to the severe transit and material monopolies of the south, have operated most heavily against the obstinate success of the north. The expression "obstinate success" is used advisedly, for sheer obstinacy has alone enabled the Northern States, far from all supply and surrounded by every possible impediment, to retain sufficient prestige to make Massachusetts a household word among 60,000,000 people, as a manufacturer of cotton, woollen, and other useful articles. This state, containing 238 inhabitants per mile, annually consumes £80,000,000 worth of raw material, nearly all of which is imported from her sister states, and in all this possesses no available deposits of native raw material nearer than that of her jealous and sometimes unscrupulous rivals. The principal parts in the rival states from which her supplies are drawn are distant from Boston as follows: New York, 292 miles; Philadelphia, 480; Norfolk and Newport, 620; Baltimore, 880; or an average distance of 550 miles; but to this must be added the distance from the mines to the above ports, such as 250 and 335 miles from Clearfield to Philadelphia and New York respectively, and 290 and 196 miles from the Cumberland mines of Maryland to Philadelphia and Baltimore respectively; so that Massachusetts has to purchase all her raw material, plus this land and sea transport, both of which are subject to the enormous extortions of monopolists. As on coal alone the consequent loss to the New England States is estimated at £1,000,000 sterling per annum, it is not at all surprising that the northern manufacturers and coal or iron consumers should have long meditated a *coup de main* in Nova Scotia, which is the only country so situated geographically as to be able to come into competition with the south. In Nova Scotia, unlike the latter districts, no very pronounced or vexatious monopolies or combines, either in mines or transit arrangements, hamper the cheap getting of raw material. The mines, especially in Cape Breton Island, notably at Cow Bay, Glace Bay, or Mira Bay, are actually on the coast, close to fine harbors, and are operated with exceptional ease and economy, being also capable of development to a sufficient degree to meet the annual consumption of the New England States, which is now set at 1,000,000 tons. As long as the Harrison Government remained in power, however, Pennsylvania and the south succeeded in upholding the duty on Canadian coal and held the New England Democrats in

check, quashing every petition to Congress, notably that of the autumn of 1891, which called for free coal, iron ore and coke, backed as it was by 237 of the leading directors and managers of New England iron-making establishments. Consequently all attempts to place Nova Scotian coal properties on the Boston market during the Harrison tenure have proved fruitless until the present time. Now that the vested interests of the south have suffered a reverse in the defeat of General Harrison, a modification of the coal duties looms sufficiently near to tempt the northern consumers into a consummation of their long-cherished plans, and the collieries have been bought. That these purely commercial arrangements imply anything like a gigantic monopoly of North American coal from Labrador to the Gulf of Mexico is, of course, as impossible as untrue. It is most unlikely that the lion of Pennsylvania will lie down with the lamb of Massachusetts, and as far as the latter is concerned it is equally impossible that Boston or New York, by the mere acquisition of the Nova Scotian collieries, could control the Canadian coalfields, for irrespective of wealthy and unexploited coal areas of New Brunswick and Western Cape Breton, vast areas of the undeveloped Nova Scotian coalfields proper will be outside the new syndicate's control.

### Breakage of Winding Ropes in Saxon Mines.

C. Menzel states that since 1884 the law has been enforced in Saxony that all breakages of winding ropes and chains shall be notified to the mine inspectors. The returns obtained in this way show that during the seven years ending in 1891 there were in all 133 breakages of ropes and chains in the Saxon mines. Of this total, 32 occurred in metalliferous mines, 97 in collieries, and 4 in lignite mines. The breakages during the various years were as follows:—

Year.	Metal Mines.	Collieries.	Lignite Mines.	Total.
1884	4	23	1	28
1885	2	20	1	23
1886	1	24	1	25
1887	3	12	1	16
1888	6	6	1	13
1889	9	8	1	17
1890	7	4	1	11

From these figures it is seen that, in the case of the collieries, although the output increased  $5\frac{1}{2}$  per cent. from 1884 to 1888, and then decreased, the number of breakages is considerably less, whilst the depth of the shafts has continuously increased. The majority of breakages, as would naturally be expected, occurred as the cage was being raised; in only 18 cases the breakage occurred as the cage was being lowered. The causes of the accidents cannot be ascertained with accuracy. Some 43 of the cases were, however, undoubtedly due to bad or worn material; 5 to 7 were due to imperfect welding, 20 to friction on the pulleys, and 20 to the jamming of the cage or kibble in the shaft.

The question whether it is desirable to have safety-catches or merely to trust to the rope being of good quality is not yet definitely decided by the mine managers. In the 79 cases in the collieries in which safety-catches were provided, they came into satisfactory action in 60 cases, or, in other words, 76 times in 100. These results certainly appear to be in favor of the adoption of safety-catches.

### A Great Coal Shaft In the States.

The sinking of the largest coal shaft in the world by the Lehigh & Wilkesbarre Coal Company at Ashley, three miles from Wilkesbarre, Pa., has now progressed as far as the bed rock, which has been encountered at a distance of fifty feet from the surface. The shaft is 70 by 30 feet over all and will be 1,000 feet deep, penetrating to the red ash vein of coal. The size of the opening will be reduced to 55 by 14 feet by the banking of a five-foot wall and a hemlock cribbing. This wall will rest upon the solid rock fifty feet below the surface. The shaft will not only be the largest in dimensions of any in the world, but will have four compartments for hoisting coal, whereas the largest collieries have but two; and with the new breaker to be erected here, it is expected that the daily output and capacity will considerably exceed those of any anthracite coal plant in the world. The excavation of the soil has been rapid, and the refuse has been taken away by means of an overhead railway system. It has taken just one month to get through the quicksand bed, a foot thick, which was near the rock. For this work caissons had to be constructed.

These new workings, with the development of the South Wilkesbarre shaft of the same company, will furnish employment to 1,500 extra men, a fact which is contemplated with pleasure by many hundreds of miners hereabouts, who are in constant fear of partial or total suspension of work at some of the other collieries. The South Wilkesbarre shaft has never yet been worked. It had just been prepared for mining operations when there came the terrible gas explosion two years ago, by which eighteen men were killed, the mine set on fire, and a large part of the cribbing and brattice work destroyed. Since that time the mine has been twice flooded, the first proving insufficient, and the destroyed timbering has just been replaced.

\* Lecture delivered before the Yorkshire College Engineering Society.