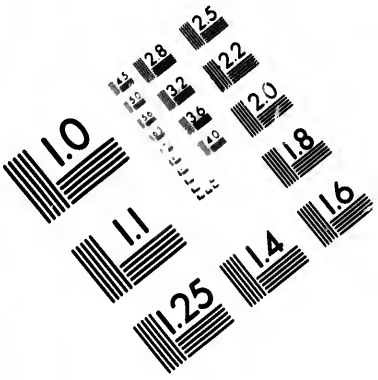

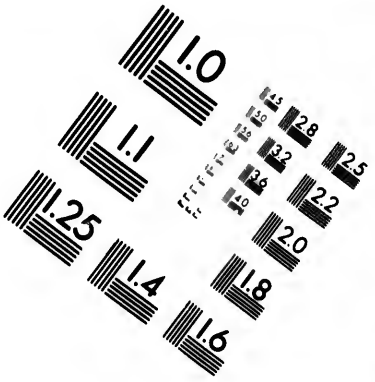

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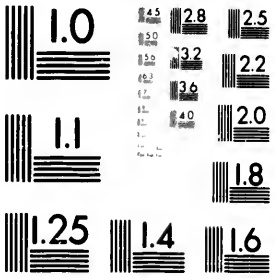

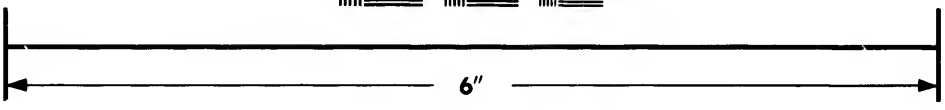

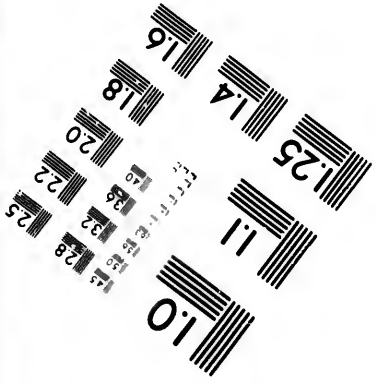

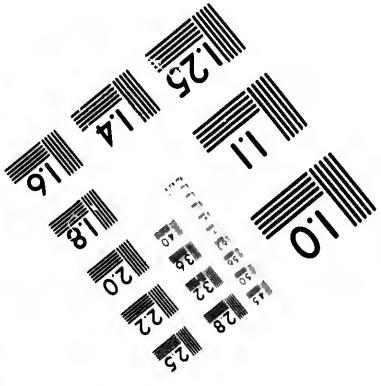

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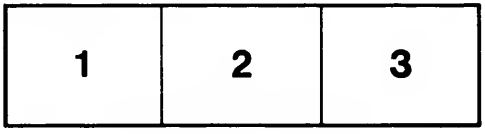

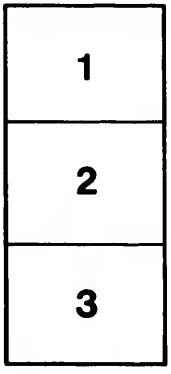

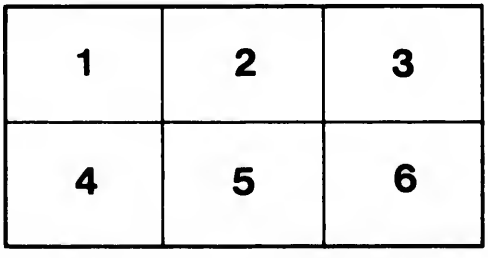

PROVINCE HOUSE

XI.—*Coal Mining in Pictou County.*

By E. GILPIN, JR., LL.D.,

Inspector of Mines, Nova Scotia.

(Read May 21, 1896.)

When the settlement of Halifax was decided on as the preliminary step to the pacification of Nova Scotia, and its future development by a race of settlers more congenial to English rule than those relinquished by the French Government, the home authorities seem to have been guided as to the ownership of the minerals by the conditions of those domains in England most directly vested in the Crown. This is noticeable in the short term leases at first granted for mining coal; and down to a few years ago in the granting of gold leases for a term of twenty-one years, equivalent to three of the customary leases of seven years each, and renewable, as was the practice in the Duchy of Cornwall.

It does not appear that the French engaged in any mining operations in Nova Scotia, except in coal mining along the outcrops of the seams in Cape Breton, and a reported washing of the sands of the Avon River for gold.

Owing to the natural exposures of the seams, the Cape Breton coal first attracted attention. From the Treaty of Paris in 1763 to 1784, several desultory leases were granted to mine coal, but were not sanctioned by the Lords of Trade. From this date until the annexation of Cape Breton to Nova Scotia in 1820, with the exception of a few short leases, the mines were worked on government account, and this state of affairs continued until the advent of the General Mining Association.

It is stated that coal was first detected on the branch of the Middle River in Pictou county in the year 1795. This would probably be one of the outcrops of the Albion seams on McCullock's Brook. In 1801, coal was mined in small quantities from the McGregor seam. In the year 1807, John McKay mined coal from a three feet seam on his father's farm near New Glasgow; the sales in the year 1815 amounting to 650 chaldrons.

In this year a lease was granted him by Sir John Sherbrooke. Becoming indebted to Messrs. Hartshorn and Boggs, of Halifax, in the sum of three thousand pounds, they were obliged to take possession of his mine in 1817, and to seek an extension of his lease.

About this time coal was found at several points in this coal field, and applications made for leases. Mr. E. Mortimer, of Pictou, finally secured a lease for twenty-one years to work the main seam on each side

of the East River, on the following terms, as given in a report to the Earl of Bathurst, June 12th, 1819: Royalty, 3s. per chaldron on all coal raised over 1,700 chaldrons on the west side of the river, in addition to an annual rent of £230; and a royalty of 3s. per chaldron on all coal raised over 700 chaldrons on the east side of the river, in addition to an annual rent of £110. The difference between the two rents being allowed on account of alleged inferiority of the coal on the eastern bank.

On the death of Mortimer, shortly after, the leases were continued on the same terms to Messrs. Geo. Smith and Wm. Liddell, November 3rd, 1819. The eastern mine was on lands granted to James Turnbull, and the western on lands allotted to Wm. Grant. The mines were worked up to 1828 on this lease, and yielded about 23,325 chaldrons, from small openings along the crop of the main seam. Some of these early workings were recently entered, but presented no features of interest.

After the close of the American war there were many applications for mining concessions in the colonies, from persons who had been engaged on this side of the Atlantic in the service of the Crown, as well as from merchants and others who had made money in profitable shipping and other adventures during the continental wars.

These applications for mineral grants were considered by the Treasury as recorded in a minute of March 26th, 1825. Among them was one by Mr. Adams on behalf of His Royal Highness Frederick, Duke of York and Albany, asking for the reconsideration and completion of the intention expressed by His Majesty's Government in the year 1788 to recommend to His late Majesty to make a grant to the Duke of York of mines in Nova Scotia. Upon inquiry being made it was found that not only had such recommendation been made, but that the draft form of lease had been submitted for the approval of the Attorney-General in the year 1792, and had been substantially agreed upon. The grant was accordingly concurred in, and formally issued, as proposed thirty-seven years before.

An intimation of this proposed grant may have been connected with the brief and unsatisfactory leases secured by the early coal miners in Nova Scotia, and with the extended working of Cape Breton mines by the government, as already alluded to. By this lease the Duke secured all the mines and minerals not at its date included in any granted Crown lands, or under working lease from the representative of the Crown in Nova Scotia for the term of sixty years. This lease was executed August 26th, 1826, in pursuance of His Majesty's command, given July 11th, 1826, through the Earl of Liverpool.

Under the terms of this lease the Duke was required to pay a rent of one shilling sterling per ton, of two thousand six hundred and twenty pounds of coal sold. He was also to pay four pence for every ton of iron ore, and one-twentieth part of the value of the gold, silver, copper, lead,

and all other ores and metals. At that time it was believed that the most valuable product of the grant would be copper ore, but no deposits of this metal were found of economic value, and at that date the gold deposits were unknown.

The grants of Crown lands made prior to 1759 contain no reservations of minerals. This would have the effect of reserving the royal metals, gold and silver, it being held that they pass only by special mention. From this date to 1809 the usual reservations expressed in the grants were gold and silver, copper, lead, coal, lapis luzuli, and in some cases, precious stones. There were, however, some large township grants in which gold, silver, and coals only are reserved. In 1809 iron ore was added to the list of reserved minerals. After the passing of the grant to the Duke of York in 1826 the Crown land grants necessarily reserved all the minerals, but in 1858, when the greater part of the General Mining Association's monopoly was surrendered, an Act of the Provincial Legislature declared that the grantees of land since 1826 received all the minerals previously reserved excepting coal, silver, lead, tin, copper, coal, iron and precious stones. Those grantees receiving land prior to 1826, retained of course all the minerals already granted, and all others relinquished by the government in 1858, and their possession of subsequently reserved minerals was confirmed. In the words of the Act "all other minerals, mines, ores and earths, including ironstones, limestones, slate stones, gypsum and clay" are now granted with the lands.

At the present date a good deal of confusion exists as to the actual minerals held with the land in many of the large township grants. These grants were made usually in a block to a number of settlers, many of whom did not take up their lots. When these lots were settled on at a later date, the occupants in some cases had no title, in other cases new grants were issued with reservations differing from those in the original grant.

One of the schemes of the General Mining Association was the smelting of iron ore, but they found that the principal known deposits were included in the grants issued prior to 1809, in which iron ore was not reserved, and the idea was abandoned after the erection of a small test furnace.

The Duke of York, however, did not propose to work the mines, and lost no time in arranging for a lease of his rights to the General Mining Association of London, a company formed to acquire and work mining properties in all parts of the world. They believed that valuable deposits of copper ore existed in Nova Scotia, but an examination showed that the coal deposits gave greater promise.

The company found, on taking possession, that the Sydney mines and the best known exposures of the Pictou seams were already being worked under lease, and consequently were not transferable to them by

the Duke of York. However, the lease of the Sydney tract was on the point of expiration, and was secured by them January 1st, 1827. In the following year they purchased the Pictou leases already referred to, and became the sole lessees of all the mines and minerals in the province except these previously granted with the Crown lands.

Some years later it was pointed out that it was originally intended by the Crown to grant only the minerals in Nova Scotia proper, and that in the wording of the patent in 1826, Cape Breton having been annexed to Nova Scotia in 1820, the intention of the extended grant was not expressed. Following the custom of interpreting the grants in favour of the Crown, it was decided that the contention was well founded, and that the company held only the Sydney mines under the grant from the Government of Nova Scotia, which in its turn became liable to a consideration of being ill-advised. However, this point was rectified by express declaration.

The company did not take advantage of the neglect of many of the Crown land grantees to settle their lots, or to pay their rent, as their attention was practically confined to coal.

When the new company obtained control of all the coal, the Government of Nova Scotia having issued a new lease of the Sydney mines and of the leases purchased in Pictou county, concurrent with that obtained from the Duke of York, it was agreed between the three parties interested that upon the payment of a fixed rent of three thousand pounds a year, they should be allowed to sell 20,000 chaldrons (Newcastle), and that a royalty of 1s. 7d. sterling should be paid on every chaldron sold over that amount.

In addition to this the company had an agreement with the Duke of York by which they were to pay him one-fourth of the net profits.

On June 4th, 1827, Mr. Richard Smith informed the Lieutenant-Governor that he had arrived with a number of miners, mechanics, etc., and a large amount of tools and machines preparatory to opening the Pictou coal seams on an extensive scale, and suggested that the initiation of the enterprise should be publicly marked. On June 11th, an order-in-council was issusd certifying that Mr. Smith was the agent of the General Mining Association, and calling upon all government officers, magistrates, and proprietors of land to afford every reasonable facility for the execution of the designs of the company.

The proclamation did not have much effect upon the proprietors of land, as Mr. Smith complained of the exorbitant prices demanded, and of the determined hostility shown by many parties, especially by those connected with the former leases. Finally these land troubles were settled by an expenditure of £10,110 which secured for them ample space.

A judicious site was chosen on the west side of the East River on the outcrop of the main seam, about half a mile from the head of tide water,

and the first pit reached the coal in February, 1828. The plans show that eight pits were sunk in working this section of the seam, the deepest being 199 feet. The coal worked extended from the river along the crop for a distance of 1,300 yards and a width of 175 yards or over, about 48 acres.

On December 29th, 1832, the coal was found to be on fire in these pits, and fourteen horses were burned to death. As the coal was found to have been on fire at widely separated points incendiarism was suspected. This view was confirmed by an investigation held on behalf of the government by Mr. C. R. Fairbanks, but the guilty parties were never discovered. It was believed that the fires had been started by persons who considered themselves aggrieved by the action of the government in granting the lease to the company instead of to local parties. The pits were closed and water let in, and after nine months of pumping work was resumed. The expense of pumping and loss of material by this fire was estimated at $6,000.

In 1837 an explosion of gas occurred at the east face of the workings by which three men were killed, and work interrupted for six months. In 1839 a more serious explosion occurred by which forty horses were killed. The loss by this fire was estimated at $25,000. This section of workings was then abandoned and allowed to fill with water up to the level of the river, but the fires continued to burn for several years in the upper workings. Prior to this, however, it had been decided that as the coal at each extremity of the workings had deteriorated fresh and deeper pits were needed.

The company starting its operations in 1827 began in what may be called a wilderness. It is true that the district was well settled and produced easily enough to support its population, but at that day the engineering development of the province showed little beyond a blacksmith's shop. They were compelled to build foundries, machine and repair shops, etc., in fact a self-supporting establishment. The first preliminary appears to have been a brickyard which was continued for a number of years. The foundry appears to have received much attention, and it had a chain factory added to it, but the cost of labour led to the early abandoning of the latter.

A small blast furnace was built and an attempt made to smelt iron ores brought down from Bridgeville, a few miles up the river. The experiment proved a failure, as the man brought out from England to take charge of the furnace was accustomed to smelting ores softer and more easily reduced than those they selected.

The brickyard furnished a large supply of material for engine houses, residences, etc., but the imported prejudice against wood as a building material must have proved an unnecessary expense.

After nine years of development in 1836 there were 30,678 chaldrons raised. To effect this output there were employed :

1 Resident manager,	2 Sawyers,	48 Labourers,
6 Clerks and overmen,	1 Stable-keeper,	4 Wharfmen,
66 Colliers,	1 Woodman,	2 Farmers,
28 Drivers,	1 Saddler,	32 Brickmakers,
3 Engineers,	1 Groom,	28 Foundrymen,
8 Carpenters,	18 Surface drivers,	5 Sailors,
7 Masons,	8 Bankhead men,	10 Ship carpenters,
3 Blacksmiths,	2 Pick carriers,	50 Shipping labourers.

335

For an economic output the proportion of colliers should have been one-half of the total number employed, instead of one-fifth.

In 1838 the number of employés had increased to 619, the proportion of colliers being slightly larger, but the production was only 28,506 chaldrons, the cost per chaldron of screened coal being 12s. 2d. currency.

When the first attempt was made to work coal systematically in 1818, a rough tramway was built from the mines to a point on the East River, a few hundred yards distant, which could be reached by barges at high tide. In 1827 when the association began to mine on a large scale, attention was directed to the necessity of improved shipping facilities, and a wharf was built a short distance above New Glasgow which could be reached by boats at low water. A railway was built and horses used to draw the coals from the pits. Barges received the coal, and they were towed by a steamer to the harbour where their loads were transferred to the vessels.

About the year 1834 a further improvement was made by continuing the railroad to a point about one-half a mile below New Glasgow where a set of loading shoots were built, traces of which still remain. At this point vessels drawing seven feet of water could be loaded at any tide and pass the various bars in the river. Vessels of a larger draught were partly loaded at the wharfs, and received the remainder of their cargoes from lighters in the harbour. The necessity of deepening the channel of the river next engaged attention, and a bill for this purpose was introduced in the Provincial Legislature in 1836. This bill passed, but the dislike and jealousy with which the General Mining Association were viewed, led to the incorporation of a clause calling in question the wisdom of the grant to the Duke of York, and the Act was disallowed by the Imperial Government. A similar bill introduced the following year was thrown out, as the New Glasgow people objected to the power sought to allow the company to levy toll on vessels using the improved navigation. The system of transportation and loading are described as indifferent, but capable of improvement. However, it was decided that a new road should be built to the harbour itself.

It may be questioned if a moderate expenditure for dredging the river, even if not accompanied by the privilege of levying tolls, coupled with an improved system of transport and loading, would not have secured sufficient shipping facilities to have permitted the postponement of the construction of a costly railroad and wharf for a number of years.

It would almost appear that a spirit of vindictiveness against New Glasgow actuated the company in abandoning the old railway and wharfs valued at £15,376, and constructing a new road and shipping place at a cost of £76,109, when the expenditure of a few thousand pounds would have deepened the channel sufficiently to permit the greater number of the vessels then engaged in coal transport to load directly from the coal shoots near New Glasgow.

The new railroad was about six miles in length to an excellent shipping point on the west side of the East River, a little above its mouth. The location and supervision of the construction of the road was entrusted to a local surveyor who built it on the principles most approved of in England. As nearly five miles of the road was level and the remainder a very easy grade, it will readily be seen that its cost was heavy. The engineer's estimate was £35,574; the actual cost, £76,109. At that date roads were being constructed over more difficult ground in the United States at from £4,000 to £5,000 per mile. The road was equipped with three locomotives and about one hundred and fifty wagons, each holding two chaldrons or about 7,000 lbs. of coal. Shipments were carried on over this road until 1889, when the Government road to Fisher's Grant, and the pier of the Acadia Coal Company at that point, were utilized. The locomotives originally introduced were kept in good repair and effective service until a short time before the closing of the road, and were interesting specimens of the earliest stages of railroad transportation.

Before 1827 the coal was sold at 13s. 6d. per chaldron, but there is evidence to show that whenever practicable a higher price was demanded. Up to 1836 the price averaged per Newcastle chaldron about 14s. 6d. at the mine, the cost of the coal being about 12s. A complaint that the coal was being sold locally at higher figures than before elicited a statement that no profit was made on the coal owing to the costly nature of the establishment. This can readily be credited when out of 618 men there were only 146 miners, and no less than 40 men employed at the foundry, and as many more in the brickyard. As the proportion of coal miners to other labourers was so small, it is not surprising that the returns showed a meagre margin over the cost of the coal, and left next to nothing to meet the fixed charges.

From a report of a committee of the House of Assembly in 1839, it appears that the coal was being sold in Pictou at 18s. 3½s., and that the total average price was 17s. This inquiry arose out of a formal complaint by the people of Pictou that they were being subjected to a mon-

opoly. In 1840 the price was stated to be 18s. for round coal, the slack being of no value.

When it is stated that up to 1842 there had been about £180,000 invested in the Pictou mines, it is evident that the labours of twenty-five years had been anything but remunerative. In this year the association represented to Lord Viscount Falkland, governor of the province, that the association had raised from all the mines 39,333 Newcastle chaldrons, and that being dependent on the United States for their market, they were threatened with serious loss, as the American Government had increased the duty from $1.00 to $2.20 per chaldron, and the completion of the Reading and the Baltimore & Cumberland Railways had materially lessened the cost of competing coal at the seaboard. The combined duty and cheapened transport had led to a large consumption of anthracite coal, and practically stopped the imports of Nova Scotia coal. In consequence of this representation the company was allowed to raise in 1843, 40,000 chaldrons for the payment of the fixed rent of £3,000 sterling, instead of 20,000. However, even with lowered prices for coal, the shipments fell off 5,783 chaldrons in this year. This decline in output led the governor to report adversely against a proposal from the home government to extend the privilege of raising a larger amount for the fixed rental.

Shortly after this a charter was granted the company by the Provincial Legislature, and a long law suit with the assignees of the Duke of York settled.

The complaints made by the association of the heavy burden imposed on them by the rents and royalties were met by statements that the operations of the company in Pictou had been marked by needless extravagance.

A special report on the mines in 1841 was made to the Provincial Government by George Wightman. He reported, that not including losses from underground fires estimated at £6,891, large losses had been occasioned by the following causes: Unduly large purchases of real estate, fluctuation in the management, unnecessarily expensive work, waste of stores and materials, and imperfect system of works.

His summary of the actual over expenditures made on works compared with what would have been their fair cost amounted to £43,470. He estimated that an efficient railway could have been built for £30,000 less than the actual cost. The cost incurred in securing a level road being so high that the fixed charge thereby imposed per ton of coal carried over it was in excess of the transport expenses incidental to a road having a variety of grades.

He quotes the experience of Carr, who worked prior to 1827, on a small scale, and mined coal at a cost of 10s. per chaldron, and retailed it at 13s., while the company working on a large scale with every appliance

were losing money with a better selling price. He states that the miners had become a privileged class, receiving from eight to twelve shillings a day, and privileges in the way of rent and fuel equal to fifteen pounds a year. In the pits labourers performed equally severe work and were paid three and sixpence a day, without being allowed by the miners to join their ranks. Sometimes the miners took an apprentice who by the payment of a fee attained the standing of a miner, but the employer could not send a single man among them. He concluded by reporting that if the management would inaugurate a system of strict economy, put out more of the work to contract, and abolish the exclusive tactics of the miners, much better returns would be received.

The association, threatened with the loss of their most important market, did retrench as far as possible, having completed their railway, and their new colliery enjoyed for some time a somewhat improved condition.

The second colliery was commenced in 1837 to the north of the first, or Store pits, a barrier of one hundred feet of solid coal being left. The shallowest pit next the barrier, used for ventilation, was 240 feet deep. From this point there were seven other shafts sunk over a space of 253 yards, the deepest being 455 feet on the Seam. The cost of sinking and equipping this colliery was £18,178. It was worked on a system similar to that adopted in the Store pits, and enjoyed an immunity from serious accidents for many years. This colliery was equipped in accordance with the best mining practice of the day, and proved very efficient. The pumps were of the Cornish pattern, the boilers in part of the "wagon" or "balloon" type. In 1855 much damage was caused by the crushing of part of the workings owing to the weakness of the pillars left to support the roof. At this date the practice of sinking a new pit whenever the coal within easy reach of a shaft became exhausted, was changed, and slants were sunk from the pit bottom running obliquely across the dip of the coal seam. Engines were used to bring the coals up these inclines, when they were raised to the surface through the vertical shaft. In 1861 the coal in the slant running to the eastward took fire from a blast igniting the coal, and it had to be filled with water. In the year 1867 the other or western slant took fire, and the mine was finally abandoned.

The westward extension of the Store and Bye pit collieries was limited by a band of inferior coal marked superficially by the course of Coal Brook. As the coal was proved to improve again in quality beyond this space, fresh workings were decided on, and in 1849 the Dalhousie pits were sunk. There were five pits, the main shaft being 234 feet deep. Shortly after a shaft was sunk through the outcrop of the main seam, a few yards from the Dalhousie colliery to the next underlying coal bed known as the Cage pit or Deep seam.

Workings were carried on in the Dalhousie pit for a number of years in the coal lying between the level of the shaft and its outcrop, and through a slant running to the dip in a northwesterly direction. In this colliery much of the coal was worked to a height of about twenty-seven feet, leaving tall and weak pillars; this brought on a general crush which overwhelmed a great part of the workings. The final blow to this colliery, however, was delivered from another and newer shaft. For some unexplained reason it was decided in 1866 to start a colliery to the westward of the crushed workings of the Dalhousie pit. A comparatively superficial examination would have shown that in the district to be commanded by the new pit the coal was inferior in quality, and that whatever there was of good coal to the dip of the shaft would have been ultimately secured by the new shaft then being sunk to the dip of the Bye pit workings. However, the shaft known as the Foster pit was sunk, and ill-advisedly connected with the western faces of the Dalhousie pit. Some large stoppings built to shut off some of these connections took fire, and in May, 1870, both the pits were practically closed. The expenditure on the Foster pit was totally lost, without any return whatever, as only a few tons of coal had been extracted.

The closing chapter of these notes on coal mining in Pictou County refers to the Foord pit. This shaft was projected at the same time as the Foster pit, and intended to win the large area of coal lying in the northern half of the area to the dip of the abandoned Store, Bye and Dalhousie collieries. It was successfully completed, reaching the main seam at a depth of about 900 feet, and equipped with the best pumps, hoisting machinery, etc., procurable in England. It was continuously worked until 1880, when a terrific explosion of gas caused the loss of nearly fifty lives, and it was found necessary to let in the water of the East River, on account of the coal being set on fire by the explosion. After some years the water was pumped out, and an attempt made to reopen it. As an undue amount of air was admitted into the old workings during the operation of reopening, spontaneous fires arose which led to the reclosing of the pit in the fall of 1892. The explosion in 1880 was communicated to the Cage pit, or deep seam workings, a through tunnel, and that colliery has also since remained closed. The details of the history of the Foord pit and of the attempts made to reopen it are given in a report by the writer to the Government of Nova Scotia made in 1895, and need not be dwelt upon here.

The reopening of the solid or unworked coal lying to the north of the Foord pit, as well as of the pillars and lower half of the seam in the old workings are discussed in the report referred to. At present the mining operations in the Pictou Main Seam, begun in 1817 and continued up to 1892, are practically closed.

The lessees when they found all their mines closed by explosions and fires in 1880, opened two underlying seams which have since been worked

steadily. These operations, however, need not be referred to further, as they are of so recent a date.

The early records of the coal trade were not accurately kept by the Provincial Crown Land Department, but as far as the writer is able to learn, there were extracted between the years 1877 and 1880, in round numbers 6,000,000 tons of coal from the Main and Deep seams.

A reference may appropriately be made to the quality of the coal in this great seam which for so many years proved a source of wealth to Picton county, and to what measure of success attended the efforts of the lessees to extract coal from it.

The main seam may be divided in general terms into an upper and a lower bed. Each of these beds is about twelve feet in thickness, of workable coal. The upper divisions in the Store, Bye and Foord pits was better in quality than the lower; accordingly in these pits we find that the upper layer of the top portion won out, and the lower bed proved good enough to be worked conjointly only in the Dalhousie pit. Workings were carried on in the coal to a height of some twenty-four feet, and an inadequate scale of pillarage led to a crush causing the loss of the pit and of an immense amount of coal. A description of the systems of working adopted at these collieries need not be given here, but it may be described as forming an immense extent, some four hundred acres, of excavations leaving blocks of coal to support the roof. As each colliery was connected with that preceding, it became finally a vast burrow, and the fires which occurred from time to time became incapable of isolation or extinction, and remain so to-day at numerous points.

Reference has already been made to the fact that in the Store pits the coal was found to deteriorate in the upper part of the seam to the eastward and westward. A similar state of affairs was found to exist in the Bye pit workings.

The change for the better in the quality of the coal in the Dalhousie pit, already referred to as sunk beyond this zone of inferior coal superficially indicated by the course of Coal Brook, was only comparative. The "fall" or top layer of coal disappeared and the lower part of the upper portion of the seam was higher in ash than the coal met at the western face of the Bye pit workings. This is shown by the following set of analyses from "Acadian Geology" of the three divisions of the upper part of the seam as worked in the Bye and Dalhousie pits. The first sample is from a point about 700 yards east of the Bye pit, the second from a point about 700 yards west of the Bye pit, and the third from a point about one-half a mile west of the Dalhousie pit:

		No. 1.	No. 2.	No. 3.
Full Coal 3′ 2″ ?	Moisture	1·750	1·550	Thinned out.
	Volatile combustible	25·875	27·988	
	Fixed carbon	61·950	60·837	
	Ash	10·425	9·625	
Top Bench 3′ 9″ ?	Moisture	1·500	1·500	2·3
	Volatile combustible	24·800	28·613	22·7
	Fixed carbon	51·428	61·087	62·0
	Ash	22·272	8·800	13·1
Bottom Bench 5′ 0″ ?	Moisture	2·250	1·800	2·5
	Volatile combustible	22·375	27·075	22·7
	Fixed carbon	52·475	59·950	58·8
	Ash	22·900	11·175	16·0

The composition of the untouched lower part of the seam in the Bye pit is apparently as follows:

Volatile combustible matter	25·8 to 30·4
Fixed carbon	54·8 to 67·4
Ash from	8·7 to 23·3

as condensed from a number of analyses.

The following analysis by the writer, from a paper on the composition of Canadian Coals, of the upper portion of the Main seam, as worked at the Forest pit, shows its improvement in quality toward the dip:

Moisture	1·05
Volatile combustible matter	26·19
Fixed carbon	63·41
Ash	9·35

The same rule appears to hold good in the case of the lower portion of the seam; as in the Foord pit district the ash in the lower part is stated by the present agent of the lessees, to be eleven per cent against an average of about sixteen per cent nearer the outcrop. The coal of the Deep seam was very similar to the upper portion of the Main seam but had a slightly greater percentage of ash.

As to the coal contents of the Main seam forming the scene of the operations more specially noted, the writer has been unable to procure exact figures of the tonnage of coal extracted, as the returns at the dis-

posal of the government are not complete. The lower division of the seam was not worked at all in the Store, Bye, and Foord pits, and only partly worked in the Dalhousie pit. It would probably be found to be an over estimate, assuming that the upper portion of the seam was only worked in the Dalhousie pit, to say that one-half of the upper portion of the seam was worked.

Assuming the acreage of the pits at 450 acres, and the two divisions of the seams to be each twelve feet thick, on the figures given in Acadian Geology, there would be in the seam within their limits 16,200,000 tons of coal, or allowing for barriers and unworked blocks of coal in all 18,000,000 tons.

Taking one-half for the lower division of the seam, and adding one-half of the upper or worked portion there would be still in these workings 13,500,000 tons of coal. In any estimate of the future of this seam of coal account would have to be taken of the enormous but as yet undeveloped field lying to the north of the Foord pit workings.

In this brief review of the history of coal mining in the Pictou main seam we have noticed successive fires, explosions, crushes, inundations, and all the woes of the coal miner until it has become abandoned. The successful recovery of this vast body of coal and its application to the industrial pursuits of the country is a legacy left by the accumulating disasters of half a century for the ingenuity of mining engineers. Abandoned pits, lurking fires, crushed pillars, impounded bodies of water, imperfect plans, and outbreaks of spontaneous combustion, all unite to appall the miner, and invite condemnation of man's waste of the gifts of nature.