

CANADA  
DEPARTMENT OF MINES

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MINES BRANCH

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**BULLETIN No. 22.**

# Analyses of Canadian Fuels

IN FIVE PARTS

PART I

THE MARITIME PROVINCES

COMPILED BY

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J. DE LABROQUERIE TACHE

PRINTER TO THE KING'S MOST EXCELLENT MAJESTY

1918

## EXPLANATORY NOTES.

The samples of fuel from the Maritime Provinces collected previous to 1910 were analysed at McGill University by the staff then engaged in a special "Investigation of the Coals of Canada." Early in 1910, however, this work was transferred to the Division of Fuels and Fuel Testing, Mines Branch, Department of Mines, Ottawa; and all subsequent samples have been tested there.

The expressions "anal." and "calc." at the head of any column indicate whether the figures recorded were obtained directly by analysis, or by calculation. The usual practice was to analyse the fuels after air-drying, although, in some cases, determinations were made on samples either in the condition received, or after being completely dried.

Figures in columns "R" refer to fuels as received; in columns "AD" to air-dried fuels; and in columns "D" to those dried at 105° C.

In making the determinations, the necessary calculations were made to give one more significant figure than is reported. All deduced values were calculated before the rounding-off process took place.

A description of the "Hoffmann Potash Test" is given on page 65 of the Summary Report of the Mines Branch for the year 1916.

A "Commercial" sample of any grade of fuel is one representative of the corresponding product as shipped from any mine.

The "Mine" and "Prospect" samples were collected by technical officers of either the Federal or Provincial Governments; the former term being applied to those procured from deposits already under development. "Prospect" samples are apt to be weathered, and may, therefore, only give an indication of the composition of the main body of the deposit.

HOMAS ZEAM  
VASSAL

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## Nova Scotia Coal Fields.

## Sydney Area.

Description.	Tracy Mines. Near Mira. East side of False Bay beach.		North Atlantic Collieries, Ltd., Port Morien.		Outcrops at Port Morien.							
	1281		M50		1282		1284		1285		1283	
Moisture condition (see note, p. 2)	R	D	R	D	R	D	R	D	R	D	R	D
Loss on air-drying.....%												
Results obtained by.....	Anal. Calc.		Calc. Anal.		Anal. Calc.		Anal. Calc.		Anal. Calc.		Anal. Calc.	
Proximate analysis:—												
Moisture.....%	2.0		2.8		1.7		2.0		1.6		1.5	
Ash.....%	9.2 9.4		11.0 12.3		20.8 21.2		11.0 11.2		15.7 16.0		12.9 13.1	
Volatile matter.....%	34.5 35.2		33.8 34.7		30.5 31.0		34.0 34.7		31.4 31.9		31.2 31.7	
Fixed carbon.....%	54.3 55.4		51.5 53.0		47.0 47.8		53.0 54.1		51.3 52.1		54.4 55.2	
Ultimate analysis:—												
Carbon.....%			68.5 70.5									
Hydrogen.....%			5.0 4.8									
Ash.....%			11.0 12.3									
Sulphur.....%			6.2 6.4									
Nitrogen.....%			1.0 1.0									
Oxygen.....%			7.4 5.0									
Calorific value:—												
Calories per gram, gross.....			6810 7010									
B. Th. U. per lb., gross.....			12260 12620									
Fuel ratio.....	1.60		1.55		1.55		1.55		1.65		1.75	
Carbon-Hydrogen ratio.....			13.7 14.7									
Coking properties.....	small lump of fair coke		....		small lump of good coke		small lump of good coke		small lump of good coke		good, swollen coke	
Location in mine.....			Gowrie seam.		Gowrie seam.		Blockhouse seam.		Upper 13-ft. of Long Beach seam.		Lower part of Long Beach seam.	
Kind of sample.....	Mine.....		Commercial.		Prospect.....							
Quality of coal.....			Over $\frac{1}{2}$ inch screen and picking belt.									
Taken by.....	A. O. Hayes, Geological Survey, Ot- tawa.		E. Stansfield.		A. O. Hayes.							
Date of sampling.....	Summer of 1917.		Jan. 15, 1909.		1917.							

## Nova Scotia Coal Fields.

## Sydney Area.

Description.	Outcrops at or near Port Morien.											
	1275		1287		1277		1278		1279		1276	
Sample No.....	R	D	R	D	R	D	R	D	R	D	R	D
Moisture condition (see note, p. 2)...												
Loss on air-drying.....%												
Results obtained by.....	Anal.	Calc.	Anal.	Calc.	Anal.	Calc.	Anal.	Calc.	Anal.	Calc.	Anal.	Calc.
Proximate analysis:—												
Moisture.....%	2.1		1.7		2.0		2.0		1.7		2.2	
Ash.....%	21.1	21.5	10.6	10.8	14.8	15.1	13.7	14.0	17.4	17.7	6.1	6.2
Volatile matter.....%	30.8	31.5	33.1	33.7	31.4	32.0	33.1	33.8	32.7	33.3	36.1	36.9
Fixed carbon.....%	46.0	47.0	54.6	55.5	51.8	52.9	51.2	52.2	48.2	49.0	55.0	56.9
Ultimate analysis:—												
Carbon.....%												
Hydrogen.....%												
Ash.....%												
Sulphur.....%												
Nitrogen.....%												
Oxygen.....%												
Calorific value:—												
Calories per gram, gross.....												
B. Th. U. per lb., gross.....												
Fuel ratio.....	1.50		1.65		1.65		1.55		1.45		1.55	
Carbon-Hydrogen ratio.....												
Coking properties.....	small lump of good coko		small lump of good coke		small lump of good coke		small lump of good coke		small lump of fair coko		small lump of fair coke	
Location in mine.....	S p o n c o r seam, south limb of synclinal.		S p o n c o r seam, north limb of synclinal.		Wilsonseries of seams, top 1-3 feet.		Wilsonseries 1-foot seam.		Wilsonseries 4 seams, total thickness about 2 feet.		Wilsonseries 1.4-foot seam.	
Kind of sample.....	Prospect.											
Quality of coal.....												
Taken by.....	A. O. Hayes, Geological Survey.											
Date of sampling.....	Summer of 1917.											

## Nova Scotia Coal Fields.

## Sydney Area.

Description.	Outcrop at Port Morien.		Birch Grove pit, 1½ miles south of Dominion Colliery No. 21.		Dominion Coal Co., Ltd., Glace Bay.					
	R	D	R	D	382			536		
Sample No.....	1286		1280		382			536		
Moisture condition (see note, p. 2).....	R	D	R	D	R	AD	D	R	AD	D
Loss on air-drying.....%	.....	.....	.....	.....	4.6	.....	.....	9.0	.....	.....
Results obtained by.....	Anal.	Calc.	Anal.	Calc.	Calc.	Anal.	Calc.	Calc.	Anal.	Calc.
Proximate analysis:—										
Moisture.....%	2.4	.....	3.1	.....	7.4	2.9	.....	11.2	2.4	.....
Ash.....%	15.4	15.8	16.2	16.7	6.0	6.3	6.4	8.2	9.0	9.2
Volatile matter.....%	32.3	33.1	28.2	29.1	.....	.....	.....	30.8	33.8	34.6
Fixed carbon.....%	49.9	51.1	52.5	54.2	.....	.....	.....	49.8	54.8	56.2
Ultimate analysis:—										
Carbon.....%	.....	.....	.....	.....	.....	.....	.....	67.0	73.6	75.4
Hydrogen.....%	.....	.....	.....	.....	.....	.....	.....	5.6	5.1	4.9
Ash.....%	.....	.....	.....	.....	.....	.....	.....	8.2	9.0	9.2
Sulphur.....%	.....	.....	.....	.....	1.8	1.9	2.0	2.3	2.5	2.6
Nitrogen.....%	.....	.....	.....	.....	.....	.....	.....	1.0	1.1	1.2
Oxygen.....%	.....	.....	.....	.....	.....	.....	.....	15.9	8.7	6.7
Calorific value:—										
Calories per gram, gross.....	.....	.....	.....	.....	7280	7030	7850	6660	7320	7490
B. Th. U. per lb., gross.....	.....	.....	.....	.....	13100	13730	14130	11980	13170	13490
Fuel ratio.....	1.55		1.85		.....			1.60		
Carbon-Hydrogen ratio.....	.....		.....		.....			12.0 14.6 15.4		
Coking properties.....	good, swollen coke		agglomerates		.....			forms small lump of good firm coke		
Location in mine.....	McRury seam.....		.....		.....					
Kind of sample.....	Prospect.....		Prospect.....		Commercial.					
Quality of coal.....	.....		.....		Washed screenings.					
Taken by.....	A. O. Hayes, Geological Survey.		A. O. Hayes.....		Submitted by purchasers.					
Date of sampling.....	Summer of 1917.		1917.....		August 1914.....			February 1915.		

## Nova Scotia Coal Fields.

## Sydney Area.

Description	Dominion Coal Co., Ltd.										
	Dominion No. 7 or Hub Colliery, Glaco Bay.					Dominion No. 9 Colliery, Glaco Bay.					
	M36			M236	M2036		M35			M2035	
Sample No.....	R	AD	D	D	R	D	R	AD	D	R	D
Moisture condition (see note, p. 2)	0.9	.....	.....	.....	.....	.....	0.8	.....	.....	.....	.....
Loss on air-drying.....%	0.9	.....	.....	.....	.....	.....	0.8	.....	.....	.....	.....
Results obtained by.....	Calo.	Calo.	Anal.	Anal.	Calo.	Anal.	Calo.	Calo.	Anal.	Calo.	Anal.
Proximate analysis:—											
Moisture.....%	3.5	2.6	.....	.....	3.4	.....	2.4	1.6	.....	2.1	.....
Ash.....%	5.7	5.8	5.9	2.7	4.3	4.5	5.7	5.8	5.9	6.8	6.9
Volatile matter.....%	35.2	35.5	36.5	38.2	35.9	37.2	37.7	38.0	38.6	37.4	38.2
Fixed carbon.....%	55.6	56.1	57.6	59.1	56.4	58.3	54.2	54.6	55.5	53.7	54.9
Ultimate analysis:—											
Carbon.....%	74.1	74.7	76.8	80.0	75.6	78.2	75.2	75.8	77.0	74.4	76.0
Hydrogen.....%	5.2	5.2	5.0	5.2	5.4	5.2	5.4	5.3	5.2	5.3	5.2
Ash.....%	5.7	5.8	5.9	2.7	4.3	4.5	5.7	5.8	5.9	6.8	6.9
Sulphur.....%	2.3	2.3	2.4	2.0	2.8	3.0	3.6	3.7	3.8	3.7	3.7
Nitrogen.....%	1.6	1.6	1.6	1.7	1.5	1.5	1.5	1.5	1.5	1.3	1.4
Oxygen.....%	11.1	10.4	8.3	8.4	10.4	7.6	8.6	7.9	6.6	8.5	6.8
Calorific value:—											
Calories per gram, gross.....	7430	7500	7700	7050	.....	.....	7590	7660	7780	.....	.....
B. Th. U. per lb., gross.....	13370	13490	13860	14310	.....	.....	13670	13780	14010	.....	.....
Fuel ratio.....	1.60			1.55	1.55		1.45			1.45	
Carbon-Hydrogen ratio.....	14.2	14.5	15.3	15.4	13.9	15.0	14.1	14.3	14.8	14.0	14.6
Coking properties.....	.....										
Location in mine.....	Hub seam.....			.....	Hub seam.....		Harbour seam.....			Harbour seam	
Kind of sample.....	Commercial—10 tons.....			.....	Commercial..		Commercial—5 tons			Commercial.	
Quality of coal.....	Over 2½ inch shaking screen and picking belt.			Washed coal from M36, yield 93%.	.....		Over 2½ inch bar screen and picking belt.			.....	
Taken by.....	T. Denis, Mines Branch, Ottawa.			.....	Mine authori- ties.		T. Denis.....			Mine authori- ties.	
Date of sampling.....	June 24, 1908.....			.....	Jan. 1909.....		June 23, 1908.....			Jan. 1909.	



## Nova Scotia Coal Fields.

## Sydney Area.

Description.	Dominion Coal Co., Ltd.									
	Dominion No. 5 or Reserve Colliery, Glace Bay.					Dominion No. 1 Colliery, Glace Bay.				
	M35 SP			M2035 SP		M38			M2038	
Sample No.....	R	AD	D	R	D	R	AD	D	R	D
Moisture condition(see note, p.2)										
Loss on air-drying.....%	1.5	.....	.....	.....	.....	1.4	.....	.....	.....	.....
Results obtained by.....	Calc.	Calc.	Anal.	Calc.	Anal.	Calc.	Calc.	Anal.	Calc.	Anal.
Proximate analysis:—										
Moisture.....%	3.4	1.9	.....	1.9	.....	3.5	2.1	.....	1.8	.....
Asb.....%	5.3	5.4	5.5	6.4	6.6	5.7	5.7	5.9	4.7	4.8
Volatile matter.....%	33.8	34.3	35.0	34.5	35.2	33.1	33.6	34.3	34.2	34.8
Fixed carbon.....%	57.6	58.4	59.5	57.2	58.2	57.7	58.0	59.8	59.3	60.4
Ultimate analysis:—										
Carbon.....%	75.9	77.1	78.7	76.8	78.3	75.8	77.0	78.6	78.8	80.2
Hydrogen.....%	5.6	5.4	5.3	4.9	4.7	5.3	5.2	5.1	5.4	5.3
Asb.....%	5.3	5.4	5.5	6.4	6.6	5.7	5.7	5.9	4.7	4.8
Sulphur.....%	1.8	1.8	1.8	2.3	2.3	1.8	1.8	1.8	1.5	1.5
Nitrogen.....%	1.4	1.4	1.4	1.3	1.3	1.4	1.4	1.5	1.4	1.4
Oxygen.....%	10.1	8.9	7.3	8.3	6.8	10.0	8.9	7.1	8.2	6.8
Calorific value:—										
Calories per gram, gross....	7630	7650	7800	.....	.....	7610	7620	7780	.....	.....
B. Tb. U. per lb., gross....	13560	13770	14940	.....	.....	13520	13710	14010	.....	.....
Fuel ratio.....	1.70			1.65		1.75			1.75	
Carbon-Hydrogen ratio.....	13.8	14.2	14.8	15.8	16.5	14.3	14.7	15.4	14.5	15.1
Coking properties.....	.....			.....		.....			.....	
Location in mine.....	Phalen seam.....			Phalen seam.....		Phalen seam.....			Phalen seam.	
Kind of sample.....	Commercial—2 tons			Commercial.....		Commercial—10 tons			Commercial.	
Quality of coal.....	Over 1½ inch shak- ing screen and picking belt.			.....		Over 1 inch screen and picking table.			.....	
Taken by.....	T. Denis, Mines Branch.			Mine authorities..		T. Denis.....			Mine authorities.	
Date of sampling.....	June 25, 1908.....			January, 1909.....		June 26, 1908.....			January, 1909.	

## Nova Scotia Coal Fields.

## Sydney Area.

Description.	Dominion Coal Co., Ltd.										
	Dominion No. 10 colliery, Glace Bay.						Dominion No. 12 colliery, Glace Bay.				
	M37			M237	M2037		M30			M2039	
	R	AD	D	D	R	D	R	AD	D	R	D
Sample No.....											
Moisture condition (see note, p. 2).....	R	AD	D	D	R	D	R	AD	D	R	D
Loss on air-drying.....%	2.0	.....	.....	.....	.....	.....	1.3	.....	.....	.....	.....
Results obtained by.....	Calc.	Calc.	Anal.	Anal.	Cnc.	Anal.	Cnc.	Calc.	Anal.	Calc.	Anal.
Proximate analysis:—											
Moisture.....%	3.9	1.9	.....	.....	4.1	.....	4.8	3.6	.....	4.3	.....
Ash.....%	10.7	10.9	11.1	5.8	5.8	6.0	4.5	4.6	4.8	3.9	4.1
Volatile matter.....%	33.7	34.4	35.1	36.0	34.0	35.5	35.5	35.9	37.3	35.5	37.1
Fixed carbon.....%	51.7	52.8	53.8	57.3	56.1	58.5	55.2	55.9	57.9	56.3	58.
Ultimate analysis:—											
Carbon.....%	70.4	71.9	73.3	78.5	76.0	79.3	73.9	74.8	77.6	76.9	80.4
Hydrogen.....%	5.2	5.0	4.9	5.2	5.5	5.2	5.5	5.4	5.2	5.7	5.5
Ash.....%	10.7	10.9	11.1	5.8	5.8	6.0	4.5	4.6	4.8	3.9	4.1
Sulphur.....%	2.4	2.5	2.5	2.1	1.6	1.7	1.7	1.7	1.8	1.5	1.6
Nitrogen.....%	1.2	1.2	1.2	1.3	1.1	1.2	1.5	1.5	1.6	1.5	1.5
Oxygen.....%	10.1	8.5	7.0	7.1	10.0	6.6	12.9	12.0	9.0	10.5	6.9
Caloric value:—											
Calories per gram, gross...	7010	7150	7290	7710	.....	.....	7290	7380	7660	.....	.....
B. Th. U. per lb., gross....	12620	12870	13130	13880	.....	.....	13130	13290	13700	.....	.....
Fuel ratio.....		1.55		1.55		1.65		1.55			1.60
Carbon-Hydrogen ratio.....	13.6	14.3	14.9	15.1	13.9	15.2	13.5	13.9	15.0	13.4	14.6
Coking properties.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Location in mine.....	Emery seam.....			.....	Emery seam		Victoria seam.....	Victoria seam		Victoria seam	
Kind of sample.....	Commercial—10 tons			.....	Commercial.		Commercial—3 tons	Commercial.		Commercial.	
Quality of coal.....	Over picking table.			Washed coal from M37, yield, 89%.	.....		Run-of-mine.....	.....		.....	
Taken by.....	T. Denis, Mines Branch.			.....	Mine authorities.		T. Denis.....	.....		Mine authorities.	
Date of sampling.....	June 25, 1908.....			.....	Jan., 1909.....		June 27, 1908.....	.....		Jan., 1909.	

## Nova Scotia Coal Fields.

## Sydney Area.

Description.	Nova Scotia Steel and Coal Co., Ltd.										
	Sydney No. 1 colliery, Sydney Mines.					Sydney No. 3 colliery, Sydney Mines.					
	M13			M213	M2013		M12			M2012	
	R	AD	D	D	R	D	R	AD	D	R	D
Sample No. ....											
Moisture condition (see note, p. 2) .....											
Loss on air-drying.....%	0.8						1.4				
Results obtained by.....	Calc.	Calc.	Anal.	Anal.	Calc.	Anal.	Calc.	Calc.	Anal.	Calc.	Anal.
Proximate analysis:—											
Moisture.....%	3.5	2.7			1.6		5.5	4.1		3.5	
Ash.....%	6.9	7.0	7.2	3.5	11.2	11.4	6.3	6.4	6.7	16.2	16.8
Volatile matter.....%	36.0	36.3	37.3	40.2	35.4	36.0	36.8	37.3	38.0	33.6	34.8
Fixed carbon.....%	53.6	54.0	55.5	56.3	51.8	52.6	51.4	52.2	54.4	46.7	48.4
Ultimate analysis:—											
Carbon.....%	72.8	73.4	75.4	79.3	71.4	72.6	70.8	71.8	74.9	65.0	67.3
Hydrogen.....%	5.3	5.2	5.1	5.4	5.2	5.1	5.4	5.3	5.0	4.9	4.7
Ash.....%	6.9	7.0	7.2	3.5	11.2	11.4	6.3	6.4	6.7	16.2	16.8
Sulphur.....%	2.8	2.8	2.9	1.9	2.2	2.2	2.4	2.4	2.5	3.4	3.5
Nitrogen.....%	1.3	1.3	1.3	0.9	1.4	1.4	1.3	1.4	1.4	1.2	1.3
Oxygen.....%	10.9	10.3	8.1	9.0	8.6	7.3	13.8	12.7	9.5	9.3	6.4
Calorific value:—											
Calories per gram, gross...	7380	7440	7650	8050			7190	7290	7600		
B. Th. U. per lb., gross...	13290	13400	13770	14490			12940	13130	13690		
Fuel ratio.....		1.50		1.40		1.45		1.40			1.40
Carbon-Hydrogen ratio.....	13.8	14.1	14.9	14.7	13.6	14.1	13.2	13.6	14.8	13.3	14.4
Coking properties.....											
Location in mine.....	Main seam.....				Main seam....		Main seam.....			Main seam.	
Kind of sample.....	Commercial—10 tons				Commercial..		Commercial—10 tons			Commercial.	
Quality of coal.....	Over ½ inch bar screen and picking belt.			Washed coal from M13, yield 89%.	Slack.....		Over ½ inch screen and picking belt.			Slack.	
Taken by.....	T. Denis, Mines Branch.				Mine authorities.		T. Denis.....			Mine authorities.	
Date of sampling.....	July 5, 1907.....				January, 1909.		July 4, 1907.....			January, 1909.	

## Nova Scotia Coal Fields.

## Inverness Area.

Description.	Inverness Railway and Coal Co.											
	Inverness colliery, Inverness.											
	M14			M214	1261		1262		1263		1264	
Moisture condition (see note, p. 2).....	R	AD	D	D	R	D	R	D	R	D	R	D
Loss on air-drying.....%	1.8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Results obtained by.....	Calc.	Calc.	Anal.	Anal.	Anal.	Calc.	Anal.	Calc.	Anal.	Calc.	Anal.	Calc.
Proximate analysis:—												
Moisture.....%	9.3	7.6	.....	.....	3.5	.....	3.5	.....	3.9	.....	5.4	.....
Ash.....%	9.4	9.6	10.4	6.5	13.4	13.9	12.1	12.5	9.0	9.4	7.9	8.4
Volatile matter.....%	36.2	36.9	39.9	42.5	37.5	38.9	36.2	37.6	36.6	38.1	39.4	41.6
Fixed carbon.....%	45.1	45.9	49.7	51.0	45.6	47.2	48.2	49.9	50.5	52.5	47.3	50.0
Ultimate analysis:—												
Carbon.....%	61.0	62.1	67.2	70.3	.....	.....	.....	.....	.....	.....	.....	.....
Hydrogen.....%	5.4	5.3	4.8	4.8	.....	.....	.....	.....	.....	.....	.....	.....
Ash.....%	9.4	9.6	10.4	6.5	.....	.....	.....	.....	.....	.....	.....	.....
Sulphur.....%	5.4	5.5	6.0	5.0	5.7	6.0	5.7	5.9	4.1	4.2	6.3	6.6
Nitrogen.....%	0.8	0.8	0.9	0.6	.....	.....	.....	.....	.....	.....	.....	.....
Oxygen.....%	18.0	16.7	10.7	12.8	.....	.....	.....	.....	.....	.....	.....	.....
Calorific value:—												
Calories per gram, gross.	6130	6240	6750	7110	6410	6640	6490	6720	6750	7020	6580	6950
B. Th. U. per lb., gross.	11030	11230	12160	12800	11540	11950	11080	12100	12150	12640	11840	12510
Fuel ratio.....	1.25			1.20	1.20		1.35		1.40		1.20	
Carbon-Hydrogen ratio.....	11.4	11.8	14.1	14.6	.....	.....	.....	.....	.....	.....	.....	.....
Coking properties.....	.....			.....	small lump of fair coke	small lump of poor coke	small lump of poor coke	small lump of poor coke	small lump of poor coke	small lump of poor coke	small lump of poor coke	small lump of poor coke
Fusion point of ash.....	.....			.....	1040°C	985°C	1050°C	1010°C	.....	.....	.....	.....
Specific Gravity.....	.....			.....	1.39	.....	1.34	.....	1.28	.....	1.31	.....
Location in mine.....	Nos. 5, 6 and 7 levels			.....	Upper bench of 7-ft. seam	Middle bench of 7- ft. seam.	Bottom bench of 7- ft. seam.	.....	.....	.....	3-ft. seam, south of McIsaac.	.....
Kind of sample.....	Commercial—10 tons			.....	.....	.....	.....	.....	.....	.....	.....	.....
Quality of coal.....	Over ½ inch shaking screen and picking belt.			Washed coal from M14, yield 87%.	.....	.....	.....	.....	.....	.....	.....	.....
Taken by.....	T. Denis, Mines Branch and mine authorities.			.....	Mine authorities.							
Date of sampling.....	July, 1907.			.....	December, 1917.							

## Nova Scotia Coal Fields.

Description.	Inverness Area.							Richmond Area.		
	Samples from exposures at Maple Brook.				Port Hood & Richmond Railway & Coal Co., Ltd., Port Hood colliery, Port Hood.			Coal from Glengarry Valley.		
Sample No.....	1289		1291		M15		M215	1001		
Moisture condition (see note, p. 2)..	R	D	R	D	R	AD	D	D	R	D
Loss on air-drying.....%	.....	.....	.....	.....	1.5	.....	.....	.....	.....	.....
Results obtained by.....	Anal. Calc.		Anal. Calc.		Calc.	Calc.	Anal.	Anal.	Anal.	Calc.
Proximate analysis:—										
Moisture.....%	0.9	.....	1.1	.....	4.7	3.2	.....	.....	3.9	.....
Ash.....%	48.9	49.3	46.6	47.1	13.9	14.1	14.6	10.9	14.8	15.4
Volatile matter.....%	.....	.....	.....	.....	35.4	35.9	37.1	37.9	32.6	33.9
Fixed carbon.....%	.....	.....	.....	.....	46.0	46.8	48.3	51.2	48.7	50.7
Ultimate analysis:—										
Carbon.....%	.....	.....	.....	.....	60.7	61.6	63.7	68.7	.....	.....
Hydrogen.....%	.....	.....	.....	.....	4.5	4.4	4.2	4.4	.....	.....
Ash.....%	.....	.....	.....	.....	13.9	14.1	14.6	10.9	.....	.....
Sulphur.....%	.....	.....	.....	.....	7.6	7.7	7.9	6.7	1.3	1.3
Nitrogen.....%	.....	.....	.....	.....	0.8	0.8	0.8	0.6	1.0	1.1
Oxygen.....%	.....	.....	.....	.....	12.5	11.4	8.8	8.7	.....	.....
Calorific value:—										
Calories per gram, gross.....	.....	.....	.....	.....	6240	6330	6540	6970	6630	6900
B. Th. U. per lb., gross.....	.....	.....	.....	.....	11230	11400	11780	12550	11930	12420
Fuel ratio.....	.....	.....	.....	.....	.....	1.30	.....	1.35	.....	1.50
Carbon-Hydrogen ratio.....	.....	.....	.....	.....	.....	13.5	14.0	15.3	.....	.....
Coking properties.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	fair coke
Location in mine.....	Upper (1-ft. 8 in.) seam, west bank of brook.	.....	From a pit 200 yds. down the brook on the south bank.	.....	.....	.....	.....	.....	.....	.....
Kind of sample.....	Mine.....	.....	Mine.....	.....	.....	.....	Commercial—10 tons	.....	.....	.....
Quality of coal.....	.....	.....	.....	.....	.....	.....	Over ½ inch shaking screen and picking belt.	Washed coal from M15, yield 76%	.....	.....
Taken by.....	A. O. Hayes, Geological Survey.	.....	A. O. Hayes..	.....	T. Denis, Mines Branch.	.....	.....	.....	.....	Private individual.
Date of sampling.....	Summer of 1917.	.....	1917.....	.....	July 15, 1907.....	.....	.....	.....	.....	1917.

## Nova Scotia Coal Fields.

## Pictou Area.

Description.	Acadia Coal Co., Ltd., Stellarton.									
	Valé colliery, Thorburn.						Allan Shaft colliery, Stellarton.			
	M4			M204	M2004	M16			M2016	
Sample No.....	R	AD	D	D	D	R	AD	D	R	D
Moisture condition (see note, p. 2).....	R	AD	D	D	D	R	AD	D	R	D
Loss on air-drying.....%	0.0	.....	.....	.....	.....	1.9	.....	.....	.....	.....
Results obtained by.....	Calc.	Calc.	Anal.	Anal.	Anal.	Calc.	Calc.	Anal.	Calc.	Anal.
Proximate analysis:—										
Moisture.....%	2.1	2.1	.....	.....	.....	3.7	1.8	.....	2.8	.....
Ash.....%	16.9	16.9	17.3	12.6	19.1	10.9	11.1	11.3	9.0	9.2
Volatile matter.....%	31.5	31.5	32.1	33.2	.....	32.1	32.7	33.3	32.7	33.7
Fixed carbon.....%	49.5	49.5	50.6	54.2	.....	53.3	54.4	55.4	55.5	57.1
Ultimate analysis:—										
Carbon.....%	66.6	66.6	68.0	71.7	.....	71.4	72.8	74.1	75.6	77.8
Hydrogen.....%	4.4	4.4	4.3	4.2	.....	4.9	4.8	4.6	5.2	5.0
Ash.....%	16.9	16.9	17.3	12.6	.....	10.9	11.1	11.3	9.0	9.2
Sulphur.....%	1.0	1.0	1.0	1.0	.....	0.6	0.6	0.6	0.6	0.6
Nitrogen.....%	1.8	1.8	1.8	1.7	.....	1.8	1.8	1.9	2.1	2.2
Oxygen.....%	9.3	9.3	7.6	8.8	.....	10.4	8.9	7.5	7.5	5.2
Calorific value:—										
Calories per gram, gross....	6540	6540	6680	7090	.....	7080	7220	7350	.....	.....
B. Th. U. per lb., gross....	11770	11770	12020	12760	.....	12750	13000	13230	.....	.....
Fuel ratio.....	1.55			1.65	.....	1.65			1.70	
Carbon-Hydrogen ratio.....	15.2	15.2	16.0	17.1	.....	14.6	15.3	16.0	14.5	15.4
Coking properties.....	.....			.....	.....	.....			.....	
Location in mine.....	Six-foot seam.....			.....	.....	Foord seam.....			Foord seam.	
Kind of sample.....	Commercial—5 tons.....			.....	Commercial—2 tons.	Commercial—10 tons			Commercial.	
Quality of coal.....	Over $\frac{1}{2}$ inch screen and picking belt.			Washed coal from M4, yield 83%	Over $\frac{1}{2}$ inch screen and picking belt.	Over picking belt.				
Taken by.....	T. Denis, Mines Branch.			.....	Mine authorities.	T. Denis.....			Mine authorities.	
Date of sampling.....	March 25, 1907.....			.....	July 18, 1907	July 20, 1907.....			January 1909.	

## Nova Scotia Coal Fields.

## Pictou Area.

Description.	Acadia Coal Co., Ltd., Stellarton.							
	Albion colliery, Stellarton.							
Sample No.....	M1	M201	M1001	M2			M2002	
Moisture condition (see note, p. 2).....	D	D	D	R	AD	D	R	D
Loss on air-drying.....%	.....	.....	.....	1.7	.....	.....	.....	.....
Results obtained by.....	Anal.	Anal.	Anal.	Calc.	Calc.	Anal.	Calc.	Anal.
Proximate analysis:—								
Moisture.....%	.....	.....	.....	3.6	2.0	.....	1.7	.....
Ash.....%	14.7	12.3	13.8	10.2	10.3	10.5	9.6	9.8
Volatile matter.....%	29.8	30.8	28.5	30.3	30.8	31.4	29.0	29.5
Fixed carbon.....%	55.5	58.9	57.7	55.9	56.9	58.1	59.7	60.7
Ultimate analysis:—								
Carbon.....%	71.4	73.4	72.7	71.5	72.8	74.2	75.6	76.9
Hydrogen.....%	4.5	4.5	4.4	4.7	4.6	4.5	5.0	4.9
Ash.....%	14.7	12.3	13.8	10.2	10.3	10.5	9.6	9.8
Sulphur.....%	1.4	1.0	1.1	0.8	0.8	0.9	2.1	2.1
Nitrogen.....%	1.7	1.5	1.6	2.1	2.1	2.1	1.6	1.7
Oxygen.....%	6.3	7.3	6.4	10.7	9.4	7.8	6.1	4.6
Calorific value:—								
Calories per gram, gross.....	6990	7250	6920	7050	7170	7320	7400	7520
B. Th. U. per lb., gross.....	12580	13050	12460	12690	12910	13170	13310	13540
Fuel ratio.....	1.85	1.85	2.00	1.85			2.05	
Carbon-Hydrogen ratio.....	15.8	16.3	16.5	15.2	15.8	16.6	15.2	15.8
Coking properties.....	.....	.....	.....	.....	.....	.....	.....	.....
Location in mine.....	Third seam.....	.....	.....	Cage Pit seam.....	Cage Pit seam			
Kind of sample.....	Commercial —10 tons.	.....	.....	Commercial—5 tons	Commercial.			
Quality of coal.....	Run-of-mine	Washed coal from M1, yield 86%	Fresh sam- pling of M1 after one year's in- door stor- age.	Run-of-mine.....	.....			
Taken by.....	T. Denis, Mines Branch.	.....	.....	T. Denis.....	Mine authori- ties.			
Date of sampling.....	Mar. 26, 1907	.....	.....	March 26, 1907.....	January 1909.			

## Nova Scotia Coal Fields.

## Pictou Area.

Description.	Intercolonial Coal Mining Co., Ltd.										
	No. 5 or Acadia colliery, Westville					Drummond colliery, Westville.					
	M8			M2008		M3			M203	M2003	
	R	AD	D	R	D	R	AD	D	D	R	D
Sample No.....											
Moisture condition (see note p. 2).....											
Loss on air-drying.....%	0.2	.....	.....	.....	.....	0.3	.....	.....	.....	.....	.....
Results obtained by.....	Calc.	Calc.	Anal.	Calc.	Anal.	Calc.	Calc.	Anal.	Anal.	Calc.	Anal.
Proximate analysis:—											
Moisture.....%	1.8	1.6	.....	1.3	.....	1.4	1.1	.....	.....	1.7	.....
Ash.....%	9.0	9.0	9.2	8.1	8.2	14.3	14.4	14.5	11.3	13.3	13.5
Volatile matter.....%	25.5	25.6	26.0	27.0	27.4	24.4	24.4	24.7	26.3	22.2	22.6
Fixed carbon.....%	63.7	63.8	64.8	63.6	64.4	69.9	60.1	60.8	63.4	62.8	63.9
Ultimate analysis:—											
Carbon.....%	76.2	76.4	77.6	78.9	80.0	71.6	71.9	72.6	76.0	74.1	75.4
Hydrogen.....%	4.9	4.8	4.7	4.8	4.7	4.4	4.3	4.3	4.5	4.5	4.4
Ash.....%	9.0	9.0	9.2	8.1	8.2	14.3	14.4	14.5	11.3	13.3	13.5
Sulphur.....%	0.9	0.9	0.9	0.8	0.8	2.5	2.5	2.5	1.3	1.3	1.3
Nitrogen.....%	1.5	1.6	1.6	2.1	2.2	2.0	2.0	2.1	2.0	1.9	1.9
Oxygen.....%	7.5	7.3	6.0	5.3	4.1	5.2	4.9	4.0	4.9	4.0	3.5
Calorific value:—											
Calories per gram, gross.	7560	7580	7700	.....	.....	7100	7130	7200	7530	.....	.....
B. Th. U. per lb., gross.	13620	13650	13860	.....	.....	12780	12830	12960	13850	.....	.....
Fuel ratio.....	2.50			2.35		2.45			2.50	2.80	
Carbon-Hydrogen ratio.....	15.7	15.8	16.4	16.3	16.8	16.5	16.6	17.0	16.9	16.3	17.0
Coking properties.....	.....			.....		.....			.....	.....	
Location in mins.....	Main seam.....			Main seam.....		Main seam.....			Main seam.....		
Kind of sample.....	Commercial—5 tons.			Commercial.		Commercial—10 tons.			Commercial.		
Quality of coal.....	Over 1 inch screen and picking belt.			.....		Over 1 inch screen and picking belt.			Washed coal from M3, yield 82%		
Taken by.....	T. Denis, Mines Branch.			Mine authorities.		T. Denis.....			Mine authorities.		
Date of sampling.....	March 28, 1907.....			January 1909.		March 27, 1907.....			January 1909.		
Remarks.....	Operated by Acadia Coal Co., Ltd., at time of sampling.										



## Nova Scotia Coal Fields.

## Springhill Area.

Description.	Outcrop coal from Edison Electric Light & Power Co., Ltd., Springhill.		Dominion Coal Co., Ltd.,									
			No. 1 colliery, Springhill.		No. 2 colliery, Springhill.							
Sample No.....	1148		M49		M5			M205	M205			
Moisture condition (see note, p. 2).....	R	D	R	D	R	AD	D	D	R	D		
Loss on air-drying.....%	.....	.....	.....	.....	0.8	.....	.....	.....	.....	.....		
Results obtained by.....	Anal.	Calc.	Calc.	Anal.	Calc.	Calc.	Anal.	Anal.	Calc.	Anal.		
Proximate analysis:—												
Moisture.....%	9.2	.....	2.2	.....	2.8	2.0	.....	.....	2.5	.....		
Ash.....%	3.8	4.2	3.3	3.4	3.9	9.0	9.2	7.1	5.8	5.9		
Volatile matter.....%	31.0	34.1	32.6	33.3	31.4	31.6	32.3	33.1	31.2	32.1		
Fixed carbon.....%	56.0	61.7	61.9	63.3	56.9	57.4	58.5	59.8	60.5	62.0		
Ultimate analysis:—												
Carbon.....%	.....	.....	79.7	81.5	73.1	73.6	75.1	76.9	77.5	79.4		
Hydrogen.....%	.....	.....	5.3	5.1	5.1	5.0	4.9	5.0	5.3	5.2		
Ash.....%	.....	.....	3.3	3.4	3.9	9.0	9.2	7.1	5.8	5.9		
Sulphur.....%	1.1	1.2	0.9	0.9	1.5	1.6	1.6	1.4	0.9	0.9		
Nitrogen.....%	.....	.....	1.8	1.9	1.2	1.2	1.2	1.0	1.9	2.0		
Oxygen.....%	.....	.....	9.0	7.2	10.2	9.6	8.0	8.6	8.6	6.6		
Calorific value:—												
Calories per gram, gross....	8440	7080	7710	7380	7220	7280	7430	7700	7520	7710		
B. Th. U. per lb., gross....	11600	12770	13370	14190	13000	13100	13370	13860	13540	13380		
Fuel ratio.....	1.80		1.90		1.80			1.80	1.95			
Carbon-Hydrogen ratio.....	.....		15.2 15.9		14.3 14.6 15.3			15.4	14.6 15.4			
Coking properties.....	non-coking		.....		.....			.....	.....			
Location in mine.....												
Kind of sample.....			Commercial.....		Commercial—10 tons				Commercial.			
Quality of coal.....					Over $\frac{1}{2}$ inch screen and picking belt.			Washed coal from M5, yield 32%				
Taken by.....			Mine authorities		T. Denis, Mines Branch.				Mine authorities.			
Date of sampling.....	1917.....		January, 1909.....		April 1, 1907.....				January 1909.			
Remarks.....	Operated by Cumberland Railway & Coal Co. at time of sampling											

## Nova Scotia Coal Fields.

Description.	Springhill Area.					Joggins—Chignecto Area.				
	Dominion Coal Co., Ltd., No. 3 colliery, Springhill.					Minudie Coal Co., Ltd., Minudie colliery, River Hebert.				
	M6		M206	M2006		M9			M209	
Moisture condition (see note, p. 2).....	R	AD	D	D	R	D	R	AD	D	D
Loss on air-drying.....%	0.5	.....	.....	.....	.....	.....	1.0	.....	.....	.....
Results obtained by.....	Calc.	Calc.	Anal.	Anal.	Calc.	Anal.	Calc.	Calc.	Anal.	Anal.
Proximate analysis:—										
Moisture.....%	2.8	2.3	.....	.....	2.3	.....	3.8	2.8	.....	.....
Ash.....%	11.1	11.2	11.5	8.3	4.6	4.7	14.9	15.1	15.5	11.0
Volatile matter.....%	32.6	32.7	33.5	34.7	32.9	33.7	34.4	34.8	35.8	37.3
Fixed carbon.....%	53.5	53.8	55.0	57.0	60.2	61.6	46.9	47.3	48.7	51.7
Ultimate analysis:—										
Carbon.....%	71.1	71.4	73.1	75.4	79.3	81.2	62.3	62.9	64.8	68.2
Hydrogen.....%	4.8	4.8	4.6	4.9	5.3	5.2	4.7	4.6	4.4	4.6
Ash.....%	11.1	11.2	11.5	8.3	4.6	4.7	14.9	15.1	15.5	11.0
Sulphur.....%	1.7	1.7	1.8	1.5	0.9	0.9	6.4	6.5	6.7	6.3
Nitrogen.....%	1.8	1.8	1.8	1.4	1.7	1.8	1.0	1.0	1.0	0.8
Oxygen.....%	9.5	9.1	7.2	8.5	8.2	6.2	10.7	9.9	7.6	9.1
Calorific value:—										
Calories per gram, gross...	7010	7040	7210	7540	.....	.....	6320	6380	6570	7000
B. Th. U. per lb., gross...	12620	12680	12980	13570	.....	.....	11380	11490	11820	12600
Fuel ratio.....	1.65		.....	1.65	1.85		1.35			1.40
Carbon-Hydrogen ratio.....	14.8	15.0	15.9	15.4	15.0	15.7	13.4	13.7	14.8	14.8
Coking properties.....	.....									
Location in mine.....	.....									
Kind of sample.....	Commercial—10 tons			.....	Commercial.		Commercial—5 tons			.....
Quality of coal.....	Over ½ inch screen and picking belt.			Washed coal from M6, yield 87%	.....	.....	Over ½ inch screen and picking belt.			Washed coal from M9, yield 79%
Taken by.....	T. Denis, Mines Branch.			.....	Mine authori- ties.		T. Denis.....			.....
Date of sampling.....	April 1, 1907.....			.....	January 1909.		April 3, 1907.....			.....
Remarks.....	Operated by Cumberland Railway & Coal Co. at time of sampling.									

## Nova Scotia Coal Fields.

## Joggins—Chignecto Area.

Description.	Maritime Coal, Railway & Power Co., Ltd.											
	Chignecto colliery, Joggins Mines.				Joggins colliery, Old mine, Joggins Mines.							
Sample No.....	M7		M207	M10		M210	M2010	M3010				
Moisture condition (see note p. 2).....	R	AD	D	D	R	AD	D	D	D	R	D	
Loss on air-drying.....%	0.4	.....	.....	.....	0.7	.....	.....	.....	.....	.....	.....	
Results obtained by.....	Calc.	Calc.	Anal.	Anal.	Calc.	Calc.	Anal.	Anal.	Anal.	Calc.	Anal.	
Proximate analysis:—												
Moisture.....%	3.6	3.2	.....	.....	1.3	0.6	.....	.....	.....	4.8	.....	
Ash.....%	12.8	12.9	13.3	9.1	18.4	18.5	18.6	10.3	16.9	10.9	11.5	
Volatile matter.....%	39.5	39.6	41.0	41.3	36.1	36.4	36.6	38.1	36.6	36.5	38.4	
Fixed carbon.....%	44.1	44.3	45.7	49.6	44.2	44.5	44.8	51.6	46.5	47.8	50.1	
Ultimate analysis:—												
Carbon.....%	63.9	64.2	66.2	70.0	62.7	63.1	63.5	70.3	.....	65.5	68.8	
Hydrogen.....%	5.0	5.0	4.8	5.0	4.2	4.2	4.1	4.9	.....	5.2	4.9	
Ash.....%	12.8	12.9	13.3	9.1	18.4	18.5	18.6	10.3	.....	10.9	11.5	
Sulphur.....%	6.2	6.2	6.4	6.2	5.3	5.3	5.4	4.8	5.2	6.5	6.8	
Nitrogen.....%	1.2	1.2	1.3	1.0	1.3	1.3	1.3	0.9	1.7	1.5	1.6	
Oxygen.....%	10.9	10.5	8.0	8.7	8.1	7.6	7.1	8.8	.....	10.4	6.4	
Calorific value:—												
Calories per gram, gross...	6510	6540	6750	7160	6360	6400	6440	7080	.....	.....	.....	
B. Th. U. per lb., gross...	11720	11770	12160	12800	11440	11520	11590	12740	.....	.....	.....	
Fuel ratio.....	1.10		1.20	1.20		1.35	1.25	1.30				
Carbon-Hydrogen ratio.....	12.8	13.0	13.9	14.0	14.8	15.1	15.3	14.4	.....	12.6	14.0	
Coking properties.....	.....				.....				.....			
Location in mine.....	.....											
Kind of sample.....	Commercial — 5 tons.				Commercial — 6 tons.				Commercial — 2 tons.		Commercial.	
Quality of coal.....	Hand picked lump		Washed coal from M7, yield 87%.	Over ½ inch screen and picking belt.		Washed coal from M10, yield 79%.	Over ½ inch screen and picking belt.					
Taken by.....	Mine authorities.				T. Denis.				T. Denis.		Mine authorities.	
Date of sampling.....	April 1907.				April 3, 1907.				1907.		January 1909	
Remarks.....	This mine has since been abandoned.											

## Nova Scotia Peat Bogs.

Description.	Caribou bog, Berwick,* King's county.				Cherryfield bog, Cherryfield† Lunenburg county.	Clyde bog, Clyde River, Shelburne county.		
	501	502	503	504	509	510	511	512
Sample No.....	501	502	503	504	509	510	511	512
Moisture condition (see note, p. 2).....	D	D	D	D	D	D	D	D
Loss on air-drying.....%	.....	.....	.....	.....	.....	.....	.....	.....
Proximate analysis:—								
Moisture.....%	.....	.....	.....	.....	.....	.....	.....	.....
Ash.....%	7.7	4.4	2.9	2.0	6.1	7.0	5.4	3.2
Volatile matter.....%	62.6	64.7	66.7	67.5	64.1	64.0	64.8	66.4
Fixed carbon.....%	29.7	30.9	30.4	30.5	29.8	29.0	29.8	30.4
Ultimate analysis:—								
Carbon.....%	.....	.....	.....	.....	.....	.....	.....	.....
Hydrogen.....%	.....	.....	.....	.....	.....	.....	.....	.....
Ash.....%	.....	.....	.....	.....	.....	.....	.....	.....
Sulphur.....%	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3
Nitrogen.....%	1.6	1.2	1.0	0.9	1.1	1.4	1.1	1.1
Oxygen.....%	.....	.....	.....	.....	.....	.....	.....	.....
Calorific value:—								
Calories per gram, gross.....	5440	5410	5300	5320	5250	5280	5150	5260
B. Th. U. per lb., gross.....	9790	9740	9550	9580	9450	9510	9270	9460
Fuel ratio.....	0.47	0.48	0.46	0.45	0.47	0.45	0.46	0.46
Carbon-Hydrogen ratio.....	.....	.....	.....	.....	.....	.....	.....	.....
Coking properties.....	.....	.....	.....	.....	.....	.....	.....	.....
Location in bog.....								
Kind of sample.....	All prospect.							
Taken by.....	All by A. Anrep, Mines Branch, Ottawa.							
Date of sampling.....	All during summer of 1914.							
Remarks.....	*Bog traversed by Dominion Atlantic railway. †Bog traversed by Halifax & Southwestern railway.							

## Nova Scotia Peat Bogs.

Description.	Clyde bog, Clyde River, Shelburne county.		Port Clyde bog, Port Clyde, † Shelburne county.		Latour bog, Port Latour, Shelburne county.	
Sample No.....	513	514	517	518	522	523
Moisture condition (see note, p. 2)...	D	D	D	D	D	D
Loss on air-drying.....%	....	....	....	....	....	....
Proximate analysis:—						
Moisture.....%	....	....	....	....	....	....
Ash.....%	4.9	4.3	3.0	3.4	3.8	4.0
Volatile matter.....%	62.8	66.4	66.6	66.5	68.0	67.9
Fixed carbon.....%	32.3	29.3	30.4	30.1	28.2	28.1
Ultimate analysis:—						
Carbon.....%	....	....	....	....	....	....
Hydrogen.....%	....	....	....	....	....	....
Ash.....%	....	....	....	....	....	....
Sulphur.....%	0.3	0.3	0.3	0.3	0.3	0.3
Nitrogen.....%	1.2	1.2	1.1	1.1	1.1	1.1
Oxygen.....%	....	....	....	....	....	....
Calorific value:—						
Calories per gram, gross.....	5430	5280	5400	5340	5150	5170
B. Th. U. per lb., gross.....	9780	9510	9730	9610	9280	9310
Fuel ratio.....	0.52	0.44	0.46	0.45	0.42	0.41
Carbon-Hydrogen ratio.....	....	....	....	....	....	....
Coking properties.....	....	....	....	....	....	....
Location in bog.....						
Kind of sample.....	All prospect.					
Taken by.....	All by A. Anrep, Mines Branch.					
Date of sampling.....	All during summer of 1914.					
Remarks.....	†Bog traversed by Halifax and Southwestern railway.					

## Nova Scotia Peat Bogs.

Description.	The Heaths bog, Lower Argyle,† Yarmouth county.				Makoko bog, Tusket, Yar- mouth county.		Tusket bog, Tusket,† Yarmouth county.	
	505	506	507	508	515	516	520	521
Sample No.....	505	506	507	508	515	516	520	521
Moisture condition (see note, p. 2).....	D	D	D	D	D	D	D	D
Loss on air-drying.....%	.....	.....	.....	.....	.....	.....	.....	.....
Proximate Analysis:—								
Moisture.....%	.....	.....	.....	.....	.....	.....	.....	.....
Ash.....%	8.0	9.6	4.5	4.9	6.1	4.3	12.7	7.7
Volatile matter.....%	60.0	63.2	65.6	67.5	65.0	67.0	59.5	62.5
Fixed carbon.....%	30.2	27.2	29.9	27.6	28.9	28.7	27.8	29.8
Ultimate analysis:—								
Carbon.....%	.....	.....	.....	.....	.....	.....	.....	.....
Hydrogen.....%	.....	.....	.....	.....	.....	.....	.....	.....
Ash.....%	.....	.....	.....	.....	.....	.....	.....	.....
Sulphur.....%	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5
Nitrogen.....%	1.7	1.6	1.4	1.5	1.6	1.5	1.8	1.6
Oxygen.....%	.....	.....	.....	.....	.....	.....	.....	.....
Calorific value:—								
Calories per gram, gross.....	5230	4950	5410	5490	5180	5280	5070	5210
B. Th. U. per lb., gross.....	9410	8890	9740	9890	9320	9510	9130	9380
Fuel ratio.....	0.50	0.43	0.46	0.41	0.44	0.43	0.47	0.48
Carbon-Hydrogen ratio.....	.....	.....	.....	.....	.....	.....	.....	.....
Coking properties.....	.....	.....	.....	.....	.....	.....	.....	.....
Location in bog.....								
Kind of sample.....	All prospect.							
Taken by.....	All by A. Anrep, Mines Branch.							
Date of sampling.....	All during summer of 1914.							
Remarks.....	†Bog traversed by the Halifax and Southwestern railway.							

## Prince Edward Island Peat Bogs.

Description.	Mermaid bog, 5 miles N.E. of Charlottetown, Queen's county.		Miscouche bog, St. Nicholas Station,* Prince county.		Black Marsh bog, 6 miles north of Tignish, Prince county.	
	443	444	400	500	407	498
Moisture condition (see note, p. 2)...	D	D	D	D	D	D
Loss on air-drying.....%	....	....	....	....	....	....
Proximate analysis:—						
Moisture.....%	....	....	....	....	....	....
Ash.....%	3.6	4.9	5.7	8.3	4.4	5.3
Volatile matter.....%	67.1	65.8	62.8	62.7	64.5	65.8
Fixed carbon.....%	29.3	29.3	31.5	29.0	31.1	28.9
Ultimate analysis:—						
Carbon.....%	....	....	....	....	....	....
Hydrogen.....%	....	....	....	....	....	....
Ash.....%	....	....	....	....	....	....
Sulphur.....%	....	0.4	0.3	0.4	0.3	0.3
Nitrogen.....%	0.9	1.2	1.3	1.4	0.8	0.9
Oxygen.....%	....	....	....	....	....	....
Calorific value:—						
Calories per gram, gross.....	5320	5520	5300	5170	5480	5440
B. Th. U. per lb., gross.....	9580	9940	9550	9300	9860	9790
Fuel ratio.....	0.44	0.45	0.50	0.46	0.48	0.44
Carbon-hydrogen ratio.....	....	....	....	....	....	....
Coking properties.....	....	....	....	....	....	....
Location in bog.....						
Kind of sample.....	All prospect.					
Taken by.....	All by A. Anrep, Mines Branch.					
Date of sampling.....	All during summer of 1914.					
Remarks.....	*Bog traversed by Canadian Government railway.					

## New Brunswick Coal Fields.

## Grand Lake Area.

Description.	Grand Lake Coal Co., Ltd., Rapids Mine, near Minto.											
	847		848		849		850		852		851	
Sample No.....	R	D	R	D	R	D	R	D	R	D	R	D
Moisture condition (see note, p. 2)...												
Loss on air-drying.....%												
Results obtained by.....	Anal. Calc.		Anal. Calc.		Anal. Calc.		Anal. Calc.		Anal. Calc.		Anal. Calc.	
Proximate analysis:—												
Moisture.....%	1.2	....	1.0	....	1.4	....	1.0	....	1.0	....	2.4	....
Ash.....%	13.3	13.4	14.6	14.7	20.2	20.5	17.9	18.1	28.0	28.3	6.4	6.5
Volatile matter.....%	31.7	32.1	31.3	31.6	31.5	32.0	30.6	30.9	28.4	28.7	33.2	34.1
Fixed carbon.....%	53.8	54.5	53.1	53.7	46.9	47.5	50.5	51.0	42.6	43.0	58.0	59.4
Ultimate analysis:—												
Carbon.....%												
Hydrogen.....%												
Ash.....%												
Sulphur.....%	6.6	6.7	8.9	9.0	4.9	4.9	6.6	6.6	12.1	12.2	2.5	2.6
Nitrogen.....%	1.0	1.0	0.9	0.9								
Oxygen.....%												
Calorific value:—												
Calories per gram, gross.....	7230	7320	7060	7130	6530	6630	6800	6880	5590	5640	7500	7600
B. Th. U. per lb., gross.....	13020	13180	12710	12840	11760	11930	12250	12380	10060	10160	13500	13840
Fuel ratio.....	1.70		1.70		1.50		1.65		1.50		1.75	
Carbon-hydrogen ratio.....												
Coking properties.....	fair coke..		fair coke..		fair coke..		good coke..		good coke..		good coke..	
Hoffmann potash test.....	8											
Location in mine.....	Upper part of main seam.		Lower part of main seam.		Thin seam on bottom main seam.		Main seam, 600 ft. from first opening.		Lower seam, 600 ft. from first opening.			
Kind of sample.....												
Quality of coal.....											Blacksmith coal.	
Taken by.....	All by mine authorities.											
Date of sampling.....	All in the fall of 1916.											



## New Brunswick Coal Fields.

Description.	Grand Lake Area.				Gloucester Area.			
	G. H. King's Mine, New Brunswick Colliery, Minto.				Coal from Mattampeak brook, Pokemouche.			
Sample No.....	M11		M211		756		757	
Moisture condition (see note, p. 2).....	R	AD	D	D	R	D	R	D
Loss on air-drying.....	0.4	.....	.....	.....	.....	.....	.....	.....
Results obtained by.....	Calc.	Calc.	Anal.	Anal.	Anal.	Calc.	Anal.	Calc.
Proximate analysis:—								
Moisture.....%	1.3	0.9	.....	.....	5.9	.....	6.2	.....
Ash.....%	14.2	14.3	14.4	9.4	20.6	21.9	50.4	53.8
Volatile matter.....%	31.8	31.9	32.2	34.0	33.2	35.3	20.9	22.3
Fixed carbon.....%	52.7	52.9	53.4	56.6	40.3	42.8	22.5	23.9
Ultimate analysis:—								
Carbon.....%	69.5	69.7	70.3	75.4	.....	.....	.....	.....
Hydrogen.....%	4.6	4.6	4.6	5.0	.....	.....	.....	.....
Ash.....%	14.2	14.3	14.4	9.4	.....	.....	.....	.....
Sulphur.....%	5.7	5.7	5.8	4.9	6.1	6.5	4.4	4.7
Nitrogen.....%	0.6	0.6	0.6	0.5	.....	.....	.....	.....
Oxygen.....%	5.4	5.1	4.3	4.8	.....	.....	.....	.....
Calorific value:—								
Calories per gram, gross.....	7070	7100	7160	7680	.....	.....	.....	.....
B. Th. U. per lb., gross.....	12730	12780	12890	13820	.....	.....	.....	.....
Fuel ratio.....	.....	1.05	.....	1.05	.....	1.20	.....	1.05
Carbon-Hydrogen ratio.....	15.0	15.1	15.4	15.1	.....	.....	.....	.....
Coking properties.....					very poor coke		non-coking.	
Location in mine.....								
Kind of sample.....	Commercial—10 tons.....				Prospect.....		Prospect.	
Quality of coal.....	Over ½-inch bar screen and roughly picked.				Washed coal from M11, yield 82%.			
Taken by.....	T. Denis, Mines Branch.....				A. O. Hayes, Geological Survey.		A. O. Hayes.	
Date of sampling.....	April 8, 1907.....				1916.....		1916.	

## New Brunswick Peat Bogs.

Description.	Seely Cove bog, near Pennfield, Charlotte county.			Bogs near Pennfield, Charlotte county.			
				Hunter bog.*		Pocologan bog.*	
Sample No.....	1178	1179	1180	1181	1182	1183	1184
Moisture condition (see note, p. 2).....	D	D	D	D	D	D	D
Loss on air-drying.....%	....	....	....	....	....	....	....
Proximate analysis:—							
Moisture.....%	....	....	....	....	....	....	....
Ash.....%	3.4	13.3	31.6	3.1	2.4	2.3	2.2
Volatile matter.....%	64.4	58.9	47.7	66.9	66.8	65.9	66.8
Fixed carbon.....%	32.2	27.8	20.7	30.0	30.8	31.8	31.0
Ultimate analysis:—							
Carbon.....%	....	....	....	....	....	....	....
Hydrogen.....%	....	....	....	....	....	....	....
Ash.....%	....	....	....	....	....	....	....
Sulphur.....%	1.1	1.1	1.1	0.3	0.3	0.3	0.3
Nitrogen.....%	1.0	1.4	1.7	1.1	1.1	1.0	1.0
Oxygen.....%	....	....	....	....	....	....	....
Calorific value:—							
Calories per gram, gross.....	5230	4910	4050	5270	5300	5330	5380
B. Th. U. per lb., gross.....	9420	8840	7200	9490	9710	9600	9690
Fuel ratio.....	0.50	0.47	0.43	0.45	0.46	0.48	0.46
Carbon-Hydrogen ratio.....	....	....	....	....	....	....	....
Coking properties.....	....	....	....	....	....	....	....
Location in bog.....						From depth of	General sample.
Kind of sample.....	Prospect.						
Taken by.....	A. Anrep, Mines Branch.						
Date of sampling.....	Summer of 1917.						
Remarks.....	*Bogs traversed by the Canadian Pacific Railway.						

## New Brunswick Peat Bogs.

Description	St. Stephen bog, St. Stephen, Charlotte county.				Hayman's bog, St. Stephen, Charlotte county.		Gitchell Settlement bog, Charlotte county.
	1187	1188	1189	1190	1185	1186	
Sample No.....	1187	1188	1189	1190	1185	1186	1191
Moisture condition (see note, p. 2)	D	D	D	D	D	D	D
Loss on air-drying.....%	....	....	....	....	....	....	....
Proximate analysis:—							
Moisture.....%	....	....	....	....	....	....	....
Ash.....%	11.6	5.8	3.4	2.6	6.2	4.9	48.9
Volatile matter.....%	61.0	64.3	65.4	66.5	61.9	63.1	36.7
Fixed carbon.....%	27.4	29.9	31.2	30.9	31.9	32.0	14.4
Ultimate analysis:—							
Carbon.....%	....	....	....	....	....	....	....
Hydrogen.....%	....	....	....	....	....	....	....
Ash.....%	....	....	....	....	....	....	....
Sulphur.....%	0.4	0.4	0.4	0.4	0.8	0.8	1.2
Nitrogen.....%	1.5	1.1	1.5	1.1	1.4	1.4	1.5
Oxygen.....%	....	....	....	....	....	....	....
Calorific value:—							
Calories per gram, gross.....	4790	5020	5200	5170	5210	5290	2810
B. Th. U. per lb., gross.....	8020	9030	9360	9310	9380	9520	5050
Fuel ratio.....	0.45	0.46	0.48	0.47	0.51	0.50	0.39
Carbon-Hydrogen ratio.....	....	....	....	....	....	....	....
Coking properties.....	....	....	....	....	....	....	....
Location in bog.....	Depth of 13 feet and over.	General sample.	Depth of 10 feet and more.	General sample.			
Kind of sample.....	Prospect.						
Taken by.....	A. Anrep, Mines Branch.						
Date of sampling.....	Summer of 1917.						

## NEW BRUNSWICK OIL SHALE.

Sample No. 1040  
Shale from main dump at Albert Mines.

*Proximate Analysis:—*

Moisture.....	4.4%
Ash.....	73.9%
Volatile matter.....	17.8%
Fixed carbon.....	3.9%

*Ultimate Analysis:—*

Sulphur.....	0.2%
Nitrogen.....	0.8%

This nitrogen content theoretically corresponds to a yield of 81 pounds of ammonium sulphate per long ton.

*Gross Calorific Value:—*

Calories per gram.....	1170
B. Th. U. per lb.....	2110

*Destructive Distillation.*—In electrically heated retort with the temperature gradually raised to 665°C (1229°F.).

Yield of oil—4.6 per cent by weight of shale, or 12.2 imperial gallons per long ton.

The oil has a specific gravity of 0.85 at 15.5°C. (60°F.), and a gross calorific value of about 18700 B. Th. U. per pound.

Distillation with superheated steam gave results in agreement with these.

The shale was sampled with the primary object of determining whether it would be of value as a substitute for coal in case of a shortage. The dump had been made some 30 or 40 years previous during mining operations for Albertite, and there was a small amount of this substance mixed through the shale. The sample, of about 15 tons, was taken by J. H. H. Nicolls in June 1917.