Panoramic view of the Alfred peat bog.

CANADA

DEPARTMENT OF MINES

HON. LOUIS CODERRE, MINISTER; R. W. BROCK, DEPUTY MINISTER.

MINES BRANCH

EUGENE HAANEL, PH.D., DIRECTOR

BULLETIN No. 9

Investigation of the Peat Bogs and Peat Industry of Canada 1911-12

BY

A. v. Anrep

OTTAWA .
GOVERNMENT PRINTING BUREAU
1914

No. 266

LETTER OF TRANSMITTAL.

DR. EUGENE HAANEL,
Director Mines Branch,
Department of Mines,
Ottawa.

SIR,—

I beg to submit, herewith, a report on the investigation of the peat bogs and peat industry of Canada, during 1911–12. This report includes a detailed examination of nine peat bogs in the Province of Quebec, and an account of a preliminary investigation of a number of peat bogs situated in the immediate vicinity of Sudbury and Sellwood, in the Province of Ontario.

In addition to the foregoing, I have included profiles illustrative of the high (hochmooren) bogs frequently found in the eastern provinces of Canada; together with translations of a number of valuable official documents on the utilization of peat: dealing with recent developments in European practice.

I have the honour to be, Sir,
Your obedient servant,
(*Signed*) **A. v. Anrep.**

March 18, 1913.

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INVESTIGATION OF PEAT BOGS AND PEAT INDUSTRY OF CANADA, 1911-12

METHOD OF INVESTIGATION.

When the surface of a peat bog is to be mapped for investigation, parallel lines, 500 to 1000 feet, or more, apart, are run across the field: the precise distance between the lines depending on the area of the bog and the quality of the peat. On each of the lines, at intervals of 500 feet, holes 3 feet deep are drilled by means of a specially designed drill, and samples of the peat taken. If, however, the contour of the bottom of the bog varies to any great extent, or, if the peat is found to vary considerably in appearance and organic content, then the drillings are made on the lines at shorter intervals, say 200 to 500 feet.

In the case of bogs of even depth, and uniform organic formation, the samples taken during each day's investigation are mixed together into one general sample; but in cases where the depth is irregular, and the formation composite, the samples taken are kept separate, and the elevation of each drilling point carefully recorded.

CLASSIFICATION OF PEAT.

All the samples are roughly tested for humification, on the spot; then dried, and subsequently analysed. The different degrees of humification, and the commercial adaptability, as determined by the tests, are typically expressed by the following symbols:—

C		B	
C+		B+	
Bc—	Suitable for moss litter.	AB—	Suitable for peat fuel.
Bc.		AB.	
Bc+		AB+	
B—		A—	
		A.	

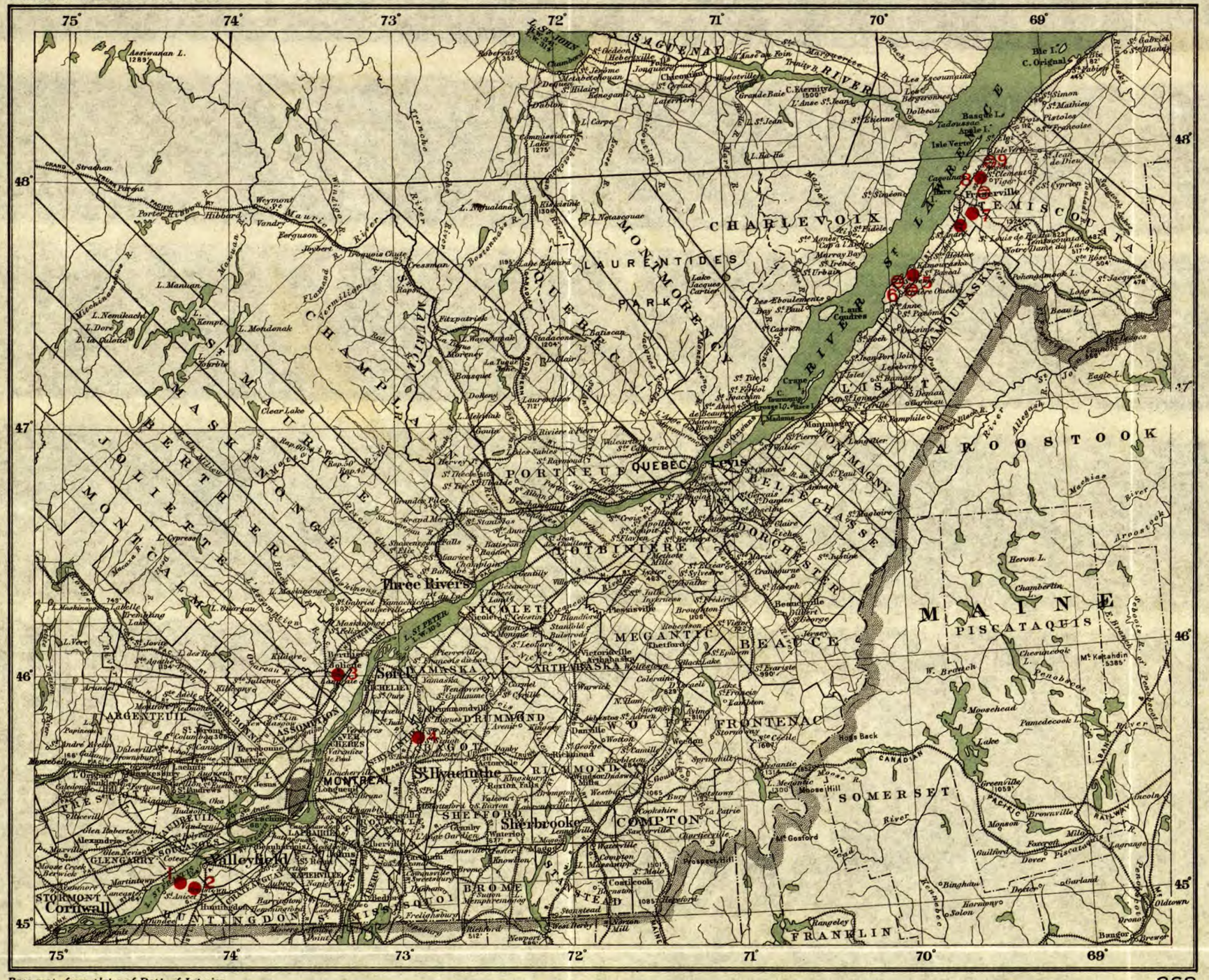
Peat, classified as C to B— is only suitable for the manufacture of moss litter; bedding for stabling of cattle; sanitary purposes; fruit packing, and the like, C to Bc—indicating first class litter; while each added degree signifies its lessened value for this purpose. The symbols B to A indicate adaptability for peat fuel, B+ to A signifying a high-grade fuel, whereas bogs classified as Bc+ to B are unsuitable for either peat fuel or moss litter, since the peat content is too little humified for fuel purposes, and too much humified for use as moss litter.

The sign "+" after a letter means increase; whereas "—" means decrease in degree of humification.

TABLE I.

(See Map No. 268).

Names of the Peat Bogs.	Locality.		Approx. total area.	Volume of workable peat.				Approx. area of peat litter bog.	Remarks.
	County.	Township Parish.		Cu. yds. of peat fuel.	Tons of fuel with contents 25% moisture.	Cu. yds. of peat litter.	Tons of litter with contents 20% moisture.		
Large Tea Field.	Huntingdon.	Godmanchester.	5,268	36,179,000	4,823,867	.....	.....	.....	Princ. formed of Sphagnum and remains of Carex.
Small Tea Field.	Huntingdon.	Godmanchester.	4,190	24,866,304	3,315,507	.....	.....	.....	Princ. formed of Sphagnum and remains of Eriophorum.
Laneraie.	Berthier and Joliette.	.....	7,500	35,636,295	4,751,500	.....	.....	.....	Princ. formed of Sphagnum and remains of Carex.
St. Hyacinthe.	St. Hyacinthe and Bagot.	St. Hyacinthe.	3,890	27,494,850	3,665,980	.....	.....	.....	Princ. formed of Sphagnum and remains of Carex and Eriophorum.
Rivière du Loup.	Temiscouata.	Terrebois Riviere du Loup Leparc Whitworth.	7,220	94,579,816	12,610,643	19,360,000	1,927,666	500	Princ. formed of Sphagnum.
Cacouna.	Temiscouata.	Leparc.	845	.....	.....	8,371,581	602,773	.....	Princ. formed of Sphagnum.
Leparc.	Temiscouata.	Leparc.	614	5,373,407	716,455	.....	.....	.....	Princ. formed of Sphagnum.
St. Denis.	Kamouraska.	Rivière Ouelle.	315	.....	.....	6,053,703	602,772	.....	Princ. formed of Sphagnum.
Rivière Ouelle.	Kamouraska.	Rivière Ouelle.	4,521	21,911,110	2,921,481	36,440,747	2,623,734	1,921	Princ. formed of Sphagnum and remains of Carex.



Name of Bog

1—Large Tea Field
2—Small Tea Field
3—Lanorie
4—St. Hyacinthe
5—Rivière Ouelle
6—St. Denis
7—Rivière du Loup
8—Cacouna
9—Le Parc

Base map, from plates of Dept. of Interior.

PEAT BOGS INVESTIGATED IN QUEBEC

- *Peat fuel bogs*
- *Peat litter bogs*

Scale 35 Miles to 1 Inch

BOTANY OF THE PEAT BOGS.

A number of photographs were taken of the mosses and plants found in the peat bogs investigated in the Province of Quebec during 1911–12. These have been reproduced in this report (see Plates II–XVII), and serve to show the constituent organic growths from which the peat in the respective bogs has been formed.

Nine photographic prints, illustrative of the botany of the Alfred peat bog, Ont., were incorporated in Bulletin No. 8, 1910–11: Plates VII to XVI, p. 4, and these have been supplemented in the present report by two additional photographs taken in 1911–12: see Plates XVIII and XIX.

The following is an inventory of the plants found in the various bogs:—

QUEBEC.

Large Tea Field peat bog, Huntingdon, Que.

Sphagnum acutifolium	Plate	II.
Pogonia ophioglossoides (L. Ker)	"	III.
Alisma plantago aquatica (L)	"	IV.
Iris versicolor (L)	"	V.
Smilacina stellata (L. Desf.)	"	VI.

Small Tea Field peat bog, Huntingdon, Que.

Maianthemum Canadense	"	VII.

Lanoraie peat bog, Lanoraie, Que.

Cypripedium hirsutum (Mill.)	"	VIII.

St. Hyacinthe peat bog, St. Hyacinthe, Que.

Carex riparia (W. Curtis)	"	IX.

Riviere du Loup peat bog, Riviere du Loup, Que.

Eriophorum callistixcham	"	X.
Carex canescens (L. var subloliana)	"	XI.
Andromeda glaucophylla	"	XII.
Cummune polytrihum	"	XIII.
Cladonia rangeferina	"	XIV.
Cladonia gracilis	"	XV.
Boemus aeruginosus	"	XVI.
Pettigera	"	XVII.

ONTARIO.

Alfred peat bog, Ontario.

Cypripedium acaule (Ait.)	"	XVIII.
Hypnum kneiffie (Sch.)	"	XIX.

The peat bogs investigated in eastern Canada are formed, chiefly, of Sphagnum mosses, and a few of Hypnum and Carex; but more often of

Sphagnum intermixed with Hypnum, Carex, Eriophorum, and other aquatic plants.

The bogs in the Province of Quebec are formed mainly of Sphagnum moss, slightly intermixed with Hypnum, Carex, Eriophorum, and other aquatic plants.

The bogs in the Province of Ontario are mostly intermixed with Carex, Hypnum, Eriophorum, and other aquatic plants; but there are some fairly clean Sphagnum bogs.

The bogs in the Province of Manitoba consist principally of Carex grass peat, intermixed to a certain extent with Hypnum, and Sphagnum; occasionally a Sphagnum bog is found.

The bogs in other provinces have not, as yet, been investigated.

QUEBEC.

COMPARATIVE ANALYSES OF PEAT.

The following table gives the chemical composition of dry peat from the various bogs investigated in the Province of Quebec.

TABLE II.

Analyses of the different peat samples collected from bogs in the Province of Quebec.

No. of samples from each bog	Location	ANALYSES OF PEAT (Absolutely dry)						Fuel ratio
		Fixed carbon	Volatile matter	Ash	Nitrogen	Calorific Value		
						Cals.	B.T.U. per lb.	
1	Large Tea Field	29·2	65·2	5·6	1·6	5160	9290	0·45
2	" " "	29·2	65·8	5·0	2·0	5290	9530	0·44
1	Small Tea Field	30·4	64·9	4·7	1·7	4970	8940	0·47
2	" " "	27·7	64·2	8·1	2·0	5310	9550	0·43
1	Lanoraie	26·4	64·4	9·2	2·0	4940	8900	0·41
2	"	28·2	66·4	5·4	2·2	5120	9220	0·42
3	"	26·3	65·0	8·7	2·0	4890	8810	0·40
1	St. Hyacinthe	30·5	62·9	6·6	1·9	4890	8800	0·49
2	" "	31·0	64·4	5·7	1·7	4970	8940	0·49
1	Rivière du Loup	28·0	69·2	2·8	1·0	5060	9070	0·41
2	" " "	28·6	69·3	2·1	1·0	5040	9070	0·41
3	" " "	27·6	70·5	1·9	0·8	5000	9000	0·39
4	" " "	28·7	69·2	2·1	0·9	4960	8930	0·41
5	" " "	29·4	67·8	2·8	0·9	5020	9030	0·43
6	" " "	28·3	68·8	2·9	1·0	5030	9060	0·41
7	" " "	27·7	70·0	2·3	0·9	4950	8910	0·40
8	" " "	29·0	67·1	3·9	1·1	5100	9180	0·43
9	" " "	28·6	67·2	4·2	1·1	5360	9650	0·43
10	" " "	28·6	68·8	2·8	1·0	4960	8930	0·42
1	Leparc	27·8	69·5	2·7	0·9	5000	9000	0·40
1	Rivière Ouelle	28·8	67·9	3·3	1·1	5050	9080	0·42
2	" "	28·9	67·6	3·5	1·1	5160	9280	0·43

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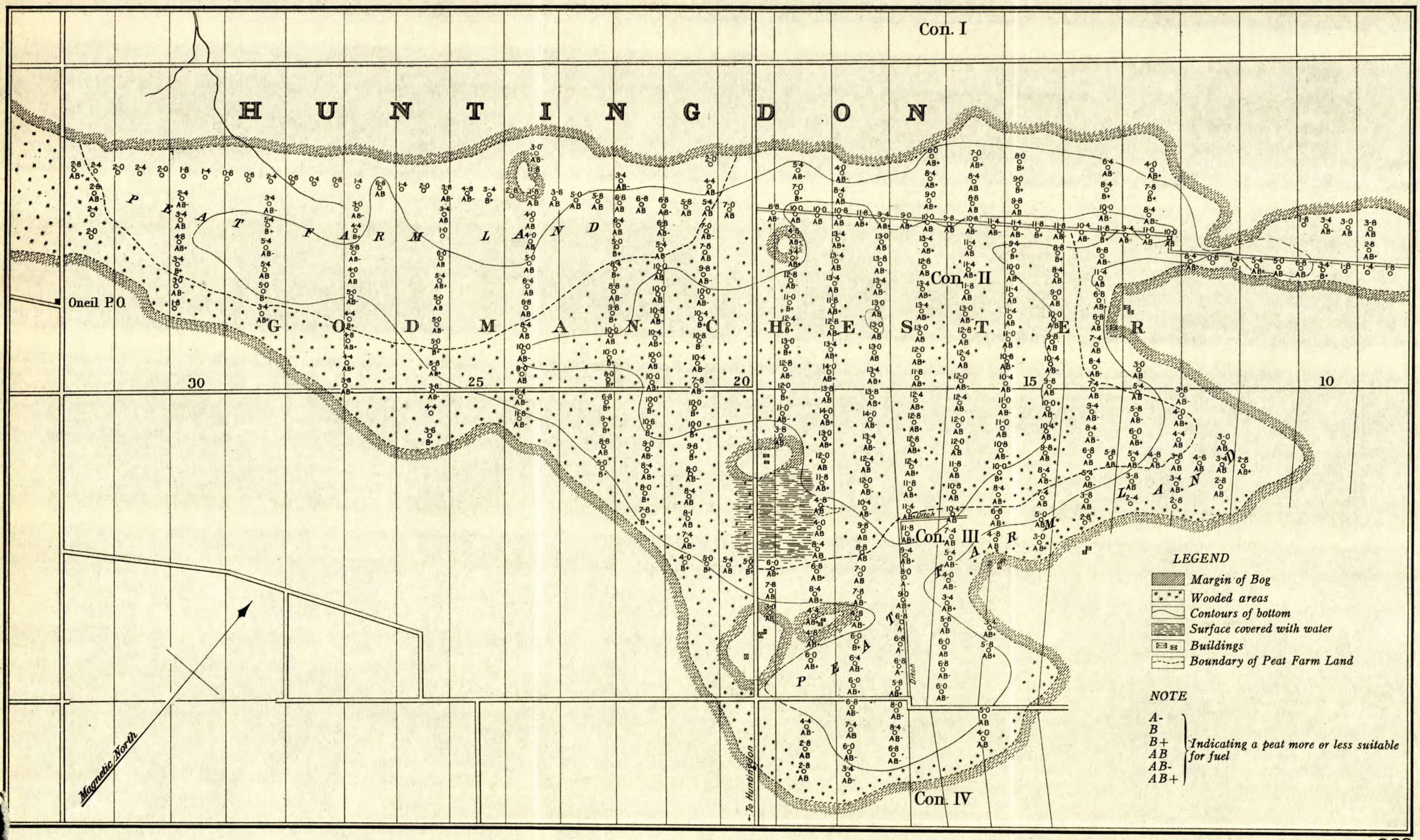


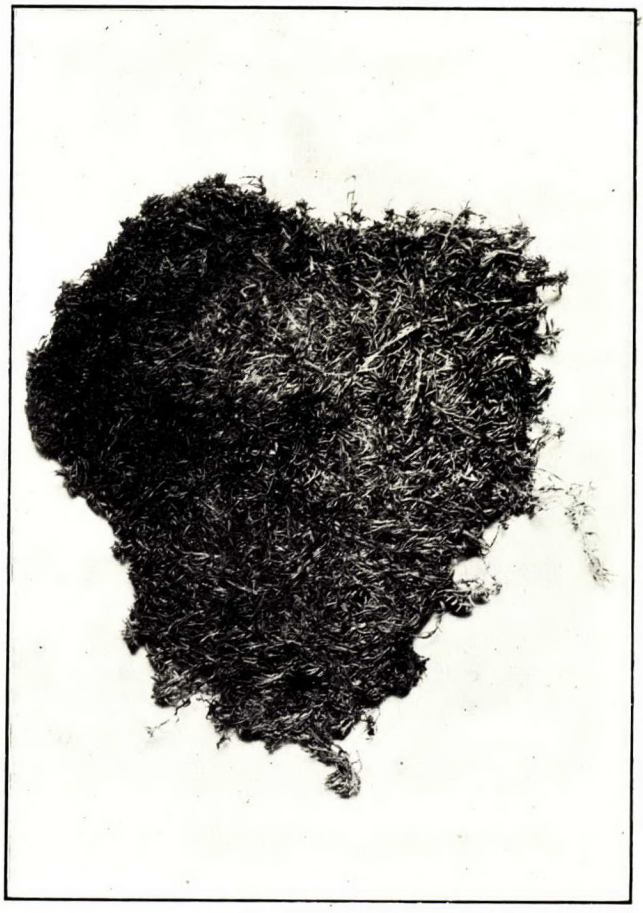
269

LARGE TEA FIELD PEAT BOG
QUEBEC

Scale of Feet

1000 0 1000 2000 3000 4000 5000 6000 7000 8000

PLATE II.



Sphagnum acutifolium.

PLATE III.

Pogonia ophioglossoides. (L. Ker.)

PLATE IV.

Alisma plantago aquatica. (L.)

Iris versicolor. (L.)

PLATE VI.

Smilacina stellata. (L. Desf.)

PLATE VII.

Maianthenum Canadense.

PLATE VIII.

Cypripedium hirsutum. (Mill)

PLATE IX.

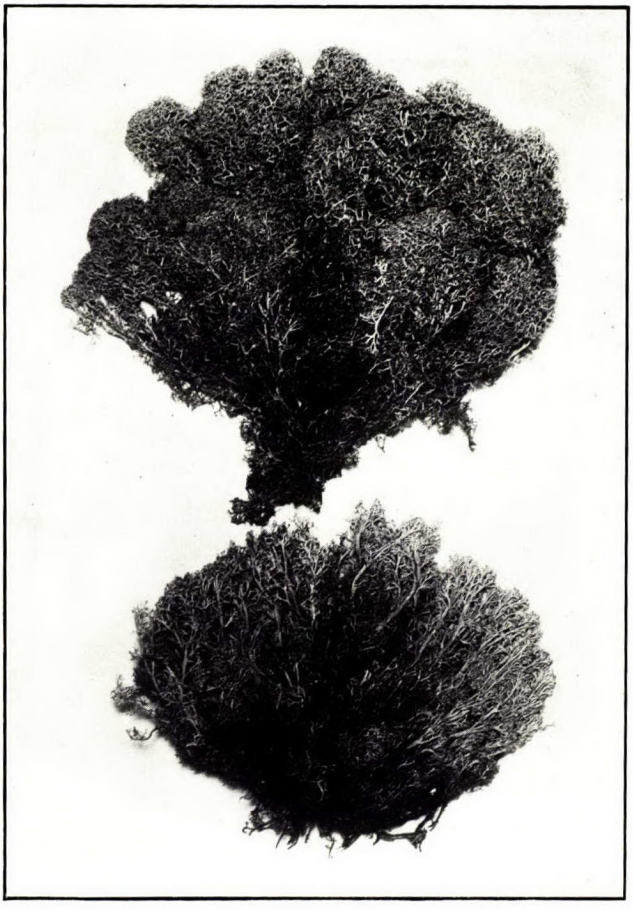
Carex riparia. (W. Curtis)

PLATE XI.

Carex canescens. (L. var subfoliacea.)

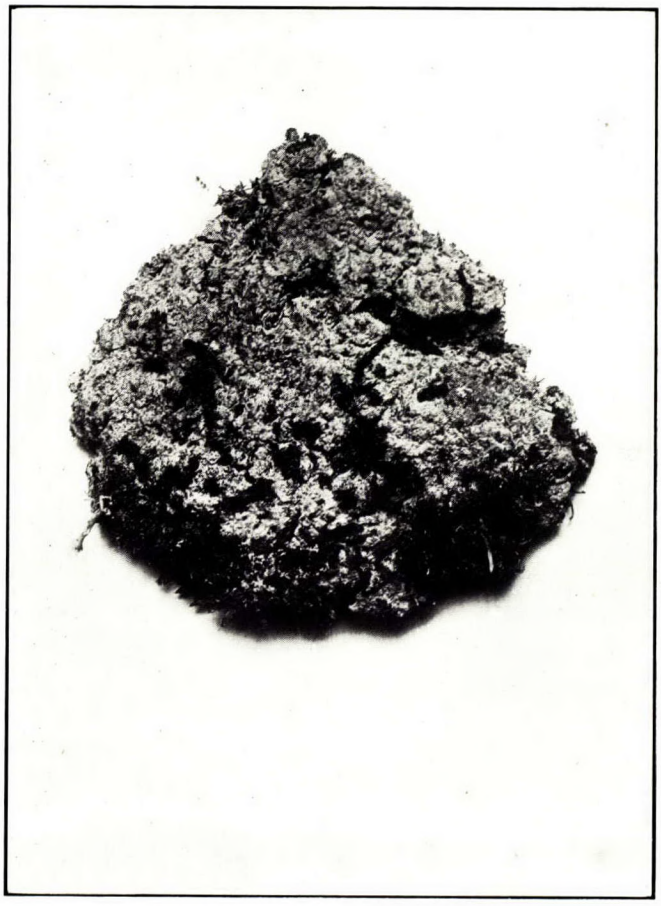
Andromeda glaucophylla.

Cummune polytrichum.



Cladonia rangeferina.

Cladonia gracilis.



Bœmus æruginosus.

Peltigera.

Cypripedium acaule. (Ait.)

The content of ash in some bogs is comparatively high, but this is accounted for by the fact that the surface of these bogs has been burned over several times, hence the ash has accumulated in the upper layer of the bog.

The following table shows the analyses of peat litter from the samples also collected in the Province of Quebec.

No. of sample.	Location.	Kind of sample analysed.	Content of moisture. %	Absorptive factor.	Phospho-rus.	Nitrogen.
1	Rivière du Loup	*Sphagnum*	Not stated	11·4	0·037	1·0
1	Rivière Ouelle	"	" "	11·2	0·017	0·9

DESCRIPTION OF PEAT BOGS INVESTIGATED.

QUEBEC.

Large Tea Field Peat Bog.

The Large Tea Field peat bog is situated about 2 miles northwest of Huntingdon station, in the township of Godmanchester, county of Huntingdon, Que., and runs in a northeast and southwest direction (See Map No. 269), covering more or less of

Lots 20–34 range III township of Godmanchester,
" 20–28 " IV " " "
" 20 " V " " "
" 9–20 " II " " "
" 10–20 " III " " "
" 15–20 " IV " " "

The total area covered by the bog is, approximately, 5,268 acres. Of this area some 1,960 acres have a depth of less than 5 feet, the average depth being 3 feet. Approximately 2,131 acres have a depth of from 5 to 10 feet, the average depth being 7 feet; and about 1,177 acres have a depth of more than 10 feet, the average depth being 12 feet.

The quantity of peat contained is—

Approximately 9,484,000 cubic yards, in an area having a depth of less than 5 feet.

Approximately 24,065,000 cubic yards, in an area having a depth of 5–10 feet.

Approximately 22,786,000 cubic yards in an area having a depth of more than 10 feet.

That portion of the bog which lies east of the road running through the middle of Lot No. 20, in a longitudinal direction, is specially suited for the manufacture of machine peat, as it is well humified, and is of consider-

able depth, so that long working lines can be obtained. A smaller portion of the bog situated immediately west of the above mentioned road has a fairly good depth, and is also suitable for the manufacture of machine peat; but the greater part of this area is comparatively shallow. Moreover, the surface has been several times burnt over, and in some places is thickly covered by ashes, which makes the percentage of ash in the peat high; and, due to the fact that the larger part of this portion of the bog has been under cultivation, the cohesive properties of the peat has been affected, and renders it inferior to the eastern part, which is practically untouched.

The eastern portion of the bog consists mainly of Sphagnum. The bottom layer of the bog—about 2 feet in thickness, seems to be intermixed with a large quantity of aquatic plants, together with a certain amount of Carex. Occasionally, Eriophorum can be seen growing in groups, indicating the present and previous formation of the peat.

Through the northern part of the eastern portion of the bog runs a wide and well dug drain, which has drained, considerably, that section of the bog. This drain would be very suitable as a main ditch, and if used as a working line, would save considerable expense in the drainage of the bog, in the event of the installation of an air-dried peat fuel manufacturing plant.

The major portion of the western section of the bog is comparatively shallow, and less decomposed. It consists mainly of Sphagnum; but towards the margin it is intermixed with Carex and aquatic plants, and occasionally Hypnum is found. A considerable area of the shallow part is used for agricultural purposes; and if the peat was cut by hand, the remainder could be used for domestic purposes.

The bottom of the bog is formed of grey clay; but occasionally, rocks occur. At the northern margin of the bog the clay banks rise considerably.

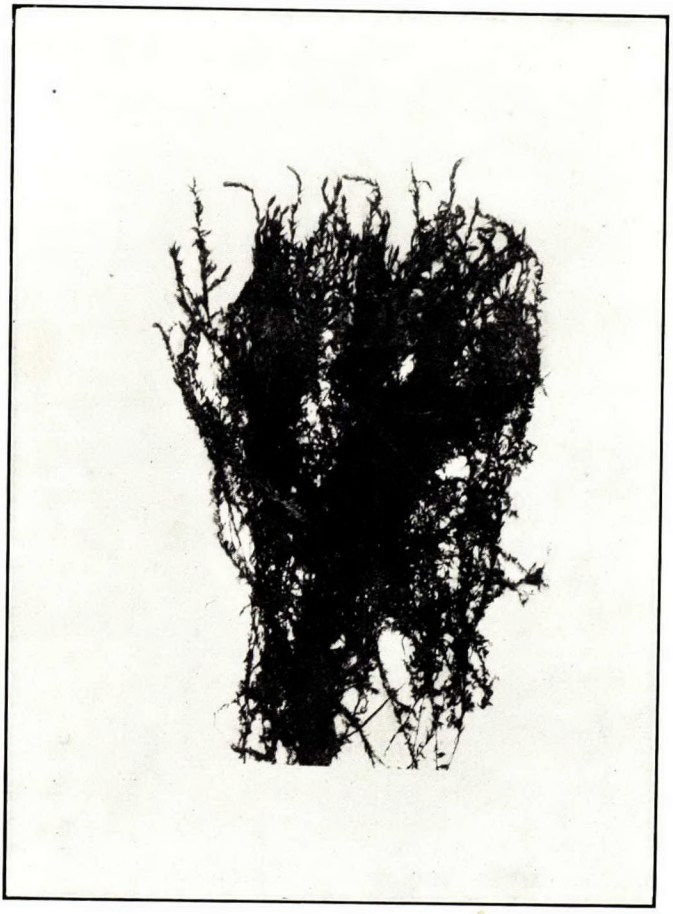
The margin of the bog is partly drained by the surrounding farmers. This enables them to use the shallow parts of the bog for agricultural purposes. Certain parts of the surface of the bog is wooded with spruce, young poplar, dwarf birch, cedar, and tamarac. When drilling, roots and stumps have been found.

The bog is very well situated both as regards shipping facilities and market, being only about 2 miles from Huntingdon—which has a population of over 1200. Huntingdon develops its own power from a small waterfall in the Chateauguay river, which runs through the middle of the town. This power is used mainly by the saw mill, and the condensed milk factory.

In 1912 the prices of hard coal varied from $7.15 to $8.50 per ton; soft coal being $6 per ton; soft wood $4 to $4.50 a cord, and hard wood from $5 to $5.30 a cord.

Huntingdon is situated about 12 miles from Valleyfield, 17 miles from Dundee, and about 48 miles from Montreal. It is on the lines of the Grand Trunk and New York Central railways.

Deducting the 1,960 acres with a depth of less than 5 feet, and allowing for the decrease in depth through the drainage area, we have left—



Hypnum kneiffii. (Sch.)

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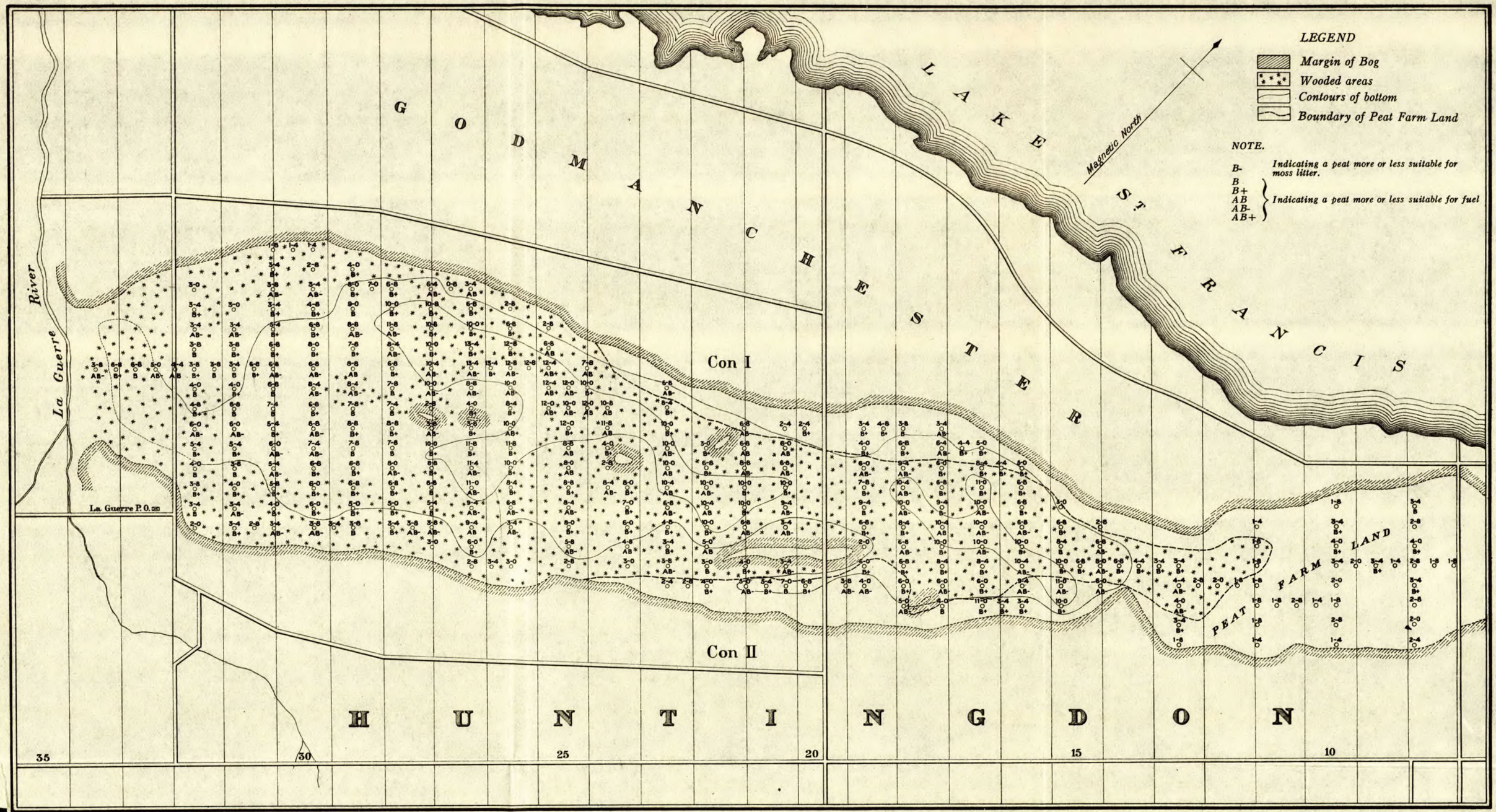

SMALL TEA FIELD PEAT BOG
QUEBEC

Scale of Feet

1000 0 1000 2000 3000 4000 5000

2,131 acres having an average depth of approximately 5 feet.
1,177 acres having an average depth of approximately 10 feet.
Making a total of 36,179,000 cubic yards.

Assuming that one cubic yard of the drained bog would furnish 200 pounds of dry peat substance, the total tonnage would be 3,517,000 tons of 2,000 pounds, or 4,823,000 tons of peat fuel having 25 per cent moisture.

Analyses of peat (absolutely dry).

	1.	2.
Volatile matter,	65·2	65·2
Fixed carbon,	29·2	29·2
Ash,	5·6	5·0
Nitrogen	1·6	2·0
Calorific value B.T.U. per lb	9290	9530
Cals	5160	5290
Fuel ratio	0·45	0·44

Small Tea Field Peat Bog.

This bog is situated about 4½ miles northwest of Huntingdon station, or 1½ miles southeast of Port Lewis wharf, in the township of Godmanchester, county of Huntingdon, Province of Quebec, and runs in a northeast and southwest direction, parallel to the Large Tea Field peat bog (See Map No. 270) covering more or less of

Lots 8–11, range I, township of Godmanchester;
" 13–35, " I, " " "
" 8–32, " II, " " "

The total area covered by this bog is, approximately, 4,190 acres. Of this area—

Approximately 1,800 acres have a depth of less than 5 feet, with an average depth of 3 feet.
Approximately 1,530 acres have a depth of 5 to 10 feet, with an average depth of 7 feet.
Approximately 860 acres have a depth of more than 10 feet, with an average depth of 11 feet.

The quantity of the peat contained is—

Approximately 8,712,000 cubic yards, in an area with a depth of less than 5 feet.
Approximately 17,278,800 cubic yards, in an area with a depth of 5 to 10 feet.
Approximately 15,262,100 cubic yards, in an area with a depth of more than 10 feet.

The middle part of that portion of the bog lying west of the road, and running longitudinally through the middle of Lot No. 20, is very well suited for the manufacture of machine peat, as it is well humified, and has a good depth. Some difficulties will be met with in securing long working lines, due to the fact that the rocks are elevated above the surface, thus forming islands, and hence interfering, to a certain extent, with the length of the working lines. This is calculated to entail some difficulty, especially when a large quantity of the peat is wanted for the manufacture of peat fuel. However, sufficiently long working lines can be obtained for plants with an output of from 30 to 35 tons of air dried peat fuel per day.

It can be seen from the above calculation that about half of the area of the bog is very shallow. This part is also less decomposed than the rest of the bog. The land is practically useless, but with a thorough system of drainage, and utilized for agricultural purposes, the expenditure could be recovered.

This bog is formed mainly of Sphagnum and Eriophorum, here and there intermixed with Carex and other aquatic plants. The bottom of the bog is composed of clay, and when drilled, rocks have occasionally been struck. The surface of the bog is heavily overgrown with tamarac, dwarf birch, young poplar, spruce, and other soft-wood trees. It is well situated both as regards shipping facilities and market. It is $1\frac{1}{2}$ miles from Port Lewis wharf, on the St. Lawrence river. The wharf is situated about 9 miles from Valleyfield, which is an important manufacturing town, and about 45 miles by water from Montreal.

The prices of hard and soft coal and wood are practically the same as in Port Lewis and Huntingdon.

Deducting the 1,800 acres with a depth of less than 5 feet, and allowing for the decrease in depth through the drainage, we have left:—

1,530 acres, with an average depth of approximately 5 feet; and 860 acres, with an average depth of approximately 9 feet; containing a total quantity of 24,866,304 cubic yards.

Allowing that one cubic yard of the drained bog could furnish 200 pounds of dry peat substance, the total tonnage of dry substance available would be 2,486,630 tons of 2,000 pounds, or 3,315,507 tons of peat fuel having 25 per cent moisture.

Analyses of peat (absolutely dry)

	1.	2.
Volatile matter	64·9	64·2
Fixed carbon	30·4	27·7
Ash	4·7	8·1
Nitrogen	1·7	2·0
Calorific value B.T.U. per lb	8940	9550
Cal	4970	5310
Fuel ratio	0·47	0·43

The content of ash is not excessive, and the calorific value satisfactory.

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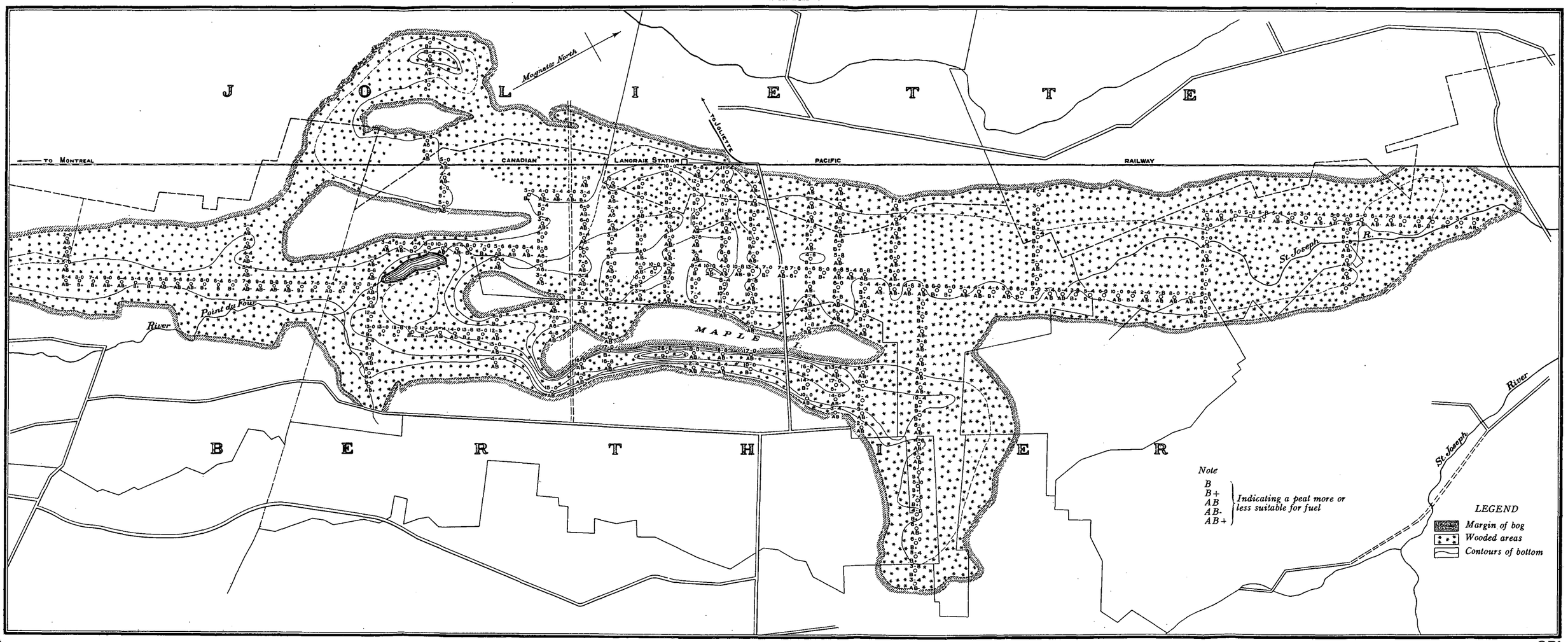

LANORAIE PEAT BOG

QUEBEC

Scale of Feet

1000 0 1000 2000 3000 4000 5000

Lanoraie Peat Bog.

This bog is situated at the Lanoraie station, in the counties of Berthier and Joliette, Province of Quebec, and runs in a northeast and southwest direction. (See Map No. 271).

It covers more or less of—

Southern part of the county of Berthier.

Southern part of the county of Joliette.

The total area covered by this bog is approximately 7,500 acres. Of this area—

Approximately 3,966 acres have a depth of less than 5 feet, the average depth being 4′-6″.

Approximately 2,830 acres have a depth of from 5 to 10 feet, the average depth being 7 feet.

Approximately 500 acres have a depth of from 10 to 15 feet, the average depth being 12 feet.

Approximately 195 acres have a depth of from 15 to 20 feet, the average depth being 16 feet.

Approximately 5 acres have a depth of 20 to 25 feet, the average depth being 21 feet.

Approximately 4 acres have a depth of more than 25 feet, the average depth being 26 feet.

The volume of peat contained is—

Approximately 25,593,000 cubic yards, in an area with a depth of less than 5 feet.

Approximately 31,940,000 cubic yards, in an area with a depth of 5 to 10 feet.

Approximately 9,733,000 cubic yards, in an area with a depth of 10 to 15 feet.

Approximately 5,031,000 cubic yards, in an area with a depth of 15 to 20 feet.

Approximately 161,300 cubic yards, in an area with a depth of 25 to 25 feet.

Approximately 169,400 cubic yards, in an area with a depth of more than 25 feet.

The middle part of the bog, lying in the southern part of the county of Berthier, has a comparatively good depth, and is fairly well humified. It is suitable for the manufacture of machine peat. The best part of the bog, as regards humification, and depth, is a comparatively narrow strip, which is situated south of Maple island. On account of its width, and the

high banks rising on the north and south sides, it is not likely that this part of the bog can be utilized and turned into machine peat by methods known at the present time.

The part of the bog lying in the southern end of the county of Joliette, and the environing part of the middle portion of the bog lying in the seigniory of Berthier, is comparatively shallow, and poorly humified, hence is not suitable for the manufacture of machine peat. If, however, the heavily wooded surface was cleared of trees and thoroughly drained, the land could be utilized for agricultural purposes. This would involve a large expenditure of money on account of its comparatively low-lying situation; but taking into account the improvement that would result in the surrounding farming land in consequence of the drainage, the undertaking would eventually be a paying proposition.

The bog consists mainly of Sphagnum and Hypnum, and is lightly intermixed with Eriophorum. Around the margin, Carex and aquatic plants are the main factors.

The bottom of the bog is formed of sand, lightly intermixed with grey clay. The surface is heavily overgrown with spruce, cedar, poplar, alder, and other soft-wood trees.

The bog is very well situated, both as regards shipping facilities and market, being traversed through the northern part by the Canadian Pacific railway, having Lanoraie station in the middle, with Lavaltrie station about 1 mile from the west end of the bog, and Berthier station about 2 miles from the east end. It is about 40 miles from Montreal, and 7 miles from Joliette.

The price of hard coal at the above places, in 1912, varied from $7.50 to $8 per ton.

Allowing for the decrease in depth through drainage, and deducting 3,966 acres with a depth of less than 5 feet, we have left—

2,830	acres	with	an	average	depth	of	approximately	5	feet
500	"	"	"	"	"	"	"	10	"
195	"	"	"	"	"	"	"	4	"
5	"	"	"	"	"	"	"	19	"
4	"	"	"	"	"	"	"	24	"

having a total volume of 35,636,295 cubic yards.

Assuming that one cubic yard of the drained bog will furnish 200 pounds of dry peat substance, the total tonnage of dry substance available is 3,563,630 tons—of 2,000 pounds, or 4,751,500 tons of peat fuel with 25 per cent moisture.

Analyses of Peat.

	1.	2.	3.
Volatile matter,.....	64.4	66·4	65·0
Fixed carbon,.....	26·4	28·2	26·3
Ash,.....	9·2	5·4	8·7

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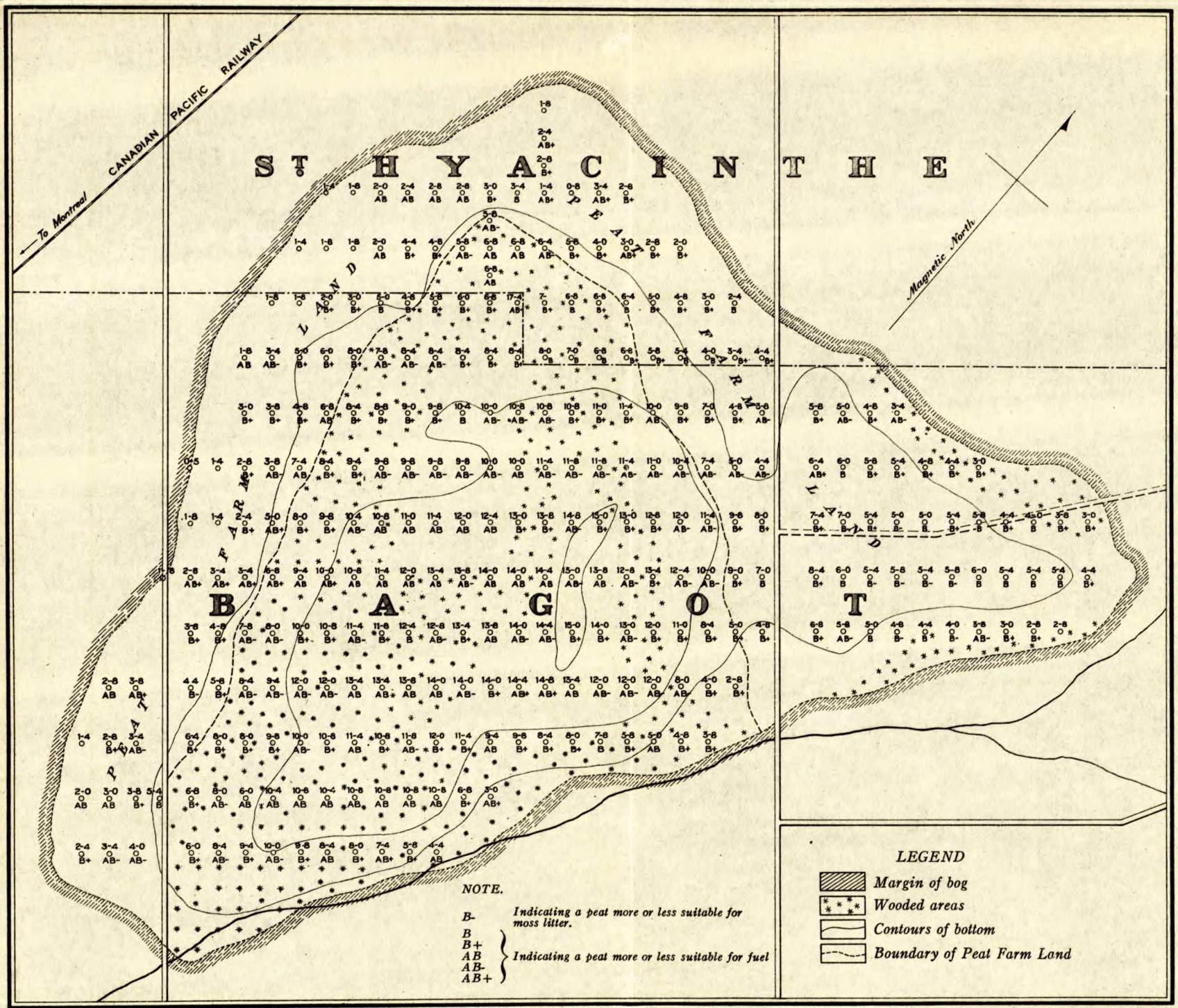

272

ST HYACINTHE PEAT BOG

QUEBEC

Scale of Feet

1000 0 1000 2000 3000 4000 5000

Nitrogen,.....	2·0	2·2	2·0
Calorific value B.T.U. per lb.....	8900	9220	8810
Cals.....	4940	5120	4890
Fuel ratio.....	0·41	0·42	0·40

The content of ash is comparatively high, accounted for by the fact that the surface of the bog has been several times burnt over. The calorific value is satisfactory.

St. Hyacinthe Peat Bog.

This bog is situated about 2 miles southeast from St. Hyacinthe C.P.R. station, in the parish of St. Hyacinthe, counties of St. Hyacinthe and Bagot, Province of Quebec, and runs in a northwestern and southeastern direction, (See Map No. 272) and covers more or less of the southeastern part of the county of St. Hyacinthe, and the southern part of the parish of St. Hyacinthe, county of Bagot.

The total area covered by this bog is approximately 3,890 acres. Of this area—

Approximately 1,394 acres have a depth of less than 5 feet, the average depth being 3 feet.

Approximately 1,390 acres have a depth of from 5 to 10 feet, the average depth being 7 feet.

Approximately 1,074 acres have a depth of from 10 to 15 feet, the average depth being 12 feet.

Approximately 32 acres have a depth of more than 15 feet, the average depth being 15 feet.

The volume of the peat contained is—

Approximately 6,746,000 cubic yards, in an area with a depth of less than 5 feet.

Approximately 15,694,000 cubic yards, in an area with a depth of 5 to 10 feet.

Approximately 20,803,000 cubic yards, in an area with a depth of 10 to 15 feet.

Approximately 783,300 cubic yards, in an area with a depth of more than 15 feet.

The peat located in St. Hyacinthe county is comparatively well humified; but on account of its inconsiderable depth, and of its having been burnt over several times, it is not suitable for machined peat; but the larger portion of this part of the bog could be utilized for agricultural purposes.

The middle part of the bog located in the county of Bagot is very well humified, and comparatively deep. It will produce a very good and heavy fuel.

Practically, the whole area of the part of the bog lying east of St. Dominie road is being used for agricultural purposes, and most of the margin around the middle portion of the bog, extending 1000 feet and more, is under cultivation.

The formation of the bog consists mainly of Sphagnum, intermixed with Eriophorum, and a considerable quantity of Carex riparia. Through the Sphagnum can be seen a network of Vaccinium oxycoccos (small cranberry). In some places they were in such quantities that the Sphagnum plants were invisible. Around the southern margin a large growth of Iris versicolor, and large varieties of Carex plants, are to be found.

Certain parts of the bog are heavily wooded with tamarack, spruce, and young poplar. In places where the surface has been burnt several times, alder and birch have grown; and occasionally when drilling, stumps and roots have been encountered.

If this bog were carefully drained, and its surface cleared of wood, it would be one of the ideal bogs for the manufacture of air-dried peat fuel.

This bog is very well situated both as regards shipping facilities and market, being only 2 miles from St. Hyacinthe station; and a siding for shipping could be built only 200 feet west of the bog on the Canadian Pacific railway.

St. Hyacinthe has a population of more than 9000, and is a large agricultural centre. It is situated about 35 miles from Montreal.

The price of fuel at St. Hyacinthe varies—

Hard coal from $7.50 to $10.50 per ton.
Soft coal " 5.50 " 7.00 " "
Hard wood " 5.50 " 7.00 per cord.
Soft wood " 4.50 " 5.00 " "

Allowing for the decrease in depth through drainage, and deducting 1,394 acres with a depth of less than 5 feet, we have left—

1,390 acres with an average depth of approximately 5 feet,
1,074 " " " " " " " 9 "
32 " " " " " " " 13 "

making a total volume of 27,494,000 cubic yards.

Assuming that one cubic yard of the drained bog could furnish 200 pounds of dry peat substance, the total tonnage of dry substance available is 2,749,000 tons of 2,000 pounds, or 3,665,000 tons of peat fuel with 25 per cent moisture.

Analyses of Peat (absolutely dry).

	1	2
Volatile matter	62·9	63·3
Fixed carbon	30·5	31·0
Ash	6·6	5·7
Nitrogen	1·9	1·7
Calorific value B.T.U. per lb.	8800	8940
Cal	4890	4970
Fuel ratio	0·49	0·49

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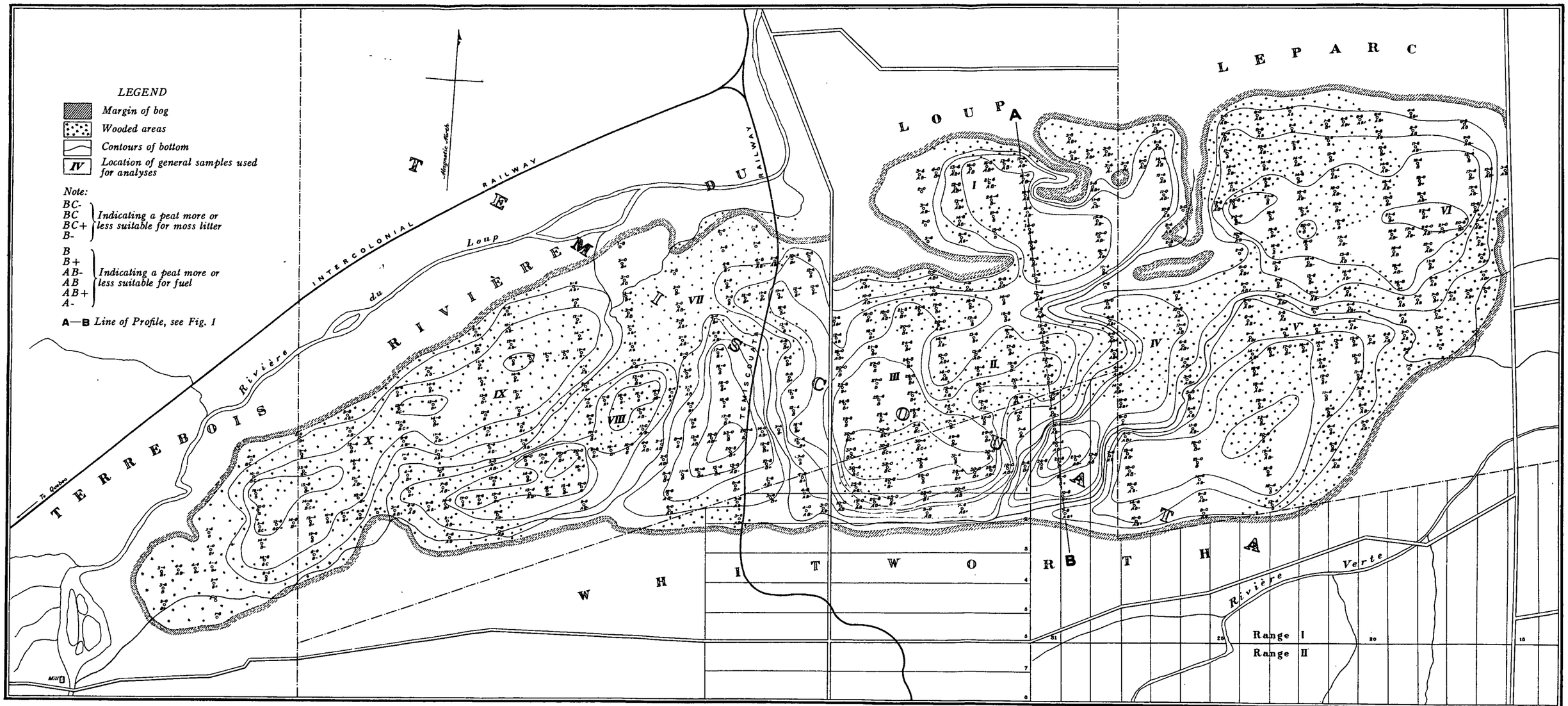

RIVIÈRE DU LOUP PEAT BOG
QUEBEC

Scale of Feet
1000 0 1000 2000 3000 4000 5000

Rivière du Loup Peat Bog.

This bog is situated about 1 mile south of Rivière du Loup station, in the Parishes of Terrebois, Riviere DuLoup, and Leparc, township of Whitworth, county of Temiscouata, Province of Quebec; and runs in a west and east direction (See map No. 273)—covering more or less of:—
Eastern part of the parish of Terrebois, county of Temiscouata;
Parish of Rivière du Loup, " " "
Southern part of the parish of Leparc, " " "
Lot 2— 3 township of Whitworth, county of Temiscouata;
" 22—24 " " " " "
" 29—31 " " " " "

The total area covered by this bog is approximately 7,220 acres, out of which 500 acres, approximately, is suitable for the manufacture of peat litter. Of the total area—

Approximately 893 acres have a depth of less than 5 feet, average depth of 3 feet;
Approximately 1,500 acres have a depth of 5 to 10 feet, average depth of 8 feet;
Approximately 2,900 acres have a depth of 10 to 15 feet, average depth of 12 feet;
Approximately 1,302 acres have a depth of 15 to 20 feet, average depth of 17 feet;
Approximately 350 acres have a depth of 20 to 25 feet, average depth of 21 feet;
Approximately 170 acres have a depth of 25 to 30 feet, average depth of 27 feet;
Approximately 105 acres have a depth of more than 30 feet, average depth of 30 feet.

The volume of the peat contained is:—

Approximately 4,322,000 cubic yards, in an area having a depth of less than 5 feet.
Approximately 19,348,000 cubic yards, in an area having a depth of 5 to 10 feet;
Approximately 56,133,000 cubic yards, in an area having a depth of 10 to 15 feet.
Approximately 35,710,000 cubic yards, in an area having a depth of 15 to 20 feet;
Approximately 12,250,000 cubic yards, in an area having a depth of 20 to 25 feet.
Approximately 7,440,000 cubic yards, in an area having a depth of 25 to 30 feet.
Approximately 5,222,000 cubic yards, in an area having a depth of more than 30 feet.

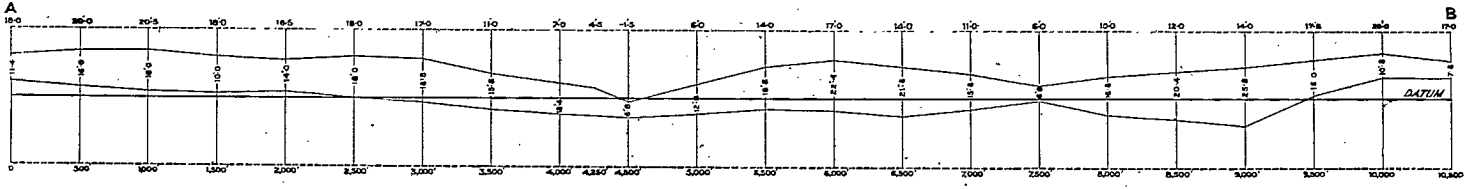

FIG. 1. Rivière du Loup peat bog, Quebec. Profile on line A-B.

This bog is exceptionally high (hochmore), and swells up to enormous sponges in different parts. A glance at the bottom contours, indicated on Fig. 1, will show that the bog consists of six hills, surrounded by a narrow creek which winds around them and supplies the growth of Sphagnum with water. The slopes of the hills can be seen both on Fig. 1, and on the line A and B, map No. 273.

With the exception of the 500 acres lying east of the Temiscouata road, the bog is very well humified, is of considerable depth, and will produce a very good fuel.

Certain portions of the bog are heavily wooded with spruce and tamarack, while around the margin alder, poplar, willow, and other soft-wood trees are intermixed. At intervals around the edges of the creek, small pine trees are found, which indicate that the peat bog is shallow.

The bog is principally formed of Sphagnum fuscum and Sphagnum acutifolium. In a number of places heavy layers of Eriophorum callitrixcham have been found. Around the margin of the ponds, which occur in the deeper part of the bog, Sphagnum can be seen, intermixed with different species of aquatic plants. Carex canescens is very plentiful around the margin.

In the northwestern portion of the bog, certain parts of the surface are heavily covered with Cladonia rangeferina, Cladonia gracilis, Boemus aeruginosus, and Peltigera.

A large amount of Commune polytricum, intermixed with various peat forming plants, may be observed on the banks above the bog.

The bottom of the bog is formed of blue clay, hence, while drilling, very few stumps or tree roots were touched.

Allowing for the decrease in depth through drainage, and deducting 893 acres having a depth of less than 5 feet, together with 500 acres suitable for peat litter only, we have left—

1,500 acres having an average depth of approximately 6 feet
2,900 " " " " " " " 10 "
1,302 " " " " " " " 15 "
125 " " " " " " " 19 " —

having a total volume of 94,579,000 cubic yards.

Assuming that one cubic yard of the drained bog will furnish 200 pounds of dry substance, there is then available 9,457,000 tons of 2,000 pounds, or 12,610,000 tons of peat fuel with 25 per cent moisture.

Analyses of Peat (absolutely dry).

	1	2	3	4	5	6	7	8	9	10	
Fixed carbon	28·0	28·6	27·6	28·7	29·4	28·3	27·7	29·0	28·6	28·6	
Volatile matter	69·2	69·3	70·5	69·2	67·8	68·8	70·0	67·1	67·2	68·6	
Ash	2·8	2·1	1·9	2·1	2·8	2·9	2·3	3·9	4·2	2·8	
Nitrogen	1·0	1·0	0·8	0·9	0·9	1·0	0·9	1·1	1·1	1·0	*Calorific*
Cals.	5060	5040	5000	4960	5020	5030	4950	5100	5360	4960	
Calorific values in B.T.U. per lb.	9070	9070	9000	8930	9030	9060	8910	9180	9650	8930	
Fuel ratio	0·41	0·41	0·39	0·41	0·43	0·41	0·40	0·43	0·43	0·42	

PEAT LITTER.

Part of Rivière du Loup peat bog, situated east of the Temicouata road.

The total area covered by this portion of the bog is approximately 500 acres, having an average depth of 26 feet.

The volume of peat litter contained in an area having an average depth of 26 feet = 20,973,000 cubic yards.

The bog is very little humified; is of considerable depth; hence should produce a very good peat litter, suitable for bedding, packing, etc.—especially as the upper layers are comparatively free from humus.

Allowing for the decrease in depth due to drainage we have—
500 acres having an average depth of 24 feet approximately; giving a total volume of 19,360,000 cubic yards of peat litter.

Calculating that one cubic yard of the bog will furnish about 120 pounds of peat substance, the total tonnage of dry peat litter substance available is approximately 1,161,000 tons of 2,000 pounds; or 1,927,000 tons of peat litter with 20 per cent moisture.

The peat is principally formed of Sphagnum moss, earth, etc.; excepting the bottom layer, in which a large variety of Carex plants are found.

The surface of this portion of the bog is fairly free from trees, but is dotted with small ponds, which are partly overgrown with Sphagnum and other peat forming plants.

Analysis of Peat Litter.

Kind of sample analysed	Sphagnum
Content of moisture	not stated
Absorption factor	11·4
Phosphorus	0·037
Nitrogen	1·0

The bog is conveniently situated both as regards shipping facilities and market, being only 1 mile south from Rivière du Loup station, on the Temiscouata railway. Rivière du Loup has a population of over 1000, and is well supplied with waterfalls, but fuel rates are high.

Prices of fuel at Rivière du Loup, 1912—
Hard coal from $9—$12.
Soft " " $5—$5.50.

Rivière du Loup is situated about 115 miles from the city of Quebec.

Cacouna Peat Bog.

This bog is situated immediately at the Cacouna station, in the parish of Leparc, county of Temiscouata, Province of Quebec, and runs in a west and east direction (See Map No. 274), covering more or less of—

The parish of Leparc, county of Temiscouata.

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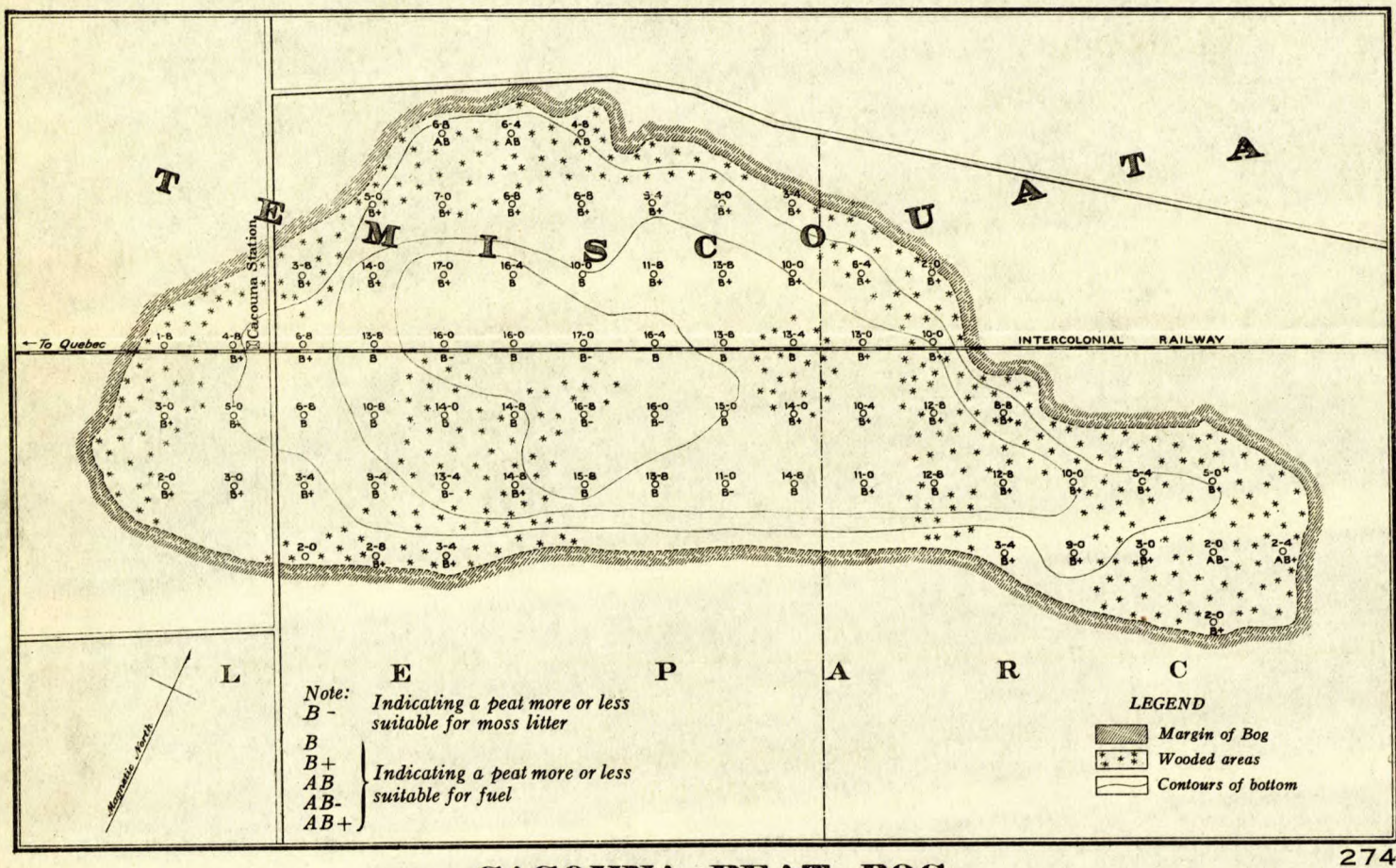

274

CACOUNA PEAT BOG

QUEBEC

Scale of Feet

0 500 1000 1500 2000 2500 3000

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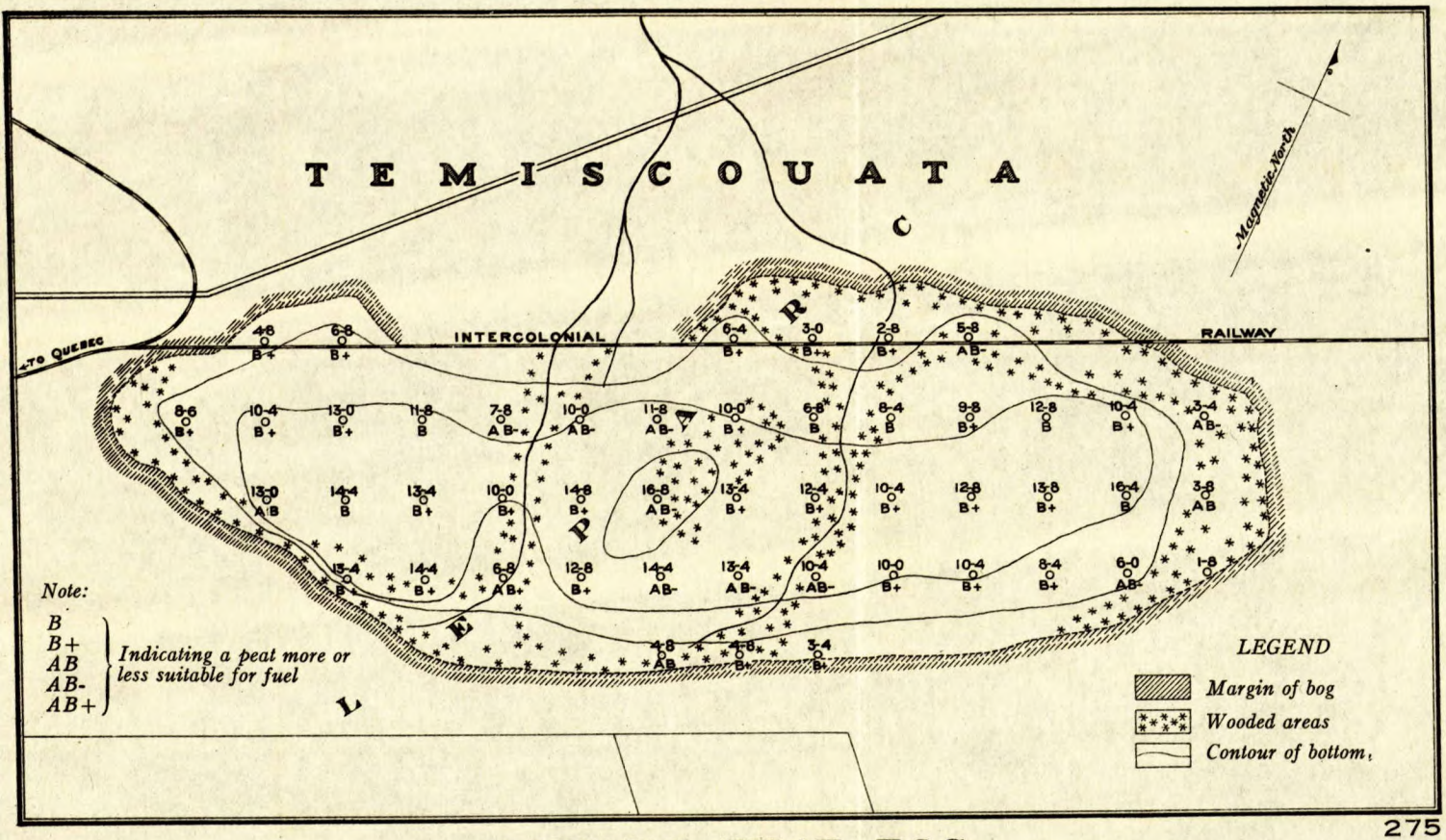

275

LEPARC PEAT BOG

QUEBEC

Scale of Feet

0 500 1000 1500 2000 2500 3000

The total area covered by the bog is, approximately, 845 acres. Of this area—

Approximately 262 acres have a depth of 5 feet, with an average depth of 3 feet;

Approximately 215 acres have a depth of 5 to 10 feet, with an average depth of 12 feet;

Approximately 104 acres have a depth of more than 15 feet, the average depth being 16 feet.

The volume of the peat contained is approximately—

In an area having a depth of less than 5 feet = 1,268,000 cubic yards.
" " " " " " " 5—10 feet = 2,437,000 " "
" " " " " " " 10—15 feet = 8,823,000 " "
" " " " " " " more than 15 feet = 2,762,000 " "

The peat is principally formed of Sphagnum moss, but towards the margin it is intermixed with different species of Carex plants.

This bog is not sufficiently humified to be utilized for fuel purposes, and it contains too much humus to produce a first class litter. However, by using suitable machinery, and proper methods of digging, the bog should give fairly good litter. The surface is practically free from trees, and the part which is overgrown is composed mostly of young spruce. The bottom of the bog is formed of a compact layer of grey clay.

Deducting 262 acres having a depth of less than 5 feet, and allowing for the decrease in depth due to drainage, there are—

215 acres having an average depth of 5 feet
264 " " " " " " 10 "
104 " " " " " " 14 "

giving a total volume of 8,371,000 cubic yards of peat litter.

Assuming that one cubic yard of the bog will furnish about 120 pounds of dry peat substance, the total tonnage of dry peat litter substance available will be approximately 502,000 tons of 2,000 pounds, or 602,000 tons of peat litter with 20 per cent moisture.

The bog is advantageously situated as regards shipping facilities, being traversed by the Intercolonial railway, while Cacouna station is situated directly on the bog.

Leparc Peat Bog.

This bog is situated about 5 miles east of Rivière du Loup station, and 500 feet west of Cacouna station, in the parish of Leparc, in the county of Temiscouata; and runs in a west and east direction (See Map No. 275), embracing more or less of the parish of Leparc, county of Temiscouata.

The bog comprises approximately 614 acres.

Of this area—

Approximately 123 acres have a depth of less than 5 feet, average depth 4 feet;

Approximately 148 acres have a depth of 5 to 10 feet, average depth 7 feet.

Approximately 239 acres have a depth of 10 to 15 feet, average depth 12 feet;

Approximately 14 acres have a depth of more than 15 feet, average depth 16 feet.

The volume of peat contained is approximately—

In an area with a depth of less than 5 feet	793,600	cubic yards.
" " " " " " " 5 to 10 feet	1,675,000	" "
" " " " " " " 10 to 15 feet	4,631,000	" "
" " " " " " " more than 15 feet	358,500	" "

The peat is formed chiefly of Sphagnum moss, is very well humified, and will produce a very good fuel. The bog is well situated both as regards shipping facilities and market, being on the Intercolonial railway, and is only 5 miles from Rivière du Loup.

The prices of fuel are given in the description of the Rivière du Loup peat bog.

Twelve years ago an attempt was made on this bog by the Quebec Peat Fuel Co., to manufacture peat fuel in the form of briquettes. The process consisted in macerating the peat and drying the raw product in a small electric drying furnace. When a certain dryness was reached, the peat was mixed with very inferior crude oil, and then pressed into small cylindrical moulds, and ejected as briquettes.

In 1901 the buildings were burned down, and operations discontinued.

Deducting the 123 acres having a depth of less than 5 feet, and allowing for the decrease in depth, due to drainage, we have left:—

148 acres having an average depth of approximately 5 feet
239 " " " " " " " 10 "
14 " " " " " " " 14 "

giving a total volume of approximately 5,373,000 cubic yards.

Assuming that one cubic yard of the drained bog could furnish 200 pounds of dry peat substance, the total tonnage of dry substance available would be approximately 537,300 tons, of 2,000 pounds, or 716,400 tons of peat fuel having 25 per cent moisture.

Analyses of Peat (absolutely dry).

Volatile matter	69·5
Fixed carbon	27·8
Ash	2·7
Nitrogen	0·9
Calorific value B.T.U. per lb.	9000
Calories	5000
Fuel ratio	0·40

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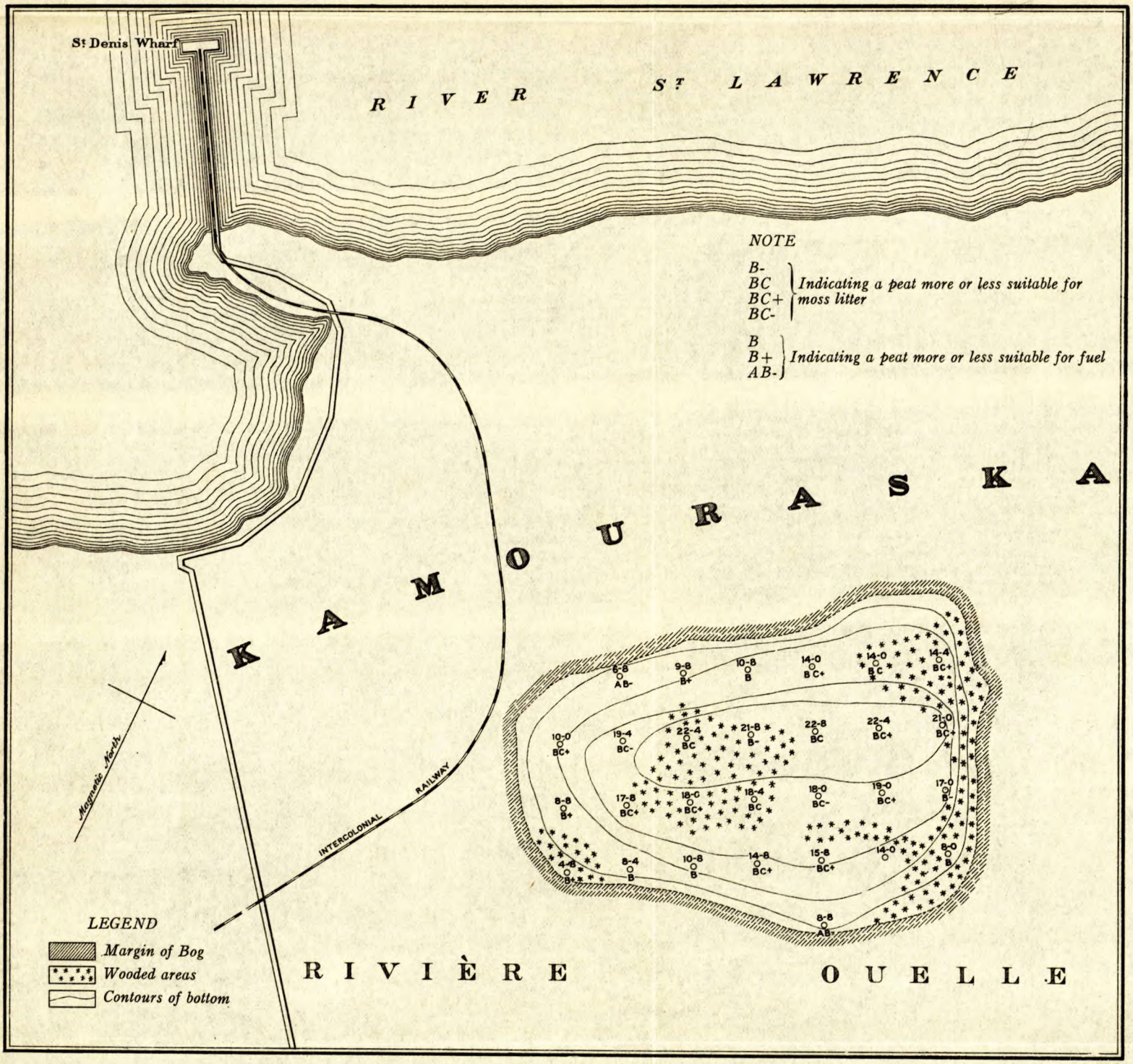

St DENIS PEAT BOG

QUEBEC

276

Scale of Feet

0 500 1000 1500 2000 2500 3000

St. Denis Peat Bog.

This bog is situated about 1 mile south of St. Denis wharf, about 7 miles north of Rivière Ouelle station, in the parish of Rivière Ouelle, county of Kamouraska (See Map No. 276), covering more or less of the parish of Rivière Ouelle, county of Kamouraska. The total area covered by this bog is, approximately, 315 acres. Of this area:—

Approximately 34 acres have a depth of less than 5 feet, average depth 3 feet;

Approximately 63 acres have a depth of 5 to 10 feet, average depth 8 feet;

Approximately 77 acres have a depth of 10 to 15 feet, average depth 13 feet;

Approximately 81 acres have a depth of 15 to 20 feet, average depth 18 feet.

Approximately 60 acres have a depth of more than 20 feet, average depth 22 feet.

The volume of the peat contained is—

164,000 cubic yards in an area with a depth of less than 5 feet
797,000 " " " " " " " " " 5 to 10 "
1,622,000 " " " " " " " " " 10 to 15 "
2,426,000 " " " " " " " " " 15 to 20 "
2,118,000 " " " " " " " " " more than 20 feet.

The peat is chiefly formed of Spagnum fuscum, slightly intermixed with Eriophorum callitrixcham.

The bog is not sufficiently humified to be utilized for fuel purposes. The upper layers from 3 to 4 feet deep are comparatively free from humus, but below that depth it is fairly well humified. On the average, therefore, it would produce a fairly good litter.

The surface of the bog is practically free from trees, while the bottom consists of a compact blue clay.

Deducting the 34 acres having a depth of less than 5 feet, and allowing for the decrease in depth due to drainage, we have left—

63 acres having an average depth of approximately 6 feet
77 " " " " " " " 11 "
81 " " " " " " " 16 "
60 " " " " " " " 20 "

giving a total volume of 6,053,000 cubic yards of peat litter.

Assuming that one cubic yard of the bog will furnish about 120 pounds of dry peat substance, the total tonnage of dry peat litter available is approximately 502,000 tons of 2,000 pounds, or 602,000 tons of peat litter with 20 per cent moisture.

The bog is advantageously situated as regards shipping facilities, being about 200 feet away from the St. Denis branch line of the Intercolonial railway.

Rivière Ouelle Peat Bog.

This bog is situated about 1 mile northwest of Rivière Ouelle station, in the parish of Rivière Ouelle, county of Kamouraska, Province of Quebec, and runs in a west and east direction (See Map No. 277) covering more or less of the parish of Rivière Ouelle, county of Kamouraska.

The total area covered by the bog is, approximately, 4521 acres. Of this area 2300 acres are suitable for the manufacture of peat fuel; while 2221 acres are suitable for the manufacture of peat litter.

This bog is a high more (hochmore). A reference to Fig. 2 will show that the bottom contours of the bog swells considerably in the middle. The slope for drainage can be seen on both Fig. 2, and on the line A and B, Map No. 277.

PEAT FUEL.

That portion of the bog suitable for the manufacture of peat fuel is situated between the margin of the bog and the bottom contour lines which surrounds the area having a depth of 15 to 20 feet.

The total area covered by this part of the bog is, approximately, 2,300 acres. Of this area—

Approximately 802 acres have a depth of less than 5 feet, the average depth being 3 feet;

Approximately 879 acres have a depth of from 5 to 10 feet, the average depth being 7 feet;

Approximately 919 acres have a depth of from 10 to 15 feet, the average depth being 12 feet.

The volume of the peat contained is—

Approximately 3,888,000 cubic yards, in an area with a depth of less than 5 feet;

Approximately 9,924,000 cubic yards, in an area with a depth of 5 to 10 feet;

Approximately 17,786,000 cubic yards, in an area with a depth of 10 to 15 feet.

This portion of the bog is fairly well humified, and has a sufficient depth to produce fairly good fuel.

It is comparatively free from wood; but spruce, cedar, and occasionally young poplar trees, are found towards the margin of the bog.

The peat consists mainly of Sphagnum fuscum, and Sphagnum acutifolium, but in some places Hypnum is found. The surface is covered with Eriophorum callitrixcham. The bottom formation is intermixed with Carex and aquatic plants.

Allowing for the decrease in depth, due to drainage, and deducting 802 acres having a depth of less than 5 feet, we have left 879 acres with an

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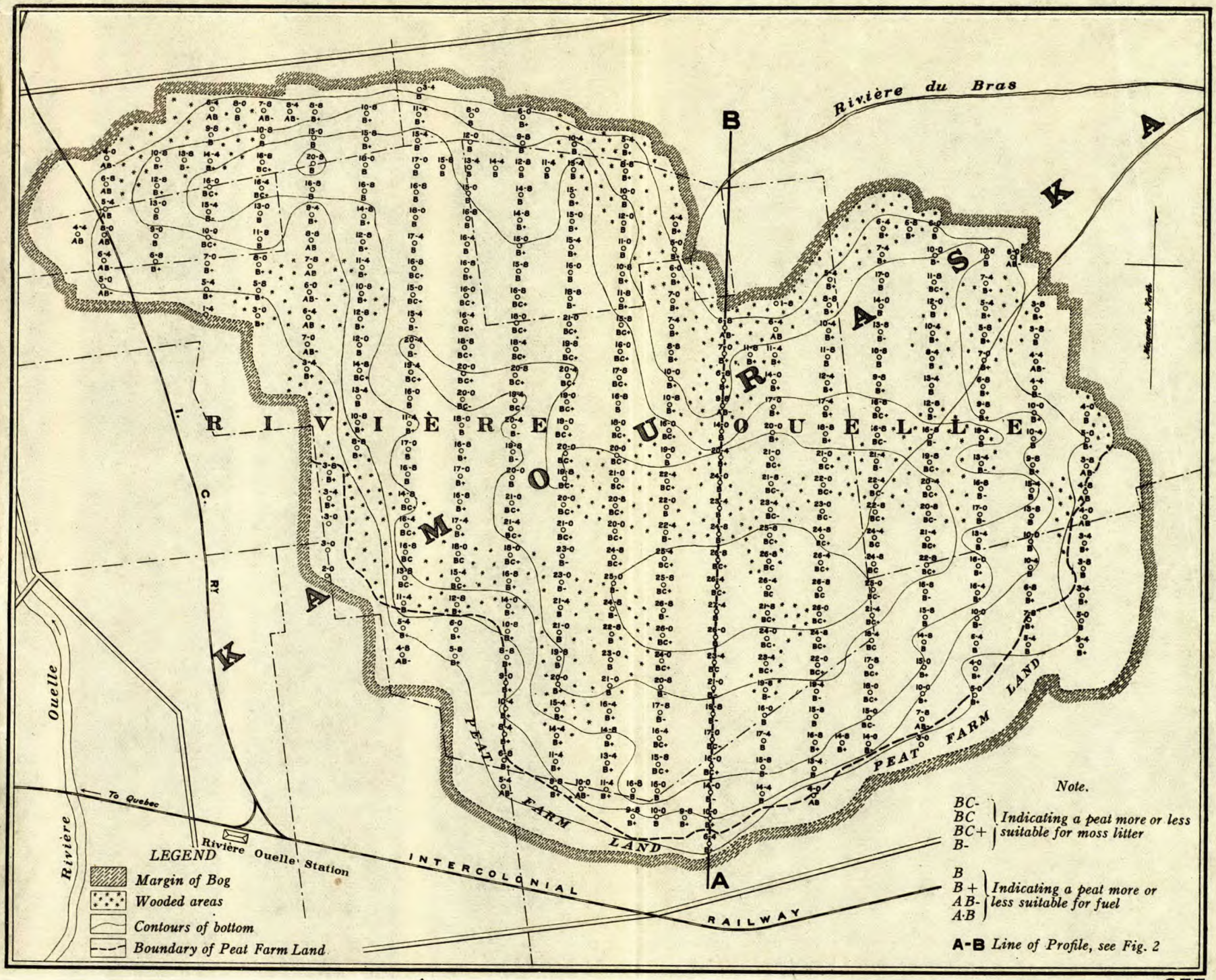


277

RIVIÈRE OUELLE PEAT BOG

QUEBEC

Scale of Feet

1000 0 1000 2000 3000 4000 5000

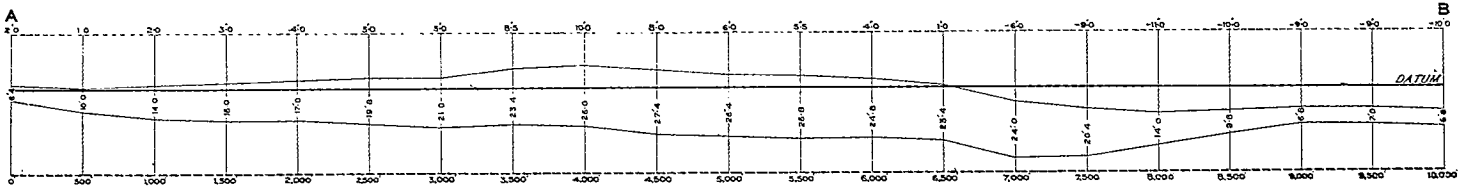


FIG. 2. Rivière Ouelle peat bog, Quebec. Profile on line A-B.

average depth of 5 feet; and 919 acres having an average depth of 10 feet, giving a total volume of 21,911,110 cubic yards.

Assuming that one cubic yard of the drained bog will furnish 200 pounds of dry substance, there is then available = 2,190,000 tons of 2,000 pounds, or approximately 2,920,000 tons of peat fuel with 25 per cent moisture.

Analysis of Peat Fuel (absolutely dry).

	1	2
Fixed carbon	28·8	28·9
Volatile matter	67·9	67·6
Ash	3·3	3·5
Nitrogen	1·1	1·7
Calorific value in calories per gram in B.T.U. per lb.	9080	9280
Calories	5050	5160
Fuel ratio	0·42	0·43

The content of ash is comparatively low, and the calorific value satisfactory.

PEAT LITTER.

That portion of the bog suitable for peat litter is situated in the middle, and is environed by the bottom contour line representing an area having a depth of 15 to 20 feet.

The total area covered by this portion of the bog is approximately 1921 acres. Of this area:—

Approximately 1,105 acres have a depth of 15 to 20 feet, the average depth being 16 feet;

Approximately 633 acres have a depth of 20 to 25 feet, the average depth being 22 feet;

Approximately 183 acres have a depth of more than 25 feet, with an average depth of 26 feet.

The volume of the peat contained therein is—

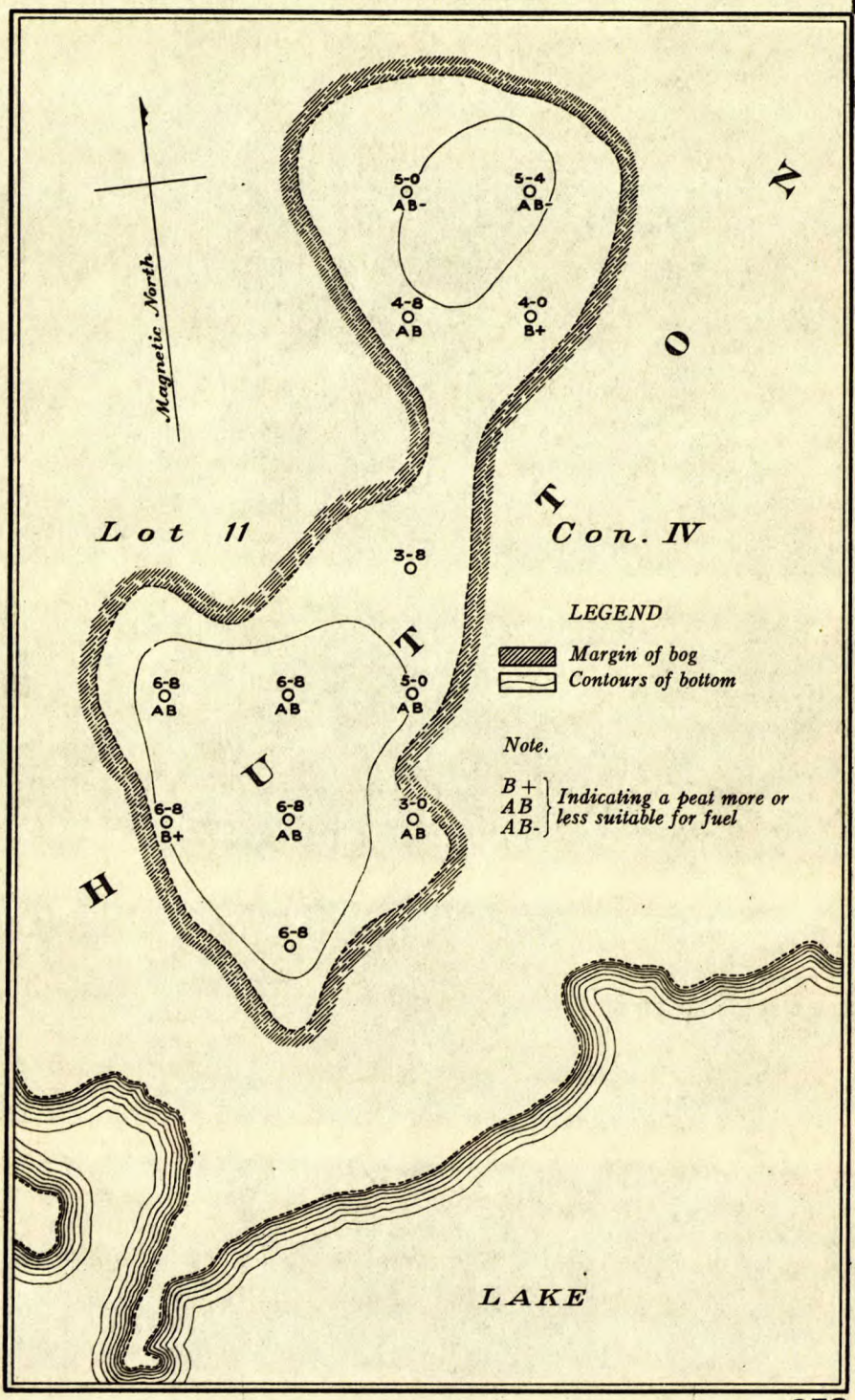
Approximately 28,503,000 cubic yards, in an area with a depth of from 15 to 20 feet;

Approximately 22,464,000 cubic yards, in an area with a depth of from 20 to 25 feet;

Approximately 7,703,000 cubic yards, in an area with a depth of more than 25 feet.

The peat consists chiefly of Sphagnum fuscum, and Sphagnum acutifolium. Large groups of Eriophorum callitrixcham and other peat forming plants are found on the surface.

Canada
DEPARTMENT OF MINES
HON. LOUIS CODERRE, MINISTER, R.W. BROCK, DEPUTY MINISTER.
MINES BRANCH
EUGENE HAANEL, PH.D., DIRECTOR



278

MOOSE MOUNTAIN PEAT BOG
ONTARIO

Scale of Feet

200 100 0 200 400 600

The peat is very little humified, and is of considerable depth, hence will produce a very good peat litter suitable for bedding, packing, etc., especially as the upper layers are comparatively free from humus.

Allowing for decrease in depth, due to drainage, we have:—

Approximately 1105 acres having an average depth of 14 feet
" 633 " " " " " " 20 "
" 183 " " " " " " 24 " —

giving a total volume of 36,440,000 cubic yards of peat litter.

Calculating that one cubic yard of such bog will furnish about 120 pounds of peat substance, the total tonnage of dry peat litter substance available is 2,186,000 tons of 2,000 pounds, or 2,623,734 tons of peat litter with 20 per cent moisture.

The surface of this portion of the bog is practically free from trees; the bottom is formed of blue clay.

Analysis of Peat Litter.

Kind of sample analyses	Sphagnum.
Content of moisture	not stated.
Phosphorus	0·037
Nitrogen	0·9

The bog is conveniently situated both as regards shipping facilities and market, being only 2,000 feet north of Rivière Ouelle station, on the Intercolonial railway—which is surrounded by several small parishes.

In the surrounding district the fuel values are comparatively high, the prices being very much the same as those at Rivière du Loup.

INVESTIGATION OF PEAT BOGS IN ONTARIO.

Moose Mountain Peat Bog.

This bog is situated about $2\frac{1}{2}$ miles from Sellwood station, on the Canadian Northern railway (See Map No. 278), and covers more or less of lot 2, concession IV, township of Hutton.

The total area covered by this bog is approximately 9 acres—too small an area to be utilized for the manufacture of peat fuel. The peat is very well humified, and has an average depth of, approximately, 6 feet.

The investigation of this northern Ontario bog—which was continued about two weeks in July—shows that peat fuel areas may ultimately be found in the Sudbury district; but a considerable length of time would be required for a thorough investigation of such a large area. Under the circumstances, and taking into consideration the present sparsely settled condition of this part of the Province, it was not considered advisable to attempt, at present, a detailed examination of these large areas.

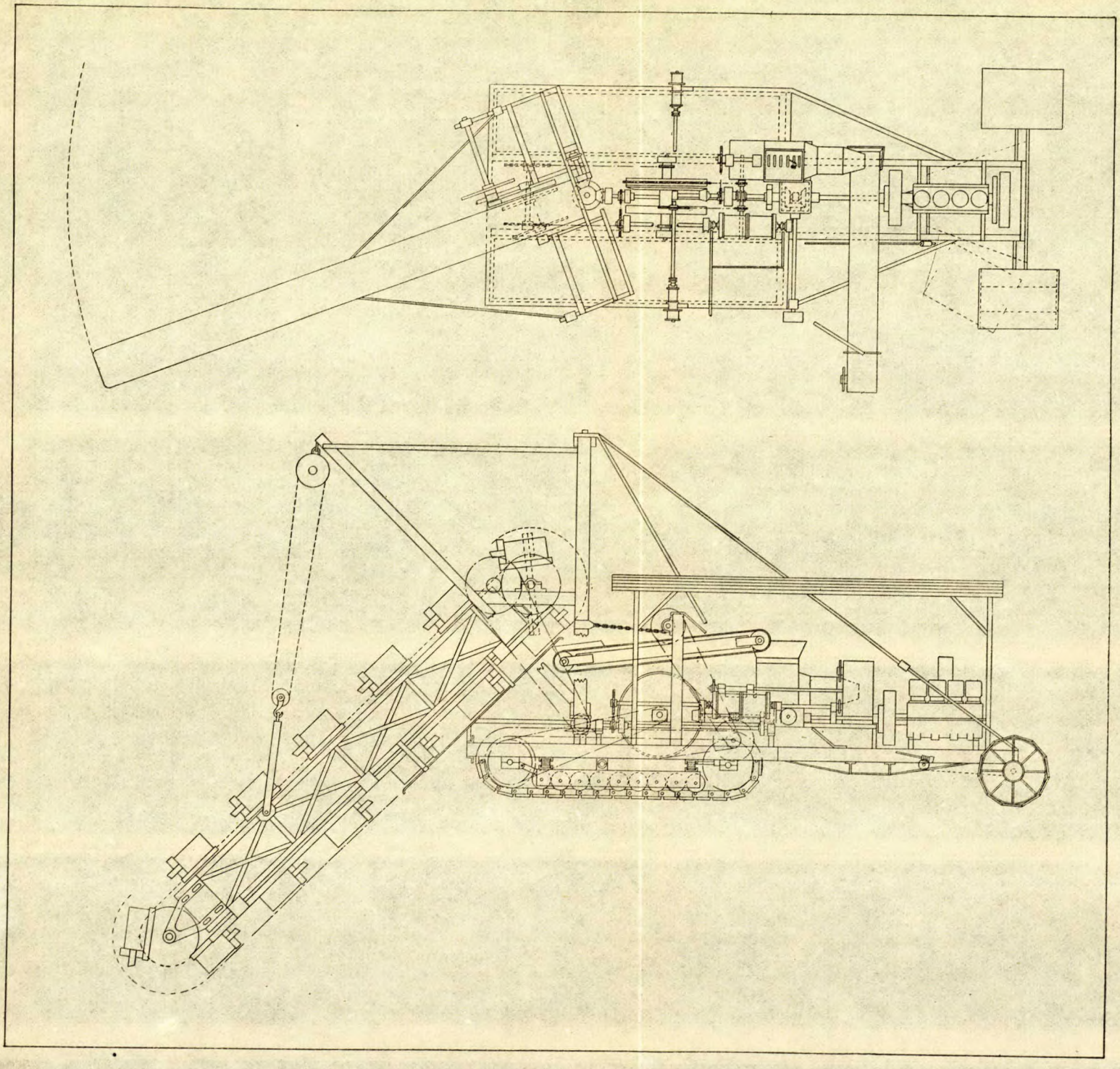


FIG. 3. Top view and side elevation of Krupp excavating machine.

NOTES ON SPECIAL APPLIANCES FOR THE MANUFACTURE OF PEAT FUEL.

A Krupp excavator for digging the peat automatically, together with an Anrep[1] macerating machine, Jakobson[2] spreading device, and Ekelund[3] system for transporting the macerated peat to the spreading ground were installed, and under operation during 1911-12 on the Farnham peat bog; which is traversed by the Central Vermont railway, about 40 miles from Montreal. During my visit to Farnham the plant was in operation for only two hours, as it was the close of the season, and the manufacture of peat was discontinued.

MACHINERY EQUIPMENT.

A platform resting on caterpillar rollers is placed directly on the surface of the bog, on which are mounted the excavator, peat machine, and gasoline engine (See Plates Nos. XX and XXI).

Plates XXIV, XXV, and XXVI illustrate the stacking, loading, and shipping of the peat at Farnham, Que.

Description of the Krupp Excavator.

(Patent, No. 135075.)

At the rear of the above mentioned platform a crane is pivoted so as to swing about on a vertical axis. The crane is provided with suitable outriggers, to the extremities of which are connected blocks and tackles actuated by drums, mounted so as to revolve on the platform. A power shaft is connected by clutches to either of the drums. The arrangement being such that, when the shaft is clutched to one of the drums, the other drum is left free. By these means the crane may be swung in either direction, at will. Upon the crane is mounted a boom adapted to swing about a horizontal axis. This boom is intended to carry the excavating buckets and it may be raised or lowered according to the depth of the excavation. (See Figure 3.) Near the outer end of the boom is secured a cable, passing through two pulleys. This arrangement serves to raise and lower the boom.

The cable may be actuated in any suitable way, as for example, by means of a drum to which its minor end is connected.

The pivoted support for the boom on the crane is used in the form of a shaft, passing through the inner end of the boom, and revolves on the crane supported in bearings. By allowing the shaft to run freely in the boom it is also made to serve as the driving member for the chain of buckets and the automatic cleaver, which will be described below.

To this end, the shaft is provided with two sprocket wheels spaced apart somewhat less than the width of the boom. At the free end of the boom are similar and similarly spaced sprocket wheels, thus making provision for driving two endless sprocket chains, on which the buckets are hung and which extend longitudinally about the boom.

Along the upper side of the boom are two parallel tracks, conveniently made of angle irons, each of which has one flange extending horizontally and the other flange extending vertically. On the underside of the boom are two double tracks, these being made of channel irons. The endless chain of buckets is supported on the tracks by means of shoes which project laterally from the sides of the buckets, at the top thereof. (See Fig. No. 4.) These shoes may conveniently consist of blocks of wood shaped to fit into the channel-iron tracks on the underside of the boom, the shoes being on the portion of the chain which lies above the boom simply resting upon the tracks. It will thus be seen that the buckets are firmly supported while they remain on the underside of the boom, and must follow a given path when the driving power is applied.

---

[1] See "Peat and Lignite: their manufacture and uses in Europe," by E. Nystrom (1908). Mines Branch Report, No. 19.

[2] Ibid.

[3] See Description of Ekelund Process in Mines Branch Report, No. 71 (1909).

As the peat in a raw state is of a very stickly substance usually, some of the contents of the bucket will remain in the bucket if gravity is alone relied upon to effect the discharge when the discharging point is reached. To prevent this a power driven ejector, which takes the form of a double-ended paddle, is secured to the shaft between the sprocket wheels. The parts are so proportioned and adjusted, that as each bucket approaches the sprocket wheel, one of the paddles descends into the top of the bucket and as the bucket travels around the sprocket wheels the paddle passes into and through the bucket, pushing the contents positively through the bottom. It will thus be seen that as the buckets travel around the sprocket wheels the paddles sweep clear through the same and insure a complete discharge of their contents.

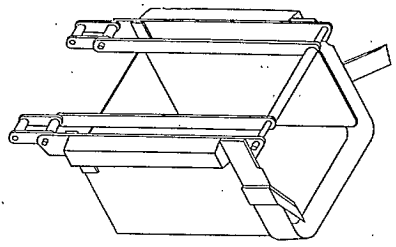


FIG. 4. Krupp excavator bucket.

The shaft may be driven in any suitable manner. It is provided at one end with a gear wheel which meshes with a pinion carried by a counter shaft mounted on the crane. The counter shaft is geared to a second counter shaft, mounted on the crane near the base thereof, the gearing between the two counter shafts conveniently taking the form of a sprocket chain. At the pivotal axis of the crane is a horizontal level gear, which meshes with a pinion on the shaft. The gear may be driven by a driving gear, mounted upon the end of a suitable shaft. The shaft is mounted in stationary bearings on the carriage without interfering with the driving connection between the members when the crane is swung about on its axis.

The operation of the excavator.

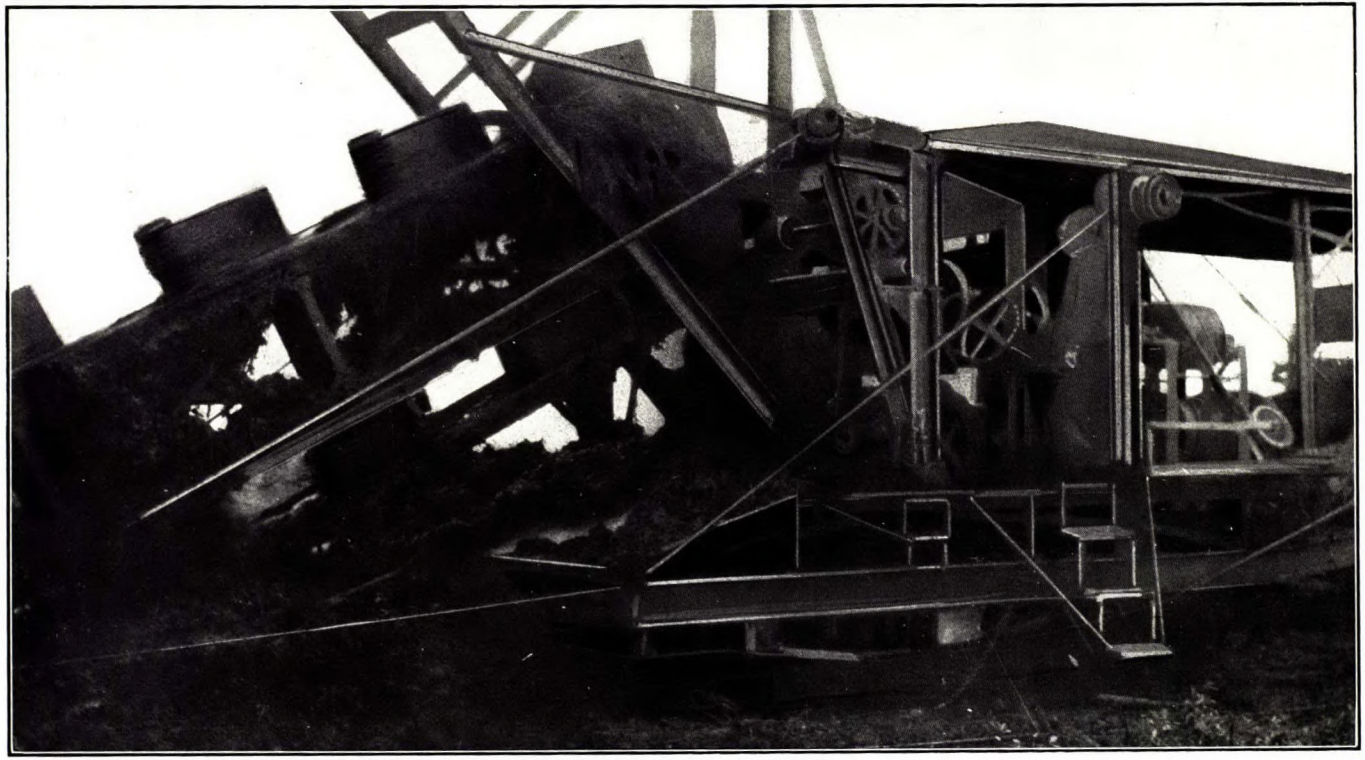
The apparatus is moved to the starting point; the boom is swung laterally to one boundary of the ditch to be excavated; the chain of buckets is set in operation and the boom is lowered until the buckets cut to a depth of about a foot. The crane is then set in motion, slowly sweeping the boom across the path to be cut until the opposite side is reached. When an initial cut has been completed, the boom is again lowered and is started back toward the opposite side. In this way the boom is swung back and forth, being lowered at each limit of its movement, until the excavator has proceeded to the desired depth. Thereafter no change is made in the vertical position of the boom it being simply swung back and forth in the transverse direction, the apparatus being moved forward the proper distance for a new cut, at the end of each swinging movement of the boom.

After the buckets leave the face of the inclined bank they pass above the shield and their contents are prevented from dropping out through the open bottoms. When a bucket reaches the upper end of the shield, one of the automatic cleaning paddles enters the same and its contents are discharged upon a screw conveyor, which carries the excavated peat into an inverted cone shaped hopper, which prevents the peat from arching and blocking the flow as it would otherwise do. From the hopper the peat drops into the cylinder of the peat machine. After the peat is thoroughly kneaded so that it is practically of a homogeneous nature it leaves the mouth piece of the peat machine and is conveyed by means of a screw conveyor into the dumping cars. These cars (see Plate XXV) are run on a track, and are hauled by a small gasoline locomotive. The filled cars are brought to the drying field and the peat is dumped into a field press of a simplified "Jacobsson" construction. (See plate XXIII.) This apparatus spreads, cuts through and divides the peat moss into fifteen continuous strips. These rows or strips are cut by a special cutting tool, fitted with three steel discs, into blocks, with a dimension of 10" × 5" × 4".

Labourers employed.

1 engineer,
1 man receiving cars,
1 man filling cars,
1 man dumping cars at the field press,
1 man spreading peat in the field press,
1 man cutting peat strips vertically,
1 man clearing up the ground,
2 or 3 boys.

Total — 7 men and 3 boys.



Krupp excavator, Farnham, Que.

Krupp excavator, Farnham, Que.

The capacity of the machine, according to my estimate, is 35 to 40 tons per day, of 10 hours work, without stoppages.

NOTE,—

The main objection to this excavator is, that it cuts jagged vertical walls. This is caused thus: each time the excavator is moved back from the wall of the trench toward the opposite face, the wedge shaped cut it has made leaves a right handled wedge sticking out, 6 feet long, 3 feet wide, 10 feet deep; which is a very dangerous condition for bogs in countries with a severe climate, as the peat which is exposed on the faces of the walls, and for some distance in, freezes during the winter, and dries up during the summer. Consequent upon such severe changes, the walls are certain to cave in, thus making it dangerous for the machine on the next trip when excavating along the edge of the previous excavation. As the excavator at Farnham is of very heavy construction, it would have to start excavating 40 to 50 feet away from the edge of the previous excavation. This would cut up the peat bog, and entail a considerable waste of economic land; otherwise the excavator is soundly constructed.

Krupp spreading device.

(Patent No. 134138).

This spreading device represents a carriage which is made in the form of an open rectangular frame on which is placed the spreading and cutting devices. This carriage is mounted on wheels, and suitable tracks are provided to support it. On the carriage a platform is placed upon which is mounted a suitable engine for propelling the carriage and for actuating the spreading and cutting device. A special driving mechanism is designed for the purpose of rotating the axle in either direction and thus moving the carriage either backwards or forwards. A clutch which forms part of this driving mechanism serves to disconnect the engine entirely from the driving wheels so as to permit the carriage to remain stationary while the engine is running (see Fig. 5).

Detailed Description of the Spreading Device.

One side of the carriage is provided with a platform for receiving the peat which is to be spread. The apparatus is divided into two parts, the front half being for the purpose of spreading and the rear half for the purpose of producing cross-cuts over a strip equal in width to the new strip which is being spread at the front. The open frame is divided by a cross member, which extends through the middle and the platform runs from the front end of the machine to this cross member, along one side of the machine. The peat is removed from the platform and spread in a layer between the tracks by a spreading board which is as long as the platform and is adapted to be moved transversely to the carriage. The spreading board is placed in position against the side of the frame above the platform so that the load when deposited lies inside of the spreading board, and is easily scraped from the platform when the board is moved toward the opposite side of the carriage. This spreading board is moved back and forth across the carriage and is controlled in such a manner that its lower edge moves in a horizontal plane, lying above the surface of the ground a distance equal to the depth of the layer desired. The mass of peat flows before the board and is spread in a uniform layer.

The carriage is made of two similar frames arranged one above the other and the cross member also comprises two separated parallel pieces. Consequently the front member of the carriage and the cross member forms tracks adapted to receive shoes connected to the ends of the spreading board and extended at right angles thereto. A shaft is extended longitudinally from the carriage above the platform, this shaft being suitably geared to the engine by means of driving mechanism which includes a clutch and a reversing device, so that the shaft may either be allowed to remain stationary or be driven in either direction. On the front end of the shaft is a drum and a similar drum is secured to the shaft just back of the cross member.

At each side of the front end of the machine is a pulley and similar pulleys are located just back of the cross member adjacent to the sides of the carriage. A cable is wound one or more times about the drum, its ends extending from the drum in opposite directions across the pulleys, one end of the cable being then connected to one end of the shoe at the front end of the spreading board and the other end of the cable being connected to the opposite end of this shoe. A similar cable surrounds the drum, passes over the pulleys and is connected to the ends of the shoe at the opposite end of the spreading board.

By this arrangement, when the shaft is rotated in one direction, the spreading board is moved across the carriage in the direction to spread the peat and when the shaft is rotated in the opposite direction the spreading board is returned to its initial position.

As the upper surface of the layer of peat is apt to be left in a rough condition and in order that it may be made smooth and level, the apparatus is provided with a smoothing plate which lies beneath the cross member. The front end of the smoothing plate is curved upwardly, so that it will ride upon the spread layer and engage it from above, thus preventing the peat from piling up in front of the smoothing plate, when the carriage is moved forward. From the curved front plate toward the rear there is a gradual downward inclination so that a gradually increasing pressure is produced upon the surface of the peat and it is smoothed and compacted when the carriage moves forward.

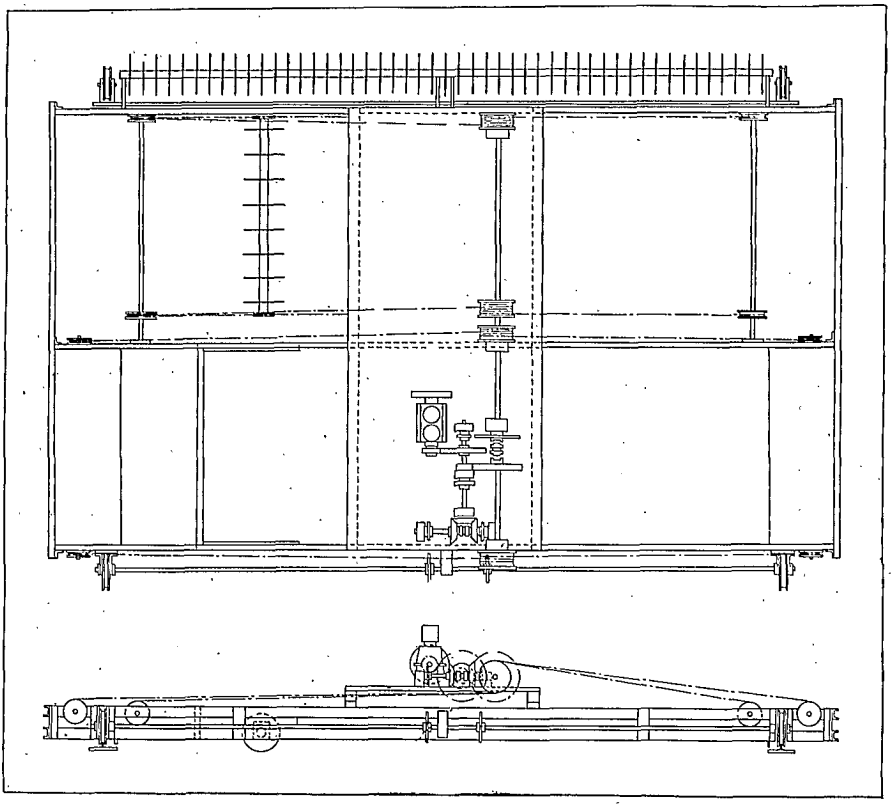


FIG. 5. Krupp spreading and cutting machine.

The layer of peat is cut along lines at right angles to each other. For cross cutting of one strip while a new strip is being spread in advance the rear half of the carriage is provided with a shaft which runs through it, suitable cutting discs are mounted upon this shaft so that when the latter is drawn across the machine the discs will cut through the underlying layer and separate it into a series of narrow transverse strips.

The cutting member is actuated in the following way. The main shaft is extended to the rear of the machine and is provided with drums, which are located at the rear end of the carriage, directly behind the above mentioned drum. Two sets of pulleys, corresponding to the above mentioned pulleys but located closer together so as to lie inside of the tracks, are suitably mounted on the rear half of the carriage. A cable is wound upon the drums and passes in opposite directions from the drum over the pulleys and has its ends connected to one end of the shaft. A similar cable to the above passes around the drum over the pulleys and has its ends connected to the opposite end of the shaft.

It will thus be seen that when the shaft is driven so as to move the spreading board across the carriage in either direction a corresponding movement of the cutting member is produced so that cross cuts are made in one strip while the next strip is being spread.

For the purpose of cutting the peat longitudinally to the path of movement of the carriage, the rear of it is provided with a horizontal cross shaft which is supported upon arms

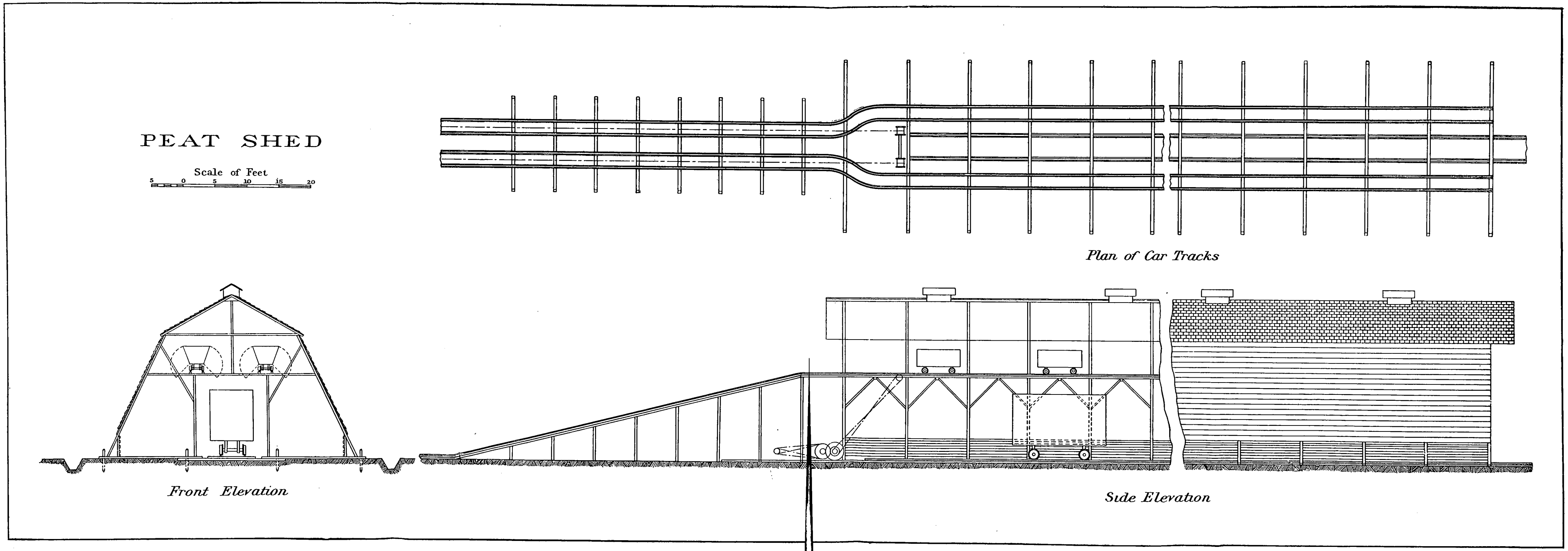
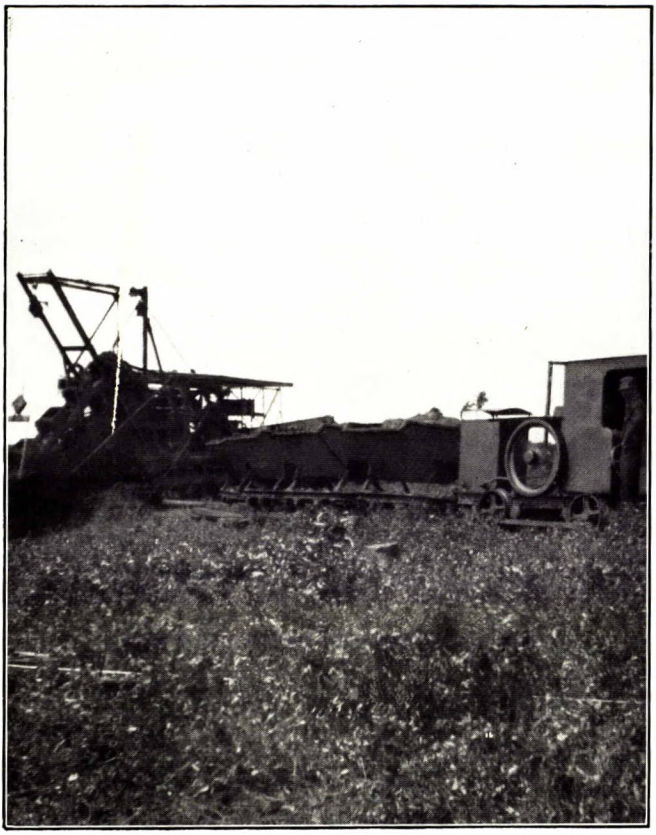


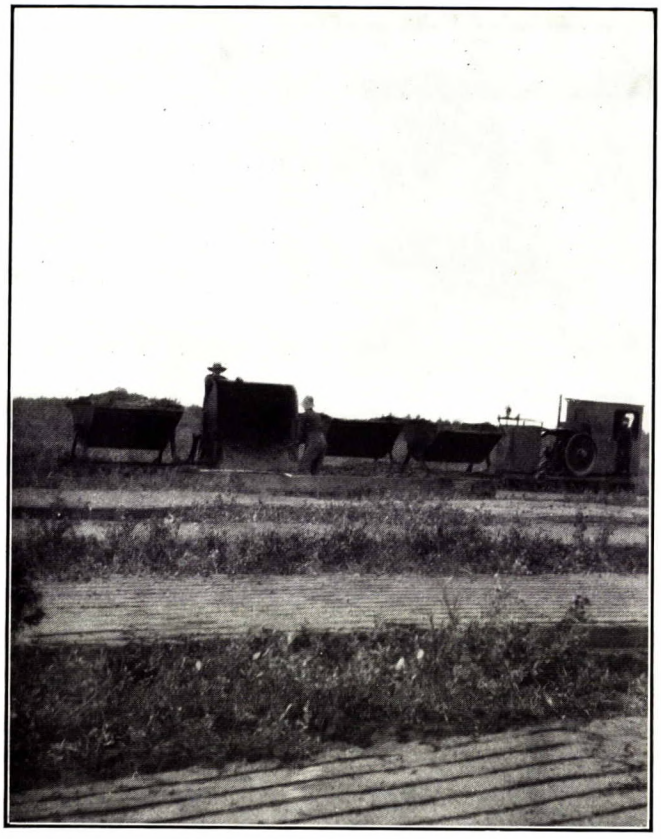
Fig. 6. Shed, improved, for storage of peat fuel.

PLATE XXII.

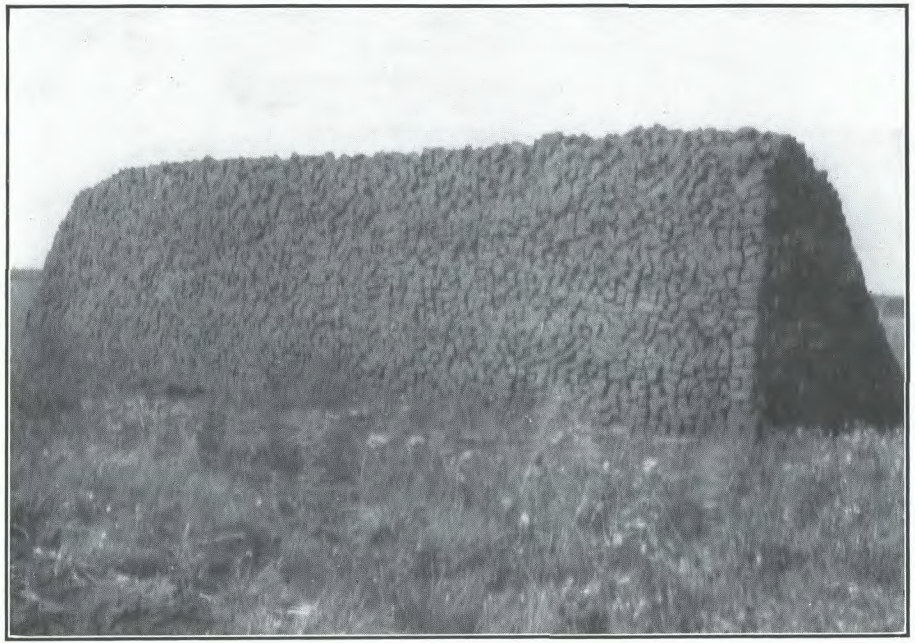


Loaded cars leaving for the spreading field.

PLATE XXIII.

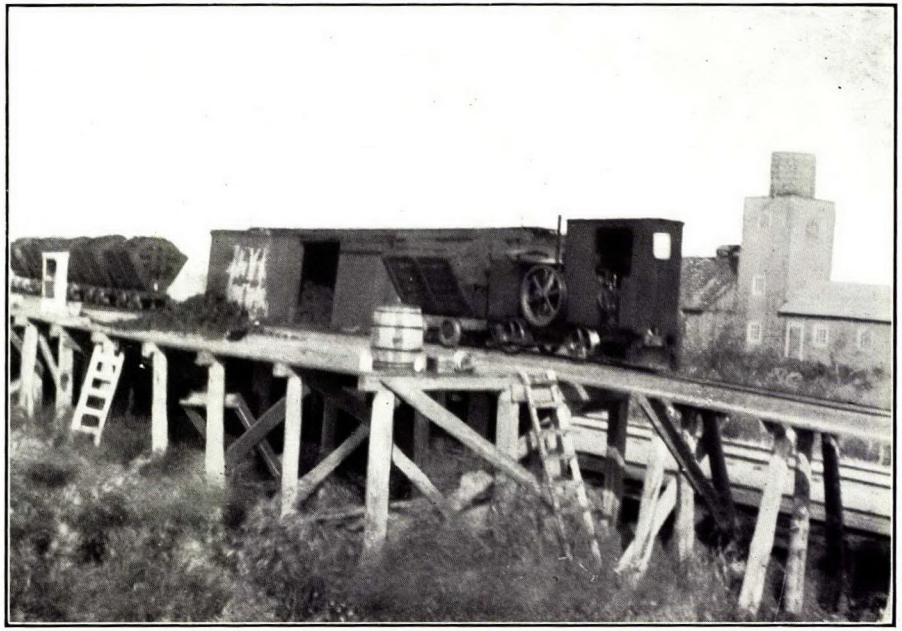


Peat dumped into spreader, Farnham, Que.



Peat stack at Farnham, Que.

Loading peat.



Shipping platform at Farnham, Que.

which are hinged upon the rear of the carriage so as to be capable of swinging in vertical planes. On the shaft are cutting discs similar to the ones described above. The shaft and its cutting discs may be raised and lowered by means of suitable levers mounted on the carriage, when the shaft is raised, the carriage may be moved back and forth without affecting the peat, and when the shaft is lowered, the peat will be cut longitudinally whenever the carriage is moved backward or forward.

As it is desirable to cut the peat into rectangles of any desired dimensions, cutting discs are adjustably supported on their shaft in such a manner that they may conveniently and quickly be shifted along their shafts and locked securely in their adjusted positions.

This spreading device was not in operation during my visit at Farnham.

Alfred Peat Plant, Alfred, Ont.

During my visit to the Alfred peat bog, I saw certain parts separately in operation. These consisted of the Anrep excavator and pulper, Moore's aero-cable device and spreader. The complete arrangement looked very promising, and was expected to be in full operation in the spring of 1913.

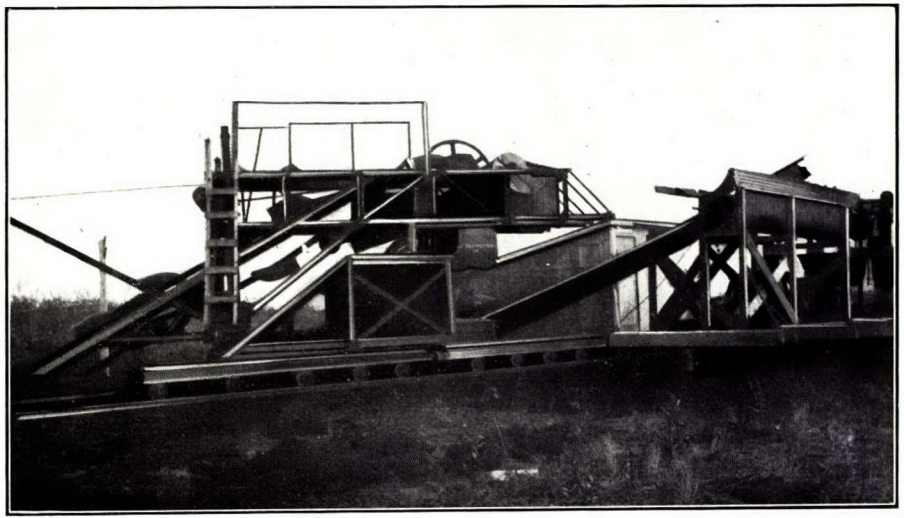
Due to late installation, and several mechanical alterations, only a few hundred tons of air-dried peat fuel were manufactured. This was sold in the immediate vicinity. No detailed description of the completed plant can be given until it has been in commercial operation an appreciable time; but with a view of giving a rough idea of this up to date peat making installation, a number of photographic illustrations have been given (see Plates Nos. XXVII, XXVIII, and XXIX).

IMPROVED PEAT SHED.

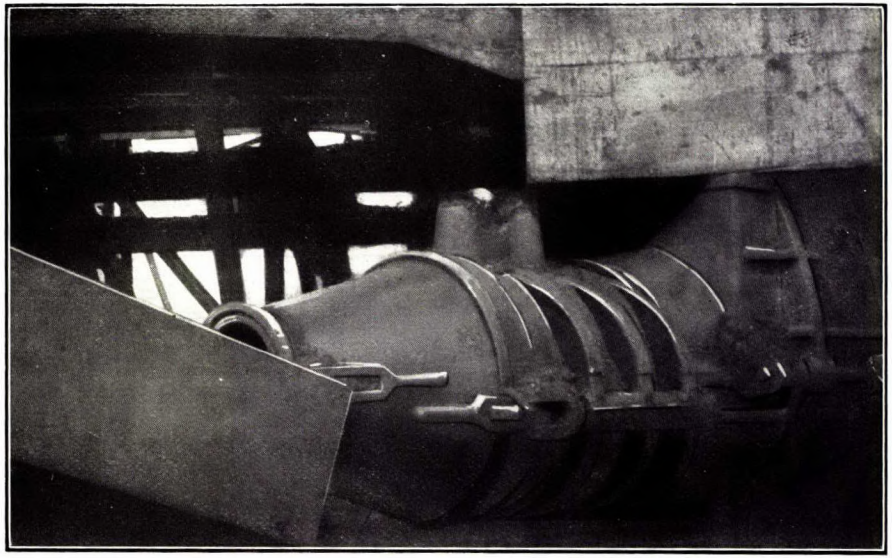
The shed illustrated in Fig. 6 is a considerable improvement on the sheds originally erected by the Government on the peat bog at Alfred. It is supplied with a platform on which double track narrow gauge rails are placed, and which lead into the upper story of the shed. This upper story has a similarly arranged double track.

The cars loaded with dry peat are hoisted up by a winch, and the peat is dumped into the shed on the outer side of each of the tracks or into the inner side of the track where an open car is supposed to run.

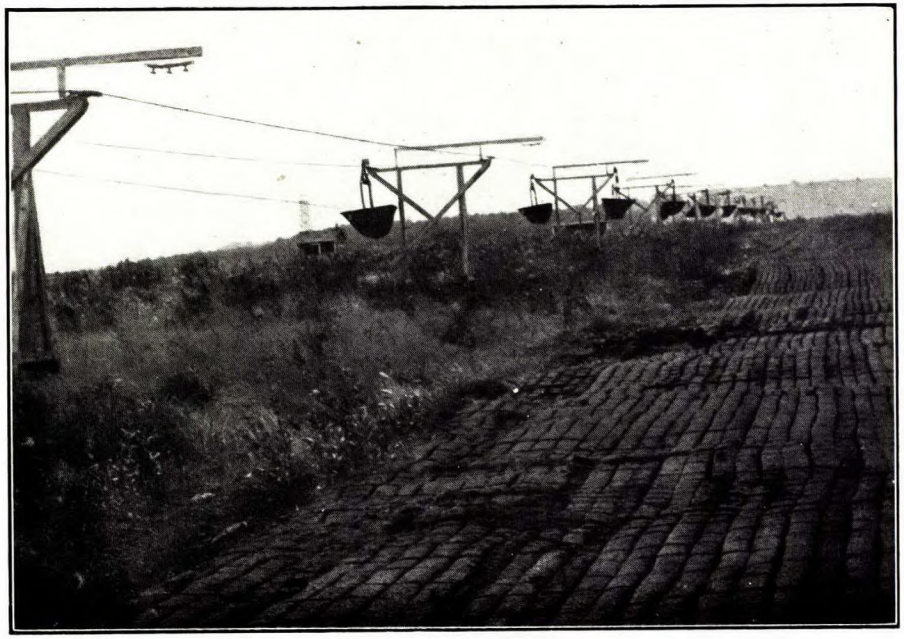
This shed is intended to be built at the end of the side track, so that a train can be run in.



Anrep excavator combined with Moore's cable device, Alfred, Ont.



Anrep peat pulper, Alfred, Ont.



Moore's aerocable device.

GENERAL STATISTICS OF PEAT MANUFACTURE.

The following tables give information regarding the amount of peat manufactured in Canada, Russia, Holland, Denmark, and Sweden, during 1912:—

CANADA.

According to the information received from the manufacturers in the Provinces of Ontario and Quebec, the following quantities of peat were manufactured during 1912:—

Ontario 700 tons of peat fuel,

Quebec 2000 tons of air-dried peat fuel, with 25 per cent moisture.

RUSSIA.

Information received from the Imperial Russian Ministry of Agriculture, Reclamation Department, St. Petersburg.

The area of the peat bogs in Russia is estimated to be about 100,000,000 acres, containing, 1,000,000,000,000 cubic yards of peat, from which it is calculated 81,600,000,000 metric tons of peat fuel may be manufactured. The average depth of the bogs is supposed to be 7 feet and over.

For the last few years, the yearly output of peat containing 25 per cent moisture, has been 2,500,000 tons; which is used in factories for industrial purposes; as for instance, in the furnaces of the Brianst foundry works; in the smelting furnaces of the glassworks of S. Ritig and Co., Luga district; in the Province of St. Petersburg, for brick manufacture, and for various other purposes.

Further detailed statistical information is expected in the year 1914.

(Note by A. A.) In 1902 there was manufactured in Russia, over 4,000,000 tons of peat fuel. Since that year the decrease in production is attributed to the low price of crude oil. But inasmuch as the price of crude oil has increased again, it is expected that a greatly increased amount of peat fuel will be manufactured.

No statistical information could be obtained from Germany, Austria, or Hungary.

TABLE III.

HOLLAND.

Table of Peat manufactured in Holland during 1910.

County	Names of places	Millions of peat blocks	Total in millions	[1]Gulden.
Drenthe	Bargerwesterveen	111		
"	Bargeroosterveen	121		
"	Emmercompascum	119		
"	Weerdingermond	182		
"	Valthermond	110·5		
"	2e Exloermond	77		
"	Molenwijk	6		
"	Ees Westdorp	27		
"	Nieuw-Drouwen	0·5		
"	Nieuw-Buinen	5		
In the remaining part	of the County of Drenthe	193		
	Total		952	2,540,000
Groningen		27		70,000
Friesland	GrooteVeenpolder in Weststellingwerf	16		
	Echterveenpolder	7		
	Groote Veenpolder in Opsterland en Smallingerland	42		
	Trijegaster Veenpolder	10·5		
In the remaining part	of the County of Friesland	131		
	Total		233·5	610,000
Overijssel	Ambt-Hardenberg	50·5		
	Vriezeveen	77		
	Zwartsluis, Amdt-Vollenhove, Hasselt, Dedemsvaart, Ambt-Ommen, Gramsbergen	116		
In the remainder part	of the County Overijssel	5		
			248·5	690,000
Utrecht			104	175,000
North of Holland			98	370,000
South of Holland			6	18,000
Gelderland			1	3,000
North-Brabant and Limburg			180	570,000
	Total		1823	5,046,000

[1] 1 Gulden = 40·2 cents.

TABLE IV.

Total amount of Machine Peat manufactured in Denmark during 1911.

Names of Peat Plants.	Machine Peat. No.	D = Steam. EM = Electric motor. EP = Gasoline. H = Horse pwr. Figures indicate HP.	Numbers of labourers.	Number of engineers and drivers	Number of horses.	The drying field. F = Hard ground. M = Boggy ground.	Working Time. From date to date.	Working hours per day.	The Manufactured Product. Daily capacity. Thousands. Average.	Maximum	Yearly. Per 1,000	Tons.	Tons during 1910.	Test cut by hand. Per 1,000.
A. Machine Peat Manufactured without Additional Water.														
Holmegaard glass works I.	1	D 8	15	2	1	M	22/4–14/8	10	64	76	5,000	2,500	2,500	10,400
Holmegaard " " II.	2	D 10	16	2	1	M	24/4–26/7	10	64	76	5,000	2,500	2,500	.....
		18	31	4	2						10,000	5,000	5,000	10,400
B. Machine Peat Manufactured with Additional Water. 1.—*Stationary Plants.*														
Bak, N., peat plant, Sparkaer.	3	D 5	4	2	2	F	5/5–28/7	10	30	35	1,600	800	850	.....
Bjerregaard N., peat plant, Vinderup.	4	D 10	10	4	4	F	22/4– 5/8	10½	50	70	3,800	1,710	1,755	.....
Björnekaer peat plant, Vinderup.	5	D 8	10	4	4	F	22/4– 5/8	10½	55	80	4,300	1,935	1,600	.....
Brunmose peat plant, Ebeltoft.	6	D 8	9	3	3	F and M	14/5–12/8	10	25	35	2,000	1,000	985	.....
Breandstrup peat plant, Rödkaersbro.	7	D 7	6	3	2	F	12/5– 1/8	10	35	52	2,000	700	900	.....
Elling peat plant, Moselund.	8	D 12	11	1	3	F	26/4– 1/8	11	26	39	2,000	600	.....	.....
Engesvang large plant, Moselund.	9	D 25	20	4	4	F	8/4–12/8	11	130	170	12,000	6,000	4,950	.....
Engesvang small plant, Moselund.	10	D 10	10	2	3	F	1/5–22/7	11	75	90	4,500	2,250	2,250	.....
Einderup peat plant, Viborg	11	P 4	This plant has not been in operation during the year 1911.								.....	.....	.....	100
Cammelgaard peat plant, Mejrup, Holstebro	12	D 6	6	3	2	M	In operation only part of season 1911				.....	150	1,000	.....
Canderupgaard peat plant, Doense.	13	P 10	7	.....	.....	F	6/5–25/7	10	50	55	2,700	880	2,000	.....
Catten peat plant, Hornum.	14	D 5	6	4	3	F	12/5–28/7	11	33	40	about 2,000	about 800	about 1,000	.....
Grauballegaard peat plant, Silkeborg.	15	D 8	10	4	3	F	1/5–23/7	11	50	50	2,500	1,000	1,125	.....
Hvam, Ndr., peat plant, Kellerup.	16	P 4	4	1	2	F	13/5–?	10	20	26	600	250	.....	.....
Hörby peat plant, Hobro.	17	P 10	6	1	1	F	1/6–?	10	30	45	2,000	about 800	about 1,125	.....
Kalbygaard peat plant, Laasby.	18	D 7	11	3	3	M	27/5–29/7	10½	50	.....	2,000	1,000	1,250	.....
Karup peat plant, Karup.	19	D 6	4	2	1	F	20/4–15/8	11	30	30	about 2,000	650	1,500	.....
Klosterlund peat plant, Moselund.	20	D 10	10	2	3	F	22/4–22/7	11	60	80	4,000	2,000	2,250	.....
Klosterlundsgaard peat plant, Moselund.	21	P 7	4	1	1	M	1/7–?	11	20	30	900	450	.....	900
Kaergaards peat plant, Sparkaer.	22	D 12	10	5	4	F and M	2/5–28/7	10	70	85	4,000	1,500	1,590	.....
Little Löjtvedgaar peat plant, Svebölle.	23	D 3	7	3	2 and 3	F	16/5–10/6	10½	20	25	275	165	.....	.....
Lundergaard peat plant, Aabybro.	24	P 20	15	7	7	F	20/5– 5/8	11	65	95	4,300	1,875	1,875	1,500
Molmbaks peat plant, Moselund.	.....	.....	.....	.....	Not working.		.....	.....	.....	.....	.....	.....	.....	.....
Mosebjerg " " Tolne.	25	D 8	10	3	2	F	26/5–25/7	11	50	65	2,055	720	800	.....
Mosegaard " " Sparkaer.	26	D 10	7	2	2	M	.....	10	.....	.....	2,000	800	203	.....
Moselund " " A. Moselund.	27	D 8	8	4	5	F	18/4–29/7	11	60	65	4,000	1,900	2,000	.....
Moselund " " B. "	28	D 35	8	1	1	M	28/4– 7/7	11	.....	71	2,500	937	960	4,000
Moselund " " C. "	29		12	3	2	F	18/4– 7/7	11	80	102	5,000	2,000	2,520	
Moselund rented peat plant, Moselund.	30	P 8	3	.....	.....	M	1/5– 1/7	11	15	15	800	400	.....	.....
Nagbölgaard peat plant, Lunderskov.	31	D 5	9	4	3	F	8/5– 3/8	10½	50	75	3,500	875	1,125	.....
Onsild, Sdr., peat plant, Sdr., Onsild.	32	D 5	6	3	2	F	.....	10	37	48	2,250	1,000	1,100	.....
Raakilde peat plant, Stövring	33	.....	5	.....	.....	.....	18/4–15/7	10	20	25	.....	.....	.....	1,250
Rönbjerg fuel and litter plant, Vinderup.	34	D 12	10	3	3	F	18/4– 5/8	10½	60	85	5,500	2,200	about 2,500	.....
Rönbjerg fuel and the new litter plant, Vinderup.	35	D 10	9	3	3	F	18/4– 5/8	10½	50	65	4,500	1,800	2,250	.....
Rönbjerg peat plant, Rönbjerg.	36	D 15	16	4	6	F	18/4– 3/8	10½	80	120	7,500	3,000	3,750	.....
Stausö peat plant, Rönbjerg.	37	D 8	6	3	3	F	15/4– 5/8	11	35	47	2,600	1,300	920	65
Sparkaer peat plant, Sparkaer.	38	D	10	3	3	F	28/4–29/7	10	45	57	4,000	1,440	1,855	.....
Staarupgaard peat plant, Höjslev.	39	D 6	8	3 and 4	3 and 4	F and M	2/5–22/7	10	40	58	2,600	1,300	1,550	400
Stockholm peat plant, Doense.	40	P 12	6	3	3	F	5/5– 1/8	10	45	53	2,000	700	525	1,200
Söbo peat plant, Trunderup.	41	H 1	4	1	3	M	16/5–13/6	9	12	15	300	105	.....	.....
Sörensen peat plant, Rönbjerg.	42	P 8	5	3	2	F and M	26/4–12/8	10	.....	44	2,300	920	400	.....
Tandrup peat plant, Bedsted.	43	D 6	11	2	1	M	1/5–?	11	50	60	3,000	1,500	1,650	.....
Tougaard peat plant, Sparkaer.	44	D 12	9	4	3	F	.....	10½	.....	.....	4,500	1,800	1,700	.....
Trunderup peat plant, Trunderup.	45	P 6	4	3	2	F	11/5–22/7	10½	15	23	600	230	.....	.....
Tustrup peat plant, Randers.	46	D 6	6	3	2	F	.....	11	35	40	135	54	720	.....
Tvaermose northern peat plant, Vinderup.	47	D 12	14	4	4	F	18/4– 5/8	9½	50	70	4,600	1,840	1,900	.....
Tvaermose central " " "	48	D 10	9	4	4	F	20/4– 5/8	9½	50	70	4,100	1,640	1,720	.....
Vejrholt peat plant, Arden.	49	P 15	7	2	1	.....	1/5–15/7	.....	.....	.....	3,000	1,200	.....	.....
Vestergaard peat plant, Sparkaer.	50	D 8	5	3	2	F	7/5–27/7	10	40	49	2,700	1,080	1,250	300
Videbaek peat plant, Videbaek.	51	D 6	7	3	2	F	20/5– 4/8	10	33	42	1,400	560	600	.....
Okaer peat plant, Sparkaer.	.....	.....	.....	.....	Not working.		.....	.....	.....	.....	.....	.....	1,340	.....
Ostergaard peat plant, Sparkaer.	.....	.....	.....	.....	" "		.....	.....	.....	.....	.....	.....	490	.....
Total	.....	429	394	135	124	.....	.....	.....	.....	.....	137,915	57,816	61,833	9,755
2.—Floating Plants.														
Aamosen peat plant I, Vedde.	52	D 4	6	2	2	M	1/5–29/7	10	40	58	3,000	1,200	1,782	.....
Aamosen " " II, "	53	D 4	6	2	2	M	1/5–29/7	10	40	58	3,000	1,200	1,782	.....
Birknaes " " Ostbirk.	54	P 6	5	1	2	F	22/5–10/8	9½	37	41	1,000	500	400	.....
Bedsted " " Bedsted.	55	E 6	4	1	1	M	12/5–26/7	10	23	30	1,000	400	450	.....
Broksö " " Herlufmagle.	.....	.....	.....	.....	.....	Not in operation.					.....	.....	.....	.....
Count Langeland's peat plant, Tranekaer.	56	D 4	8	3	2	M	29/5–22/7	10	35	53	2,000	1,000	1,600	.....
Holmegaard glasswork peat plant, Olstrup.	57	D 6	6	2	1	M	25/4–10/8	10	32	49	2,700	1,350	.....	.....
Jörgensen E., peat plant, Ejby.	58	P 2	3	.....	.....	M	8/5–25/7	10	12	16	700	300	268	.....
Kvodsted " " Lögstrup.	59	P 2	3	1	1	F	.....	.....	.....	.....	800	320	200	.....
Mosegaard peat plant, Resen, Struer.	60	D 6	5	2	2	M	4/5– 4/8	11	35	45	2,300	920	1,050	.....
Rosenholm " " Hornslet.	61	P 8	6	3	4	F	24/4–20/7	10	54	60	3,000	1,500	1,132	.....
Solvang peat plant, Thorsager.	62	.....	.....	Information not available.							.....	.....	.....	.....
Tangsgaard peat plant, Humlum.	63	D 5	5	2	2	F and M	1/5– 3/8	9¾	35	51	2,200	880	950	.....
Total	.....	53	57	19	19	.....	.....	.....	.....	.....	21,700	9,570	10,114	.....
b.—Peat Plants Driven by Motor and Horse Power.														
Alling Skovgaard peat plant, Silkeborg.	64	H 3	9	.....	3	M	21/4–18/7	.....	27	34	about 1,000	500	.....	.....
Baagegaard peat plant, Tommerup.	65	.....	3	1	1	M	1/7– 8/8	10	5	7	150	56	.....	.....
Bögildgaard peat plant, Kellerup.	66	H 1	2 men 7 boys	.....	1	M	15/5–15/6	9	10	10	200	100	52	50
Jensen Th., peat plant, Linderupgaard, Sindal.	67	P 6	4	3	3	M	18/5– 8/7	11	50	60	140	700	650	.....
Lyng peat plant, Troldhede.	68	H 2	6	.....	2	M	0/5–20/7	10½	30	38	1,500	550	850	100
Malles N., peat plant, Sperring, Todböl.	69	H 1	.....	.....	.....	M	.....	.....	.....	.....	.....	.....	.....	.....
Nielsen L., peat plant, Pindstrup.	70	.....	9	1	1	M	15/5–20/7	8½	30	34	500	200	.....	.....
Pindstrup " " "	71	H 10 P 5	35	1	11	M	1/5–29/7	10	130	155	8,000	4,000	2,800	250
Spjarupgaard peat plant, Egtved.	72	.....	.....	.....	Not in operation during the season 1911.						.....	.....	266	550
Stubbergaard peat plant, Sevel, Vinderup.	73	.....	.....	.....	" " " " " "						.....	.....	.....	.....
Söndergaard peat plant, Rönbjerg.	74	P 4	3	1	1	F and M	1/5– 2/8	10	20	29	1,500	750	300	.....
Viksö peat plant, Viksö.	.....	.....	.....	.....	Information not available.		.....	.....	.....	.....	.....	.....	.....	.....
Ydes Th., peat plant, Gjersböl, Snedsted.	75	B 2	9	.....	.....	M	1/6–14/7	9½	In operation only part of season 1911.					
Total	.....	34	83	7	23	.....	.....	.....	.....	.....	14,250	6,856	4,918	950
Grand total	.....	534	565	165	168	.....	.....	.....	.....	.....	183,865	79,242	81,865	21,105

This table was given by J. Rasmussen, peat engineer, to the Danish Peat Society Journal, "Hedeselskabets Tidskrift," March 25th, 1912.
1 metric ton = 2,240 lbs.

TABLE V.

Various Information in connexion with Peat Manufacturing in Denmark, 1911.

MACHINE PEAT.

Names of Peat Plants.	No.	Transportation. The distance from bog to the delivery places in meters.	Selling Prices. Per 1,000. Kr.	Ö.	Per Ton. Kr.	Ö.	Amount of peat left after autumn. Thousands.	The condition of the market.	Weather conditions.	Paid for turning and piling, "cubing" per 1,000. Ore.	Sold for industrial uses approx. in 1,000's.	Loss due to winter storage during 1910. Approx. Kronor.	No. of outside workmen used.
A.—Peat Manufactured without Additional Water.													
Holmegaard plant I, Olstrup	1	Appr. 1,300					The whole production consumed at the glassworks.		Good, but too dry.	10	2,000	Approx. 14% of the balance.	12
Holmegaard " II, "	2	" 2,000							Too dry, crumbled.				
B.—Peat Manufactured with Additional Water.													
Bak N., Sparkaer	3	1,900	4	50	9	00	.....	Normal	Good	22	.....	.....	.....
Bjerregaard N., Vinderup	4	3,800	4	50	10	00	.....	Good	"	24	400	.....	.....
Björnekaer, Vinderup	5	3,800	4	50	10	00	.....	"	"	24	.....	.....	.....
Brunmose, Ebeltoft	6	1,900	3	75*	7	50	350	Normal	"	25	.....	.....	5
Braenstrup, Rödkaersbro	7	1,900	4	00	11	40	.....	Very good	"	20	500	200	.....
Elling Mosegaard, Moselund	8	2,800	4	00	13	30	1,100	Fairly good	"	8	300	300	.....
Engesvang large plant, Moselund	9	1,250	4	37	8	74	.....	Good	"	25	.....	.....	.....
Engesvang small " "	10	1,600	4	25	8	50	.....	"	"	25	.....	.....	.....
Finderup, Viborg	11	8,800	4	.....	.....	Plant has not been in operation during the season 1911.							
Gammelgaard, Holstebro	12	.....	4	00*	8	00	Plant in operation only part of the season 1911.						
Gandrupgaard, Doense	13	3,800	3	50*	10	80*	1,100	Poor	Good	14	.....	500	.....
			4	00	12	30							
Gatten, Hornum	14	1,900	3	65	9	10	120	Good	"	23	.....	.....	.....
Grauballegaard, Silkeborg	15	.....	4	00*	10	00	.....	"	Very good	25	200	.....	.....
Hvam Ndr., Kellerup	16	3,800	4	00*	10	00	.....	"	Good	30	40	.....	.....
Hörby, Hobro	17	3,800	3	50	8	10	300	"	"	15	.....	500	.....
Kalbygaard, Laasby	18	6,000	4	75*	9	50	700	Very good	"	25	.....	.....	.....
Karup, Karup	19	2,500	4	50	13	85	150	Good	"	25	400	.....	.....
Klosterlund, Moselund	20	2,500	4	25	8	50	500	"	"	25	.....	.....	.....
Klosterlundgaard, Moselund	21	1,900	3	75*	7	50	.....	"	Very good	10	.....	.....	.....
			4	25	8	50							
Kaergaard, Sparkaer	22	about 1,000	4	25	11	30	.....	.....	.....	22	.....	400	.....
Little Löjtvedgaard, Svebölle	23	1,900	5	00*	8	30	.....	Fairly good	Good	25	.....	.....	.....
Lundergaard, Aabybro	24	7,500	4	25	11	30	.....	Good	"	33	300	.....	5
Mosbjerg, Tolne	25	7,500	3	50*	10	00	150	"	Fairly good	18	300	.....	6
Mosegaard, Sparkaer	26	.....	4	25	10	60	.....	"	Good	.....	.....	.....	.....
Moselund plant A, Moselund	27	450	4	25	9	00							
Moselund " B, "	28	750	4	00	10	65				16	.....	.....	.....
Moselund " C, "	29	1,550	4	00	10	00	500	Very good	Specially good	23	.....	.....	.....
Moselund rented plant, Moselund	30	1,250	4	25	8	50				23	.....	.....	.....
Nagbölgaard, Lunderskov	31	1,900	4	00	16	00	500	Good	Good	25	200	.....	2
Onsild Sdr., Onsild	32	1,900	4	35	9	00	400	"	"	25	.....	.....	.....
Raakilde, Stövring	33	2,800	3	00	12	00	.....	"	"	25	.....	.....	.....
Rönbjerg, Hoide Mose, Vinder	34	950	4	75	11	90	200	Fairly good	"	21	.....	1,000	.....
Rönbjerg new plant, Vinder	35	1,900	4	75	11	90	400	"	"	21	.....	1,000	.....
Rönbjerg peat factory, Rönbjerg	36	1,900	.....	.....	.....	.....	3,000	Not very good	"	21	.....	3,000	.....
Stausö, Rönbjerg	37	2,800	4	00*	8	00	2,600	Good	"	23	.....	.....	.....
Sparkaer, Sparkaer	38	600	4	15	11	50	.....	"	"	22	200	.....	.....
Staarupgaard, Hojslev	39	3,000	4	25*	8	50	.....	"	"	25	15	.....	1
Stockholm, Doense	40	1,900	3	25*	9	30	250	"	"	18	.....	.....	.....
Söbo, Trunderup	41	400	6	00*	17	10	30	"	"	25	.....	.....	.....
Sörensen, Rönbjerg	42	2,500	3	35	8	40	.....	"	"	22	.....	.....	.....
Tandrup, Bedsted	43	1,000	5	00*	10	00	.....	Very good	"	30	.....	.....	.....
Tougaard, Sparkaer	44	.....	4	25	10	60	.....	Good	"	.....	.....	.....	.....
Trunderup, Trunderup	45	1,900	5	00*	13	00	.....	Specially good	.....	.....	.....	.....	.....
Tustrup, Randers	46	5,800	.....	.....	In 1911 manufactured peat only for own use.								
Tvaermose northern, Vinderup	47	5,600	4	10*	10	20	.....	Good	"	24	50	.....	.....
Tvaermose central, "	48	5,600	4	10*	10	20	.....	"	"	24	100	.....	.....
Vejrholt, Arden	49	.....	4	00	10	00	.....	"	"	25	.....	.....	.....
Vestergaard, Sparkaer	50	1,250	4	50	11	20	.....	"	"	22	300	.....	.....
Videbaek, Videbaek	51	18,800	3	60*	9	00	.....	Fairly good	Exceptionally good	.....	500	.....	.....
A.—Floating Plants.													
Aamosen 2 plants, Vedde	52	3,800	3	75*	9	40	.....	Good	Good	21	.....	.....	.....
"	53		4	50	11	25							
Birknaes, Olsbirk	54	5,000	4	50*	9	00	.....	Specially good	"	35	.....	.....	.....
Bedsted, Bedsted	55	8,000	5	00*	12	50	.....	Good	"	30	.....	.....	.....
Count Langeland's, Tranekaer	56	.....	7	00*	14	00	.....	Normal	"	25	.....	.....	.....
									"	12	.....	.....	.....
Holmgaard, Olstrup	57	1,200	.....	.....	.....	.....	The private output consumed at the glass works				2,700	.....	.....
Jörgensen, E., Ejby	58	1,900	5	00*	11	00	.....	Good	.....	.....	.....	.....	.....
Kvodsted, Lögstrup	59	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mosegaard, Resen, Struer	60	1,900	4	25*	10	60	500	Good	.....	25	.....	.....	.....
Rosenholm, Hornslet	61	2,800	4	00*	8	00	.....	"	Good	25	.....	.....	.....
Solvang, Thorsager	62	.....	.....	.....	.....	.....	No information available.						
Tangsgaard, Humlum	63	.....	4	25	10	60	350	Good	"	25	.....	.....	.....
B.—Peat Plants driven by Motor and Horse Power.													
Alling Skovgaard, Silkeborg	64	11,300	4	00*	8	00	.....	Specially good	Good	32	150	200	.....
Baahegaard Mose, Tommerup	65	300	5	00	13	30	.....	Good	"	25	.....	.....	.....
Bögildgaard " Kellerup	66	.....	.....	.....	.....	.....	The whole amount used at the place.		Good.	.....	.....	.....	.....
Jensen, Th., Linderumgaard, M. Sindal	67	.....	.....	.....	.....	Works	by contract on several bogs.		Good.	.....	.....	.....	.....
Lyng Mose, Troldhede	68	.....	.....	.....	.....	Peat manufactured only for their own use.							
Malle N. Sperring, Todböl	69	1,900	3	50	8	75	.....	Good	Good	27½	.....	.....	.....
Nielsen, L., Pindstrup	70	1,250	4	50	12	80	200	"	"	25	.....	.....	.....
Pindstrup, Pindstrup	71	1,600	4	50	9	00	1,500	Normal	Good	27½	500	600	.....
Spjarupgaard, Egtved	72	.....	.....	.....	.....	Plant not in operation during the season 1911.							
Stubbergrd H., Sevel, Vinderup	73	.....	.....	.....	.....	" "	" "	"	"	.....	.....	.....	.....
Söndergaard, H., Rönbjerg	74	3,800	3	75*	7	50	200	Good	Good	25	.....	.....	.....
			4	50	9	00							
Vdes, Th., Gjersböl, Snedsted	75	1,900	4	00*	.....	.....	.....	"	"	14	.....	.....	.....
Total	.....	.....	.....	.....	.....	.....	15,100	.....	.....	.....	27,155	.....	31

* Prices marked indicate that peat is sold directly from the bog.
1 Krona = 27c. 1 Krona = 100 öre.
This table was given by J. Rasmussen, peat engineer, to the Danish Peat Society Journal, "Hedeselskabets Tidskrift," March 25th. 1912.

TABLE VI.

Tramp Peat and Peat cut by hand, in Denmark, 1911.*

NAME OF PEAT BOGS.	No.	Manufactured peat per 1000
Arden and surrounding peat bogs	1	15,000
Attrup peat bog	2	1,000
Auning peat bog	3	1,000
Birkemose, Videbaelk	4	100
Broksö peat bog, Herlufmagle	5	1,200
Filsö peat bog, Vindum, Viborg	6	250
Various small bogs in Hvetbo county	7	1,500
Galtmose with the adjoining bog Nörre Omme	8	4,400
Hörreby Lyng, Nyköbing, Falster	9	230
Hölmgaard peat bog, Skals St	10	650
Hummelmose, Hjerm	11	2,000
Högholm und Björnholm peat bogs, Trustrup	12	2,000
Höjslev peat bogs, Höjslev	13	5,000
Kirkebaek peat bog, near Viborg,	14	1,000
Kirsebaer peat bog in Vorgod and Snejbjerg township, Herning	15	10,000
Knudmose near Herning	16	5,000
Kurreborg-Baekdal	17	500
Karup peat bog	18	1,500
Landmaalergaard with adjoining peat bog, Glamsbjerg	19	300
Lammehavegaard with adjoining peat bog Ringe	20	200
Lille Lojtvedgaard peat bog, Svebölle	21	440
Peat bogs around Åbild Aa North from Videbaek	22	2,500
" " " Ebeltoff and Skaersö	23	1,000
" " " Moselund and Bording	24	5,000
" " in Nörreaadalen	25	5,000
" " between Rind, Vindum and Vandet	26	7,000
" " in Skalsaadalen	27	5,000
" " in Skjern Aas Kildeopland	28	20,000
" " around Tjele river	29	1,000
" " in Vaarde-Grindsted Aas Kildeapland	30	48,000
" " Versenbjerg Township, Bred St	31	5,000
" " around Rosenholm Aa—	32	2,000
Munklinde peat bog between Ilskov and Bording	33	2,000
Peat bogs between Langholt and Vodskov	34	500
Paarup peat bog, south from Engesvang	35	1,000
Ryomgaard peat bog	36	1,000
Ronbjerg peat bog	37	5,000
Skaaphus peat bog, near Ilskov	38	500
Skern, Ilsö and Hjorthede small bogs	39	250
Skindbjerg and other bogs around Viberso Raek, near Grenaa	40	14,000
Sparkaer peat bogs	41	1,600
Sperring peat bog, Sjörring St	42	3,000
Stockholm peat bog, Doense	43	200
Todbjerg and Pannerup peat bog, Lystrup St	44	1,500
Tödböl, Hindborg-og Gjaersböl peat bogs, Thy	45	20,000
PEAT BOGS IN THE COUNTY OF KAER.		
Peat bogs between BrandsKov and the large Vildnose	46	12,000
Peat bogs around Brunsholt and Eget	47	700
Peat bogs between Gjettrup-Ornholt-Staa	48	6,000
Peat bogs around Lindholm Aa from Örum bog to the railway	49	700
Peat bogs around Sindholt, Aeslholt and Vesterbakke	50	1,000
Peat bogs between Vodskov and Vestbjerg	51	800
Örum and adjoining small bogs	52	2,000
Total		218,520

*Peat which is trampled by horses or men with the help of water.
This table was read by J. Rasmussen, peat engineer, before the Danish Peat Society Journal, "Hedeseldkabets Tidskrift," March 25, 1912.

The Manufacture of Peat in Denmark, 1912.

Extract from the Danish Peat Society Journal—"Hedeselskabets Tidskrift," December 25, 1912, by J. Rasmussen, Esq., Peat Engineer.

The following tables, VIII and IX, have been compiled from information received from different peat manufacturers, to show the amount of peat and peat litter manufactured and sold during the season of 1912. In addition to the statistical information is also included a Summary which will show more clearly and completely the condition of affairs than the tables given in previous years.

The Summary table dealing with peat, which is cut by hand and trampled by horses and men for domestic use, is omitted because it is impossible to obtain reliable information from a very large number of bogs, where peat is manufactured in this manner.

The total amount of peat manufactured during the season of 1912 is as follows:—

At 90 peat plants approximately 215,000,000 peat bricks or approximately 95,000 metric[1] tons of air dried peat fuel, with an average weight of 400 grammes per peat brick.

In 1911 the production was 205,000,000 peat bricks to approximately 88,000 tons or 7,000,000 peat bricks less than 1912.

Prices of peat loaded on railway cars at the nearest station to the plant averaged 4½ kronor per 1000 peat bricks. This shows that the prices have not risen since last year, in spite of the increase in the price of coal.

The manufacture of peat litter is approximately 11,000 bales, which shows a decrease of 2,000 bales compared to the table of 1911.

TABLE VII.

Total Amount of Peat Litter manufactured in Denmark during 1911[2]

FACTORIES	Not disintegrated peat litter	Disintegrated and pressed peat litter			
		No. of bales	Weight per bale, Kilg.	Price per bale, Kr.[3]	Ore
1. A/S Lundergaard peat bog, Aabybro	500 cubic feet	about 1000	about 50	1	00
2. Pindstrup peat litter plant	.....	" 7500	" 100	1	90
3. A/S Pontoppidans peat litter plant, Herning	700,000 pieces	" 4500	" 110	2	20
Total	.....	" 13,000			

We therefore, suppose that on the average, one hectolitre is equal to forty kilograms. The weight of the peat bricks also varied considerably and for this reason each brick was presumed to have an average weight of 0·5 kilograms.

The following table (No. X) shows that in the district of Kristianstads, 14,150 tons of peat fuel were manufactured. In certain other years 2,600 tons more than this were manufactured.

In the district of Malmohus, 11,466 tons were manufactured. Certain other years this amount was increased by 2,500 tons. The total amount being from 25,616 tons to 30,716 tons with an average price of 10 kronor per ton, which represents a value of from 250 to 300 thousand kronor.

[1] 1 metric ton = 2,240 lbs.

[2] This table was read by J. Rasmussen, peat engineer, before the Danish Peat Society Journal "Hedeselskabets Tidskrift," March 25, 1912.

[3] 1 Krona = 27c. 100 öre = 1 Krona.

The plants which did not give information are:—

In the Kristianstads District.

Getinge Bog—Three machines.
Hyllstofta Bog—One machine.
Brandsberga Bog—One machine.
Glimakra Bog— } Operations discontinued.
Bjorkeberger Bog—Sösdala }

Malmohus District.

Maglasäbe Bog, Hör—One machine.
Bjräsjölagard —Two machines.
Silfåkra Bog —One machine.
St. Rostätt Bog —Two machines.
Peat manufactured for the Skabersjö gas plant.
Trolleholms Estate at Boarp-Stabbarps Bog—One machine.

In these districts, at certain places, peat is cut by hand on a small scale for private consumption. At such places the capacity does not exceed 100 tons.

Manufacture of Peat Litter.

The first peat litter plant was erected in Sweden at Ronneholms Bog in 1887 by S. Coyet.

Most of the plants have been erected in the present century. In Skåus most of them are co-operative societies, which in the last 7 or 8 years have reached a remarkable development.

In the District of Kristianstads it will be seen from the following table (No. XI) that 16 peat litter plants are in operation, with 34 presses and a yearly output of 766,300—811,300 bales. In the District of Malmohus are 4 peat litter plants with a yearly output of 265,000 bales and giving a total yearly turnover of 1,000,000 kr.

In Kristianstads District there are 5 peat litter plants with one press each, from which no record of their yearly output has been obtained.

TABLE IX.

Manufacture of peat litter in Denmark during 1912.*

Names of peat plants	Number of bales	Weight per bale Kg.	Price per bale Kr.	Price per bale Ore.
1. A/S Lundergaard peat bog, Aabybro....	None manufactured.			
2. Pindstrup peat litter plant, Pindstrup...	8,000	90	1	70
3. A/S Pontoppidan peat litter plant, Herning	3,000	100	1	90
Total	11,000			

*This table was read by J. Rasmussen, Esq., peat engineer. before the Danish Peat Society Journal, "Hedeselskabets' Tidskrift," December 25, 1912.

TABLE VIII.

Table of Peat manufactured and sold in Denmark during 1912.

Number	Names and Addresses of Peat Plants.	F = Stationary plants. T = Moveable plants. FL = Floating plants.	D = Steam. E = Electric motor. P = Gasoline. H = Horses.	Number of labourers.	Number of horses.	The Drying Field. FB = Hard ground. MB = Boggy ground.	Production. The date work started.	The date work finished.	Per day. In 1,000.	For the year. In 1,000.	Tons.	Weight of peat per brick. Grams.	Selling Prices of Peat per 1,000. Half year during the summer. On the bog. Kr.	0	In railway cars at the bog. Kr.	0	Half year during the winter. On the bog. Kr.	0	In railway cars at the bog. Kr.	0	Amount of peat left after 1st Sept., 1912. In 1,000.	Delivered for industrial use.	Peat manufactured by hand.
1	Allingskovgaard peat plant, Silkeb	3 T	3 H	9	3	MB	20/4	1/8	25	1,300	520	400 (5)	4	25	....	....	5	00	....	....	400	400	.....
2	Auning bog, Auning (1)	T	H	.....	.....	.....	.....	.....	.....	about 3,500	1,400	400 (5)	about 4	00	....	....	....	....	....	....	.....	.....	.....
3	Baks peat plant, Sparkaer	1 F	D5 HP	6	2	FB	27/4	4/8	25	1,800	900	500	4	00	4	50	4	00	4	50	100	.....	.....
4	Bedsted peat & electric plant, Bedsted	1 FL	E6 HP	5	1	MB	27/5	25/7	25	600	300	500	5	00	....	....	....	....	....	....	200	.....	.....
5	Birknaes peat plant, Ostbirk	1 FL	P6 HP	6	1	FB	9/5	31/7	41	800	400	500	4	75	5	00	....	....	....	....	.....	100	.....
6	Brandstreep peat plant, Rödkaersbro	1 F	P9 HP	9	2	FB	15/5	3/8	35	1,700	510	300	3	50	4	00	....	....	....	....	200	3	.....
7	Broksö peat bogs, Herlufsnagle (2)	.....	.....	4	1	MB	1/5	31/7	14·6	1,100	440	400 (5)	4	00	....	....	5	00	....	....	500	.....	1,400
8	Brunmose peat plant, Ebeltoft	2 T	IH.P8.HP	10	2	FB and MB	11/5 10/6	16/8 22/6	10 30	1,700	850	500	3	75	4	50	5	00	5	50	600	.....	160
9	Bögildgaard bog, Kellerup	1 T	1 H	about 6	1	MB	17/6	19/7	12·5	220	112	500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
10	Baagegaard peat plant, Tommerup	1 T	E5 HP	3–4	1–2	MB	15/5	20/7	16	450	100	250	5	00	5	00	5	00	5	00	200	.....	.....
11	Elling peat plant, Moselund	1 F	D10 HP	12	3	FB	3/5	14/8	37	2,500	750	300	3	50	4	00	4	00	4	35	200	500	.....
12	Engesvang peat plant, Moselund	3 F	D45 HP	45	11	FB	9/4	14/9	260	23,300	11,650	500	.....	.....	4	50	.....	.....	.....	.....	5,000	.....	.....
13	Ganderupgaard peat plant, Doense	1 F	P9 HP	14	6	FB	1/5	6/8	45	3,000	975	325	3	75	4	25	4	00	4	50	1,200	.....	.....
14	Gatten peat plant, Gatten	1 F	D5 HP	7	3	FB	21/5	1/8	36	1,000	260	260	4	00	4	70	5	00	5	70	200	.....	.....
15	Grauballegaard peat plant, Silkeb	1 F	D7 HP	14	3	FB	1/5	15/8	40	3,300	1,320	400 (5)	4	25	....	....	5	00	....	....	1,000	200	.....
16	Count Langel's peat administration	1 FL	D4 HP	11	2	MB	15/5	15/8	30	2,000	750	375	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
17	Heinstrup peat plant, Olstykke	2 T	2 H	3	2	FB	20/5	3/8	10	500	200	400 (5)	3	70	....	....	....	....	....	....	.....	.....	.....
18	Holmegaard glass works, Olstrup	1FL 2T	D24 HP	42	3	MB	22/4	3/8	174	12,000	6,000	500	.....	.....	.....	.....	.....	.....	.....	.....	.....	23,000	11,000
19	Hvam peat plant, Kellerup	1 F	P4 HP	5	2	FB	6/5	.....	25	600	225	375	4	00	5	00	.....	.....	.....	.....	.....	.....	.....
20	Hörby peat plant, Hobro	1 F	P8 HP	7	1	FB	6/5	31/7	30	1,700	425	250	3	50	4	25	4	00	4	75	350	.....	100
21	Jensen peat plant, Sindal (3)	1 T	P6 HP	7	3	MB	7/5	21/6	50	1,400	700	500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
22	Kolbygaard peat plant, Laashy	1 F	D7 HP	14	3	MB	3/5	4/8	40	2,400	1,440	600	4	75	....	....	6	00	....	....	1,000	.....	.....
23	Klosterlundgaard peat plant, Moselund	1 F	D4 HP	6	1	MB	9/4	10/8	25	1,800	900	500	4	00	4	35	....	....	....	....	.....	100	.....
24	Kaergaard peat plant, Sparkaer	1 F	D12 HP	14	4	FB	26/4	6/8	70	5,000	2,500	500	4	00	4	50	....	....	....	....	1,250	.....	.....
25	Lammehave peat plant, Ringe	1 F	E4 HP	5	1	FB	3/6	30/7	10	300	225	750	5	50	....	....	....	....	....	....	.....	.....	.....
26	Lundergaard bog A/S, Aabybro	1 F	P20 HP	22	9	FB	1/5	15/8	80	5,500	2,063	375	3	50	4	75	3	50	4	75	.....	1,400	3,200
27	Little Löjtvedgaar peat plant, Svebölle	1 F	D3 HP	8–9	2–3	FB	12/6	27/7	17·5	750	450	600	5 6	00 00	....	....	....	....	....	....	115	.....	.....
28	Mosbjerg peat plant, Tolne	1 F	D8 HP	13	2	FB	.....	.....	50	2,300	805	350	3	50	4	50	....	....	....	....	.....	.....	.....
29	Malles peat plant, Sperring via Sjörring	1 T	H	10	2	MB	.....	.....	30	330	162	490	3	50	....	....	....	....	....	....	.....	.....	.....
30	Mejeribakken peat plant, Ejby	1 FL	P2 HP	2	.....	MB	15/5	30/8	5	430	183	425	5	00	....	....	5	00	....	....	130	.....	.....
31	Mosegaard peat plant, Trunderup	1 T	P6 HP	6	2	FB	22/5	10/8	15	800	300	375	5	00	....	....	....	....	....	....	.....	.....	.....
32	Mosegaard peat plant, Resen, Struer	1 FL	D6 HP	7	2	MB	20/4	4/8	30	2,130	799	375	4	25	5	25	4	25	5	25	600	.....	.....
33	Moselund peat plants, Moselund	4 F	D43,P8 HP	39	8	MB and FB	9/4	1/8	230	13,500	5,400	400	.....	.....	4	25	.....	.....	4	70	.....	1,000	4,200
34	Nagbölgaard peat plants, Lunderskov	1 F	D5 HP	13	3	FB	15/5	8/8	53	3,740	1,402	375	4	00	4	25	4	50	5	00	900	30	.....
35	Onsild peat plants, Önsild	1 F	D5 HP	9	3	FB	2/5	3/8	35	2,300	1,150	500	3	75	4	35	....	....	....	....	.....	300	.....
36	Pindstrup peat plants, Pindstrup	12 T	10H P14HP	41	12	MB	25/5	10/8	160	11,100	5,550	500	4	00	4	50	....	....	5	00	2,000	.....	200
37	Ristrup peat plants, Mundelstrup	1 T	1 H	2–3	1	MB	1/6	1/8	4·5	250	100	400 (5)	4	50	....	....	....	....	....	....	50	.....	.....
38	Rosenholm peat plants, Hornslet	1 FL	P8 HP	9	4	FB	1/5	11/8	54	3,125	1,172	375	4	00	....	....	....	....	....	....	800	.....	.....
39	Rönbjerg peat plants, Vinderup	2 F	D22 HP	25	6	FB	.....	.....	110	10,000	4,500	450	.....	.....	4	75	....	....	....	....	1,500	.....	.....
40	Rönbjerg " " Rönbjerg	1 F	D12 HP	20	6	FB	18/4	12/8	.....	7,500	3,375	450	.....	.....	4	75	....	....	....	....	.....	.....	.....
41	Raakilde " " Stövring	.....	.....	5	.....	MB	29/4	20/7	.....	.....	.....	.....	.....	.....	3	40	.....	.....	3	75	.....	.....	1,020
42	Sparkaer " " Sparkaer	1 F	D	13	3	FB and MB	24/4	3/8	60	4,480	1,680	375	4	00	4	25	....	....	....	....	1,200	100	200
43	Stokholm " " Doense	1 F	P6 HP	10	4	FB	1/5	10/8	40	2,000	900	450	3	50	3	90	....	....	....	....	400	.....	1,500
44	Large Flansmose peat plant, Bonnet	1 T	P5 HP	5	2	FB	.....	.....	15	300	180	600	5	50	....	....	....	....	....	....	.....	.....	.....
45	Stubbergaard peat plant, Vinderup	.....	.....	.....	.....	MB	3/5	22/7	5·5	.....	.....	.....	4	00	....	....	....	....	....	....	.....	.....	450
46	Söbo peat plant, Trunderup	1 T	1 H	6	3	FB	2/5	25/7	16	300	112	375	6	00	6	50	6	25	6	50	60	.....	.....
47	Söndergaard H., peat plant, Rönbjerg	1 F	D6 HP	10	3	FB	8/7	28/7	25	460	230	500	4	50	....	....	....	....	....	....	400	.....	290
48	Söndergaard K., " " "	1 T	P4 HP	4	1	FB	1/5	1/8	20	1,400	700	500	4	00	5	00	5	00	6	00	400	.....	.....
49	Sörensen, N., " " "	1 F	P8 HP	8	2	FB and MB	20/4	11/8	.....	1,900	950	500	4	00	4	50	....	....	....	....	500	.....	150
50	Tandrup peat plant, Bedsted	1 F	D6 HP	14	2	MB	5/5	1/8	50	2,300	1,150	500	5	25	....	....	....	....	....	....	.....	.....	.....
51	Tangsgaard peat plant, Humlum	1 FL	D5 HP	7	2	MB	28/4	10/8	30	1,800	810	450	4	50	....	....	....	....	....	....	.....	.....	.....
52	Thoug & Moseg peat plant, Sparkaer	2 F	D12 P6 HP	20	7	FB	1/5	16/8	100	7,000	3,150	450	.....	.....	4	25	....	....	....	....	2,000	500	.....
53	Tustrup peat plant, Randers	1 F	D6 HP	9	2	FB	3/5	5/7	30	1,000	450	450	4	75	....	....	....	....	....	....	.....	.....	.....
54	Tvaermose peat plant, Vinderup	2 F	D20 HP	28	8	FB	23/4	10/8	110	8,700	3,697	425	4	00	4	50	....	....	....	....	.....	500	.....
55	Tvaermose Northern peat plant, Vinderup	2 F	D24 HP	26	8	FB	19/4	10/8	104	9,370	4,216	450	4	10	4	75	4	50	....	....	2,000	500	.....
56	Underbj peat plant, Lomborg, Bonnet	1 F	1 H	5	2	FB	8/5	31/7	10	600	270	450	5	50	....	....	....	....	....	....	75	.....	.....
57	Vejrholt peat plant, Arden	1 F	P15 HP	10	3	FB and MB	6/5	8/8	40	2,200	880	400	4	00	4	25	....	....	....	....	1,000	.....	450
58	Vestergaard peat plant, Sparkaer	1 F	P8 HP	7	2	FB	1/5	9/8	40	3,130	1,565	500	4	00	4	50	....	....	....	....	600	75	.....
59	Vigersdalgaard peat plant, Ringsted (4)	.....	2 H	2	2	FB	10/6	15/7	5·5	120	90	750	4	50	....	....	....	....	....	....	.....	.....	.....
60	Videbaek peat plant, Videbaek	1 F	D4 HP	9	2	FB	1/5	8/8	30	1,800	720	400 (5)	3	65	....	....	4	20	....	....	500	475	.....
61	Ydes peat plant, Gjersböl, Snedsted	1 T	P3 HP	10	2	MB	1/6	31/7	18	200	100	500	4	00	5	00	....	....	....	....	150	.....	400
62	Ostergrd peat plant, Hvaeskaer Bonnet	1 F	1 H	5	2	MB	30/5	13/7	12	350	175	500	5	50	....	....	....	....	....	....	.....	.....	.....
63	Aamosen, A/S, Vidde	1 FL	D4 HP	9	2	MB	4/5	3/8	40	3,000	1,500	500	4	25	5	00	6	00	8	00	600	.....	.....
	Total	about 90.	492	614	189	.....	.....	.....	.....	190,090	84,788	.....	.....	.....	....	....	....	....	....	....	28,380	29,183	24,900

(1) Peat is manufactured with several small horse trampling plants.
(2) The trampling is done by men.
(3) The owner of this plant manufactures peat by contract on different bogs.
(4) The peat is trampled by horses in a floating plant.
(5) As no information from above factories was available it is assumed that an average weight of one peat brick is 400 grams.

1 Kr = 27c.
1 Kr = 100 Öre.

This table was given by J. Rasmussen, peat engineer, to the Danish Peat Society Journal, "Hedeselskabets Tidskrift," December 25th, 1912.

TABLE XI.

Peat Litter manufactured in the Province of Skåne, Sweden, during the year 1912.

PEAT LITTER PLANTS.

District, parish, name of the bog.	Situation.	Area, hectar.[1]	Depth. Average depth in metres.	Depth. Greatest depth in metres.	Absorption Capacity %.	Owners.	The year established.	Number of presses.	No. of bales manufactured.	Size of Bale. Metre.	Average weight per bale, kg	Cost of Manufacturing—Öre per Cu. Metre. Total per bale.	Cutting.	Turning.	Raising.	Stacking.	Brought into shed.	Tearing and pressing.		Selling price per bale.	Distance from the station. (Kilometres.)	Remarks.
KRISTIANSTADS DISTRICT.																						
Loshults parish. Hökön bog	Next to Hökön station	138	1·9	3·5	14·6	Färs and Frosta Baronies Co-operative Peat Litter Society	1907	2	50,000	1×0·5×0·75	76	96	16	2·5	3	10	9	3·8	per bale	1·40	0·2	Free at the nearest railway station.
Orkene parish. Kärraboda bog	Next to the station	200	4			North Eastern Skanes and Blekinge District Co-operative Litter Society		2	50,000													
Osby parish. Gullarps bog	West of the station	100	above 2		Absolutely dry 21·3 17·20% moisture.	Osby Peat Litter Co., Ltd	1905	2	45,000	1×0·5×0·75	70–65		15	2·5	3	9	7	12·2	per bale	1·03	2	
Häsveda parish. Store peat bog	3·5 km. N. W. of Hästveda station	250	3·5	11	18	Skanska Agricultural Co-operative Peat Litter Society	1905	4	140,000	1×0·5×0·75	70		16	3	4	9	7·2	5·2		1	3·5	
Ö. Broby parish. Glimminge peat bog	Next the station	25	1·5	2·5		Glimminge Peat Litter Plant		1														
Hemmestorps peat bog	West of Hemmestorp	20	1·3	2·5	18	Hemmestorps Peat Litter Society	1906	1	3,200	1×0·45×0·60	70		22	3	4	7		15	per bale	1·10	4	
Vittsjö parish.	2 km. S. of Vittsjö	180	2·1		17·3	Bjernums Peat Litter Co., Ltd	1905	2	45,000	1 m³	75	90	16	2·5	3·5	8	7	6·5		1	1·2	
Fagerhults parish. Björnholms bog	N. W. of Fagershult station	150	2	5		Engelholm-Fagerhults Peat Industry		2	40–80,000												2·5	Bought from baronies Asbo-Bjäre Co-operative Peat Litter Society, 1913.
Svenske bog	W. of Köphults lake	250	3	6·5	14	Sk. Agricultural Co-operative Peat Litter Society	1906	4	120,000	1×0·5×0·7	75		16	3	4	10				1	4·5	
Floss bog	Next Yxenhult	65–70	1·5		12·1 moisture. 20% moisture.	Skanish superphosphate and Sulphuric Acid Co., Halsingborg	1906	2	30,000	1×0·5×0·72	65–70		16·5	2·5	4	10	9	15		0·95–1·10	2	
N. Akarps parish. Hemmeströ bog	Immediately W. of the village	50				N. Akarps Peat Litter Society. Bjärnum		1	4,500													
Oderljunga parish. Köpinge bog	5 km. N. of Perstorps station	150	2	3		Kopinge bog Co-operative Peat Litter Society		2	110,000												5	
Vankifva parish. Myreholms bog	3 km. from Mala station	125	3	5	20% moisture.	Myreholms Peat Litter Plant, Rosander and Johansson		3	25–30,000													Peat plant next the station.
Orkelljunga parish. Lemmeshults bog	3 km. N. of the station	31	5	15		Örkelljunga Peat Litter Co., Ltd. A. V. Lindstrom, A. T. Lindstrom, N. E. Nilsson	1900	2	13,600	1×0·5×0·75	67	80	20	3	4	12	18 per bale			1	3	
Hörja parish. Angsholm bog	Near Angsholm lake	54	3·2		12·5 moisture 20%.	A. B. Tyringe Peat Litter Plant, Ltd	1905	2	30,000	1×0·5×0·75	80		16	1·5	3	9				1	2·5	
V. Torups parish. Byggets bog	0·1–1·3 km. E. of Torups Sta.	22	1·35		12–24	V. Skanes Co-operative Peat Litter Society	1904	2	60,000	1×0·7×0·5	70		16	2	3–4	9	11	10	8	0·95		Unloading per bale 2 öre.
Smedboda bog	2 km. S. of Torups station	22	2·3																			
MALMÖHUS DISTRICT.																						
Stehags parish. Rönneholms peat bog	Near Sjöholmens station	350	3·5			Horda Peat Litter Co., Ltd., Gottenburg		3	40,000												0·5	
Munkarps parish. Agerods and Rackare peat bog	3 km. N. of Sjöholmens station	175	1·5	2		Gottenburg		3	110,000												3	Below the above layers is peat fuel.
S. Rörums parish. Stads bog	4 km. N. of Satserups station	150	1·9	3·5		Färs and Frosta Baronies, Co-operative Peat Litter Society		2	50,000													
Törastorps bog	4 km. E. of Satserups station																					
Konga parish. Gillastigs bog	10 km. E. of Kageröd	53	2			Gillastigs Peat Litter Plant, Wachtmeister and Jakobsson		2	65,000												10	

This statistical information was given by E. Haglund to the Swedish Peat Society, and published in the Svenska Mosskulturföreningens Journal, May, 1913, No. 3.

[1] 1 hectar = 2·2 acres.
[2] 1 kilogram = 2·2 lbs.
[3] 100 öre = 1 krona.
1 krona = 27 cents.
1 metre = 3′ 4″ approx.
1 kilometre = approx. 3333

TABLE X.

Peat Fuel manufactured in the Province of Skåne, Sweden, during the year 1912.

PEAT FUEL PLANTS.

District, Parish, Name of Bog.	Situation.	Area, hectars.[1]	Depth. Average depth.	Depth. The greatest depth.	Ash %.	Calories.	Hectolitre weight in kilograms.[2]	The owners.	Type of peat machine.	The amount manufactured.	The manufacturing season.	Number of men.	Labour. Digging and spreading.	Expenses. Turning.	Expenses. Stacking or put in shed.	The price of peat per ton.[3] On the bog.	The price of peat per ton.[3] F.O.B. railway car.	Remarks.
KRISTIANSTADS DISTRICT.																		
Loshults parish. Fjärkulla bog	Near Hokons station	130	2·2	.....	2·45	.....	.....	Hökön's peat fuel plant, S.W. Stalprassn, Olofsström	Anrep	2,500 tons	.....	.....	.....	.....	.....	.....	.....	For own use.
Vittsjö parish. Emmaljunga bog	West of the railway station	211	2	.....	4–5·1	5,748, 5,450	.....	Emmaljunga peat fuel plant. Ernst Persson	Anrep I. and II.	3,200 tons	.....	.....	.....	.....	.....	.....	.....	.....
Fagerhults parish. Flossmyr	Next Yxenhults station	150	2·25	.....	3·12	5,390 absolutely dry. 3,680 25% moisture.	35	Yxenhults peat fuel plant, Skanska. The Swedish Superphosphate and Sulphuric Acid plant, Halsingborg.	Anrep I. and II.	2–3–4,000 tons. 3,000 av. "	2 months.	70	26 öre per cu. metre[2]. or kr. 2·25 per 1,000.	(cubing) 10 öre. 17 öre per 1,000 pieces.	15 öre per cu. metre or kr. 0·75 per ton.	.....	10–11 kr. per ton.	.....
Oderljunga parish. Köpinge bog	5 km. north of Perstorp	20	2	3	.....	.....	.....	Kopinge Bog Co-operative Peat Litter Society, Oderljunga.	Körner.	.....	.....	.....	.....	.....	.....	.....	.....	For own use.
V. Torups parish. Byggets peat bog	Next to west Torups station	16·5	3	.....	3·63–6·58	5,200 absolutely dry	35–40	W. Skanes Co-operative Society.	Ekholm-Anrep-Svedala Jakobson's field press	300–500 tons.	.....	7–8.	25 öre per cu. metre (approx.).	0·5–1 öre per running metre.	.....	45 öre hectolitre.	9–10 kr. per ton.	1 running metre = 1·25 hectolitre = 45–50 kgm. Cost of mfgr = 3 kr. per ton.[3]
Linderöds parish. Törnstorps bog	East of the Törastorps farm	.....	.....	.....	0·99	5,338 absolutely dry.	41	Middle Skanes Co-operative Society.	1 Sparkjaer	350 tons.	48 av. days.	58 men.	The total cost including interest and loaded on car is kr. 9·82 at Linderöds station	.....	.....	.....	.....	Own use.
Hulta bog	3·5 km. S. of Linderöds station	50	2·5	3·5	2·5	5,340 dry. 3,930 25% moisture.	36	Karpalunds Sugar Co., Ltd.	1 Anrep I.	2,600 " 3,600 "	25/4–31/7.	10 women and children			.....	.....	.....	Own use.
Hördja parish. Angsholms bog	S. of Angsholm lake	54	3·2	.....	2·4	4,600 dry.	37	Tyringe peat plant, limited.	Anrep II B.	1,200 tons.	2½ months.	.....	2 kr. per 1,000.	15 öre per 1,000.	11 kr. per stack of 16 tons.	10 kr.	11 kr.	.....
Vankifva parish. Vankifva peat bog	2 km. from Finja station	15	4	.....	2·3	5,435, 5,232	.....	Hässleholms Peat Plant, Ltd.	2 Akerman 1901.	50,000 hectolitres.	.....	.....	.....	.....	.....	.....	.....	.....
MALMOHUS DISTRICT.																		
Stehags parish. Ronnoholms peat bog	Next Sjoholmens station	350	3·5	.....	1·37	5,421, 5,221	.....	Hörda Peat Litter Plant, Ltd., Göteborg	Körner, 2.	1,000 tons.	.....	.....	.....	.....	.....	.....	.....	.....
Munkarps parish. Agerölds and Rackare peat bogs	3 km. N. of Sjohlmen	175	3	4	1·19	5,321, 5,238	.....	Peat Litter Factories, Ltd., Turba.	1 Akerman, 1 Korner.	2–4,000 tons.	.....	.....	.....	.....	.....	.....	.....	.....
Hammarlunda parish. Löberöds peat bog. " " " "	Next to Löberöds station. " " " "	5 20	2·75 3	 4	2·71 2·62	5,433, 5,221 4,077 25% moisture.	45	Löberöds new peat fuelplant Bros. Pehrsson. Löberöds old peat fuel plant.	1 Körner. 1 Körner.	45,000 hectolitres. 4,000 "	3 months.	14 men, 6 women; 7 men loading.	kr. 0·85 per 1,000.	15 öre per 1,000 pieces.	.....	52 öre hectolitre.	52 öre hectolitre.	Total cost kr. 0·25 per hectolitre.
Silfakra parish.								P. Johansson.	Akerman.	5,900 hectolitres.	.....	.....	.....	.....	.....	.....	.....	.....
Silfakra nygards peat bog	1 km. S. W. of the station	10 4	2 2	 3	.....	.....	.....	Karsten Fredriksson.	Körner.	13,000 "	2½ months.	7.	kr. 0·85 per 1,000.	17 öre per 1,000.	5 öre hl.	45 öre hectolitre.	50 öre hectolitre.	.....
Svalöfs parish. Bare peat bog " " "	1·5 km. W. of Axelvolds station	15 28	1·5 1·5	..... 3·5	7 2	5,000	40	Svalöfs peat plant. Axelvolds Peat Ltd.	Akerman. Körner.	15,000 " 1,000 tons.	3 months.	11 men plus women and children.	75 öre per 1,000 pieces.	15 öre per 1,000.	25 öre per 1,000.	50 öre hectolitre.	10 kr. per ton.	.....
Bosjökloster parish. Bosjöklosters peat bog	2 km. N. of the church	50	2	.....	1·8	5,291	45	Count Philip Bonde.	Anrep II.	20,000 hectolitres.	2 months.	28.	14 öre per hectolitre dry peat.	2 öre hl.	10 öre hl.	50 öre hectolitre.	60 öre hectolitre.	.....
Harlösa parish. Säljeröds peat bog	4 km. from Askeröds station	50	.....	.....	.....	.....	.....	Hjularöds estate management.	Akerman.	1 million pieces.	.....	.....	.....	.....	.....	.....	.....	.....
Vånga parish. Rögle peat bog	1-2 km. W. of the station	100	2	3	.....	.....	.....	Rögle brick plant, Ltd.	Crane plant with horse.	2–3 million pieces.	1/5–15/7.	8–10.	.....	.....	.....	65 öre hectolitre.	.....	.....
Gustafs parish. Slätteröds peat bog	At the south end of Björkesakra lake	100	3·7	5·3	4·2	5,000	45	Slätteröds Power Plant, Ltd.. K.–Junk. G. Stjernsvärd, Jordbergs.	Anrep–Svedala II field press.	1,850 tons.	3 months.	18 men, 5 boys.	1·20 per 1,000 peat. 30 öre per hour.	22 öre per 1,000.	20 öre kubikm.	.....	.....	Built 1908. Peat is used for an electrical power plant.

This statistical information was given by E. Haglund to the Swedish Peat Society, and published in the Svenska Mosskultur Föreningens Journal No. 3, May, 1913.

[1] 1 hectar = 2·2 acres.
[2] 1 hectolitre = 40 kilograms.
1 krona = 27 cents.
1 krona = 100 öre.
1 metre = 3'—4" approx.
[3] 1 kilogram = 2·2 lbs.
1 kilometre = 3,333 feet, approx.

SWEDEN.

The Manufacture of Peat in Sweden during the year 1912.

An extract from the Swedish Peat Society Journal—"Svenska Mosskulturforeningens Tidskrift," May 1913, Journal No. 3, by E. Haglund:—

MANUFACTURING OF PEAT FUEL.

In the spring of 1912, circulars were distributed to the Danish Peat Manufacturers, to obtain the correct statistical information on peat. Twenty eight circulars were sent to manufacturers of peat fuel, of which number, only eight gave detailed information. The presumption being that some of the manufacturers had difficulty in answering all the questions asked in the circular, a second circular containing a fewer number of questions was sent out to which thirteen more replied. In addition to this, one plant had ceased operations and two manufactured peat for their own use only. Therefore twenty-one answers were obtained by sending out twenty-six circulars.

The given hectolitre varied considerably up to 45 kilograms. This figure, under ordinary circumstances is too high as the quality of peat varies greatly in the different bogs.

APPENDIX I.

A PROCLAMATION GIVEN BY THE ROYAL AGRICULTURAL ADMINISTRATION AT STOCKHOLM, SWEDEN.

May 18, 1910.

The Royal Agricultural Administration have renewed their grant given—during the administration of June 15, 1906—to the Chemical Stations, for agricultural and household supplies, which are under the supervision of the Government.

The Administration have found it advisable to add to the charter the following clause in connection with the "Investigation and Analysis of peat litter, in its natural state, and the manufactured peat litter, and peat mull."

Sec. I. (a)

The peat litter samples for analysis are to be collected out of the bog in the following manner. The samples are to be taken from different parts of the bog, and in such quantities as required. These samples should be taken from each layer and kept apart. The depth from the surface of the bog from which the sample is taken should be marked.

Only such samples as are taken from the same depth may be mixed, and these only when they are of uniform texture.

The weight of the samples must not exceed 1 kilogram. 1 kilogram = 2·2 lbs.

(b)

When samples of manufactured peat litter and peat mull are to be analysed, they should be collected in the following manner. If analysis is to be taken of a large bulk, a portion should be taken from every 10th bale, of a small bulk, from every 3rd bale. Samples should be taken from the inside of the bale from three places, after either the bale is opened up, or from 25 to 30 centimeters removed from the surface of the bale.

A specially constructed sample drill may be used for sampling the bales.

After the samples are taken, they are thoroughly mixed, without delay, so that no change in the degree of dryness can occur. ¼ kilogram of the sample is put in a dry well-closed tin or glass jar which should be sent directly to the chemical laboratory.

Sec. II.

The samples for the laboratories have to undergo the following treatment:

(a) Samples of peat litter, taken directly from the bog, are broken up into the size of a walnut, and dried in a room or in a dry stove at a temperature not exceeding 60° centigrade, until the samples seem to feel thoroughly dry.

(b) The samples of manufactured peat litter or peat mull, which are not to be analysed immediately, should be stored, so as not to change the moisture content. The larger pieces of the samples are broken or cut into pieces, after which they are to be put through an iron sieve—mesh 2 centimetres. If after this treatment any fibres should remain in the sieve, they should be taken up and cut again and sieved over again.

Finally, the sieved samples are thoroughly intermixed and carefully spread out whereupon samples are taken immediately for determination of moisture content and absorption of moisture.

Sec. III.

Plan of Analyses.

(a) The analysis of the sample is done in the following manner. To determine the content of moisture, take a sample of 10 grammes, and dry it until it becomes a constant weight at a temperature of 105-110°C.

(b) The absorption quantity is determined in the following manner.

A sample of 30 grammes of peat, as described in paragraph 2, is taken and 1 litre of boiling water is poured over it, then stirred up several times until the peat sinks to the bottom of the dish. After soaking at least six hours, the water is poured off and the peat mass is turned over into a morter, then mashed with a pounder, and the water that has been already poured off is poured on again.

When stirred by the hand, no lumps should be felt, only loose fibres. The aluvial peat mass is poured into a graduated cubic shaped wire basket, with a mesh of from 0·2 to 1 millimetre and with a content of 1 litre.

The peat substance which sifts through the basket with the water is taken and poured back into the basket with the other peat and sieved through again. No notice should be taken if the solution is muddled and still contains some small particles of peat.

The basket is then inclined at an angle of 45° with one corner turned downwards and kept in this position until less than a drop of water a minute passes from the basket. The basket is then weighed.

Sec. IV.

The following rules should be followed when determining the

Results of the Investigation.

The absorption capacity of the peat litter from the bog is calculated on absolutely dry peat or on samples of 30 per cent. moisture, and on the manufactured peat litter and mull, on the content of moisture that the samples contain.

The absorption capacity of the original sample is obtained by deducting from the water-soaked sample the weight of the original previously weighed sample, and dividing the remainder by the weight of the weighed sample.

For calculating on 30 per cent moisture, the following formula is used:—

$$A_{30} = 0 \cdot 7 \times A_0 - 0 \cdot 3.$$

A_{30} represents the absorption capacity of 30 per cent moisture and A_0 absorption capacity of absolute dry sample.

Sec. V.

The determination of the moisture content must be calculated to within 2 per cent.

The determination of the absorption capacity, with an absorption up to 10 times its own weight, to within $1\frac{1}{2}$ per cent.

With a larger absorption capacity to within $2\frac{1}{2}$ per cent of the weight.

Sec. VI.

The remainder of the sample is to be enclosed in a glass jar, placed in a cool place and protected from the sun for a month's time.

Sec. VII.

The certificate of analysis is made up according to the following form:—

Analysts.

Kind of sample analysed.....
Packed in.....
Content of moisture per cent.....
Maximum absorption quality of the
absolutely dry sample.....times its weight.
Samples moisture content 30 per cent.....times its weight.

Special note should be taken of the kind of packing in which samples of manufactured peat litter or mull arrived at the laboratory, and also the content of moisture at which the determination has taken place.

Stockholm, May 18, 1910.

(*Signed*) **M. von Feilizen.**

Aug. Lyttkens. **Frederict Egerström.**

APPENDIX II.

PEAT COKE.

(Extract from "Coal Age," March 22, 1913—Page 453.)

The Peat, Coke & Oil Syndicate, of Doncaster, in Yorkshire, is developing a new invention for treating special dried black peat and converting it into a hard foundry coke, by-products being tar and tar liquor, from which can be distilled fuel and automobile oils. It is not claimed that all kinds of peat can be profitably utilized, but it is said that thousands of acres, containing millions of tons of peat, by this process can yield results satisfactory as a commercial undertaking.

The bottom or black layer of the peat is most suitable for the manufacture of coke. This is freed from an excess of moisture and subjected to a carbonizing process by which the by-products are recovered, the residue being a soft, friable coke. Although peat coke contains a lower percentage of sulphur than other fuel, a difficulty hitherto has been to produce a coke from it hard and strong to hold up in the smelting furnace. This, it is said, has now been overcome, a hard, strong, clean coke being the result. Analysis by a German chemist, based on 1000 tons of air-dried peat, show that the following results can be obtained: coke, 400 tons; tar, 40 tons; tar water, 400 tons. The tar can be further distilled, yielding 18 tons of crude oil, 2 tons of creosote oil, 2 tons of pitch, 8 tons of paraffin. The tar water will yield 4 tons sulphate of ammonia, 6 tons acetate of lime, 2 tons methylic alcohol. It is estimated there will be a profit of 90c. on every ton of prepared peat so treated.

APPENDIX III.

NOTES ON PEAT POWDER.

Translation of an article appearing in a Swedish newspaper, "Handelstidningens Veckoblad," Stockholm.

January 22, 1913.

It has been mentioned before that a trial demonstrating the use of peat powder for running a locomotive on the Stockholm-Rimbo railway has been made by the Mechanical Engineer, Mr. H. J. von Porat.

According to the information received, several private railway firms in this country have shown great interest in the above trials. The Board of the Halmstad-Nässjo railway and the new Kalmar railway company have each bought from the Aktie Bolaget Torf (Peat Co. Ltd., Bäk) 1200 tons of peat powder for firing the locomotives. The trials are to take place as soon as the firing apparatus, which is constructed by Engineer von Porat, is delivered.

Even foreign countries have manifested interest, and mechanical engineers from Russian and French railway companires have come over to study the peat powder question. As a result of this, it has been reported from Finland that a peat powder plant, which is expected to be in operation next summer, is to be erected. The Government railways of Finland also intend to try the new fuel.

Engineer von Porat has already sold his Finnish patent rights on the firing apparatus, and the patent rights on manufacturing peat powder were sold some time before.

Requests for a considerable amount of peat powder have been received from Russia, but, on account of the high freight rates, it was impossible to forward it. It is, however, expected that they will be able, in the near future, to supply the demand from their own peat powder factories in Russia.

The Halmstad-Nässjo Railway Company has bought the property at Lake Unnen for 60,000 kronor from Thomas Skinner. The area is approximately 2200 acres. The company intends to experiment this summer with different methods for firing with peat powder, and if the trials give satisfactory results, the company intends to erect a plant and manufacture its own peat powder.

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MINES BRANCH

EUGÈNE HAANEL, PH. D., DIRECTOR.

REPORTS AND MAPS

PUBLISHED BY THE

MINES BRANCH

REPORTS.

1. Mining Conditions in the Klondike, Yukon. Report on—by Eugène Haanel, Ph. D., 1902.

†2. Great Landslide at Frank, Alta. Report on—by R. G. McConnell, B.A., and R. W. Brock, M.A., 1903.

†3. Investigation of the different electro-thermic processes for the smelting of iron ores, and the making of steel, in operation in Europe. Report of Special Commission—by Eugene Haanel, Ph.D., 1904.

†4. Rapport de la Commission nommée pour étudier les divers procédés électro-thermiques pour la réduction des minerais de fer et la fabrication de l'acier employés en Europe—by Eugene Haanel, Ph.D. (French Edition), 1905.

5. On the location and examination of magnetic ore deposits by magnetometric measurements—by Eugene Haanel, Ph.D., 1904.

†7. Limestones and the Lime Industry of Manitoba. Preliminary Report on—by J. W. Wells, M.A., 1905.

†8. Clays and Shales of Manitoba: Their Industrial Value. Preliminary Report on—by J. W. Wells, M.A., 1905.

†9. Hydraulic Cements (Raw Materials) in Manitoba: Manufacture and Uses of. Preliminary Report on—by J. W. Wells, M.A., 1905.

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†Publications marked thus † are out of print.

†10. Mica: Its Occurrence, Exploitation, and Uses—by Fritz Cirkel, M.E., 1905. (See No. 118.)

†11. Asbestos: Its Occurrence, Exploitation, and Uses—by Fritz Cirkel, M.E., 1905. (See No. 69.)

†12. Zinc Resources of British Columbia, and the Conditions affecting their Exploitation. Report of the Commission appointed to investigate—by W. R. Ingalls, M.E., 1905.

†16. *Experiments made at Sault Ste. Marie, under Government auspices, in the smelting of Canadian iron ores by the electro-thermic process. Final Report on—by Eugene Haanel, Ph.D., 1907.

†17. Mines of the Silver-Cobalt Ores of the Cobalt district: Their Present and Prospective Output. Report on—by Eugene Haanel, Ph.D., 1907.

†18. Graphite: Its Properties, Occurrence, Refining, and Uses—by Fritz Cirkel, M.E., 1907.

†19. Peat and Lignite: Their Manufacture and Uses in Europe—by Erik Nystrom, M.E., 1908.

†20. Iron Ore Deposits of Nova Scotia. Report on (Part 1)—by J. E. Woodman, D.Sc.

†21. Summary Report of Mines Branch, 1907-8.

22. Iron Ore Deposits of Thunder Bay and Rainy River districts. Report on—by F. Hille, M.E.

†23. Iron Ore Deposits along the Ottawa (Quebec side), and Gatineau rivers. Report on—by Fritz Cirkel, M.E.

24. General Report on the Mining and Metallurgical Industries of Canada, 1907-8.

25. The Tungsten Ores of Canada. Report on—by T. L. Walker, Ph.D.

26. The Mineral Production of Canada, 1906. Annual Report on—by John McLeish, B.A.

26a. French Translation: The Mineral Production of Canada, 1906. Annual Report on—by John McLeish, B.A.

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*A few copies of the Preliminary Report 1906. are still available.
†Publications marked thus † are out of print.

27. The Mineral Production of Canada, 1907. Preliminary Report on—by John McLeish, B.A.

†27a. The Mineral Production of Canada, 1908. Preliminary Report on—by John McLeish, B.A.

†28. Summary Report of Mines Branch, 1908.

†28a. French translation: Summary Report of Mines Branch, 1908.

29. Chrome Iron Ore Deposits of the Eastern Townships. Monograph on—by Fritz Cirkel, M.E. (Supplementary Section: Experiments with Chromite at McGill University—by J. B. Porter, E.M., D.Sc.

30. Investigation of the Peat Bogs and Peat Fuel Industry of Canada, 1908. Bulletin No. 1—by Erik Nystrom, M.E., and A. Anrep, Peat Expert.

32. Investigation of Electric Shaft Furnace, Sweden. Report on—by Eugene Haanel, Ph.D.

47. Iron Ore Deposits of Vancouver and Texada Islands. Report on—by Einar Lindeman, M.E.

†55. Report on the Bituminous, or Oil-shales of New Brunswick and Nova Scotia; also on the Oil-shale industry of Scotland—by R. W. Ells, LL.D.

56. French translation: Bituminous or Oil-shales of New Brunswick and Nova Scotia: also on the Oil-shale Industry of Scotland. Report on—by R. W. Ells, LL.D.

58. The Mineral Production of Canada, 1907 and 1908. Annual Report on —by John McLeish, B.A.

NOTE.—*The following parts were separately printed and issued in advance of the Annual Report for 1907-8:—*

†31. Production of Cement in Canada, 1908.
42. Production of Iron and Steel in Canada during the Calendar Years 1907 and 1908.
43. Production of Chromite in Canada during the Calendar Years 1907 and 1908.

†Publications marked thus † are out of print.

44. Production of Asbestos in Canada during the Calendar Years 1907 and 1908.

†45. Production of Coal, Coke, and Peat in Canada during the Calendar Years 1907 and 1908.

46. Production of Natural Gas and Petroleum in Canada during the Calendar Years 1907 and 1908.

59. Chemical Analyses of Special Economic Importance made in the Laboratories of the Department of Mines, 1906-7-8. Report on—by F. G. Wait, M.A., F.C.S. (With Appendix on the Commercial Methods and Apparatus for the Analyses of Oil Shales—by H. A. Leverin, Ch. E.)

Schedule of Charges for Chemical Analyses and Assays.

†62. Mineral Production of Canada, 1909. Preliminary Report on—by John McLeish, B.A.

63. Summary Report of Mines Branch, 1909.

67. Iron Ore Deposits of the Bristol Mine, Pontiac county, Quebec. Bulletin No. 2—by Einar Lindeman, M.E., and Geo. C. Mackenzie, B.Sc.

†68. Recent Advance in the Construction of Electric Furnaces for the Production of Pig Iron, Steel, and Zinc. Bulletin No. 3—by Eugene Haanel, Ph.D.

69. Chrysotile-Asbestos: Its Occurrence, Exploitation, Milling, and Uses. Reports on—by Fritz Cirkel, M.E. (Second Edition, enlarged.)

†71. Investigation of the Peat Bogs and Peat Industry of Canada, 1909-10; to which is appended Mr. Alf. Larson's Paper on Dr. M. Ekenberg's Wet-Carbonizing Process; from Teknisk Tidskrift, No. 12, December 26, 1908—translation by Mr. A. v. Anrep, Jr.; also a translation of Lieut. Ekelund's Pamphlet entitled 'A Solution of the Peat Problem', 1909, describing the Ekelund Process for the Manufacture of Peat Powder, by Harold A. Leverin, Ch. E. Bulletin No. 4—by A. v. Anrep (Second Edition, enlarged.)

81. French Translation: Chrysotile-Asbestos: Its Occurrence, Exploitation, Milling, and Uses. Report on—by Fritz Cirkel, M.E.

82. Magnetic Concentration Experiments. Bulletin No. 5—by Geo. C. Mackenzie, B.Sc.

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†Publications marked thus † are out of print.

83. An investigation of the Coals of Canada with reference to their Economic Qualities as conducted at McGill University under the authority of the Dominion Government. Report on—by J. B. Porter, E. M., D.Sc., R. J. Durley, Ma.E., and others—
    Vol. I—Coal Washing and Coking Tests.
    Vol. II—Boiler and Gas Producer Tests.
    Vol. III—
      Appendix I
        Coal Washing Tests and Diagrams.
    Vol. IV—
      Appendix II
        Boiler Tests and Diagrams.
    Vol. V—
      Appendix III
        Producer Tests and Diagrams.
    Vol. VI—
      Appendix IV
        Coking Tests.
      Appendix V
        Chemical Tests.

†84. Gypsum Deposits of the Maritime Provinces of Canada—including the Magdalen Islands. Report on—by W. F. Jennison, M.E. (See No. 245.)

88. The Mineral Production of Canada, 1909. Annual Report on—by John McLeish, B.A.

NOTE.—*The following parts were separately printed and issued in advance of the Annual Report for 1909.*

†79. Production of Iron and Steel in Canada during the Calendar Year, 1909.

†80. Production of Coal and Coke in Canada during the Calendar Year, 1909.

85. Production of Cement, Lime, Clay Products, Stone, and other Structural Materials during the Calendar Year, 1909.

89. Reprint of Presidential address delivered before the American Peat Society at Ottawa, July 25, 1910. By Eugene Haanel, Ph.D.

90. Proceedings of Conference on Explosives.

92. Investigation of the Explosives Industry in the Dominion of Canada, 1910. Report on—by Capt. Arthur Desborough. (Second Edition.)

†Publications marked thus † are out of print.

93. Molybdenum Ores of Canada. Report on—by Professor T. L. Walker, Ph. D.

100. The Building and Ornamental Stones of Canada. Report on—by Professor W. A. Parks, Ph. D.

100a. French Translation: The Building and Ornamental Stones of Canada. Report on—by W. A. Parks.

102. Mineral Production of Canada, 1910. Preliminary Report on—by John McLeish, B.A.

†103. Summary Report of Mines Branch, 1910.

104. Catalogue of Publications of Mines Branch, from 1902 to 1911; containing Tables of Contents and list of Maps, etc.

105. Austin Brook Iron-bearing district, Report on—by E. Lindeman, M.E.

110. Western Portion of Torbrook Iron Ore Deposits, Annapolis county, N.S. Bulletin No. 7—by Howells Fréchette, M.Sc.

111. Diamond Drilling at Point Mamainse, Ont. Bulletin No. 6—by A. C. Lane, Ph.D., with Introductory by A. W. G. Wilson. Ph.D.

118. Mica: Its Occurrence, Exploitation, and Uses. Report on—by Hugh S. de Schmid, M.E.

142. Summary Report of Mines Branch, 1911.

143. The Mineral Production of Canada, 1910. Annual Report on—by John McLeish, B.A.

NOTE.—*The following parts were separately printed and issued in advance of the Annual Report for 1910.*

†114. Production of Cement, Lime, Clay Products, Stone and other Structural Materials in Canada, 1910.

†115. Production of Iron and Steel in Canada during the Calendar Year 1910.

†116. Production of Coal and Coke in Canada during the Calendar Year 1910.

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†Publications marked thus † are out of print.

†117. General Summary of the Mineral Production of Canada during the Calendar Year 1910.

145. Magnetic Iron Sands of Natashkwan, Saguenay county, Que. Report on—by Geo. C. Mackenzie, B.Sc.

149. French translation: Magnetic Iron Sands of Natashkwan, Saguenay county, Que. Report on—by Geo. C. Mackenzie, B.Sc.

†150. The Mineral Production of Canada, 1911. Preliminary Report on—by John McLeish, B.A.

151. Investigation of the Peat Bogs and Peat Industry of Canada, 1910-1911. Bulletin No. 8—by A. v. Anrep, Peat Expert.

154. The Utilization of Peat Fuel for the Production of Power, being a record of experiments conducted at the Fuel Testing Station, Ottawa, 1910-11. Report on—by B. F. Haanel, B.Sc.

155. French translation: The Utilization of Peat Fuel for the Production of Power, being a record of experiments conducted at the Fuel Testing Station, Ottawa, 1910-11. Report on—by B. F. Haanel, B.Sc.

156. French translation: The Tungsten Ores of Canada. Report on—T. L. Walker, Ph.D.

167. Pyrites in Canada: Its Occurrence, Exploitation, Dressing, and Uses. Report on—by A. W. G. Wilson, Ph.D.

169. French translation: Pyrites in Canada: Its Occurrence, Exploitation, Dressing, and Uses. Report on—by A. W. G. Wilson, Ph.D.

170. The Nickel Industry: with Special Reference to the Sudbury region, Ont. Report on—by Professor A. P. Coleman, Ph.D.

180. French translation: Investigation of the Peat Bogs, and Peat Industry of Canada, 1910-11. Bulletin No. 8—by A. v. Anrep, Peat Expert.

184. Magnetite Occurrences along the Central Ontario Railway. Report on—by E. Lindeman.

195. French translation: Magnetite Occurrences along the Central Ontario Railway. Report on—by E. Lindeman, M.E.

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†Publications marked thus † are out of print.

196. French translation: Investigation of the Peat Bogs and Peat Industry of Canada, 1909-10; to which is appended Mr. Alf. Larson's paper on Dr. Ekenburg's Wet Carbonizing Process: from Teknisk Tidskrift, No. 12, December 26, 1908—translation by Mr. A. v. Anrep; also translation of Lieut. Ekelund's Pamphlet entitled "A solution of the Peat Problem," 1909, describing the Ekelund Process for the Manufacture of Peat Powder, by Harold A. Leverin, Ch.E. Bulletin No. 4—by A. v. Anrep, Peat Expert. (Second Edition, enlarged.)

197. French translation: Molybdenum Ores of Canada. Report on—by Professor T. L. Walker, Ph.D.

198. French translation: Peat and Lignite: Their Manufacture and Uses in Europe—by Erik Nystrom, M.E., 1908.

201. The Mineral Production of Canada during the Calendar Year 1911. Annual Report on—by John McLeish, B.A.

NOTE.—*The following parts were separately printed and issued in advance of the Annual Report for 1911.*

181. Production of Cement, Lime, Clay Products, Stone, and other Structural Materials in Canada during the Calendar Year 1911. Bulletin on—by John McLeish, B.A.

†182. Production of Iron and Steel in Canada during the Calendar Year 1911. Bulletin on—by John McLeish, B.A.

183. General Summary of the Mineral Production in Canada during the Calendar Year 1911. Bulletin on—by John McLeish, B.A.

†199. Production of Copper, Gold, Lead, Nickel, Silver, Zinc, and other Metals of Canada, during the Calendar Year 1911. Bulletin on—by C. T. Cartwright, B.Sc.

†200. The Production of Coal and Coke in Canada during the Calendar Year 1911. Bulletin on—by John McLeish, B.A.

202. French translation: Graphite: Its Properties, Occurrence, Refining, and Uses—by Fritz Cirkel, M.E., 1907.

203. Building Stones of Canada—Vol. II: Building and Ornamental Stones of the Maritime Provinces. Report on—by Professor W. A. Parks, Ph.D.

209. The Copper Smelting Industry of Canada. Report on—by A. W. G. Wilson, Ph.D.

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†Publications marked thus † are out of print.

216. Mineral Production of Canada, 1912. Preliminary Report on—by John McLeish, B.A.

219. French translation: Austin Brook Iron-bearing district. Report on—by E. Lindeman, M.E.

222. Lode Mining in Yukon: An investigation of the Quartz Deposits of the Klondike Division. Report on—by T. A. MacLean, B.Sc.

224. Summary Report of the Mines Branch, 1912.

226. French translation: Chrome Iron Ore Deposits of the Eastern Townships. Monograph on—by Fritz Cirkel, M.E. (Supplementary Section: Experiments with Chromite at McGill University—by Professor J. B. Porter, E.M., D.Sc.)

227. Sections of the Sydney Coal Field—by J. G. S. Hudson.

†229. Summary Report of the Petroleum and Natural Gas Resources of Canada, 1912—by F. G. Clapp, A.M. See. No. 224.)

230. Economic Minerals and the Mining Industries of Canada.

231. French translation: Economic Minerals and the Mining Industries of Canada.

233. French translation: Gypsum Deposits of the Maritime Provinces of Canada—including the Magdalen Islands. Report on—by W. F. Jennison, M.E.

245. Gypsum in Canada: Its Occurrence, Exploitation, and Technology Report on—by L. H. Cole, B.Sc.

254. Calabogie Iron-Bearing District. Report on—by E. Lindeman, M.E.

259. Preparation of Metallic Cobalt by Reduction of the Oxide. Report on—by Professor H. T. Kalmus, B.Sc., Ph.D.

262. The Mineral Production of Canada during the Calendar Year 1912. Annual Report on—by John McLeish, B.A.

NOTE.—*The following parts were separately printed and issued in advance of the Annual Report for 1912.*

238. General Summary of the Mineral Production of Canada, during the Calendar Year 1912. Bulletin on—by John McLeish, B.A.

†247. Production of Iron and Steel in Canada during the Calendar Year 1912. Bulletin on—by John McLeish, B.A.

†Publications marked thus † are out of print.

†256. Production of Copper, Gold, Lead Nickel, Silver, Zinc, and other Metals of Canada, during the Calendar Year 1912 —by C. T. Cartwright, B.Sc.

257. Production of Cement, Clay Products, stone, and other Structural Materials during the Calendar Year 1912. Report on—by John McLeish, B.A.

†258. Production of Coal and Coke in Canada, during the Calendar Year 1912. Bulletin on—by John McLeish, B.A.

263. French translation: Recent Advances in the Construction of Electric Furnaces for the Production of Pig Iron, Steel, and Zinc. Bulletin No. 3—by Eugene Haanel, Ph.D.

264. French translation: Mica: Its Occurrence, Exploitation, and Uses. Report on—by Hugh S. de Schmid, M.E.

265. French translation: Annual Mineral Production of Canada, 1911. Report on—by John McLeish, B.A.

266. Investigation of the Peat Bogs and Peat Industry of Canada, 1911 and 1912. Bulletin No. 9—by A. v. Anrep, Peat Expert.

279. Building and Ornamental Stones of Canada—Vol. III. Report on—by Professor W. A. Parks, Ph.D.

281. The Bituminous Sands of Northern Alberta. Report on—by S. C. Ells, M.E.

283. Mineral Production of Canada, 1913. Preliminary report on—by J. McLeish, B.A.

288. French translation: Production of Coal and Coke in Canada during the Calendar Year 1912. Bulletin on—by John McLeish, B.A.

290. French translation: Production of Copper, Gold, Lead, Nickel, Silver, Zinc, and Other Metals of Canada, during the Calendar Year 1912. Bulletin on—by C. T. Cartwright, B.Sc.

299. Peat, Lignite, and Coal: Their Value as Fuels for the Production of Gas and Power in the By-product Recovery Producer. Report on —by B. F. Haanel, B.Sc.

303. Moose Mountain Iron-Bearing District. Report on—by E. Lindeman, M.E.

305. Non-metallic minerals used in the Canadian Manufacturing Industries. Report on—by H. Frechette, M.Sc.

†Publications marked thus † are out of print.

309. The Physical Properties of the Metal Cobalt, Part II. Report on—by H. T. Kalmus, B.Sc., Ph.D.

315. The Production of Iron and Steel during the Calendar Year 1913. Bulletin on—by John McLeish, B.A.

316. The Production of Coal and Coke during the Calendar Year 1913. Bulletin on—by John McLeish, B.A.

317. The Production of Copper, Gold, Lead, Nickel, Silver, Zinc, and other Metals, during the Calendar Year 1913. Bulletin on—by C. T. Cartwright, B.Sc.

318. The Production of Cement, Lime, Clay Products, Stone, and other Structural Materials in Canada, during the Calendar Year, 1913. By J. McLeish, B.A.

319. A General Summary of the Mineral Production in Canada during the Calendar Year 1913. Bulletin on—by J. McLeish, B.A.

322. Economic Minerals and Mining Industries of Canada. (Revised Edition, for Panama-Pacific Exposition.)

NOTE.—*The Division of Mineral Resources and Statistics has prepared the following lists of mine, smelter, and quarry operators: Metal mines and smelters, Coal mines, Stone quarry operators, Manufacturers of clay products and Manufacturers of lime; copies of the lists may be obtained on application.*

IN THE PRESS.

179. French translation: The Nickel Industry: with Special Reference to the Sudbury region. Report on—by Prof. A. P. Coleman, Ph.D.

204. French translation: Building Stones of Canada—Vol. II: Building and Ornamental Stones of the Maritime Provinces. Report on—by W. A. Parks, Ph.D.

285. Summary Report of Mines Branch, 1913.

287. French translation: Production of Iron and Steel in Canada during the Calendar Year 1912. Bulletin on—by John McLeish, B.A.

289. French translation: Production of Cement, Lime, Clay Products, Stone, and Other Structural Materials during the Calendar Year 1912. Bulletin on—by John McLeish, B.A.

291. Petroleum and Natural Gas Resources of Canada. Report on—by F. G. Clapp, A.M., and others.

308. French translation: An investigation of the Coals of Canada with reference to their Economic Qualities: as conducted at McGill University under the authority of the Dominion Government. Report on—by J. B. Porter, E.M., D.Sc., R. J. Durley, Ma.E., and others

Vol. I—Coal Washing and Coking Tests.
Vol. II—Boiler and Gas Producer Tests.
Vol. III—
Appendix I
Coal Washing Tests and Diagrams.
Vol. IV—
Appendix II
Boiler Tests and Diagrams.

314. French translation: Iron Ore Deposits, Bristol Mine, Pontiac county, Quebec. Report on—by E. Lindeman, M.E.

320. The Mineral Production of Canada, 1913. Annual Report on—by John McLeish, B.A.

MAPS.

†6. Magnetometric Survey, Vertical Intensity: Calabogie Mine, Bagot township, Renfrew county, Ontario—by E. Nystrom, 1904. Scale 60 feet to 1 inch. Summary report, 1905. (See Map No. 249.)

†13. Magnetometric Survey of the Belmont Iron Mines, Belmont township, Peterborough county, Ontario—by B. F. Haanel, 1905. Scale 60 feet to 1 inch. Summary report, 1905. (See Map. No. 186).

†14. Magnetometric Survey of the Wilbur Mine, Lavant township, Lanark county, Ontario—by B. F. Haanel, 1905. Scale 60 feet to 1 inch. Summary report, 1905.

†33. Magnetometric Survey, Vertical Intensity: Lot 1, Concession VI, Mayo township, Hastings county, Ontario—by Howells Fréchette, 1909. Scale 60 feet to 1 inch.

†34. Magnetometric Survey, Vertical Intensity: Lots 2 and 3, Concession VI, Mayo township, Hastings county, Ontario—by Howells Fréchette, 1909. Scale 60 feet to 1 inch.

NOTE.—1. Maps marked thus * are to be found only in reports.
2. Maps marked thus † have been printed independently of reports, hence can be procured separately by applicants.

†35. Magnetometric Survey, Vertical Intensity: Lots 10, 11, and 12, Concession IX, and Lots 11 and 12, Concession VIII, Mayo township, Hastings county, Ontario—by Howells Fréchette, 1909. Scale 60 feet to 1 inch.

*36. Survey of Mer Bleue Peat Bog, Gloucester township, Carleton county, and Cumberland township, Russell county, Ontario—by Erik Nystrom, and A. v. Anrep. (Accompanying report No. 30.)

*37. Survey of Alfred Peat Bog, Alfred and Caledonia townships, Prescott county, Ontario—by Erik Nystrom, and A. v. Anrep. (Accompanying report No. 30.)

*38. Survey of Welland Peat Bog, Wainfleet and Humberstone townships, Welland county, Ontario—by Erik Nystrom and A. v. Anrep. (Accompanying report No. 30.)

*39. Survey of Newington Peat Bog, Osnabruck, Roxborough, and Cornwall townships, Stormont county, Ontario—by Erik Nystrom and A. v. Anrep. (Accompanying report No. 30.)

*40. Survey of Perth Peat Bog, Drummond township, Lanark county, Ontario—by Erik Nystrom and A. v. Anrep. (Accompanying report No. 30.)

*41. Survey of Victoria Road Peat Bog, Bexley and Carden townships, Victoria county, Ontario—by Erik Nystrom and A. v. Anrep. (Accompanying report No. 30.)

*48. Magnetometric Survey of Iron Crown claim at Nimpkish (Klaanch) river, Vancouver island, B.C.—by E. Lindeman. Scale 60 feet to 1 inch. (Accompanying report No. 47.)

*49. Magnetometric Survey of Western Steel Iron claim, at Sechart, Vancouver Island, B.C.—by E. Lindeman. Scale 60 feet to 1 inch. (Accompanying report No. 47.)

*53. Iron Ore Occurrences, Ottawa and Pontiac counties, Quebec, 1908—by J. White and Fritz Cirkel. (Accompanying report No. 23.)

*54. Iron Ore Occurrences, Argenteuil county, Quebec, 1908—by Fritz Cirkel. (Accompanying report No. 23.) Out of print.

*57. The Productive Chrome Iron Ore District of Quebec—by Fritz Cirkel. (Accompanying report No. 29.)

NOTE.—1. Maps marked thus * are to be found only in reports.
2. Maps marked thus † have been printed independently of reports, hence can be procured separately by applicants.

†60. Magnetometric Survey of the Bristol Mine, Pontiac county, Quebec—by E. Lindeman. Scale 200 feet to 1 inch. (Accompanying report No. 67.)

†61. Topographical Map of Bristol Mine, Pontiac county, Quebec—by E. Lindeman. Scale 200 feet to 1 inch. (Accompanying report No. 67.)

†64. Index Map of Nova Scotia: Gypsum—by W. F. Jennison.
†65. Index Map of New Brunswick: Gypsum—by W. F. Jennison
†66. Map of Magdalen Islands: Gypsum—by W. F. Jennison.
(Accompanying report No. 84)

†70. Magnetometric Survey of Northeast Arm Iron Range, Lake Timagami, Nipissing district, Ontario—by E. Lindeman. Scale 200 feet = 1 inch. (Accompanying report No. 63.)

†72. Brunner Peat Bog, Ontario—by A. v. Anrep.
†73. Komoka Peat Bog, Ontario—by A. v. Anrep.
(Accompanying report No 71)
74. Brockville Peat Bog, Ontario—by A. v. Anrep.
75. Rondeau Peat Bog, Ontario—by A. v. Anrep.
Out of print.
†76. Alfred Peat Bog, Ontario—by A. v. Anrep.
†77. Alfred Peat Bog, Ontario: Main Ditch profile—by A. v. Anrep.

†78. Map of Asbestos Region, Province of Quebec, 1910—by Fritz Cirkel. Scale 1 mile to 1 inch. (Accompanying report No. 69.)

†94. Map showing Cobalt, Gowganda, Shiningtree, and Porcupine districts—by L. H. Cole. (Accompanying Summary report, 1910.)

†95. General Map of Canada, showing Coal Fields. (Accompanying report No. 83—by Dr. J. B. Porter.)

†96. General Map of Coal Fields of Nova Scotia and New Brunswick. (Accompanying report No. 83—by Dr. J. B. Porter.)

†97. General Map showing Coal Fields in Alberta, Saskatchewan, and Manitoba. (Accompanying report No. 83—by Dr. J. B. Porter.)

NOTE.--1. Maps marked thus * are to be found only in reports.
2. Maps marked thus † have been printed independently of reports, hence can be procured separately by applicants.

†98. General Map of Coal Fields in British Columbia. (Accompanying report No. 83—by Dr. J. B. Porter.)

†99. General Map of Coal Field in Yukon Territory. (Accompanying report No. 83—by Dr. J. B. Porter.)

†106. Geological Map of Austin Brook Iron Bearing district, Bathurst township, Gloucester county, N.B.—by E. Lindeman. Scale 400 feet to 1 inch. (Accompanying report No. 105.)

†107. Magnetometric Survey, Vertical Intensity: Austin Brook Iron Bearing District—by E. Lindeman. Scale 400 feet to 1 inch. (Accompanying report No. 105.)

†108. Index Map showing Iron Bearing Area at Austin Brook—by E. Lindeman. (Accompanying report No. 105.)

*112. Sketch plan showing Geology of Point Mamainse, Ont.—by Professor A. C. Lane. Scale, 4,000 feet to 1 inch. (Accompanying report No. 111.)

†113. Holland Peat Bog, Ontario—by A. v. Anrep. (Accompanying report No. 151.)

*119–137. Mica: Township maps, Ontario and Quebec—by Hugh S. de Schmid. (Accompanying report No. 118.)

†138. Mica: Showing Location of Principal Mines and Occurrences in the Quebec Mica Area—by Hugh S. de Schmid. Scale 3.95 miles to 1 inch. (Accompanying report No. 118.)

†139. Mica: Showing Location of Principal Mines and Occurrences in the Ontario Mica Area—by Hugh S. de Schmid. Scale 3.95 miles to 1 inch. (Accompanying report No. 118.)

†140. Mica: Showing Distribution of the Principal Mica Occurrences in the Dominion of Canada—by Hugh S. de Schmid. Scale 3.95 miles to 1 inch. (Accompanying report No. 118.)

†141. Torbrook Iron Bearing District, Annapolis county, N.S.—by Howells Fréchette. Scale 400 feet to 1 inch. (Accompanying report No. 110.)

†146. Distribution of Iron Ore Sands of the Iron Ore Deposits on the North Shore of the River and Gulf of St. Lawrence, Canada—by Geo. C. Mackenzie. Scale 100 miles to 1 inch. (Accompanying report No. 145.)

NOTE.—1. Maps marked thus * are to be found only in reports.
2. Maps marked thus † have been printed independently of reports, hence can be procured separately by applicants.

†147. Magnetic Iron Sand Deposits in relation to Natashkwan harbour and Great Natashkwan river, Que. (Index Map)—by Geo. C. Mackenzie. Scale 40 chains to 1 inch. (Accompanying report No. 145.)

†148. Natashkwan Magnetic Iron Sand Deposits, Saguenay county, Que.—by Geo. C. Mackenzie. Scale 1,000 feet to 1 inch. (Accompanying report No. 145.)

†152. Map showing the Location of Peat Bogs investigated in Ontario—by A. v. Anrep.

†153. Map Showing the Location of Peat Bogs investigated in Manitoba—by A. v. Anrep.

†157. Lac du Bonnet Peat Bog, Manitoba—by A. v. Anrep.

†158. Transmission Peat Bog, Manitoba—by A. v. Anrep.

†159. Corduroy Peat Bog, Manitoba—by A. v. Anrep.

†160. Boggy Creek Peat Bog, Manitoba—by A. v. Anrep.

†161. Rice Lake Peat Bog, Manitoba—by A. v. Anrep.

†162. Mud Lake Peat Bog, Manitoba—by A. v. Anrep.

†163. Litter Peat Bog, Manitoba—by A. v. Anrep.

(Accompanying report No. 151)

†164. Julius Peat Litter Bog, Manitoba—by A. v. Anrep.

†165. Fort Francis Peat Bog, Ontario—by A. v. Anrep.

(Accompanying report No. 151.)

*166. Magnetometric Map of Mine No. 3, Lot 7, Concessions V and VI McKim township, Sudbury district, Ont.—by E. Lindeman. (Accompanying Summary Report, 1911.)

†168. Map showing Pyrites Mines and Prospects in Eastern Canada, and their relation to the United States Market—by A. W. G. Wilson. Scale 125 miles to 1 inch. (Accompanying report No. 167.)

†171. Geological Map of Sudbury Nickel region, Ont.—by Prof. A. P. Coleman. Scale 1 mile to 1 inch. (Accompanying report No. 170.)

NOTE.—1. Maps marked thus * are to be found only in reports.
2. Maps marked thus † have been printed independently of reports, hence can be procured separately by applicants.

†172. Geological Map of Victoria mine—by Prof. A. P. Coleman.

†173. Geological Map of Crean Hill mine—by Prof. A. P. Coleman. } (Accompanying report No. 170.)

†174. Geological Map of Creighton mine—by Prof. A. P. Coleman.

†175. Geological Map showing contact of Norite and Laurentian in vicinity of Creighton mine—by Prof. A. P. Coleman. (Accompanying report No. 170.)

†176. " " of Copper Cliff offset—by Prof. A. P. Coleman. (Accompanying report No. 170.)

†177. " " No. 3 Mine—by Prof. A. P. Coleman. (Accompanying report No. 170.)

†178. " " showing vicinity of Stobie and No. 3 mines—by Prof. A. P. Coleman. (Accompanying report No. 170.)

†185. Magnetometric Survey, Vertical Intensity: Blairton iron mine, Belmont township, Peterborough county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 184.)

†185a. Geological Map, Blairton iron mine, Belmont township, Peterborough county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 184.)

†186. Magnetometric Survey, Belmont iron mine, Belmont township, Peterborough county, Ont.—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 184.)

†186a. Geological Map, Belmont iron mine, Belmont township, Peterborough county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 184.)

†187. Magnetometric Survey, Vertical Intensity: St. Charles mine, Tudor township, Hastings county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 184.)

†187a. Geological Map, St. Charles mine, Tudor township, Hastings county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 184.)

NOTE.—1. Maps marked thus * are to be found only in reports.
2. Maps marked thus † have been printed independently of reports, hence can be procured separately by applicants.

†188. Magnetometric Survey, Vertical Intensity: Baker mine, Tudor township, Hastings county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 184.)

†188a. Geological Map, Baker mine, Tudor township, Hastings county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 184.)

†189. Magnetometric Survey, Vertical Intensity: Ridge iron ore deposits, Wollaston township, Hastings county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 184.)

†190. Magnetometric Survey, Vertical Intensity: Coehill and Jenkins mines, Wollaston township, Hastings county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 184.)

†190a. Geological Map, Coehill and Jenkins mines, Wollaston township, Hastings county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 184).

†191. Magnetometric Survey, Vertical Intensity: Bessemer iron ore deposits, Mayo township, Hastings county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 184.)

†191a. Geological Map, Bessemer iron ore deposits, Mayo township, Hastings county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 184.)

†192. Magnetometric Survey, Vertical Intensity: Rankin, Childs, and Stevens mines, Mayo township, Hastings county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 184.)

†192a. Geological Map, Rankin, Childs, and Stevens mines, Mayo township, Hastings county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 184.)

†193. Magnetometric Survey, Vertical Intensity: Kennedy property, Carlow township, Hastings county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 184.)

†193a. Geological Map, Kennedy property, Carlow township, Hastings county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 184.)

NOTE.—1. Maps marked thus * are to be found only in reports.
2. Maps marked thus † have been printed independently of reports, hence can be procured separately by applicants.

†194. Magnetometric Survey, Vertical Intensity: Bow Lake iron ore occurrences, Faraday township. Hastings county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 184.)

†204. Index Map, Magnetic occurrences along the Central Ontario Railway —by E. Lindeman, 1911. (Accompanying report No. 184.)

†205. Magnetometric Map, Moose Mountain iron-bearing district, Sudbury district, Ontario: Deposits Nos. 1, 2, 3, 4, 5, 6, and 7—by E. Lindeman, 1911. (Accompanying report No. 303.)

†205a. Geological Map, Moose Mountain iron-bearing district, Sudbury district, Ontario. Deposits Nos. 1, 2, 3, 4, 5, 6, and 7—by E. Lindeman. (Accompanying report No. 303.)

†206. Magnetometric Survey of Moose Mountain iron-bearing district, Sudbury district, Ontario: Northern part of Deposit No. 2—by E. Lindeman, 1912. Scale 200 feet to 1 inch. (Accompanying report No. 303.)

†207. Magnetometric Survey of Moose Mountain iron-bearing district, Sudbury district, Ontario: Deposits Nos. 8, 9, and 9A—by E. Lindeman, 1912. Scale 200 feet to 1 inch. (Accompanying report No. 303.)

†208. Magnetometric Survey of Moose Mountain iron-bearing district, Sudbury district, Ontario: Deposit No. 10—by E. Lindeman, 1912. Scale 200 feet to 1 inch. (Accompanying report No. 303.)

†208a. Magnetometric Survey, Moose Mountain iron-bearing district, Sudbury district, Ontario: Eastern portion of Deposit No. 11—by E. Lindeman, 1912. Scale 200 feet to 1 inch. (Accompanying report No. 303.)

†208b. Magnetometric Survey, Moose Mountain iron-bearing district, Sudbury district, Ontario: Western portion of Deposit No. 11—by E. Lindeman, 1912. Scale 200 feet to 1 inch. (Accompanying report No. 303.)

†208c. General Geological Map, Moose Mountain iron-bearing district, Sudbury district, Ontario—by E. Lindeman, 1912. Scale, 800 feet to 1 inch. (Accompanying report No. 303.)

†210. Location of Copper Smelters in Canada—by A. W. G. Wilson. Scale 197·3 miles to 1 inch. (Accompanying report No. 209.)

NOTE.—1. Maps marked thus * are to be found only in reports.
2. Maps marked thus † have been printed independently of reports, hence can be procured separately by applicants.

†215. Province of Alberta: Showing properties from which samples of coal were taken for gas producer tests, Fuel Testing Division, Ottawa. (Accompanying Summary Report 1912.)

†220. Mining Districts, Yukon. Scale 35 miles to 1 inch—by T. A. MacLean. (Accompanying report No. 222.)

†221. Dawson Mining District, Yukon. Scale 2 miles to 1 inch—by T. A. MacLean. (Accompanying report No. 222.)

*228. Index Map of the Sydney Coal Field, Cape Breton, N.S. (Accompanying report No. 227.)

†232. Mineral Map of Canada. Scale 100 miles to 1 inch. (Accompanying report No. 230.)

†239. Index Map of Canada, showing gypsum occurrences. (Accompanying report No. 245.)

†240. Map showing Lower Carboniferous formation in which gypsum occurs. Scale 100 miles to 1 inch. (Accompanying report No. 245.)

†241. Map showing relation of gypsum deposits in Northern Ontario to railway lines. Scale 100 miles to 1 inch. (Accompanying report No. 245.)

†242. Map, Grand River gypsum deposits, Ontario. Scale 4 miles to 1 inch. (Accompanying report No. 245.)

†243. Plan of Manitoba Gypsum Co.'s properties. (Accompanying report No. 245.)

†244. Map showing relation of gypsum deposits in British Columbia to railway lines and market. Scales 35 miles to 1 inch. (Accompanying report No. 245.

†249. Magnetometric Survey, Caldwell and Campbell mines, Calabogie district, Renfrew county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 254.)

†250. Magnetometric Survey, Black Bay or Williams mine, Calabogie district, Renfrew county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 254.)

NOTE.—1. Maps marked thus * are to be found only in reports.
2. Maps marked thus † have been printed independently of reports, hence can be procured separately by applicants.

†251. Magnetometric Survey, Bluff Point iron mine, Calabogie district, Renfrew county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 254.)

†252. Magnetometric Survey, Culhane mine, Calabogie district, Renfrew county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 254.)

†253. Magnetometric Survey, Martel or Wilson iron mine, Calabogie district, Renfrew county, Ontario—by E. Lindeman, 1911. Scale 200 feet to 1 inch. (Accompanying report No. 254).

†261. Magnetometric Survey, Northeast Arm iron range, Lot 339 E. T. W. Lake Timagami, Nipissing district, Ontario—by E. Nystrom, 1903. Scale 200 feet to 1 inch.

†268. Map of Peat Bogs Investigated in Quebec—by A. v. Anrep, 1912.

†269. Large Tea Field Peat Bog, Quebec " "

†270. Small Tea Field Peat Bog, Quebec " "

†271. Lanorie Peat Bog, Quebec " "

†272. St. Hyacinthe Peat Bog, Quebec " "

†273 Rivière du Loup Peat Bog " "

†274. Cacouna Peat Bog " "

†275. Le Parc Peat Bog, Quebec " "

†276. St. Denis Peat Bog, Quebec " "

†277. Rivière Ouelle Peat Bog, Quebec " "

†278. Moose Mountain Peat Bog, Quebec " "

†284. Map of northern portion of Alberta, showing position of outcrops of bituminous sand. Scale 12½ miles to 1 inch. (Accompanying report No. 281.)

†293. Map of Dominion of Canada, showing the occurrences of oil, gas, and tar sands. Scale 197 miles to 1 inch. (Accompanying report No. 291.)

NOTE.—1. Maps marked thus * are to be found only in reports.
2. Maps marked thus † have been printed independently of reports, hence can be procured separately by applicants.

2†94. Reconnaissance Map of part of Albert and Westmorland counties, New Brunswick. Scale 1 mile to 1 inch. (Accompanying report No. 291.)

†295. Sketch plan of Gaspe oil fields, Quebec, showing location of wells. Scale 2 miles to 1 inch. (Accompanying report No. 291.)

†296. Map showing gas and oil fields and pipe-lines in Southwestern Ontario. Scale 4 miles to 1 inch. (Accompanying report No. 291.)

†297. Geological Map of Alberta, Saskatchewan and Manitoba. Scale 35 miles to 1 inch. (Accompanying report No. 291.)

†298. Map, Geology of the forty-ninth parallel, 0.9864 miles to 1 inch. (Accompanying report No. 291.)

†302. Map showing location of main gas line, Bow Island-Calgary. Scale 12½ miles to 1 inch. (Accompanying report No. 291.)

†311. Magnetometric Map, McPherson mine, Barachois, Cape Breton county, Nova Scotia. Scale 200 feet to 1 inch.

†312. Magnetometric Map, iron ore deposits at Upper Glencoe, Inverness county, Nova Scotia. Scale 200 feet to 1 inch.

†313. Magnetometric Map, iron ore deposits at Grand Mira, Cape Breton county, Nova Scotia. Scale 200 feet to 1 inch.

Address all communications to—

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