

FIELD TRIP GUIDE  
for the  
FRIENDS OF THE PLEISTOCENE

26th ANNUAL REUNION  
RIVIERE-DU-LOUP, QUEBEC, CANADA

May 25-26  
1963

First day ..... page 1  
Second day ..... page 17

Leader

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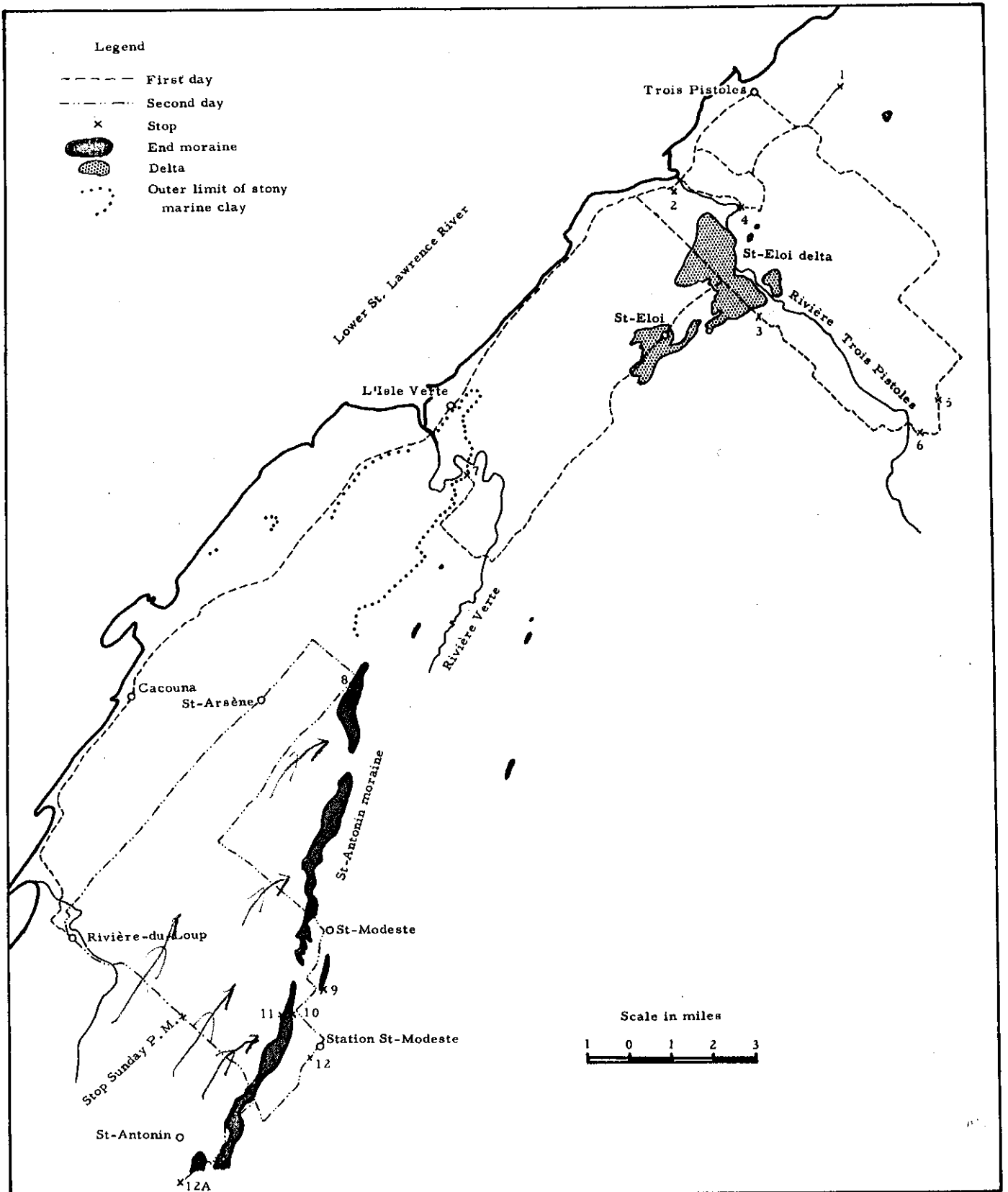


Figure 1. Field trip routes.

## INTRODUCTION

During 3 months in 1961 and 1 month in 1962, the area covered by this field guide was mapped and studied by Lee. The area represents the northern end only, and the completion of field work comprising 8 seasons of study, of a strip of land chosen to represent deglaciation across the Appalachians.

The deglaciation strip that was studied is connected to the sea at both ends which permits dating by Carbon 14. It was chosen to include the valleys of Saint John-Madawaska Rivers so as to give the best stratigraphy. A section which had a wide but low, plateau gap across the Notre Dame Mountains was chosen for continuity of deglaciation. Here, south of Rivière-du-Loup, the gap is at an altitude between 850 feet and 1,500 feet above sea level. Figures 3 to 6 on pages 26 to 28, illustrate the steps in deglaciation as interpreted by the writer. Selected references are given at the end of the guide.

**STOP O: HOTEL PARKING LOT, FIRST DAY.** Buses leave at 8 a.m.

Our first day will be spent in the region of Trois-Pistoles, situated 40 miles northeast of Rivière-du-Loup and in the area lying outside the margin of the former "St-Antonin" ice-lobe of the lower St. Lawrence basin.

EN ROUTE TO STOP 1:

(31 miles)

Turning right on Route 2 the buses go northward for 1 mile to bottom of hill, then turn right (NE) onto Route 10, towards Cacouna and Trois Pistoles.

On the left of the bus we can see the lower St. Lawrence River, locally referred to as the sea, and having in it dominantly the same species of Mollusca living today as are found as shells in the ancient Champlain Sea deposits.

We can observe on both sides of the bus the bedrock hills swept clean of glacial drift. The bedrock is Cambro-Ordovician in age and includes green and red slates, grey slates, quartzites, sandstones and conglomerates.

The lowest flat plains next to the sea, that our route occasionally crosses, are below 50 feet in altitude and are mapped as Low Terrace sands. This altitude corresponds to that of the Micmac Terrace. A local peat bed overlying the terrace sands has been dated at its base at  $6,970 \pm 100$  (GSC 112). But also locally we find modern debris spread from the sea onto this terrace. And in addition both modern and ancient terrestrial materials are being brought onto the terrace through seepages.

At 6 miles from the starting point we drive through the village of Cacouna. Cacouna signifies in Algonquin "land of the porcupine". An agricultural parish founded in 1806.

The bus slows down in another 4 miles so that we can observe the large boulders on the surface of a stony marine clay. We are now crossing the beginning of the outer margin of the St-Antonin ice lobe where it stood in the sea. In another 6 miles the bus crosses the bridge over Rivière Verte and we have passed outside the margin of the St-Antonin ice lobe.

The bus slows after crossing the bridge so that we can have the best view of the Low Terrace.

Continuing northeastward for a mile we can see on the right of the bus a step cut into a large ancient delta.

The bus continues for another 1.5 miles to cross a bridge over Rivière Trois-Pistoles and then another 3 miles to the village of Trois-Pistoles.

Trois-Pistoles was founded in 1713. Its name comes from the loss of a goblet that a French sailor dropped in the river in 1621. "There are three pistoles lost", the sailor is reported to have cried out, referring to the price of the article. An industrial and commercial centre.

Turning right (SE) in the village the bus passes a Roman Catholic church on the left, bearing the date 1887, and continues for 1.5 miles before turning left (NE) and going 1 mile to stop 1.

#### STOP 1: TROIS PISTOLES ROAD CUT

(30 minutes)

The Trois-Pistoles clay exposed here has characters that permit it to be recognized and distinguished from the younger clays

in the region, the stony marine, and the Champlain Sea (Leda) clay regressive phase.

#### COLOUR

Trois-Pistoles clay (here)—medium dark grey (Munsell N4) on a fresh damp surface; moderate yellowish brown (Munsell 10 yr. 5/3) on an oxidized surface. Occasionally a streak of reddish cast along a fracture or a single lamina.

Stony marine clay (St-Antonin ice lobe)—uniformly reddish grey.

Champlain Sea (Leda) clay, regressive phase—dominantly light to medium grey, occasional reddish grey along some laminae.

#### STONINESS

Trois-Pistoles clay (here)—dominantly free of stones, occasional angular pebbles.

Stony marine clay (St-Antonin ice lobe)—pebbles and cobbles frequent, boulders occasional.

Champlain Sea (Leda) clay, regressive phase—dominantly free of stones, occasional subrounded pebbles.

#### STRENGTH

Trois-Pistoles clay (here)—good; undrained shear strength  $5.5 \text{ kg/cm}^2$ .

Stony marine clay (St-Antonin ice lobe)—moderate, and low.

Champlain Sea (Leda) clay—dominantly low, but variable; average undrained shear strength about 0.7 kg/cm<sup>2</sup>.

#### SALT CONTENT

Trois-Pistoles clay—4.3 gm/litre.

Champlain Sea (Leda)—average ca 0.8 gm/litre.

#### SENSITIVITY

(Undisturbed strength)  
(Remoulded strength)

Trois-Pistoles clay—insensitive; shear strength of 5.5 kg/cm<sup>2</sup> when remoulded at natural water content gave 6.1 kg/cm<sup>2</sup>.

Champlain Sea (Leda) clay—very sensitive; average 5 to infinity.

#### CLAY MINERALOGY (by X-ray diffraction)

Trois-Pistoles clay—(1) chlorite 31%, illite 69%, other clay minerals n. d.; (2) chlorite 31%, illite 69%, others n. d.; and (3) chlorite 31%, illite 69%, others n. d.

Stony marine clay—(1) chlorite 25%, illite 75%, others n. d.; and (2) chlorite 27%, illite 73%, others n. d.

#### FAUNA

Trois-Pistoles clay—dominantly small and fragile shells. The following are found here: Pelecypoda: Yoldia arctica (Gray); Foraminifera: Elphidium clavatum (Cushman), and Cassidulina islandica (Nørvang); Ostracoda: cytheropteron sp.

Stony marine clay—the shells are dominantly small and fragile. Yoldia arctica is the dominant species, but others mainly forams and ostracods have been identified.

Champlain Sea (Leda) clay, regressive phase—the shells are dominantly large and thick shelled. A large varied assemblage has been collected and identified from this region. Also abundant are the very small shells as ostracods and forams.

#### RADIOCARBON AGE

Trois-Pistoles clay (here)—shells of Yoldia arctica from here are dated at  $12,720 \pm 170$  (GSC 102).

Stony marine clay (St-Antonin ice lobe)—probably about 12,000 years. Spanned between  $12,720 \pm 170$  and  $10,340 \pm 130$  (GSC 61).

Champlain Sea (Leda) clay, regressive phase—shells in this region at various elevations are dated at  $11,410 \pm 150$  (GSC 63),  $10,600 \pm 170$  (GSC 70),  $10,340 \pm 130$  (GSC 61),  $9,830 \pm 130$  (GSC 68) and  $9,690 \pm 150$  (GSC 69).

Why the superior strength of the Trois-Pistoles clay?  
Why the characteristic colours? What is the ecology of the contained fauna? The age significance can be best discussed at the next 2 stops after we see some of the spatial relationships.



EN ROUTE TO STOP 2:

(6 miles)

Returning southwestward for 1 mile along a corridor of Trois-Pistoles clay, we turn right onto a paved road for 0.5 mile then left (SW) onto a gravel road.

The road follows for 0.5 mile the contact between Trois-Pistoles clay on the left of the bus and a capping-mat of High Terrace sands on the right.

The bus takes up across a fill in a ravine where we have a section through the surface that we are travelling over. The section, not easily seen from the bus, is on the left side about 150 yards from the road and when measured in 1961 showed:

High Terrace sands	- - - - -	2 ft. thick
Delta sands	- - - - -	15 ft. thick
Trois-Pistoles clay with Yoldia arctica	- - - - -	20 ft. thick

Some of the units in this section will be well displayed at the next stop.

The bus passes a gravel pit that can be seen on the left side as we climb onto a higher terrace.

Looking to the left of the bus, off a mile distant, is the highest level of the Trois-Pistoles clay plain at altitude about 540 feet, the same approximate height as the delta top farther west. We are now driving on High Terrace sands.

Driving another mile west to an intersection, then turning right, and going northwestwards for 1.5 mile, we cross the best surface

expression of the High Terrace sands. Note the shallow troughs.. These are well marked on air photographs and are continuous in length for several miles at a time. We can discuss the origin of the High Terrace sands at the next stop, but along this route we should get a feeling of the surface expressions and the nature of these sands.

Turn left (SW) onto Route 10 and continue for about 1 mile.

**STOP 2: GRAVEL PIT AT RIVIERE TROIS-PISTOLES**

(60 minutes)

This section exposes the interior of one of the giant steps cut into a delta.

Section at Back of Pit

	<u>Thickness (ft)</u>
Buff coarse sand, stratified. High Terrace sands -----	11
Medium to dark grey sands, deltaic bedding. Delta sands ----	71

Section at Side of Pit

	<u>Thickness (ft)</u>
Buff coarse sand, stratified. High Terrace sands -----	9

**UNCONFORMITY**

Medium to dark grey sands, deltaic bedding. Delta sands ---- base of pit

*cross to south*

Lithology		<i>(Orange)</i>	<i>(Blk)</i>
		High Terrace Sands	Delta Sands
Red and green slates	%	14	5
→ Carbonatized slates	%	0	23
Grey slates and siltstones	%	0	15
Granites	%	1	1
Quartz, vein quartz	%	30	36
Conglomerate	%	1	3
Impure sandstone	%	50	17
Others	%	4	0

Disc shapes are more common in the Delta sands compared to more spheroids and rollers in the High Terrace sands.

What is the provenance of the stones in these two deposits? How do we interpret the unconformity? We can discuss some crude uplift curves that will be shown.

**EN ROUTE TO STOP 3:**

(5 miles)

Driving westward for 1 mile over sands, we turn left (SE) off the pavement and climb a succession of giant steps each one carved by the regressive sea into the sands of the delta and occasionally the hard clay. Each step is carpeted with a mat 5 to 20 feet thick, of High Terrace sands, below which there may be bits of underpad of sensitive clay, or on top of which are frequent blobs of peat.

At the first farm settlement the road jogs right and we leave the High Terrace sands at top altitude of 250 to 300 feet, then climb the escarpment to the huge flat top of the undissected delta at altitude 540 feet. Cross delta for next 2 miles.

STOP 3:

(15 minutes)

Standing on the bedrock and till unit of the Notre Dame Mountains and overlooking the huge flat top of the undissected delta at altitude 540 feet.

Discussion of relationship of delta to Trois-Pistoles clay.

EN ROUTE TO STOP 4:

(4 miles)

Returning northwestward the bus descends onto the delta top, crosses it and descends again onto the lower mats of High Terrace sands.

The buses turn right, and continue (NE) on the pavement of Route 10 to the far side of the bridge over Rivière Trois-Pistoles. They turn right (SE) here onto a gravel road.

We can now see as we drive along glimpses of the interior of the delta—the bedrock basement, Trois-Pistoles clays, and the various sands.

STOP 4: LUNCH, 1 hour

EN ROUTE TO STOP 5:

(13 miles)

Turning right on the gravel road, we drive east for 0.25 mile to intersection, then turn left.

Looking on the left side of the bus to the top of the hill we see the delta surface ca 540 feet altitude underlain by delta sands and Trois Pistoles clay.

Looking on the right side of the bus we see the exhumed Trois-Pistoles clay surface. Ahead a quarter mile is a remnant of the original delta top. A gravel pit is cut into it.

After 1 mile turn right and cross route of this morning for 1.5 miles. Turn right on pavement.

The bus route crosses the surface of the Trois-Pistoles clay broken by 2 bedrock ridges. After 2 miles on the pavement, we leave the upper clay plain and cross the upper marine limit as the bus climbs a steep hill onto the Notre Dame Mountains.

Continuing on the pavement for another 6.5 miles, we can observe the bedrock and till topography of the Notre Dame Mountains. At a small stream, called Rivière aux Bouleaux, the bus turns right onto a gravel road and continues for 1 mile to a bridge crossing a tributary of Rivière Trois-Pistoles. We now enter the area of pitted glacial outwash, an inland facies of the delta.

**STOPS 5 and 6:**

(15 minute discussion at stop 5, then about 1 mile walk to stop 6 where we meet the buses. Total time is 55 minutes)

We are now standing on glacial outwash, altitude ca 550 feet. Transition from the glacial environment to marine environment is represented by a change from the deeply pitted outwash here, to a concordant surface of the extensive delta plain which we observed this morning.

Note the orientation of the kettle holes.

A mile walk over the pitted outwash takes us to a section in the outwash at stop 6 where we can observe the lithology of the sands and compare them with the delta sands seen at stop 2.

The relationship of the outwash sands to an esker system that trends southward descending towards the Atlantic coast can be discussed with the aid of figures 3, 4, 5 and 6 on pages 26 to 28.

**EN ROUTE TO STOP 7:**

(19 miles)

Turning right onto road, we begin a 7 mile trip generally northwest towards the sea, this time on the west side of the Rivière Trois-Pistoles, before changing to a southwesterly course and travelling 12 miles to the outer margin of the St-Antonin ice lobe.

We cross for 0.5 mile the eroded surface of the outwash plain, before descending to the bridge over the Rivière Trois-Pistoles. The river is flowing here through a bedrock gorge.

Ascending a steep hill to the level of the outwash plain at altitude ca 550 feet, the bus travels 0.75 mile from the bridge before turning right at road intersection.

For the next 3 miles, the contact between outwash and the combined till and bedrock unit crosses back and forth across the road. The outwash is generally on the right of the bus.

Leaving the outwash plain which passes to our right, we climb a hill onto the bedrock and till unit of the Notre Dame Mountains. Passing a cross-road on the left at 0.5 mile we continue for another 0.5 mile before descending a steep hill onto the delta top of this morning.

Continuing for 1 mile across the delta, the bus turns left (SW) onto a gravel cross-road.

On the right side of the bus after crossing a hundred yards of delta surface, we can observe bedrock ridges and Trois-Pistoles clay. On the left side of the bus we can see the exhumed surface of the Trois-Pistoles clay.

The buses continue southwestward for 2 miles passing through the village of St-Eloi.

A monument has been erected in this village by the Canadian government and bears the following inscription:

ERNEST LAPOINTE

1876 - 1941

HOMME D'ETAT

Ministre dans le gouvernement canadien de 1921 à 1930 et de 1935 à 1941, il joua un rôle important dans l'administration du pays et dans son évolution vers sa complète souveraineté.

Sa vive intelligence, sa grande éloquence, son courage et son esprit de tolérance lui ont acquis l'admiration et la reconnaissance de ses compatriotes dont il a bien servi les intérêts, tant aux conférences impériales et internationales que dans les conseils de la nation.

Il naquit dans une maison située sur cet emplacement le 6 octobre 1876

Plaque apposée par le gouvernement du Canada  
Commission des Lieux et Monuments.

Continuing past St-Eloi for 5 miles, the bus jogs left at an intersection and then continues for another 2 miles before turning right (NW) at the next intersection.

Driving for a mile, we cross a bridge over Rivière Verte. A road cut on the right side is in sensitive clay of the regressive sea. Shells in this clay are dated at 10,600  $\pm$  170 years B. P. (GSC 70).

The bus continues for 0.5 mile past the bridge to a road intersection, then continues for another mile before turning right onto a dead-end road.

We are now crossing High Terrace sands and some bedrock. After 1 mile we approach the end of the gravel road.



## STOP 7: RIVIERE VERTE SECTION

(60 minutes)

We have now entered the former outer margin of the St-Antonin ice lobe where the margin stood in the sea. Our first bus slowdown this morning out of Rivière-du-Loup was to observe boulder concentrations on top of stony marine clay. That locality is only a few miles west of here. The section exposed here below the top unit is interpreted as representing ice margin conditions of interbedded stony marine clay and outwash.

### RIVIERE-VERTE SECTION

	THICKNESS (Ft) (vertical strip near left side of face)
1. Sandy gravel, horizontal bedding, with brown iron oxides and a band of black manganese hydroxides - HIGH TERRACE SANDS.	8.5
2. Clay, grey to weakly reddish, occasional stone, occasional marine shell.	0.5
3. Sand, brown, well sorted, partially cemented.	11.0
4. Clay, reddish grey, numerous stones, shells <u>Yoldia arctica</u> (Gray); clay minerals as 25% chlorite, 75% illite; interbedded with thin sand beds - STONY MARINE CLAY.	22.0
5. Sand, grey, well sorted; some parting planes.	17.5

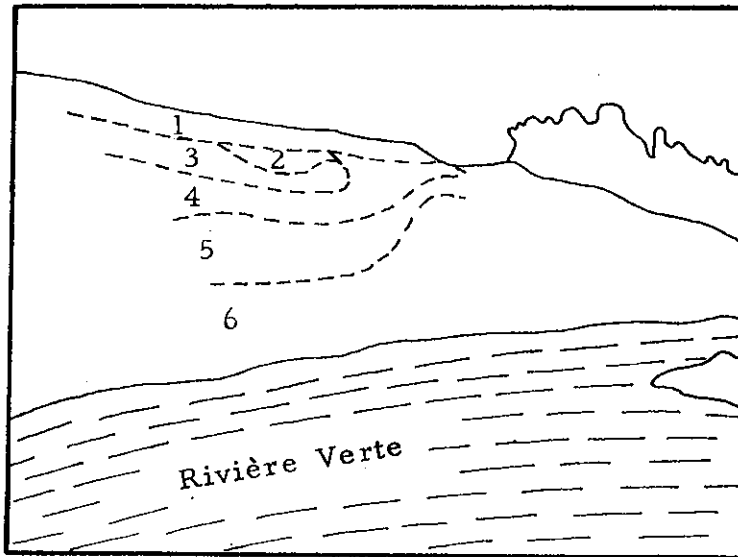


Figure 2. Rivière Verte Section  
(from a photo taken in 1961).

THICKNESS (Ft)  
(vertical strip near  
left side of face)

6. Clay, reddish grey, numerous stones, occasional 8.5  
shell Yoldia arctica, Foraminifera  
Cassidulina islandica (Nørvang), and  
Ostracoda Cytherura sp.; clay minerals as  
27% chlorite, 73% illite - STONY MARINE  
CLAY.

EN ROUTE TO STOP O:

(15 miles)

Returning for 1 mile southwestward to gravel road, turn right and continue northwestward for 1 mile. Then turn left (SW) and drive for 6 miles to the village of St-Arsène. Continue another 7 miles to Rivière-du-Loup and hotel parking lot.

The annual dinner is at 6:00 p. m. in the Convention Dining Hall of the Hotel St-Louis Inn.

STOP O: SECOND DAY, HOTEL PARKING LOT. Buses leave at 8 a. m.

Our second morning will be spent examining the ice-margin position of the former St-Antonin ice lobe. Yesterday we saw where this ice margin had rested in the sea. At our first slow-down in the morning we saw the boulder concentrations on the surface of the stony marine clay; and at our last stop we saw a section exposing this stony marine clay and interlayered sands. Today we observe the continuation of this former ice margin on land.

**EN ROUTE TO STOP 8:**

(11 miles)

The bus leaves the hotel parking lot at 8 a.m. and drives northeastward via the St-Arsène Road. We cross the bridge over the waterway, Rivère-du-Loup, and continue for 8 miles to the village of St-Arsène. The Roman Catholic church on the right was built in 1869. We continue another 2 miles to a road intersection.

We are now situated 7 miles southwest of the section of stony marine clay of yesterday.

The bus turns right and goes southeast for 1 mile, then turns right, going southwest.

On the left side of the bus, the ridge is an end moraine, and the micro-wave tower on its crest will be our orientation marker for the remaining part of the morning, if the weather is sufficiently clear.

The bus continues 0.5 mile to next stop.

**STOP 8:**

(30 minutes)

We are on the northwest (proximal) side of an end moraine ridge. The pit exposes tills and gravel. The gravel is stratified and dips in all directions, with an anticlinal structure exposed in 1961 near the innermost part of the pit. Till occurs only on the northwest side of the large ridge (where we are) and mainly at its outer edge. The lithology shows a noticeable lack of carbonatized slates. The spatial relations of the major units of the region—the younger basal till, the

younger outwash, the pattern of striations and position of the end moraine and stony marine clay—indicate that the end moraine was formed by an ice lobe in the St. Lawrence Valley. The bedding of the gravels may be in part due to an original stratigraphy of (1) basement, (2) glacier ice thinning as a sheet-wedge to the southeast, (3) overlain by gravels, and (4) then till. On uniform melting of the buried sheet-wedge of ice, we would expect reverse slopes and anticlinal conditions in the gravels. Lateral streams could also produce some of the observed bedding.

#### EN ROUTE TO STOP 9:

(9 miles)

Turning left onto the gravel road, the bus continues southwest for 2 miles driving over bedrock controlled topography. On the right of the bus, we can see in clear weather the village of St-Arsène.

The bus turns left (SE) at the first intersection. We can see on the left side of the bus, the micro-wave tower marking the crest of the end moraine. We drive over a peat bog.

After 1 mile the bus turns right (SW) and we drive for 3 miles over bedrock controlled topography.

Turning left (SE), and after driving for 1.5 miles, we cross a low ridge with a scattering of boulders. This is an extension of the end moraine.

We continue driving for 0.5 mile to the village of St-Modeste where the bus turns right (SW) onto pavement.

On the left side of the bus is the ice-contact side, or head, of the proglacial outwash.

Driving for 1 mile southwest of St-Modeste the bus turns left (SE). On the left side of the bus we pass the ice-contact head of the proglacial outwash situated south and east of the end moraine.

We continue driving southward for 1 mile before stopping for an orientation of the spatial relationships of end moraine to outwash plain.

**STOP 9:**

(10 minutes)

We are standing on the younger glacial outwash situated on the southeast (distal) side of the end moraine. By the aid of air photographs, scale ca 1 inch = 1 mile, we can observe the meltwater drainage morphology that was formed by streams flowing southwards. Later in the morning the buses will cross the surface of these channels and we can observe the cobble gravels in road cuts. R.C.A.F. Photos All663 - 131 and 132.

**EN ROUTE TO STOP 10:**

(1 mile)

The buses turn, and drive southwest for 1 mile over glacial outwash.

STOP 10:

(15 minutes)

This gravel pit is in the central portion of an end moraine ridge. The materials exposed include gravels, sands and possibly some till. The gravels are stratified. Bedding directions are extremely variable which seems to be a characteristic of these end moraine ridges. Some major anticlinal structures are seen (exposed in 1961). Lithology of the stones shows a noticeable absence of the carbonatized rocks. A very large elongated depression is parallel to the ridge along where the road enters the pit. The next stop is across the ridge.

EN ROUTE TO STOP 11:

(0.25 mile)

The buses cross the ridge by turning left onto the road and going a few hundred yards.

STOP 11:

The buses will let us off here and pick us up at stop 11C.

STOP 11A:

(15 minutes)

We are on the northwest side of an end moraine ridge composed of till and gravels. Part of the domed structure in the gravels which we saw at the last stop can be seen near the point where we left the bus. Around the bend in this same pit is a section exposing 3 feet of till at the top

(stripped back about 100 feet from the face), and below this 60 feet of gravelly sands, cemented with Fe oxides. The northwest dip here is thought to be due to an original stratigraphy that contained a sheet-wedge of ice at its base upon which the gravels, and then the till were deposited. The reverse slopes resulted on melting of the sheet-wedge of ice leaving a hinge in the area of anticlines of the last stop. Walk to the top of the ridge to the next sub-stop.

**STOP 11 B:**

(5 minutes)

On top of section 11A we can observe the capping of till on the northwest slope of the end moraine ridge.

**STOP 11C:**

(20 minutes)

In this pit we can see more of the materials and variability of the dipping beds composing the end moraine. The stratigraphy is approximately 15 feet of gravels and clay, overlying 5 feet of till and below this 15 feet of gravels.

**EN ROUTE TO STOP 12:**

(2 miles)

The buses turn and proceed south across the end moraine and onto glacial outwash with a rolling surface.



At 0.5 mile distance the buses slow and we can observe cobble ridges crossing the road. On air photos these ridges are seen as being part of several meltwater channels that drained from the position of the end moraine southwards and dissected the surface of the previously deposited material.

The buses continue across the railway tracks at station St-Modeste and halt near the school.

#### STOP 12: SCHOOL HOUSE

(10 minutes)

We can see from here, if the day is clear, the older glacio-fluvial ridges, where the earlier glacial meltwaters drained as eskers southwards into New Brunswick. Refer to figures 3, 4, 5, 6 and 7 on pages 26 to 28.

#### EN ROUTE TO STOP 12A:

(7 miles)

Continuing southwestwards, we cross the outwash plain. At first the plain shows considerable dissection.

After 0.5 mile drive we cross the bridge over Rivière des Roches. It is in part flowing on bedrock and drains northward. We ascend from the bridge onto the outwash plain and continue on this plain for another 1.5 miles to Route 2.

At the intersection, the bus turns right (NE) onto pavement. A road cut now situated ahead is in the end moraine.

The bus turns left (SW) onto a gravel road before crossing the end moraine. We continue driving along the head area of the outwash plain for 0.5 mile before taking a gentle rise up onto the crest of the end moraine.

Looking to the left of the bus we can see a lake that occupies a kettle hole.

Driving another 0.75 mile the bus descends the slope onto the proximal (northwest side) of the moraine. We can now see the end moraine on the left side of the bus and can note some of the large indentations interpreted as ice marginal.

The village to the right of the bus is St-Antonin.

After driving another 1.5 mile, the bus turns left (SW) onto another gravel road.

We are now driving between two subparallel end moraine ridges. As we drive further the dominant ridge of the end moraine is seen from the left side of the bus. After 1.5 miles, the end moraine continues but the bus turns around.

**STOP 12A: BUS TURNS**

**EN ROUTE TO STOP O:**

(10 miles)

As the bus returns to Route 2 the passengers on the right side of the bus can get an impression of the dimensions of the end moraine.

Turning left on the pavement, we have a 6 mile drive to the hotel. The large peat bog that we cross on the way will be visited this afternoon.

Dinner is served in the main dining room of the hotel at 12:30 and the charge is included in your registration fee. This is the end of the official trip.

Assembly for the optional trip will be in the parking lot of the hotel at 1:45. A car caravan will leave from there.

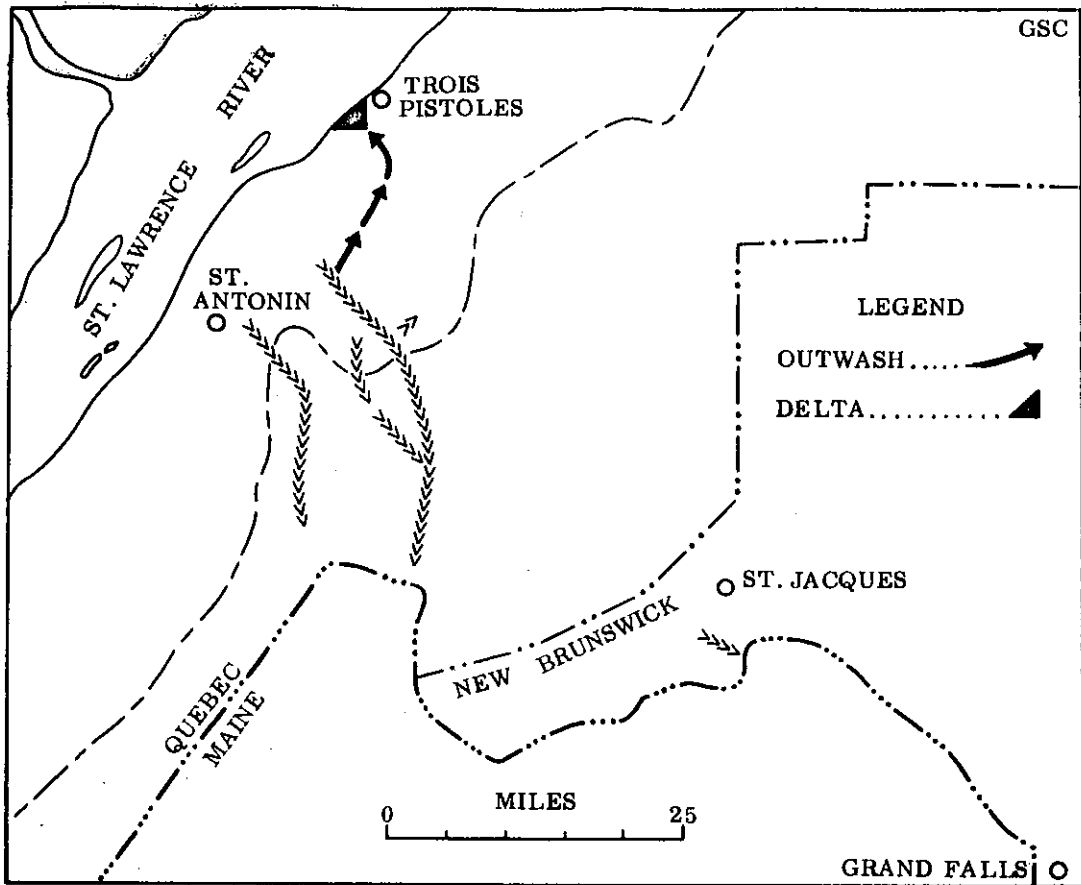


FIG. 5 GLACIAL-MARINE RELATIONS AT TROIS-PISTOLES, QUEBEC

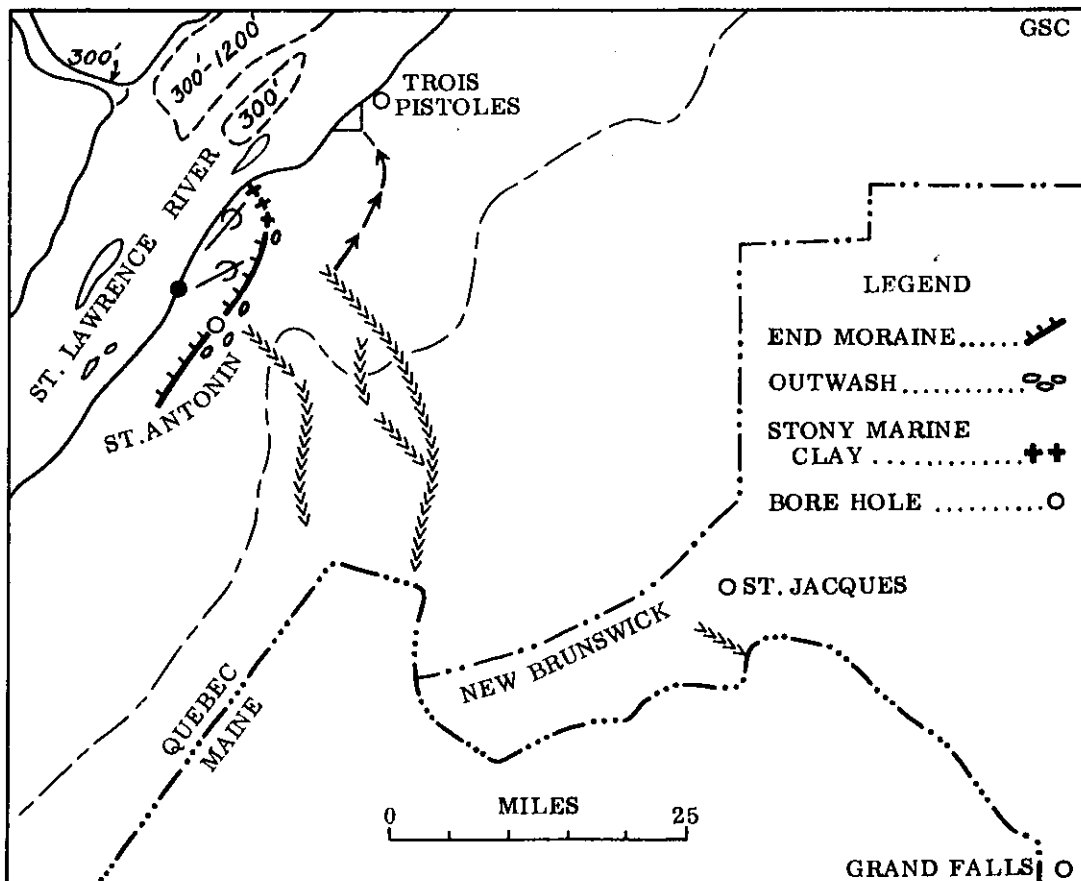


FIG. 6 "ST. ANTONIN" ICE LOBE

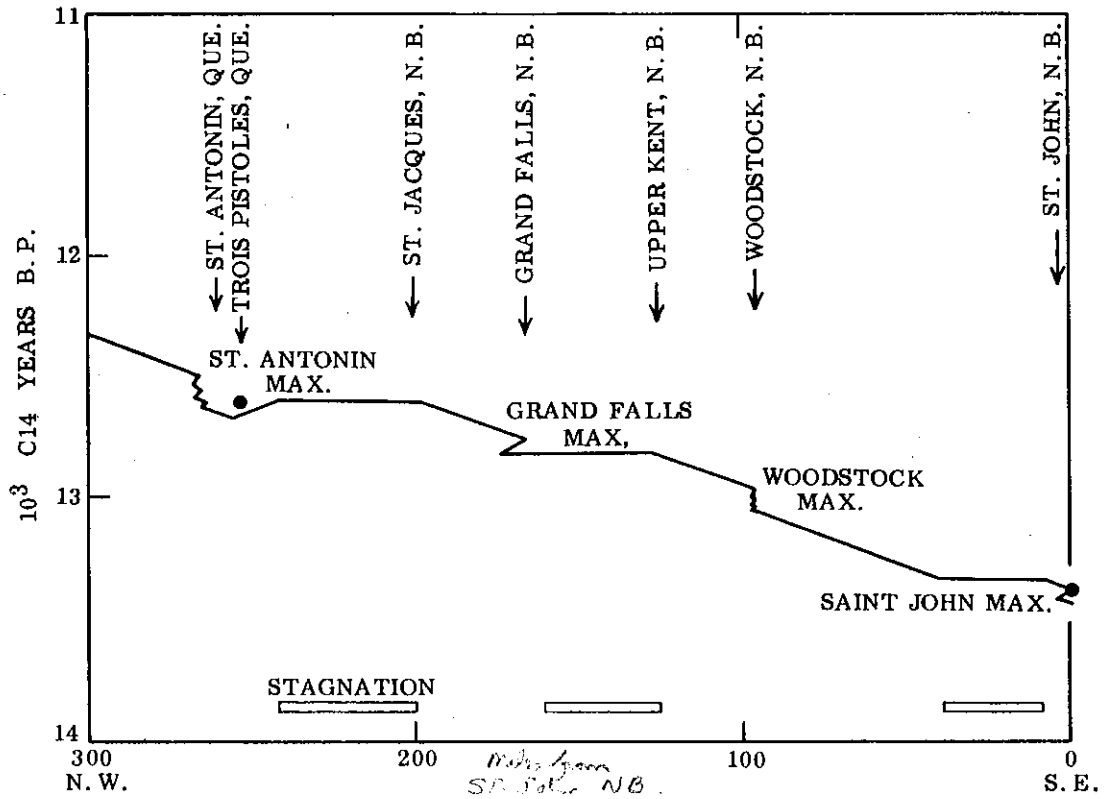


FIG. 7 DEGLACIATION FROM ATLANTIC TO ST. LAWRENCE RIVER

GSC

Science

of Hudson Bay Marine Dept.

St. John's N.S.

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	Prest, V.K.; G.S. Canada	

## SCHEDULE

### FIRST DAY

- 7:00 a. m. - Main dining room of Hotel St-Louis Inn, opens for breakfast. Please remember to pick up lunch.
- 8:00 a. m. - Buses leave from parking lot of Hotel St-Louis Inn.
- 6:00 p. m. - Convention Dining Hall of Hotel St-Louis Inn, Annual Dinner.

### SECOND DAY

- 7:00 a. m. - Main dining room of Hotel St-Louis Inn, opens for breakfast.
- 8:00 a. m. - Buses leave from parking lot of Hotel St-Louis Inn.
- 12:30 noon - Dinner in main dining room of Hotel St-Louis Inn; official end of trip. Optional trip for afternoon will be in private cars.
- 1:45 p. m. - Optional trip leaves from Hotel St-Louis Inn parking lot in private cars.



OPTIONAL TRIP

SUNDAY AFTERNOON

26th ANNUAL REUNION

RIVIERE-DU-LOUP, QUEBEC, CANADA

1963

Leader

J. Terasmae

Geological Survey of Canada

601 Booth Street

Ottawa, Ontario

## OPTIONAL TRIP. SECOND DAY

At 1:45 p. m. the car caravan will leave from the parking lot of the Hotel St.-Louis Inn to a commercially developed bog at the outskirts of Rivière-du-Loup—which will include a short tour through the peat processing plant.

### Trip to the Rivière-du-Loup bog

#### 1. The bog.

This bog has an estimated total area of 7,220 acres. It is 2 miles south of the city of Rivière-du-Loup and is crossed by the main highway to Edmundston. A large part of the bog is wooded.

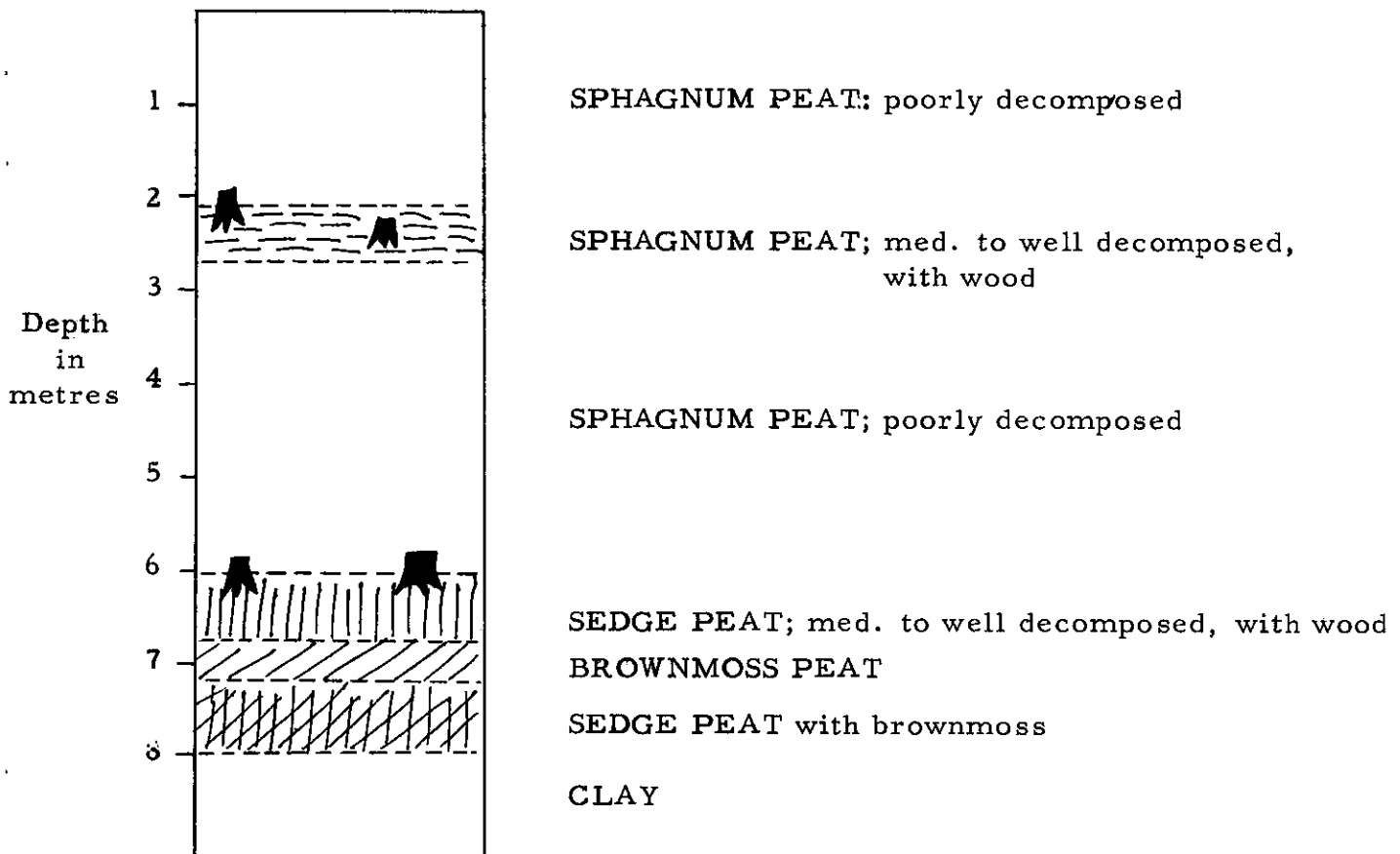
The poorly decomposed Sphagnum peat in this domed bog is suitable for peat moss manufacture, down to a depth of about 6 feet. Deeper, the peat is generally too highly decomposed for good grade peat moss production. However, this peat was considered suitable for use as fuel (Anrep, 1914). An estimate by Anrep gives the figure of 20,000,000 cubic yards as the volume of peat suitable for peat moss production. It was calculated that 1 cubic yard of the bog will furnish about 120 lb. of peat and that the total tonnage of dry peat moss available is ca. 1,161,000 tons, or 1,927,000 tons with 20% moisture.

The total volume of peat fuel was estimated at 94,579,000 cubic yards or about 12,610,000 tons with 25% moisture. Since the use of peat as fuel is not feasible at the present time other possible uses for such peat were investigated by Risi (Risi et al., 1950 and 1955).

2. Display and demonstration of equipment for sampling of bog and lake deposits.

- a) Hiller peat sampler
- b) G. S. C. piston sampler
- c) Combination sediment sampler; includes:
  - Livingstone piston corer
  - Hiller sampler
  - Davis sampler
  - Auger bit
- d) Brown sampler; for water/sediment interface.
- e) Portable depth sounder.

3. Discussion on terminology of bog and lake deposits.



Peat profile in one part of the Rivière-du-Loup bog

(Modified from Auer, 1930)

The usage of terminology and nomenclature as related to bog and lake deposits has been rather inconsistent in North America. Detailed classifications of such deposits have been proposed and accepted in Europe - and may serve as useful guidance.

The purpose of this discussion is to investigate the need for a more co-ordinated terminology and nomenclature of bog and lake deposits in North America and the basic principles which should be employed.

4. Problems of bog studies in postglacial chronology and climatic change.

- a) The sampling site
- b) Completeness of record
- c) The recurrence surfaces

The enclosed map will illustrate adequately the problems of selecting the sampling site for obtaining the most complete and satisfactory record of deposits. The proper location of sampling site is of fundamental importance to the later use of results.

The recurrence surfaces, widely used as stratigraphic markers in bogs of northern Europe, have attracted new attention as to the validity of their previous use. Little is known about this subject in Canada, chiefly because of lack of extensive and detailed studies of bog stratigraphy.

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