Frederick Brook

Highlights
- Oil shales (some of which may burn if heated)
- Fossil fish and fish scales

Directions
Drive 21 km south of Moncton along Route 114 to the town of Hillsborough (Fig. 1). Continue on Route 114 for 4 km until you come to an unnumbered road, designated the Albert Mines Road, going west. Proceed west on this road for 3.6 km nearly to the bottom of a large hill where there is a small church and a secondary road leading to the right (northwest). Follow this unnumbered road for about 1.8 km to a shale pile on the right (west) side of the road. The pile lies near the northeast end of the underground albertite vein and is indicated as stop 6 in Fig. 2. Note that the final 700 m of road leading to the site is not a hard surface.

Precautions
This is a remote site. Do not wander into the bush without a compass and safety pack. The road is not paved so drive with care and caution.

Significance
The area at Frederick Brook, and Albert County in general, became famous in 1849 following discovery of a unique natural substance that became known as albertite. Albertite is a black, glassy, solid bitumen that occurs as a vein along Frederick Brook (Fig. 2). The discovery led to the opening of an underground mine that began production in 1860. By 1879, the mine was depleted: a total of 200,000 tons of albertite had been exported to the United States for the production of kerosene oil and gas.

The Albert Formation underlies the Moncton Subbasin (Fig. 1); it is composed of three members. In ascending order, they are: the Dawson Settlement Member, the Frederick Brook Member, and the Hiram Brook Member. The oil shales at Frederick Brook constitute the type section of the medial Frederick Brook Member. The shales represent a spectacular example of thinly laminated strata deposited in a fresh-water lacustrine environment in Early Carboniferous (Tourmaisian) time. Some shale beds contain well-preserved complete specimens of Palaeoniscid fishes and abundant fish scales.

The Albert shales are highly deformed and folded into upright, south-plunging mesoscopic folds. In addition to these larger folds, there are smaller scale recumbent folds present in exposures along Frederick Brook. The Frederick Brook rocks are bounded on the north and south by regional east-northeast-trending normal faults. To the southeast, the deformed Albert strata are unconformably overlain by the post-tectonic Late Mississippian or Pennsylvanian Enrage Formation.

Regional Geology
The Albert Formation underlies an area of about 3,000 km² in the Moncton Subbasin of southeastern New Brunswick. The Albert strata constitute the medial formation of the Upper Devonian to Lower Mississippian Horton Group (Fig. 2). The Horton rocks represent the first sediments to accumulate in the Moncton Sub-basin. The Sub-basin formed in late Devonian time as a result of normal faulting or strike-slip faulting of deformed Middle Devonian and older crystalline rocks. The Albert Formation is conformably underlain and overlain by the Memramcook and Weldon Formations, respectively. Both the Memramcook and Weldon Formations are composed of alluvial fan and fluviatile red beds. The Horton group rocks are exposed along the south flank of the Subbasin, where in most places the group is in fault contact with the crystalline basement of the Caledonia Uplift. On the north side of the Moncton Subbasin, the Horton rocks are exposed in a northeast-trending belt where they are typically unconformably overlain by Upper Mississippian- or Pennsylvanian-age strata.

The Horton rocks are overlain by Visean-age red beds, carbonates, sulfates, and evaporites of the Windsor Group. The Windsor represents the only known marine sequence in the Carboniferous of New Brunswick. Economically important potash beds occur in the upper evaporites of the Windsor in the Sussex area. The Windsor strata in the Moncton Subbasin are conformably overlain by the late Mississippian to Early Pennsylvanian Hopewell Group. The Hopewell strata are mostly fine-grained red beds lying concordantly on Windsor evaporites.

Pennsylvanian-age, predominantly gray fluviatile