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ROAD LOG, TRIP AF
THE ANTICLINORIUM CORE, AND THE SILURIAN AND
DEVONIAN ROCKS ON ITS NORTHWEST FLANK

By Robert B. Neuman, Leader

Topographic quadrangle maps:

15-minute
Shin Pond

2-degree
Presque Isle

Assemble in front of Shin Pond House, Shin Pond, Maine ready for departure at 8:00 A.M., Friday, September 30. Road limitations dictate that private cars be used. Please insure that (1) each car carries at least 4 people, (2) at the start the fuel tank of each car is full, and (3) the spare tire is inflated and useable. Most stops will be off the road, examining sections in the woods along streams. It will be in the best interests of all participants to keep the group as compact as possible. When the leader decides adequate time has elapsed for examination of the exposures, he will return to the cars and proceed to the next stop. Therefore, keep alert to the movements of the group, and do not risk being left in the woods like Hansel and Gretel. There are no gingerbread houses here.

Mileage

- 0.0 Shin Pond House, facing northwest.
- 0.3 Roadside ledges are thin-bedded, crossbedded quartzite of the Grand Pitch Formation and porphyritic quartz diorite.
- 0.4 Roadside ledges are medium- and dark-gray slate and quartzite of the Grand Pitch Formation.
- 0.5 Very light colored and fine-grained phase of the porphyritic quartz diorite, and Grand Pitch slate.
- 0.9 T5R7 town line.
- 1.3 Wild Land Grocery; T6R6 town line.
- 1.5 T6R7 town line.
- 1.6 Road on right to Snowshoe and Whitehorse Lakes.
- 1.9 View of Sugarloaf Mountain straight ahead. The mountain is capped by a metadiabase sill enclosed in a syncline plunging northeast. Beneath the sill, on the slopes of the mountain is the Shin Brook Formation. The best fossils to come from the Shin Brook were found on the easily climbed southern slope at 1,500 feet altitude.
- 2.6 Spring and lunchgrounds.
- 2.7 STOP 1. SHIN BROOK FORMATION: (fig. 3) Walk down old road to left about 1,300 feet to small clearing, then straight ahead through the bushes to the bank of Shin Brook at an old bridge abutment. At this point, and for about 50 feet to the north, the Grand Pitch Formation is exposed in the streambank. Here it consists of medium- to dark-gray slate, and thin-bedded, laminated, fine-grained, light-gray quartzite. With a little search some crossbedded quartzite can be found. Note the tight, steeply plunging folds.

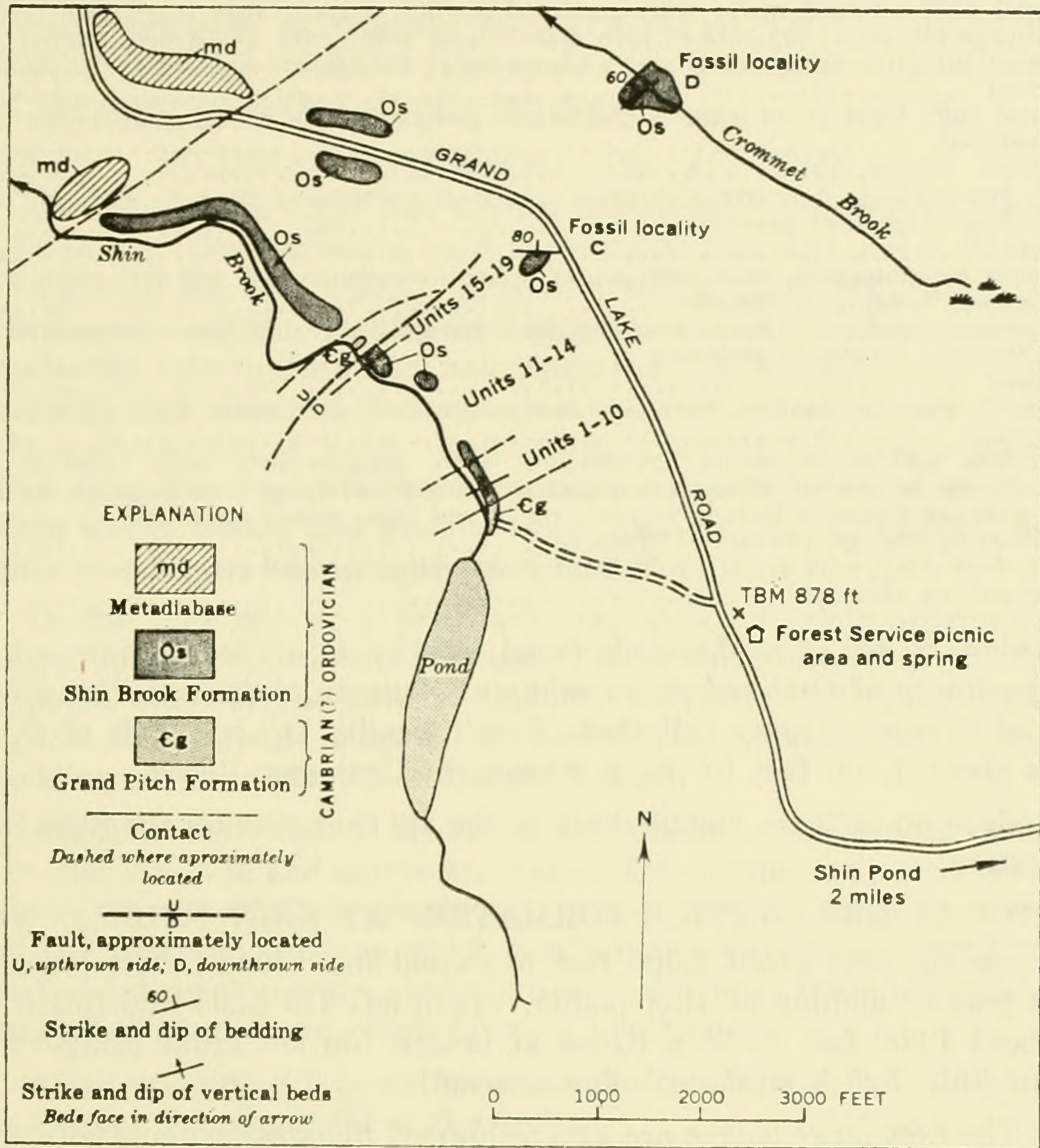


Figure 3. Geologic sketch map of the vicinity of the type section of the Shin Brook Formation; units 1-19 described in text. Patterned areas indicate outcrops

The base of the Shin Brook Formation is just above a spotted slate which is about 2 feet thick. The section measured here (reproduced from U. S. Geol. Survey Bull. 1181-E, p. E-6) consists of:

	Thickness (feet)
Shin Brook Formation: (907 ft. measured of which 304 ft. is exposed)	
19. Tuffaceous sandstone and siltstone in graded layers 3-12 in. thick; with coarse-grained sandstone in the basal part and finely laminated siltstone at the top; siltstone more abundant than sandstone; unit includes two layers of crystal tuff, 6 in. and 2 ft. thick, respectively	35
18. Crystal tuff, greenish-gray; crystals are green altered plagioclase	10
17. Covered	3
16. Tuffaceous sandstone, grit, and conglomerate; finer grained part is well laminated, coarser part not laminated and includes fragments of porphyritic and nonporphyritic fine-grained igneous rock; ledge in streambed has distorted bedding structures that suggest deformation prior to lithification; base concealed	7
15. Tuffaceous sandstone, fine- to medium-grained, calcareous; strongly sheared with weathered pits that may have been concentrations of fragmental fossils; fossils, largely brachiopods, too strongly deformed to be identified	18
14. Covered	70

13.	Crystal tuff, greenish-gray; with scattered angular cognate rock fragments ½-6 in. in average diameter; crystals of both matrix and fragments are green altered plagioclase; no primary layering seen; quartz veins abundant	20
12.	Covered	375
11.	Crystal tuff; light-green altered plagioclase phenocrysts in a darker aphanitic matrix; fractured	45
10.	Covered	95
9.	Tuff, fine-grained, light-greenish-gray; abundant carbonate; strongly sheared, with no bedding structures preserved	30
8.	Covered	30
7.	Volcanic conglomerate, with granules of aphanitic volcanic rock and dark slate, strongly sheared; bedding obliterated	50
6.	Tuffaceous sandstone, gray, medium- and fine-grained; abundant carbonate; bedding obliterated by strong shearing	20
5.	Covered	30
4.	Volcanic granule conglomerate and coarse-grained sandstone, light-gray, strongly sheared	25
3.	Sandstone and conglomerate, interbedded, with conglomerate beds 10-20 in. thick, sandstone somewhat thinner; angular to subrounded fragments as much as 1½ in. in average diameter include volcanic rocks and fine-grained quartzite	35
2.	Phyllite, light-gray, probably tuffaceous	2
1.	Slate, dark-gray, with small (¼-½ mm) white grains (altered plagioclase?) with rhombic outline abundant	2

3.1 Ledges to left of road include fossil locality C of fig. 3 from which large specimens of *Orthambonites robustus* Neuman, deformed *Platystrophia* sp., and bryozoans were collected. Fossil locality D, shell beds of *O. robustus*, is about 1,500 feet to the northeast in Crommet Brook.

3.6 Ledges on left are metadiabase of the sill that overlies the Shin Brook Formation.

4.9 STOP 2. GRAND PITCH FORMATION AT SHIN FALLS: Walk south along old road about 2,500 feet to second small road to left (rushing water is plainly audible at this point). Turn left (to east) and follow this road about 1,200 feet to Shin Brook at bridge (do not cross bridge); then follow Shin Brook westward, downstream.

The first large ledges are greenish-gray, fine-grained quartzite with interbedded gray and red slate. Crossbedding and graded bedding are not as conspicuous as they are in the next exposures downstream.

Exposures at the upper cascades of the falls have somewhat more slate and thinner quartzite layers. Note that from graded bedding and crossbedding, beds face in the same direction for only short distances, and then are abruptly reversed.

Please do not descend waterfalls, but return to road and cars from above log sluice.

- 5.7 Ledges on left are quartzite of the Grand Pitch Formation.
- 5.9 Bridge over Seboeis River.
- 6.7 Road right to Scraggly Lake.
- 8.6 Roadside ledge of Seboomook Formation.
- 9.0 Roadside ledge of Seboomook Formation.
- 10.2 Roadside ledge of Seboomook Formation.
- 10.5 Forest Service Camp; road right to Hay Lake; glimpse of lake from the highway.
- 10.7 Turn left onto Bowlin Pond Road (signs point to Chapmans Camps).
- 12.0 Weathered exposure of Seboomook Formation.
- 12.5 Roadbed "pavement" exposure of Seboomook Formation.

- 12.6 Small road right at Smokey-the-Bear sign; reverse direction of caravan by turning into this road and backing down (south) gravel road the full length of the caravan so that all cars can turn.

STOP 3. SILURIAN SEQUENCE: (fig. 4). Walk south along Bowlin Pond Road about 1,200 feet beyond turnaround to overgrown woods road to left (east). Follow woods road about 1,500 feet east and south to clearing and abrupt left turn uphill. In Bowlin Brook about 300 feet south of this clearing is a small waterfall exposing the base of the Silurian sequence. Opposite the falls to the south, and separated from the Silurian rocks by a covered interval about 10 feet wide, is a ledge of red and green slate and siltstone of the Grand Pitch; southward from this ledge for several hundred feet along the brook are nearly continuous exposures of red, green, and gray slate and siltstone, and greenish-gray, fine-grained, laminated, thin-bedded quartzite typical of parts of the Grand Pitch.

In the falls are gray and dark-gray slate and slaty siltstone with thin seams of coarse-grained sandstone. Note the contrast of deformation on opposite sides of the covered interval; also note that in the Silurian rocks in the waterfall the lineation formed by the intersection of cleavage on bedding surfaces plunges to the northeast.

About 50 feet west of the brook are beds of crudely graded quartzose pebble conglomerate and coarse-grained sandstone that are probably covered beneath the waterfalls in the brook. Above the waterfalls are about 30 feet of red slate and siltstone which are in turn overlain by about 50 feet of interbedded conglomerate, sandstone, and siltstone; these conglomerates contain *Pentamerus* and other Silurian brachiopods.

After examining this section return to the Bowlin Pond Road for examination of the remainder of the section.

The following section was measured in the woods west of the road (fig. 4).

Unit

11. Seboomook Formation, including fossiliferous siltstone at the base.
10. Gray, well-bedded calcareous siltstone with widely scattered comminuted organic debris; 85 feet thick.
9. Calcarenite, largely pelmatozoan debris, with stromatoporoids and favositid corals as much as 6 inches in cross section; 50 feet thick.
8. Calcareous siltstone with silty limestone nodules a few inches in diameter irregularly distributed; 25 feet thick.
Covered interval of 70 feet.
7. Calcareous siltstone, largely massive, but containing a few silty limestone nodules an inch or two in diameter in beds 5 to 10 inches thick separated by fine-grained limestone beds 1 to 2 inches thick, some of which are cut into *boudins* by partitions of siltstone parallel to slaty cleavage; 170 feet thick.
Covered interval of 70 feet.
6. Calcareous siltstone, faintly laminated, with prominent partings at 2- to 10-inch intervals; scarce, fragmentary brachiopods; 65 feet thick.
Covered interval of 85 feet.
5. Calcareous siltstone like Unit 6 above; 50 feet thick.

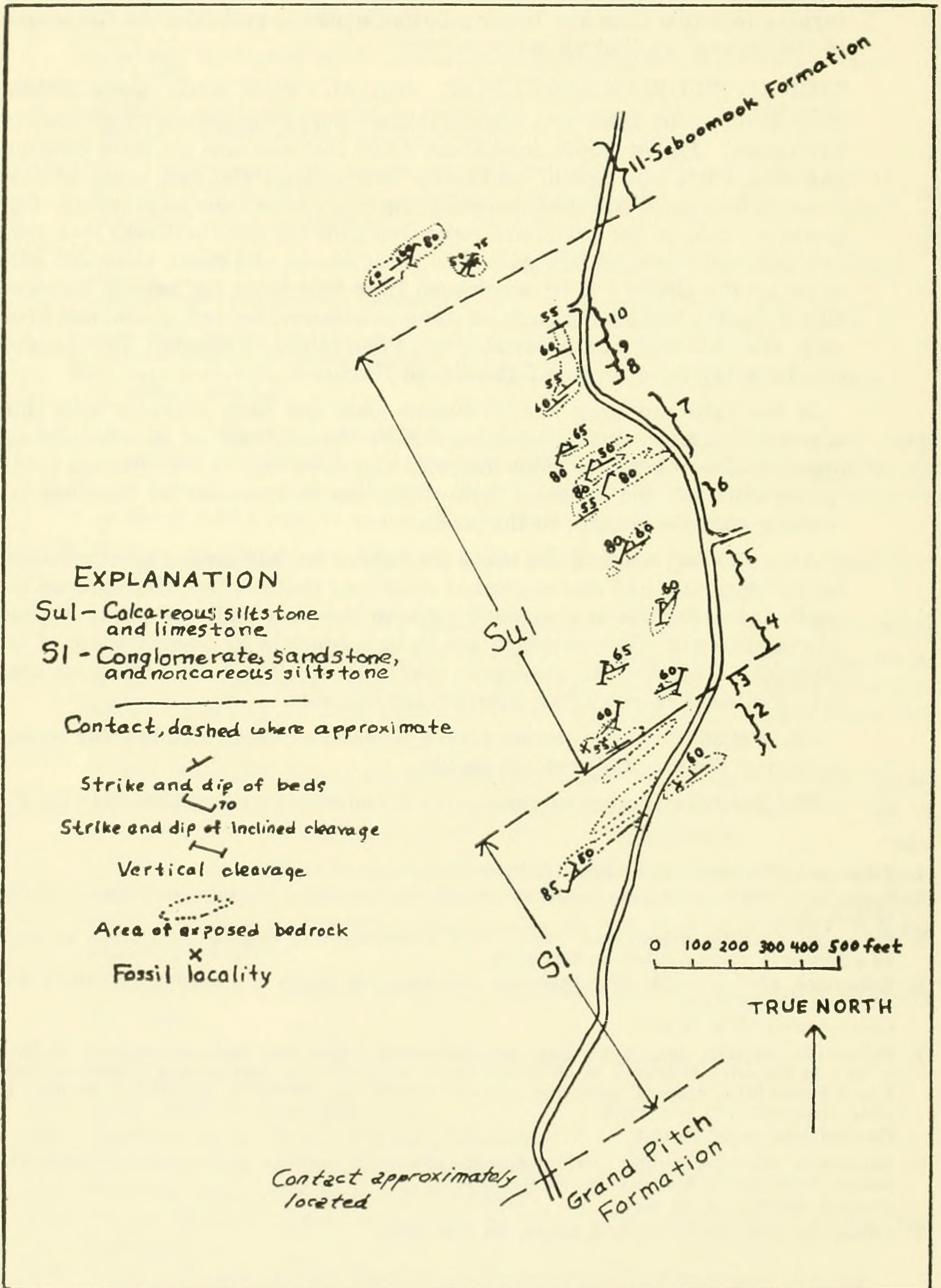


Figure 4. Sketch map showing location of exposures and units of the Silurian sequence along the Bowlin Pond Road, Shin Pond quadrangle

Unit

4. Calcareous fine-grained sandstone and siltstone, mostly in graded beds 4 to 8 inches thick; includes a dark, noncalcareous siltstone bed about 3 feet thick, 10 feet below the top of the unit, that contains abundant, well-preserved brachiopods, trilobites, and corals; 70 feet thick.
3. Pebble and granule conglomerate, sandstone and siltstone, all calcareous, in well-defined graded beds 4 to 8 inches thick; contains fragments of brachiopods and corals; 45 feet thick.

Covered interval of 35 feet.

2. Conglomerate with rounded pebbles and granules, mostly of quartz, but felsitic volcanic rock, quartzite, and tabular fragments of slate and siltstone also common; beds poorly defined, about 4 feet thick; scattered brachiopods, tabulate and rugose corals; 65 feet thick.

Covered interval of 25 feet.

1. Noncalcareous, greenish-gray siltstone and fine-grained sandstone and thin granule conglomerate (exposed in the bed of the Bowlin Pond Road); 5 feet exposed.

Estimated thickness of unexposed beds to the Grand Pitch Formation contact: 575 feet.

Return to Grand Lake Road

Mileage

14.5 Turn right onto Grand Lake Road.

18.5 Turn left onto Scraggly Lake Road.

20.0 Bridge over Sawtelle Brook.

STOP 4. SEBOOMOOK FORMATION AT SAWTELLE FALLS: Ledge on the north bank of Sawtelle Brook is fine-grained sandstone identical to that of the Matagamon Sandstone, one of several that occur throughout the Seboomook.

Walk eastward along old road and trail about 2,000 feet to falls.

The falls afford an especially informative exposure of the Seboomook Formation as large areas of bedding surface are visible. The ripplemarked fine-grained sandstone is especially interesting, as it reveals in plan view what is seen as small-scale crossbedding at the base of graded sets in cross section. Note the regular orientation of the ripplemarks and the relation of their elongation to the intersection of bedding and cleavage.

The plunge pool and its downstream extension follows the trough of a syncline, the beds on the opposite side of the stream dipping steeply northwest. This is the only fold in the area that has a horizontal axis.

Return to cars and to the Shin Pond House. If time permits, the first 2 or 3 stops of Trip AS₂ will be added to the itinerary.