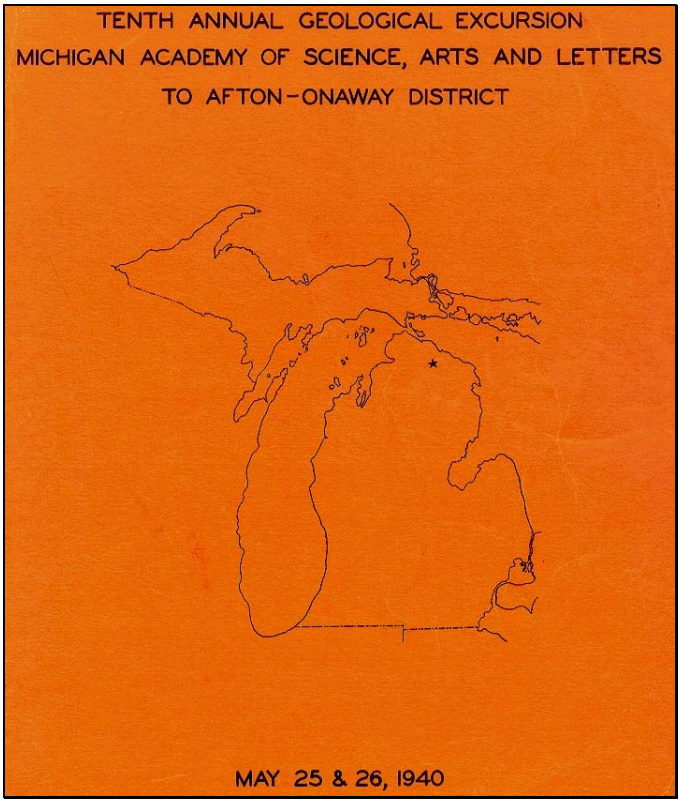


MICHIGAN ACADEMY OF SCIENCE, ARTS AND LETTERS
TENTH ANNUAL GEOLOGICAL EXCURSION
TO AFTON-ONAWAY DISTRICT
May 25-26, 1940

The, excursion will assemble at Onaway, Presque Isle County, at 7.45 A.M., Saturday, May 25. Owing to the impossibility of obtaining lunch for a large group within a reasonable time, it is requested that each person bring his or her own lunch. An attractive spot has been selected for the lunch hour.

The first day (Saturday) will be devoted to a study of the stratigraphy of the Traverse group and correlation of the formations wherever possible, with those studied in the 1937 and 1938 excursions to the Alpena and Petoskey regions. Saturday night there will be a dinner (price $1.00) and discussion at the Ottawa Hotel in Cheboygan.

Sunday will be devoted chiefly to physiographic features. One of the few waterfalls in the Southern Peninsula will be visited, and the solvent action of running water in limestone will be seen at the Little Ocqueoc River, which disappears through enlarged cracks in limestone and at Rainy Lake, which has been known to completely disappear into solution channels in the underlying limestone. Several spectacular sinkholes will be seen, and near Onaway there is a peculiar and striking glacial formation which the group will be asked to theorize upon.

Hotel accommodations are available at Gaylord, Rogers City, Cheboygan, and Petoskey. Cabins are available at Gaylord, Indian River, and Cheboygan. Cabin rates are generally lower than hotel prices.

Please return the inclosed card.

G. M. Ehlers
W. A. Kelly
G. M. Stanley
O. F. Poindexter

Committee

MICHIGAN ACADEMY
OF
SCIENCE, ARTS AND LETTERS

Section of Geology and Mineralogy

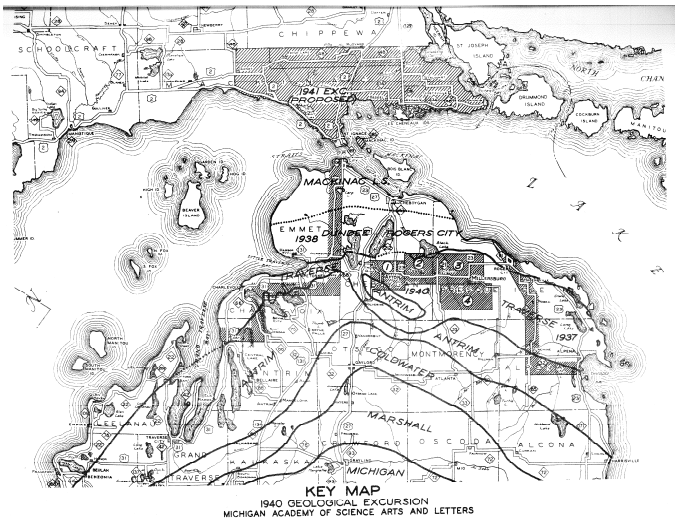
GUIDE BOOK

10th Annual Excursion to AFTON, ONAWAY DISTRICT

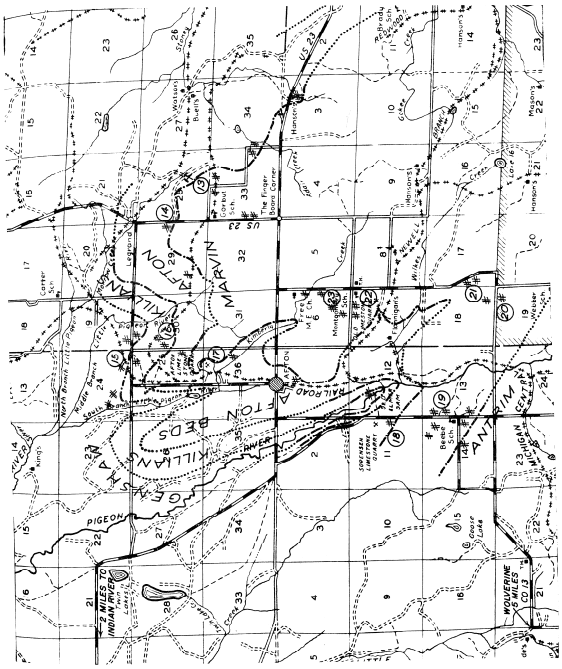
By
W. A. KELLY

Michigan State College

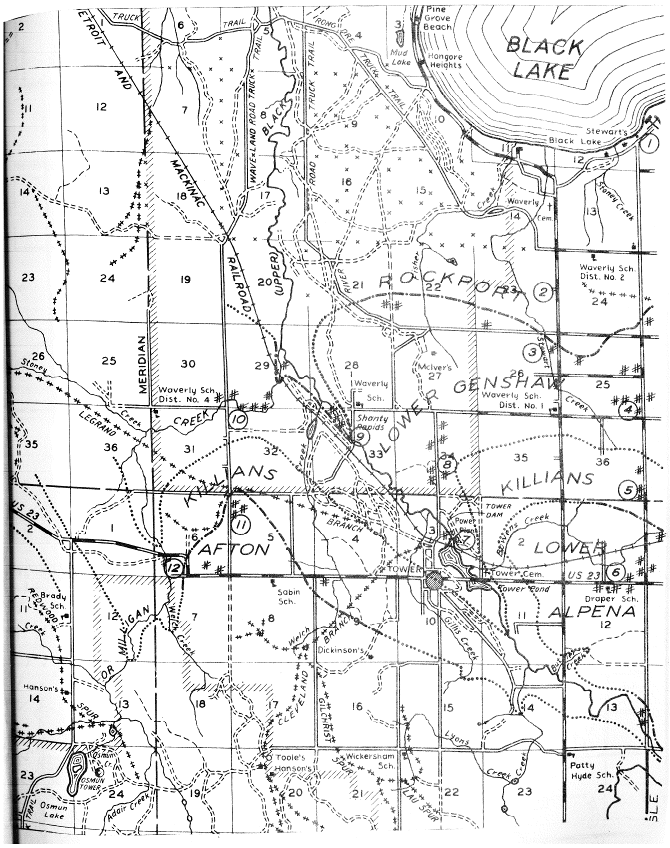
May 25-26, 1940

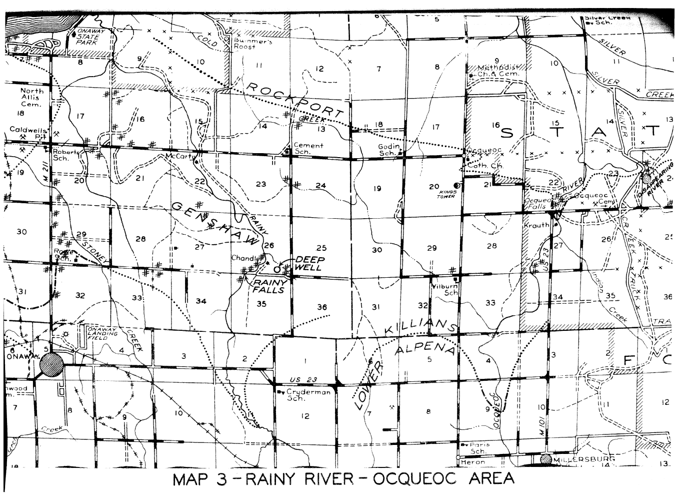


MAP I – AFTON AREA



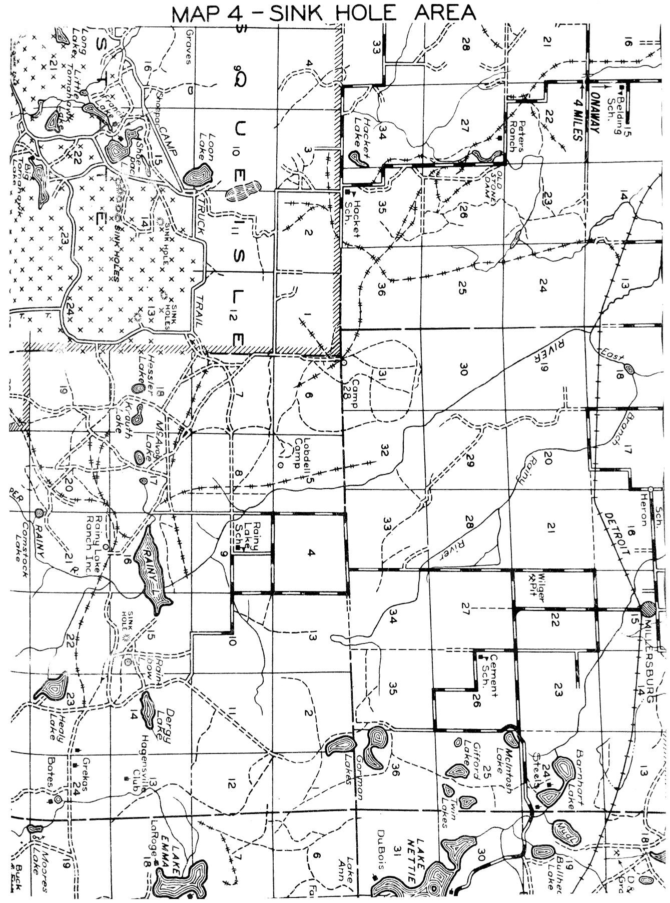
MAP 2 – BLACK RIVER AREA





MAP 3 – RAINY RIVER – OCQUEOC AREA

MAP 4 – SINK HOLE AREA



MICHIGAN ACADEMY OF SCIENCE, ARTS AND LETTERS

SECTION OF GEOLOGY AND MINERALOGY

Tenth Annual Field Excursion, May 25-26, 1940

The formations exposed within the area studied in 1940 (See Key Map) belong entirely to the Traverse group. The sequence is similar in many respects to the section near Lake Huron (Excursion of 1937) and some of the names of formations and members. Bell, Rockport, Ferron Point, Genshaw, Killians, used there are carried over to the Afton and Onaway areas. The upper half of the Afton section cannot be definitely correlated, and provisional names, Afton beds, Marvin beds, Beebe beds, are used in place of Alpena, Norway Point, Potter Farm, Partridge Point, Squaw Bay, employment of which would imply stricter correlation than is justified. (See columnar sections illustrating stratigraphy of Michigan.)

Two well defined anticlinal folds occur in the areas, and evidence for these will be examined in the course of the excursion.

In addition to stratigraphic and structural problems, there is also the problem concerning the origin of peculiar glacial features near Onaway, as well as the origin of the sink-hole district south of Millersburg.

Itinerary

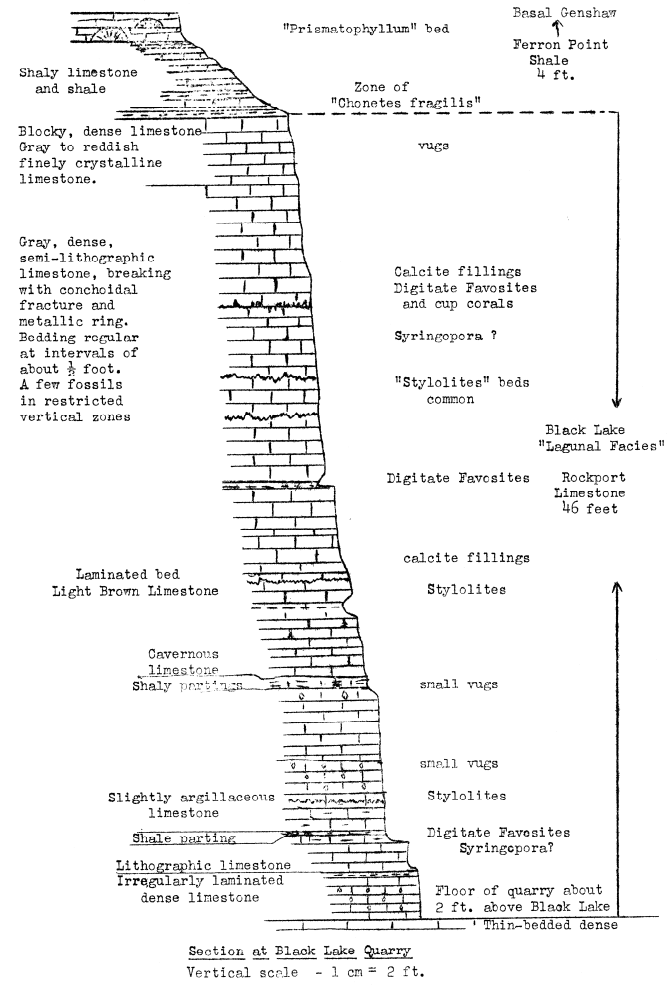
Meet at intersection of M-211 and U.S. 23 in Onaway (Map 3) - Follow M-211 north 5 miles to State Park. Highway crosses low drumlinoids near fair grounds - Occasional outcrops of Gonshaw in roadside ditches and embankments from Sec. 32 to Sec. 20. Turn left at State Park, follow road for 1 mile to the west.

(Map No. 2)

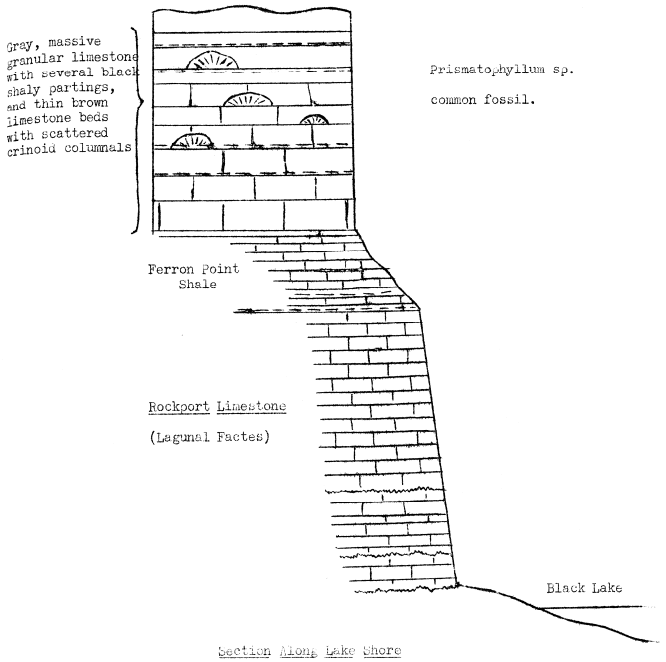
Stop No. 1. Arrive Black Lake Quarry - El. 610 ft. Exposure of Rockport limestone, overlain by Perron Point shale. Because of relatively strong local dip to the northeast, these two formations dip below lake level within a distance of a few hundred feet, and the bluffs along the lake shore expose the lower Genshaw. (For details of section see accompanying figures.) The dense limestone of this section is comparable to the upper part of the Rockport limestone in the Rockport Quarry, and may represent a lagunal facies. The fauna is sparse and represented principally by cup corals and branching Favosites. The massive Prismatophyllum is absent.

The Ferron Point shale is exposed at the top of the quarry, and also along the lake shore. It carries a rich fauna characterized by corals and brachiopods, including the form, Chonetes fragilis, which is diagnostic of the Ferron Point in the Lake Huron section.

The basal Genshaw is a massive, impure limestone with many black shale partings. It contains many overturned specimens of Prismatophyllum. Throughout the limestone there are also many scattered crinoid columnals.



Section at Black Lake Quarry
Vertical scale - 1 cm = 2 ft.



Section Along Lake Shore
1100 Feet N. 75° E. of Quarry
Vertical Scale - 1 cm = 2 ft.

Stop No. 2. Drift exposure along road between sections 23 and 24, 2 miles south and one mile west of Black Lake quarry. The gravel in the cut is composed almost entirely of dense, lithographic limestone similar to that exposed in Black Lake quarry, and probably reflects, the underlying rock.

Stop No. 3. Elevation 772 ft. Excavation in the northeast quarter of section 26. Very fossiliferous shale boulders of apparent local derivation, containing Ferron Point fauna. The high elevation of this shale indicates an easterly dip towards Black Lake.

Stop No. 4. Exposures on north face of 25 foot bluff, 1/4 mile north of the southeast corner of section 25. Elevation of base of bluff 772 ft. The beds here belong to the lower Genshaw, and include the following fossils: Prismatophyllum sp., Atrypa large species with narrowed and high brachial valve, Gypidula romingeri, Spirifer like euryteines, Sp. mucronatus, Stropheodonta like erratica, Stropheodonta, sp. with indistinct fold on pedicle valve. Large Stromatoporoids also occur near the top of the section.

Stop No. 5. Exposure of black shale and limestone, belonging to the Killians member, in southeast corner of section 36. Characteristic fossils include large subspherical heads of Favosites like alpenensis, Prismatophyllum sp, Spirifer like mucronatus, thick variety, Spirifer like euryteines, large variety, Gypidula sp, small Stropheodonta, Gomphoceroid.

Stop No. 6. Exposures of Lower Alpena limestone in roadside cuts on the south side of U.S. 23, 1-1/4 miles west of Onaway. Some of the limestone lacks stratification and suggests a reef facies. The exposures of stratified limestone are crystalline and crinoidal, and are in contrast to the dense lithographic limestone, which, in the area to the west, is known to overlie the Killians. Few fossils other than flat stomatoporoids and cup corals occur in these beds.

Stop No. 7. Exposures of strongly dipping Genshaw limestone at damsite north of Tower. The uppermost bed, a massive limestone, contains numerous specimens of Gypidula romingeri, large Atrypa, Spirifer like euryteines, large variety. Many of these form the nuclei of spherical stromatoporoids. natural sections being common on glaciated surfaces. The massive limestone is underlain by shaly limestone, which contains many bryozoa.

Stop No. 8. Exposures of Genshaw shale and limestone on roadside through center of section 34, 1-1/2 miles north of Tower. The presence of specimens of Goriphoceras, a large cephalopod, as well as fish plates, suggests the Killians fauna, and these beds are probably high in the Genshaw.

Stop No. 9. Shanty Rapids. Elevation 690 feet. The rapids are formed from ledges of dense limestone of the Rockport. The beds are also, exposed in the banks of the stream at intervals for half a mile, and also near the mouth of Milligan Creek. The fauna is poor, and consists of ostracods, cup corals and digitate Favosites.

Stop No. 10. Bridge across Milligan Creek on road between sections 29 and 30. Exposures of Genshaw limestone and shale in valley bluffs and bed of stream. Outcrops occur at intervals downstream for a distance of about 3/4 of a mile.

Stop No. 11. Base of north slope of hill in northwest corner of section 5. Elevation 755 feet. The surface of the hill is mantled with blocks of dense semi-lithographic limestone similar to the Afton beds which are exposed in the lower part of the Afton quarry. (See Stop No. 17.) The character of the rock suggests an origin similar to that for the Black Lake exposures, and this may represent a lagunal facies of the Lower Alpena. This facies is not recorded east of this exposure.

On leaving stop No. 11 note basal beds of Afton exposed in ditches along U.S. 23 where that highway cuts diagonally through section 6.

Stop No. 12. Bridge across Milligan Creek on U.S. 23. Elevation 752 feet. Black limestone of the Killians exposed in ledges at low water level beneath the bridge. Characteristic blocks of the Killians member have been thrown out near the west approach to the bridge.

Change to Map No. 1

The position of this outcrop with respect to the dense beds exposed at a higher elevation 3/4 of a mile to the east serves to establish the correlation of the dense, semi-lithographic limestone as the Afton.

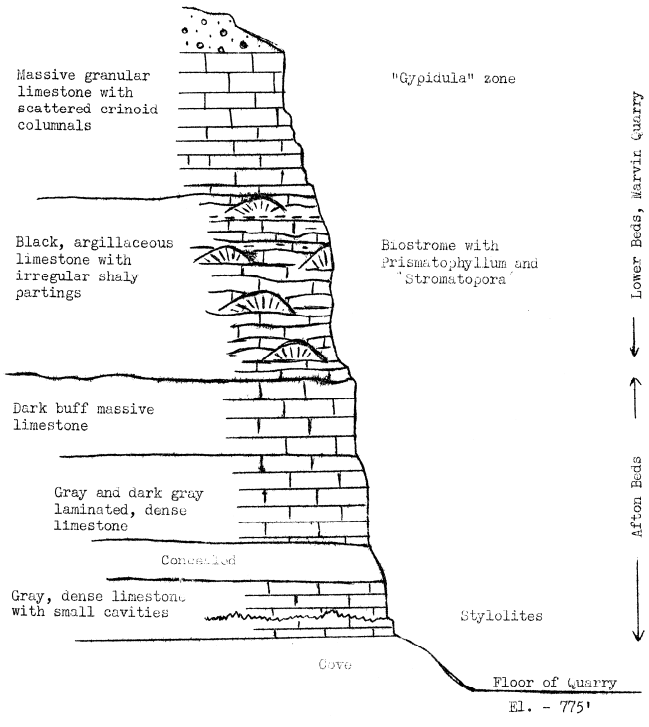
Note high linear ridge, probably an esker,

which crosses highway near the east boundary of section 2. This ridge is continuous, except for minor breaks, to the morainic area north of Le Grand.

Other exposures of glacial material near Hanson's spring in section 3 show a high percentage of dense semi-lithographic material. Northwest of the spring the highway is underlain by ledge rock, blocks of which were thrown to one side of the road at the time of construction. The loose blocks are similar in lithology, and fossil content to the section exposed at stop No. 13.

Stop No. 13. Elevation about 825 feet. Exposure of massive crystalline limestone in cut of abandoned right-of-way. These beds are higher than any exposed in the Le Grand quarry (near the center of section 28) and belong to the Marvin. The fossils include Gypidula sp. with smooth umbo; a large Stropheodonta resembling the species from the Gravel Point formation; and a cylindrical coral, Diversophyllum sp., which also suggests the Gravel Point.

Stop No. 14. Exposure on roadside (U.S. 23), between 1/2 and 3/4 mile north of Gorbut School. The rocks are exposed on the north slope of a bluff which is continuous with that of the Le Grand quarry. (See accompanying section.) The lithology is characteristic of the Afton beds.



Section at Le Grand Quarry

Vertical scale
1 cm = 2 ft.

Stop No. 15. Elevation 710 feet. Corner between sections 19, 24, 25, and 30. Ledges of upper Crenshaw in open field north of section 25, and exposures of Killians black shale and limestone along roadside which follows line between sections 24 and 25. Note slabs of Crenshaw limestone covered almost entirely with valves of Spirifer mucronatus (brachiopod with extended hinge line). Other slabs of Genshaw possess a more varied fauna, including brachiopoda such as Schizophoria sp. Spirifer like euryteines, Cyrtina sp., Athyris sp., and bryozoa such as Fenestella sp., and Sulcoretepora sp.

Stop No. 16. Higher beds of Killians exposed in open field in section 30. Fossils include Favosites, alpenensis, Prismatophyllum sp., several genera of brachiopoda, a large cephalopod, and fish plates.

Following the road south the elevation increases about 100 feet between the northeast and the southeast corners of section 25, so that one crosses several formational boundaries.

Stop No. 17. Afton Quarry. Elevation of rim of quarry about 817 feet. This quarry furnishes an important key to the correlation of the area, and the details of the section are illustrated by an accompanying profile section.

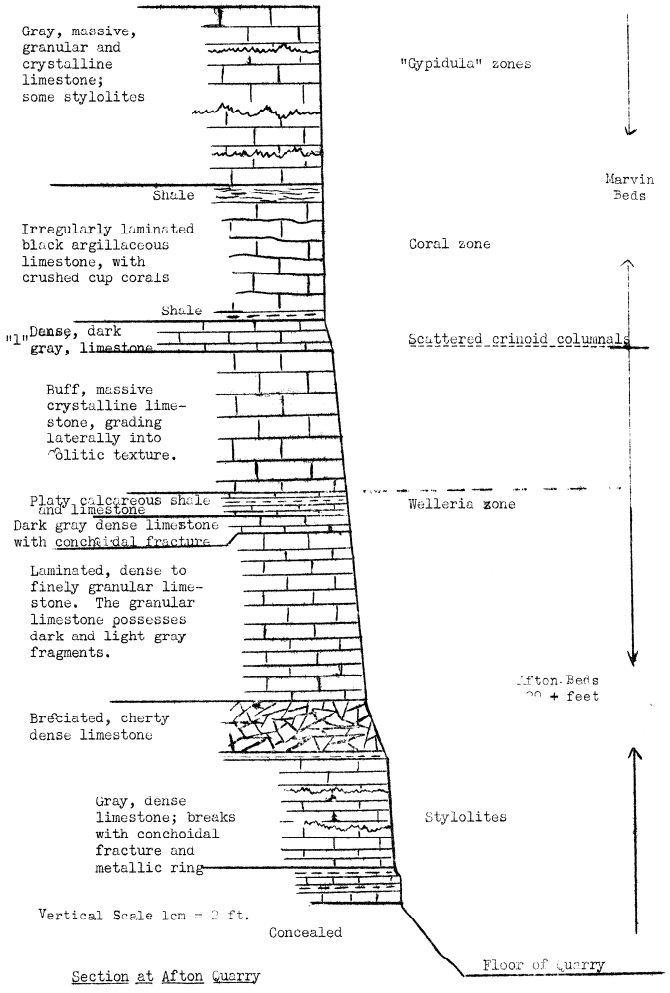
Note the minor structures exposed in the walls of the quarry, the synclinal sags being emphasized by the remnants of the black beds of the Lower Marvin.

Stop No. 18. Sorenson quarry. Elevation about 795 feet. Exposure of dense, semi-lithographic limestone with many solution cavities. This bed is assigned to the Afton, partly on its lithology, and partly on its position with respect to an outcrop of the Genshaw limestone (elevation about 750 feet) on the banks of the Pigeon River about 1/2 mile to the east. South of the Sorenson quarry loose blocks of the ostracod and oolite beds have been found.

Stop No. 19. Exposures of limestone stratigraphically above the Marvin beds on both the steep and gentle slopes of northwest trending cuestas. The average inclination of these beds is close to 2-1/2 degrees to the southwest. Between the outcrop of limestone (assigned to the Marvin) on the north side of the small creek flowing through sections 13 and 14, and the Antrim exposures, west of the Beebe

School, there is a calculated thickness of about 125 feet. This relatively small thickness either includes strata equivalent to the thick Alpena and Thunder Bay formations, or indicates non-deposition of, or unconformities within the Upper Traverse of the Afton area. The section has not been carefully studied, and its position with respect to a specific member, or members, of the better known Lake Huron or Little Traverse Bay sections, is not known.

Stop No. 20. Outcrop of limestone of Upper Marvin. The chief fossil is a relatively small Atrypa with coarse radial plications and concentric flanges.



Section at Afton Quarry

Stop No. 21. Outcrop of black limestone member of Lower Marvin in bottom of gully in southwest corner of section 17. The strata here carry the same fauna as that of the black limestone in the Afton and Marvin quarries.

Stop No. 22. Marvin quarry. To the north of the quarry is the Campbell No. 1 elevation 847 feet, which was drilled to a depth of 650 feet, and which intersected the Rogers City limestone at 380 feet. The log of this well serves as an adequate check on much of the Traverse of this area as it starts in the Upper Marvin beds.

At the west end of the quarry beds of the Afton are exposed, but owing to an easterly dip, higher beds of the Lower (Black) and Upper (Gray) Marvin are exposed in the main portion of the quarry.

Note the biostrome consisting principally of heads of stromatoporoids and two varieties of Prismatophyllum. In one of the latter the calycs are small and suggest a species occurring in the lower part of the Michigan Alkali quarry at Alpena.

Stop No. 23. Outcrop of both lower and upper Marvin beds on west face of bluff.

Map No. 3.

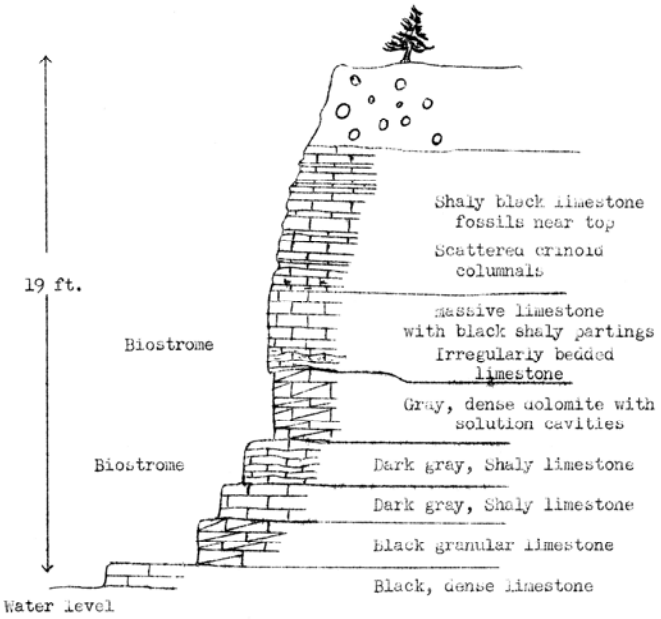
On the road east of Onaway note the long low drumlinoids just beyond the railway crossing. Other examples can be noted at the turn in the road at the southeast corner of section 35.

Stop No. 24. Outcrop of Genshaw limestone and shaly limestone in gully in southeast corner of section 26. The massive limestone shows numerous examples of Gypidula romingeri and large Atrypa, and the horizon suggests the Gypidula bed at the Tower damsite. The deep well, elevation 787 feet near this gully logged the Dundee (Rogers City) at 187 feet.

One half mile west of the corner are extensive exposures of lower Genshaw limestone and shale along the Rainy River. This stream has cut a miniature gorge below a small waterfalls formed by domed ledges of the Genshaw. Small sink-holes present, here, bear a distinct relationship to former stream channels.

Stop No. 25. Ocqueoc Falls. Outcrops of limestone, dolomite, and shale of the Rockport formation (See profile section). The strata here are in strong contrast to those exposed at Black Lake, but compare quite closely in lithology, as well as in faunal content, with the exposures in the Rockport quarry north of Alpena.

Stop No. 26. Little Ocqueoc River. Outcrops of Rockport formation in isolated channels of Little Ocqueoc. The underlying beds have caved in many places, and the stream flows below the surface.



Section at Ocqueoc Falls

(Vertical Scale - 1 cm. = 2 ft.)

Map No. 4

Stop No. 27. Broad deep valley about 7 miles south of Millershurg. Within this valley are several examples of sink-holes, including those below Rainy Lake. Records state that the lake has disappeared at least twice, and at the tine of the last disappearance, Mr. Gregg of Onaway, obtained many photographs of the lake bottom before the waters returned.

END OF TRIP