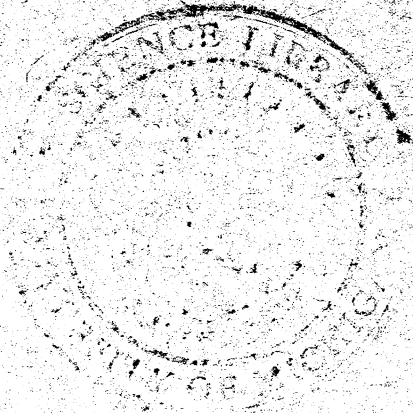




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LITHOLOGY AND INSOLUBLE RESIDUES  
OF A CORE FROM THE DETROIT  
RIVER GROUP

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of the requirements for the degree  
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Lithology and Insoluble Residues of a Core  
from the Detroit River Group

INTRODUCTION

The middle Devonian section in Southeastern Michigan contains several formations. In ascending order they are the Sylvania sandstone, Detroit River group, Dundee limestones, and equivalents of the Silica shale and Ten Mile Creek dolomite of northwestern Ohio.

The stratigraphic units studied in this investigation comprise the Detroit River group. This group consists mainly of dolomites with some limestones and a few beds of gypsum. In the central part of the state where the formations thicken considerably there are some salt and anhydrite beds in the Detroit River group. The group has been divided into four formations which in ascending order are the Flat Rock dolomite, Amherstburg dolomite, Lucas dolomite, and Anderdon limestone (Grabau and Sherzer, 1909, p. 27). It is possible that the Flat Rock dolomite is not a separate unit but rather a part of the Amherstburg dolomite.

PREVIOUS WORK

Previous workers with the Detroit River group have been handicapped by the fact that the section, as exposed in outcrops and quarries, is discontinuous. At no one locality is the section exposed in its entirety. Type sections of the four formations previously listed are widely separated and it is difficult, if not impossible, to make a lithologic

correlation between the type sections and other nearby sections presumably at the same horizons. In addition, the contact between the Detroit River group and the Dundee limestone is often very difficult to place accurately. This is usually due to insufficient fossil evidence and lack of lithologic differences of the respective formations at the contact zone. The contact between the Sylvania sandstone and the Detroit River group is not as difficult to place, as more often than not there is a sharp break from sandstone to dolomite.

#### STATEMENT OF THE PROBLEM

A complete section of the Detroit River group was obtained from a continuous core obtained by drilling through the Devonian and into the upper Silurian rocks. The well was drilled by the International Salt Company at a site one-half mile west of the Oakwood Salt Shaft which is in the Delray Concession, Detroit, Wayne County, Michigan. The core was presented to the University of Michigan in 1947.

After penetrating 94' of drift the core drill struck bedrock in the Dundee limestone and after drilling through a series of limestones and dolomites penetrated the Sylvania sandstone at a depth of 415'11", giving a total thickness of 321'11" for the combined Dundee limestone and Detroit River group. This is the first continuous core to be drilled entirely through the Detroit River group.

The purpose of this investigation is to make a lithologic description of this complete section of the Detroit

River group as revealed in the core and to place the contact between the Detroit River group and the Dundee limestone.

Fossils found in the core are to be examined by Drs. Ehlers and Stumm. It is hoped that the four major divisions in the Detroit River group may be established in the section as revealed in the core on the basis of the fossil evidence.

For aid in this investigation the writer is indebted to Dr. George V. Cohee, Professor George M. Ehlers, Professor Kenneth K. Landes, Professor Maurice W. Senstius, and Professor Erwin C. Stumm.

#### METHODS OF INVESTIGATION

The laboratory procedure used in the investigation is identical to that described in an unpublished Master's Thesis by Gerald A. Cooley (1947, pp. 2-4). This procedure is essentially the same as that employed by G. E. Eddy (1932, pp. 345-361).

The core was studied by hand methods and divided into units on the basis of lithologic differences.

Samples of approximately 50 grams were taken from each unit described in the core. Several samples were taken from the basal unit, and in the vicinity of the contact between the Detroit River group and the Dundee limestone samples were taken at each inch. The samples were weighed on an analytical balance to an accuracy of 1/100 gram. They were placed in 1,000 cc. beakers, and 250 cc. of commercial



hydrochloric acid, diluted to half strength, was added. The samples were then allowed to digest at room temperature. Watch glasses were placed over the beakers in case the reactions were violent enough to expel part of the clay fractions.

After digestion was complete the samples were filtered through filter papers of previously determined weights. Care was taken in transferring the liquids from the beakers to the filter papers so as to prevent tearing of the latter, which may occur when the liquids are transferred too rapidly. Next, the residues and filter papers were thoroughly washed after filtration to remove any soluble salts. If such salts were to remain, the weights of the residues would be increased considerably in case the residues were small, thus causing an appreciable error in the final computation of weight-percentages.

After having washed the filter papers and residues, they were placed in an oven to dry at about 100° C. After six to eight hours of drying they were removed from the oven, cooled to room temperature, and accurately weighed to 1/100 gram.

The weight of the residues were obtained by subtracting the original weights of the filter papers from the weights of the filter papers plus the residues, and the weight percentages computed. The residues were then removed from the filter papers and put in glass vials for further study.

It was found to be most convenient to run a set of ten samples at one operation. While one set was digesting, another set was prepared, filter papers were weighed, and computations kept up.

The residues obtained were examined with a binocular microscope. In general, medium magnification was used in order to obtain a large field and yet have sufficient magnification to distinguish the different types of residue. At times a high magnification was desirable. The residues were divided into sand, silt, and clay on the basis of grain size. The sand fraction was largely composed of quartz with small amounts of pyrite, magnetite, and celestite in a few samples. Chert, gypsum, and bituminous material, when present, were considered regardless of grain size. The percentages by volume were visually estimated in each sample.

#### DESCRIPTION OF CORE AND RESIDUES

To determine the contact between the Detroit River group and the Dundee limestone samples were taken at each inch for 24 inches. Dr. Stumm has placed the contact somewhere in this span. The information is as follows:

<u>Sample</u>	<u>Weight Percentage of Total Residue</u>	<u>Percentage by volume of total residue</u>
X	12.58	Silt, 50; clay 40; gypsum, 10.
W	11.76	Silt, 100.
V	13.13	Sand, 1; silt, 99.

<u>Sample</u>	<u>Weight Percentage of Total Residue</u>	<u>Percentage by volume of total residue</u>
U	7.97	Sand, 30; silt, 60; clay, 10.
T	5.60	Sand, 5; silt, 30; clay, 65.
S	7.01	Silt, 20; clay, 80.
R	5.93	Silt, 20; clay, 80.
Q	6.57	Sand, 1; silt, 30; clay, 69.
P	9.44	Silt, 50; clay, 30; gypsum, 10; bituminous material, 10.
O	6.64	Sand, 5; silt, 65; clay, 25; bituminous material, 5.
N	5.35	Sand, 5; silt, 60; clay, 35; some magnetite.
M	7.09	Sand, 10; silt, 80; clay, 10; some magnetite.
L	7.05	Sand, 20; silt, 50; clay, 25; gypsum, 5.
K	5.16	Sand, 5; silt, 30; clay 30; gypsum 35
J	14.35	Sand 90; silt 8; clay 2.
I	5.49	Sand 5; silt 15; clay 20; gypsum 60.
H	4.74	Sand 10; silt 20; clay 50; gypsum 20; some magnetite.
G	3.58	Sand 10; silt 80; clay 5; gypsum 5; some magnetite.
F	5.91	Sand 20; silt 20; clay 10; gypsum 50.
E	2.04	Sand 50; silt 30; clay 20.
D	1.91	Sand 35; silt 45; clay 10; bituminous material, 10.
C	1.87	Sand 30; silt 40; clay 20; gypsum 5; bituminous material 5.
B	2.57	Sand 25; silt 45; clay 5; gypsum 20; bituminous material 5; some pyrite and magnetite.
A	2.83	Sand, 15; silt, 60; clay, 25.

The contact between the Detroit River group and the Dundee limestone is characterized by a basal sand. Residue "J" marks the contact in this case as the sand content at "J" rises to 90% of the total residue and is much lower than this on either side. This point is 155'10" below the surface and 61'10" below the top of the Dundee limestone.

The section studied in the core was divided into units on the basis of lithologic differences. A residue determination was taken from each unit and is included with the description.

	<u>Feet</u>	<u>Inches</u>
<u>Dundee limestone</u>		
15. Limestone, sandy, bituminous, brownish gray, coarse grained, slightly porous with layers of rotted chert present. Unfossiliferous .....	7	10
Total Residue: 4.17%. % by Volume: Sand, 60; silt, 30; bituminous matter, 10.		
14 Limestone, sandy, light buff, medium grained and slightly porous with few laminations present. Unfossiliferous.....	4	1
Total Residue: 3.25%. % by Volume: Sand, 10; silt, 80, clay, 10.		
13. Limestone, sandy, earthy, light gray, medium grained becoming coarse at top, compact. A few fine laminations present. Very fossiliferous .....	10	0
Total Residue: 11.34%. % by Volume: Sand 20; silt, 30; clay 10, bit. 40.		
12. Limestone and gypsum, very bituminous, dark brown and light gray. Appears brecciated. Very fossiliferous .....	0	5
Total Residue: 45:. % by Volume: Sand 5; silt 10; gypsum 85.		

	<u>Feet</u>	<u>Inches</u>
11. Limestone, light buff, medium grained and compact. Unfossiliferous.....	1	0
Total Residue: 4.17%. % by Volume: Silt, 60; clay, 40.		
10. Limestone, buff gray, coarse grained and porous, with heavy laminations present. Unfossiliferous.....	1	3
Total Residue: 8.93%. % by Volume: Sand, 5; silt, 80; clay, 5; bituminous matter, 10		
9. Limestone, very sandy, bituminous, gray, coarse grained, gashed, and heavily laminated. Unfossiliferous .....	0	5
Total Residue: 13.90%. % by Volume: Sand, 30; silt, 50; bituminous matter, 20.		
8. Limestone, white to gray with brown mottling, very fine grained, nearly lithographic. Irregular laminations present at top. Unfossiliferous .....	2	8
Total Residue: 6-17%. % by Volume: Silt, 70; clay, 30.		
7. Limestone, slightly argillaceous, light buff with brown mottling, fine grained and compact with irregular wavy laminations present. More argillaceous and finer grained at top. Unfossiliferous .....	2	7
Total Residue: 10.14%. % by Volume: Sand, 5; silt, 85; clay, 10.		
6. Limestone, dolomitic, buff to white, medium grained, porous, heavily laminated. Appears brecciated. Unfossiliferous .....	0	9
Total Residue: 7.83%. % by Volume: Sand, 5; silt, 45; clay, 30; bituminous matter, 20 .....		
5. Limestone, argillaceous, white to gray with bluish mottling at top. Fine grained and porous. Unfossiliferous .....	1	5
Total Residue: 4.77%. % by Volume: Sand, 1; silt, 60; bituminous matter, 39.		

	<u>Feet</u>	<u>Inches</u>
4. Limestone, dolomitic, sandy, light tan, fine grained and porous with heavy laminations and layers of bituminous matter present. Veins and angular fragments of calcite throughout unit. Unfossiliferous .....	2	10
Total Residue: 13.39%. % by Volume: sand, 20; silt, 60; clay, 20.		
3. Dolomite, sandy, tan, very fine grained, porous, with small areas of bituminous material present. Very sandy at top. Unfossiliferous .....	1	6
Total Residue: 8.78%. % by Volume: Sand, 10; silt, 80; clay, 10.		
2. Limestone, buff to tan grading to a gray blue with whitish mottling. Medium grained and porous, laminations and stylolites present. Fossiliferous .....	4	2
Total Residue: 9.44%. % by Volume: Silt, 50; clay, 40; gypsum, 10.		
1. Limestone, sandy, light gray with brown mottling, fine grained and compact. Fossiliferous .....	0	6
Total residue: 7.05%. % by Volume: Sand, 20; silt, 50; clay, 25; gypsum, 5.		

Detroit River Group.

118. Limestone, sandy, light gray with brown mottling, fine grained and compact with wavy laminae at base. Bituminous at top and capped by a stylolite. Unfossiliferous.....	0	10
Total Residue: 3.58%. % by Volume: Sand, 10; silt, 80; clay, 5; gypsum, 5; some magnetite.		
117. Dolomite, sandy, light gray, dense and compact with wavy laminae and stylolite, chalky at top. Unfossiliferous.....	0	6
Total Residue: 2.57%. % by Volume: Sand, 25; silt, 45; clay, 5; gypsum, 20; bituminous material, 5; some magnetite		

	<u>Feet</u>	<u>Inches</u>
116. Limestone, light buff, fine grained and compact with wavy laminae. Unfossiliferous	0	3
Total Residue: 1.19%. % by Volume: Sand, 10; silt, 80; clay, 10.		
115. Dolomite, sandy, buff, fine grained and slightly porous, stylolitic. Upper part very coarse and very porous. Unfossiliferous...	1	0
Total Residue: 2.40%. % by Volume: Sand, 5; silt, 80; clay, 15.		
114. Dolomite, argillaceous, buff gray, very fine grained and porous, laminations and stylolites present. Unfossiliferous.....	0	10
Total Residue: 5.41%. % by Volume: Sand, 5; silt, 60; clay, 35.		
113. Dolomite, sandy and chalky, gray to buff gray, very fine grained and porous with a gashed appearance, evenly laminated. Top 4" very very fine and but slightly porous. Unfossiliferous.....	1	5
Total Residue: 1.47%. % by Volume: Sand, 1; silt, 90; clay, 9.		
112. Dolomite, argillaceous and sandy, light gray with bluish mottling at top, very fine grained and very porous, gashed in spots, calcareous in some areas with vertical veins of calcite. Unfossiliferous.....	4	3
Total Residue: 2.29%. % by Volume: Sand, 5; silt, 80; clay, 15.		
111. Limestone, sandy, pearl gray, fine grained and porous with a few wavy laminae. Dolomitic at top with a heavy bituminous layer 4" from top. Unfossiliferous .....	2	0
Total Residue: 1.61%. % by Volume: Sand, 5; silt, 70; clay, 25.		
110. Dolomite, sandy, light buff gray to grayish tan, fine grained and porous with specks of gypsum and bituminous material, cross-cutting laminations, chalky at top. Unfossiliferous.	2	9
Total Residue: 1.87%. % by Volume: Silt, 20; clay, 80.		

*Plumotrochus tricarinatus*  
*Stropharolus*  
*Goniatitrocha*  
*Rhynchodroma*

Anderson ls. gastropod zone  
 13' 10" below base of  
 Dundee ls.

11

Feet    Inches

- { 109. Dolomite, sandy, light grayish tan, dense and very porous, friable at top. Fossiliferous 1 6  
 Total Residue: 2.33%. % by Volume: Silt, 10; clay, 90.
108. Dolomite, sandy, light grayish tan with brownish mottling at top, fine grained and very porous, gashed, laminated, and very friable at top. Unfossiliferous..... 2 10  
 Total Residue: 1.53%. % by Volume: Silt, 15; clay, 85.
107. Dolomite, light gray with brown mottling, fairly fine grained and compact, speckled with gypsum and bituminous material, irregular wavy laminations present. Unfossiliferous.... 2 5  
 Total Residue: 3.61%. % by Volume: Silt, 10; clay, 5; gypsum, 85.
106. Dolomite, light blue gray, fine grained and compact, with alternate thin layers of cherty and carbonaceous material. Heavily laminated and stylolitic. Unfossiliferous ..... 0 9  
 Total Residue: 10.91%. % by Volume: Silt, 15; clay, 5; chert, 80.
105. Dolomite, slightly sandy, creamy gray to dark buff, medium grained and very porous, gashed and pitted, laminated and friable. Unfossiliferous ..... 2 3  
 Total Residue: 3.99%. % by Volume: Sand, 10; silt, 70; clay, 10; gypsum, 10.
104. Dolomite, sandy, light tan with brown mottling, fine grained and porous, slightly gypsiferous, wavy laminations present. Laminations more frequent at base with greater sand content, capped by a brittle shaly layer. Unfossiliferous..... 1 11  
 Total Residue: 3.39%. % by Volume: Sand, 15; silt, 45; clay, 35; gypsum, 5.
103. Dolomite, creamy gray, medium grained and very porous, gashed and pitted. Unfossiliferous ..... 0 11  
 Total Residue: 5.47%. % by Volume: Sand, 10; silt, 80; clay, 10.



	<u>Feet</u>	<u>Inches</u>
102. Dolomite, siliceous, dark brownish gray, very fine grained and porous, with specks and vertical verins of gypsum. Top 2" a brecciated mass of gypsum and dolomite below which is a stylolite. Unfossiliferous .....	1	3
Total Residue: 1.01%. % by Volume: Sand, 20; silt, 20; clay, 10; gypsum, 40; chert, 10.		
101. Dolomite, bluish gray. Mised with crystalline gypsum, appearance of whole unit contorted. Unfossiliferous .....	0	3
Total Residue: 2.72%. % by Volume: Sand, 15; silt, 70; clay, 5; gypsum, 10.		
100. Dolomite, earthy, light tan, coarsely crystalline and very porous, gashed at base, very gypsiferous. Top 4" of unit much finer and almost lithographic. Unfossiliferous .....	1	8
Total residue: 3.70%. % by Volume: Silt, 5; clay, 10; gypsum, 85.		
99. Dolomite, light blue gray, very fine grained and compact, almost lithographic. A stylolite filled with bituminous material midway in the unit. Unfossiliferous .....	1	1
Total Residue: 1.71%. % by Volume: Sand, 10; silt, 5; gypsum, 85.		
98. Dolomite, light gray, fine to coarse grained, very porous, gashed, gypsiferous with vertical veins of gypsum. Midway in the unit a stylolite in a mixed layer of gypsum and bituminous material. Upper 7" of unit very hard and very gypsiferous. Fossiliferous .....	1	3
Total Residue: 3.17%. % by Volume: Clay, 5; gypsum, 95.		
97. Dolomite, buff gray, fine grained, slightly porous, gypsiferous. Very fossiliferous.....	0	6
Total Residue: 2.24%. % by Volume: Clay, 10; gypsum, 90.		

	<u>Feet</u>	<u>Inches</u>
96. Dolomite, gritty, dark tan, coarse grained, compact, gypsiferous. Capped by a bituminous layer. Unfossiliferous .....	0	6
Total Residue: 2.24%		
% by Volume: Clay, 10; gypsum, 90.		
95. Dolomite, light tan, crystalline, porous, gashed, pitted, and contorted. Very fossiliferous .....	0	9
Total Residue: 9.54%		
% by Volume: Sand, 15; silt, 40; gypsum, 45.		
94. Dolomite, buff gray, medium grained and compact, gashed at top, gypsiferous, and laminated. Fossiliferous .....	1	4
Total Residue: 6.25%		
% by Volume: Sand, 70; silt, 20; gypsum, 10.		
93. Dolomite, tan, coarse grained at top with remainder very fine and compact, gypsum in streaks with wavy laminations, gashed near top. Unfossiliferous .....	1	6
Total Residue: 1.43%		
% by Volume: Sand, 5; silt, 55; clay, 30; gypsum, 10.		
At this point 14' of rock are missing.....	14	0
92. Dolomite, slightly sandy, dark tan with blue-gray mottling, very fine grained and compact, heavily pitted in some areas, and very gypsiferous at top. Unfossiliferous.....	1	9
Total Residue: 4.31%. % by Volume: Sand, 1; gypsum, 99.		
91. Dolomite, light gray, fine grained and porous, gashed at top. Unfossiliferous .....	0	10
Total Residue: 1.66%. % by Volume: Silt, 10; clay, 10; gypsum, 80.		
90. Dolomite, sandy, light buff to buff gray, medium grained and quite compact, gashed at top, and very bituminous. Unfossiliferous...	1	0
Total Residue: 5.26%. % by Volume: Sand, 20; silt, 20, clay, 60.		

	<u>Feet</u>	<u>Inches</u>
89. Dolomite, light blue gray with blue mottling, very fine grained and compact, gashed, gypsiferous, contains many laminations filled with carbonaceous material. Upper part brecciated and stylolitic with top inch a lithographic bluish dolomite. Fossiliferous .....	1	0
Total Residue: 47.76%. % by Volume: Clay, 5; gypsum, 95.		
88. Dolomite, argillaceous, slightly sandy, light buff, very fine grained and fairly compact, gashed, gypsiferous with vertical veins of gypsum, toward the top carbonaceous filled laminations appear. Unfossiliferous.....	4	6
Total Residue: 6.52%. % by Volume: Clay, 5; gypsum, 95.		
87. Dolomite, buff gray, coarse grained and porous, very gypsiferous in basal foot, slightly laminated, and capped by a layer of brittle shale. Very fossiliferous .....	4	2
Total Residue: 12.74%. % by Volume: Silt, 1; gypsum, 99.		
86. Dolomite, earthy, siliceous, light gray, lithographic, few fine laminations. Unfossiliferous .....	0	9
Total Residue: 1.36%. % by Volume: Sand, 10; silt, 10; clay, 20; chert, 60.		
85. Dolomite, sandy, light gray with bluish mottling, upper part of unit very fine grained and compact, lower part slightly porous, gypsum in small veins and stringers concentrated midway in unit, heavily laminated, and stylolitic. Unfossiliferous .....	0	10
Total Residue: 1.43%. % by Volume: Sand, 80; silt, 20.		
84. Dolomite, light buff gray, coarse grained and compact, very gypsiferous, irregularly laminated, capped by a bituminous filled stylolite. Fossiliferous .....	1	11
Total Residue: 5%. % by Volume: Gypsum 100%.		

	<u>Feet</u>	<u>Inches</u>
83. Dolomite, grayish white to white, very fine grained and compact, contains gypsum in pea-sized chunks, and a bituminous layer at top. Base of unit a pebbly bituminous mass, with a similar layer 4" above base. Unfossiliferous	0	9
Total Residue: 1.84%. % by Volume: Clay, 60; gypsum, 40.		
At this point 1' of rock is missing .....	1	0
82. Base of unit a pebbly surface of dolomite and gypsum which grades into a conglomerate with a matrix of light tan dolomite and pebbles of dark blue dolomite; pebbles up to 3.5" in diameter, decreasing in size upward. Entire unit gypsiferous with specks and vertical veins of gypsum. Unfossiliferous .....	1	1
Total Residue: 17.06%. % by Volume: Silt, 2; gypsum, 98.		
81. Dolomite, argillaceous, (light pearly gray, fine grained and compact, finely laminated with elliptical masses of brown carbonaceous material. Unfossiliferous .....	0	4
Total Residue: 6.33%. % by Volume: Sand, 20; silt, 80.		
80. Dolomite, sandy, dark tan, crystalline and compact, evenly laminated. A layer of brittle blue shale at top. Unfossiliferous .....	1	9
Total Residue: 5.85%. % by Volume: Sand, 10; silt, 70; clay, 20.		
79. Dolomite, slightly sandy, dark buff gray, fine grained, mainly compact but porous at top, very gypsiferous, wavy laminations with elliptical masses of carbonaceous material parallel to the laminations. Fossiliferous.....	4	5
Total Residue: 1.5%. % by Volume: Sand, 5; silt, 15; gypsum, 80.		
78. Dolomite, sandy, light gray, fine grained and compact, gypsum in specks and vertical veing, laminated. Fossiliferous .....	0	11
Total Residue: 0.41%. % by Volume: Silt, 10; clay, 90.		

	<u>Feet</u>	<u>Inches</u>
77. Dolomite, sandy, dark grayish brown, very coarse grained and compact, with chunks and vertical veins of gypsum. Fossiliferous ....	1	3
Total Residue: 26.12%. % by Volume: Sand, 15; silt, 70; clay, 10; gypsum, 5.		
76. Gypsum, variety selenite, translucent to brown. Base and top brecciated gypsum and sandy, light gray, very fine grained dolomite. Unfossiliferous .....	1	5
Total Residue: 90.70%. % by Volume: Gypsum, 100.		
75. Dolomite, slightly sandy, light gray with dark blue gray mottling, very fine grained and compact. Small patches and vertical veins of gypsum, carbonaceous filled laminations present. At top laminations become wavy and unit more gypsiferous. Unfossiliferous.....	2	11
Total Residue: 6.17%. % by Volume: Silt, 10; clay, 5; gypsum, 85.		
74. Gypsum, selenite and granular, translucent to brown. Base of unit brecciated gypsum and argillaceous, light gray, fine grained, compact dolomite. Dolomite evident throughout unit in patches and stringers with a very contorted appearance. Unfossiliferous .....	6	9
Total Residue: 92.30%. % by Volume: Gypsum, 100.		
73. Dolomite, argillaceous, light buff gray, fine grained and compact, gashed, with some gashes gypsiferous, wavy laminations present with bands of gypsum parallel to laminae. At top laminae contorted with much bituminous material. Unfossiliferous .....	2	0
Total Residue: 5.84%. % by Volume: Silt, 2; clay, 3; gypsum, 95.		
72. Dolomite, sandy buff, very fine grained and slightly porous with small patches of crystalline gypsum. Base heavily laminated. Upper part very bituminous and of a darker color. (1' of this unit missing) Fossiliferous .....	2	6
Total Residue: 2.19%. % by Volume: Sand, 10; silt, 20; clay, 70.		

	<u>Feet</u>	<u>Inches</u>
71. Dolomite, earthy, dark buff gray at base and light buff gray at top, very fine grained and porous, porosity extreme in basal foot with much gypsum. Laminations abundant in basal and top parts of unit. Fossiliferous .....	3	9
Total Residue: 1.05%. % by Volume: Silt, 5; clay, 95.		
70. Dolomite, slightly sandy, dark buff, fine to coarse grained and porous, gypsiferous. Irregular but heavy cross-cutting laminae and a stylolite at top. Unfossiliferous .....	3	10
Total Residue: 0.96%. % by Volume: Clay, 60; gypsum, 40.		
69. Dolomite, light gray, fine grained and porous, gypsiferous with specks and vertical veins of gypsum, a stylolite at top. Unfossiliferous.	0	10
Total Residue: 20.51%. % by Volume: Gypsum, 100		
68. Dolomite, light buff to white, very fine grained and slightly porous, gashed, gypsiferous. Upper part almost lithographic with a stylolite at top. Unfossiliferous .....	1	2
Total Residue: 0.96%. % by Volume: Clay, 60; gypsum, 40.		
67. Dolomite, sandy, light buff gray with dark gray mottling, 1" thick at base of Dark buff bands, medium grained and very porous, gashed, gypsiferous with specks and vertical veins of gypsum. Fossiliferous .....	4	6
Total Residue: 11.43%. % by Volume: Sand, 8; silt, 2; gypsum, 90; gypsum in form of contact and penetration twins.		
66. Dolomite, argillaceous, light gray, very fine grained and porous, gashed, gypsiferous, heavily laminated. Laminae wavy with layers of bituminous material between them. Stylolites at middle and top of unit. Unfossiliferous.....	0	9
Total Residue: 2.34%. % by Volume: Clay, 70; gypsum, 30.		

	<u>Feet</u>	<u>Inches</u>
65. Dolomite, argillaceous, dark buff, fine to medium grained, slightly porous, gashed, very gypsiferous with specks and vertical veins of gypsum. Contains many wavy laminations. At top a bituminous layer with a stylolite. Fossiliferous .....	4	0
Total Residue: 2.96%. % by Volume: Clay, 30; gypsum, 70.		
64. Dolomite, earthy, buff gray, very fine grained, very porous, gashed, very gypsiferous, and evenly laminated. Fossiliferous.....	2	7
Total Residue: 3.72%. % by Volume: Clay 35; gypsum, 65.		
63. Dolomite, light gray, very fine grained, compact, gypsiferous. Carbonaceous filled laminations present. Unfossiliferous.....	-	7
Total Residue: 1.09%. % by Volume: Clay, 60; gypsum, 40.		
62. Dolomite, sandy, dirty tan, coarse grained, very porous, very gypsiferous. Concentration of laminae 19" above base. Above this point unit extremely gypsiferous. Very fossiliferous .....	2	6
Total Residue: 2.26%. % by Volume: Silt, 5; clay, 10; gypsum, 85.		
61. Dolomite, earthy, light to dark buff gray, medium grained, slightly porous, gypsiferous, A thin argillaceous layer at top. Fossiliferous .....	3	2
Total Residue: 1.96%. % by Volume: Clay, 60; gypsum, 40.		
60. Dolomite, light buff gray with dark buff gray mottling, very fine grained, porous, and gypsiferous. A heavy concentration of sub-rounded pieces of gypsum averaging 1/4" in diameter 6" above the base. Unfossiliferous..	1	1
Total Residue: 0.91%. % by Volume: Clay, 1; gypsum 99.		

	<u>Feet</u>	<u>Inches</u>
59. Dolomite, sandy, light buff gray, very fine grained, porous, gashed. A thin layer of dark brown granular gypsum at top. Unfossiliferous .....	0	10
Total Residue: 12.67%. % by Volume: Silt, 30; gypsum, 70.		
58. Dolomite, sandy, light buff gray, fine grained, porous, gypsiferous. A heavy concentration of gypsum in upper 8". A stylolite with bituminous filling at top. Unfossiliferous .....	4	8
Total Residue: 3.89%. % by Volume: Silt, 3; clay 2; gypsum 95.		
57. Dolomite, sandy, dark buff, fine grained, slightly porous, and heavily laminated. Laminae with bituminous filling. Unfossiliferous.	0	7
Total Residue: 3.40%. % by Volume: Sand, 20; silt, 40; clay, 30; magnetite, 10.		
56. Dolomite, similar to Unit 57, but gypsiferous and containing fewer laminae. Unfossiliferous..	5	1
Total Residue: 2.81%. % by Volume: Sand, 20; silt, 20; clay, 30; gypsum, 30.		
55. Dolomite, sandy, light buff gray, fine grained, porous, gypsiferous with veinlets of gypsum, laminated with laminae 30" to horizontal in uppermost part of unit. A stylolite at top. Unfossiliferous .....	0	9
Total Residue: 1.74%. % by Volume: Sand, 10; clay, 70; gypsum, 20.		
54. Dolomite, light buff gray, fine grained, porous, very gypsiferous. A half inch layer of brown crystalline gypsum 19" above base. A stylolite at top with half inch of bituminous, heavily laminated, dark brown dolomite. Unfossiliferous.....	2	2
Total Residue: 2.72%. % by Volume: Clay, 5; gypsum, 95.		
53. Dolomite, earthy, light gray to pearly white, fine grained, very hard, gashed, gypsiferous with specks and vertical veins of gypsum. Unfossiliferous .....	1	4
Total Residue: 14.68%. % by Volume: Clay, 20; gypsum, 80.		



	<u>Feet</u>	<u>Inches</u>
52. Dolomite, argillaceous, light buff gray, very fine grained, compact, gypsiferous. Extremely gypsiferous at top. Stylolites with bituminous fillings 16" and 45" above the base. Small pebbles of white dolomite, sub-rounded to angular, on either side of lower stylolite. Unfossiliferous .....	6	6
Total Residue: 2.06%. % by Volume: Clay, 20; gypsum, 80.		
51. Dolomite, light buff with gray and white mottling, very fine grained, slightly porous, very hard, gypsiferous. Mottling heavy at base. A few laminae in a concentrated zone of 6" thick beginning at a point 3" above base. Layers of blue brittle shale 42" and 55" above base between which gypsum content rises. Unfossiliferous...	4	10
Total Residue: 1.61%. % by Volume: Clay, 10; gypsum, 90.		
50. Dolomite, slightly sandy, light gray, fine grained, slightly porous, gashed, gypsiferous. A few but even laminae. A stylolite at top above 10" of bituminous layers. Unfossiliferous .....	5	4
Total Residue: 2.32%. % by Volume: Sand, 5; silt, 15; clay, 10; gypsum, 70.		
49. Dolomite, earthy, light gray to light buff, very fine grained, slightly porous, gypsiferous, some celestite, many laminae, and stylolites. Some calcareous areas present. A hard heavily laminated bituminous layer at top. Unfossiliferous .....	3	10
Total Residue: 5.56%. % by Volume: Clay, 10; gypsum, 90; some celestite is present.		
48. Dolomite, light gray with tan mottling, fine grained, compact, very gypsiferous at base, some celestite throughout. Upper inch heavily laminated. Unfossiliferous .....	0	11
Total Residue: 8.02%. % by Volume: Clay, 24; gypsum, 75; celestite, 1.		

	<u>Feet</u>	<u>Inches</u>
47. Dolomite, sandy, buff, fine grained, very porous, gashed, gypsiferous. Contains small elliptical masses of bituminous material with few laminae. Unfossiliferous .....	3	6
Total Residue: 3.34%. % by Volume: Sand, 20; silt, 40; clay, 20; gypsum, 20.		
46. Gypsum, white to dark brown, crystalline and granular. A layer of argillaceous, gypsiferous dolomite 12" thick at top. Unfossiliferous.	0	8
Total Residue: 10.15%. % by Volume: Clay, 15; gypsum, 85.		
45. Dolomite, argillaceous, light pearly gray, fine grained, compact, brittle, gypsiferous, and heavily laminated. Unfossiliferous .....	1	0
Total Residue: 18.47%. % by Volume: Clay, 15; gypsum, 85.		
44. Dolomite, argillaceous, light pearly gray, compact, dense with a reworked appearance. Many contorted laminae in basal part. Unfossiliferous.....	1	5
Total Residue: 6.75%. % by Volume: Clay, 10; gypsum, 90.		
43. Dolomite, light gray, medium grained, very porous, gypsiferous. A stylolite just below top with a thin layer of fibrous gypsum above it. Unfossiliferous .....	0	8
Total Residue: 9.33%. % by Volume: Sand, 5; silt, 10; clay, 5; gypsum, 80.		
42. Dolomite, light gray, fine grained, slightly porous, gypsiferous. A few even laminae present. Unfossiliferous .....	0	10
Total Residue: 12.06%. % by Volume: Silt, 5; clay, 15; gypsum, 80.		
41. Dolomite, argillaceous, white to buff, very fine grained, compact, gypsiferous, with specks and small stringers of gypsum. Closely laminated, with an average of 12 laminae per inch. Unfossiliferous .....	1	4
Total Residue: 5.22%. % by Volume: Clay, 30; gypsum, 70.		

	<u>Feet</u>	<u>Inches</u>
40. Dolomite and gypsum, brecciated, dark brown to black with much bituminous material. Unfossiliferous .....	0	3
Total Residue: 8.01%. % by Volume: Gypsum, 100.		
39. Dolomite, sandy, light gray, very fine grained, compact, gypsiferous, contains wavy laminae with bituminous fillings. A bituminous layer present at top. Unfossiliferous .....	2	7
Total Residue: 3.25%. % by Volume: Sand, 60; silt, 15; clay, 15; gypsum, 10.		
38. Dolomite, slightly sandy, light gray, very fine grained, compact and gypsiferous with specks and vertical veins of gypsum. Unfossiliferous .....	3	3
Total Residue: 9.30%. % by Volume: Silt, 5; clay, 10; gypsum, 85.		
37. Dolomite, sandy, light buff gray with blue gray mottling, finely crystalline and compact, slightly porous, Gypsiferous at top. Unfossiliferous .....	1	0
Total Residue: 5.09%. % by Volume: Sand, 35; silt, 35; clay, 20; gypsum, 10.		
36. Dolomite, argillaceous, changing to pearl gray at top, light tan, fine grained, porous, Contains vertical veins of gypsum. Unstyolitic and heavily laminated with laminae wavy at top. Fossiliferous .....	3	3
Total Residue: 4.90%. % by Volume: Clay, 35; gypsum, 65.		
35. Dolomite, argillaceous, light buff gray, fine grained, porous, contains vertical veins of gypsum. Unfossiliferous .....	0	6
Total Residue: 4.68%. % by Volume: Clay, 55; gypsum, 45.		

	<u>Feet</u>	<u>Inches</u>
34. Dolomite, argillaceous, whitish gray, very fine grained, compact, gypsiferous. Contains contorted laminae with bituminous fillings. Fossiliferous .....	0	8
Total Residue: 4.14%. % by Volume: Clay, 20; gypsum, 80.		
33. Dolomite, light gray, very fine grained, compact, gypsiferous, containing wavy laminae with bituminous fillings. Unfossiliferous ...	0	8
Total Residue: 4.40%. % by Volume: Silt, 5; clay, 35; gypsum, 60.		
32. Dolomite, argillaceous, slightly sandy, light gray, fine grained, compact, gypsiferous. A stylolite with bituminous filling present at top. Fossiliferous .....	0	11
Total Residue: 11.18%. % by Volume: Sand, 10; silt, 5; clay, 45; gypsum, 40.		
31. Dolomite, light gray, fine grained, porous. Contains many solution cavities with gypsum fillings. Unfossiliferous .....	0	9
Total Residue: 9.14%. % by Volume: Clay, 20; gypsum, 80.		
30. Dolomite, chalky, light gray, fine grained, slightly porous, gypsiferous. Contains wavy laminations with bituminous fillings. Unfossiliferous .....	0	7
Total Residue: 5.86%. % by Volume: Clay, 15; gypsum, 85.		
At this point 1' of rock is missing .....	1	0
29. Dolomite, argillaceous, light gray, fine grained, porous, and gypsiferous, Fossiliferous .....	0	7
Total Residue: 3.69%. % by Volume: Clay, 90; gypsum, 10.		
28. Dolomite, cherty, buff gray, medium grained, very porous, and very gypsiferous. Fossiliferous .....	1	1
Total Residue: 19.40%. % by Volume: Clay, 5; gypsum, 65; chert, 30.		

	<u>Feet</u>	<u>Inches</u>
27. Dolomite, light buff, very fine grained, compact, and gypsiferous. Fossiliferous ....	1	1
Total Residue: 4.41%. % by Volume: Clay, 20; gypsum, 60.		
26. Dolomite, cherty, light gray, medium grained, very porous. Contains laminae with bituminous fillings. Unit becomes finer grained, sandy, and gypsiferous at top. Fossiliferous .....	2	6
Total Residue: 6.19%. % by Volume: Clay, 30; gypsum, 40; chert, 30.		
25. Limestone, tan with blue and gray mottling. Contains blue and gray pebbles. Few bituminous laminae present. Fossiliferous .....	1	2
Total Residue: 14.16%. % by Volume: Sand, 5; silt, 20; clay, 20; silicious casts, 55.		
24. Dolomite, argillaceous, dark buff gray, very fine grained, compact. Contains many laminae with bituminous fillings. Very bituminous at base. Unfossiliferous .....	0	4
Total Residue: 4.92%. % by Volume: Clay, 99; gypsum, 1.		
23. Dolomite, light buff gray, very fine grained, very porous, with porosity decreasing upward, gypsiferous. Unfossiliferous .....	1	6
Total Residue: 11.76%. % by Volume: Clay, 2; gypsum, 98.		
22. Limestone, argillaceous, light buff to dark buff, mottling apparent, brecciated at base. Remainder conglomeratic with cobbles up to 3" in diameter, laminated, very bituminous. Fossiliferous .....	1	4
Total Residue: 5.18%. % by Volume: Clay, 90; gypsum, 1; bituminous material, 9.		
21. Limestone, bituminous, dark buff gray, fine grained, compact, bedding irregular, unit slightly conglomeratic with white limestone pebbles up to 1/2" in diameter. Unfossiliferous .....	0	3
Total Residue: 4.87%. % by Volume: Clay, 95; chert, 5.		

	<u>Feet</u>	<u>Inches</u>
20. Limestone, silimar to Unit 21 but pebbles only up to 1/16" in diameter. Fragmentary fossils .....	0	7
Total Residue: 5.83%. % by Volume: Silt, 5; clay, 80; gypsum, 15.		
19. Dolomite, calcitic, light tan, medium grained, porous, and gypsiferous. Fossiliferous .....	0	10
Total Residue: 14.28%. % by Volume: Clay, 20; gypsum, 80.		
18. Dolomite, calcitic, light buff gray, medium grained, very porous, friable, and gypsiferous. Unfossiliferous .....	0	8
Total Residue: 12.33%. % by Volume: Clay, 1; gypsum, 99.		
17. Limestone, dolomitic in basal inch, remainder a calcitic dolomite, light gray, fine grained, and slightly porous. Unfossiliferous .....	0	6
Total Residue: 6.12%. % by Volume: silt, 10; clay, 85; gypsum, 5.		
16. Limestone, bituminous, light gray to light buff, dense, compact, almost lithographic, gypsiferous. Possesses contorted laminae, some of which are inclined 45° to horizontal. Fossiliferous .....	3	5
Total Residue: 5.33%. % by Volume: Clay, 40; gypsum, 60.		
15. Limestone, dolomitic, light gray to dark gray, fine grained, compact. Wavy laminae, and cherty bituminous layers present at irregular intervals. (2' of this unit are missing) Fossiliferous .....	3	3
Total Residue: 5.50%. % by Volume: Silt, 15; clay, 50; chert, 35.		
14. Dolomite, light buff gray, fine to medium grained, porous, gypsiferous, evenly laminated. A very calcareous zone at top. Unit has brecciated appearance due to angular fragments of gypsum. Unfossiliferous .....	0	7
Total Residue: 5.19%. % by Volume: Silt, 10; clay, 40; gypsum, 50.		

	<u>Feet</u>	<u>Inches</u>
13. Dolomite, cherty, dark buff gray, very fine grained, slightly porous, few laminae, thin cherty bituminous layers present at base and top. Unfossiliferous .....	0	4
Total Residue: 4.47%. % by Volume: Silt, 15; clay 50; chert, 35.		
12. Dolomite, light gray, fine grained, porous, gypsiferous. Contains wavy laminae with bituminous fillings. Fossiliferous .....	2	9
Total Residue: 5.80%. % by Volume: Silt, 20; clay, 55; gypsum, 25.		
11. Dolomite, bituminous, dark buff gray, coarse grained, porous, and gypsiferous. Unfossiliferous .....	0	7
Total Residue: 5.31%. % by Volume: Silt, 15; clay, 80; gypsum, 5.		
10. Dolomite, light gray, fine grained, porous, gypsiferous. Top 2" very bituminous. Fossiliferous .....	2	3
Total Residue: 3.33%. % by Volume: Clay, 85; gypsum, 15.		
9. Dolomite, dary gray blue, fine grained, porous, Contains laminae with bituminous fillings. Unfossiliferous .....	0	9
Total Residue: 6.21%. % by Volume: Clay, 80; chert, 20.		
8. Dolomite, gritty, light gray, very fine grained, porous, speckled with particles of bituminous material. Very calcareous in topy 9". Unfossiliferous .....	2	1
Total Residue: 6.75%. % by Volume: Silt, 10; clay, 80; chert, 10.		
7. Dolomite, sandy, light gray, fine grained, porous, cherty and gypsiferous. Contains elliptical masses of bituminous material. A layer of chert and gypsum mixed with dolomite present at top. Fossiliferous .....	5	3
Total Residue: 7.17%. % by Volume: Silt, 5; clay, 65; gypsum, 15; chert, 15.		

Feet    Inches

6. Dolomite, similar to Unit 7 but more porous, with thick layers of bituminous material and large areas of rotten chert. A calcareous chert 2" thick present at top. Unfossiliferous ..... 10    2

Total Residue: 7.11%. % by Volume: Silt, 15; clay, 15; gypsum, 20, chert, 50.

5. Dolomite, cherty light buff, medium grained, porous with increasing porosity at top. Contains large areas of rotten chert. A bituminous layer present at top. Fossiliferous ..... 7    6

Total Residue: 7.74%. % by Volume: Clay, 10; chert, 90.

4. Dolomite, sandy, light gray, fine grained, porous, contains areas of rotten chert, and layers of bituminous material. A dark blue chert 4" thick present at top. Fossiliferous ..... 3    8

Total Residue: 10.94%. % by Volume: Clay, 10; chert, 90.

3. Dolomite, sandy, light gray, fine grained, porous, calcareous in spots. Contains large areas of rotten chert and stylolites with bituminous fillings. A rough surfaced bituminous layer at top. Fossiliferous ..... 2    9

Total Residue: 12.45%. % by Volume: Sand, 15; silt, 10; clay, 5; chert, 70.

2. Dolomite, bituminous, grayish blue, very fine grained, slightly porous, gypsiferous. Contains some areas of rotten chert. Stylolitic near top, and 3" of a dolomitic chert above stylolites. Fossiliferous ..... 2    5

Total Residue: 8.17%. % by Volume: silt, 10; clay, 20; gypsum, 60; chert, 10.

1. Dolomite, sandy at base and less so throughout rest of unit, grayish blue, fine grained, porous, gypsiferous. Contains irregular but abundant laminae with bituminous fillings and stylolites. A thin cherty layer present at top. Fossiliferous 15    7

Residues: eight residues were obtained from Unit 1, and they are arranged below from the top of the unit to the base.



<u>Sample</u>	<u>Weight percentage of total residue</u>	<u>Percentage by volume of total Residue</u>	<u>Feet</u>	<u>Inches</u>
Za	12.65	Silt, 40; clay, 20; gypsum, 40.		
Ya	5.44	Sand, 1; silt, 40; clay, 30; gypsum, 29.		
Xa	6.51	Sand, 1; silt, 50; clay, 30; gypsum, 19.		
Wa	5.78	Sand, 10; silt, 50; clay, 40.		
Va	5.68	Sand, 1; silt, 85; clay, 10; gypsum, 4.		
Ua	6.48	Sand, 5; silt, 70; clay, 10; gypsum, 15.		
Ta	5.85	Sand, 5; silt, 70; Clay, 25.		
Sa	9.76	Sand, 15; silt, 60; clay, 5; gypsum, 20.		
TOTAL, Detroit River Section .....			260	1

Sylvania sandstone.

1. Sandstone, dolomitic, friable, white to gray, fine to medium grained, angular to rounded, frosted and pitted.  
Unfossiliferous .....

Total Residue: 77.84%. % by Volume: Sand, 100.

## FOSSILS FROM THE CORE

The position of all fossils that were observed in the first inspection of the core was noted. Later, by means of a cone splitter, the core was cut into sections not more than two inches in length. All fossils previously noted, as well as those not seen before, were removed from the core. The fossils so removed were put into separate specimen boxes with labels bearing an identification number and the depth at which found. Later the identification numbers were inked on the fossils. These fossils were stored in the Museum of Paleontology of the University of Michigan where they now are. The following table shows the identification number of each fossil, the depth at which it was found, and the unit in the section to which it belongs. The missing intervals in the identification numbers such as the interval between #37 and #138 and between #143 and #244 have no significance. At the time of removal some difficulty was encountered with the depths recorded on the core boxes and the change in numbering was deemed advisable to isolate a specific box of core around which the difficulty centered. The identification numbers do represent a continuous line of fossils from a continuous section and the apparent gaps are not to be construed as evidence of missing fossils.

<u>Number</u>	<u>Depth</u>	<u>Unit</u>	<u>Number</u>	<u>Depth</u>	<u>Unit</u>
274	134'2"	Dundee	249	261'9"	67
273	155'0"	Dundee	248	266'2"	65
272	170'6"	109	247	267'3"	65
271	171'2"	109	246	269'3"	65
270	187'0"	98	245	269'9"	64
269	188'0"	97	244	271'7"	64
268	189'7"	95	143	273'11"	62
267	189'9"	94	142	274'3"	62
266	190'0"	94	141	274'6"	62
265	210'1"	89	140	275'0"	62
264	218'0"	87	139	276'4"	61
263	218'7"	87	138	276'10"	61
262	219'1"	87	,37	334'5"	36
261	219'6"	87	36	336'0"	34
260	221'2"	84	35	337'4"	32
259	222'3"	84	34	340'4"	30
258	233'2"	79	33	340'9"	28
257	233'4"	78	32	340'11"	28
256	234'4"	77	31	341'8"	27
255	279'11"	72	30	344'0"	26
254	249'11"	72	29	345'2"	26
253	252'9"	71	28	346'7"	25
252	253'2"	71	27	349'4"	22
251	260'0"	67	26	351'2"	19
250	261'3"	67	25	355'6"	16

<u>Number</u>	<u>Depth</u>	<u>Unit</u>	<u>Number</u>	<u>Depth</u>	<u>Unit</u>
24	357'8"	15	12	394'3"	4
23	258'4"	15	11	295'4"	3
22	359'2"	15	10	395'8"	3
21	361'7"	12	9	402'11"	2
20	361'9"	12	8	405'3"	1
19	362'2"	12	7	406'1"	1
18	365'5"	10	6	407'0"	1
17	369'0"	7	5	410'0"	1
16	370'11"	7	4	412'0"	1
15	371'11"	7	3	412'11"	1
14	386'5"	5	2	413'2"	1
13	388'1"	5	1	414'5"	1

### CONCLUSIONS

1. It was found that the presence of a basal sand, as shown by the insoluble residues, at 155'10" below the surface and 61'10" below the top of the Dundee limestone indicated the contact between the Detroit River group and Dundee limestone. This supports the previous work done by Gerald A. Cooley (1947, p.56).

2. The section of the core studied containing the Detroit River group did not easily lend itself to division into the four members described before (see p. 1). The lithology is not strikingly different through large spans in the

core and although the insoluble residues may be of some value in this division, there is not at the present time, enough data available from which to make correlations.

3. The uppermost series of limestones found in the section of the core from unit 118 through unit 111 may be the Anderdon limestone. Beds somewhat similar to these and also overlain directly by the Dundee limestone are found in the Sibley quarry, NW quarter, Sec.7, T.4s, T.11E., Wayne County, Michigan; and in the Brunner Mond quarry, 1 1/2 miles northeast of Amherstburg, Essex County, Ontario, Canada. The lithology of the Anderdon limestone in these two quarries is not too similar to that in the units mentioned above and fossil evidence is lacking in the core. The evidence available on insoluble residues in these beds is not easily tied in with the writer's findings.

4. Although Cooley (1947, p.56) states that correlations may be made in the Detroit River group by means of insoluble residues the writer was unable to correlate the section studied in the core with any of the sections that Cooley had studied and analyzed. It does not seem to the writer that much far reaching correlation can be done at the present in the Detroit River group on the basis of insoluble residues. This is because of the extreme variability of the insoluble residues at almost any horizon from place to place.

5. The fossil evidence as examined by Drs. Stumm and Ehlers was not sufficient to establish the four major divisions in the Detroit River group. Until more work is done with the existing fossils and more are collected it does not seem possible that accurate division of the Detroit River group can be done on the basis of fossil evidence alone. Since the lithology is not strikingly different this problem will be very difficult to solve.

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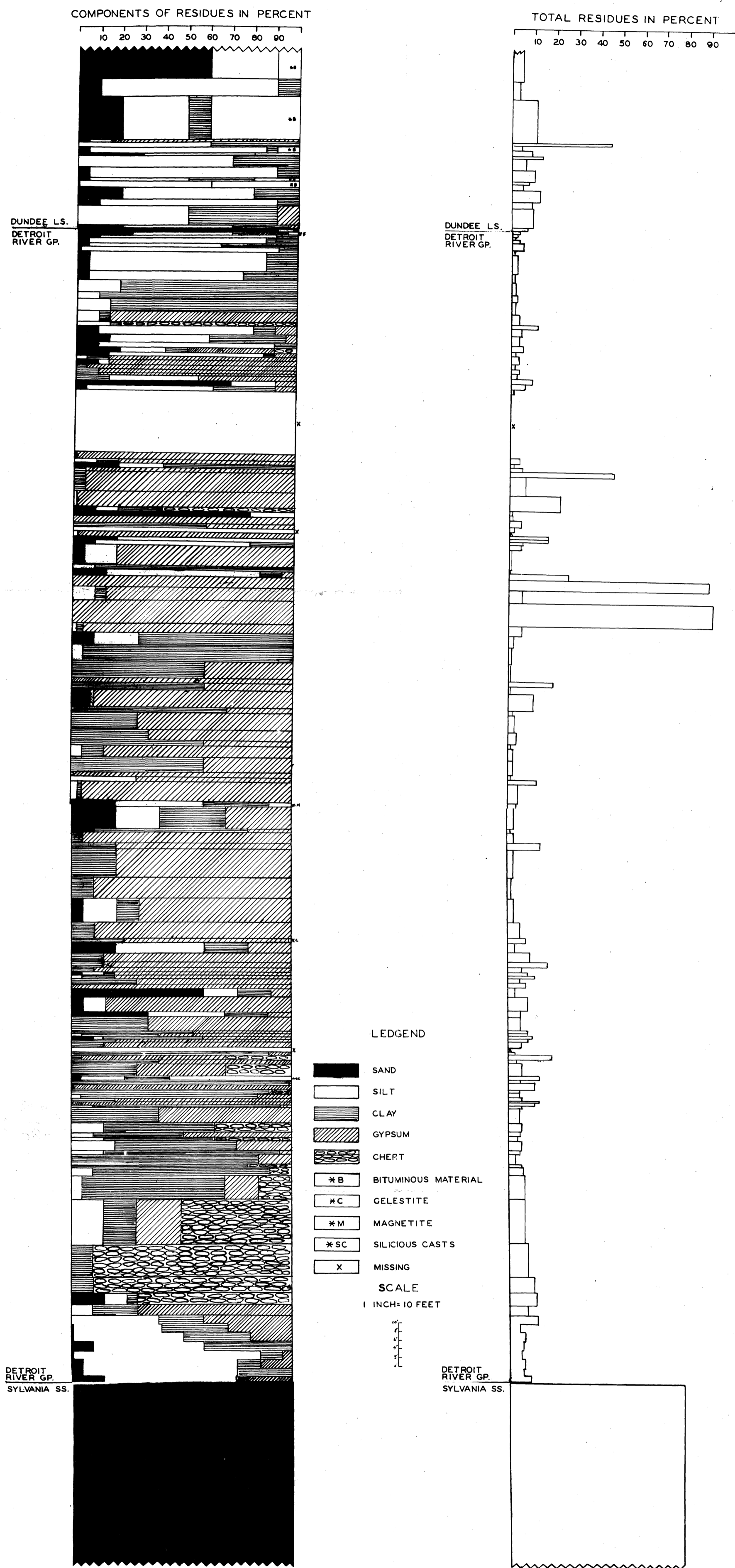
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SYSTEM	SERIES	STAGE	FORMA-TION	LITHOLOGY	DESCRIPTION	THICK-NESS		UNIT				
						FT.	IN.					
DEVONIAN	ERIAN	CAZENOVIA	DUNDEE LIMESTONE		LIMESTONE, BITUMINOUS, BROWNISH GRAY. LAYERS OF 'ROTTEN' CHERT			15				
					LIMESTONE, LIGHT BUFF	4	1	14				
					LIMESTONE, EARTHY, LIGHT BUFF	10	0	13				
					LIMESTONES, GRAY TO BROWN	3	1	9-12				
					LIMESTONES, BUFF TO BROWN	5	3	7-8				
					DOLOMITE AND LIMESTONES, TAN TO GRAY	6	6	3-6				
					LIMESTONES, GRAY TO TAN TO BLUE	4	8	1-2				
					LIMESTONES AND DOLOMITE, BUFF AND GRAY	1	7	116-118				
					DOLOMITES, GRAY, BUFF GRAY, AND BUFF	3	3	113-115				
					DOLOMITE, LIGHT GRAY WITH BLUISH MOTTLING, CALCAREOUS IN SPOTS	4	3	112				
					LIMESTONE, PEARL GRAY	2	0	111				
					DOLOMITES, GRAYISH TAN	4	3	109-110				
					DOLOMITE, GRAYISH TAN WITH MOTTLING	2	10	108				
					DOLOMITE, LIGHT GRAY WITH MOTTLING	2	5	107				
					DOLOMITES, CREAMY AND LIGHT BLUE GRAY	3	0	105-106				
					DOLOMITE, TAN WITH MOTTLING	1	11	104				
					DOLOMITES, BROWNISH AND CREAMY GRAY	2	2	102-103				
					DOLOMITES, BLUISH GRAY AND LIGHT TAN	3	0	99-101				
					DOLOMITES, DARK TAN, BUFF GRAY, LIGHT GRAY	2	3	96-98				
					DOLOMITES, TAN, BUFF GRAY, GYPSIFEROUS	3	7	93-95				
										14	0	*
									DOLOMITES, GRAY AND DARK TAN	2	7	91-92
									DOLOMITES, LIGHT BLUE GRAY TO LIGHT BUFF	2	0	89-90
									DOLOMITE, LIGHT BUFF, GYPSIFEROUS	4	6	88
									DOLOMITE, LIGHT GRAY WITH BLUISH MOTTLING, DOLOMITE, SILICEOUS LIGHT GRAY AND DOLOMITE, BUFF GRAY, GYPSIFEROUS	5	9	85-87
									DOLOMITES, GRAYISH WHITE TO BUFF GRAY	2	8	83-84
									DOLOMITES, DARK TAN TO GRAY, CONGLOMERATIC	3	2	80-82
									DOLOMITE, DARK BUFF GRAY, GYPSIFEROUS	4	5	79
									DOLOMITES, GRAYISH BROWN TO LIGHT GRAY	2	2	77-78
									GYPSUM, SELENITE, TRANSLUCENT TO BROWN	1	5	76
									DOLOMITE LIGHT GRAY WITH MOTTLING	2	11	75
									GYPSUM, TRANSLUCENT TO BROWN. BRECCIATION AT BASE	6	9	74
									DOLOMITE, LIGHT BUFF GRAY, GYPSIFEROUS	2	0	73
									DOLOMITE, BUFF, GYPSIFEROUS	2	6	72
									DOLOMITE, EARTHY, DARK TO LIGHT BUFF GRAY, GYPSIFEROUS	3	9	71
									DOLOMITE, DARK BUFF, GYPSIFEROUS	3	10	70
									DOLOMITES, LIGHT BUFF TO GRAY, GYPSIFEROUS	6	6	67-69
									DOLOMITES, DARK BUFF TO LIGHT GRAY, GYPSIFEROUS	4	9	65-66
									DOLOMITES, LIGHT TO BUFF GRAY	3	2	63-64
									DOLOMITE, DIRTY TAN, GYPSIFEROUS	2	6	62
									DOLOMITE, LIGHT TO DARK BUFF GRAY	3	2	61
									DOLOMITES, LIGHT BUFF GRAY	1	11	59-60
									DOLOMITES, DARK BUFF TO LIGHT BUFF GRAY, GYPSIFEROUS	5	3	57-58
									DOLOMITE, LIGHT BUFF GRAY TO DARK BUFF, GYPSIFEROUS	5	10	55-56
									DOLOMITES, LIGHT GRAY AND BUFF GRAY	3	6	53-54
									DOLOMITE, LIGHT BUFF GRAY, GYPSIFEROUS, SLIGHTLY CONGLOMERATIC	6	6	52
									DOLOMITE, LIGHT BUFF WITH GRAY AND WHITE MOTTLING, GYPSIFEROUS	4	10	51
									DOLOMITE, LIGHT GRAY, GYPSIFEROUS	5	4	50
									DOLOMITES, LIGHT GRAY WITH TAN MOTTLING, GYPSIFEROUS	4	9	48-49
									DOLOMITE, BUFF, GYPSIFEROUS	3	6	47
									GYPSUM, WHITE TO DARK BROWN	0	8	46
									DOLOMITES LIGHT GRAY AND PEARLY GRAY	3	11	42-45
									DOLOMITE, LIGHT GRAY, BRECCIATED GYPSUM AND DOLOMITE, AND DOLOMITE, LIGHT BUFF	4	2	39-41
									DOLOMITES, LIGHT BUFF GRAY MOTTLED BLUE GRAY, AND LIGHT GRAY	4	3	37-38
									DOLOMITE, ARGILLACEOUS, LIGHT TAN	3	3	36
									DOLOMITES, LIGHT GRAY, WHITISH GRAY, AND LIGHT BUFF GRAY	4	1	30-35
									DOLOMITES, LIGHT BUFF TO GRAY, AND BUFF GRAY	1	0	*
									DOLOMITE, CHERTY, LIGHT GRAY	2	9	27-29
									DOLOMITE AND LIMESTONE, LIGHT BUFF TO TAN AND CONGLOMERATIC LIMESTONES	2	8	26
									DOLOMITES, CALCITIC, LIGHT BUFF TO TAN, AND CONGLOMERATIC LIMESTONES	3	8	18-22
									LIMESTONES, DOLOMITIC, LIGHT GRAY TO BUFF, ALMOST LITHOGRAPHIC, GYPSIFEROUS	3	11	16-17
									LIMESTONE, DOLOMITIC, LIGHT TO DARK GRAY	3	3	15
									DOLOMITES DARK TO LIGHT BUFF GRAY	0	11	13-14
									DOLOMITES, DARK BUFF GRAY AND LIGHT GRAY	3	4	11-12
									DOLOMITE, LIGHT GRAY, GYPSIFEROUS	2	3	10
									DOLOMITES, LIGHT GRAY AND DARK GRAY BLUE	2	10	8-9
									DOLOMITE, LIGHT GRAY, GYPSIFEROUS AND CHERTY, CHERT AND GYPSUM LAYER AT TOP	5	3	7
									DOLOMITE, LIGHT GRAY, GYPSIFEROUS AND CHERTY, CHERT LAYER AT TOP	10	2	6
									DOLOMITE, CHERTY, LIGHT BUFF	7	6	5
									DOLOMITE, LIGHT GRAY, CHERTY LAYER AT TOP	3	8	4
									DOLOMITE, CALCAREOUS, LIGHT GRAY, CHERTY	2	9	3
									DOLOMITE, GRAYISH BLUE, GYPSIFEROUS, CHERTY	2	5	2
									DOLOMITE, GRAYISH BLUE, GYPSIFEROUS, SOME CHERT AT TOP	15	7	1
							SYLVANIA SANDSTONE		SANDSTONE, DOLOMITIC, WHITE TO GRAY			1

\* MISSING

STRATIGRAPHIC SECTION OF THE DETROIT RIVER GROUP



HISTOGRAMS OF INSOLUBLE RESIDUES  
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