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STRATIGRAPHY REPORT ON THE TOPEKA FORMATION

by

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STRATIGRAPHY

REPORT

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JACOB E. LEMMONS

STRATIGRAPHY REPORT

The Topeka Formation

The class in stratigraphy at the University of Kansas for the spring semester in 1940 made three field trips to various counties in eastern Kansas for the purpose of studying the Topeka limestone formation at various outcrops. Sections were drawn and descriptions written for the outcrops studied. The descriptions included kinds of lithology, thickness of the beds, and listing of fossils contained in the beds.

References used in working up this report are: Stratigraphic Classification of the Pennsylvanian Rocks of Kansas, by Dr. R. C. Moore; Correlation of the Members of the Shawnee Group in Southeastern Nebraska and Adjacent Areas of Iowa, Missouri and Kansas, by G. E. Condra and E. C. Reed; and the Lexicon of Geologic Names of the United States, by M. Grace Wilmarth.

Nomenclature

The Topeka limestone formation was the name originally applied to a limestone cropping out in the vicinity of Topeka, Kansas, by M. Z. Kirk in 1896. The same year rocks of the same age and general characteristics were studied and named the Hartford limestone by J. Bennett, from exposures along the Neosho river in Coffey County, Kansas.

In 1915, Hinds and Greene named rocks found in northwestern Missouri the Topeka formation but included in their Topeka, rocks higher than those originally included in this formation, namely the Turner Creek shale, and the Coal Creek limestone, the Dubois limestone, and the Holt shale.

The Hartford limestone originally included beds now divided into the Sheldon, Jones Point shale, Curzen limestone, Iowa Point

shale, and the Wolf River limestone. Condra in 1937 dropped the name Hartford as too inclusive and adopted the# names given above. Thus the present Topeka formation has as its members, beginning at the bottom: The Wolf River limestone, Iowa Point shale, Curzen limestone, Jones Point shale, Sheldon limestone, Turner Creek shale, Dubois limestone, Holt shale, and the Coal Creek limestone.

The Topeka limestone formation is the topmost division of the Shawnee group of Pennsylvanian age in Kansas and adjacent states. The four limestone members (Topeka, Deer Creek, Lecompton, and Oread) of the Shawnee each form prominent eastward facing cuestas with a dipslope westward of about 25 feet to the mile.

The Topeka crops out in Kansas in a narrow band from Doniphon County to Chautauqua County, Kansas. The upper members of the Topeka down to the Curzen is missing south of the Kaw River. The Curzen south of the Kaw river valley is in places overlain by the Severy shale where the contact is visible. Whether the upper Topeka was ever laid down in this area is not known. North of the Kaw river valley the Severy shale rests on the Coal Creek limestone where the upper contact of the Coal Creek has been observed.

Description of Members

Coal Creek limestone.--The Coal Creek limestone is the topmost member of the Topeka limestone, underlying the Severy shale and in turn underlain by the Holt shale. The member consists of about eight feet of dark blue, dense, brittle, and fossiliferous limestone. Sometimes this member splits into two limestones with an interbedded shale. Fossils include: Fusulina, Bryozoa, Crinoid stems, Brachiopods. The shale is black and usually coaly. The Coal Creek limestone was named by Condra in 1927 from exposures on Coal Creek, in Cass County, Nebraska. The member is not present

in Kansas south of the Kaw River valley, but extends northward to Iowa.

Holt shale.--The Holt shale consists of from one to nearly four feet of black to gray shale. It underlies the Coal Creek limestone and overlies the Dubois limestone. It was named by Condra in 1927 from exposures in Holt County, Missouri, just below Forest City, Missouri. No fossils were found in the Holt shale. The Holt shale is not found in Kansas south of the Kaw River valley but extends northward to Iowa.

Dubois limestone.--The Dubois limestone consists of one or two dense, Blue-gray, massive limestones which together measures from one to a little more than two feet in thickness. It was named from exposures on Turner Creek southeast of Dubois, Nebraska, by Condra in 1927. The fossils include: Derbya, High-spired Gastropods, Fusulina, Bryozoa, Neospirifer, Echinoid spines, Crinoid stems, and Dielasma. The Dubois limestone is also absent south of the Kaw river valley in Kansas.

Turner Creek shale.--The Turner Creek shale consists of about four feet of blu#ish-gray shale with one or two thin limestones. It was named from exposures on Turner Creek southeast of Dubois, Nebraska by Condra, in 1927. The fossils include: high-spired Gastropods, Myalina, Juresania, Ostracods, Algae, and plant remains. The Turner Creek shale is present in Kansas north of the Kaw river valley and extends into Iowa, where in places it appears to be missing.

Sheldon limestone.--The Sheldon limestone consists of about 2½ feet of massive bluish-gray, fossiliferous limestone. It was named from exposures in Cass County, Nebraska, in 1930 by Condra. The fossils include: Pelecypods and Gastropods, Bryozoa, Juresania, shell

small Brachiopods, Ambrochia, Osagia, and in places it is oolitic. The Sheldon limestone is present north of the Kaw river valley and extends into Iowa.

Jones Point shale.--The Jones Point shale is a greenish-gray, argillaceous, fossiliferous shale and was named by Condra in 1927 from exposures in Cass County, Nebraska. The thickness varies from 1½ to 7 feet. The fossils include: Echinoid remains and plant remains. The Jones Point shale is the lowermost Topeka which is not exposed south of the Kaw river valley. It extends into Iowa.

C Curzen limestone.--The Curzen limestone was named by Gallher in 1900 from exposures at "Curzens Station" southeast of Forest City, Missouri. It consists of from 3 to 9 feet of limestone of a variable character which is usually divided into two limes and a thin shale. It contains an Osagia bed and also some chert in places. The fossils include: Osagia, Derbya, Fusulina, Bryozoa, small Brachiopods, Echinoid spines, Aviculopecten, Crinoid stems, Rhombopora, fenestellate Bryozoa, Gastropods, Algae, Ambrochia, and Productids. The Curzen limestone is the highest member of the Topeka exposed south of the Kaw river valley where it extends into southern Kansas. It is also present north into Iowa.

Iowa Point shale.--The Iowa Point shale was named by Condra in 1927 from exposures near the Iowa Point abandoned railroad station, Doniphon County, Kansas. The Iowa Point shale thickens from as little as 3 feet in Northeastern Kansas to as much as 27 feet in southern Kansas. It consists of interbedded fossiliferous shales and thin limestones. The fossils include; Echinoconchus, Astartella, Chonetina, Crinoid stems, Gastropods, abundant Chonetes, Dictyoclostus, Brachiopods, Bryozoa, Fusulina, Rhombopora, Neospirifer, Bellerophon, Nucleopsis, Marginifera, Pleurotomaria.

The Iowa Point shale outcrops from southern Kansas north into Iowa.

Wolf River limestone.--The Wolf River limestone is a new name proposed by Condra in 1937 for what he calls the basal member of the Topeka formation in northeastern Kansas. It is named from exposures at the mouth of Wolf River near Fanning, Kansas. The Wolf River limestone varies from as little as 3 feet in northern Kansas to as much as 6 feet or more in southern Kansas. It consists of interbedded limestones and shales. The fossils include: Bryozoa, Crinoid remains, Leiorhynchus, Fusulina, Amblysiphonella, Osagia, Ottonosia, Dictyoclostus, Myalina, Derbya. The Wolf River limestone outcrops from southern Kansas to Iowa and is underlain by the Calhoun shale.

Correlation.

North of the Kaw rivery valley in Kansas the Topeka formation has been pretty well studied by members of the Nebraska Geological Survey, and by Dr. R. C. Moore of the Kansas Geological Survey. The character of the members are constant enought and the outcrops frequent enough so that correlation does not present the problem it does farther south where the upper part of the formation is absent and those which are present change considerable in character as one approaches southern Kansas.

The upper members of the Topeka formation down as far as the Curzen limestone was pointed out to the class at various places north of the Kaw rivery valley by Dr. R. C. Moore. Studies were made of the type section in a road cut along the oiled road northeast of Topeka in NE-NW. of sec. 16-11-16 E. From these studies and the descriptions by Condra and Reed it was fairly easy to pick the various members of the whole Topeka formation north of the Kaw river.

South of the Kaw rivery valley where the upper members of the Topeka formation down to the Cruzen limestone is missing the

correlation and picking of the lower members were done on the basis of lithological and fossil characteristics. Certain of these lower members becomes more and more sandy southward. The Iowa Point shale in particular thickens from as little as 3 feet to as much 27 feet thick in southern Kansas. Its character is that of thin limestones and shales with a high fossil content.

According to Condra and Reed the, "Close analysis of the Topeka formation shows that it consists of part of at least two megacyclothems. The Coal Creek limestone is the "upper" limestone of the upper megacyclothem, the Dubois is the "middle" bed of the upper megacyclothem, the Sheldon is the "super " bed of the lower megacyclothem, and the Wolf River may be a "lower " bed of the lower megacyclothem. Referring to these same beds in the terms of Moore's decimal classification, we believe the following divisions are represented:

Megacyclothem II

Coal Creek limestone.....C.5

Holt shale.....C.1

DuBois limestone.....B.5

Megacyclothem I

Turner Creek shale.....D.9

Sheldon limestone.....D.7

Jones Point shale.....D.2-.4

Curzen limestone.....C.5-.7

Iowa Point shale.....B.1

Wolf River limestone.....A.5"

According to Moore's description of the beds for each of these places in a megacyclothem, the arrangement of Condra's and Reed's is all right, as far as I can see, north of the Kaw river valley, and is all right to the south except for the Iowa Point shale.

A B.1 bed according to Moore should be a non-marine shale which may be coaly in places. At least parts of the Iowa Point shale as I have named it farther south is definitely marine, as it has a great many marine fossils. I believe, however, that this is not a great difficulty. Between the Wolf River limestone which is A.5 and the Curzen limestone which is C.5-17 there is enough leeway to give the Iowa Point shale in southern Kansas several numbers. In fact, the Iowa Point could include the whole interval from A.5 to C.5-17. This would simply mean that at the time non-marine Iowa Point was being laid down to the north, in southern Kansas oscilation of the seas caused the formation of both marine and non-marine beds. Thus it appears that we might have here a facies differentiation in the Iowa Point shale, which might alos raise the question as to whether the name Iowa should be used for the whole interval in southern Kansas between the Wolf River and the Curzen limestones.

In conclusion, I believe that the Calhoun shale should include only that shale between the Ervine Creek limestone and the first limestone above the Ervine Creek.

follows 6

Div. Beds Foss. Strat. Name

T. 2 S., R. 20E County Doniphan

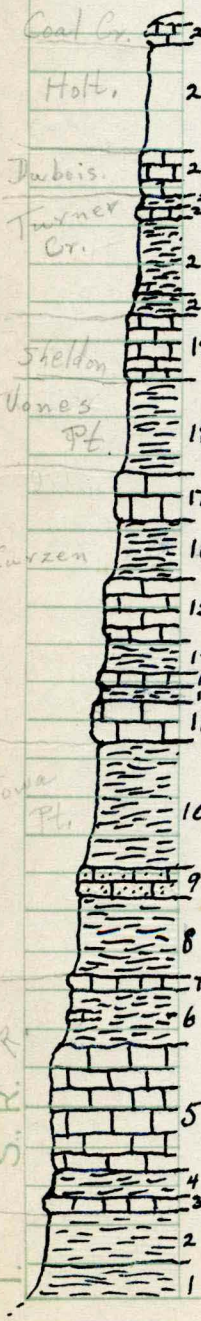
Sec. 7

Locality description- Misson Cr. in middle of a farm, along creek bank

Measured by- Stratigraphy Class Date- April 21, 1940

Remarks-

Bed No.	Description	Thickness
26	Fusulinid limestone. Not in place.	?
25	Covered	33"
24	Light-gray, massive, very fossiliferous ls. Brachs., Gastropods, Bryozoans.	15"
23	Light-green shale	4"
22	Light-brown platy limestone. Laminae in relief. Algae?	3"
21	Gray-brown siltstone. Micaeous, plant remains. Rubbly limestone at base. Gastropods, Ostracods.	24"
20	Green shale.	6"
19	Light-greenish gray, argillaceous limestone. Tall, small gastropods in lower part.	20"
18.	Greenish-gray, clay shale.	30"
17.	Light-gray, massive limestone. Weathers buff. Derbya	15"
16.	Greenish, limy shale. Very fossiliferous. Echinoid spines, Brachiopods, Bryozoa.	18"
15.	Light-gray limestone with dark chert 6" from top in bands. Massive beds. Vertical joints.	20"
14.	Limy shale, fossiliferous.	10"
13.	Light-gray limestone, fossils.	4"
12.	Buff shale. Fossils - Fusulina	5"
11.	Light-gray limestone - weathers buff. Fusulina, Brachiopods, Bryozoa.	12"
10.	Blue, clay shale, micaeous.	40"
9.	Gray, platy, sandy limestone with fish teeth.	10"
8.	Shale interval.	2'±
7.	"Cone-in-cone" limestone.	4"
6.	Nodular limestone and shale. Very fossiliferous. Brachiopods, Bryozoa, Crinoid remains.	16"
5.	Brown limestone. Corals, Crinoid stems. Derbya at top. Black chert up to 6" thick near top. Massive.	39"
4.	Buff to gray shale. Calcareous. Lyorhynchus.	8"
3.	Light-gray limestone. Gastropods, Crinoids, Bryozoa.	5"
2.	Green, clay shale. Marine fossils in upper part.	16"
1.	Black shale. Base covered. Pelecypods.	12"



Div. | Beds | Foss. | Strat. | Name

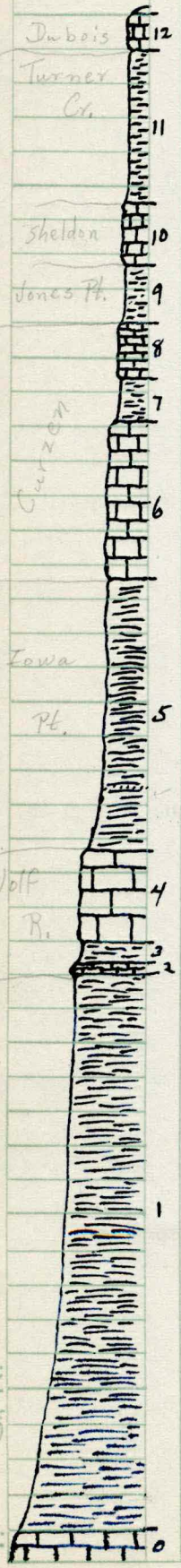
T. 4 S., R. 19 County Doniphon

Sec. 34

Locality description-

Measured by- Stratigraphy Class Date- April 21, 1940

Remarks-



Bed No.	Description	Thickness
12.	Light-black, Limestone, not definitely in place. Fine-grained. Mollusca.	12" ±
11.	Shale-covered	4½'
10.	Gray limestone. Weathers yellow. Mollusca in lower part. Ramose calcite markings etch out on weathered surface	20½"
9.	Soft, gray-green, clay shale	20"
8.	Brown, slabby, argillaceous limestone. Echinoid spines Aviculopecten.	21½"
7.	Greenish, calcareous shale. Weathering brown.	17"
6.	Gray, argillaceous limestone. Weathers buff. Silicified Fossils in upper part.	57"
5.	Slumped and covered shale. Sandy, micaceous zone contains carbonaceous material.	95"
4.	Gray, massive limestone. Honeycomb weathering. Contains Fusulines.	32"
3.	Shale-dark-gray below, olive-green above. Calcareous. Contains Leiorhynchus.	7"
2.	Thin, wavy limestones containing Bryozoa, Crinoid remains	5"
1.	Calhoun shale.	16'
0.	Ervine Creek Limestone.	

Div. | Beds | Foss. | Strat. | Name

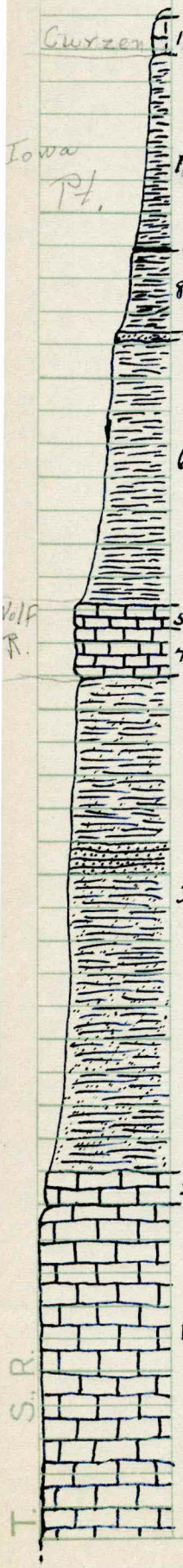
T. 4 S., R. 19 E County Doniphon

Sec. 11 & 14

Locality description- Lower section in NE corner 14-4-19E.
Upper section in SE-NE 11-4-19 E

Measured by- Stratigraphy class. Date- April 21, 1940

Remarks-



Bed No.	Description	Thickness
11.	Lower Topeka - in creek - not measured	?
10.	Soft, dark blue shale.	5.9'
9.	Coal horizon	1" ±
8.	Black, coaly shale. Contains ostracods	2.5'
7.	Sandy, micaceous zone	3"
6.	Dark shale.	8'
5.	Hard, dense, dark blue limestone. Crinoid stems, Brachiopods.	8"
4.	Bluish, molluscan limestone. Weathers brown. Abundant sponges. Amblysiphonella.	18"
3.	Black to sandy, covered shale with thin, micaceous sandstones ± 5' below sponge bed.	15-16'
2.	Light-brown limestone. Top Ervine Cr.	
1.	Ervine Cr. limestone.	10'+

Div. | Beds | Foss. | Strat. | Name

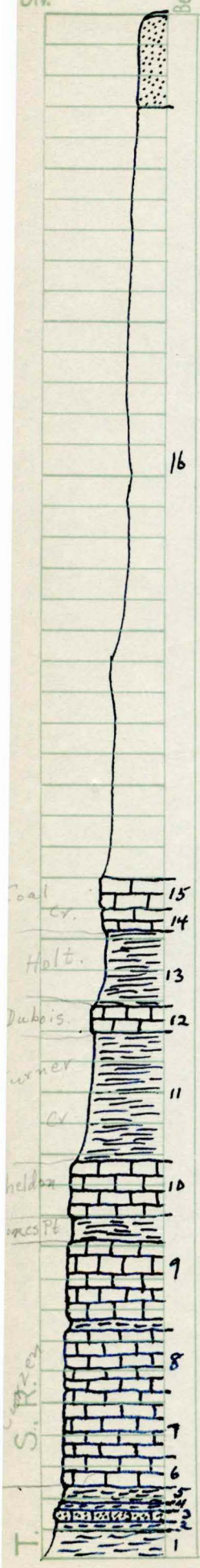
T. 5 S., R. 19 County Atchison

Sec. 11

Locality description-

Measured by- Stratigraphy Class Date- April 21, 1940

Remarks-



Bed No.	Description	Thickness
17.	Sandstone.	3′ ±
16.	Shale, covered.	30′ 2″
15.	Covered limestone. Contains Fusulinids, bryozoans, etc. Crinoid stems, Brachiopods.	
14.	Nodular, fossiliferous limestone.	
13.	Gray, sticky, clay shale.	32″
12.	Gray, massive limestone. Fine, dense.	11″
11.	Shale	52″
10.	Oolitic limestone. Granular	22″
9.	Shale and limestone. Limestone about 2′ thick, rubbly. Echinoid remains in upper shale.	43″
8.	Dark-gray, limestone containing black chert. Fragmental Bryozoa, Crinoids, etc.	24″
7.	Osagia limestone	24″
6.	Gray, Fusulinid limestone.	10-15″
5.	Fissile, micaceous, chocolate shale. Bryozoa. Derbya in upper half.	6″
4.	Gray silt. Weathers brown.	3″
3.	Nodular, sandy limestone.	4-5″
2.	Green, sandy, micaceous shale.	3″
1.	Blue-green, sticky, clay shale at base of our section	?

Div. | Beds | Foss. | Strat. | Name

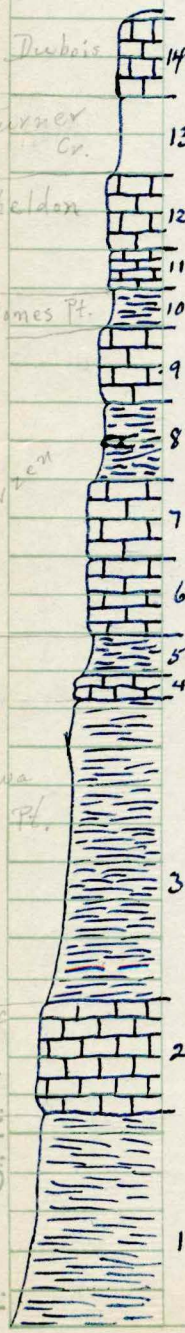
T. 5 S., R. 19 County Atchison

Sec. 15

Locality description- Road ditch

Measured by- Stratigraphy class Date- April 21, 1940

Remarks-



Bed No.	Description	Thickness
14.	Medium-gray, massive limestone. Robust fusulinids, Bryozoa, Neospirifer, Echinoid spines, Crinoid stems.	?
13.	Covered.	?
12.	Medium-gray limestone, massive. Very fossiliferous. Gastropods, Pelecypods, Bryozoa; Juresania, small brachiopods, Ambrochia?	?
11.	Thin-bedded fossiliferous limestone.	?
10.	Shale, light-greenish, silty. Plants at top.	?
9.	Brown, massive limestone. Honeycomb weathering. Few Brachiopods. Few fossils.	
8.	Gray, clay shale with rotten limestone member which is Fossiliferous. Echinoid spines, Rhombopora, Productus, Ambrochia?	?
7.	Massive, dark-gray limestone. Weathers brown. Black chert near middle.	?
6.	Gray limestone. Weathers brown. Shale partings. Basal 10" Rhombopor, Fenestella, Echinoid spines, Gastropods, Fusulina, Algae. Brachiopods at top.	?
5.	Black to chocolate shale. Plant material, laminated.	?
4.	Nodular, brown limestone. Carbonaceous	8.5"
3.	Green, sticky, clay shale.	93"
2.	Massive, brown limestone. Fusulina at base. Dictyoclostus, Rhombopora, Neospirifer, Derbya	37.5"
1.	Black-gray shale just above micaceous sandy shale containing plants.	66"

Div. | Beds | Foss. | Strat. | Name

T. 10 S., R. 17 County Jefferson

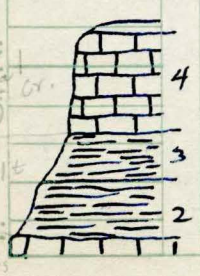
Sec. 9

Locality description-

Measured by- Stratigraphy Date- Mar. 10, 1940

Remarks-

Bed No.	Description	Thickness
4.	Coal Cr. limestone. Very fossiliferous	2.5'
3.	Gray shale	1.2'
2.	Black shale	1.5'
1.	DuBois limestone. Dense, blue. Brachiopods.	6"



Div. | Beds | Foss. | Strat. | Name

T. 11 S., R. 16 County Shawnee

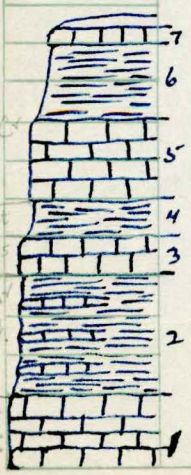
Sec. 5

Locality description- In steep-sided cut - made by creek near road

Measured by- Williams & Swain Date- March 10, 1940

Remarks-

Bed No.	Description	Thickness
7.	Thin limestone	5"
6.	Mostly black shale	2'
5.	Massive limestone. Very fossiliferous, Weathers rough. Bryozoa at top.	25"
4.	Black fissile shale. Upper 3" gray shale.	?
3.	DuBois limestone. Fusulina, Dielasma	?
2.	Numerous thin limestones and shales	3'
1.	Dense, finely crystalline limestone.	2'±



Div. | Beds | Foss. | Strat. | Name

T. 11 S., R. 16 County Shawnee

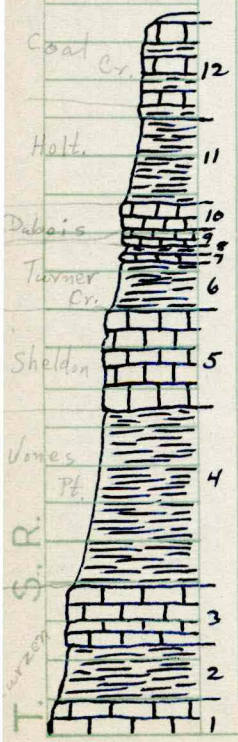
Sec. 9

Locality description- North of Topeka.

Measured by- Williams + class Date- Mar. 10, 1940

Remarks-

Bed No.	Description	Thickness
12.	Limestones and thin shales. Coal Cr.	2' 6"
11.	Shale.	28"
10.	Limestone - DuBois	8"
9.	Thin limestone with 5" shale above	0.6'
8.	Shale	0.2'
7.	Thin limestone	0.2'
6.	Shale	1.2'
5.	Limestone. Weathers yellow. Pelecypods and Gastropods.	2.5'
4.	Green shale	4.6'
3.	Limestone - Brachiopods	1.6'
2.	Shale - Bryozoans.	1.3'
1.	Nodular limestone.	?



Div. | Beds | Foss. | Strat. | Name

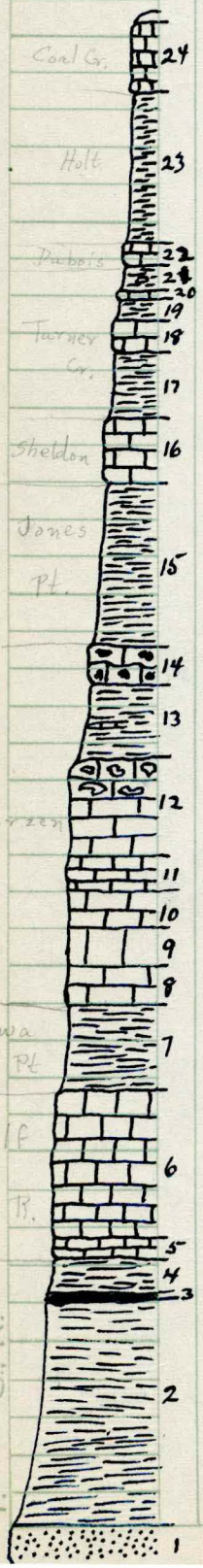
T. 11 S., R. 16 County Shawnee

Sec. 16

Locality description- Road cut along oiled road NE of Topeka. Considered type section for Stratigraphy class.

Measured by- Williams & Class Date- Mar. 10, 1940

Remarks-



Bed No.	Description	Thickness
24.	Coal Cr. limestone. Quite fossiliferous in places. Many Brachiopods and Bryozoans.	23".
23.	Holt shale ?? Black fissile shale at base and gray above.	47"
22.	Blue limestone contain Derbya, high-spired snails.	7½"
21.	Nodular shale.	9"
20.	Thin limestone containing small gastropods - some Juresania.	2"
19.	Shale containing Myalina.	7"
18.	Limestone. Two lower beds are dark blue - mollusca, upper bed contains no fossils. High-spired Gastropods	10"
17.	Gay shale.	21"
16.	Limestone - weathers light gray. Osagia at top	21."
15.	Greenish shale.	52"
14.	Nodular limestone. Osagia, Derbya	12"
13.	Shale with thin limestones.	24"
12.	Chert bed. This limestone seems to characterize upper bed of this thick limestone section.	
11.	Thin-bedded limestone containing both Osagia and Fusulina, also Bryozoa and small Brachiopods.	6'8"
10.	Limestone containing Fusulina at top.	
9.	Massive limestone containing Osagia.	
8.	Limestone containing Fusulina.	
7.	Sandy, micaceous shale containing plant fossils and coaly material.	27"
6.	Massive bed in lower Topeka. Fusulina in lower 6", then thin zone of Crinoidal material. Ottonosia in center. Dictyoclostus above center, then zone of clams, some myalina. Crinoidal material and Fusulina in upper 6".	4'
5.	Thin limestone. Weather brown, Fusulina in lower 2". Crinoidal material in material in middle with Osagia in top one inch or two. Thin brown calcareous shale break just above.	6"
4.	Gray shale	12"
3.	Thin bed of coaly, carbonaceous material.	2"
2.	Blue to gray shale.	24'.
1.	Sandstone in Calhoun shale.	

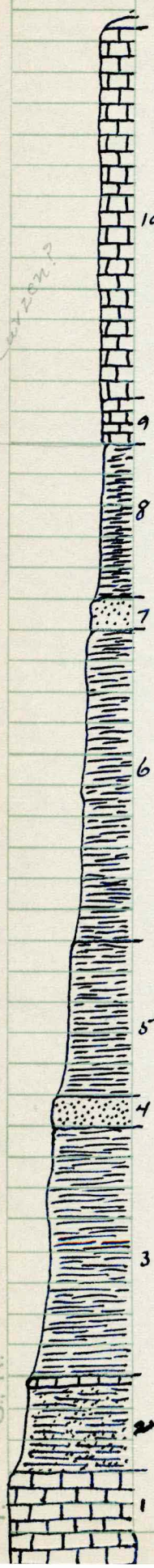
Div. | Beds | Foss. | Strat. | Name | T. | S., R. | County Shawnee

Sec.

Locality description- U.P. RR. cut and highway cut on North side of Kansas River E. of Topeka at point known as Calhoun Bluffs.

Measured by- Williams and Marshall Date- Mar. 10, 1940

Remarks- Upper Topeka Beds obscured.



Bed No.	Description	Thickness
10.	Limestone. Top 8" weathers light gray and full of crinoidal material.	12"
9.	Limestone – weathers brown. Lower Topeka?	1½'
8.	Shale.	5'2"
7.	Brown, micaceous sandstone – variable thickness.	
6.	Light-gray shale.	12'
5.	Brownish shale – sandy in spots.	5'.
4.	Gray, micaceous sandstone.	12"
3.	Gray to dark shale. Variable color. Sandy in places.	20'.
2.	Not like typical brown, weathered top of Ervine Cr. which usually contains Osagia. This material is sandy, clay shale with Fusulina in top. Limestone at top.	3'6"
1.	Ervine Cr. limestone	4'6"

Div. Beds Foss. Strat. Name T. S., R. County Shawnee

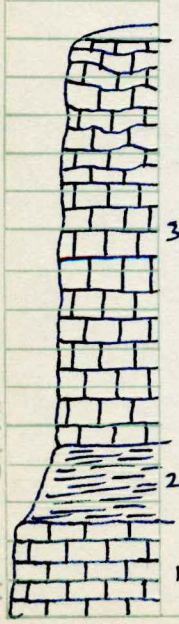
Sec.

Locality description- West edge of Calhoun Bluffs – E. of Topeka at newly opened quarry N. of highway bordering the Kaw River

Measured by- Williams & Swain Date- Mar. 10, 1940

Remarks-

Bed No.	Description	Thickness
3.	Ervine Cr. limestone. Wavy bedded near top.	10½′
2.	Black fissile shale	25″
1.	Rock Bluff limestone. Fusulina in lower 6″	31½″



S. R.

T.

Div. Beds Foss. Strat. Name

T. 19 S., R. 15 E County Coffey

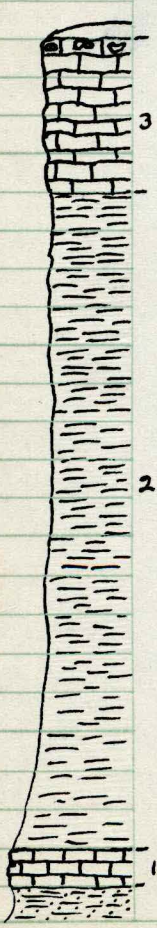
Sec. 7

Locality description- On U.S. Highway 50.

Measured by- Earl Marshall Date- May 25, 1940

Remarks-

Bed No.	Description	Thickness
3	Limestone; abundant fusulina at top and cherty Neospirifer, Composita, Derbya, Dictyoclostus, crinoid stems, bryozoans.	4'
2.	Shale	16.85'
1.	Limestone – Ottonosia, crinoid stems	11"
	Shale, sdy.	



S. R.

T.

Div. | Beds | Foss. | Strat. | Name

T. 19 S., R. 15 E County Coffey

Sec. 10

Locality description- 1 mi. west on U.S. 50 of junction with U.S. 75.

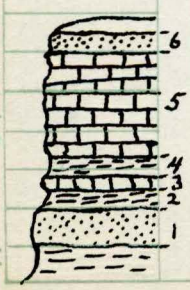
Measured by- Earl Marshall Date- May 25, 1940

Remarks-

Bed No.	Description	Thickness
6	Sandstone; hard, gray, pyritiferous, micaceous	?
5.	Buff, Crystalline, weathers flaggy, [illegible], corals.	32"
4.	Gray to yellow, clay shale, sticky. Lophophyllum.	6.5"
3.	Limestone, a few Fusulina, Ottonosia, [illegible]	4"
2.	Gray shale, plant fossils.	6"
1.	Sandstones Shale.	12"

Additional Paleontology

3. Derbya, Rhombopora, Chonetina(?).



S. R.

T.

Div. | Beds | Foss. | Strat. | Name

T. 20 S., R. 14E County Coffey

Sec. 18

Locality description-

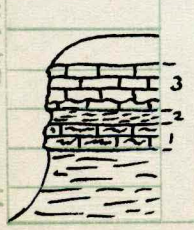
Measured by- Earl Marshall Date- May 25, 1940

Remarks-

Bed No.	Description	Thickness
3	Lt. gray limestone, Fusulina.	1'1"
2	Green-gray clay shale	4"
1	Algal limestone, Fusulina. Rough, resembling mortar without sand.	8"
	Gray shale.	

S., R.

T.



Div. | Beds | Foss. | Strat. | Name

T. 20 S., R. 13 County Coffey

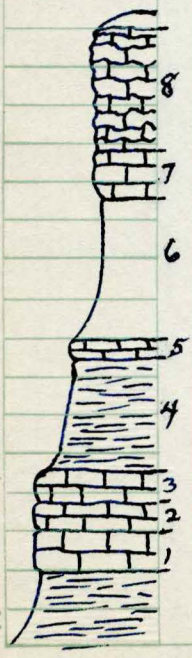
Sec. 36

Locality description-

Measured by- Earl Marshall Date- May 25, 1940

Remarks-

Bed No.	Description	Thickness
8.	Nodular, wavy-bedded limestone, bryozoans, Marginifera	3'
7.	Limestone containing Marginifera.	17"
6.		3' 7"
5.	Limestone	5"
4.	Gray shale.	3'
3.	Limestone	10"
2.	Limestone containing Myalina	10"
1.	Limestone containing Cephlapods	12"



S. R.

T.

Div. Beds Foss. Strat. Name

T. 20 S., R. 13 E County Coffey

Sec. 36

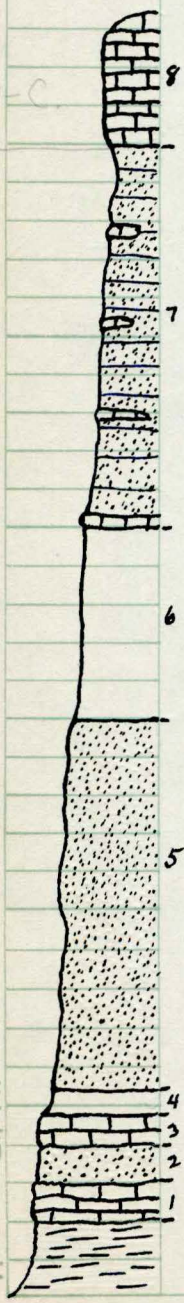
Locality description- West side of road, west of gully, south of creek

Measured by- Earl Marshall Date- May 25, 1940

Remarks-

Bed No.	Description	Thickness
8.	White and yellow limestone, crinoid stems, brachiopods, Amblysphonella.	3'+
7.	Sandstones and thin limestones, basal limestone contains Ottonosia	10.3'
6.	Covered.	5.2'
5.	Hard, brown, micaceous sandstone	10.2'
4.	Covered	0.8'
3.	Molluscan limestone	?
2.	Sandstone	?
1.	Limestone, oatmeal appearance	?

Shale.



H-C

S. R.

T.

Div. Beds Foss. Strat. Name

T. 20 S., R. 13 E County Coffey

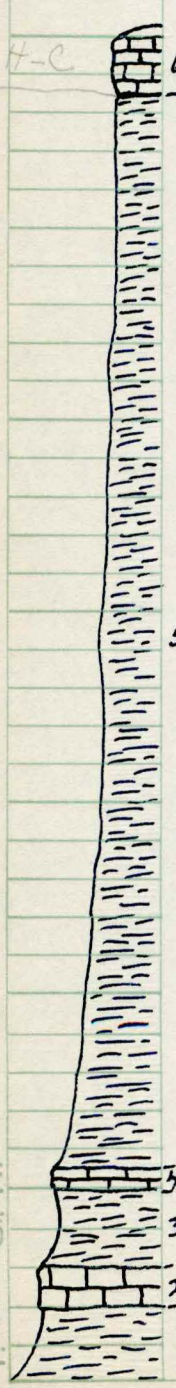
Sec. 36

Locality description- East of gully, west of road, south of creek

Measured by- Earl Marshall Date- May 25, 1940

Remarks-

Bed No.	Description	Thickness
6.	Limestone containing Fusulina and Marginifera	?
5.	Gray, platy shale	28'
4.	Dense, gray limestone. Septarian zone	6"
3.	Gray shale	?
2.	Blk. limestone	?
1.	Gray, platy shale.	?



S.
R.
T.

Div. Beds Foss. Strat. Name

T. 23 S., R. 12 County Greenwood

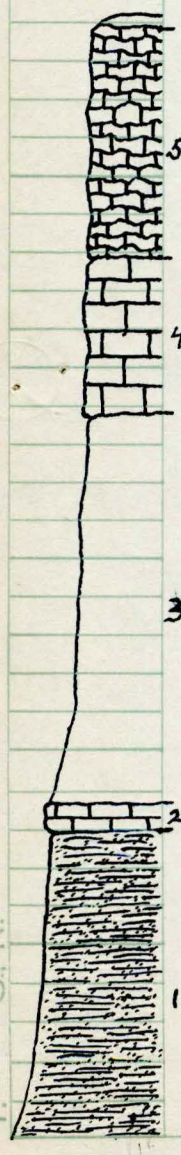
Sec. 1

Locality description-

Measured by- Earl Marshall Date- May 26, 1940

Remarks-

Bed No.	Description	Thickness
5.	Wavy-bedded limestone.	6'±
4.	Massive limestone.	4'
3.	Covered.	10'3"
2.	Blue limestone. Brachiopods	7"
1.	Sandy shale.	



S. R.

T.

Div. Beds Foss. Strat. Name

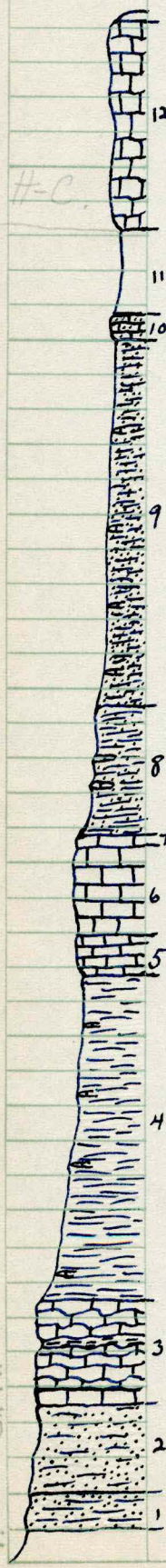
T. 25 S., R. 11 County Greenwood

Sec. 25

Locality description- On U.S. highway 54

Measured by- Earl Marshall Date- May 25, 1940

Remarks-



Bed No.	Description	Thickness
12.	Limestone – Fusulina, Brachiopods, Bryozoa, Dictyoclostus, at base; Crinoid stems.	6' 1"
11.	Covered	31"
10.	Yellow, sandy, argillaceous limestone containing Derbya	8"
9.	Yellow, sandy, clay shale containing thin limestones. Dictyoclostus, Chonetes, Fusulina. Osagia at the base	10'6"
8.	Yellow, clay shale and thin limestones. Corals, Fusulina, Crinoid stems.	3'6"
7.	Limestone containing Crinoid stems.	4"
6.	Limestone containing Fusulina	31"
5.	Limestone containing Fusulina, Amblysphonella, algae, Derbya Bryozoans, Corals, Ottonosia, Gastropods. Ls. gray.	14"
4.	Shale	9'3"
3.	Limestone – sdy. – shale break in the middle. Osagia at the top. Fusulina at the bottom. At top Amblysphonella, Produtus, Ottonosia, Myalina, Crinoid stems	3'
2.	Fine, gray, shaly sandstone.	2'5"
1.	Limy, sandy, shale.	

Div. | Beds | Foss. | Strat. | Name

T. 26 S., R. 11 E County Greenwood

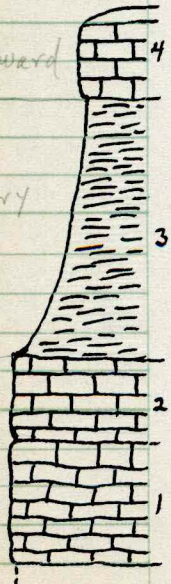
Sec. 32

Locality description-

Measured by- Earl Marshall Date- May 25, 1940

Remarks-

Bed No.	Description	Thickness
4.	Howard limestone	?
3.	Severy shale	?
2.	Ripple-marked limestone - Osagia, cephlapods, algal, Myalina, gastropods.	2'
1.	Limestone containing Fusulina	3.2'



Div. Beds Foss. Strat. Name

T. 25 S., R. 11E County Greenwood

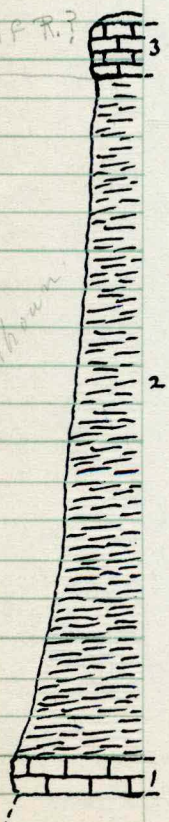
Sec. 30

Locality description- On U.S. Highway 50

Measured by- Earl Marshall Date- May 25, 1940

Remarks-

Bed No.	Description	Thickness
3.	Limestone	?
2.	Yellow clay shale – between top of Ervine Cr. and base of Topeka.	17.7'
1.	Limestone	?



Div. Beds Foss. Strat. Name T. 29 S., R. 11E County Elk

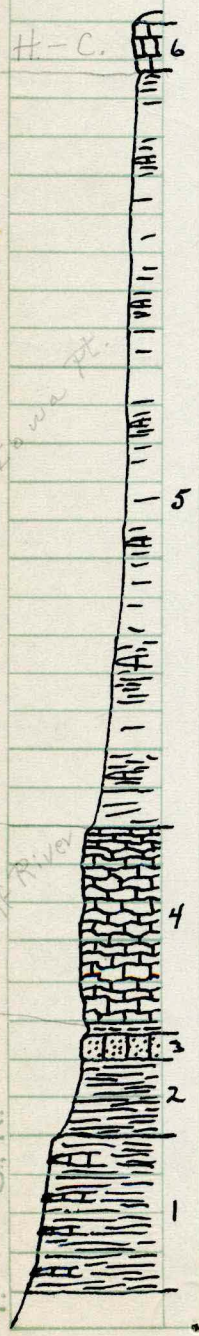
Sec. 31

Locality description-

Measured by- Earl Marshall Date- May 26, 1940

Remarks-

Bed No.	Description	Thickness
6.	Buff limestone. Abundant Fusulina; Brachiopods.	?
5.	Gray. Covered in part. Rhombopora zone at top.	19'9"
4.	Thin limestones. Gray, crystalline, very poorly bedded.	5'3"
3.	Gray, massive, shaly, sandy limestone.	8"
2.	Black shale.	?
1.	Thin limestones and shales. Derbya, Echinoconchus, Crinoid stems.	



Div. | Beds | Foss. | Strat. | Name

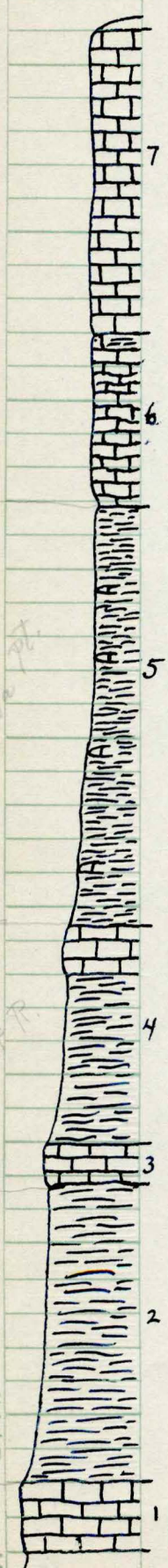
T. 30 S., R. 11E County Elk

Sec. 6

Locality description-

Measured by- Earl Marshall Date- May 25, 1940

Remarks-



Bed No.	Description	Thickness
7.	Limestone. Osagia at the top. Echinoid spines, plates, bryozoans. Fusulina at the base.	9'
6.	Limestone with gray shale at top. Bryozoans, Echinoconchus, Astartella. Limestone wavy-bedded	5.2'
5.	Shale with thin interbedded limestones	12'3"
4.	Shale wih limestone bed at the top	6'4"
3.	Gray limestone containing Fusulina	14"
2.	Shale	8.8'
1.	Ervine Cr. limestone	?

Div. Beds Foss. Strat. Name T. 31 S., R. 10 County Elk

Sec. 11

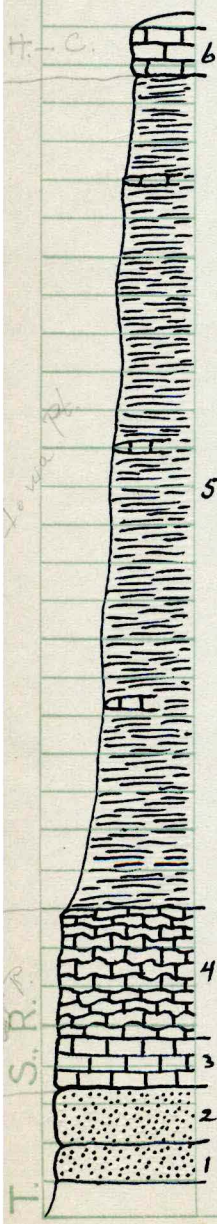
Locality description-

Measured by- Earl Marshall Date- May 26, 1940

Remarks-

Bed No.	Description	Thickness
6.	Thin, wavy-bedded limestone. Crinoid stems, abundant Bryozoa, ? large Fusulina - abundant.	
5.	Shale and thin limestones. Zone of Rhombopora at Top. Top yellow, clayey, limy.	21'10"
4.	Gray, crystalline, wavy-bedded limestone. Fusulina at top. Gastropods, Derbya.	3'5"
3.	Limestone. Fusulina, Brachiopods, Crinoid stems.	10"
2.	Light gray, massive sandstone.	17"
1.	Yellow, fine-grained sandstone. Pleurophorus.	12"

Note: Top, thin limestone of bed 5 contains: Crinoids (Delocrinus), Trilobites, Platyceras, abundant Chonetes, Echinoconchus, Marginifera, Cephlapods (Mitacoceras cornutus), Gastropods (Belerophon, etc.).



Additional Paleontology

6. Echinoconchus, Dictyoclostus, Astartella, Gastropods, Chonetes, Neospirifer, Rhombopora, Bellerophon, Nucleopsis, Marginifera, Pleurotomaria.

Div. | Beds | Foss. | Strat. | Name

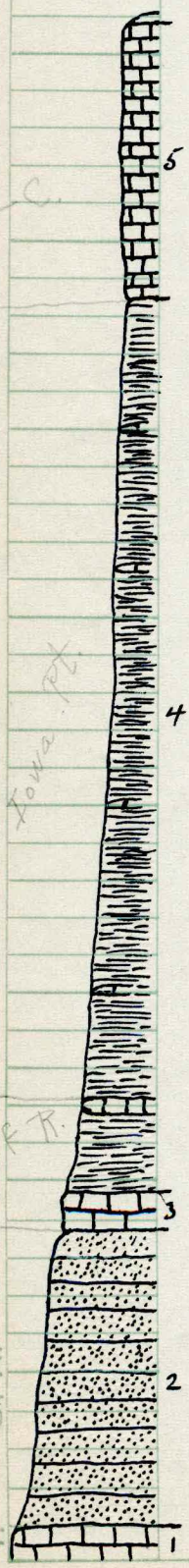
T. 31 S., R. 10 E County Elk

Sec. 11

Locality description- East of bridge across creek, east of Moline on U.S. Highway 160

Measured by- Earl Marshall Date- May 26, 1940

Remarks-



Bed No.	Description	Thickness
5.	Gray limestone. Crinoid stems, Bryozoa, Brachiopod, abundant Fusulina.	7'4"
4.	Shale and thin limestones. 7" very fossiliferous limestone 2'6" above the base.	23'9"
3.	Blue-gray, Fusulina limestone.	12"
2.	Sandstone.	7'9"
1.	Limestone.	?

Div. Beds Foss. Strat. Name

T. 30 S., R. 11E County Elk

Sec. 3

Locality description-

Measured by- Earl Marshall Date- May 26, 1940

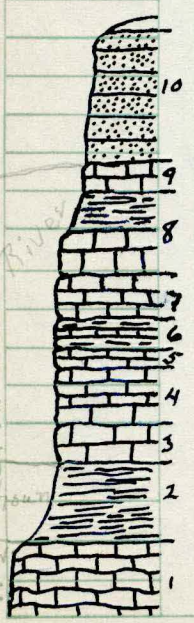
Remarks-

Bed No.	Description	Thickness
10.	Yellow sandstone.	43"
9.	Gray, sandy limestone.	10"
8.	Thin limestones and shale.	?
7.	Limestone.	13"
6.	Shale and thin limestone. O.	10"
5.	Limestone with shale break at base. Ottonosia	6.5"
4.	Massive, gray limestone. Shale break at base.	18"
3.	Limestone. Crinoid stems.	11"
2.	Gray, sticky shale	2'
1.	Ervine Cr. limestone.	

Additional Paleontology

8. Syringopora, Juresania, Squamalaria.

4,3,2. Large Dictyoclostus, Neospirifer, Chonetes, Fistulipora, Hustedia, Squamalaria, Derbya.



Div. Beds Foss. Strat. Name

T. 34 S., R. 10 E County Chautauqua

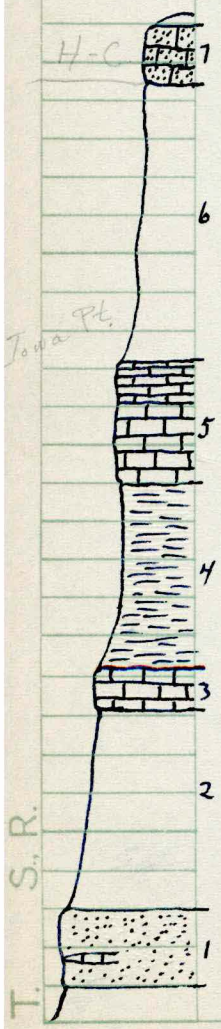
Sec. 8

Locality description-

Measured by- Earl Marshall Date- May 26, 1940

Remarks-

Bed No.	Description	Thickness
7.	Brown, sandy limestone.	?
6.	Covered.	7'2"
5.	Thin, sandy, argillaceous limestones. Echinoconchus, Chonetes, and abundant Fusulina.	3'3"
4.	Shale.	4'10"
3.	Limestone. A few Fusulina at the top. Osagia, Myalina, Echinoid spines.	12"
2.	Covered	5'2"
1.	Sandstone with thin limestones	?



Div. Beds Foss. Strat. Name

T. 35 S., R. 9 E County Chautauqua

Sec. 10

Locality description-

Measured by- Earl Marshall Date- May 26, 1940

Remarks-

Bed No.	Description	Thickness
15.	Hard, brown, ferruginous sandstone.	?
14.	Sandy shale.	5'2"
13.	Partly covered with top of blue-gray, crystalline limestone containing abundant Fusulina.	3'
12.	Gray, sandy limestone. Corals, Fusulina, Crinoid stems.	2'7"
11.	Sandy shale with thin-bedded limestone at the base. Echinoconchus, Astartella, Chonetina, Crinoid stems, Gastropods, and abundant Chonetes.	8'6"
10.	Shale	4'4"
9.	Gray limestone. Dictyoclostus, Brachiopods, Bryozoa, and abundant Fusulina	5"
8.	Gray to yellow, sandy shale with thin limestone at the base. Limestone - gray, crystalline	8'
7.	Yellow, clay shale.	5'10"
6.	Gray, sandy limestone. Myalina	13"
5.	Yellow, clay shale.	4'2"
4.	Sandy, argillaceous, yellow, poorly-bedded limestone. Fusulina	8"
3.	Yellow, clay shale	7'3"
2.	Buff limestone. Fusulina and Bryozoa at the top. Marginifera, Gastropods, Crinoid stems, and Ottonosia	31"
1.	Buff to gray, massive limestone	21"

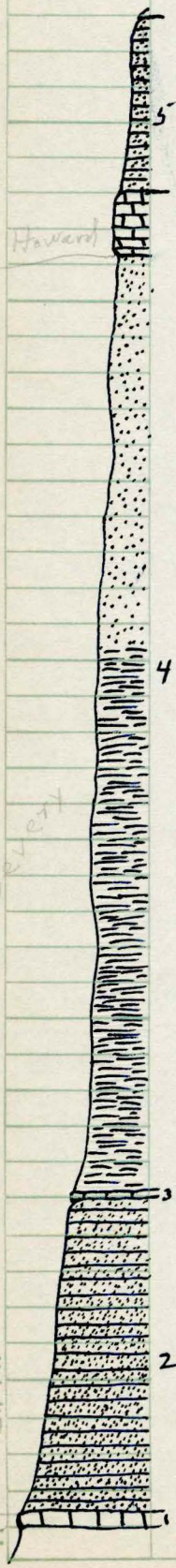
Div. Beds Foss. Strat. Name T. 35 S., R. 9 County Chautauqua

Sec. 15

Locality description-

Measured by- Earl Marshall Date- May 26, 1940

Remarks-



Bed No.	Description	Thickness
5.	Sandstone	21'.
4.	Sandstone and shale with Church limestone at top.	108'3"
3.	Thin, blue-gray limestone. Osagia, Brachiopods, Crinoid stems.	10"
2.	Thin sandstones.	38'8"
1.	Red, Osagia limestone	?

Note: Scale 1 division equals 4 feet.

Div. | Beds | Foss. | Strat. | Name

T. 34 S., R. 10 E County Chautauqua

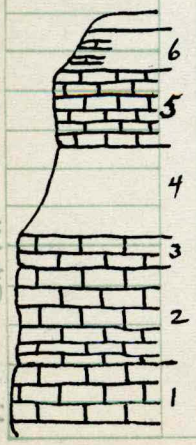
Sec. 8

Locality description-

Measured by- Earl Marshall Date- May 26, 1940

Remarks-

Bed No.	Description	Thickness
6.	Some thin limestones. Partly covered. Fusulina	?
5.	Massive, blue-gray limestone. Sponges, Hustedia, Crinoid stems, Fusulina, Gastropods.	23"
4.	Covered	2'4"
3.	Blue-gray limestone. Sponges, Ottonosia, Fusulina, Brachiopods.	10"
2.	Covered - probably limestone.	29"
1.	Limestone. Fusulina.	?




MISSOURI
RIVER
WASHINGTON
MARSHALL
NEMAHA
BROWN
DONIPHAN
ATCHISON
JACKSON
POTTAWOTOMIE
RILEY
CLAY
JEFFERSON
LEAVENWORTH
WYANDOTTE
JOHNSON
SHAWNEE
WABAUNSEE
MORRIS
OSAGE
DOUGLAS
FRANKLIN
MIAMI
LYON
MARION
CHASE
COFFEY
ANDERSON
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GREENWOOD
BUTLER
ELK
WILSON
NEOSHO
CRAWFORD
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MARION
COTTONWOOD FALLS
WINFIELD
EL DORADO
INDEPENDENCE
CHANUTE
PARSONS
OSWEGO
COLUMBUS
FORT SCOTT
ERIE
CHICOPEE
Outcrop Band of Topeka Limestone Shaded
State Capital
WICHITA County Seat name
City or large town
Town or village