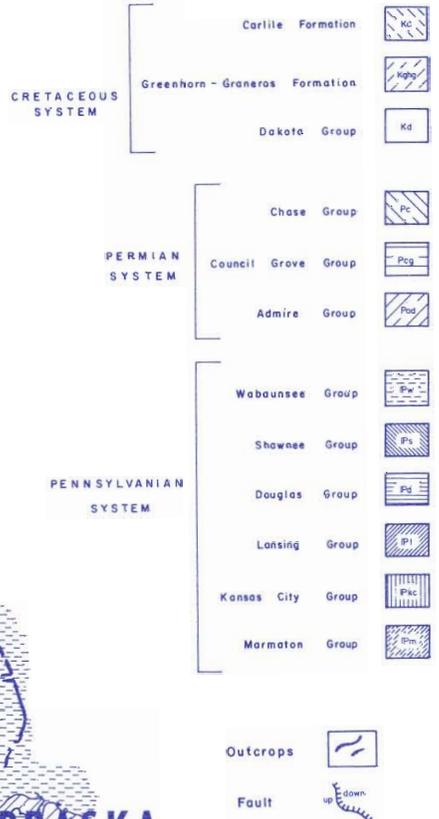


# Guidebook to the Geology Along Portions of the Lower Platte River Valley and Weeping Water Valley of Eastern Nebraska

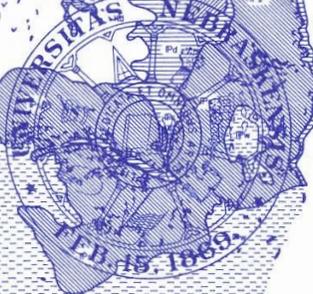
By  
**R. K. BURCHETT**

## GEOLOGIC BEDROCK MAP OF SOUTHEASTERN NEBRASKA



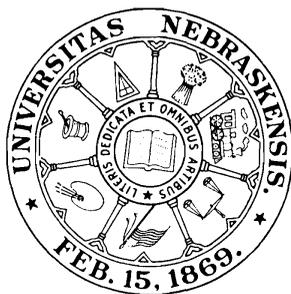
THE UNIVERSITY OF NEBRASKA  
CONSERVATION AND SURVEY DIVISION, LINCOLN  
NEBRASKA GEOLOGICAL SURVEY

April 1971



# GUIDEBOOK TO THE GEOLOGY ALONG PORTIONS OF THE LOWER PLATTE RIVER VALLEY AND WEEPING WATER VALLEY OF EASTERN NEBRASKA

By  
R. R. BURCHETT



PUBLISHED BY THE UNIVERSITY OF NEBRASKA  
CONSERVATION AND SURVEY DIVISION, LINCOLN

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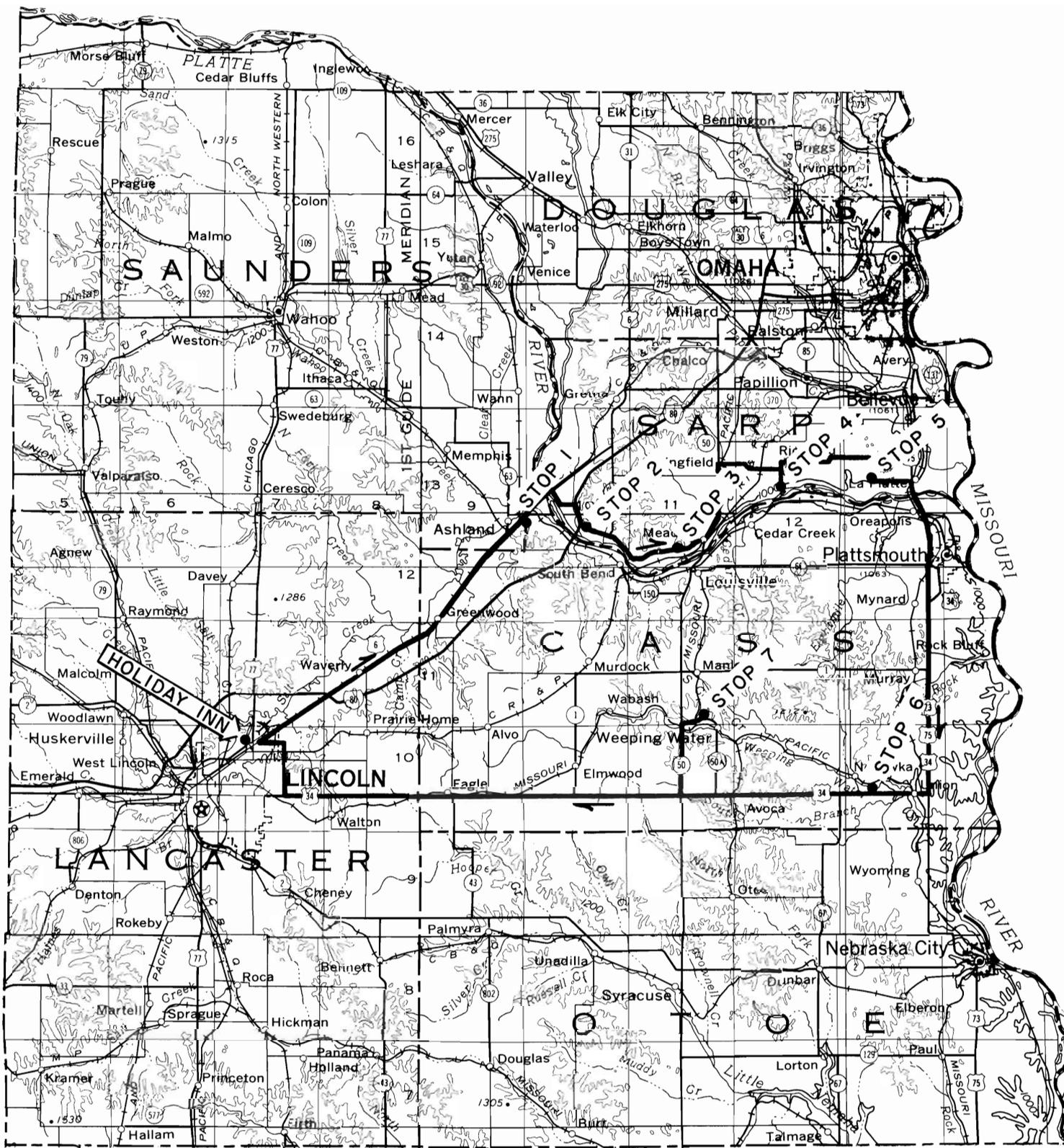
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Topographic Map of Eastern Nebraska Showing Location of Stops



Figure 1

GUIDEBOOK TO THE GEOLOGY ALONG PORTIONS OF THE  
LOWER PLATTE RIVER VALLEY AND  
WEeping WATER VALLEY OF EASTERN NEBRASKA

By R. R. Burchett

INTRODUCTION

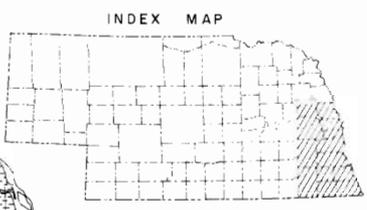
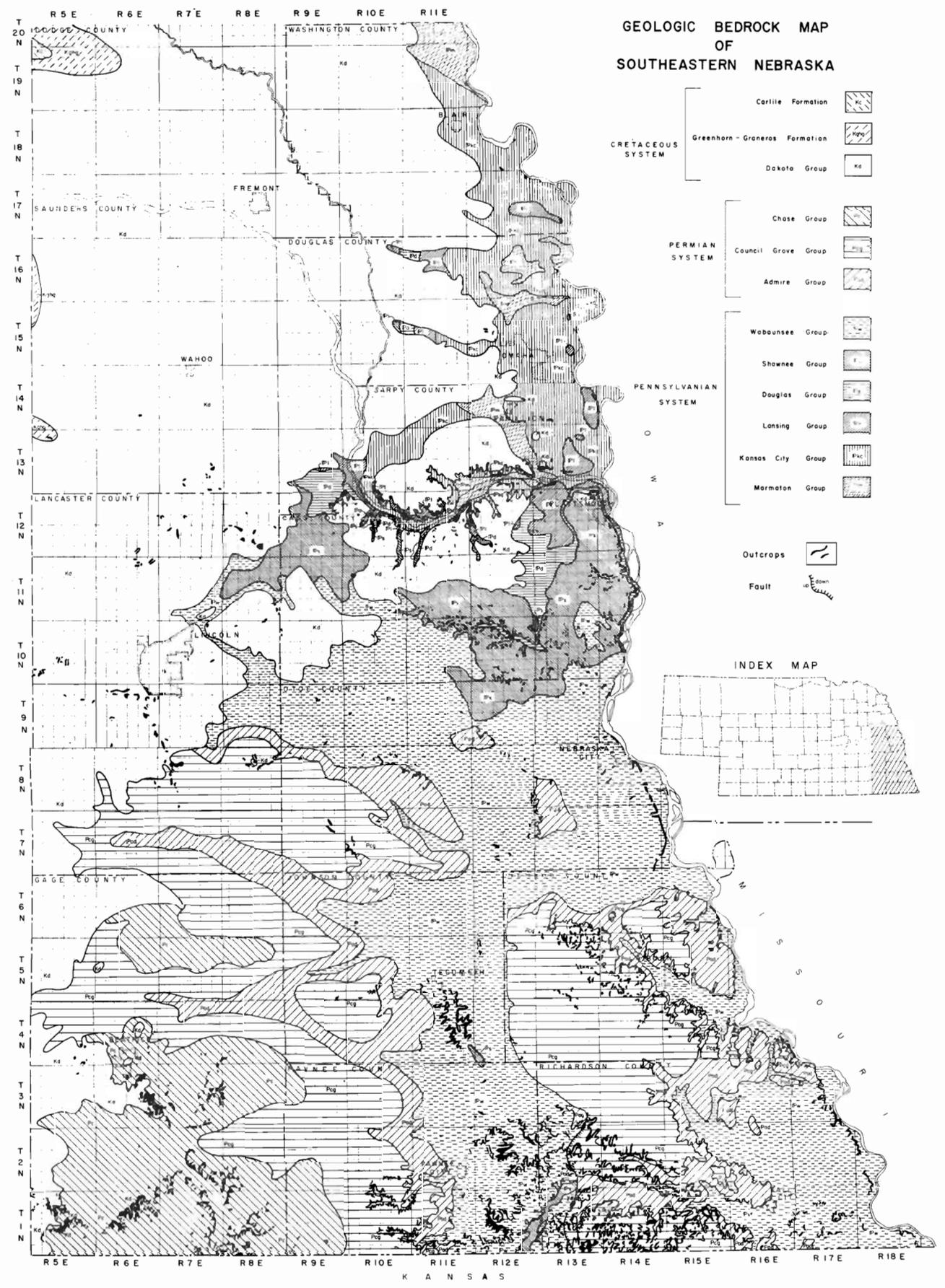
The areas along the lower Platte River valley and along Weeping Water valley in eastern Nebraska afford an excellent opportunity to examine strata of Cretaceous and Pennsylvanian age. It is hoped that this guidebook will be useful to those interested in a general summary of the geology in this eastern Nebraska area (see figure 1), and serve as a basis for more detailed studies in the future.

The geologic map illustrated in figure 2 shows the distribution of formations or groups ranging from the younger Cretaceous to the older Permian and Pennsylvanian. Outcropping areas of bedrock are shown in solid black and generally occur along valley sides. Most of the upland areas are mantled by variable thicknesses of Quaternary deposits.

A composite section of the outcropping Lower Permian and Upper Pennsylvanian bedrock in southeastern Nebraska is shown in figure 3. This composite is based on sections that have been measured in outcrops and quarries.

Exposures in the field-trip area range from the younger Dakota age sandstones and shales to the older limestones and shales of Pennsylvanian age. Stops 1, 2, and 3 in the lower Platte valley include exposures of Dakota Sandstone and Shale overlying Pennsylvanian deposits ranging from Toronto Limestone above to

# GEOLOGIC BEDROCK MAP OF SOUTHEASTERN NEBRASKA



J. H. Drexler, Director  
Conservation & Survey Division  
University of Nebraska

Prepared by  
R. R. Burcher  
March 1966  
Revised December, 1970

Figure 2

# COMPOSITE SECTION OF OUTCROPPING LOWER PERMIAN AND UPPER PENNSYLVANIAN ROCKS IN SOUTHEASTERN NEBRASKA

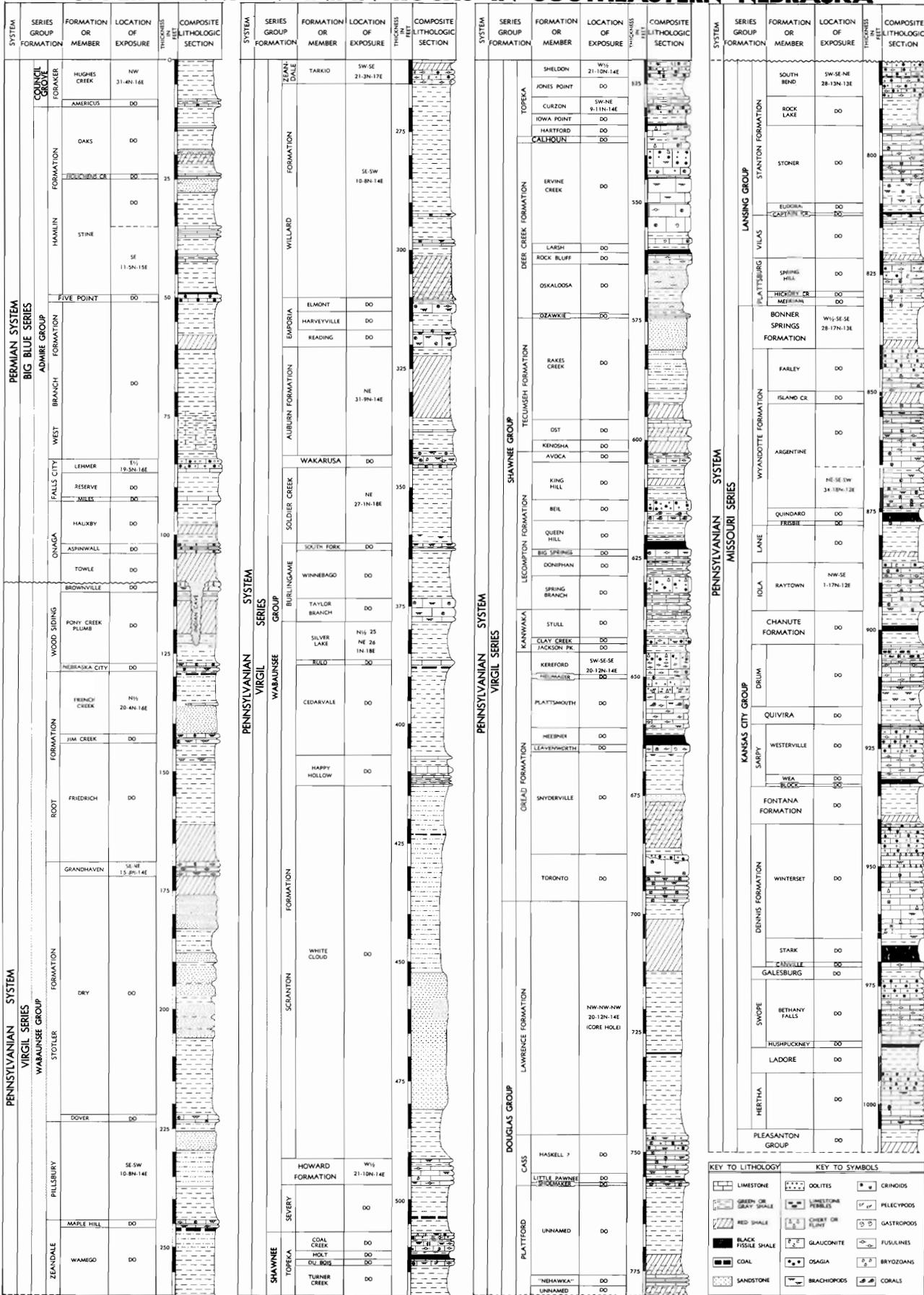


FIGURE 3

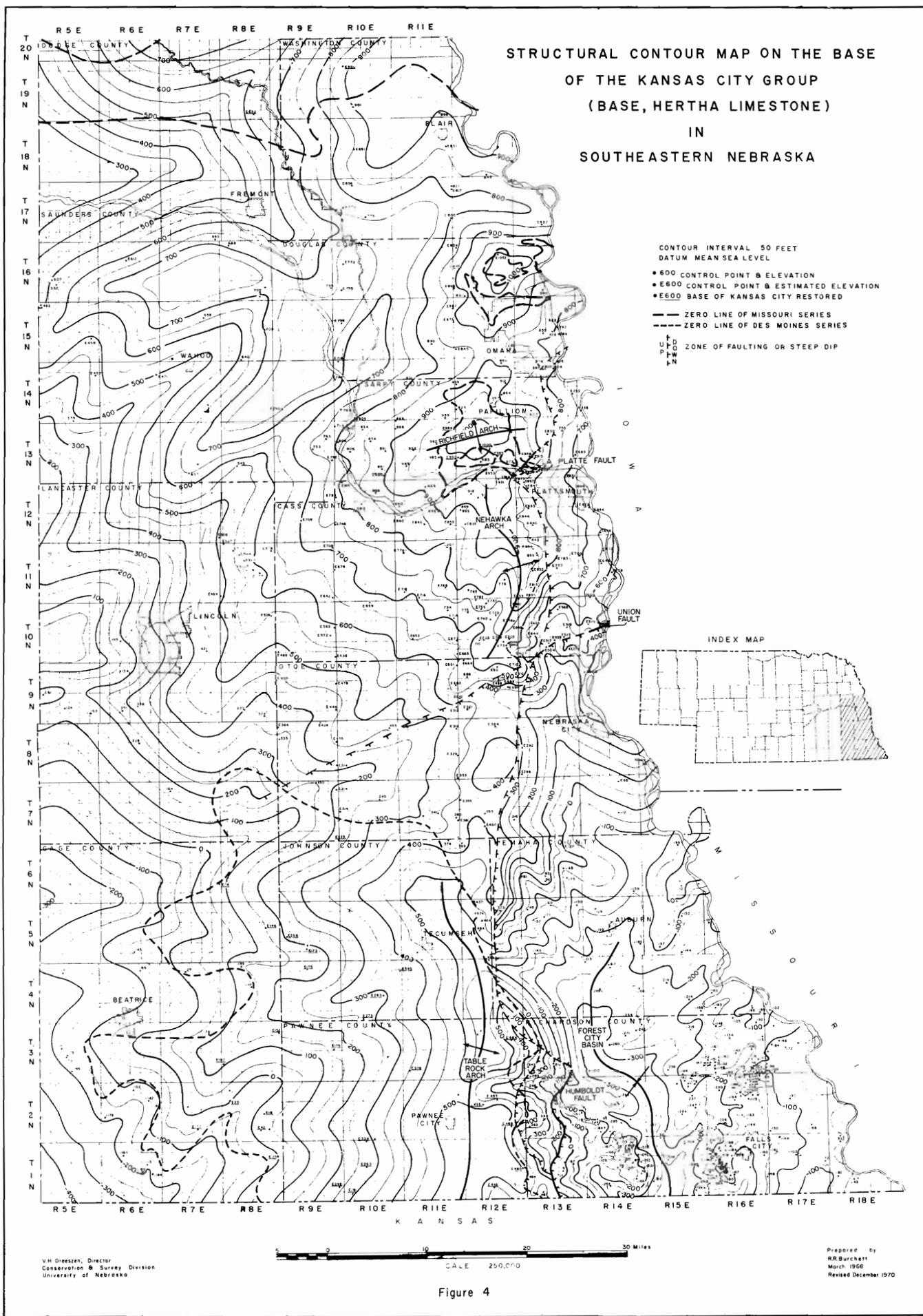
Argentine Limestone below. Stops 4 and 5 include beds below the Argentine through the Winterset Limestone. Strata of the Topeka Formation are exposed at Stop 6 in Weeping Water valley. Further up the valley the interval below the Topeka Formation will be examined (Stop 7).

A structural contour map on the base of the Hertha Limestone (Pennsylvanian) is shown in figure 4. Elevations on the base of this limestone range from more than 1000 feet above mean sea level in Douglas and Sarpy Counties, Nebraska, to more than 300 feet below mean sea level, the deepest part of the Forest City Basin in Richardson County, Nebraska. The Table Rock Arch is a north-south trending extension of the Nemaha anticline of north-eastern Kansas and is sharply faulted to the eastern edge (Humboldt and associated faults). This zone of faulting and/or steep dip extends northward across Otoe and Cass Counties along the eastern edge of the Nehawka-Richfield Arches into the surface trace of the La Platte Fault, and then northeastward into Iowa. An east-northeast to west-southwest trending fault or zone of steep dip extends from Otoe County, Nebraska, into a surface feature called the Union Fault and then into western Iowa. This fault is upthrown to the north and downthrown to the south.

#### ACKNOWLEDGMENTS

Special thanks are due to the Ashland Stone Company, the City Wide Rock and Excavating Company, the Hopper Brothers Quarries, and the various property owners for permission to go onto their properties.

STRUCTURAL CONTOUR MAP ON THE BASE  
OF THE KANSAS CITY GROUP  
(BASE, HERTHA LIMESTONE)  
IN  
SOUTHEASTERN NEBRASKA



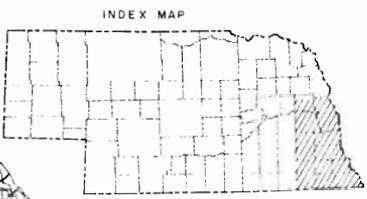
CONTOUR INTERVAL 50 FEET  
DATUM MEAN SEA LEVEL

- 600 CONTROL POINT & ELEVATION
- 6000 CONTROL POINT & ESTIMATED ELEVATION
- E000 BASE OF KANSAS CITY RESTORED

— ZERO LINE OF MISSOURI SERIES  
- - - ZERO LINE OF DES MOINES SERIES

U  
P  
D  
P  
N  
L  
N

ZONE OF FAULTING OR STEEP DIP



VH Dreeszen, Director  
Conservation & Survey Division  
University of Nebraska

SCALE 250,000

0 10 20 30 Miles

Prepared by  
RR Burchett  
March 1966  
Revised December 1970

Figure 4

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ROAD LOG, LINCOLN TO ASHLAND, LOUISVILLE, PLATTSMOUTH,  
UNION, WEEPING WATER, AND RETURN TO LINCOLN

Mileage

- 0.0 Leave south entrance of Holiday Inn (5250 Cornhusker Highway). Turn left (east) on Cornhusker Highway.
- 0.2 Junction U.S. Highways 6 and 77. Continue ahead on Highway 6.
- 1.7 Leave Lincoln City limits.
- 2.2 Junction of City route Highway 6. (STOP SIGN!) Turn left (northeast) on U.S. Highway 6.
- 4.7 There are irrigation wells which produce from 500 to 1000 gallons per minute from the Salt Creek valley alluvium here and for the next six miles down-valley. The groundwater in the valley alluvium increases in salt content near Lincoln and is very salty farther to the west where the alluvium is channeled into the lower sandstones of the Dakota Group which do not outcrop but are overlapped by the upper sandstone.
- 5.4 Underpass Interstate Highway 80.
- 7.6-8.3 Town of Waverly, Nebraska.
- 11.8 Entrance to Greenwood LP-gas storage facility of Mid-America Pipeline Company. A cavern was excavated at this location between the depths of 325 and 350 feet in the Bonner Springs Shale and the upper two-thirds of the Wyandotte Limestone (see figure 3). The plan of the cavern resembles a city street with blocks. Excavation was by the room-and-pillar method with room widths of 20 feet separated by large pillars. Storage capacity of 400,000 barrels of LP-gas is provided. A generalized correlation of the rocks penetrated in core drilling at the site is as follows:

Location: SE-SE sec. 1 and NE-NE sec. 12, T. 11 N., R. 8 E.,  
Lancaster County.

Elevation of Land Surface: 1120 feet above mean sea level.

	Depth, in feet
Quaternary System (Recent and Pleistocene).....	0 - 106
Pennsylvanian System, 330 feet cored:	
Shawnee Group, 105 feet cored:	
Tecumseh Shale.....	106 - 108
Lecompton Limestone.....	108 - 146

	Depth, in feet
Kanwaka Shale.....	146 - 157
Oread Limestone.....	157 - 211
Douglas Group, 48 feet:	
Lawrence Shale.....	211 - 229
Cass Limestone.....	229 - 248
Plattford Shale.....	248 - 259
Lansing Group, 66 feet:	
Stanton Limestone.....	259 - 296
Vilas Shale.....	296 - 301
Plattsburg Limestone.....	301 - 325
Kansas City Group, 121 feet cored:	
Bonner Springs Shale.....	325 - 333
Wyandotte Limestone.....	333 - 361
Lane Shale.....	361 - 374
Iola Limestone.....	374 - 385
Chanute Shale.....	385 - 390
Drum Limestone.....	390 - 403
Quivira Shale.....	403 - 406
Sarpy Limestone.....	406 - 427
Fontana Shale.....	427 - 435
Dennis Limestone.....	435 - 446
	(Total Depth)

#### Mileage

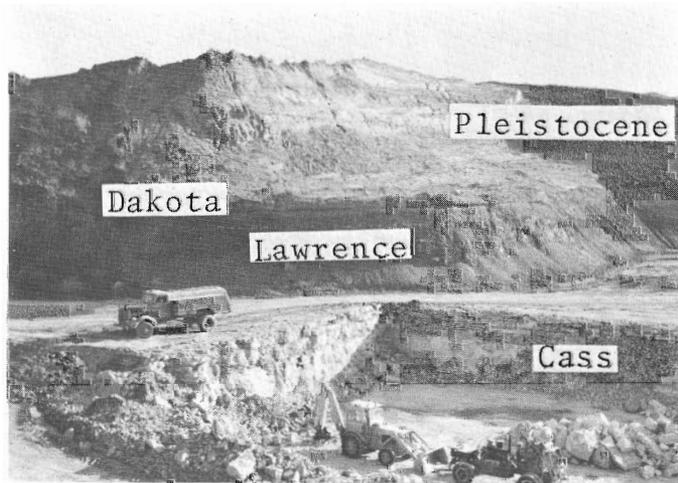
- 11.9           Leave Lancaster County and enter Cass County (figure 1).
- 12.9           Enter Greenwood, Nebraska.
- 13.8           Leave Greenwood, Nebraska.
- 18.2           Leave Cass County and enter Saunders County (figure 1).
- 19.7           Outcrop of Dakota Sandstone in roadcut on right (southeast). The lower part of the Oread Limestone Formation (Pennsylvanian) is exposed at lower elevations in this vicinity.
- 20.5           Junction with State Highway 63 and entrance to Ashland, Nebraska, to the west. Continue ahead on U.S. Highway 6.
- 20.7           Lincoln Water Treatment and Pumping Plant on right (southeast). Sandstone of the upper part of the Dakota Group of Cretaceous age forms the bedrock of Lincoln. Formerly, Lincoln's water supply came entirely from wells drilled into these sandstones within the city limits, but overdevelopment resulted in reduction of quality as more mineralized water came into the reservoir from the west. Therefore, Lincoln developed a well field near Ashland (25

## Mileage

miles to the northeast) and water is transported to Lincoln through two large pipe lines with the local wells being used largely for standby during periods of peak demand. Also, experiments are underway to evaluate the possibilities of recharging the local sandstone reservoir with water from Ashland during periods of low demand, when pipe-line capacity is not fully needed, and withdrawing more water from the local reservoir during periods of peak demand. This will eliminate the need for additional pipe-line facilities for a long period of time. A location map of the Lincoln Water Supply Ashland well field is shown in figure 5.

21.2

STOP NO. 1. Entrance to Ashland Stone Company Quarry on right (southeast). The stratigraphic sequence exposed is illustrated in figure 6. Much of the limestone used for concrete aggregate in Interstate 80 construction was produced from the Cass Limestone in this quarry.



Ashland Stone Company Quarry

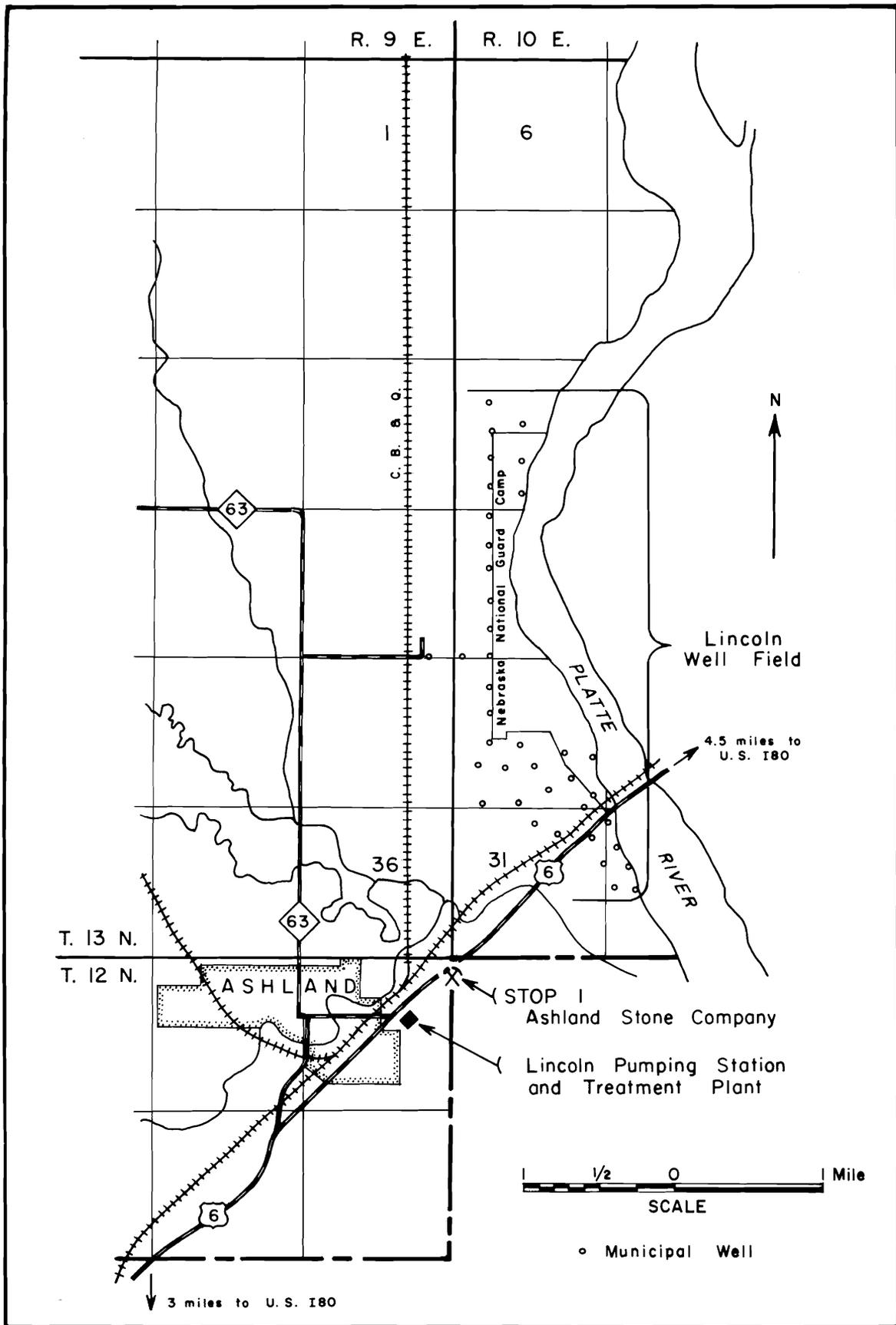


Figure 5 Map of Lincoln Well Field near Ashland, showing location of Stop I.

STOP 1:

ASHLAND STONE COMPANY QUARRY

Location: Approximately 3/8 mile northeast of Lincoln Water Treatment Plant in Ashland, Cass County, Nebraska (NW NW sec. 6-T12N-R10E)

Elevation: Top of Cass Formation (+1066 ft. MSL)

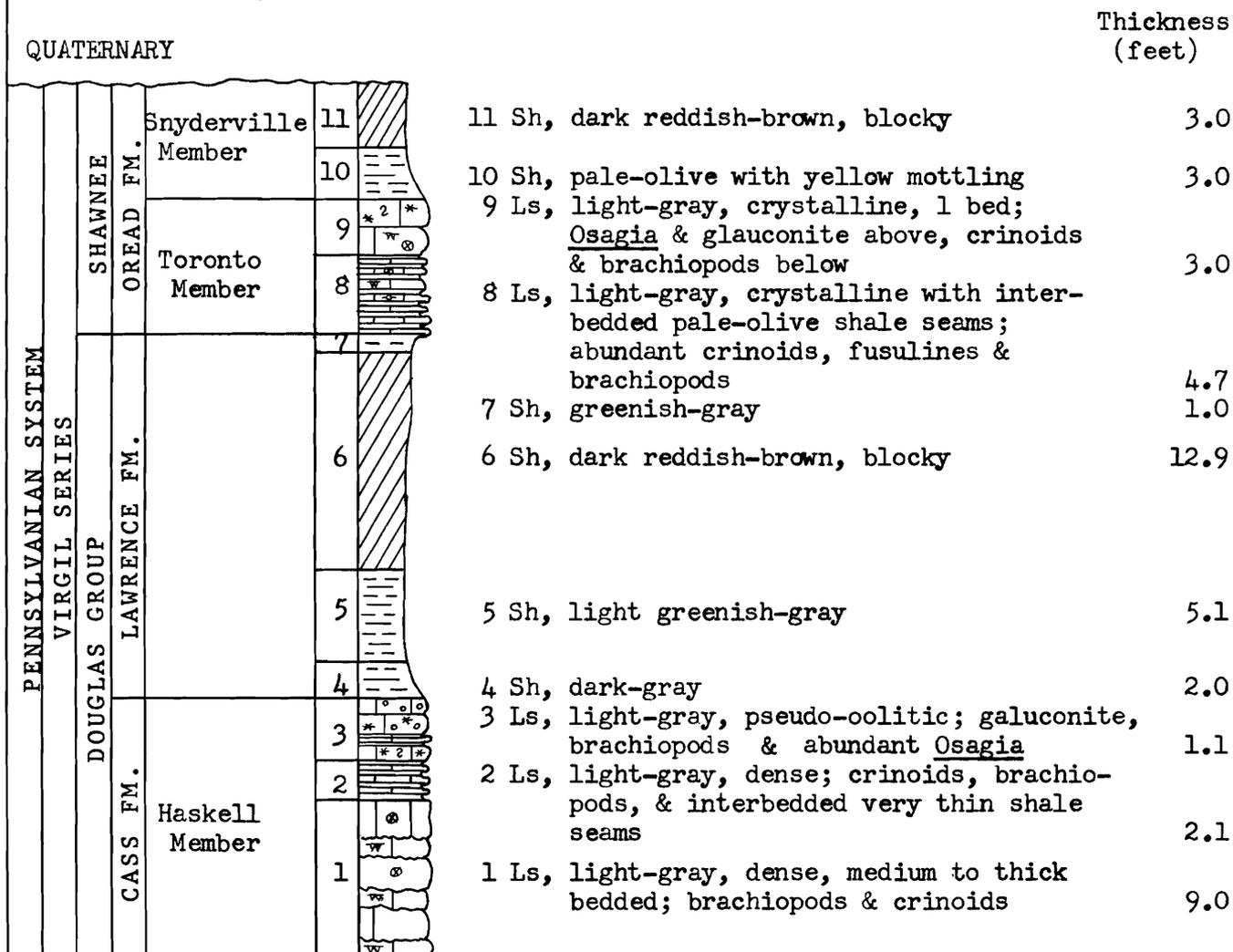
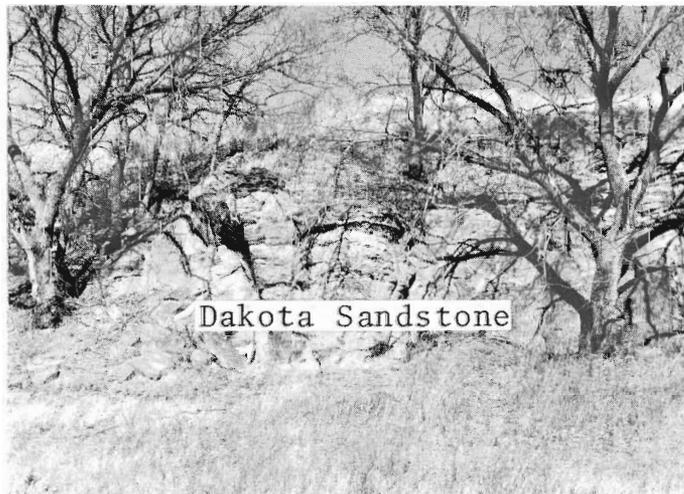


Figure 6

## Mileage

- 21.6 Burlington Northern Railroad overpass.
- 21.9 Bridge across Salt Creek.
- 23.0 Bridge across Platte River. Leave Saunders County and enter Sarpy County (figure 1).
- 23.4 Junction with county road. Turn right (east) and proceed along county road.
- 23.6 Linoma Beach on right (south). This is a privately-owned recreational area developed in abandoned sand and gravel pits.
- 24.9 Overpass across Interstate Highway 80.
- 25.0 Turn right (south) on gravel road.
- 25.4 This is the most northerly exposure of the Dakota Sandstone in this part of Sarpy County.
- 26.1-26.3 Dakota Sandstone outcrops on left mantled by Peoria Loess (Pleistocene).



Dakota Sandstone Outcrops

- 27.1 STOP NO. 2. Rock Lake Quarry on left (north). The Pennsylvanian bedrock exposures at this quarry are illustrated in figure 7. This stop will also give an opportunity to examine the Dakota Sandstone.



Rock Lake Quarry

STOP 2: ROCK LAKE QUARRY  
 Location: Approximately 1 1/2 miles west and 1/2 mile north of Gretna  
 State Fish Hatchery, Sarpy County, Nebraska (C SL NE SW  
 sec. 3-T12N-R10E)  
 Elevation: Top of Stoner Limestone Member (+1067.5 ft. MSL)

CRETACEOUS - Dakota Sandstone		Thickness (feet)	
PENNSYLVANIAN MISSOURI SERIES LANSING GROUP	STANTON FORMATION	8 Sh, dark reddish-brown, blocky	4.5
	Rock Lake Member	7 Ls, light-gray to tan, slabby bedded, highly weathered	4.1
	Stoner Member	6 Ls, light-gray, crystalline, thin to thick bedded; fusulines & brachiopods	5.5
		5 Sh, gray, silty; crinoids & brachiopods	1.9
		4 Ls, gray, crystalline, 1 bed; crinoids & brachiopods	2.0
		Eudora	3 Sh, gray above (1.6'), black fissile below
	Captain Cr.	2 Ls, 2 bluish-gray beds separated by shale	1.7
	VILAS FORMATION	1 Sh, greenish-gray with 0.3' yellowish Ls 1.5' below top	2.4

Figure 7

## Mileage

28.7 Stop sign; junction with State Highway 31. Continue ahead (east) on Highway 31.

## Mileage

- 29.2 Entrance to Gretna State Fish Hatchery on left (northeast). The State Game, Forestation and Parks Commission operates this fish hatchery. Some of the pools are fed by springs issuing from the Dakota Sandstone. Figure 8 illustrates the Pennsylvanian bedrock exposed at the eastern edge of the hatchery grounds.



Outcrops Near East Gate of Gretna State Fish Hatchery

## GRETNA STATE FISH HATCHERY

Location: Just inside east gate to Fish Hatchery, Sarpy County, Nebraska  
(NE cor. SE NW sec. 12-T12N-R10E)

Elevation: Top of Stoner Limestone Member (+1072.6 ft. MSL)

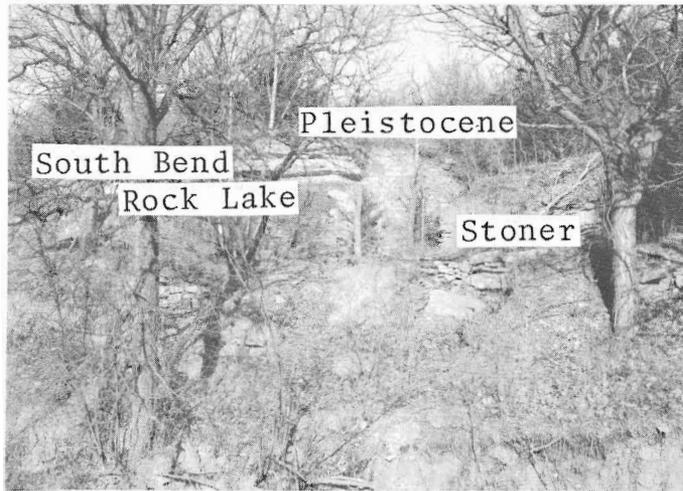
CRETACEOUS - Dakota Sandstone				Thickness (feet)
PENNSYLVANIAN MISSOURI SERIES LANSING GROUP STANTON FORMATION	South Bend	7	7 Ls, light-gray; brachiopods & fusulines	2.0
	Rock Lake Member	5	6 Sh, light greenish-gray	0.7
			5 Sh, dark reddish-brown, blocky	5.7
	Stoner Member	4	4 Ls, light-gray to tan, slabby bedded	4.1
		3	3 Ls, light-gray, crystalline, thin to thick bedded; fusulines & brachiopods	6.9
		2	2 Sh, gray; brachiopods & crinoids	1.9
		1	1 Ls, poorly exposed	1.0

Figure 3

## Mileage

29.3

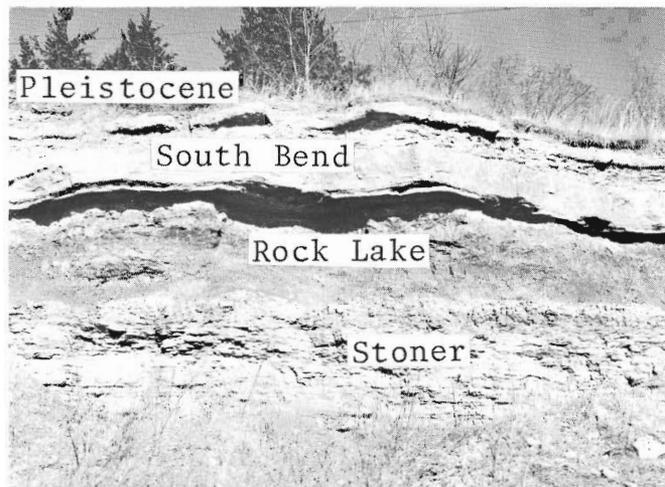
Entrance to Old Carter Quarry on left (northeast).  
See figure 9.



Old Carter Quarry

30.1

Entrance to Goodrich Rock Company Quarry on left  
(northeast). The sequence exposed in the quarry  
and in road cuts to the southeast of the quarry is  
illustrated in figure 10.



Goodrich Rock Quarry

OLD CARTER QUARRY

Location: Approximately 1/5 mile southeast of Gretna State Fish Hatchery, Sarpy County, Nebraska (SW SW SE sec. 12-T12N-R10E)

Elevation: Top of Stoner Limestone Member (+1070.8 ft. MSL)

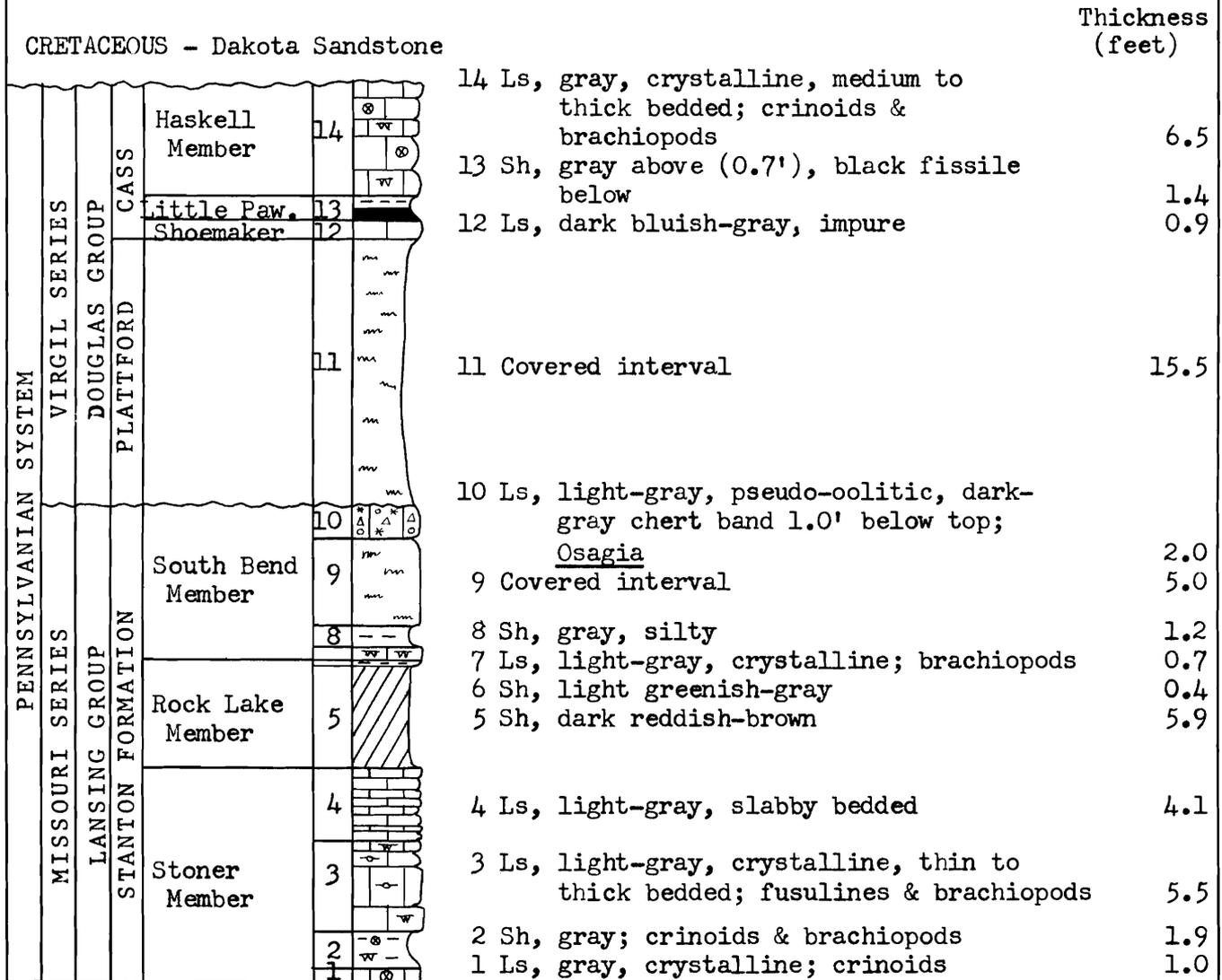


Figure 9

GOODRICH QUARRY & ADJACENT ROADCUT

Location: Approximately 1 mile southeast of Gretna State Fish Hatchery, Sarpy County, Nebraska (C EL sec. 13-T12N-R10E), & (NW SW sec. 18-T12N-R11E)

Elevation: Top of Stoner Limestone Member (+1070 ft. MSL)

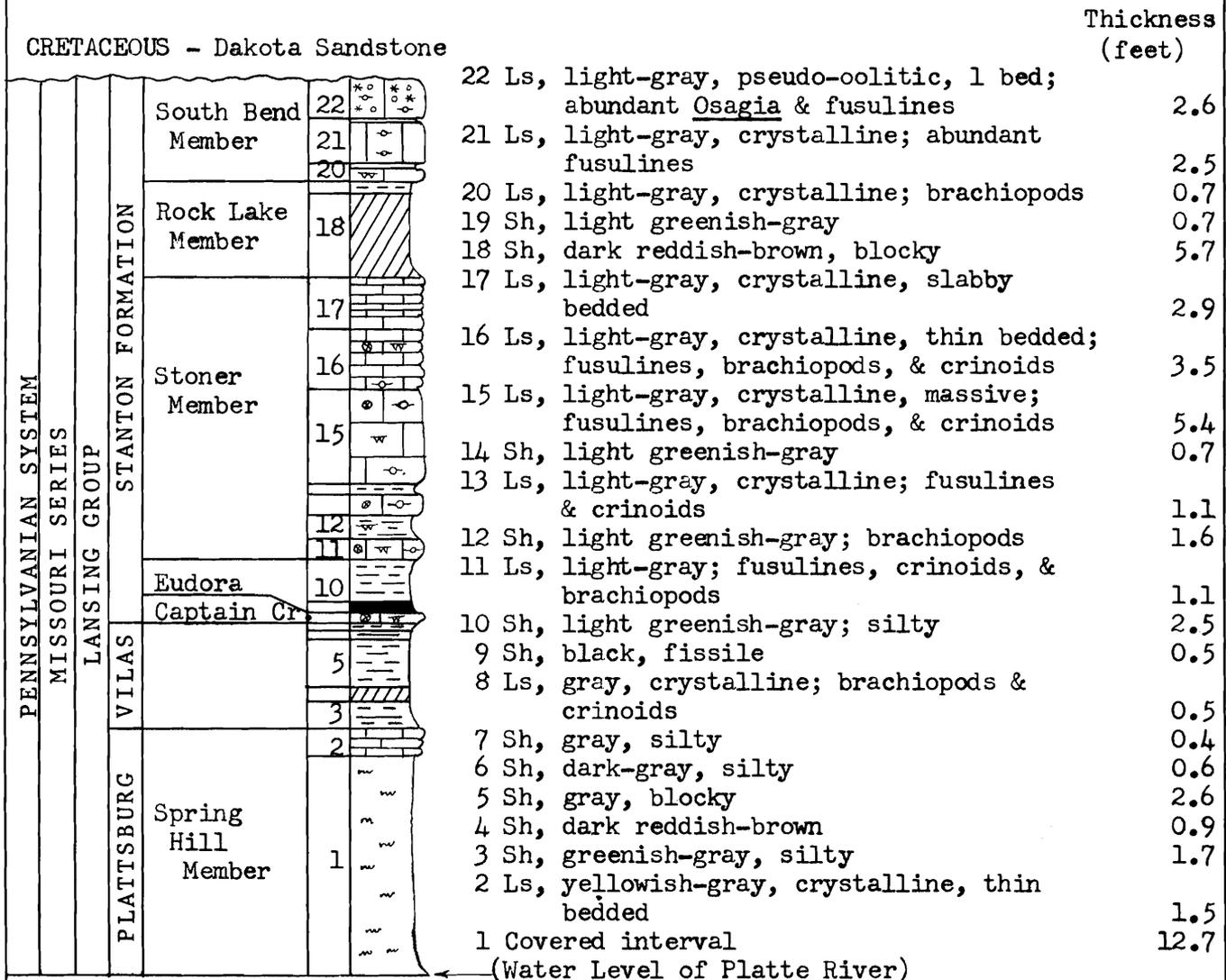
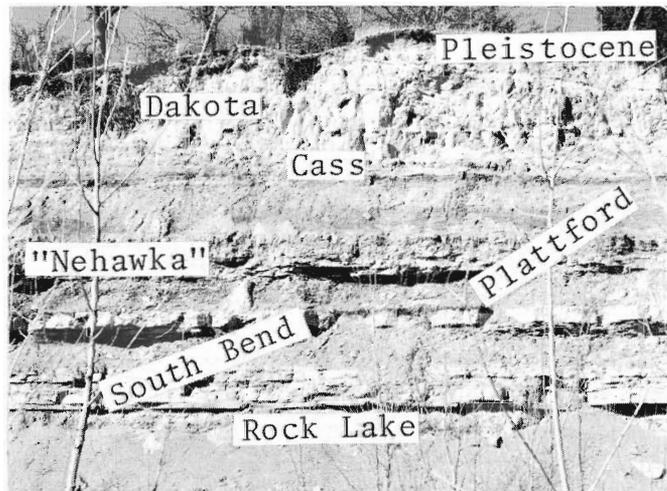


Figure 10

## Mileage

- 31.7 Exposure of Dakota Sandstone on left (north). These Cretaceous sandstones overlie the Pennsylvanian unconformably and are preserved in the pre-Cretaceous channel areas.
- 32.0 Exposure of Stoner Limestone in road cut on left (north).
- 32.3 Exposure of Dakota Sandstone (Cretaceous) exposed in valley side on left (north).
- 33.0 Entrance to Meadow Rock Company Quarry on left (north). The sequence of rocks exposed in this quarry is illustrated in figure 11.
- 33.7 STOP NO. 3. Stone Products (Derby) Quarry. The succession of limestones and shales exposed here (figure 12) includes the interval from the Argentine Limestone below to Plattford Shale above. This same sequence of beds is utilized in cement manufacture by the Ash Grove Lime and Portland Cement Company across the Platte River east of Louisville.



Stone Products Quarry

## MEADOW ROCK QUARRY

Location: Approximately 1 3/4 miles west of Meadow, Sarpy County,  
Nebraska (C S $\frac{1}{2}$  SW sec. 9-T12N-R11E)

Elevation: Top of Stoner Limestone Member (+1106 ft. MSL)

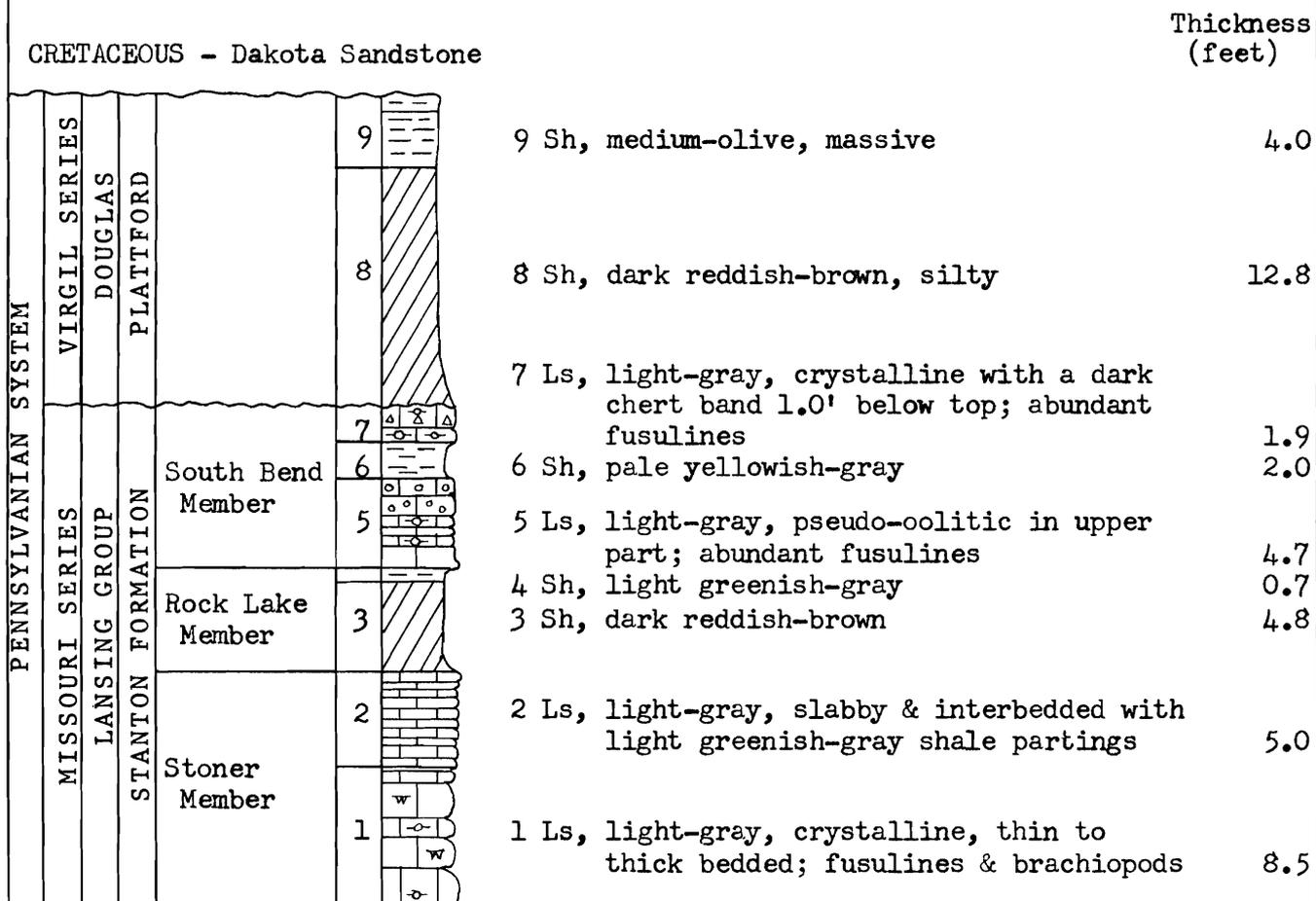


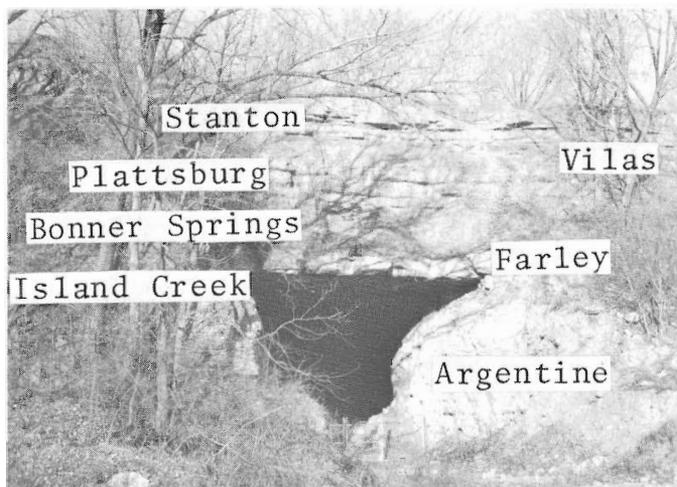
Figure 11

			STOP 3:	STONE PRODUCTS QUARRY								
			Location:	Approximately 1 1/4 miles west and 1/4 mile south of Meadow, Sarpy County, Nebraska (N $\frac{1}{2}$ NE SE NE sec. 16-T12N-R11E).								
			Elevation:	Top of Stoner Limestone Member (+1093 ft. MSL)			Thickness					
			CRETACEOUS - Dakota Shale				(feet)					
PENNSYLVANIAN SYSTEM	MISSOURI SERIES	LANSING GROUP	STANTON FORMATION	Nehawka Member	28		28 Ls, light-gray, crystalline, massive; abundant brachiopods, crinoids, fusulines, & chert	4.0				
					27		27 Ls, light-gray, crystalline, wavy bedded, irregular & wavy base	2.0				
				Unnamed Member	26		26 Sh, dark reddish-brown with greenish-gray mottling	4.5				
					25		25 Ls, light-gray, crystalline, thick bedded, dark chert in upper part; fusulines & <u>Osagia</u>	2.8				
				South Bend Member	24		24 Sh, gray to greenish-gray, silty	2.8				
					23		23 Ls, light-gray, crystalline, thin to thick bedded; brachiopods	3.0				
				Rock Lake Member	22		22 Sh, dark reddish-brown, blocky grading to light greenish-gray at top	4.7				
					21		21 Ls, light tannish-gray, crystalline, slabby bedded	5.0				
				VIRGIL	DOUGLAS	PLATTFORD	STANTON FORMATION	Stoner Member	20		20 Ls, light tannish-gray, dense, medium to thick bedded; brachiopods & fusulines	10.4
									19		19 Sh, gray, silty; brachiopods & crinoids	2.0
								18		18 Ls, gray, thin to thick bedded; brachiopods	1.6	
								17		17 Sh, gray above (1.4'), black fissile below	2.0	
								Eudora	16		16 Ls, bluish-gray, impure	0.5
								Captain Cr.	15		15 Sh, dark-gray, silty	1.4
	PLATTSB. VILAS	14						14 Ls, gray, impure	1.7			
		13						13 Sh, greenish-gray, silty	2.5			
	Spring Hill Member	12						12 Ls, yellowish-gray with maroon mottling, thin bedded	1.8			
		11						11 Ls, yellowish-gray, crystalline, medium to thick bedded; crinoids & brachiopods	4.8			
	Merriam	10		10 Sh, greenish-gray, silty	1.2							
		9		9 Ls, bluish-gray, crystalline; brachiopods	1.1							
	KANSAS CITY GROUP	WYANDOTTE	BONNER SPRINGS FORMATION	Farley Member	8		8 Sh, greenish-gray, silty	3.0				
					7		7 Ls, gray, crystalline, lenticular	0.8				
				Island Cr.	6		6 Sh, gray, massive	4.5				
					5		5 Ls, light-gray, crystalline, pseudo-oolitic, thick bedded; <u>Osagia</u>	4.6				
				Argentine Member	4		4 Ls, light-gray, crystalline, 1 bed	1.6				
					3		3 Sh, greenish-gray with Ls nodules	1.5				
				1	2		2 Ls, light-gray, crystalline, thick bedded; brachiopods, bryozoans, & corals	5.3				
					1		1 Ls, light-gray, crystalline, thick to massive bedded, chert in upper 1.0'; fusulines & brachiopods (formerly exposed)	21.1				

Figure 12

## Mileage

- 34.1 Kiewit Quarry and Mine on left (north). The succession of limestones and shales exposed here is essentially the same as exposed at the Derby Quarry (mileage 33.7). The quarry and mine in the Argentine Limestone have been abandoned for a number of years. This was the first limestone mining operation in this part of the state. The abandoned mine is a haven for bats and is reported to be the largest concentration north of Carlsbad, New Mexico.

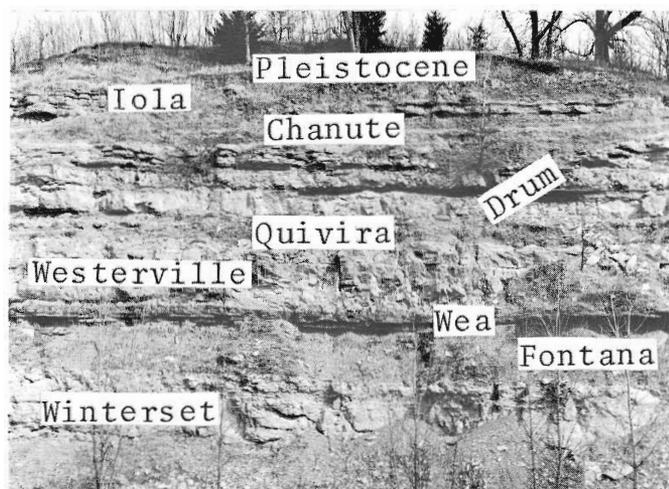


Kiewit Mine

- 34.7 CAUTION! Cross Rock Island railroad tracks.
- 34.9 CAUTION! Cross Missouri Pacific railroad tracks and stop at junction of State Highway 31 and Nebraska State Highway 50. Site of Meadow Station. Turn left (north) along Highway 50.
- 35.2 CAUTION! Cross Missouri Pacific railroad tracks.
- 35.3 CAUTION! Cross Rock Island railroad double tracks.
- 35.6 Outcrop of Pennsylvanian Limestone on left (northwest).
- 37.1 Abandoned sand pit used for asphaltic concrete to left (west).
- 39.7 Junction of Highway 50 and main street of Springfield, Nebraska. Turn right (east) and continue eastward through Springfield.

## Mileage

- 39.9 CAUTION! Missouri Pacific railroad tracks. Note building on left (north) constructed of Dakota Sandstone blocks.
- 40.9 Leave asphalt, enter gravel road. Continue ahead (eastward).
- 41.8 Turn right (south).
- 42.0 Turn left (east).
- 42.4 CAUTION! Cross Rock Island railroad tracks. Turn right (south).
- 43.0 STOP NO. 4. East end of Richfield P.W.A. Quarry (Schmid Property operated by City Wide Rock & Excavation Company). The bedrock sequence exposed in this quarry is illustrated in figure 13. A mine in the Winterset Limestone was operated at this locality many years ago.



Richfield Quarry

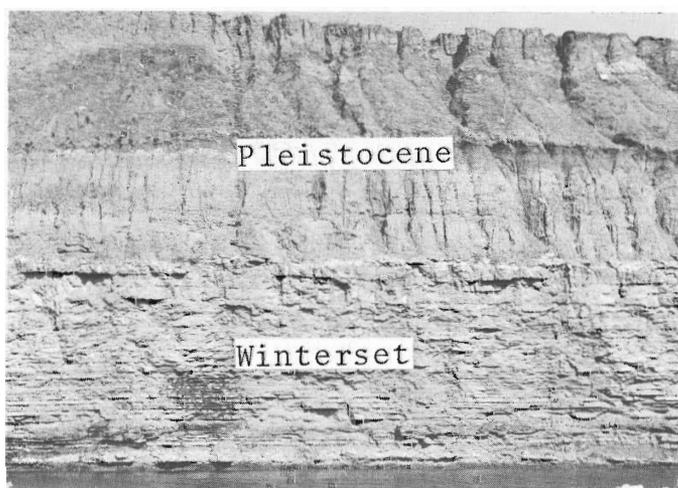
- Retrace route to north and continue ahead (north).
- 45.9 Turn right (east).
- 47.1 Turn left (north).
- 47.4 Turn right (east).
- 51.0 Turn left (north).

		STOP 4: RICHFIELD P.W.A. QUARRY					
		Location: Approximately 2 3/4 miles south of Richfield, Sarpy County, Nebraska (C S 1/2 N 1/2 sec. 28-T13N-R12E)					
		Elevation: Top of Winterset Limestone Member (+1029 ft. MSL)					
CRETACEOUS - Dakota Sandstone				Thickness (feet)			
PENNSYLVANIAN SYSTEM	MISSOURI SERIES	KANSAS CITY GROUP	WYAN	Quindaro	31	31 Sh, gray above (2.0'), black fissile	3.0
				Frisbie	29	30 Ls, bluish-gray, impure; crinoids & brachiopods	
			LANE			29 Sh, gray, silty	2.0
						28 Ls, dark-gray, impure; abundant brachiopods	0.7
						27 Sh, greenish-gray, silty	7.0
						26 Ls, gray, highly weathered, thin bedded	2.5
			IOLA	Raytown Member Only	25	25 Ls, gray, dense, medium to thick bedded; scattered fusulines, crinoids, & brachiopods	9.0
					24	24 Sh, gray; fusulines	1.0
					23	23 Ls, dark-gray, impure; crinoids & brachiopods	0.9
					22	22 Sh, gray, silty	1.1
			CHANUTE FORMATION		20	21 Sh, black, carbonaceous	1.0
						20 Sh, greenish-gray, blocky	4.1
			DRUM	Corbin City - Cement City Members	19	19 Ls, brownish-gray, pseudo-oolitic, dark limestone pebbles in upper part; fusulines	1.9
					18	18 Ls, gray, 1 bed; fusulines	2.7
				Richfield P.W.A. QUIVIRA	16	17 Sh, gray	0.4
					16	16 Ls, gray, dense, thin to thick bedded; fusulines	6.0
					15	15 Sh, gray above (0.7'), black, fissile below	1.5
				SARPY	Westerville Member	14	14 Ls, gray, impure
			13			13 Sh, greenish-gray, silty	1.0
			Wea Block		12	12 Ls, bluish-gray, pseudo-oolitic; fusulines & <u>Osagia</u>	5.0
11	11 Ls, gray, massive; small fusulines	6.6					
	10	10 Sh, gray above (0.4'), black, fissile below	1.7				
	10	9 Ls, dark-gray, impure	0.4				
FONTANA FORMATION		8	8 Sh, light grayish-green, silty	7.2			
DENNIS FORMATION	Winterset Member	7	7 Ls, light-gray, crystalline, pseudo-oolitic	2.7			
		6	6 Ls, light bluish-gray, crystalline, thick bedded; brachiopods & fusulines	6.0			
		5	5 Sh, dark-gray	0.4			
		4	4 Ls, light bluish-gray; black chert band 0.8' below top, fusulines	1.8			
		3	3 Ls, bluish-gray, crystalline, thin to thick bedded; brachiopods & crinoids	6.8			
		2	2 Ls, bluish-gray with interbedded shale seams	2.0			
		1	1 Ls, bluish-gray; crinoids	1.0			

Figure 13

## Mileage

- 51.2 Turn right (east).
- 51.7 Stop sign. Turn right (south) along secondary road (36th Street). A pipe line has been installed along this road to transport water from the Platte River valley into Omaha.
- 53.4 Turn right (west) along gravel road.
- 54.0 STOP NO. 5. City Wide Rock and Excavation Company Quarry (Iske Property). The rocks exposed at this site are illustrated in figure 14. This locality is of special interest because three separate tills of Pleistocene age are exposed above the Winterset Limestone of Pennsylvanian age.



City Wide Rock Quarry

Retrace route east to intersection with 36th Street.

- 54.2 Road crosses the La Platte Fault, along the east side of the Nehawka-Richfield Arch, with a displacement of about 23 feet. (See figure 4).
- 54.3 Entrance to Welsh Stone Company Quarry on the left (north). Glacial striations with a north 25-degree east trend have been observed on the upper surface of the Winterset Limestone in this quarry. On the right (south), a water treatment and pumping plant in connection with the new well field of Metropolitan Utilities District of Omaha has been constructed. It is anticipated that a peak of 60 million gallons of water per day will be developed for a supplement

STOP 5: CITY WIDE ROCK & EXCAVATION COMPANY QUARRY  
 Location: Approximately 2 3/4 miles west of La Platte, Sarpy County, Nebraska (SW SE SW sec. 20 & N 1/2 NE NW sec. 29-T13N-R13E)  
 Elevation: Top of Stark Shale Member (+995 ft. MSL)

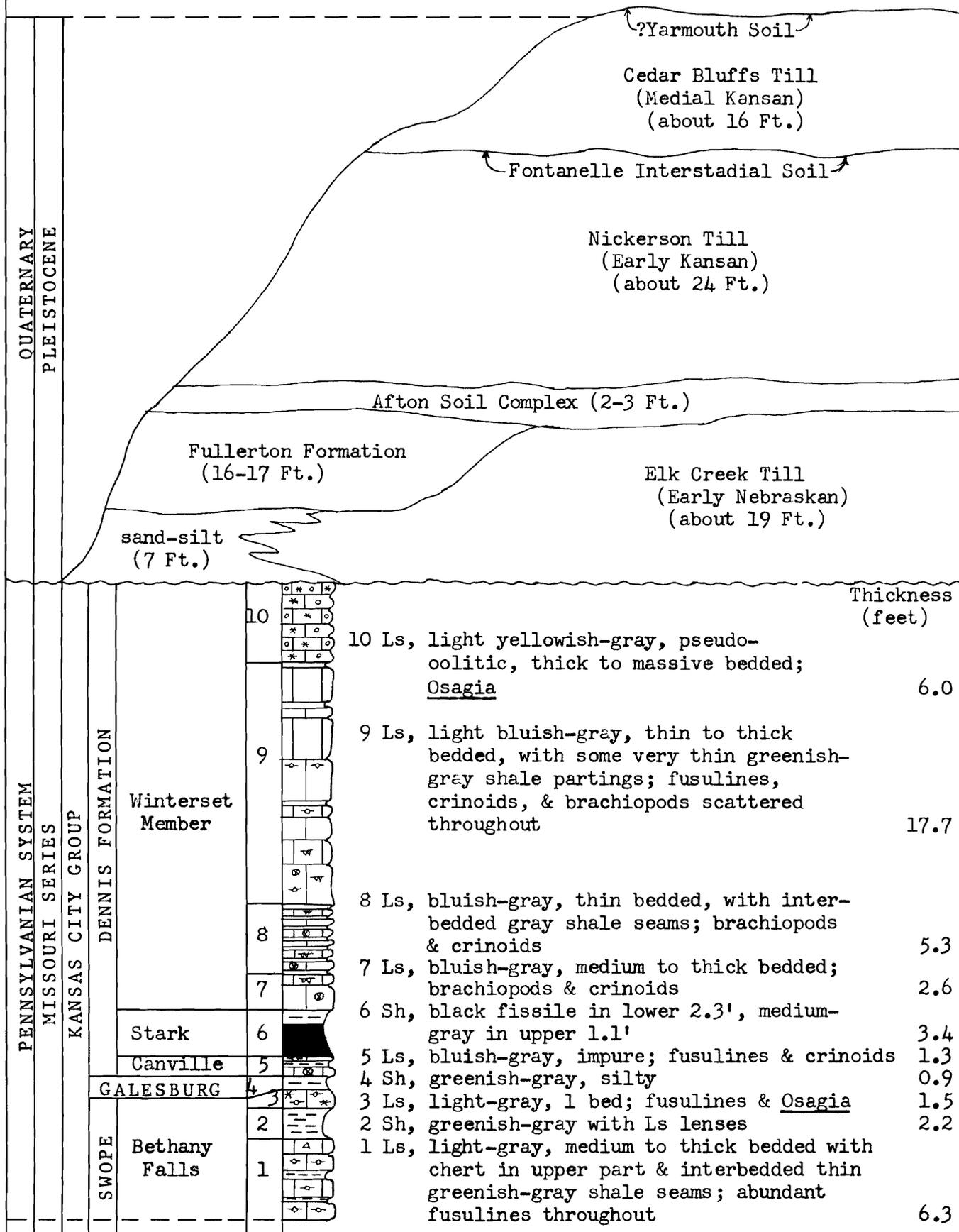
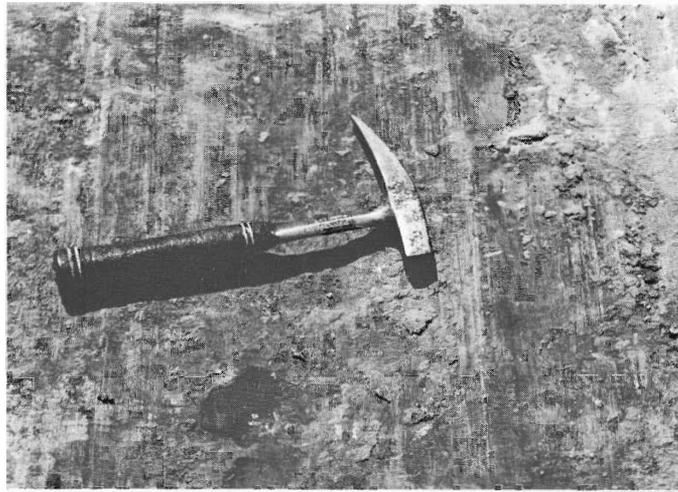


Figure 14

## Mileage

to the present Omaha supply from Missouri River stream-flow sources.



Welsh Stone Quarry

Glacial striations on top of  
the Winterset Limestone

- 54.6 Road to left (north) extends into 36th Street in Omaha.
- 55.2 Abandoned sand and gravel operations of the Lyman-Richey Sand and Gravel Company on the right (south). These were wet-pit operations in the Platte River valley alluvium with 50 feet or more of sands and gravels available below groundwater levels.
- 55.5 Secondary road and Dyson Hollow to left (north). The valley-side exposures in this vicinity are illustrated in figure 15. Note that the Lansing Limestones, exposed well above valley level here, are close to valley level at mileage 52.6, indicating a structural rise of more than 30 feet. The stratigraphic position of the Pennsylvanian outcrops in the Lower Platte River valley are shown in figure 3.
- 55.6 Entrance to Sorensen Quarry operated by Central Quarries Incorporated. The bedrock exposed in the quarry and eastward in this vicinity is shown in figure 16.

## DYSON HOLLOW

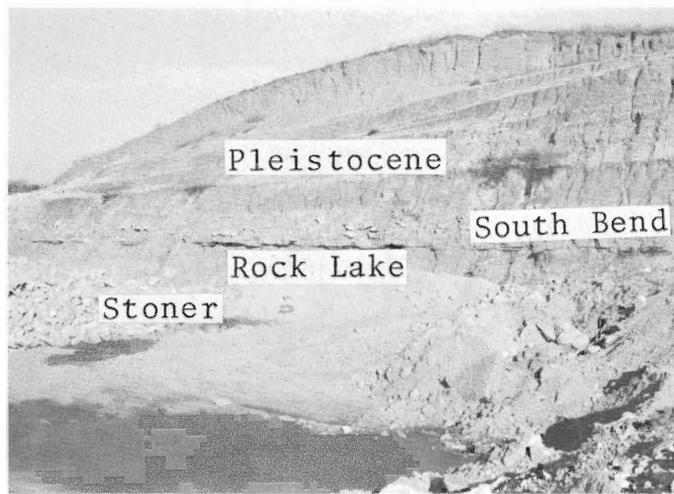
Location: Approximately 1 2/5 miles west of LaPlatte, Sarpy County,  
Nebraska (E edge W $\frac{1}{2}$  NE sec. 28-T13N-R13E)

Elevation: Top of Captain Creek Limestone Member (+1013.5 ft. MSL)

QUATERNARY

								Thickness (feet)			
PENNSYLVANIAN SYSTEM	MISSOURI SERIES	LANSING GROUP	STANTON FORMATION	South Bend	17		17 Ls, light-gray, pseudo-oolitic; fusulines & brachiopods	3.0			
				Rock Lake Member	16		16 Sh, bluish-gray, silty	4.0			
				Stoner Member	15		15 Ls, light tannish-gray, crystalline, thin to thick bedded; chert, fusulines, crinoids, & brachiopods	16.0			
					14		14 Sh, gray; brachiopods	2.5			
					13		13 Ls, bluish-gray, impure; brachiopods	1.3			
				Eudora	12		12 Sh, gray above (1.5'), black fissile below	2.0			
				Captain Cr.	11		11 Ls, dark-gray, impure; crinoids	0.4			
				KANSAS CITY	VILAS		10		10 Sh, greenish-gray, with two thin lime- stones in upper 3.4'	8.4	
						PLATTSBURG		9		9 Ls, light-gray, crystalline, thin bedded; fusulines & crinoids	6.4
								8		8 Sh, gray with interbedded Ls seams	1.7
			7					7 Ls, bluish-gray, crystalline; crinoids & brachiopods	4.9		
		BONNER SPRINGS FORMATION				6		6 Sh, bluish-gray, silty	5.5		
						5		5 Sh, dark reddish-brown, silty	1.5		
						4		4 Sh, greenish-gray, silty	2.0		
		WYANDOTTE	FARLEY MEMBER		3		3 Ls, gray, crystalline, thin bedded; <u>Osagia</u> & fusulines	5.0			
					2		2 Sh, bluish-gray, silty	2.0			
					1		1 Ls, light-gray, crystalline, thin to thick bedded; crinoids & fusulines	9.0			

Figure 15



Sorenson Quarry

		SORENSEN QUARRY							
		Location: Approximately 1 mile southwest of LaPlatte, Sarpy County, Nebraska (SE-SW-SE-NE Sec. 28-T13N-R13E)							
		Elevation: Top of Stoner Limestone Member (+1015 ft. MSL)							
		QUATERNARY							
		Thickness (feet)							
PENNSYLVANIAN SYSTEM	MISSOURI SERIES	LANSING GROUP	STANTON FORMATION	15	15 Ls, light tannish-gray, pseudo-oolitic; <i>Osagia</i> , glauconite, and abundant fusulines	5.3			
				14	14 Ls, gray, brachiopods, crinoids, and dark-gray chert nodules	2.1			
				13	13 Sh, light to medium greenish-gray	3.0			
				12	12 Ls, light-gray, very thin-bedded	3.9			
					11	11 Ls, light tannish-gray; dark-gray chert nodules	1.9		
						10	10 Ls, light-gray, crystalline, thin- to thick-bedded; brachiopods and abundant fusulines	5.5	
							9	9 Sh, greenish-gray; brachiopods & crinoids	2.0
							8	8 Ls, gray, impure; crinoids & brachiopods	1.8
				7	7 Sh, gray above (1.4), black, fissile below	1.5			
					6	6 Ls, bluish-gray, thin-bedded; fusulines	1.8		
						5	5 Sh, gray with thin limestones near top	4.1	
				VILAS	STANTON FORMATION	4	4 Sh, greenish-gray with red mottling near base	4.1	
						3	3 Ls, light-brown, with interbedded shale seams	2.5	
						2	2 Ls, light-gray, thin- to thick-bedded; crinoids	3.7	
				PLATTSBURG	STANTON FORMATION	1	1 Ls, light-gray, nodular	2.3	
1									

Figure 16

## Mileage

- 56.0 Turn left (north) to Stop Sign.
- 57.0 Junction with U. S. Highway 73-75. Turn right (south) and continue on Highway 73-75.
- 57.3 Missouri Pacific and Burlington railroad overpass. The Allied Chemical Company plant is located to the left (east) where nitrogen fertilizer is manufactured, and the Platte River valley alluvium is the source of a groundwater supply for the operation.
- 58.1 Cross Platte River. Leave Sarpy County and enter Cass County (figure 1).
- 58.4 Merritt Beach on left (east). This is a recreational area developed in abandoned sand and gravel pits.
- 58.9 Burlington Northern railroad overpass.
- 59.5 Missouri Pacific railroad overpass.
- 62.3 Missouri Pacific railroad overpass.
- 64.9 Junction of U. S. Highways 73-75 and 34. Continue ahead (south) on Highway 34 and 73-75. Access road to Murray, Nebraska on right (west).
- 69.0 Exposures of Beil Limestone in lower valley sides of Rock Creek on both sides of Highway. The exposure to the right (west) has been an excellent collecting locality for Beil corals for many years. These outcrops are not visible from the road.
- 75.7 Junction of Highway 34 and Highway 73-75. Turn right (west) and continue on Highway 34.
- 76.0 Town site of Union, Nebraska.
- 76.3 Outcrops of Ervine Creek to left (south) in bluff back of railroad depot.
- 76.4 CAUTION! Cross Missouri Pacific railroad tracks.
- 76.7 Cross Weeping Water Creek. Depth to bedrock approximately 60 feet at this bridge location.
- 77.4 Cross South Branch Creek. Drilling for this bridge site indicates Tecumseh Shale at 53 feet.

## Mileage

- 78.3 Crossing area of steep dip or faulting that occurs on the east flank of the Nehawka Arch. (see figure 4).
- 79.0 STOP NO. 6. Entrance to Schwaberer Quarry operated by Hopper Bros. Quarries. The sequence exposed in this quarry is shown in figure 17. Return to Highway 34 and continue west.

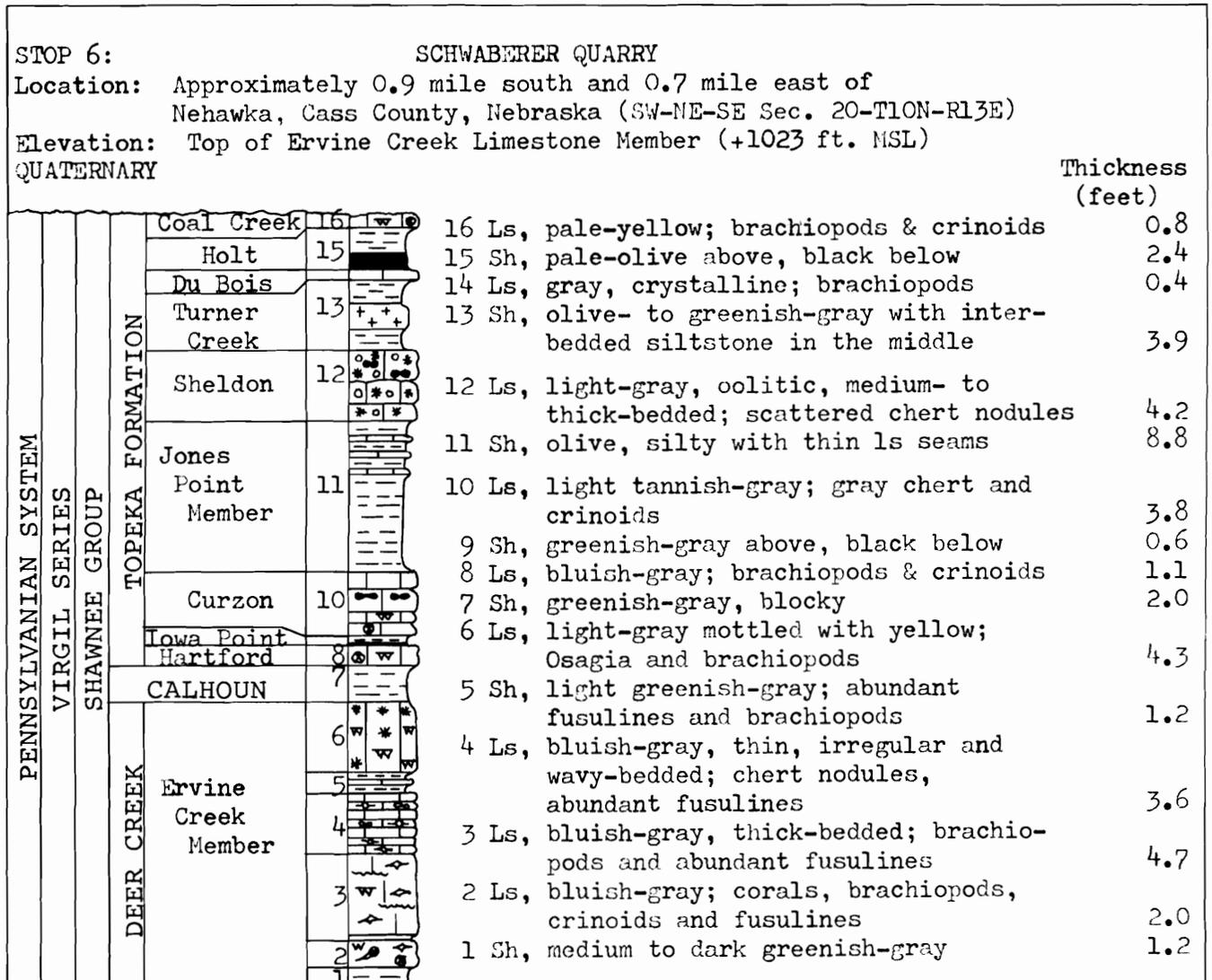
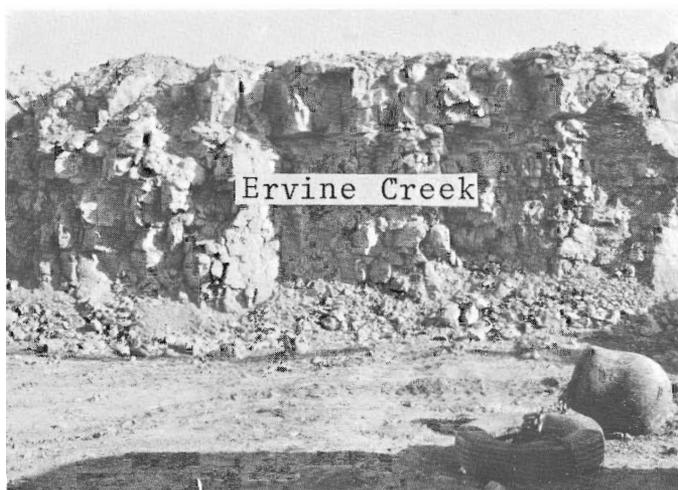


Figure 17



Schwaberer Quarry

## Mileage

- 79.4 A stratigraphic test (No. 7) drilled by Northern Natural Gas Co. in search of suitable underground gas storage was drilled just to the north (right). A generalized correlation of the rocks penetrated in this stratigraphic test is as follows:

Location: SW corner sec. 20, T. 10 N., R. 13 E., Cass County.  
Elevation of Land Surface: 1044 feet above mean sea level.

	Depth, in feet
Quaternary System (Recent and Pleistocene).....	0 - 103
Pennsylvanian System, 119 feet drilled:	
Shawnee Group, 13 feet drilled:	
Oread Limestone.....	103 - 116
Douglas Group, 74 feet:	
Lawrence Shale.....	116 - 173
Plattford Shale.....	173 - 190
Lansing Group, 32 feet drilled:	
Stanton Limestone.....	190 - 221
Vilas Shale.....	221 - 222

Many old quarries in the Plattsmouth Limestone and the Ervine Creek Limestone are evident around Nehawka.

Note: Junction of Nebraska Highway 734 leading to Nehawka, Nebraska, with U. S. Highway 34 to the right (north). Continue ahead (west).

- 80.7 Junction of Nebraska Highway 67 on left (south) with U. S. Highway 34. Continue ahead (west).

## Mileage

- 81.6 Northern Natural Gas Stratigraphic Test No. 9 was drilled just to the left (south). A generalized correlation of the rocks penetrated in this test is as follows:

Location: NW corner sec. 25, T. 10 N., R. 12 E., Cass County.  
Elevation of Land Surface: 1088 feet above mean sea level.

	Depth, in feet
Quaternary System (Recent and Pleistocene).....	0 - 17
Pennsylvanian System, 163 feet drilled:	
Shawnee Group, 73 feet drilled:	
Lecompton Limestone.....	17 - 38
Kanwaka Shale.....	38 - 43
Oread Limestone.....	43 - 90
Douglas Group, 65 feet:	
Lawrence Shale.....	90 - 132
Cass Limestone.....	132 - 139
Plattford Shale.....	139 - 155
Lansing Group, 25 feet drilled:	
Stanton Limestone.....	155 - 180
	(Total Depth)

- 82.7 Northern Natural Gas Test No. 10 was drilled just to the left (south) and a generalized correlation of the rocks penetrated in this test is as follows:

Location: C-EL-NE-NE sec. 27, T. 10 N., R. 12 E., Cass County.  
Elevation of Land Surface: 1172 feet above mean sea level.

	Depth, in feet
Quaternary System (Recent and Pleistocene).....	0 - 41
Pennsylvanian System, 223 feet drilled:	
Shawnee Group, 114 feet drilled:	
Tecumseh Shale.....	41 - 69
Lecompton Limestone.....	69 - 104
Kanwaka Shale.....	104 - 109
Oread Limestone.....	109 - 155
Douglas Group, 69 feet:	
Lawrence Shale.....	155 - 199
Cass Limestone.....	199 - 206
Plattford Shale.....	206 - 224
Lansing Group, 40 feet drilled:	
Stanton Limestone.....	224 - 256
Vilas Shale.....	256 - 260
Plattsburg Limestone.....	260 - 264
	(Total Depth)

- 83.6 Center Hill School on right (north).

- 84.2 Northern Natural Gas drilled Stratigraphic Test

## Mileage

No. 8 just to the left (south). A generalized correlation of the rocks penetrated in this test is as follows:

Location: NW corner NE sec. 28, T. 10 N., R. 12 E., Cass County.  
Elevation of Land Surface: 1223 feet above mean sea level.

	Depth, in feet
Quaternary System (Recent and Pleistocene).....	0 - 68
Pennsylvanian System, 227 feet drilled:	
Shawnee Group, 146 feet drilled:	
Deer Creek Limestone-Tecumseh Shale.....	68 - 126
Lecompton Limestone.....	126 - 162
Kanwaka Shale.....	162 - 167
Oread Limestone.....	167 - 214
Douglas Group, 65 feet:	
Lawrence Shale.....	214 - 258
Cass Limestone.....	258 - 265
Plattford Shale.....	265 - 279
Lansing Group, 16 feet drilled:	
Stanton Limestone.....	279 - 295
	(Total Depth)

84.6 Northern Natural Gas drilled a deep stratigraphic test (No. 11) just to the left (south). A generalized correlation of the rocks penetrated in this test is as follows:

Location: C-WL-NW-NW sec. 28, T. 10 N., R. 12 E., Cass County.  
Elevation of Land Surface: 1209 feet above mean sea level.

	Depth, in feet
Quaternary System.....	0 - 75
Pennsylvanian System.....	75 - 625
Devonian System.....	625 - 652
Silurian System.....	652 - 960
Ordovician System.....	960 -1480
Precambrian System.....	1480 -1497
	(Total Depth)

86.7 Junction of Nebraska Highway 634 on left (south) and Highway 34. Continue ahead (west).

A test hole was drilled just to the left (south). Correlation of the rocks penetrated in this test is as follows:

Location: NE corner NE sec. 25, T. 10 N., R. 11 E., Cass County.  
 Elevation of Land Surface: 1240 feet above mean sea level.

	Depth, in feet
Quaternary System (Recent and Pleistocene).....	0 - 95
Pennsylvanian System, 45 feet drilled:	
Wabaunsee Group, 19 feet drilled:	
Howard Limestone.....	95 - 99
Severy Shale.....	99 - 114
Shawnee Group, 26 feet drilled:	
Topeka Limestone.....	114 - 140
	(Total Depth)

#### Mileage

- 86.9 CAUTION! Missouri Pacific railroad tracks.
- 89.7 Junction with Nebraska Highway 50. Turn right (north) on Highway 50.
- 93.2 Outcrop of Lower Topeka and Upper Deer Creek Limestones in road cut on left (west); entrance to Hopper Brothers Quarry on right (east) where the Upper Oread Limestone is being quarried.
- 93.5 Cross Weeping Water Creek. Turn right (east) on Highway 50A just beyond Creek.
- 94.1 Entrance to Kerford Limestone Company Quarry on left (north). This quarry used to produce from the Ervine Creek and associated limestones of the Shawnee Group at the higher level but is now producing from a mine in the Oread Limestone just below valley level.
- 94.7 Leave Highway 50A, turn left (north) into Hopper Brothers Quarry (Clements Quarry).
- 94.8 CAUTION! Cross Missouri Pacific railroad tracks.
- 94.9 STOP NO. 7. Clements Quarry, operated by Hopper Brothers Quarries in the Plattsmouth Kereford Limestone near and below valley level. This was the first mine developed in Weeping Water Creek Valley and is a favorable site because the Plattsmouth-Kereford Limestone interval is thicker and of better quality than in areas of exposure down-valley. This rock has been used for road material and concrete aggregate. The stratigraphic position of the exposed rocks is shown in figure 3 and the details of the section exposed are illustrated in figure 18.

STOP 7: HOPPER BROS. QUARRY and ADJACENT ROADCUT  
 Location: Approximately 650 feet north of State Highway Spur 50A, 1½ miles west of Weeping Water, Cass County, Nebraska. (C SE SE sec. 34, & C WL SW SW sec. 35-T11N-R11E)  
 Elevation: Top of Rock Bluff Limestone Member (+1159 ft. MSL)

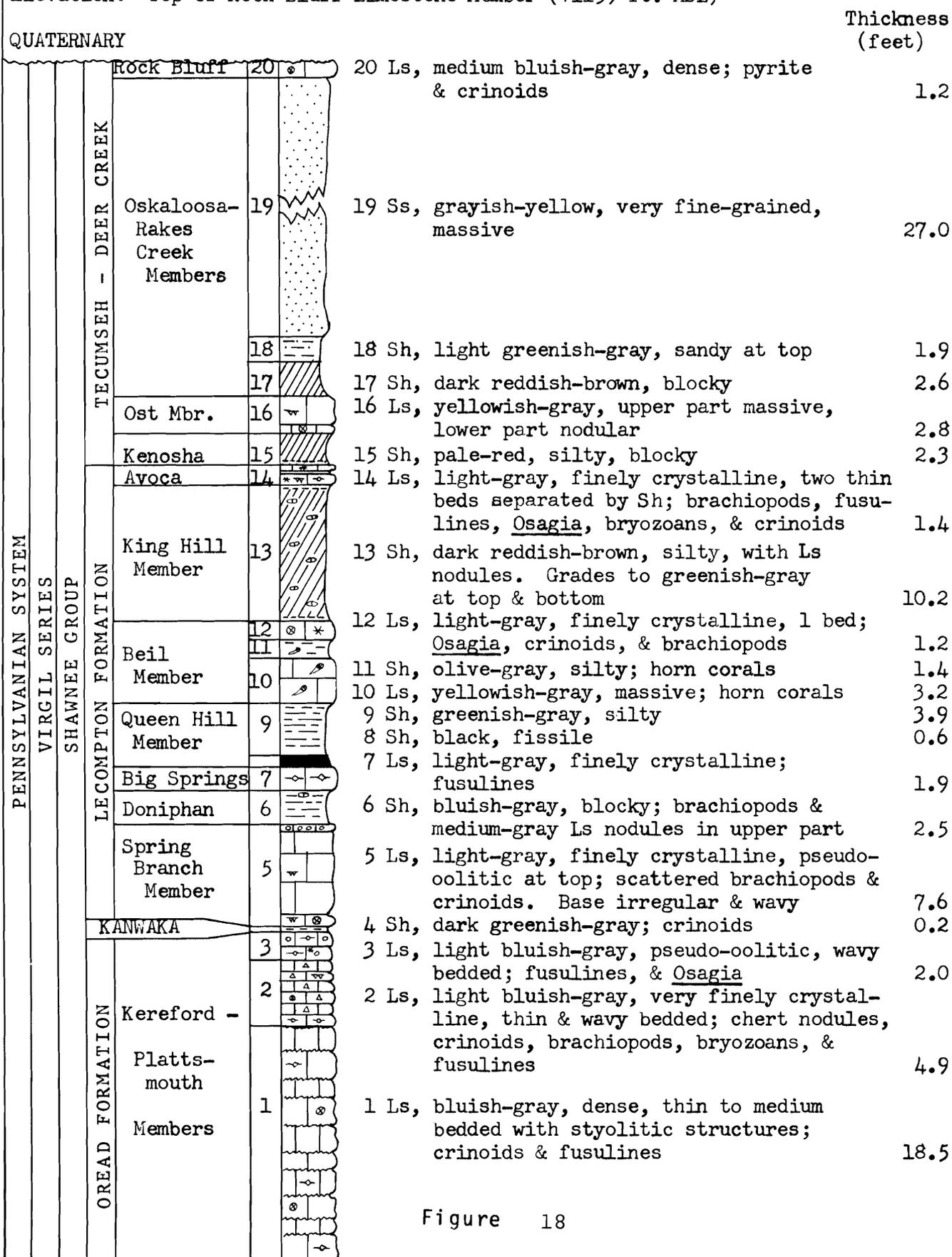


Figure 18



Clements Quarry

## Mileage

Retrace route to Highway 50A and Highway 50.

- 96.2 Junction with Highway 50. Directly to the west is the plant of the Sargent Calcium Company Quarry and Mine where limestone is fine-ground for use in feeds as mineral filler. Turn left (south).
- 100.2 Stop Sign; junction Nebraska Highway 50 and U. S. Highway 34; turn right (west) on Highway 34.
- 101.9 Abandoned missile site on right (north). The correlation of the materials drilled and excavated at this site is as follows:

Location: NW-SW-Se sec. 20, T. 10 N., R. 11 E., Cass County.  
 Elevation of Land Surface: 1303 feet above mean sea level.

	Depth, in feet
Quaternary (Pleistocene), 179 feet:	
Peoria Loess (Medial Wisconsinan).....	0 - 17
Loveland Formation (Illinoian).....	17 - 49
Cedar Bluffs and Nickerson Till (Kansan)..	49 - 143
Fullerton Formation (Late Nebraskan).....	143 - 179
Pennsylvanian (Virgil Series), 48 feet:	
Wabaunsee Group, 18 feet:	
Howard Limestone.....	179 - 183
Severy Shale.....	183 - 197
Shawnee Group, 30 feet:	
Topeka Limestone.....	197 - 223
Calhoun Shale.....	223 - 226
Deer Creek Limestone.....	226 - 227
	(Total Depth)

## Mileage

- 106.4 Road intersection. Access road to Elmwood (Nebraska Highway 1) to right (north).
- 110.4 Road right (north) to abandoned missile site. A study of the records of drilling and excavation at this site indicates a correlation of materials drilled as follows:

Location: NE-SW-NW sec. 24, T. 10 N., R. 9 E., Cass County.  
Elevation of Land Surface: 1342 feet above mean sea level.

## Depth, in feet

Quaternary (Pleistocene), 124 feet:	
Peoria Loess (Medial Wisconsinan).....	0 - 19
Gilman Canyon Formation (Early Wisconsinan).....	19 - 23
Loveland Formation (Illinoian).....	23 - 46
Glacial Till (Kansan).....	46 - 98
Pro-Kansan Sand.....	98 - 103
Glacial Till (Nebraskan).....	103 - 124
Pennsylvanian (Virgil Series), 102 feet:	
Wabaunsee Group, 102 feet:	
Willard-Langdon Shale.....	124 - 160
Emporia Limestone.....	160 - 170
Auburn Shale.....	170 - 202
Wakarusa Limestone.....	202 - 208
Soldier Creek Shale.....	208 - 226
	(Total Depth)

- 111.4 Junction with access road to Alvo on right (north).
- 113.7 Town of Eagle at right (north) of road.
- 115.5 Leave Cass County and enter Lancaster County (figure 1).
- 116.1 CAUTION! Cross Missouri Pacific railroad tracks.
- 120.5 Junction with access road to Walton on left (south).
- 122.1 Small outcrop of Dakota Group Sandstone in the drainage to right (north) of road.
- 123.0 East City limits of Lincoln. Turn right (north) on 84th Street.
- 126.0 Turn left (west) on Havelock Avenue.
- 127.0 Stop Sign! Junction with 70th Street. Continue ahead (west) on Havelock Avenue through Havelock.

## Mileage

128.0 Stop Sign! Junction with U. S. Highway 6. Turn  
left (southwest) and continue on Highway 6.

128.3 South entrance of Holiday Inn.

END OF TRIP

NOTES