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Tuttle Creek
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KANSAS ACADEMY
OF SCIENCE

G E O L O G Y S E C T I O N

Kansas State College

April 24, 1953

KGS
DHF*

PROGRAM

April 24, 1953

Room F-1 Fairchild Hall

9:00-11:00 A.M.

1. Comparison of loess in Western Europe with Kansas loess.
John C. Frye; State Geological Survey of Kansas.
2. Pleistocene Geomorphology of Wabaunsee, Eastern Riley, and
Southern Pottawatomie Counties, Kansas.
Melville R. Mudge; U.S. Geological Survey
3. The Basis for Physiographic Subdivisions of Kansas
John C. Frye and Walter H. Schoewe; State Geological Survey of
Kansas.
4. Mushroom rocks near Carneiro, Kansas
Sister Mary Grace Waring; Marymount College, Salina, Kansas.
5. New finds in Western Kansas Chalk.
L.D. Wooster and George Sternberg; Fort Hays Kansas State College.
6. Ontogenetic studies of some cyathaxonid corals.
James E. Conkin; Curator, geology museum University of Kansas.
7. The Structural geology of the Barneston-Winkler area of Riley
and Marshall Counties, Kansas
J.R. Chelikowsky; Department of Geology, Kansas State College.
8. Synthesis of an incipient stage of granitization.
Harry W. Smedes; Department of Geology, Kansas State College.

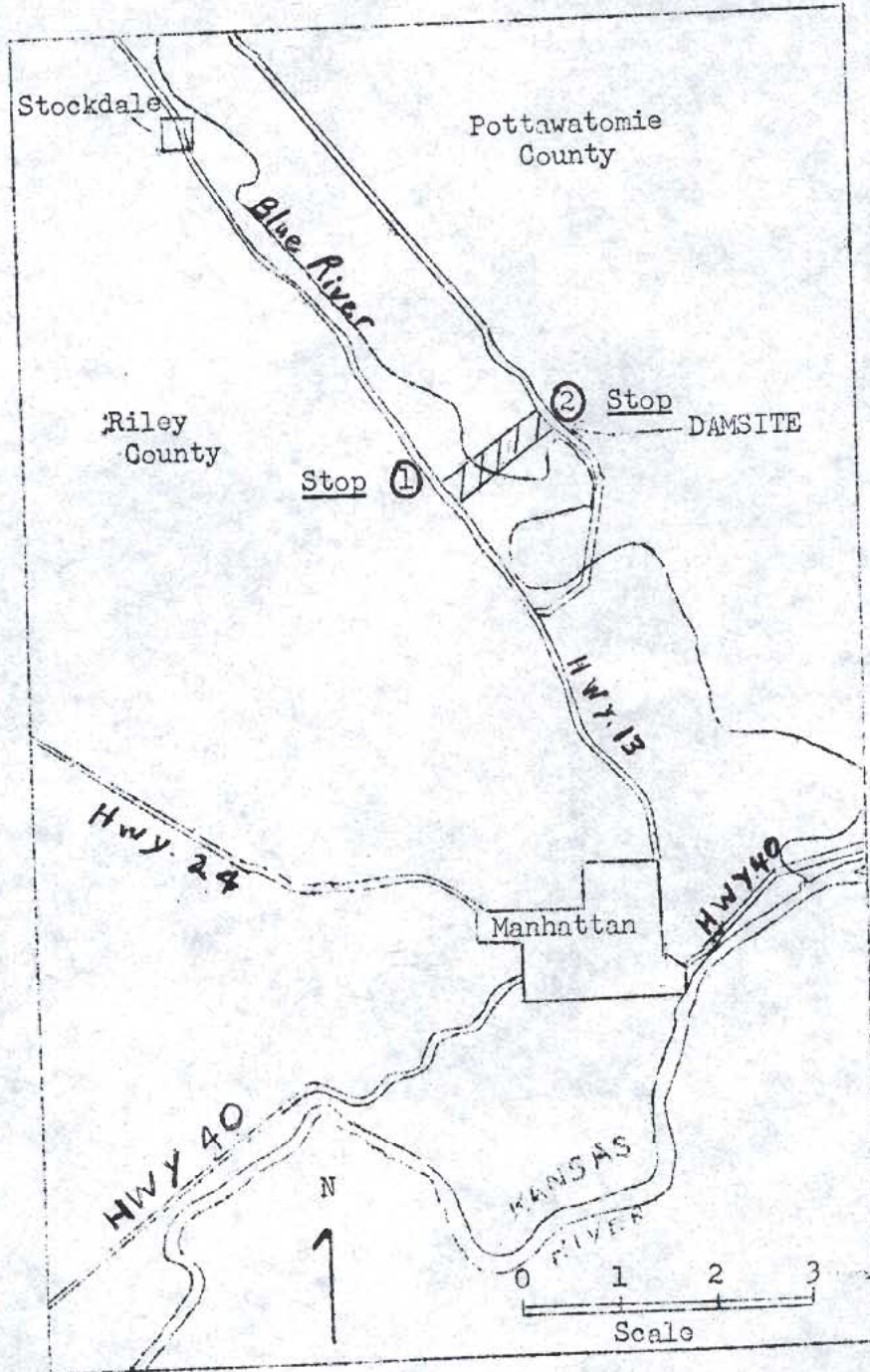
TO BE READ BY TITLE

Second Contribution to the Rexroad Fauna
Claude W. Hibbard; Museum of Paleontology, University of Michigan

Recent Water-table fluctuations in the Manhattan Area.
Frank E. Byrne and Clarence L. Harr; Department of Geology,
Kansas State College,

1:30 P.M. - Meet East entrance Fairchild Hall for field trip to
Tuttle Creek Damsite.

Field Trip
Tuttle Creek Damsite



GENERAL INFORMATION

Tuttle Creek Dam was authorized in June, 1938. The site is located 12.3 river miles above the mouth of the Big Blue River or approximately 6 miles north of Manhattan, Kansas. The project is estimated to cost \$87,000,000. Slightly over one-half of this amount would be for construction at the dam site with the remainder going for purchase of land and relocation of roads, railroads, and various utilities.

Tuttle Creek Dam will be an earth fill structure 7,350 feet in length and 136 feet high. The reservoir will have a total capacity of 2,280,000 acre-feet at full pool level. There are approximately 9,550 square miles in the drainage area of the Big Blue River above the dam.

A concrete spillway will be constructed on the left or east abutment and an outlet structure will be constructed on the west side of the dam for proper release of impounded water.

Quantities of material excavated:

Shale and limestone excavation	1,327,000 cu. ft.
Conduit excavation overburden	198,000 cu. ft.
shale and limestone	29,600 cu. ft.
Burrow Area impervious material	185,900 cu. ft.

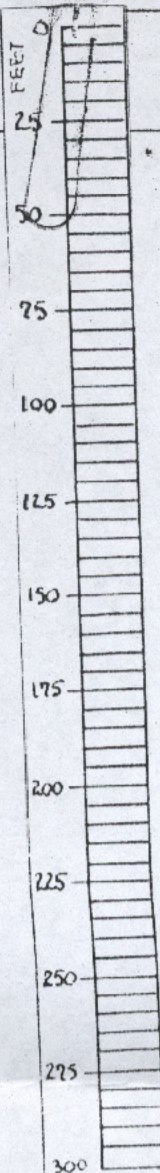
Acknowledgment

Mr. Benjamin E. Warner, Geologist, Corps of Engineers, prepared the information and geological data relative to Tuttle Creek Dam and has kindly agreed to lead the group through the dam site area.



Typical Section of Fill

LEGEND	AVERAGE THICKNESS	MEMBERS AND FORMATIONS	GROUP	SERIES	SYSTEM	REMARKS
	TO 50	WELLINGTON SH	SUMNER	LEONARD		
	7	HERINGTON LS	NOLANS LS			
	13	PADDOCK SH				
	1	KRIDER LS				
	25	ODELL SH				
	12	CRESSWELL LS	MINNER LS			
	9	GRANT SH				
	1	STOVALL LS				
	38	GAGE SH	DOYLE SH			
	12	TOWANDA LS				
	19	HOLMESVILLE SH				
	35	FORT RILEY LS	BARNESTON LS			
	9	OKETO SH				
	22	FLORENCE LS				
	28	BLUE SPRINGS SH	MATFIELD SH			
	2	KINNEY LS				
	43	WYMORE SH				
	8	SCHROYER LS	WEEFORD LS			
	21	HAVENSVILLE SH				
	8	THREEMILE LS				
	15	SPEISER SH				
	9	FUNSTON LS				
	20	BLUG RAPIDS SH				
	7	CROUSE LS				
	20	EASLY CREEK SH				
	4	MIDDLEBURG LS	BAKER LS			
	8	HOOPER SH				
	5	EISS LS				
	14	STEARNS SH	BEATTIE LS			
	2	MORRILL LS				
	7	FLORENNA SH				
	5	COTTONWOOD LS				
	35	ESKRIDGE SH				
	14	NEVA LS	GUENOLA LS			
	8	SALEM POINT SH				
	8	BURR LS				
	24	ROCA SH				
	4	HOWE LS	RED EAGLE LS			
	5	BENNETT SH				
	2	GLEN ROCK LS				
	25	JOHNSON SH				
	9	LONG CREEK LS	FORAKER LS			
	40	HUGHES CREEK SH				
	3	AMERICUS LS				
	27	HAMLIN SH				
	4	FIVE POINT LS				
	20	WEST BRANCH SH				
	2	FALLS CITY LS				
	28	HAWKBY SH				
	2	ASPINWALL LS				
	9	TOWLE SH (INCL. INDIAN CANYON MEMB.)				
	2	BROWNVILLE LS				
	7	PONY CREEK SH				
	9	CANEYVILLE LS				
	20	FRENCH CREEK SH				
	1	JIM CREEK LS				
	12	FRIEDRICH SH				
	2	GRANDHAVEN LS				
	7	DRY SH				
	3	DOVER LS				
	7	LANSDON SH				
	1	MAPLE HILL LS				
	13	WAMEGO SH				
	12	TARKIO LS				
	28	WILLARD SH				
	2	ELMONT LS				
	15	HARVEYVILLE SH				
	2	READING LS				
	7	AUBURN SH				



CHASE
WOLFCAMP
COUNCIL GROVE

PERMIAN

ADMIRE

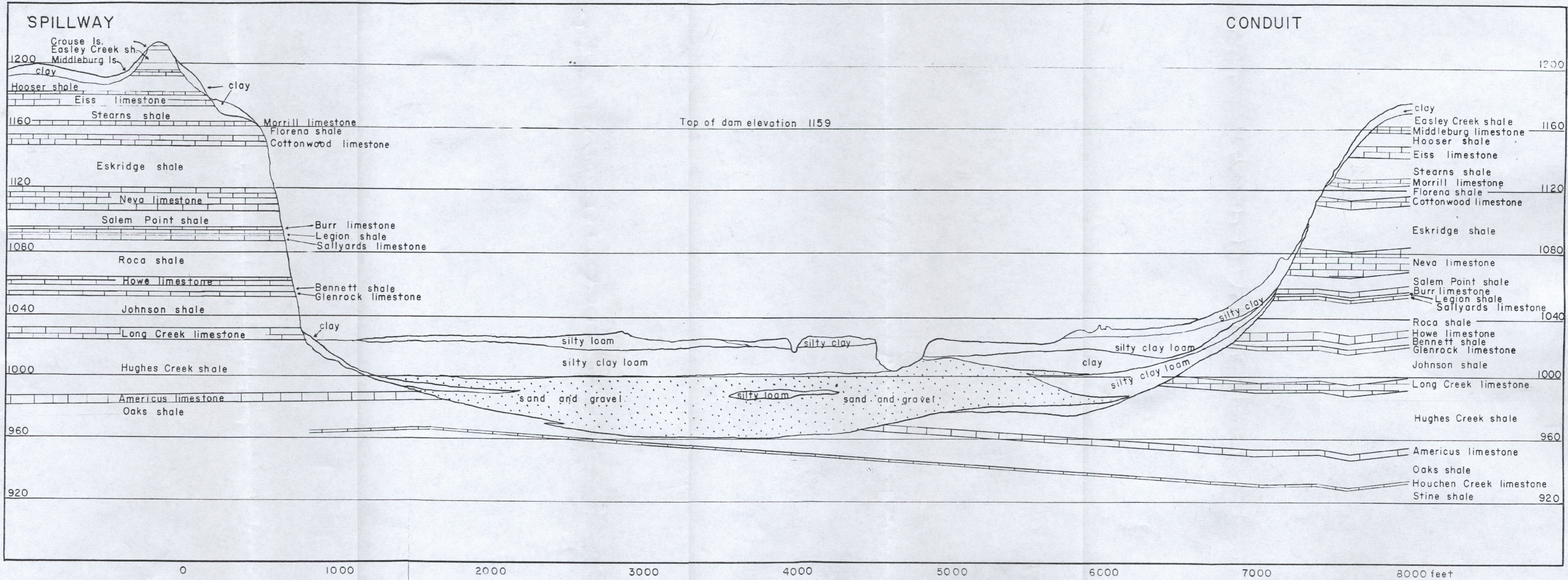
WABAUNSEE

VIRGIL

PENNSYLVANIAN

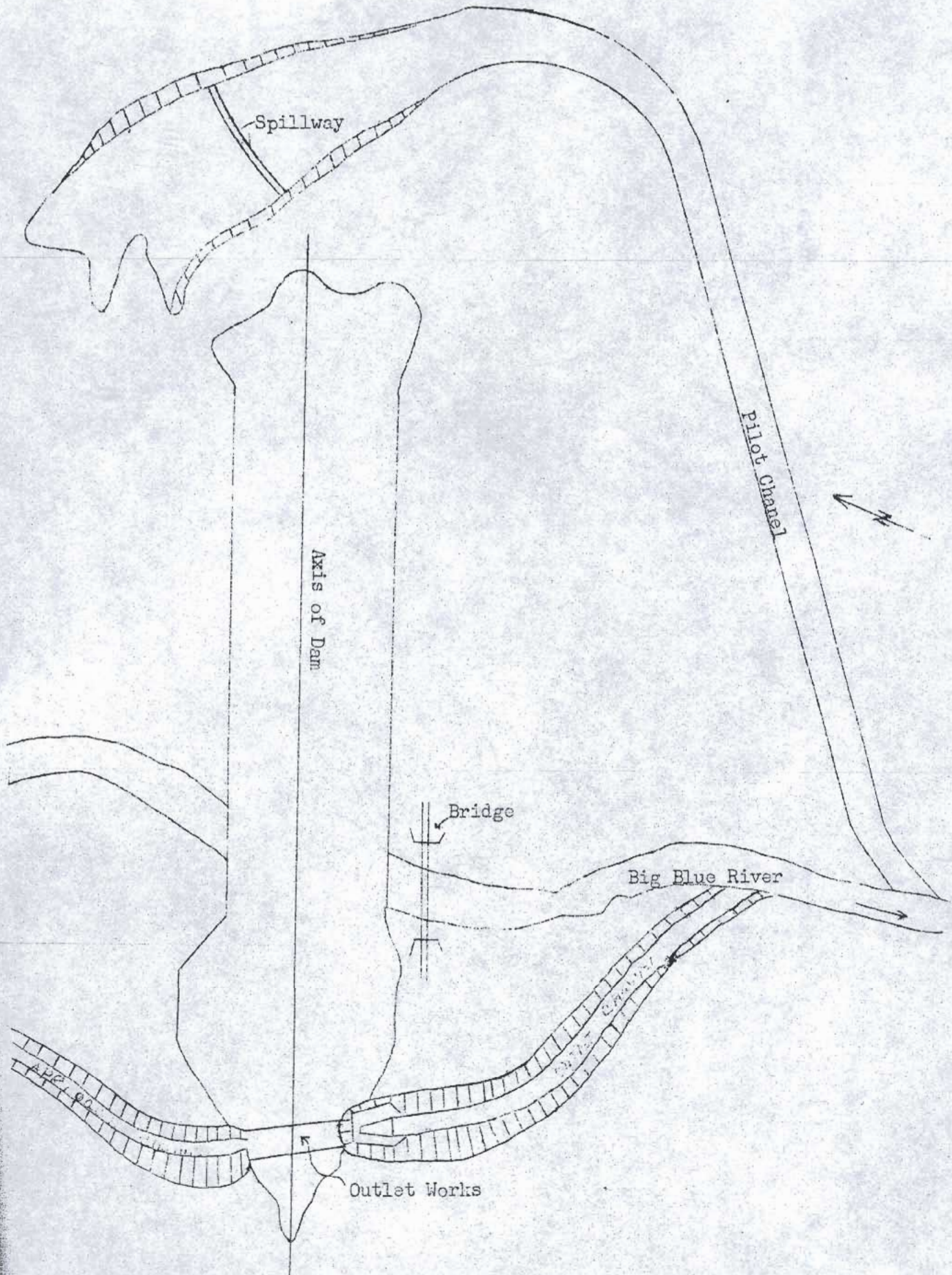
AVERAGE INTERVALS OF THE PALEOZOIC ROCKS IN RILEY COUNTY, KANSAS

(Prepared from data collected by the USGS)



SECTION ALONG AXIS LOOKING DOWNSTREAM

adapted from U.S. Engineer office report



Spillway

Axis of Dam

Pilot Channel

Bridge

Big Blue River

Outlet Works

MEASURED SECTIONS - DAMSITE AREA

by

Benjamin E. Warner, Geologist, Corps of Engineers.

Funston Lms.

- 3.3 Limestone, light gray and light brownish gray, fine grained, medium hard, medium bedded.
- 0.7 Limestone, yellowish brown, earthy, with irregular masses of medium hard limestone.
-
- 4.0 feet

Blue Rapids Shale

- 3.7 Shale, greenish gray, laminated, with thin limestone layers, fissile, subfirm and firm.
- 2.7 Shale, greenish gray, massive, blocky, subfirm and weak with lenses and seams of calcite.
- 3.1 Shale, varigated reddish brown and brownish green, with irregular masses of light brownish gray dolomitic shale or earthy dolomite, massive, blocky, subfirm. Upper contact marked by a thin earthy dolomite lense that pinches in and out.
- 0.7 Shale, greenish gray, massive, subfirm.
- 1.1 Shale, varigated reddish brown and light greenish gray massive, blocky with light gray earthy dolomite nodules.
- 0.65 Limy clay, tan, massive, weak, semi-plastic when wet, contains zones of finely crystalline calcite.
- 1.55 Shale greenish gray, massive, subfirm, usually a thin reddish brown zone at top of zone.
- 1.9 Shale, varigated reddish brown and greenish gray, massive, blocky subfirm.
-
- 15.4 feet

Crouse Limestone

- 2.0 Limestone, shaly, light gray, fine grained, thin bedded, gradational from shale above.
- 2.1 Limestone, light gray, fine grained, medium hard, thin bedded, platy.
- 4.0 Limestone, light gray and light brownish gray, fine grained, medium hard, thin bedded with beds gradational in thickness, thinner at top becoming thicker at bottom, argillaceous.
- 2.5 Limestone, light brownish gray, very fine grained, medium hard, thin to medium bedded, very argillaceous.
- 1.3 Limestone, brownish gray and yellowish brown, medium grained, medium hard with solution, cavities partially filled with calcite.
-
- 11.9 feet

Easley Creek Shale

- 8.1 Shale, dark gray to black where unweathered, laminated, fissile, subfirm with small light gray limestone nodules in upper 1.0.
- 2.0 Limestone, light gray fine grained, medium hard with small round shale inclusions, fossiliferous.
- 12.4 Shale, variegated green and reddish brown, includes some firm silty claystone and weak indurated clay, contacts
22.5 feet between greenish gray zones and reddish brown zones vary widely.

Middleburg Limestone

- 3.4 Limestone, gray and light gray, mottled in places, iron stained throughout medium hard, medium bedded, fossiliferous.

Hooser Shale

- 0.7 Shale, brownish green, laminated, fissile, subfirm.
- 0.75 Shale, massive, blocky, firm.
- 1.9 Shale, greenish gray and brownish green, massive, very firm, silty.
- 1.9 Shale, greenish gray, massive, firm blocky with limestone nodules in upper 1.0. In places a shaly limestone zone which grades in to limestone nodules.
- 1.4 Shale, reddish brown, massive, firm, silty, varies in thickness.
- 1.1 Shale greenish gray, massive, blocky subfirm.
- 1.0 Shale, light greenish gray with some reddish brown mottling indistinctly laminated, subfirm.
8.75 feet

Eiss Limestone

- 0.2 Crystals of quartz, calcite and celestite loosely cemented.
- 1.9 Limestone, light gray, fine grained, medium hard, pitted, ore bed, closely jointed.
- 1.1 Shale, light gray, in places chalky, soft.
- 1.8 Shale, light brownish green, irregularly and indistinctly laminated, subfissile, subfirm and firm.
- 0.9 Limestone, brownish gray, fine and medium grained, medium hard ore bed.
- 3.0 Limestone, very argillaceous, light gray, fine grained, medium hard, thick bedded, gradational into material
8.9 feet below.

Stearns Shale

- 4.1 Shale, dark gray with light gray limestone lenses and laminae, fissile, firm.
- 1.05 Shale, black, laminated fissile, subfirm, carbonaceous.
- 3.5 Shale, green massive, firm, in places includes a thin dolomitic limestone or nodular shale.
- 0.8 Dolomite, shaly, light gray, fine grained, medium hard, in places a nodular shale.
- 2.3 Shale variegated, reddish brown and greenish gray, massive to indistinctly laminated, usually greenish gray below.
-
- 11.75 feet

Morrill Limestone

- 1.2 Limestone, light gray or brownish gray, medium hard, medium bedded.
- 1.1 Shale, greenish gray to buff, laminated fissile, firm, in places contains thin limy laminae. Some quartz crystals in irregular zones.
- 1.0 Limestone, light gray and light brownish gray, fine grained, medium hard, medium bedded.
-
- 3.3 feet

Florena Shale

- 1.0 Shale, light greenish gray and buff laminated to indistinctly laminated, subfirm.
- 2.0 Shale, light gray and dark gray, variable, massive, firm to very firm, limy with lenses and irregular zones of calcite.
- 3.6 Shale, light greenish gray to buff laminated, subfissile, with abundant fossils.
-
- 6.6 feet

Cottonwood Limestone

- 3.4 Limestone, light gray, fine grained, medium hard, thick bedded, with abundant fusulines and fusuline pits, few scattered chert nodules.
- 3.5 Limestone, light gray, fine grained, medium hard, thin to medium bedded, few fusuline pits.
-
- 6.9 feet

Eskridge Shale

24.6

Neva Limestone

18.0

Salem Point Shale

8.4

Burr Limestone

4.0

Legion Shale

1.4

Sallyards Limestone

2.6

Roca Shale

23.1

Howe Limestone

4.9

Bennett Shale

3.9

Glenrock Limestone

2.2

Limestone, light brownish gray, fine and medium grained, medium hard ore bed.

Johnson Shale

4.95

Shale, dark gray, laminated, fissile, subfirm.

2.25

Limestone argillaceous, light brown to buff thin bedded, closely jointed.

1.0

Shale, brown to buff, indistinctly laminated, subfirm to weak slightly blocky.

2.5

Shale, light gray, massive firm, lower contact gradational into material below.

1.2

Shale, green, massive, blocky and subfirm.

0.8

Limestone very argillaceous, very fine grained, medium hard, ore bed.

2.0

Shale, light gray and light brownish gray, massive, firm.

Johnson Shale (Cont.)

3.7 Shale gray and light brownish gray laminated with thin beds of argillaceous limestone.

2.1 Shale brown, massive, weak with angular inclusions of firm shale and argillaceous limestone.

1.95 Shale, brownish green, massive to indistinctly laminated, subfissile, subfirm.

22.45 feet

Long Creek Limestone

7.0

Hughes Creek Shale

34.9

Americus Limestone

4.1