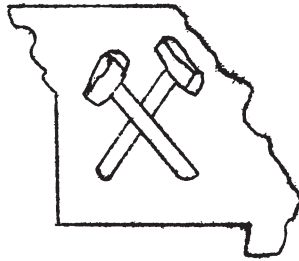


ASSOCIATION
OF
MISSOURI GEOLOGISTS



SEVENTH ANNUAL MEETING

October 7 & 8, 1960

MIDDLE MISSISSIPPIAN AND PENNSYLVANIAN
STRATIGRAPHY OF ST. LOUIS AND ST. LOUIS COUNTY,
MISSOURI

Sponsored by the
Department of Geology and Geological Engineering
Institute of Technology
St. Louis University, St. Louis

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ACKNOWLEDGMENTS

The Missouri Highway Commission cut a core of the Pennsylvanian in the County.

Mr. E. P. O'Brien of the Missouri Pacific RR and Mr. Wm. Hesse of the Frisco RR made arrangements for the trip to enter railroad property.

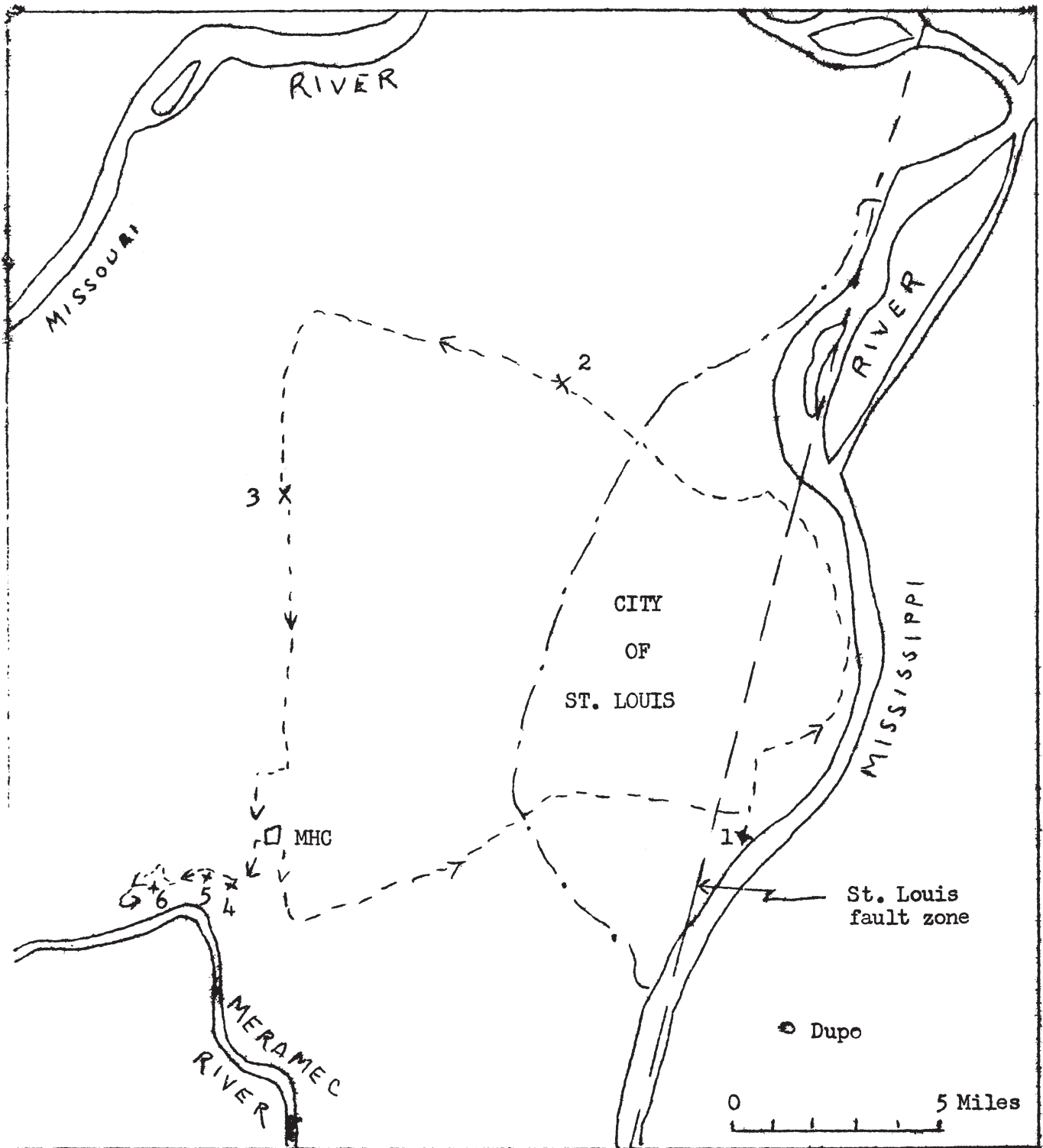


Fig. 1 Route of Field Trip.

FIELD TRIP LOG

October 8, 1960

- 00.00 District Office, Missouri Highway Commission. Head south on Lindbergh Road.
- 00.58 Cross St. Louis and San Francisco RR.
- 00.74 Cross Big Bend Road.
- 01.53 Go through underpass and make two right turns to get on U.S. Highway 66 going east. Bedrock is Pennsylvanian overlain by loess.
- 03.60 Cross Gravois Creek. The contact of the Spergen and St. Louis limestones is about level with the floor of the bridge.
- 04.30 Elm Ave. Pennsylvanian sandstone and red shale overlie the St. Louis ls. The contact is about level with the Howard Johnson parking lot (left).
- 05.35 Laclede Station Rd. Slabs of coral-bearing St. Louis limestone were removed from basement of shopping center (left).
- 07.34 Cross River Des Peres. The river flows in a sewer drain. The channel was cut in the upper St. Louis ls. The St. Louis-Ste. Genevieve contact lies about 800 feet east of the bridge.
- 08.06 Continue east on Chippewa Ave. (U.S. Highway 66).
- 08.51 Cross Hampton Ave. Entering Cheltenham syncline Fennemann (1911). Bettendorf Supermarket (right) built on Pennsylvanian clay has had foundation problems. Medical center (right) built on Ardmore ls. (Penn). Six blocks north at Hampton and Fyler avenues a large clay pit was formerly operated by Blackmer-Post Inc. Several smaller pits both north and south of Chippewa Ave. formerly produced clay.
- 09.66 Kingshighway Blvd. Famous-Barr Southtown store (left) built on St. Louis ls. Pennsylvanian strata underlie the hills both east and west of this valley.
- 10.15 Morganford Ave. Ridge capped by Marmaton. Ten blocks south near Morganford and Gravois avenues, Cheltenham clay was once mined extensively (Wheeler, 1894).
- 10.62 Gravois Ave. Continue east.
- 11.25 Grand Blvd.

- 12.22 Broadway. Turn right.
12.59 Gasconade St. Turn left.
12.85 Cross Mo. Pac. RR. Turn right.

13.03 STOP 1. Park cars at north end of dump.
Mississippian strata are exposed for more than a mile in the bluffs, railroad cuts and quarries. The most complete middle Mississippian section in this part of the state is nestled in with the Workhouse, Dog Pound, City Incinerator and Dump.

SUBSTOP A. Workhouse quarry. Strata exposed in the railroad cut north of the quarry and in the lower part of the quarry are the Spergen ls. The Warsaw-Spergen contact was formerly visible in the bottom of the quarry (Fig. 2). The Spergen-St. Louis contact is placed arbitrarily at the base of the white lithographic limestone about eye-level across the quarry.

SUBSTOP B. Hoffman quarry about 600 feet south of Workhouse quarry. The Dupo anticline (Fennemann, 1911) is visible from this point. The structure is well exposed in the bluffs south of Dupo, Illinois, and extends N. 15° W. across the Mississippi River into St. Louis. Here the east flank dips about 3° and the west flank about 15°. The maximum dip is measured in the abandoned Hoffman quarry (now nearly filled with waste).

In St. Clair County, Illinois, oil is produced from the top of the Kimmswick limestone on the Dupo anticline (Bell, 1929). In the City of St. Louis, gas produced from the Kimmswick ls. on the Dupo structure has been used locally.

SUBSTOP C. 4528 So. Broadway about 400 feet south of Hoffman quarry. The St. Louis-Ste. Genevieve contact is placed arbitrarily at the base of a thin gray argillaceous bed about 8 feet below the top of the limestone bluff. The Ste. Genevieve limestone is mainly cross-bedded calcarenite interbedded with algal limestone.

St. Louis fault (Frank, 1948). The fault zone is several hundred feet wide and strikes N. 5° E. Here two fault planes are visible in the face of the abandoned quarry. The faults are vertical and the east side is downthrown. The net throw is nearly 10 feet. Slickensides indicate that the movement was vertical. Sphalerite occurs on and near the fault planes. Frank has traced this fault zone 15 miles north and 30 miles south.

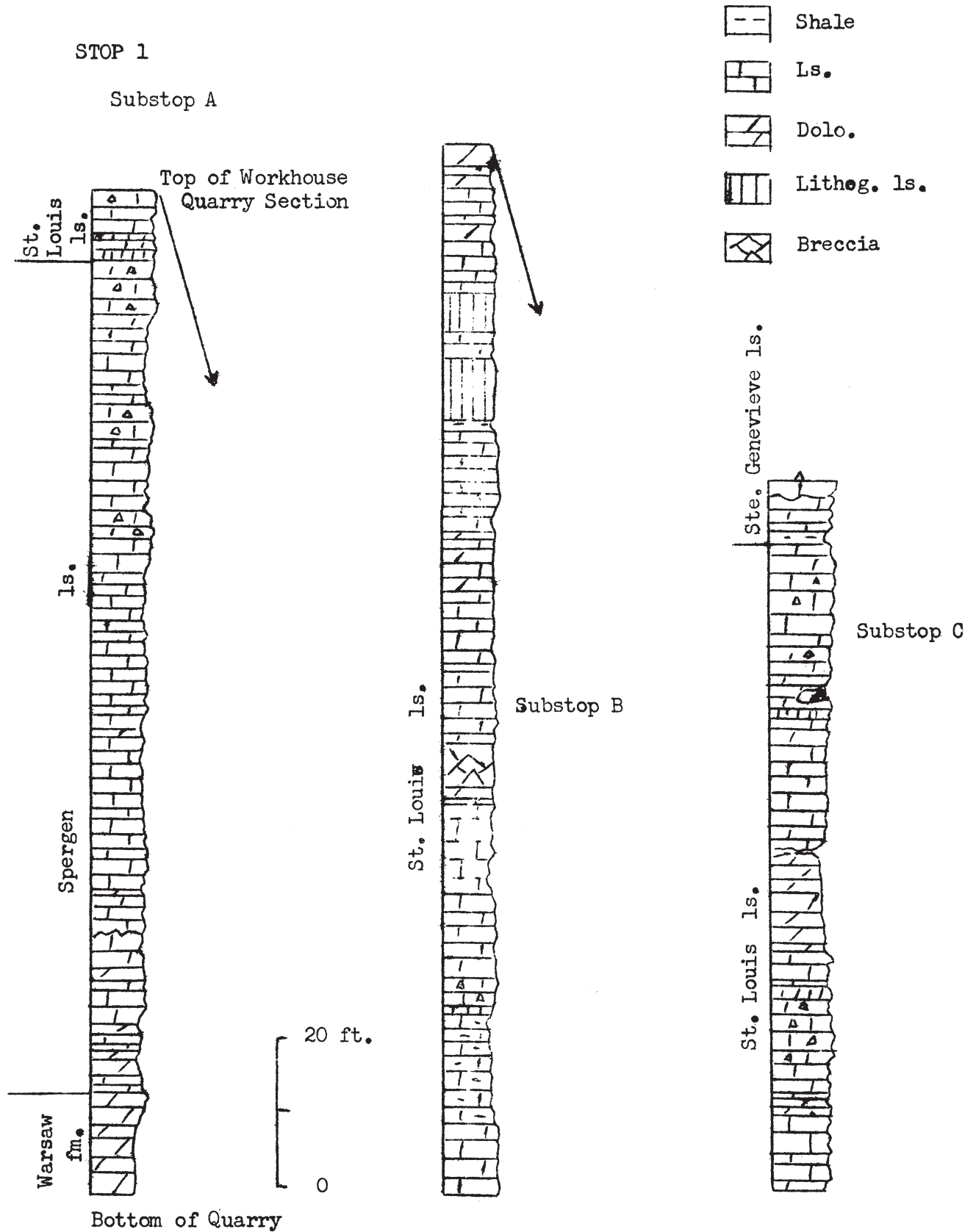


Fig. 2 Composite Section of Mississippian Strata from Bottom of Workhouse Quarry to 4528 So. Broadway, St. Louis.

Return to cars

- 13.46 Gasconade St. and Broadway. Turn right on Broadway.
- 13.83 Broadway and Jefferson Blvd. Continue straight (north) on Jefferson.
- 15.18 Gravois Ave. turn right.
- 15.99 Cross 12th St. continue east on U.S. Highway 66.
- 17.08 Pass under McArthur Bridge. Mill Creek which now flows in sewer enters the Mississippi River at this point.
- 17.50 Jefferson National Expansion Monument (under construction) on right. St. Louis-Ste. Genevieve contact formerly visible just above levee south of Eads Bridge.
- 18.85 Traveling northwest on U.S. Interstate 70. During construction 25-30 feet of clean well sorted Pleistocene (?) sand was exposed in cuts.
- 19.78 Leave Interstate 70. Turn right and go two blocks.
- 20.01 Broadway. Turn left.
- 20.54 Pass under McKinley Bridge. Contact of Ste. Genevieve and Pennsylvanian sandstone formerly visible on Interstate 70 two blocks west. Entering North St. Louis syncline (Frank, 1946).
- 21.75 Linton Ave. and Broadway. Cross St. Louis fault zone. Tilted blocks of Ste. Genevieve ls. formerly visible on left side of Broadway.
- 22.40 O'Fallon Park (left). Pennsylvanian shales in bed of Interstate 70 overlain by Illinoisan till, overlain by Peorian loess.
- 22.66 East Taylor Ave. Turn left.
- 23.10 West Florissant Ave. Turn right. Lagonda fm. (red) in hill-slope on left.
- 23.20 Bircher Ave. Turn left. Thatcher (1927) believed that this valley was a Pleistocene sluiceway which carried the Mississippi River at the time when the Illinoisan ice sheet dammed the River at St. Louis. Presumably the water flowed south to Forest Park and joined the River Des Peres.
- 24.35 Kingshighway. Turn right.
- 24.55 Bircher Blvd. Turn left.
- 25.70 Enter Interstate 70.
- 26.10 Underpass Goodfellow Blvd. Pennsylvanian shale causes slumping on left side of highway.

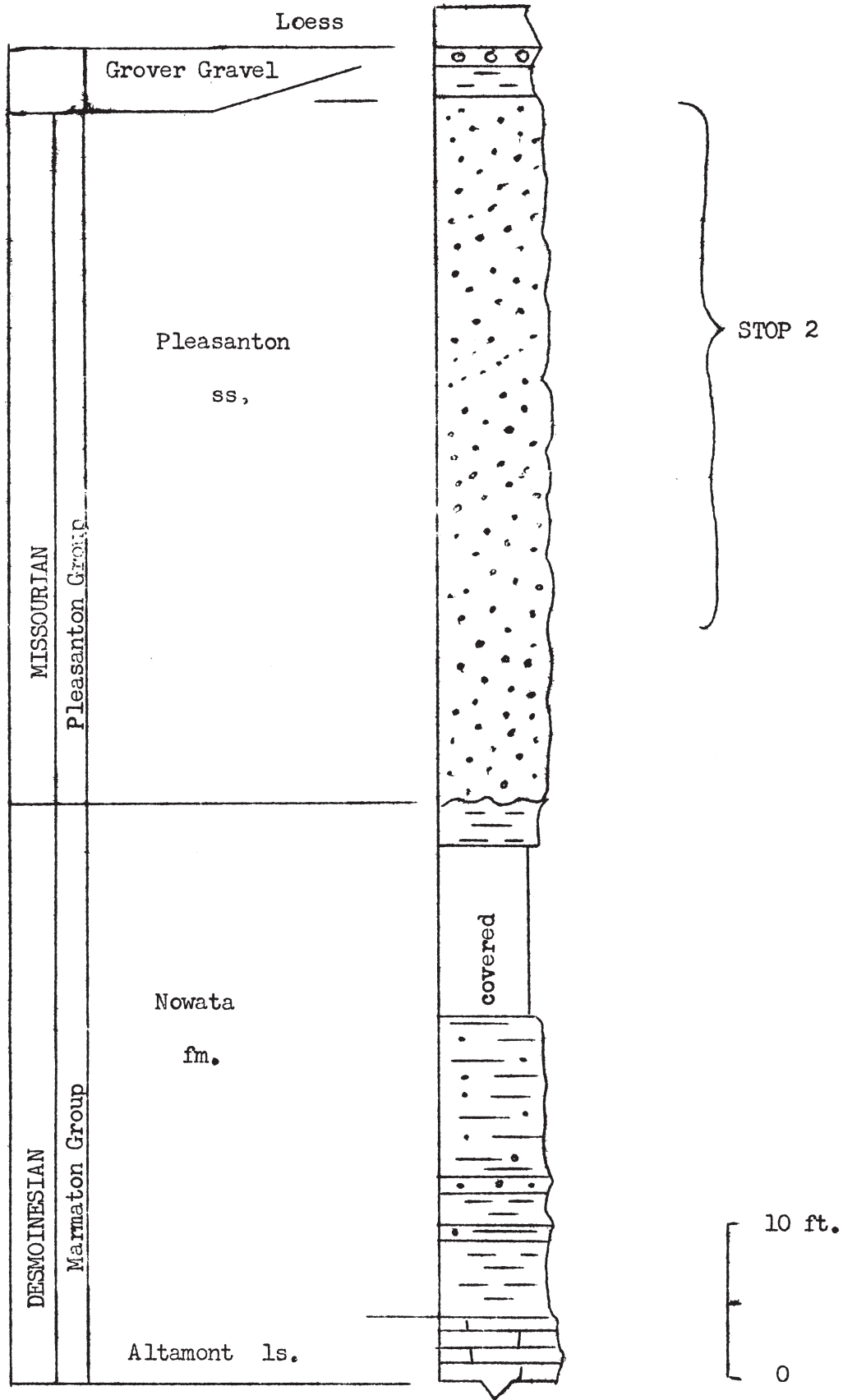


Fig. 3 Section Formerly Exposed in Cut on South Side of Interstate 70 East of Florissant Avenue.

STOP 3

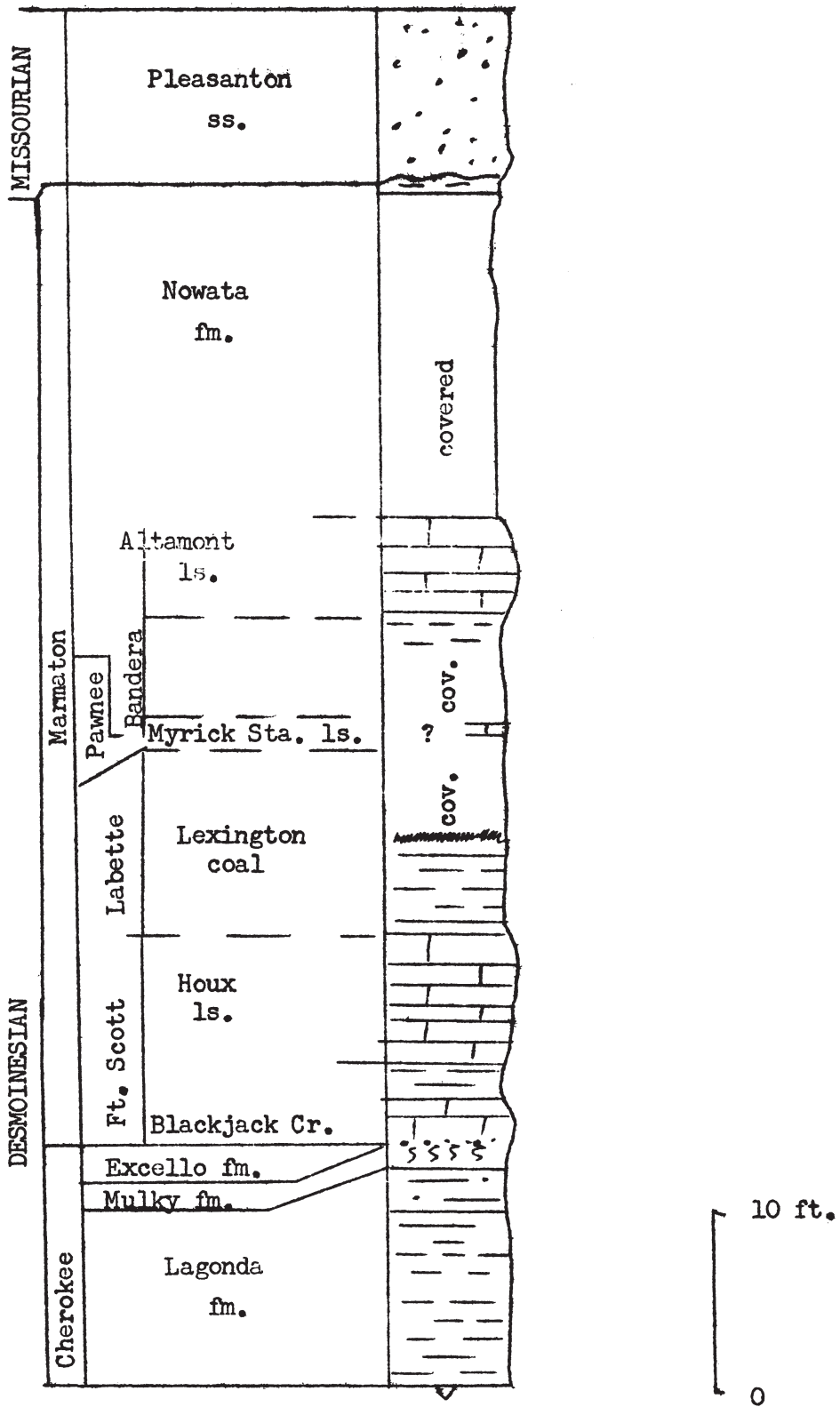


Fig. 4 Headwaters Fee Fee Cr. on West Side of Lindbergh Blvd., 0.8 Mile North of Olive Street Road.

SE, NW, 36, 46 N., 5 E.

- 27.50 Underpass Lucas & Hunt Rd. Contact of Pleasanton ss. and Grover gravel formerly visible at top of bank on right.
- 28.58 STOP 2. Cut on Wabash RR. Pleasanton ss.
The section shown in Fig. 3 was exposed during highway construction on the hillside immediately west of the bridge. The Pleasanton sandstone consists of 44 feet (30 feet exposed in RR. cut) of fine-grained, micaceous subgraywacke. The cross-bedding here and in other exposures indicate that the sediment was transported from the north and northeast. The contact with the underlying Nowata formation is irregular and the basal Pleasanton contains logs of Calamites sp. and other plants. A veneer of Grover gravel (Tertiary ?) caps the section. Loess underlies the soil.
- 28.85 Continue west of Interstate 70. Cross Florissant Ave.
- 30.00 Carsonville Creek. The Altamont limestone was blasted out of the road bed 200 yards east of bridge. There are no exposures of rock for the next five miles. The area is covered by 20 to 100 feet of Loess.
- 31.24 Underpass Brown Road.
- 32.45 Pass entrance to St. Louis Municipal Airport.
- 34.27 Turn south on Lindbergh Blvd.
- 34.89 Cross St. Charles Road.
- 36.20 Cross branches of Fee Fee Cr. Cabaniss in valley bottoms.
- 37.20 Cross large tributary of Fee Fee Cr. which flows over Lagonda formation. In excavation in hillside to right the top of the Lagonda red shale is visible. The lower of the two limestone beds is the Blackjack Creek with the Cherokee-Marmaton contact at the base. The upper limestone is the Houx.
- 37.50 Cross Dorsett Road. The clay pit and plant of the Alton Brick Co. is 1/2 mile west. Clay is obtained chiefly from the Lagonda fm. which is 32 feet thick.
- 38.58 STOP 3. Fee Fee Creek. This is Locality 43 of J. B. Knight (1933) and the most complete section of Pennsylvanian in the outlier (Fig. 4). The top of the Lagonda formation is visible at the north end of the exposure. The Excello formation is unusually thin here. Knight's G and R zones containing a remarkable molluscan fauna underlie the Altamont limestone. The Nowata formation was formerly visible in the creek bed on the east side of the road. The base of the Pleasanton sandstone crops out at about the elevation of Schuetz Road just south of this exposure.

- 39.56 Continue south on Lindbergh Blvd. Underpass Olive Street Road. Pleasanton ss. in road cuts. About 1/4 mile west the Mo. Highway Commission drilled a test core drill hole through the Pennsylvanian.
- 40.80 Cross Ladue Road. Cross Cherokee-Marmaton contact.
- 41.10 Outcrops of Lagonda red shale in drain on right.
- 41.72 Cross Deer Creek. St. Louis limestone in banks.
- 42.17 Underpass U.S. Highway 40.

LUNCH STOP

- 42.28 Cross Clayton Road.
- 43.65 Cross Two Mile Creek.
- 44.63 Manchester Ave. Turn right.
- 45.15 Geyer Road. Turn left.
- 45.57 Cross Dougherty Ferry Road.
- 46.21 Cross West Adams Ave.
- 46.62 Cross Mo. Pac. RR.
- 47.37 Big Bend Blvd. Turn right.
- 48.17 Marshall Road. Turn left.
- 48.31 Overpass Frisco RR.
- 48.35 STOP 4. Cut on Frisco RR. This is the best exposure of the lower part of the Pennsylvanian in the outlier (Fig. 5A). The upper surface of the St. Louis limestone shows pre-Pennsylvanian sinkholes and other solution features. This pre-Pennsylvanian karst topography is widespread, and has been noted in Missouri, Kansas, Wyoming and Colorado. Here a rubble of Mississippian chert lines the bottom and sides of the sinks. An incomplete cycle further fills the sinks. The "Marshall Road" sandstone is the basal member of the Croweburg coal cycle. This was also the basal member of Knight's Cycle A (Loc. 20, 1933). The Croweburg coal and the Ardmore limestone are absent here but are present in the City of St. Louis. The red shale of the Lagonda formation is the highest member of the cycle.
- 48.58 Return to Big Bend Blvd. Turn left.

STOP 4

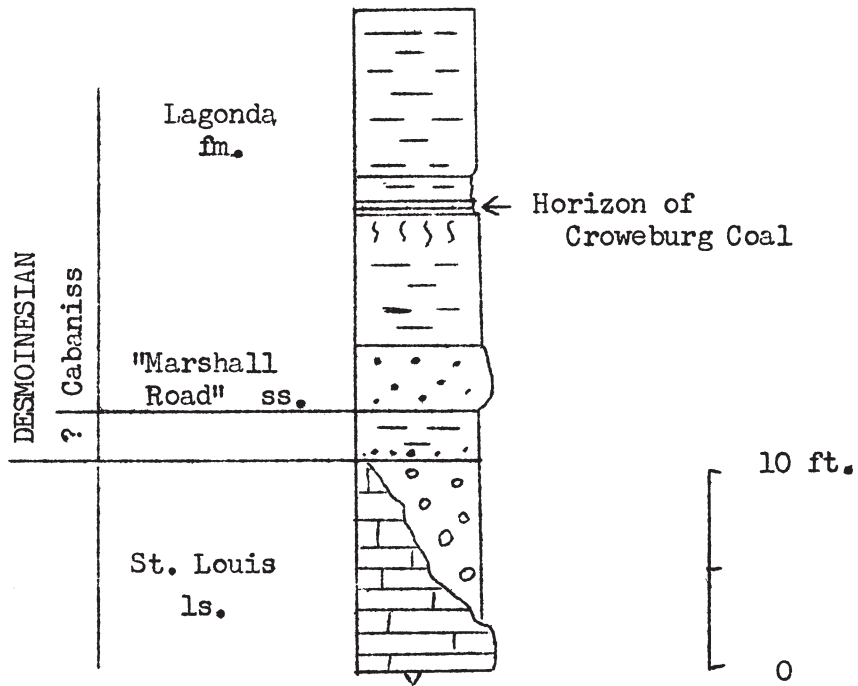


Fig. 5A Cut on Frisco RR. at Marshall Road, Kirkwood. NW, NW, SW, 11, 44 N., 5 E.

STOP 5

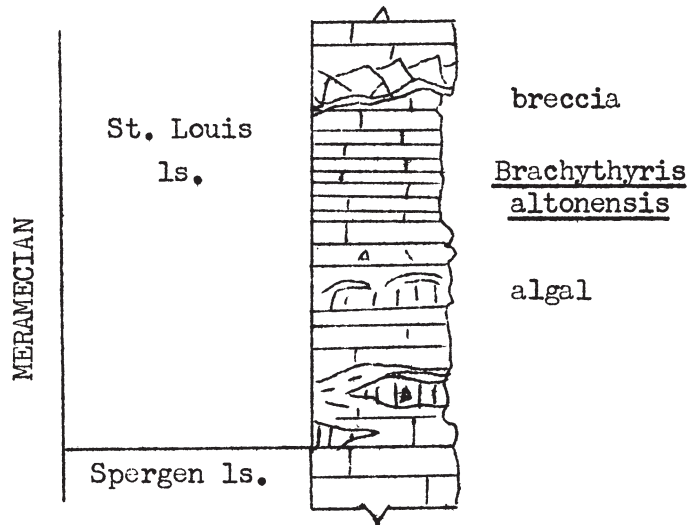


Fig. 5B Cut on Frisco RR. at Glenwood Lane, Kirkwood. NE, NW, SE, 10, 44 N., 5 E.

STOP 6

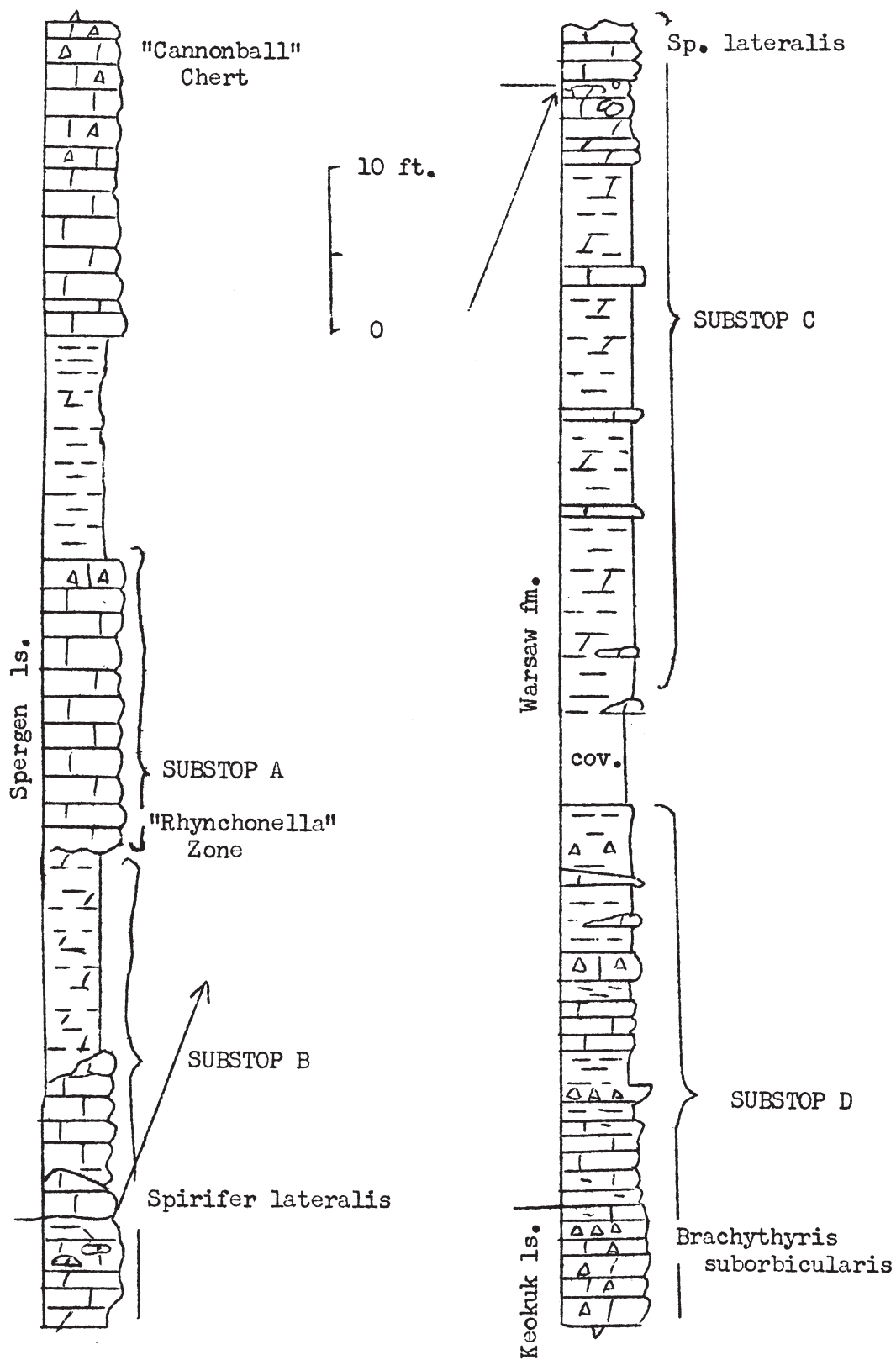


Fig. 6 Cuts on Missouri Pacific and Frisco Railroads.
SE, NW and NW, SW, 9, 44 N., 5 E.

- 49.33 Big Bend Blvd. Turn left Glenwood Lane.
- 49.44 STOP 5. Cut on Frisco RR. Contact of Spergen and St. Louis limestones (Fig. 5B) is exposed at track level on south side of cut. It is placed arbitrarily at the base of the lowest white lithographic limestone. The origin of the limestone breccia at the top of the cut was discussed by Grawe (1925). The zone of Brachythyris altonensis Weller lies in the brown limestone below the breccia. The total thickness of the St. Louis ls. at stops 4 and 5 is about 40 feet. The Ste. Genevieve ls. and about 200 feet of St. Louis ls. have been cut out by a post-Mississippian unconformity between here and Stop 1.
- 49.54 Return to Big Bend Blvd. Turn left.
- 50.24 Note view to left across mature valley of Meramec River. Note accordant summit levels of former peneplain(?). Barrett Station Road. Turn right.
- 50.90 Barrett Station on Mo. Pac. RR. Cross bridge, turn left and park. Note National Museum of Transport.

STOP 6.

SUBSTOP A. The lower Spergen, Warsaw and upper Keokuk formations are exposed for about 0.7 mile along the right-of-way. The "Rhynchonella" zone (Fennemann, 1911) crops out under the bridge. The "cannonball" chert beds appear at the east end of this cut. The top of the Spergen is about 0.8 mile east of Barrett Station, but not visible along the railroad.

SUBSTOP B. The Warsaw-Spergen contact occurs near trace level at the west end of the cut about 0.35 mile west of Barrett Station. It is placed arbitrarily at the base of the Spirifer lateralis -inequalis-bifurcatus zone.

SUBSTOP C. 1000 feet west of Big Bend Blvd. Silty shale and limestone of the upper Warsaw crop out between the railroad tracks. The top of the Warsaw is exposed on the south side of the Frisco tracks.

SUBSTOP D. 1400 feet southwest of C. The contact of the Keokuk limestone and the Warsaw formation appears in the cliff between the railroad tracks. This is also the boundary of the Osage and Meramec series. The contact is placed where shale and darker chert become common in the section. The basal limestones of the Warsaw are rather coarsely crystalline and quite fossiliferous.

The position of the contact here is about the same as that chosen by Knight and Koenig (1957) on U.S. 66, 2.5 miles southeast of here.

Return to Quinette Lane and Big Bend Blvd.

Retrace route Big Bend Blvd. to Kirkwood Road thence to Missouri Highway Commission parking lot.