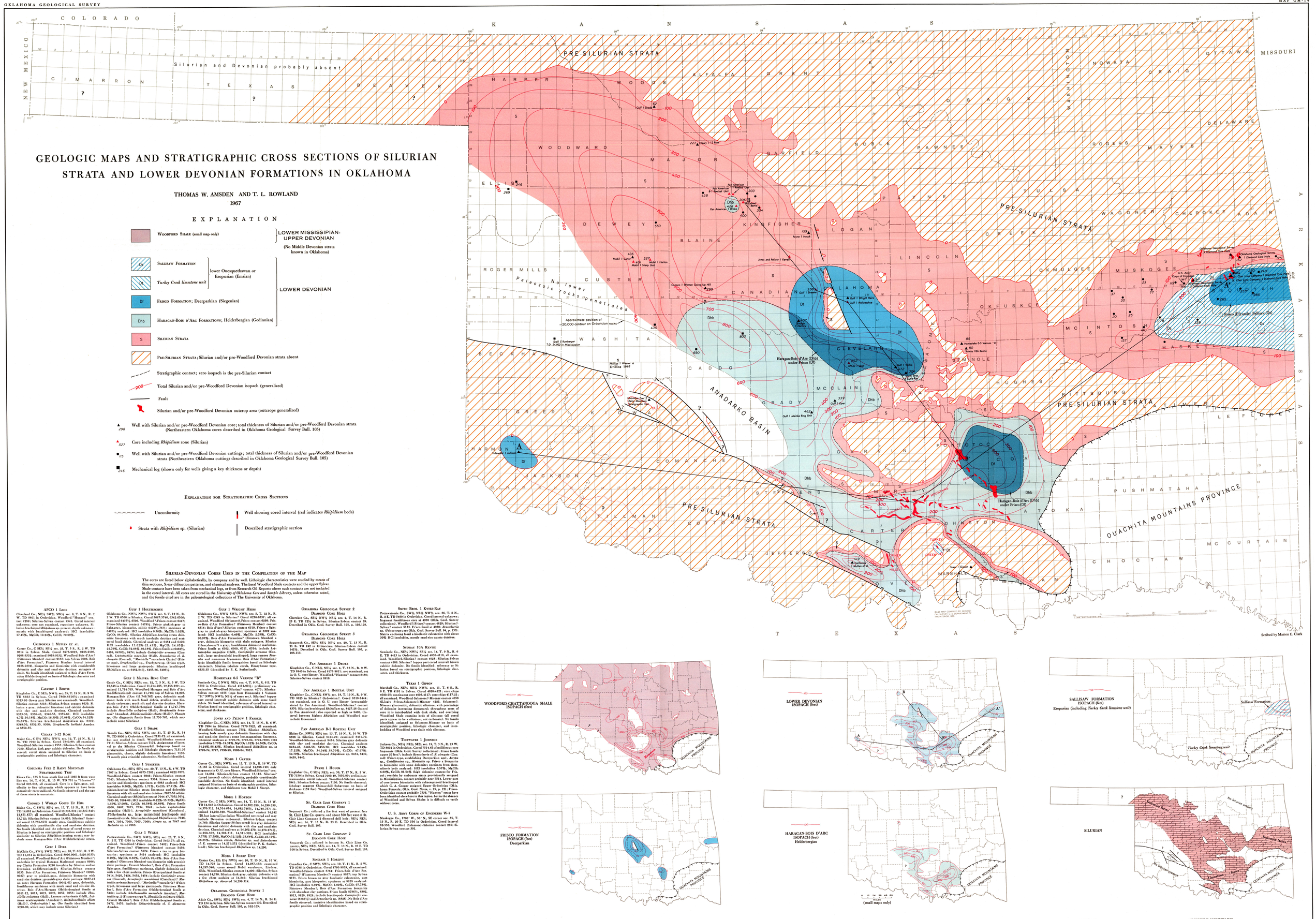
GEOLOGIC MAPS AND STRATIGRAPHIC CROSS SECTIONS OF SILURIAN STRATA AND LOWER DEVONIAN FORMATIONS IN OKLAHOMA

THOMAS W. AMSDEN AND T. L. ROWLAND
1967



EXPLANATION

- Woodford Shale (small map only) — LOWER MISSISSIPPIAN-UPPER DEVONIAN (No Middle Devonian strata known in Oklahoma)
- Sallisaw Formation (Ds) — lower Onesquethawan or Esopusian (Emsian)
- *Turkey Creek limestone unit* (Dt) — lower Onesquethawan or Esopusian (Emsian)
- Frisco Formation; Deerparkian (Siegenian) (Df)
- Haragan-Bois d'Arc Formations; Helderbergian (Gedinnian) (Dhb)
- Silurian Strata (S)
- Pre-Silurian Strata; Silurian and/or pre-Woodford Devonian strata absent
- Stratigraphic contact; zero isopach is the pre-Silurian contact
- 200 — Total Silurian and/or pre-Woodford Devonian isopach (generalized)
- Fault
- Silurian and/or pre-Woodford Devonian outcrop area (outcrops generalized)
- 298 — Well with Silurian and/or pre-Woodford Devonian core; total thickness of Silurian and/or pre-Woodford Devonian strata (Northeastern Oklahoma cores described in Oklahoma Geological Survey Bull. 105)
- 527 — Core including *Rhipidium* zone (Silurian)
- 115 — Well with Silurian and/or pre-Woodford Devonian cuttings; total thickness of Silurian and/or pre-Woodford Devonian strata (Northeastern Oklahoma cuttings described in Oklahoma Geological Survey Bull. 105)
- 246 — Mechanical log (shown only for wells giving a key thickness or depth)

Explanation for Stratigraphic Cross Sections

- Unconformity
- Strata with *Rhipidium* sp. (Silurian)
- Well showing cored interval (red indicates *Rhipidium* beds)
- Described stratigraphic section

Silurian-Devonian Cores Used in the Compilation of the Map

The cores are listed below alphabetically, by company and by well. Lithologic characteristics were studied by means of thin sections, X-ray diffraction patterns, and chemical analyses. The basal Woodford Shale contacts and the upper Sylvan Shale contacts have been taken from mechanical logs, or from Research Oil Reports where such contacts are not included in the cored interval. All cores are stored in the *University of Oklahoma Core and Sample Library*, unless otherwise noted, and the fossils cited are in the paleontological collections of The University of Oklahoma.

APCO 1 Leon
Cleveland Co., NE¼ SW¼ SW¼ sec. 9, T. 8 N., R. 2 W. TD 8801 in Ordovician. Woodford-"Hunton" contact 7250; Silurian-Sylvan contact 7541. Cored interval unknown; core not examined, repository unknown. Silurian brachiopod *Rhipidium* sp. present, depth unknown; matrix with brachiopod analyzed: HCl insolubles 17.45%, MgCO3 10.24%, CaCO3 70.09%.

California 1 Mulles et al.
Carter Co., C SE¼ SE¼ sec. 29, T. 5 S., R. 2 W. TD 9014 in Sylvan Shale. Cored 8078-8085, 8188-8190, 9208-9232, and 9016-9032. Woodford-Bois d'Arc? (Fittstown Member) contact 9232; top Sylvan 9006. Bois d'Arc Formation?, Fittstown Member (cored interval 9188-9192), biosparite and biomicrite with considerable dolomite and clay and sand-size detritus; stringers of shale. No fossils identified; assigned to Bois d'Arc Formation (Helderbergian) on basis of lithologic character and stratigraphic position.

Calvert 1 Bertie
Kingfisher Co., C SE¼ NW¼ sec. 35, T. 19 N., R. 9 W. TD 8063 in Sylvan. Cored 7860-8016; examined 8315.60 (lower part Silurian not examined). Woodford-Silurian contact 8335; Silurian-Sylvan contact 8839. Silurian a gray, dolomitic limestone and calcitic dolomite with clay and sand-size detritus. Chemical analyses 8335.36, 8336.46, 8346.55, 8355.60: HCl insolubles 4.78-10.18%, MgCO3 16.39%-37.08%, CaCO3 54.32%-75.37%. Silurian brachiopod *Rhipidium* sp. 8339, 8348.50, 8352.55, 8360; *Strophomella lodiola* Amsden at 8352.55.

Cleary 1-12 Rose
Major Co., C E½ NE¼ NW¼ sec. 12, T. 22 N., R. 11 W. TD 7795 in Sylvan. Cored 7540-90; all examined. Woodford-Silurian contact 7755; Silurian-Sylvan contact 7780. Silurian dark-gray calcitic dolomite. No fossils observed; cored strata assigned to Silurian on basis of stratigraphic position and lithologic character.

Columbia Fuel 2 Rainy Mountain Stratigraphic Test
Kiowa Co., 165 ft from south line and 1065 ft from west line sec. 14, T. 6 N., R. 15 W. TD 701 in "Hunton"? Cored 623-633, all examined. Core is a light-gray, calcilutite to fine calcarenite which appears to have been extensively recrystallized. No fossils observed and the age of these strata is uncertain.

Conoco 1 Woman Going Up Hill
Blaine Co., C SW¼ SE¼ sec. 17, T. 13 N., R. 11 W. TD 14,601 in Ordovician. Cored 13,755-831; 13,835-940; 13,871-877; all examined. Woodford-Silurian? contact 13,721; Silurian-Sylvan contact 14,035. Silurian? Examined cored 13,755-877: mostly gray, fossiliferous calcitic dolomite with considerable clay and sand-size detritus. No fossils identified and the reference of cored strata to Silurian is based on stratigraphic position and lithologic similarity to Silurian *Rhipidium*-bearing strata; may include some Haragan-Bois d'Arc (Helderbergian) strata.

Gulf 1 Dyer
McClain Co., SW¼ SW¼ NE¼ sec. 20, T. 6 N., R. 3 W. TD 11,054 in Ordovician. Cored 8006-8061, 9220-9335; all examined. Woodford-Bois d'Arc (Fittstown Member)? contact 8061; top typical Haragan Marlstone? contact 8096; top Clarita Formation 9280 (overlain by Silurian and/or Devonian undifferentiated). Silurian-Sylvan contact 9335. Bois d'Arc Formation, Fittstown Member? (8096-9037) gray to pinkish-gray, dolomitic biosparite with sand-size detritus; greenish-gray shale partings: 9037-41 no core; Haragan Formation (9042-61) gray, dolomitic, fossiliferous marlstone with much sand and silt-size detritus. Bois d'Arc-Haragan (Helderbergian) fossils at 9011.12, 9013, 9021, 9028, 9057, 9058; include *Hexaclella celebrex* (Hall), *Leptaena sahaviensis* (Hall), *Leptaena oceticostipalata* (Amsden)?, *Rhipidomella ideles* (Hall)?, *Orthostrophia*? sp. (No fossils identified from 9220-90, which may include some Silurian.)

Gulf 1 Holtzschue
Oklahoma Co., NW¼ NW¼ SW¼ sec. 6, T. 12 N., R. 2 W. TD 6506 in Silurian. Cored 5687-5746, 6342-6506; examined 6437½-6506. Woodford?-Frisco contact 6447; Frisco-Silurian contact 6479½. Frisco pinkish-gray to light-gray, biosparite, oolitic 6472½-76½; specimen at 6479½ analyzed: HCl insolubles 0.36%; MgCO3 1.02%, CaCO3 98.58%. Silurian *Rhipidium*-bearing strata dolomitic limestone with much insoluble detritus and scattered fossil debris. Chemical analyses at 6484 and 6488: HCl insolubles 13.02%-21.43%, MgCO3 14.65%-22.79%, CaCO3 52.00%-59.19%. Frisco fossils at 6462½, 6468, 6470½, 6474; include *Costispirifer arenosus* (Conrad), *Leptostrophia mucrophis* (Hall), *Remusloeria* cf. *R. elongata* (Conrad), ?*Meristella*?*maculata* Clarke? (Frisco type), *Strophomella* sp., *Trachyspira*? sp. (Frisco type), bryozoans and large gastropods. Silurian brachiopod *Rhipidium* sp. at 6482-84½, 6485-86, 6490½.

Gulf 1 Mainka Ring Unit
Grady Co., C SE¼ NE¼ sec. 12, T. 5 N., R. 5 W. TD 13,648 in Ordovician. Cored 11,714-765, 12,135-322; examined 11,714-765. Woodford-Haragan and Bois d'Arc (undifferentiated) contact 11,746; top of Sylvan 12,298. Haragan-Bois d'Arc (11,746-765) gray, dolomitic marlstone; beds with much fossil debris, grading into biocalcitic carbonate; much silt and clay-size detritus. Haragan-Bois d'Arc (Helderbergian) fossils at 11,747-750; include *Hexaclella celebrex* (Hall), *Strophomella bronson?* (Amsden), *Rhipidomelloides ideles* (Hall)?, *Phasonema* sp. (No diagnostic fossils from 11,750-765, which may include some Silurian.)

Gulf 1 Shade
Woods Co., NE¼ SE¼ SW¼ sec. 31, T. 25 N., R. 14 W. TD 8000 in Ordovician. Cored 7135-71; all examined, but not studied in detail. Woodford-Silurian contact 7110; Silurian-Sylvan contact 7172. Assignment of interval to the Silurian Chimneyhill Subgroup based on stratigraphic position and lithologic character: 7131-46 glauconitic, cherty, slightly dolomitic limestone; 7136-71 mostly pink crinoidal calcarenite. No fossils identified.

Gulf 1 Streeter
Oklahoma Co., SE¼ SE¼ sec. 20, T. 13 N., R. 4 W. TD 7307 in Sylvan. Cored 6875-7391; examined 6925-7070. Woodford-Frisco contact 6946; Frisco-Silurian contact 7045; Silurian-Sylvan contact 7294. Frisco a gray biosparite and biomicrite; specimen at 6983 analyzed: HCl insolubles 0.56%, MgCO3 1.71%, CaCO3 97.71%. Silurian-bearing Silurian strata limestone and dolomitic limestone with sand-size detritus; specimen at 7047 analyzed: HCl insolubles 18.64%, MgCO3 7044.47, 7052.56%, 7055.60, 7060.68; HCl insolubles 0.22%-15.73%, MgCO3 1.55%-17.00%, CaCO3 66.56%-96.90%. Frisco fossils 6960, 6967, 7015, 7034, 7041; include *Leptostrophia mucrophis* (Hall)?, *Acrospirifer marshiana* (Castelnau), *Platiorthotrete* sp., large meristellioid brachiopods and favositoid corals. Silurian brachiopod *Rhipidium* sp. 7040, 7047, 7054, 7060, 7065, 7068; *Atrypa* sp. at 7047 and *Halysites* sp. at 7068.

Gulf 1 Willis
Pottawatomie Co., SW¼ NW¼ SE¼ sec. 20, T. 8 N., R. 2 E. TD 6310 in Ordovician. Cored 5405-77; all examined. Woodford-Frisco contact 5402. Frisco-Bois d'Arc Formation? (Fittstown Member) contact 5459; Bois d'Arc-Sylvan contact 5577. Frisco a tan to gray biosparite; specimen at 5414 analyzed: HCl insolubles 0.19%, MgCO3 0.69%, CaCO3 98.48%. Bois d'Arc Formation? (Fittstown Member) tan biosparite with greenish-shale partings: Cravens Member?, Bois d'Arc Formation light gray, fossiliferous marlstone, slightly dolomitic and with a few chert nodules. Frisco (Deerparkian) fossils at 5414, 5426, 5434, 5452, 5454; include *Costispirifer arenosus* (Conrad), *Acrospirifer marshiana* (Castelnau)? *Meristella*?*maculata*? (Frisco type), bryozoans and large gastropods. Fittstown Member?, Bois d'Arc Formation (Helderbergian) fossils at 5464; include *Schellwienella marcidula* Amsden?, *Meristella* sp. ? *Leptaena sahaviensis* (Hall), *Leptaena oceticostipalata* (Amsden)?, *Rhipidomelloides ideles* (Hall)?, *Orthostrophia*? sp. (No fossils identified from 9220-90, which may include some Silurian.)

Gulf 1 Wright Heirs
Oklahoma Co., NW¼ SW¼ SW¼ sec. 5, T. 12 N., R. 2 W. TD 6345 in Silurian? Cored 6276-6337; all examined. Woodford (Sylvan)-Frisco contact 6299; Frisco-Bois d'Arc Formation? (Fittstown Member) contact 6314; Bois d'Arc?-Silurian contact 6318. Frisco a light-gray to pinkish-gray biosparite: specimen at 6302 analyzed: HCl insolubles 0.40%, MgCO3 2.05%, CaCO3 96.97%. Bois d'Arc Formation? (Fittstown Member) a gray, dolomitic biosparite with shale stringers. Silurian (Haragan?)? a gray, fossiliferous dolomitic marlstone. Frisco fossils at 6302, 6310, 6311, 6314; include *Leptostrophia magnifica* (Hall), *Costispirifer arenosus* (Conrad), large tetradinoidal brachiopods, *Remusloeria* cf. *R. elongata* (Conrad), ?*Meristella*?*maculata* Clarke? (Frisco type), *Strophomella* sp., *Trachyspira* sp. (Frisco type), bryozoans and large gastropods. Silurian brachiopod *Rhipidium* sp. at 6302-04½, 6305-06, 6309½.

Homestake 0-5 Vanum "B"
Seminole Co., C NW¼ NE¼ sec. 4, T. 9 N., R. 6 E. TD 5550 in Ordovician. Cored 4115.90½; preliminary examination. Woodford-Silurian? contact 4070; Silurian-Sylvan contact 4155 (tops from Homestake 5 Vanum "B," NW¼ NW¼ NE¼ of same sec.). Silurian? (upper part cored interval) calcitic dolomite with some fossil debris. No fossil identified, reference of cored interval to Silurian based on stratigraphic position, lithologic character, and thickness.

Jones and Pellow 1 Farrell
Kingfisher Co., C NE¼ NE¼ sec. 14, T. 15 N., R. 6 W. TD 7994 in Silurian. Cored 7770-7825; all examined. Woodford-Silurian contact 7752. Silurian *Rhipidium*-bearing beds mostly gray dolomitic limestone with clay and sand-size detritus; some low-magnesium limestone. Chemical analyses at 7770-76, 7779-84, 7794-7800: HCl insolubles 0.70%-18.91%, MgCO3 1.02%-24.50%, CaCO3 54.24%-88.43%. Silurian brachiopod *Rhipidium* sp. at 7770-74, 7777, 7796-98, 7800-04, 7813.

Mobil 1 Carter
Custer Co., SE¼ NW¼ sec. 15, T. 13 N., R. 16 W. TD 13,105 in Ordovician. Cored interval 14,696-749; only fragments in O. U. core library. Woodford-Silurian? contact 14,682. Silurian-Sylvan contact 15,115. Silurian? (cored interval) calcitic dolomite, probably considerable insoluble detritus. No fossils identified; cored interval assigned Silurian on basis of stratigraphic position, lithologic character, and thickness (see Mobil 1 Sharp).

Mobil 1 Horton
Custer Co., C SE¼ NW¼ sec. 14, T. 15 N., R. 15 W. TD 14,848 in Ordovician. Cored 14,202-250, 14,290-358, 14,370-512, 14,514-674, 14,682-746½, 14,748-757; examined 14,202-320. Woodford-Silurian? contact 14,242 (20-foot interval just below Woodford not cored and may include Devonian carbonate); Silurian-Sylvan contact 14,780. Silurian (upper 58-foot cored) is a gray dolomitic limestone and calcitic dolomite with clay and sand-size detritus. Chemical analyses at 14,202-270, 14,270-274½, 14,276-314, 14,302-311, 14,311-320: HCl insolubles 1.12%-21.59%, MgCO3 1.02%-14.94%, CaCO3 67.19%-90.75%. Silurian corals, *Halysites* sp. and *Endotelasma* cf. *E. sawyeri* at 14,271-272 (identified by P. K. Sutherland); Silurian brachiopod *Rhipidium* sp. 14,290.

Mobil 1 Sharp Unit
Custer Co., E½ E½ NW¼ sec. 20, T. 15 N., R. 16 W. TD 14,278 in Sylvan. Cored 14,297-453; examined 14,297-346; cores stored Mobil warehouse, Lindsay, Okla. Woodford-Silurian contact 14,299; Silurian-Sylvan contact 14,756. Silurian dark-gray, calcitic dolomite with a few chert nodules at 14,346; Silurian brachiopod *Rhipidium* sp. observed 14,298-314.

Oklahoma Geological Survey 1 Diamond Core Hole
Adair Co., SW¼ SE¼ SW¼ sec. 4, T. 14 N., R. 24 E. TD 134 in Sylvan. Silurian-Sylvan contact 126. Described in Okla. Geol. Survey Bull. 105, p. 102-105.

Oklahoma Geological Survey 2 Diamond Core Hole
Cherokee Co., SE¼ NW¼ NE¼ sec. 2, T. 14 N., R. 23 E. TD 735; in Sylvan. Silurian-Sylvan contact 69. Described in Okla. Geol. Survey Bull. 105, p. 105-108.

Oklahoma Geological Survey 3 Diamond Core Hole
Sequoyah Co., SE¼ SE¼ NE¼ sec. 20, T. 13 N., R. 21 E. TD 242 in Ordovician. Silurian-Sylvan contact 145½. Described in Okla. Geol. Survey Bull. 105, p. 108-113.

Pan American 1 Droke
Kingfisher Co., C NE¼ NE¼ sec. 6, T. 18 N., R. 9 W. TD 8040 in Sylvan. Cored 8177-8811; not examined, not in O. U. core library. Woodford-"Hunton" contact 8488; Silurian-Sylvan contact 8816.

Pan American 1 Roetzel Unit
Kingfisher Co., C NE¼ SW¼ sec. 18, T. 19 N., R. 9 W. TD 8825 in Silurian? Ordovician?. Cored 8318-8444; not examined, not in O. U. core library (presumably stored by Pan American). Woodford-Silurian? contact 8370. Silurian brachiopod *Rhipidium* sp. 8417-20 (found by Pan American); also reported as high as 8400. (Interval between highest *Rhipidium* and Woodford may include Devonian.)

Pan American B-1 Roetzel Unit
Blaine Co., NW¼ SE¼ sec. 13, T. 18 N., R. 10 W. TD 8508 in Silurian. Cored 8414-79; examined 8435-70. Woodford-Silurian contact 8434. Silurian gray dolomite with clay and sand-size detritus. Chemical analyses 8434.46, 8446.58, 8458.70: HCl insolubles 5.74%-17.21%, MgCO3 34.04%-39.79%, CaCO3 47.07%-54.79%. Silurian brachiopod *Rhipidium* sp. 8434, 8437, 8438, 8440.

Payne 1 Houck
Kingfisher Co., C SE¼ NE¼ sec. 36, T. 17 N., R. 5 W. TD 7150 in Sylvan. Cored 7005-40, 7050-90; preliminary examination cored interval. Woodford-Silurian contact 6941; Silurian-Sylvan contact 7100. No fossils observed; lithology suggests Chimneyhill Subgroup; on basis of thickness (159 feet) Woodford-Sylvan interval assigned to Silurian.

St. Clair Lime Company 1 Diamond Core Hole
Sequoyah Co.; collared in fine fore scene of present face St. Clair Lime Co. quarry, and about 500 feet west of St. Clair Lime Company 2 diamond drill hole; NE¼ NE¼ SE¼ sec. 14, T. 13 N., R. 23 E. Described in Okla. Geol. Survey Bull. 105.

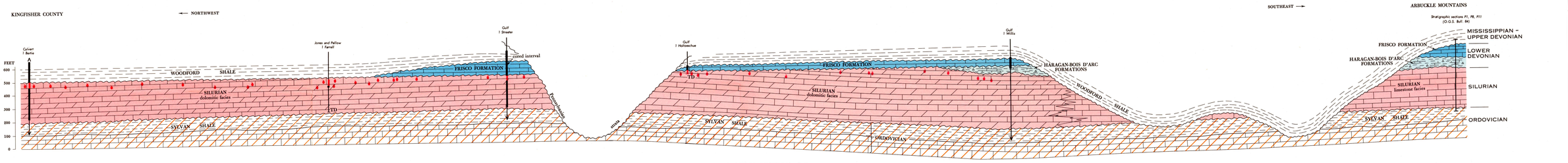
St. Clair Lime Company 2 Diamond Core Hole
Sequoyah Co.; collared in bottom St. Clair Lime Co. quarry, NE¼ NE¼ SE¼ sec. 14, T. 13 N., R. 23 E. TD 100 in Sylvan. Described in Okla. Geol. Survey Bull. 105.

Sinclair 1 Horlivy
Canadian Co., C SW¼ SW¼ sec. 19, T. 11 N., R. 5 W. TD 9798 in Ordovician. Cored 9780-8839; all examined. Woodford-Frisco contact 8764; Frisco-Bois d'Arc Formation? (Fittstown Member?) contact 8837; top Sylvan 9171. Frisco brown to gray bioclastic calcarenite, part biomicrite, part biosparite: specimen at 8828 analyzed: HCl insolubles 0.91%, MgCO3 1.02%, CaCO3 97.77%. Fittstown Member?, Bois d'Arc Formation biosparite with abundant clay partings. Frisco fossils 9786½, 8802, 8813, 8820, 8828; include brachiopods *Costispirifer arenosus* (8786½) and *Remusloeria* sp. (8820). No Bois d'Arc fossils observed; tentative identification based on stratigraphic position and lithologic character.

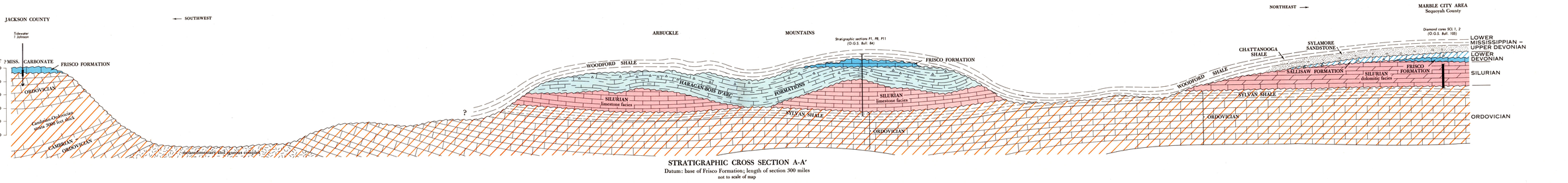
Smith Bros. 1 Kytle-Ray
Pottawatomie Co., SW¼ NE¼ NW¼ sec. 36, T. 8 N., R. 2 E. TD 5400 in Ordovician. Cored interval unknown; fragment fossiliferous core at 4959 (Okla. Geol. Survey collections). Woodford?-Frisco? contact 4929; Silurian-Sylvan? contact 5135. Frisco? a light-gray biosparite; specimen at 4959 analyzed: HCl insolubles 0.36%, MgCO3 1.02%, CaCO3 98.62%. Silurian? (upper part cored interval) brown calcitic dolomite. No fossils identified; reference to Silurian based on stratigraphic position, lithologic character, and thickness.

Texas 1 Gipson
Marshall Co., NE¼ NE¼ NW¼ sec. 11, T. 6 S., R. 6 E. TD 4101 in Sylvan. Cored 4020-4121; core chips 4020.95; continuous core 4095-4117; core chips 4117-21; all examined. Woodford-Sylvan? contact 4095. Silurian-Sylvan? contact 4121. Silurian? (upper part cored interval) brown calcitic dolomite. No fossils identified; reference to Silurian based on stratigraphic position, lithologic character, and thickness.

Sunray 10A Renfro
Seminole Co., NE¼ NW¼ SE¼ sec. 14, T. 9 N., R. 6 E. TD 4413 in Ordovician. Cored 4030-4110; all examined. Woodford-Silurian? contact 4029; Silurian-Sylvan contact 4108. Silurian? (upper part cored interval) brown calcitic dolomite. No fossils identified; reference to Silurian based on stratigraphic position, lithologic character, and thickness.



STRATIGRAPHIC CROSS SECTION B-B'
Datum: base of Frisco Formation; length of section 130 miles
not to scale of map



STRATIGRAPHIC CROSS SECTION A-A'
Datum: base of Frisco Formation; length of section 300 miles
not to scale of map

LITHO. IN U. S. A. BY A. HOEN & CO., INC.