OKLAHOMA GEOLOGICAL SURVEY

Map GM-20

EXPLANATION

QUATERNARY — Holocene

Qal — ALLUVIUM

Gravel, sand, silt, and clay in stream valleys. Thickness, about 20 feet. Some iron or zinc concentrates locally near ore bodies.

UNCONFORMITY

PENNSYLVANIAN — Gearyan

IPo — OSCAR GROUP

Limestone conglomerates, arkosic, rhyolitic, dolomitic, cherty; with interbedded shales, red-brown, gray, and greenish-gray; sandstones, tan to dark-brown; and thin white algal limestones. Some oil seeps locally in basal parts. Thickness, 600 feet or more.

UNCONFORMITY

PENNSYLVANIAN — Virgilian

IPcr — COLLINGS RANCH CONGLOMERATE

Limestone conglomerates, dolomitic, cherty, with red-brown hematitic clay cement. Trapped in faulted blocks, with base concealed and top eroded. Thickness, 2,000 feet or more.

UNCONFORMITY

PENNSYLVANIAN — Desmoinesian

IPd — DEESE GROUP (=Wewoka? of Dunham, 1955)

Limestone and chert conglomerates, sandy, brown, fossiliferous, for basal 250 feet. Overlain by 300 feet of greenish-gray to red-brown calcareous shale, 136 feet of brown calcarenite and white sandstone with limestone and chert conglomerates (and fossils including *Fusulina* and *Triticites* in lower 10 feet), and 235 feet of greenish-gray to red-brown calcareous shale. Thickness, 920 feet, with top eroded.

UNCONFORMITY

MISSISSIPPIAN — Meramecian and Chesterian

Md — DELAWARE CREEK SHALE

Shale, black, fissile, calcareous, with some silty limestone stringers in basal 100 feet; and some calcareous nodules, including some overlying Goddard Shale, with top eroded. Thickness, 600 feet.

MISSISSIPPIAN — Kinderhookian and Osagian

Ms — SYCAMORE LIMESTONE

Limestone, gray to light-tan, fine-grained, silty, quartzose; grades into limy siltstone, and erodes into mappable grass-covered hills. Thickness, about 220 feet.

DEVONIAN AND MISSISSIPPIAN — Upper Devonian and Kinderhookian

MDw — WOODFORD SHALE

Shale, black, fissile, cherty, with phosphatic nodules in upper part and fossil wood in lower part; green glauconite zone at top. Thickness, about 275 feet.

UNCONFORMITY

ORDOVICIAN, SILURIAN AND DEVONIAN — Upper Ordovician and Lower Devonian

DSOc — HUNTON GROUP

Diverse limestones of different thicknesses and ages, separated by unconformities, 101 feet measured by Amsden (1960, p. 255). Some formations missing locally: *Henryhouse Formation* at top, mainstone, tan, 58 feet. *Clarita Formation: Fitzhugh Member* at top, limestone, light-pink, crinoidal, 3 feet; *Price Falls Member*, shale, greenish-gray, mostly covered, 2 feet. *Cochrane Formation*, limestone, light-greenish-gray, glauconitic, 7 feet.

UNCONFORMITY

Upper Ordovician

Os — SYLVAN SHALE

Shale, greenish-gray, blocky, eroding into valley. Thickness, 275 feet.

UNCONFORMITY

Middle and Upper Ordovician

Ov — VIOLA GROUP

Limestone, gray; massive to thin-bedded, crystalline, crinoidal in upper part (Welling Fm.), and micritic, graptolitic, and cherty in lower part (Viola Springs Fm.); limonite zone at base; erodes into high grassy hills. Thickness, 710 feet.

Ostr — BROMIDE FORMATION

Pooleville Member at top, limestone, dense, tan to gray, fossiliferous, micritic; thickness, 80–120 feet or more. *Mountain Lake Member*, greenish-gray fossiliferous shale and tan crystalline echinodermal limestone, with basal 100 feet of quartzose fine- to medium-grained friable sandstone; thickness, 266–313 feet or more. Total thickness, 346–433 feet.

Otc — TULIP CREEK FORMATION

Shale, greenish-gray, and limestone, tan, crystalline, echinodermal; basal quartzose sandstone, friable, in lower 100 feet. Thickness, 300 feet.

Omd — MCLISH FORMATION

Shale, greenish-gray, and limestone, gray, birdseye, in upper part; basal quartzose sandstone, friable, in lower 100 feet or more. Thickness, 420–450 feet.

Ooc — OIL CREEK FORMATION

Shale and limestone, tan to greenish-gray, crystalline, echinodermal, with basal quartzose friable sandstone (Ooc ss) in lower 100 feet or more. Thickness, about 700 feet.

Oj — JOINS FORMATION

Limestone, gray, micritic, echinodermal, sandy, shaly. Thickness, 290 feet.

Ooc–Oj

ORDOVICIAN — Middle Ordovician, Simpsonian Group

Lower Ordovician, Upper Arbuckle Group

COf Owsc — WEST SPRING CREEK FORMATION

Limestone and dolomite, tan to gray, micritic, algal, cherty, sandy, with many types; mottled red-brown in upper 1,000 feet. About 285 feet below top is 9-foot sandstone and overlying massive limestone with *Ceratopea*, *Diparelasma*, and *Pomatotrema* (C-D-P Zone). About 700 feet above base is *Diparelasma-Polytoechia* Zone (– • • –). At base is 9-foot tan dolomitic siltstone. Thickness, about 1,560 feet.

Ok — KINDBLADE FORMATION

Limestone and dolomite, medium-gray, medium-bedded. Thickness, 1,400 feet.

ORDOVICIAN — Lower Ordovician, Upper Arbuckle Group

Occ — COOL CREEK FORMATION

Limestone and dolomite, tan to gray, micritic, algal, with many types and colors, very sandy; scattered sandstone layers, very cherty, with some blue siliceous oolitic chert; *Diaphelasma* Zone (– • • –) in upper part. Thickness, 1,300 feet.

Omh — MCKENZIE HILL FORMATION

Limestone and dolomite, tan to gray, micritic, with tripolitic chert. Thickness, 900 feet.

Ob — BUTTERLY DOLOMITE

Dolomite, tan, micritic to coarsely granular (dolohutite to dolarenite to dolorudite), sandy, jointed, fractured, with many sphalerite veins in upper part; grades into beds above and below and is absent in southwest part of area. Sargent (1960, 1974) treated part of this unit as tectonic dolomite, which contains 2 to 13 percent $FeCO_3$, in contrast to stratigraphic dolomite, which contains 0.7 percent or less $FeCO_3$. Thickness, 210–300 feet.

CAMBRIAN — Upper Cambrian, Lower Arbuckle Group

Csm — SIGNAL MOUNTAIN FORMATION

Limestone and dolomite, gray, micritic, medium-bedded. Thickness, 365–500 feet.

Cry — ROYER DOLOMITE

Dolomite, pink and tan, dolohutite to dolarenite to dolorudite, jointed, highly fractured; locally contains sphalerite; grades into limestone in lower part; may be tectonic dolomite in places. Thickness, 700 feet.

CAMBRIAN — Timbered Hills Group

Cfs — FORT SILL LIMESTONE

Limestone, gray, micritic, with siltstone at top. Thickness, 155 feet.

Chc — HONEY CREEK LIMESTONE

Limestone, light-gray, sandy, glauconitic. Thickness, 105 feet.

Cr — REAGAN SANDSTONE

Sandstone, buff to red-brown, quartzose, feldspathic, glauconitic, fine- to coarse-grained, with rhyolite porphyry conglomerate at base. Thickness, 240–460 feet.

UNCONFORMITY

Middle Cambrian — Carlton Rhyolite Group

Cc — COLBERT PORPHYRY (=Carlton Rhyolite Group)

Rhyolite porphyry and volcanic breccia, pale-orange to red-brown, hematitic, with quartz and pink perthite and plagioclase phenocrysts in a fine-grained devitrified quartz and feldspar groundmass; flow-banded. Thickness, 3,300–4,500 feet (drilled). Age determinations on rhyolite porphyry in Timbered Hills are 505 ± 60 m.y., 480 ± 60 m.y., 495 ± 120 m.y., and 470 ± 120 m.y., using Rb 87/Sr 87 ratios; after Ham and others (1964, p. 24-31). In Frankfort 1 Sparks Ranch well, C SE¼SE¼ sec. 32, T. 1 S., R. 1 W., 4,525 feet of rhyolite porphyry and underlying 1,529 feet of micrographic Wichita Granite (a sill) were drilled below Reagan Sandstone. In NW¼NW¼SE¼ sec. 26, T. 1 N., R. 1 W., Sohio 1A Kennedy penetrated, below Reagan, 3,323 feet of rhyolite porphyry and 1,070 feet of micrographic Wichita Granite. In SE¼NW¼SW¼ sec. 11, T. 4 N., R. 12 W., Stanolind 1 Perdasofpy penetrated, below Reagan, 2,590 feet of rhyolite, 615 feet of micrographic Wichita Granite (a sill with chilled contacts), and 1,049 feet of Navajoe Mountain Basalt.

Contact or prominent zone, approximately located; designation of lithologic or paleontologic zone from unpublished field notes of William E. Ham

Fault, approximately located; U, upthrown side; D, downthrown side

x — Collecting locality

Stratigraphic, lithologic, and paleontologic notations from unpublished mapping of William E. Ham

Open-pit mine

Prospect pit or mine, shallow (may not have been for zinc; see Gould, 1910b, p. 62)

Adit or horizontal trench in side of hill

Mine dump

Mine shaft or mill site

Iron deposit (hematite and/or limonite, with pseudomorphs after pyrite); many small areas not mapped

Strike and dip of beds

Strike and dip of overturned beds

Strike of vertical beds

Reference number for details of Hope-Sober mines (see text)

845 / 4370 — Oil and gas tests; number above line denotes surface elevation in feet, and number below line, total depth in feet

Oil well · Oil and gas well · Dry hole

Index Map of Oklahoma Showing Area Covered by Map

GEOLOGIC MAP OF SOUTHWEST DAVIS ZINC FIELD ARBUCKLE MOUNTAINS, OKLAHOMA

Compiled by

Robert O. Fay

(Geology after William E. Ham)

1981

Scale 1: 7920

0 — 1/4 — 1/2 — 1 Mile

0 — 1/4 — 1/2 — 1 Kilometer

Base from U.S. Geological Survey