U.S. DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

Geologic map of the Coffman 7.5 min. quadrangle, Ste. Genevieve County, Missouri

by

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Open-File Report 94-419

1. USGS Reston, Virginia

Geology of the Coffman 7 1/2′ quadrangle, Ste. Genevieve County, Missouri

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This report presents the initial results of field mapping conducted during 1992 and 1993. It is in part compiled from Weller and St. Clair (1928); particularly areas away from the Ste. Genevieve fault zone; there exist irregularities in some contacts taken from Weller and St. Clair which where not investigated. This report and a related Open-File Report (Schultz and Harrison, 1994) are to be incorporated in an upcoming U.S. Geological Survey publication on the Ste. Genevieve fault zone. Cross sections that are included in this report are preliminary and subject to reinterpretation. We wish to acknowledge field assistance by NAGT students Greg Baker and Phil Larson.

DESCRIPTIONS OF MAP UNITS

Qal **Alluvium (Holocene)**- Gravel, sand, silt, and clay. Varies from 0 to 100 ft (0 to 30.5 m) in thickness

Qt **Terrace deposits (Holocene and Pleistocene)**- Silt, sand, clay and gravel. As much as 30 ft (9.2 m) thick

Dd **Devonian Diatremes (Middle Devonian)**- Ultrabasic dikes and breccia pipes. Numbers in parentheses refer to locations described by Kidwell (1947). Some limestone xenoliths contain fossils which correlate them to the Early Devonian Little Saline Limestone and the Middle Devonian Grand Tower Limestone (Kidwell, 1947). Radiometric age dates by Zartman and others (1967) of 399 ± 23 Ma and 396 ± 28 Ma are compatible

Oj **Joachim Dolomite (Middle Ordovician, Mohawkian)**- Dolomite, shale, and sandstone. Dolomite is brown, fine grained, evenly bedded, rarely fossiliferous, and contains local shale partings. Shale is greenish gray and dolomitic. A 2 to 3 ft (0.6 to 1.0 m) thick sandstone bed occurs near the base of the unit (Amos, 1986). As much as 150 ft (45.8 m) thick

Ospe **St. Peter Sandstone and Everton Formation, undivided (Middle Ordovician, Mohawkian and Whiterockian)**- Combined thickness ranges from 170 to 200 ft (51.9 to 61.0 m).

St. Peter Sandstone- Sandstone. Light brown, fine grained, well sorted, and thick bedded to massive. Grains are rounded, commonly frosted quartz. Cross bedding and ripple marks are common. Approximately 100 ft (30.5 m) thick

Everton Formation- Limestone, dolomite, sandstone, and shale. Limestone is gray, fine grained, locally cross bedded, and contains common floating grains of rounded quartz. Dolomite is brownish to dark gray, fine grained, and contains sporadic grains of quartz. Sandstone is fine grained, well sorted, consists of rounded grains of quartz, and has a carbonate cement. Shale is gray, dolomitic, and occurs as thin beds or partings. Approximately 70-100 ft (21.4-30.5

m) thick

Op **Powell Dolomite (Lower Ordovician, Canadian)-** Dolomite, chert, and sandstone. Dolomite is light to brownish gray, fine grained, and in part argillaceous. Chert occurs as gray to brown nodules and discontinuous beds of soft ferruginous material. Sandstone is light brown, fine grained, calcareous, and occurs as thin beds principally in upper half of the unit. Approximately 200 ft (60 m) thick

Oc **Cotter Dolomite (Lower Ordovician, Canadian)-** Dolomite, chert, sandstone, and shale. Dolomite is gray to brown, fine grained, slightly fossiliferous, characteristically oolitic, and locally argillaceous. Chert is gray to brown and occurs as irregular nodules and thin beds. Sandstone is light brown, fine to medium grained, calcareous, and thinly bedded. Shale is greenish gray and calcareous. As much as 100 ft (31 m) thick

Ojc **Jefferson City Dolomite (Lower Ordovician, Canadian)-** Dolomite, sandstone, chert, and shale. Dolomite is brown to gray, fine grained to lithographic, evenly bedded, and commonly argillaceous. Sandstones are reddish brown, medium grained, and typically case hardened. Chert is dark blue to white, commonly fossiliferous, and occurs as nodules and thin beds, some of which are conglomeratic. Shale is greenish gray, largely dolomitic, and occurs as thin beds or partings. Residuum of this unit is a distinctive red, plastic clay. As much as 200 ft (61 m) thick

Or **Roubidoux Formation (Lower Ordovician, Canadian)-** Sandstone, dolomite, and chert. Sandstone is reddish brown, medium grained, and characteristically cross bedded. Grains are subangular to subrounded quartz. Dolomite is light gray, fine grained, locally argillaceous, and occurs in discontinuous beds that grade into chert. Chert is white to gray and highly variable in texture, although Cryptozoan and conglomeratic varieties are most common. Approximately 75 ft (23 m) thick

Og **Gasconade Dolomite (Lower Ordovician, Canadian)-**

Dolomite, chert, and sandstone. Dolomite is light gray, generally coarse grained, and locally silicified. Chert is typically white, occurs as nodules and thin to thick beds, and has characteristic Cryptozoan, cellular, and ropey varieties. Sandstone beds are typically thin and discontinuous, except for the basal Gunter Sandstone Member which consists of as much as 30 ft (9.2 m) of white to brown, medium-grained quartz sandstone and orthoquartzite. Approximately 300 ft (92 m) thick

O€ep Eminence and Potosi Formations, undivided (Lower Ordovician and Upper Cambrian, Canadian and Croixian)- Combined thickness is approximately 200 ft (61.0 m)

Eminence Formation- Dolomite and chert. Dolomite is gray, medium to coarse grained, and typically contains vugs lined by dolomite crystals. Chert is characteristically conglomeratic

Potosi Formation (Upper Cambrian, Croixian)- Dolomite and chert. Dolomite is light to dark brown, medium to coarse grained, and characterized by numerous conspicuous cavities lined with crystalline or chalcedonic quartz druse. Chert is honeycombed with druse-lined cavities and contains numerous quartz stringers.

€dd Doerun, Derby, and Davis Formations, undivided (Upper Cambrian, Croixian)- Combined thickness is approximately 150 Ft (45.8 m)

Doerun Formation- Dolomite. Gray, fine grained, and locally argillaceous; contains little to no chert

Derby Formation- Dolomite. Gray, fine grained, and locally argillaceous; contains little to no chert

Davis Formation- Shale and dolomite. Shale is green, fissile, and calcareous. Dolomite is brown to gray, fine grained, typically argillaceous, and commonly contains partings or thin interbeds of green shale

€bt Bonneterre Formation (Upper Cambrian, Croixian)- Dolomite, and minor shale and sandstone. Dolomite is brown to gray to green, fine to medium grained, and locally argillaceous, arenaceous, and glauconitic. Shale is yellowish green and typically grades

laterally into argillaceous dolomite. Sandstone is characteristically glauconitic and occurs only in lowermost section, where it interfingers with dolomite. Approximately 350 ft (107 m) thick

Єl **Lamotte Formation (Upper Cambrian, Croixian)-** Sandstone and conglomerate. Sandstone is yellow, fine to coarse grained, and consists of rounded quartz grains. Conglomerates contain pebbles, cobbles, and boulders of Middle Proterozoic lithologies. Unit was deposited upon a very irregular erosional surface and thus its thickness varies from 100 to 250 ft (30.5-76.3 m). Since the actual configuration in the subsurface is uunknown, the unit is generalized as having a constant 250 ft (76.3 m) thickness on cross sections

Yc **Middle Proterozoic crystalline rocks, undivided-** Plutonic rocks. Compositions vary from granite to granodiorite in outcropping rocks. Diorite to gabbro are probably present in the subsurface. Silicic varieties are locally intruded by diabase and granitic dikes, and commonly contain metamorphic xenoliths.

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LEGEND

Contact- Approximately located

7 **Strike and dip of beds**

⊕ **Horizontal beds**

Vertical beds

70 85 **Normal fault**- Bar and ball on downthrown block, arrow indicates rake of slickenside striations measured in the plane of the fault; dashed where approximately located, dotted where covered

R 80 78 **Reverse fault**- R on upthrown block, full arrow indicates dip of fault surface, half arrow indicates rake of slickenside striations measured in the plane of the fault

Strike-slip fault- Half arrows show direction of movement

Strike-slip fault- undetermined direction of movement

R **Fault**- Multiple periods of movement, on map only

(1st)A T (2nd)T A **Fault**- Multiple periods of movement, on cross sections only; A-away, T-towards; (1st)- first period of movement, (2nd)- second period of movement

Joint- Vertical

75 **Joint**- Showing direction and magnitude of dip

Anticline- Approximately located, showing crestline

Syncline, showing trace of troughline

⊙ **Water well hole**- Showing file number recorded at the Missouri Department of Natural Resources, Division ofGeology and Land Survey, Rolla, Missouri