GEOLOGIC MAP OF THE ONIA QUADRANGLE, BAXTER AND STONE COUNTIES, ARKANSAS

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2002
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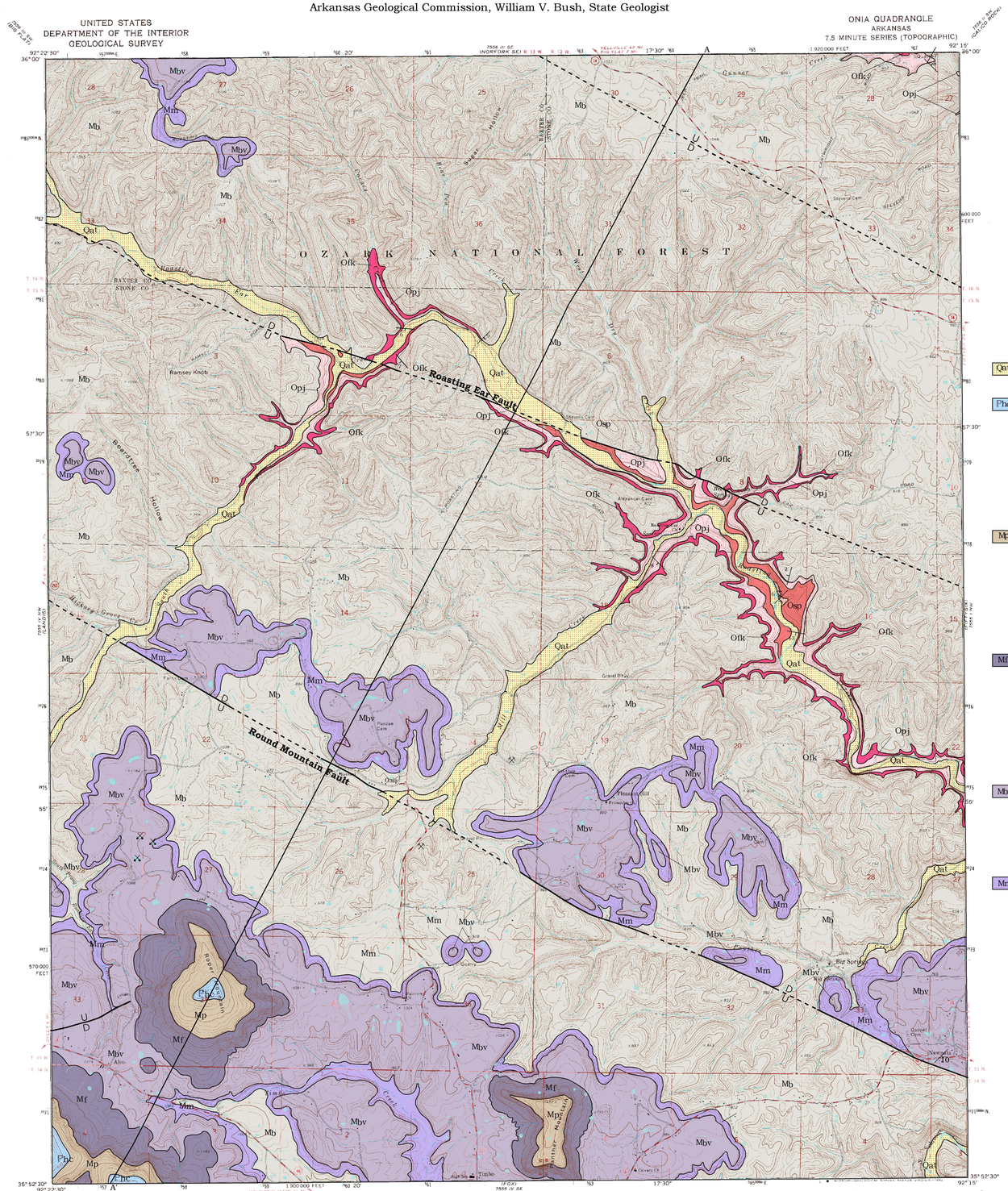
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ONIA QUADRANGLE
ARKANSAS
7.5 MINUTE SERIES (TOPOGRAPHIC)



Mapped by U.S. Forest Service
Edited and published by the Geological Survey
Control by USGS, USC&GS, and U.S. Forest Service
Topography by photogrammetric methods from aerial photographs taken 1964. Field checked 1972
Polyconic projection. 1927 North American datum
10,000-foot grid based on Arkansas coordinate system, north zone
1000-meter Universal Transverse Mercator grid ticks, zone 15, shown in blue
To place on the predicted North American Datum 1983 move the projection lines 5 meters south and 14 meters east as shown by dashed corner ticks
There may be private inholdings within the boundaries of the National or State reservations shown on this map
Map photoinspected 1980
No major culture or drainage changes observed

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
AND ARKANSAS GEOLOGICAL COMMISSION, LITTLE ROCK, ARKANSAS 72204
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

ROAD CLASSIFICATION
Primary highway, hard surface
Secondary highway, hard surface
Light-duty road, hard or improved surface
Unimproved road
Interstate Route · U. S. Route · State Route

ONIA, ARK.
N3552.5—W9215/7.5
1972
PHOTOINSPECTED 1980
AMS 7555 IV NE--SERIES V884

Correlation of Map Units

Qat	Holocene and Pleistocene	Quaternary	
Unconformity			
Phc	Morrowan	Pennsylvanian	
Unconformity			
Mp	Chesterian	Mississippian	
Mf			
Mbv	Meramecian		
Mm			
Unconformity			
Mb	Osagean and Kinderhookian		
Unconformity			
Ofk	Upper Ordovician	Ordovician	
Unconformity			
Opj	Middle Ordovician		
Osp			
Unconformity			
Oe			

Description of Map Units

Qat — **Alluvium and terrace deposits (Quaternary)** - Unconsolidated clay, silt, sand and gravel including deposits on one or more terrace levels.

Phc — **Hale Formation (Lower Pennsylvanian, Morrowan)** - The Hale Formation consists of two Members; the Prairie Grove Member and the Cane Hill Member. In this quadrangle, only the cane Hill Member is present.

Cane Hill Member - A very fine to fine-grained, moderately sorted, iron-cemented sandstone. Varies in color from white to light brown and various shades of reddish brown in fresh exposure. Usually weathers a dark gray or light brown and sometimes contains plant fragments. Forms the resistant top to Roper Mountain and Blue Mountain in the extreme SW corner of the map. Weathers in place to massive blocks while smaller pieces travel down slope great distances. The contact with the Pitkin was covered but could possibly be unconformable. Approximately 60- 40 ft. thick.

Mp — **Pitkin Limestone (Upper Mississippian, Chesterian)** - A fine to coarsely crystalline often fossiliferous limestone containing crinoidal fragments, *Archimedes*, gastropods, and coral (rugose and colonial). Occasionally seen were oolites and oncolites. Varies from light gray to dark gray on fresh surface but usually weathers to a light or medium gray. Medium to massive bedded. Often has a petroliferous odor on freshly broken surfaces. An anastomosing shiny black chert is present near the contact with the Fayetteville Shale. This limestone forms a bluff making up most of Roper and Panther Mountains. The Pitkin limestone is conformable with the Fayetteville Shale throughout this quadrangle. Approximately 140 - 160 ft. thick.

Mf — **Fayetteville Shale (Upper Mississippian, Chesterian)** - A black fissile clay shale. Alternating beds of micrite with shale occur in the upper portion of the formation to the contact with the overlying Pitkin Limestone. Black chert can be found within the micrite. This chert is distinguished from the Pitkin chert by its dull color and grainy appearance. Nodules and sideritic beds are present in the lower portion of this shale on Panther Mountain. This shale mostly forms a gentle slope upon the Batesville plateau surface, however, the micritic beds in the upper portion of the shale form resistant ledges supporting the Pitkin bluffs on Roper, Panther, and Blue Mountain. The Fayetteville Shale is conformable with the underlying Batesville Sandstone throughout this quadrangle. Approximately 220-240 ft. thick.

Mbv — **Batesville Sandstone (Upper Mississippian, Chesterian)** - A fine to medium-grained, sub-angular, moderately sorted, iron-cemented sandstone. Thin to medium bedded. Light brown to cream colored on fresh surface. Weathers light to dark gray. Bivalves and gastropods were found at two locations in this area. This sandstone forms a fairly flat plateau surface in the southwestern portion of the quadrangle. The Batesville Sandstone is conformable with the Moorefield Formation throughout this quadrangle. Approximately 60-160 ft. thick.

Mm — **Moorefield Formation (Upper Mississippian, Meramecian)** - Silty shales with interbedded very thin to thin siltstones. The shaly zones are usually dark gray to black on fresh surface but weather a gray green color. The siltstones are dark gray to brown on fresh surface but weather a light gray to buff color. Very thin to thin bedded black siltstone and shale occurs in the upper part of the formation. This shale forms a gentle slope supporting the Batesville plateau surface. The fossiliferous conglomerate and limestone seen on the Fifty-Six quad was not seen in this quadrangle, therefore the Moorefield Formation appears conformable with the Boone Formation throughout this quadrangle. Approximately 15-80 ft. thick.

Symbols

- Contact
- Quarry
- Gravel Pit
- Strike and Dip (45)
- Fault - dashed where inferred or concealed. U - upthrown D - downthrown

Mb — **Boone Formation (Lower Mississippian, Osagean and Kinderhookian)** - Coarse-grained fossiliferous and fine-grained limestones interbedded with anastomosing and bedded chert. Light to medium gray on fresh surface but usually weathers to a dark gray. The chert is white to light gray and always seems to weather a lighter color than the surrounding limestone. Springs and sinkholes are abundant. Caves occasionally develop within the Boone Formation sometimes extending through the Plattin Limestone in this area. In this area the Boone Formation exhibits an undulating topography that tends to form steep hillsides separated by ravine-like drainages. Approx. 50-400 ft. thick.

St. Joe Limestone Member - A medium-grained thin-bedded crinoidal limestone containing very thin shaly limestones. Dark gray to reddish in color but sometimes with green mottles on fresh surface. Usually weathers a medium to dark gray color. Contains small round green spheres at the top of the member which are sometimes flattened and appear to be composed of green clay. Although not persistent throughout the quadrangle, this limestone is conformable with the underlying sandstone unit. 0-5 ft. The basal sandstone is a fine to medium-grained, moderately sorted, sub-rounded to rounded, iron or quartz-cemented sandstone. White to light gray and tan on fresh surface but sometimes blotchy due to iron staining. Weathers dark gray, tan, or black. Thin to thick bedded but most often seen as float. Contains phosphate pebbles and angular white and light gray chert fragments. Although not persistent throughout the quadrangle, when present it is uncomformable with the Lafferty Limestone or the Fernvale Limestone. The greatest thickness (approx 5 ft.) in this quadrangle is on South Prong Creek in the S1/2 NE1/4, Sec 10, T15N, R13W. This unit yields abundant conodonts. 0-5 ft. thick.

Lafferty Limestone (Silurian) - A sparsely fossiliferous finely-crystalline limestone. Medium gray with small red blebs on fresh surface but weathers a light gray. Sometimes contains pyrite cubes near the upper contact. Thin to thick bedded with stylolites along bedding planes. Seen only on Roasting Ear Creek in SE1/4, NW1/4, Sec. 1, T15N, R13W in this quadrangle. Uncomformable with the overlying St. Joe Limestone and the underlying Cason Shale. 0-7 ft. thick.

Cason Shale (Upper Ordovician) - A silty limestone. Blotchy medium gray on fresh surface but weathers a greenish buff color. Contains abundant phosphate nodules. Seen only on Roasting Ear Creek in SE1/4, NW1/4, Sec. 1, T15N, R13W in this quadrangle. Unconformable with the Fernvale Limestone. 0-4 ft thick.

Ofk — **Fernvale Limestone (Upper Ordovician)** - A medium to coarsely crystalline crinoidal limestone. Medium to thick to massive bedded. White to light gray with a pink to reddish tint or mottles on fresh surface but weathers a dark gray. Contains nautiloids and barrel crinoids that are accentuated on a weathered surface. Sometimes cross-bedded when beds are massive. On a weathered slope the Fernvale Limestone occurs as rounded masses that are usually friable. This limestone is fairly persistent throughout the quadrangle. The contact with the underlying Kimmswick is commonly a bedding plane contact (sometimes solutionally enlarged) or a "welded contact" (Craig et.al., 1988) that is probably unconformable. 0- approx. 20 ft. thick.

Kimmswick Limestone (Middle Ordovician) - A medium crystalline limestone. Light gray on fresh surface but weathers dark gray. Tends to weather to rounded masses much like the Fernvale however, it is very hard and not friable. Its rounded appearance easily distinguishes it from the blocky Plattin Limestone on a weathered slope. This limestone is fairly persistent throughout the quadrangle. The contact with the underlying Plattin Limestone is usually a solutionally enlarged bedding plane contact or a "welded contact" (Craig et.al. 1988) that is probably unconformable. 0 - approx.10 ft. thick.

Opj — **Plattin Limestone (Middle Ordovician)** - A micritic limestone that sometimes displays a sugary texture. Light gray to dark gray on fresh surface and weathers white to dark gray. Very thin to thick bedded and a persistent blocky ledge former throughout this quadrangle. Stromatolites were seen near the lower and upper contacts. Springs and caves develop in the Plattin Limestone in this quadrangle. The contact with the Plattin Limestone in this quadrangle is conformable and when the Joachim is missing the Plattin rests unconformably upon the St. Peter Sandstone. Approximately 40-80 ft. thick.

Joachim Dolomite (Middle Ordovician) - A fine-grained to finely crystalline dolostone containing sand in the lower portion close to the contact with the St. Peter Sandstone. Light to medium gray on fresh surface (sometimes mottled) and weathers dark gray to tan. Calcite-filled voids (1/10 inch to 1/4 inch) are abundant. Also contains mud cracks, lamellae, and rip-up clasts. Because of its non-persistency and thinness, this unit was rarely seen and possibly overlooked in some areas of this quadrangle. The Joachim is conformable with the St. Peter Sandstone. 0- approx. 7 ft. thick (Rives, 1977).

Osp — **St. Peter Sandstone (Middle Ordovician)** - A fine to medium-grained, angular to rounded, well sorted, calcite-cemented sandstone. Usually case hardened but friable when broken. Light tan to white on fresh surface but weathers gray to dark tan. Generally displays a sugary texture. Thick to massive bedded, sometimes cross-bedded, and will either form a concave or convex rounded ledge. Commonly forms "balds" or glades but also forms bluffs along creeks. Cylindrical columns of sandstone referred to as "sandstone pipes" (Purdue and Miser, 1916; Hawley and Hart, 1933) were seen at one locality in this quadrangle. These sandstone pipes seen in the area vary in size from 1" in diameter to 6 ft. in diameter. Sometimes just the upper surface is exposed, however approximately 7 ft. of one pipe was exposed in the vertical position. The St. Peter is unconformable with the underlying Everton Formation. Approximately 15-240 ft. thick.

Oe — **Everton Formation (Middle Ordovician)** - Very fine to fine-grained crystalline to sandy and limy dolostones that are thin to massive bedded. Thin to medium beds of fine to medium-grained quartz sandstone are common and similar to the overlying St. Peter Sandstone. Medium to dark gray on fresh surface but usually weathers a lighter gray. Dolostones are sometimes mottled and contain stromatolites, mudcracks, and calcite-filled voids (up to 1 inch in diameter). Strong petroliferous odor in freshly broken calcite-filled void interval. The top of the Everton Formation is exposed at only one locality in this quadrangle in the NE1/4, SE1/4, Sec 17, T15N, R12W. Approximately 40 ft. thick.

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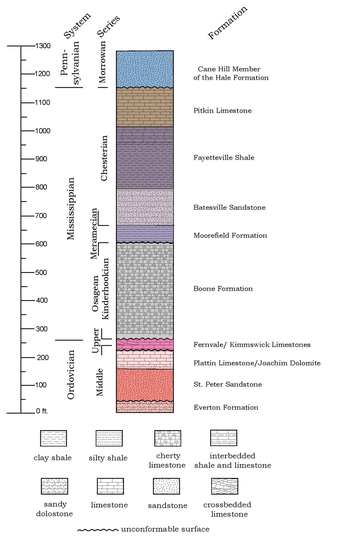
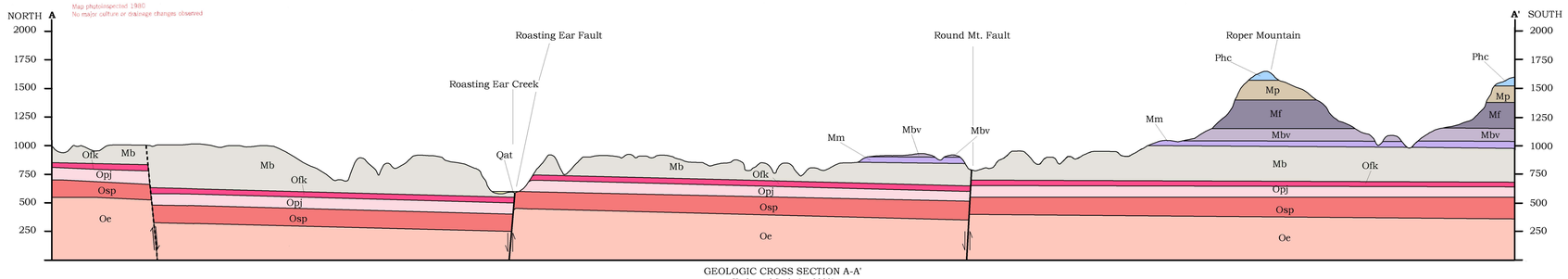
Stratigraphic Column





GEOLOGIC CROSS SECTION A-A'
Horizontal Scale 1 = 2000'
Vertical Scale 1 = 500'

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