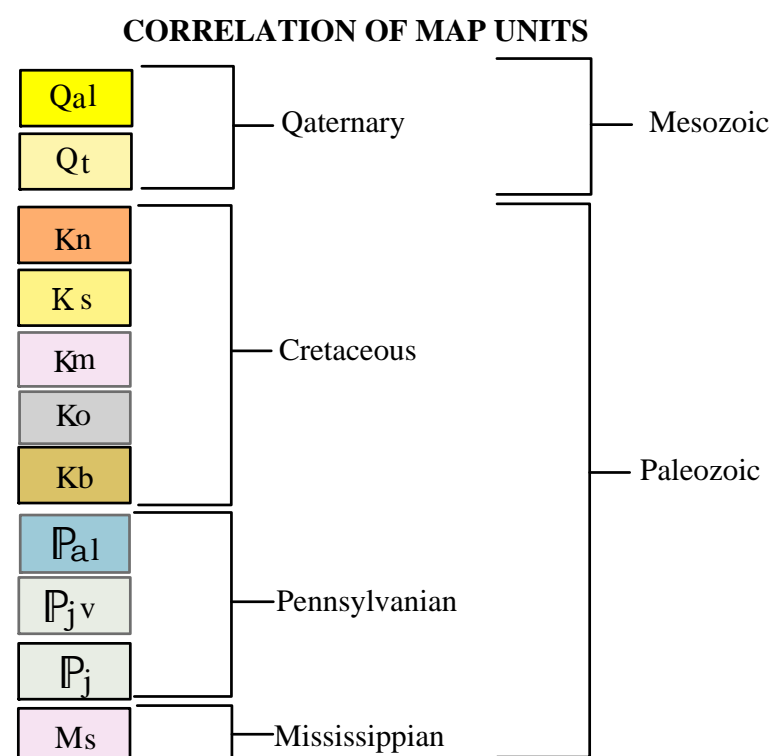
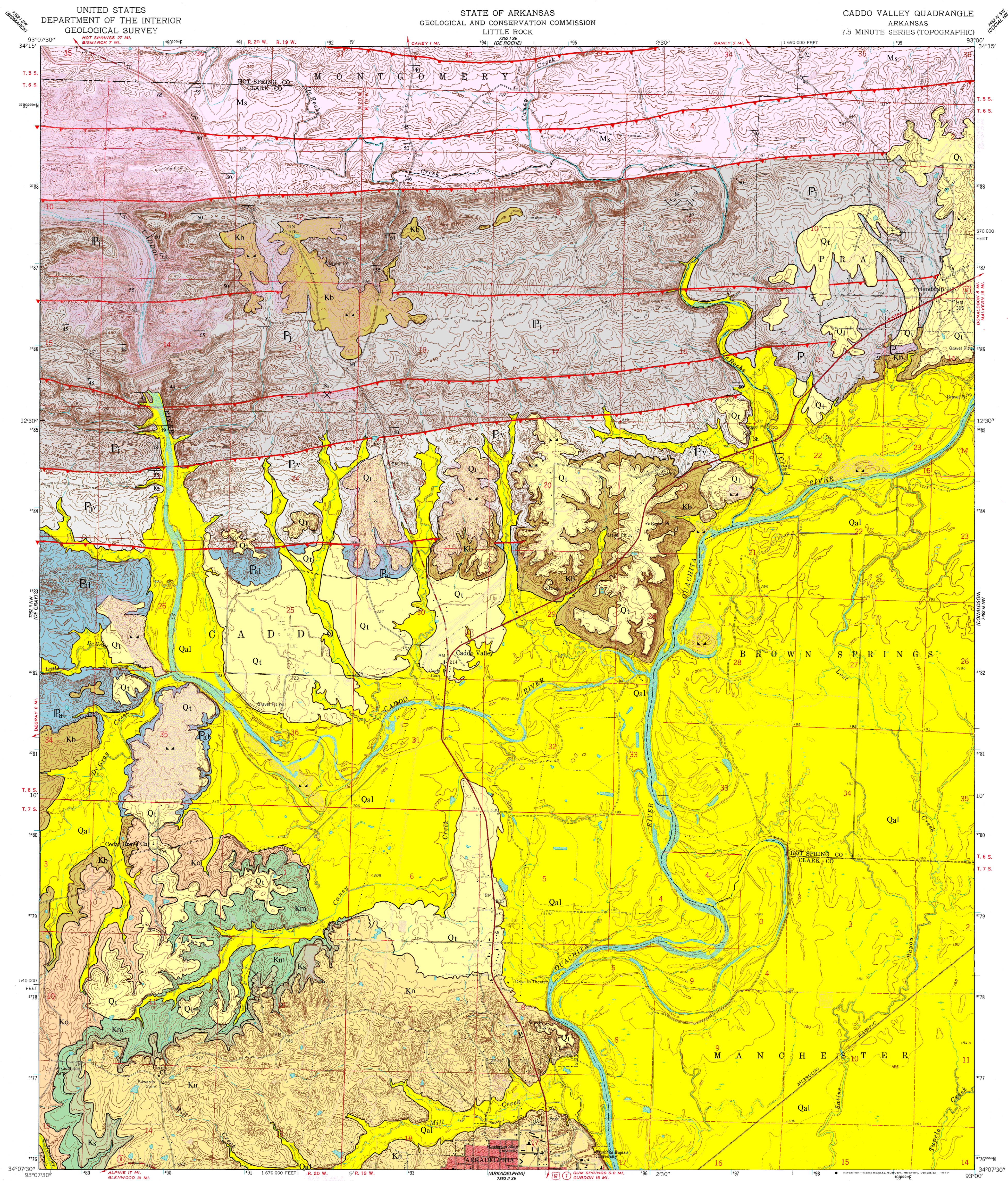


# GEOLOGIC MAP OF THE CADD O VALLEY, HOT SPRINGS AND CLARK COUNTY ARKANSAS

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## Description of Map Units

Qal

**Alluvium (Quaternary)** - Variably sized gravel overlain by unconsolidated sand, silt, and clay comprises the unit. This unit occurs in the floodplains of streams and rivers. The sediments form a rich loam and are excellent for agriculture. Gravels, primarily novaculite, originated in the Ouachita Mountain region and from local Cretaceous formations. Thickness varies from 0 to 25 feet. Areas of alluvium are presently receiving sediment deposition.

Qt

**Terrace Deposit (Quaternary)** - Terrace deposits generally grade from basal gravel to silt and clay at the top. Gravels, primarily novaculite, originated in the Ouachita Mountain region and from local Cretaceous formations. Thicknesses are generally less than 50 feet. Terraces are topographic features which are former floodplains of nearby streams and/or rivers. The sediments form a rich loamy soil. The basal gravel is sometimes utilized for water-well production and gravel-mining operations.

Kn

**Nacatoch Sand (Upper Cretaceous)** - The Nacatoch Sand is composed of unconsolidated, cross-bedded, yellowish and gray fine quartz sand, hard fossiliferous sandy limestone, coarse highly glauconitic sand, fine argillaceous blue-black sand, and bedded light-gray clay and marl. Hard fossiliferous limestones are found near the base of the unit. Thin bedded gray clay is interbedded with fine sands at the top of the unit. The Nacatoch Sand is approximately 300 to 350 feet thick in the mapped area. The unit strikes to the northeast and has a dip of approximately 80 feet per mile to the southeast in this quadrangle. Fossils found in the unit include corals, echinoderms, bryozoa, annelids, bivalves, gastropods, cephalopods, crab remains, and shark teeth. The Nacatoch Sand was deposited in a nearshore marine environment and rests unconformably on top of the Saratoga Chalk.

Ks

**Saratoga Chalk (Upper Cretaceous)** - The Saratoga Chalk is a fossiliferous, hard, glauconitic chalk with beds of marly chalk and sandy chalk. It is blue-gray when freshly exposed and weathers white, light gray, and light brown. The Saratoga Chalk is 30 to 40 feet thick in the mapped area. The unit strikes to the northeast and has a dip of approximately 80 feet per mile to the southeast in this quadrangle. Fossils found in the unit include sponges, bryozoa, echinoderms, annelids, bivalves, gastropods, cephalopods, crustaceans, and fish teeth. The Saratoga Chalk was deposited in a nearshore marine environment and rests unconformably on top of the Marlbrook Marl.

Km

**Marlbrook Marl (Upper Cretaceous)** - The Marlbrook Marl is a uniform chalky marl that is blue-gray when freshly exposed and weathers white to light brown. The unit is moderately fossiliferous in the upper part and slightly fossiliferous in the lower part. Notable fossils include *Exogyra*, *Gryphaea*, and *Ostrea* oyster species and reptile remains. The Marlbrook Marl is approximately 220 feet thick in the mapped area. The unit strikes to the northeast and has a dip of approximately 80 feet per mile to the southeast in this quadrangle. The Marlbrook Marl was deposited in a nearshore marine environment and rests unconformably on top of the Ozan Formation.

Ko

**Ozan Formation (Upper Cretaceous)** - The Ozan Formation consists of sandy marl, marl, and a sandy glauconitic marl. The unit is fossiliferous, micaceous, and weathers to a yellow-brown sticky clay. The basal sandy glauconitic marl, known as the Buckranger Sand Lenticle, has shark teeth and phosphate nodules, and is about 15 feet thick. Thickness in the quadrangle is about 260 feet. Notable fossils are the *Exogyra ponderosa* and *Gryphaea*. The outcrop belt extends from west of Arkadelphia, southwest to the Arkansas-Oklahoma border, and dip approximately 80 feet per mile to the southwest. The unit was deposited in a nearshore marine environment and rests unconformably on the Brownstown Marl.

Kb

**Brownstown Marl (Upper Cretaceous)** - The Brownstown Marl consists of dark-gray calcareous clay, marl, and sandy marl. The unit is fossiliferous and weathers yellow to gray in color. Notable fossils are the *Exogyra ponderosa* and *Inoceramus*. The outcrop belt extends from east of Arkadelphia AR, southwest to the Arkansas-Oklahoma state line, and dips approximately 80 feet per mile to the south. The approximate thickness in the quadrangle is 220 feet. The unit was deposited in a nearshore marine environment and rests unconformably on the Tokio Formation (Upper Cretaceous).

Pa1

**Lower Atoka (Pennsylvanian)** - The lower Atoka is a sequence of marine, mostly tan to gray silty sandstones and grayish-black shales. Some rare calcareous beds and siliceous shales are known. This unit has the largest areal extent of any of the Paleozoic formations in the state.

Pv

**Johns Valley (Pennsylvanian)** - The Johns Valley Formation consists of black shale with numerous intervals of brownish sandstone. Also, small amounts of gray-black siliceous shale and chert have been noted. In the frontal Ouachita Mountains large quantities of erratic masses are common. The erratics consist of limestone, dolostone, cherts, and others. This unit was deposited in a deep marine environment and is about 500 - 1500 feet thick.

P1

**Jackfork Sandstone (Pennsylvanian)** - The Jackfork is thin to massive-bedded, fine- to coarse-grained, brown, tan, or bluish gray quartzitic sandstone with subordinate brown silty sandstones and gray-black shale. Toward the north of its outcrop area the shale units of the lower and middle Jackfork take up more of the section and the sandstones are more lenticular, often occurring as chaotic masses in the shale. Minor conglomerates composed of quartz, chert, and metaquartzite occur notably in the southern exposures of the formation. The Jackfork rests conformably on the Stanley. The formation is generally between 3500 to 6000 feet in thickness.

Ms

**Stanley Shale (Mississippian)** - The Stanley Shale is composed predominantly of grayish-black to brownish-gray shale, with lesser amounts of thin- to massive-bedded, fine-grained, gray to brownish-gray feldspathic sandstone. Weathering causes the shale to turn olive-gray and the sandstone to become more porous and brown. Interbedded layers of thin black siliceous shale and chert are present and are used to subdivide the formation in other areas. Locally, volcanic tuffs (primarily the Hatton Tuff Member) and a quartzite sandstone-chert conglomerate unit (Hot Spring Sandstone Member) are present in the lower Stanley. Cone-in-cone and calcareous silty concretions are present in shale. About 8,500 feet of the Stanley is present in the quadrangle. All of the formation is exposed except for about 1,600 feet of the upper portion and 1,200 feet of the lower portion. Most of the Stanley is Late Mississippian (Chesterian) as indicated by the presence of conodonts and plant fossils. The formation is a deep-water marine turbidite sequence, derived primarily from a landmass (Llanoria) that existed along the southern margins of the Ouachita trough.

## Symbols

- ~ Contact
- ▲ Thrust Fault
- Tear Fault
- 45° Strike and Dip
- ✕ Mine-Quarries
- Me-Mercury
- ss-Shale

## Reference

- McFarland, J. D., 1998, Stratigraphic Summary of Arkansas, Arkansas Geological Commission Information Circular 36, 39p.
- Miser, H. D., and Purdee, A. H., 1929, Geology of the DeQueen and Caddo Gap Quadrangles, Arkansas: U.S. Geological Survey, Bulletin 808, scale 1:125,000.

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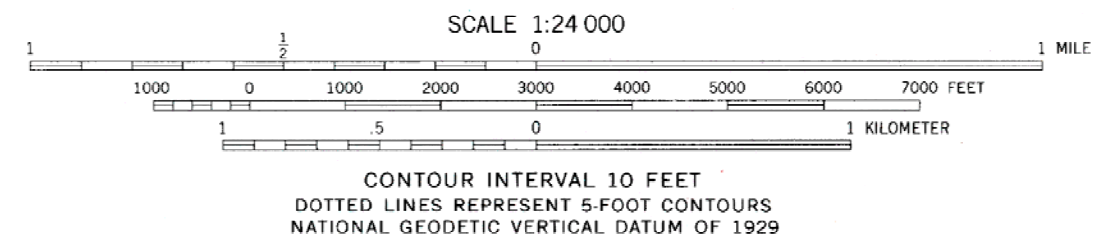
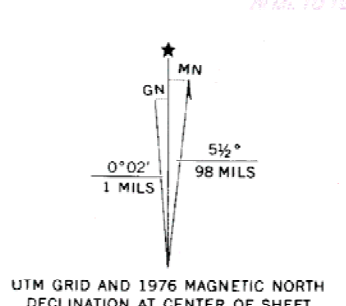
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Topography from aerial photographs by photogrammetric methods  
Aerial photographs taken 1956. Field check 1959

Polyconic projection, 1927 North American datum  
10,000-foot grid based on Arkansas coordinate system, south zone  
1000-meter Universal Transverse Mercator grid ticks,  
zone 15, shown in blue

Red first indicates areas in which only  
landmark buildings are shown  
Dashed land lines indicate approximate locations



CONTOUR INTERVAL 10 FEET  
DOTTED LINES REPRESENT 5 FOOT CONTOURS  
NATIONAL GEODETIC VERTICAL DATUM OF 1929



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CADD O VALLEY, ARK.  
N 3407.5—W 9300/7.5  
1959

AMS 7902 1:24,000 NE-SERIES V884

