Table 1.—Summary of drill-hole data in the Cedargrove quadrangle, Missouri.

[There are no logs for the upper parts of most of the drill holes. Or, Roubidoux Formation; Oc, Gasconade Dolomite; Ge, Eminence Dolomite; Op, Potosi Dolomite. Datum is mean sea level]

Drill-hole number	Location	Collar elevation, in feet	Contact elevation, in feet	Bottom elevation, in feet
Drill-hole data on file with Missouri Department of Natural Resources, Geological Survey and Resource Assessment Division				
9036	SW1/4NW1/4 Sec. 7, T. 32 N., R. 5 W.	1246	No data to 1156 alt Og/	941
17509	SE1/4SW1/4 Sec. 5, T. 31 N., R. 6 W.	935	No data to 885 825 Op–Ce 590 Ce–Cp	235
25152	SE1/4NE1/4 Sec. 10, T. 32 N., R. 6 W.	1301	No data to 776 616 Ce–Cp	511
25235	SE1/4NE1/4 Sec. 8, T. 32 N., R. 6 W.	1268	No data to 1178 1153 Or–Og	943
27566	NW1/4NW1/4 Sec. 24, T. 31 N., R. 6 W.	810	515 Ce–Cp	310

[Yield: mapping indicates approximately 40 % of Or below colle.
[Or–Og contact elevation interpreted at about 1200 ft on the basis of field mapping.

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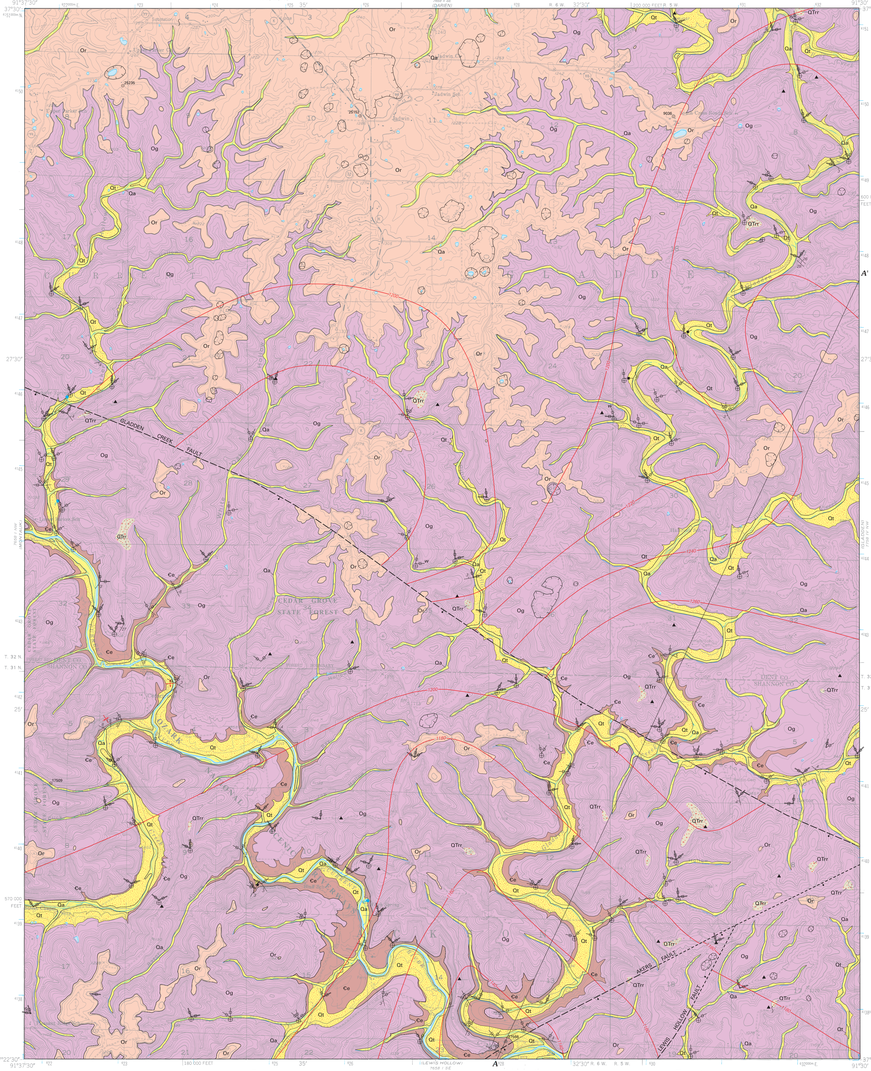
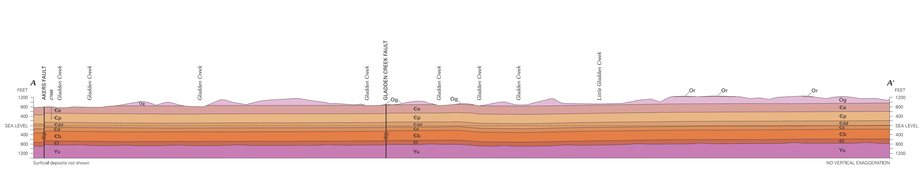
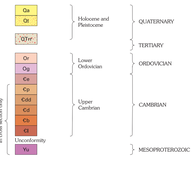
Figure 2.—Columnar section of outcropping formations in the Cedargrove quadrangle showing informal units of the Gasconade Dolomite. Abbreviation used: Ss., sandstone.





CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Qa **Alluvium (Holocene and Pleistocene?)**—Gravel, sand, and clay along the bed and active flood plains of modern stream valleys. Material consists mostly of subrounded to subangular chert, sandstone, and quartzite clasts in a matrix of sand containing silt and clay. Thickness ranges from 0 to as much as 20 ft

Qt **Terrace deposits (Holocene and Pleistocene?)**—Large cobble-size to sand-size, subrounded to subangular chert, sandstone, and quartzite clasts within a matrix of sand, silt, and clay. In some locations a significant fraction of the matrix is silt-size reworked loess. Deposited on relatively flat areas along floors and flanks of modern stream valleys, but above normal seasonal floods of present streams. Terraces along the Current River and major streams valleys are at least 6 to 10 ft above stream level. Thickness at least 10 ft and possibly more along deeper stream courses

QTfr **Residuum derived from the Roubidoux Formation (Quaternary and Tertiary)**—Sandstone and cherty sandstone slabs and sandy chert boulders and cobbles with sandy soils. Commonly occurs as boulder or slab piles on hilltops, minor knobs, and ridgecrests where carbonates from the Roubidoux Formation and some carbonates from the upper part of the underlying Gasconade Dolomite have been removed by nearly in-place weathering. Slope deposits also occur as colluvium on steep hillsides. Unit mapped only where it overlies the Gasconade Dolomite, because this residual material is ubiquitous in areas underlain by the Roubidoux Formation. Contact with Gasconade Dolomite is placed where identifiable clasts derived from the Gasconade become part of the residuum, or where residuum thickness approaches zero. Unit thickness may exceed 40 ft on some knobs and tapers down to zero on flanking hillsides

Or **Roubidoux Formation (Lower Ordovician)**—Dolomite, cherty dolomite, sandy dolomite, dolomitic sandstone, quartz sandstone, orthoquartzite, chert breccia, and bedded chert. Dolomite very light gray to medium-gray, pale-orange, or pinkish-gray, very fine grained to medium-grained, thin-bedded to laminated, even to irregularly bedded, interbedded with quartz sandstone, white to pale-orange where fresh, weathering light-brown or reddish-brown, very fine grained to coarse-grained, poorly sorted, thin-bedded to thick-bedded, commonly crossbedded or ripple marked, well-rounded quartz grains commonly have angular overgrowths; most beds dolomite-cemented, some silica-cemented. Dolomite locally replaced by white, gray, or brown chert, commonly stromatolitic and occasionally oolitic or fossiliferous. Lower and upper parts of unit are sandstone-rich, middle part chiefly dolomite. Fossils rare except for occasional impressions of the snail *Lesueurilites*. Basal part of unit commonly contains irregular, crinkly ripple marks formed by currents. Lower contact of unit mapped at lowest orthoquartzite or sandstone encountered above the Gasconade Dolomite. Up to about 130 ft of the Roubidoux Formation is exposed in the Cedargrove quadrangle

Og **Gasconade Dolomite (Lower Ordovician)**—Dolomite, chert, sandstone, and orthoquartzite. Formation includes the following five units, comprising the Gunter Sandstone Member and four informal units, that are illustrated in figure 2 but not shown separately on the map: Upper part of upper unit, light-gray, fine-grained to coarse-grained, thick-bedded, vuggy; weathers to a pitted surface. The uppermost bed of upper part of middle unit is a persistent white *Cryptozoon* chert, 2 to 10 ft thick. Dolomite of upper part of middle unit, light-gray, fine-grained to coarse-grained, medium-bedded to thick-bedded, with white to light-gray chert nodules and lenses. Dolomite of middle part of middle unit, light-gray to very light gray, medium-grained to coarse-grained, medium-bedded; contains chert as nodules, stringers, and beds; chert varieties are porcellanous, oolitic, porous with druse, and stromatolitic. A persistent oolite bed occurs at base of middle part of middle unit. Dolomite of lower part of middle unit, formerly called the Van Buren Formation by Bridge (1930), light-gray to medium-gray, fine-grained to medium-grained, thin-bedded to medium-bedded. The lower unit is the Gunter Sandstone Member, consisting of light-gray to white sandstone, sandy dolomite, or orthoquartzite interbedded with light-gray to tan, fine-grained, thin-bedded dolomite. Thickness of the Gunter ranges from 10 to 20 ft. The Gasconade Dolomite ranges from 300 to 350 ft in thickness in the Cedargrove quadrangle. Contact with underlying Eminence Dolomite is placed at base of lowest sandstone or sandy dolomite above the Eminence Dolomite

Ge **Eminence Dolomite (Upper Cambrian)**—Dolomite, light-gray to medium-gray, occasionally mottled red, pink, or green, medium-grained to coarse-grained, medium-bedded to thick-bedded, commonly massive; minor amount of chert, locally oolitic or drusy, in nodules and angular fragments, mostly in upper half of formation. About 90 ft of Eminence is exposed in the Cedargrove quadrangle, and a total thickness of as much as 335 ft is derived from well and outcrop data (table 1)

Cp **Potosi Dolomite (Upper Cambrian)**—Shown in cross section only. Dolomite, light-brownish-gray to pale-yellowish-brown, fine-grained to medium-grained, thick-bedded to massive; has unusual, irregular blebs of silica and quartz druse; locally stromatolitic; bituminous odor typical of dolomite rock. Thickness in the quadrangle is probably about 400 ft

Cdd **Derby-Doerun Dolomite (usage of Missouri Geological Survey, 1979) (Upper Cambrian)**—Shown in cross section only. Dolomite, siltstone, and shale. Dolomite, buff to brown or light-gray, fine-grained to medium-grained, thin-bedded to medium-bedded, argillaceous, silty, with minor amounts of chert and sandy beds; commonly mottled, vuggy and porous. Siltstone and shale, thin-bedded. Intercalated with the dolomite. The Derby-Doerun is probably about 200 ft thick in the Cedargrove quadrangle

Cd **Davis Formation (Upper Cambrian)**—Shown in cross section only. Siltstone, sandstone, dolomite, shale, and limestone conglomerate. Shale, dark-green, fissile, thin-bedded to thick-bedded; occasion as much as 50 percent of formation. Limestone, light-gray, fine-grained to cryptograined, dense, locally glauconitic. The Davis contains intraformational sedimentary breccias and grainstones. Unit is probably about 170 ft thick in the quadrangle

Cb **Bonneterre Formation (Upper Cambrian)**—Shown in cross section only. Dolomite, limestone, siltstone, and shale. Dolomite, light-gray, fine-grained to medium-grained, medium-bedded; commonly contains algal structures, locally glauconitic and shaly. Limestone, brownish-gray to pink, fine-grained, thin-bedded, fossiliferous, locally oolitic; more common in lower part of formation. Siltstone, quartzose, light-gray to dark-gray, laminated. Shale, dark-green, thin-bedded; occurs as sparse thin interbeds and partings. Unit is a major host of Mississippi Valley-type base-metal deposits (Pb, Zn) in the Ozark region. The Bonneterre is probably about 400 ft thick in the Cedargrove quadrangle

Ce **Lamotte Sandstone (Upper Cambrian)**—Shown in cross section only. Sandstone, quartzose, light-gray, yellow, brown, or red, dominantly medium-grained, moderately sorted to well sorted, well indurated; locally contains interbeds of red to purple silty shale and, in upper part, scattered lenses of arenaceous dolomite. Feldsite pebble or boulder conglomerate is commonly present at base. Estimated thickness in the quadrangle is as much as 200 ft

Y_U **Igneous rocks, undifferentiated (Mesoproterozoic)**—Shown in cross section only. Probably rhyolite or granite. No drill holes reached the basement rocks in the Cedargrove quadrangle

EXPLANATION OF MAP SYMBOLS

Contact—Approximately located; dotted where concealed

Fault—Long-dashed where approximately located; short-dashed where inferred; dotted where concealed. Bar and ball on downthrown side; in cross section, paired arrows indicate relative direction of vertical movement. Faults exposed in mines in nearby quadrangles have strike-slip displacement; however, strike-slip movements are not shown on this map because they cannot be documented in surface exposures

Structure contour—Drawn on base of Roubidoux Formation; projected where above land surface. Contour interval 20 ft

Minor anticline

Minor syncline

PLANAR FEATURES

[Point of observation at intersection of multiple symbols]

Strike and dip of beds

Inclined

Horizontal

Strike and dip of joints—Apertures are narrow (<0.5 in.) except where noted by w (slightly widened)

Throughgoing, vertical

Widely spaced (>6 ft)

Non-throughgoing, vertical

Widely spaced (>6 ft)

Moderately spaced (2–6 ft)

Closely spaced (<2 ft)

OTHER FEATURES

Drill hole—Number refers to well records from Missouri Department of Natural Resources; see table 1 for summary of well data

Gasconade Dolomite, *Cryptozoon* chert bed—Locality where chert bed was observed in outcrop or in float

Cataclastic deformation bands in sandstone float

Spring

Sinkhole

DISCUSSION

INTRODUCTION

The Cedargrove 7.5-minute quadrangle is located in south-central Missouri within the Salem Plateau region of the Ozark Plateaus physiographic province (Fenneman, 1938; Bretz, 1965) (fig. 1). Most of the land in the quadrangle is privately owned and used primarily for grazing cattle and horses and growing timber. The map area has topographic relief of about 565 feet (ft), with elevations ranging from about 760 ft at Akers Ferry on the central-southern edge of the map to about 1,325 ft near the town of Jadwin in the north-central part of the map area. The most prominent physiographic features in the quadrangle are the valleys of the Current River and Big Creek in the southwestern part of the map area, and the valley of Gladden Creek, which transects the eastern part of the quadrangle from north to south.

STRATIGRAPHY

Mesoproterozoic Basement Rocks

Mesoproterozoic rocks are not exposed in the Cedargrove quadrangle. However, they are present beneath the Paleozoic sedimentary rocks at depths probably exceeding 2,100 ft below the ground surface. In this region these rocks usually are encountered in deep exploration drill holes, but none in the map area reached them (table 1). The Mesoproterozoic rocks underlying the quadrangle are part of a granite–rhyolite terrane that is extensive in the Midcontinent region. Outcrops of this terrane occur in the Alley Spring, Big Spring, Eminence, Powder Mill Ferry, Stegall Mountain, and Van Buren North 7.5-minute quadrangles to the southeast and in the St. Francois Mountains 50 miles (mi) to the east (fig. 1). Uranium-lead isotopic analyses on these rocks in nearby quadrangles yielded radiometric ages of (1) 1,461.8±5.5 Ma for the granite exposed in the Big Spring quadrangle (Harrison and others, 2000), (2) 1,473±15 Ma for granite from a core hole in the Van Buren South quadrangle, (3) 1,480±42 Ma for granite from a core hole in the Winona quadrangle to the southeast (Van Schmus and others, 1993), and (4) 1,473±15 Ma for granite from a core hole in the Round Spring quadrangle to the northeast (Bickford and others, 1981). A uranium-lead age of 1,470.4±2.7 Ma was obtained from the "Rhyolite of Shut-In Mountain" in the Stegall Mountain quadrangle (Harrison and others, 2002).

Paleozoic Stratigraphy

The Cedargrove area is underlain by a total thickness of about 2,100 ft of lower Paleozoic marine strata, chiefly dolomite, sandstone, and orthoquartzite. From oldest to youngest, these units are the Upper Cambrian Lamotte Sandstone, Bonneterre Formation, Davis Formation, Derby-Doerun Dolomite (usage of Missouri Geological Survey, 1979), Potosi Dolomite, and Eminence Dolomite, and the Lower Ordovician Gasconade Dolomite and Roubidoux Formation. Only the last three units crop out in the quadrangle. The columnar section, figure 2, summarizes the general lithologies and thickness of the Paleozoic strata that crop out in the Cedargrove quadrangle.

The oldest mapped unit in the Cedargrove quadrangle is the Eminence Dolomite. The Eminence was first described by Ulrich (1911) from exposures in the vicinity of the town of Eminence, Mo. Most of the exposures in the Cedargrove quadrangle occur in the floor and along the walls of the valleys of the Current River, Big Creek, and Gladden Creek. The Eminence comprises very massive to thick-bedded, medium-grained to coarse-grained, light-gray to medium-gray dolomite and cherty dolomite; chert occurs as nodules and angular fragments. Many of the beds are stromatolitic, with pits and vugs developed between the laminae, and others are crossbedded. The thick, non-cherty dolomite beds commonly weather into irregular pinnacles, especially beds lying subjacent to sandstone of the overlying Gunter Sandstone Member of the Gasconade Dolomite.

Bridge (1930) reported the Eminence to be abundantly fossiliferous in the area to the southeast of the Cedargrove quadrangle, especially with tribolites and gastropods in residual cherts. No such fossils were observed during the course of this study.

A maximum of about 90 ft of Eminence Dolomite is exposed near Akers Ferry at the southern edge of the map area. Drill hole 27566, near the southern edge of the map (table 1), pierces 295 ft of Eminence, which added to the approximately 40 ft of Eminence above the well collar gives a total thickness of about 335 ft. The Eminence Dolomite is one of the main cave-bearing formations in the map area. Caves and springs typically are concentrated just below the Gunter Sandstone Member of the overlying Gasconade Formation. Welch Spring, near the Current River at the boundary between secs. 10 and 11, T. 31 N., R. 6 W., is in the uppermost Eminence Dolomite.

Previous maps produced by this U.S. Geological Survey (USGS) project placed the Cambrian–Ordovician boundary in the upper part of the Eminence Dolomite (McDowell, 1998; Orndorff and others, 1999; McDowell and Harrison, 2000; Orndorff and Harrison, 2001; Harrison and others, 2002; Weems, 2002; Harrison and McDowell, 2003). However, recent international agreement on redefinition of this boundary requires that it be placed at the contact between the Eminence and Gasconade Dolomites (Cooper and others, 2001). Bridge (1930) speculated that an important unconformity exists at the base of the Gasconade (fig. 2). Conodont biostratigraphy suggests that there may be multiple unconformities within the basal Gasconade interval (Repetski and others, 2000).

The Gasconade Dolomite was named by Nason (1892) for exposures along the Gasconade River in Laclede, Pulaski, and Phelps Counties, central Missouri. The basal 10 to 20 ft consists of interbedded sandstone, orthoquartzite, and thin-bedded dolomite and chert; this member named the Gunter Sandstone Member by Ball and Smith (1903) for exposures along the Niangua River at Gunter (now Hahatonka Springs), Camden County, in central Missouri. The quartz sandstone content of the Gunter varies within the Cedargrove quadrangle. Quartz sandstone and (or) orthoquartzite represent up to about 50 percent of the interval in some places and as little as zero percent in others. In the areas having no quartz sandstone or orthoquartzite, those stratigraphic intervals are occupied by dolomite or sandy dolomite containing floating quartz grains.

Bridge (1930) used the name Van Buren Formation for medium-bedded cherty dolomite above the Gunter and below a thin oolite bed in the middle part of the middle unit of the Gasconade Dolomite (fig. 2). Bridge's Van Buren Formation was defined by its faunal content, but the name is no longer used (Thompson, 1995). Pratt and others (1992) described a lower part and an upper part of the Gasconade Dolomite that are divided by a persistent *Cryptozoon* chert. This distinctive *Cryptozoon* chert is located about 80 to 100 ft below the top of the Gasconade, at the top of the upper part of the middle unit (fig. 2). Outcrops of the chert bed are rare in the Cedargrove quadrangle; however, float of *Cryptozoon* chert boulders, indicating this horizon, was observed in many locations. Triangular symbols on the map indicate locations where the *Cryptozoon* chert was observed in outcrop or as float.

The lower unit of the Gasconade Dolomite is the Gunter Sandstone Member. The middle unit of the Gasconade includes Bridge's Van Buren Formation (lower part of middle unit) and dolomite above the oolite bed, up to and including the *Cryptozoon* chert. The upper unit of the formation above the chert is thick-bedded dolomite. Where not buried in residuum from the overlying Roubidoux Formation, this interval tends to form dolomite glades on south-facing and west-facing slopes. The total thickness of the Gasconade Formation in the Cedargrove quadrangle ranges from 300 to 350 ft.

Fossils are rare in the Gasconade within the map area, though the presence of planispiral gastropods and cephalopods from cherts within this unit have been reported at Fort Leonard Wood Military Reservation, about 40 mi to the northwest, and at a locality near the town of Van Buren, about 40 mi to the southeast (Harrison and others, 1996; J.E. Repetski, USGS, oral commun., 2000).

The Roubidoux Formation was named for exposures in the area of Roubidoux Creek about 40 mi to the northwest in Pulaski County, Mo. (Nason, 1892). The Roubidoux consists of interbedded dolomite, cherty dolomite, sandy dolomite, dolomitic sandstone, quartz sandstone, orthoquartzite, chert breccia, and bedded chert. The contact between the Roubidoux and the underlying Gasconade is probably conformable and is placed at the base of the first significant orthoquartzite or sandstone in the Roubidoux. The lower 20 to 30 ft of the Roubidoux is sandstone-rich and commonly produces a topographic bench that sheds sandstone float onto the slopes below. The middle part of the Roubidoux is chiefly thick-bedded gray dolomite, which resembles the dolomite of the upper part of the Gasconade. The upper part of the Roubidoux is sandstone-rich and forms another topographic bench. Upon weathering the Roubidoux produces a sandy, orange-colored soil that in places is littered with tabular sandstone and orthoquartzite float blocks as well as white chert cobbles and boulders.

Fossils generally are rare in the Roubidoux Formation, though impressions of snails (mostly *Lesueurilites*) locally are common in cherts and sandstones. Heller (1954) reported the occurrence of brachiopods, cephalopods, and trilobites from this formation elsewhere within the Salem Plateau. Harrison and others (1996) reported the occurrence of conodonts indicative of early Early Ordovician (early to middle Ibexian) age.

The top of the Roubidoux is not present in the map area, having been removed by erosion. The Roubidoux is reported to be as much as 250 ft thick in other parts of Missouri (Thompson, 1995). About 130 ft of Roubidoux is exposed in the northern part of the Cedargrove quadrangle.

Surficial Geology

Alluvial deposits (Qa) and terrace deposits (Qt) were mapped within the stream valleys and are similar in composition. The terraces comprise Holocene to possibly late Pleistocene alluvial deposits (Haynes, 1985; Albertson and others, 1995) that were derived mostly by washing of the clay, silt, and chert fractions from the adjacent upland residual soils and to a lesser extent by reworking of loess. Terraces were mapped as morphologic features along the sides of the stream valleys at higher elevations than the present-day flood plain. Along the Current River and its major tributaries, several levels of surficial terrace deposits occur. Detailed differentiation and mapping of these terraces across the map area was beyond the scope of the present project. Therefore, all terrace deposits were mapped as a single unit (Qt).

Pleistocene loess is reported as thin or absent over most of the Salem Plateau (Ehrets and Connor, 1980). Nevertheless, the Cedargrove region includes areas of soils having a loess component (Gott, 1975). In most areas, these soils do not constitute a mappable geologic unit, because they are thin and intermingled with underlying clayey residuum due to bioturbation. Small areas having these soils were observed in the Cedargrove quadrangle, in saddles between hills and on flat ridgetops. These areas are not extensive enough to be mapped as a separate unit.

In upland areas, a pervasive mantle of residuum represents the weathering-in-place of fresh bedrock into soil. Generally, dolomites have been leached away, leaving a residue of angular pebbles, cobbles, and boulders composed of chert, quartzite, and sandstone floating in a matrix of clayey silt to silty clay. On most slopes, the residual soils have undergone downhill creep, producing a thin mantle of colluvium along most valley walls. Because this veneer typically is nearly ubiquitous but thin, in most areas it is not mapped as a separate unit.

Many of the high ridges and hills in the quadrangle underlain by Gasconade Dolomite bedrock are capped with residual deposits consisting of quartz sandstone slabs and boulders, white chert boulders and cobbles, and sandy soils clearly derived from the in-place weathering of the overlying Roubidoux Formation and ranging from 0 to about 40 ft thick. These deposits also occur as colluvium on steep hillsides. They have been mapped as a separate unit designated Qtfr (Quaternary or Tertiary Roubidoux residuum).

KARST

Karst features in the Cedargrove quadrangle include caves, springs, sinkholes, disappearing and losing streams, and small-scale solutional features on outcrops of carbonate bedrock surfaces. Caves can be found anywhere in the stratigraphic section but are concentrated at particular stratigraphic horizons. Many caves are in the upper part of the Eminence Dolomite and in the upper part of the Gasconade Dolomite, near the contact with the Roubidoux Formation. Most sinkholes are filled with sediment and residuum, and many were formed by subsidence of the land surface into caves below. Sinkholes can be found in all of the formational units, but they are larger and more numerous in the lower part of the Roubidoux Formation where it collapses into caves in the upper part of the Gasconade Dolomite.

STRUCTURAL GEOLOGY

The regional style of deformation is brittle, with vertical jointing and strike-slip faulting predominant along northeast and northwest trends (Clendenin and others, 1989; Harrison and Schultz, 2002). Strata within the Cedargrove quadrangle are generally subhorizontal to gently dipping. Gentle folding occurs as compositional or transpressional strain near faults and possibly as subsidence into large karstic voids. The steepest dips measured in the quadrangle were on beds in adjacent outcrops in the center of sec. 17, T. 32 N., R. 5 W., one striking 283° and dipping 26° to the southwest, and the other striking 282° and dipping 28° to the northeast. These high dips are probably the result of local collapse into karstic voids, since there is no other evidence of faulting in the immediate area.

The rocks of this quadrangle are pervasively jointed. Joints were characterized by their orientation, spacing, strata, persistence, and aperture. Spacing refers to the mean perpendicular distance between parallel joints in a joint set. Joints confined to individual beds are classified as non-throughgoing, and joints extending across bedding planes into surrounding beds are classified as throughgoing. Most joints in the carbonate rocks are open (containing no mineralized infilling) and have narrow apertures. However, some joints have been widened by solution and are as much as 10 inches (in.) wide. Cumulative orientations of all the joint measurements observed in outcrop are shown in figure 3. The two primary joint sets trend north-northwest and northeast and are indicative of development under a regional stress field. Coy (1995) interpreted similarly oriented joints throughout the Ozarks as far-field deformation related to the Ouachita and Appalachian orogenies.

Cataclastic deformation bands occur locally in sandstones within the quadrangle. All were found in float blocks, diminishing their usefulness for indicating direction of fault movement. The deformation bands are of tectonic origin and are created by millimeter-scale displacements through shearing that involves a combination of pore-space collapse and fracturing of grains (Davis, 1999; Harrison and Schultz, 2002). Because development of deformation bands is a strain-hardening mechanism (Davis, 1999), the bands are usually more resistant to weathering than the surrounding rock and are commonly found in raised relief on the surfaces of sandstone blocks.

Faults in this area are difficult to observe directly, due to vegetation and residuum cover, and have to be inferred on the basis of indirect evidence. This evidence includes (1) vertical offset of strata having insufficient observed dip to explain the change in vertical stratigraphic offset along faults may reverse in sense as the result of horizontal offset of gentle folds along both sides of the fault, and (2) cataclastic deformation bands observed in outcrop or in float blocks of sandstone. Although only vertical offset was observed on faults in the quadrangle, the faults are interpreted to be strike-slip on the basis of observations of similar faults exposed in subsurface base-metal mines in nearby quadrangles.

The longest fault mapped in the Cedargrove quadrangle is the Gladden Creek fault, which runs from northwest to southeast across the central part of the quadrangle. The mapping of this fault is based on stratigraphic offsets, alignment of areas with deformation bands, and interpretation of regional aeromagnetic data (R.W. Harrison, USGS, unpub. data). Total offset on this fault is difficult to determine; the horizontal slip is undetermined and the vertical offset is as much as 50 ft, with the southwestern block down in relation to the northeastern block.

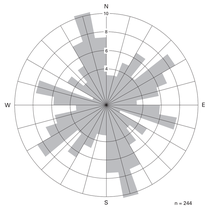
Another fault trace, herein named the Akers fault, extends northeast across the southwestern corner of the quadrangle. This fault was not observed directly and is mapped on the basis of vertical offsets of the Eminence Dolomite to Gasconade Dolomite contact seen along the Current River in the Lewis Hollow quadrangle adjacent to the south of the Cedargrove quadrangle. The apparent vertical offset is about 60 ft near the Current River, with the southeastern block down in relation to the northwestern block.

A short, north-northeast-trending fault is mapped to the southeast of the Akers fault and is herein named the Lewis Hollow fault. The Lewis Hollow fault is interpreted to terminate against the Akers fault. The apparent sense of vertical motion is down about 60 ft on the northwestern block to relation to the southeastern block. Thus, together with the Akers fault, the Lewis Hollow fault defines a graben-like structure with the downdropped block about 1.1 mi wide at the Current River. This is observable, chiefly in the Lewis Hollow quadrangle, as a stretch of about 1.9 river miles where the Eminence Dolomite–Gasconade Dolomite contact is lower in altitude than upstream or downstream of the graben. Physiographically this reach of the river exhibits a narrower gorge than either upstream or downstream. This gorge is bounded by low bluffs rising 10 to 20 ft above the river and consisting of massive beds of the uppermost Eminence Dolomite.

ECONOMIC GEOLOGY

A low-quality deposit of iron described by Crane (1910) as specular hematite and secondary limonite occurs in the Cedargrove quadrangle in sec. 23, T. 32 N., R. 6 W.

Gravel, derived from alluvial stream bottoms, and fill earth, derived from residuum, are widely available and are used locally for road-base and dam construction. Dolomite bedrock in the quadrangle, especially the Gasconade Dolomite, could be quarried for road metal or dimension stone.

HYDROLOGY

With the exception of the Current River and parts of Spring Creek, most water flow in the Cedargrove quadrangle is subterranean, with surface flow occurring only at times of abundant rainfall. Many small streams have short reaches where water flows from springs or seeps and then is lost to subterranean drainage downslope. Within the map area, the Gasconade, Eminence, and Potosi Dolomites are the major stratigraphic units that produce ground water (Imes, 1983). Collectively, these units are part of the regional Ozark aquifer that underlies the Salem Plateau (Imes and Emmett, 1994).