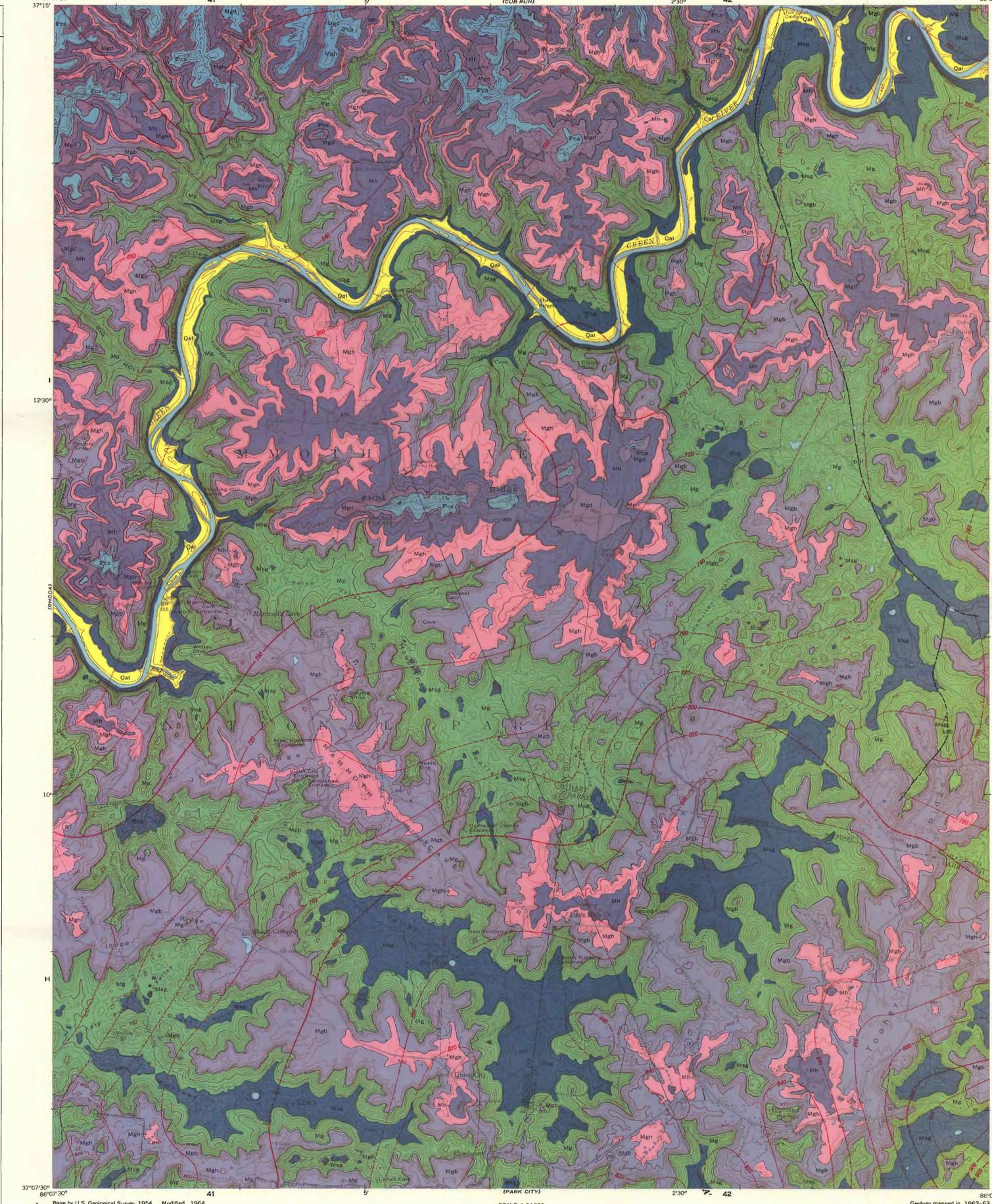


SYSTEM	SERIES	FORMATION AND MEMBER	LITHOLOGY	THICKNESS, IN FEET	DESCRIPTION
QUATERNARY		Alluvium		0-50	Sand, locally crossbedded, silt and clay, poorly sorted; locally contains gravel lenses of rounded to well-rounded quartz and chert pebbles and cobbles. Sand, clay, and silt are brown gray, and dark gray.
		Caseville Formation		90+	Conglomerate, sandstone, and siltstone: Cobble and pebble conglomerate interbedded with pebbly to granular sandstone in lower part; large sandstone in upper part. Conglomerate consists of cobbles, up to 3 inches in diameter, pebbles and granules of white and very light gray quartz and quartzite, reddish-brown and black siliceous and manganese cement. Sandstone, white, yellowish-gray, yellowish-orange, and grayish-orange, thick-bedded to massive, fine- to very coarse grained, conglomeratic, locally crossbedded, limonite- and hematite-stained grains and matrix. Siltstone occurs as thin partings and seams. Formation sparsely fossiliferous with poorly preserved plant remains. Contact with underlying Glen Dean Limestone unconformable. Locally truncates Glen Dean Limestone and rests unconformably on Hardinsburg Sandstone.
PENNSYLVANIAN	Lower	Glen Dean Limestone		0-45	Limestone and shale: Limestone, light gray to medium-dark gray, finely to medium-crystalline, thin-bedded to massive, locally argillaceous; consists of abundant fossil fragments and thin beds of a sparry calcite matrix, locally matrix is microcrystalline calcite; weathers medium gray to dark gray. Limestone partings of greenish-gray calcareous shale more abundant in upper part. Formation poorly exposed.
		Hardinsburg Sandstone		30-60	Sandstone and interbedded siltstone and shale: Sandstone, very light gray and yellowish-brown to reddish-brown, very fine to fine grained, mostly subrounded to rounded quartz; thin to thick-bedded, locally thinly laminated, gently to strongly crossbedded locally, most part parallel bedded, well indurated on fresh exposure, friable where weathered, limonite present on grains and in spaces between grains. Interbedded, medium gray and light brown siltstone and shale occur in basal part. Fractures and joints between blocks of slumped and tilted sandstone commonly filled with red clay containing silicified fossil fragments. Basal contact conformable.
CARBONIFEROUS	Upper	Glen Dean Limestone	Haney Limestone Member	10-50	Limestone, light olive-gray, medium-gray, and light brown, finely to medium-crystalline, thin to thick-bedded; consists of fossil fragments cemented by sparry calcite or microcrystalline calcite, weathers light gray, thin lenses and partings of gray shale occur throughout unit. Microcrystalline calcite more abundant as cementing material in basal part. Locally cherty. Extensively thinned due to removal of carbonate by percolating ground water resulting in collapse and slumping of overlying Hardinsburg Sandstone. Poorly exposed; many places the only evidence of the former presence of limestone is reddish-brown residual clay containing silicified fossil fragments, mostly crinoid stem plates, and porous white thin blocky chert.
			Big Clifty Sandstone Member	50-120	Sandstone, shale, and interbedded sandstone and shale: Sandstone, grayish-white, light yellowish-brown, tan, and buff, very fine to medium-grained quartz, subangular to rounded, limonite staining, thin-bedded to massive, locally crossbedded, locally contains thin green shale partings, weathers yellowish brown and brown; forms cliffs. Locally very dark gray, gray, green, and light brown shale occurs in middle and at base of unit. In places basal shale contains green, gray, and light brown siltstone lenses. Unit commonly forms slope covered with talus. Interbedded white and yellowish-brown fine to medium-fine grained sandstone and green shale common in upper part, forms slopes. Basal contact generally covered by sandstone talus.
		Girkin Formation	Girkin	95-190	Limestone, shale, and siltstone: Limestone, medium-light gray, brownish-gray, and medium-gray, finely to medium-crystalline, thin-bedded to massive; consists of fossil fragments cemented by microcrystalline calcite, locally in upper part of formation unit contains thin, fine bedded or less, lenses of green shale, weathers light yellowish gray and gray. Limestone (calcarenite), medium gray to very dark gray, very fine to coarse-grained, thin to thick-bedded, locally crossbedded; consists of limestone and dolomitic limestone grains cemented by sparry calcite and microcrystalline calcite, weathers gray to very dark gray. Limestone (calcarenite), very light gray, gray, and light tan to buff, schistose to finely crystalline, thin-bedded to massive, locally silty; microcrystalline calcite cement and inclusions, weathers brownish gray, gray, and dark tan. Limestone (calcarenite), olive, white to light gray and gray, fine-grained, thin to thick-bedded, locally crossbedded; composed of fossil fragments and limestone and dolomitic limestone grains, weathers mottled gray and white. Limestone, medium gray and gray, medium to coarsely crystalline, thin to medium-bedded, locally silty; consists of fossil fragments and entire casts in a matrix of sparry calcite; weathers orange brown and gray, locally and in the very uppermost part of formation, yellowish, reddish, to black (McChesney) and may be equivalent to Beech Creek Limestone Member of Galesburg Formation. Limestone, gray, medium-gray, and yellowish-brown, thin to medium-bedded, gently crossbedded; composed of subrounded to rounded, fine to coarse limestone and dolomitic limestone grains with sparse granules up to 4 mm in diameter, in a matrix of sparry and microcrystalline calcite, weathers orange brown, yellowish brown, and gray; commonly occurs immediately above basal contact but has been locally found higher in formation. Locally green and grayish-green shale occurs immediately below upper contact. Interbedded gray and green silty shale and brownish-green calcareous siltstone occur locally in uppermost part of formation and contain abundant fossils and sparse lenses and nodules of gray and grayish-blue chert. Characteristic of lower part of formation are simple and compound clusters of small quartz crystals as well as beds and lenses of bluish-gray, dark-gray, and reddish-gray chert up to 8 inches thick. Basal contact apparently conformable.
			Ste. Genevieve Limestone	180+	Limestone, oolitic, white, very light gray, and gray, locally crossbedded, thin to very thick bedded, locally contains beds and lenses, less than 4 inches thick of blue and bluish-gray chert, occurs throughout formation. Limestone (calcarenite), buff, light gray, and medium-gray, composed of very fine to coarse subrounded and rounded limestone and dolomitic limestone grains, granules, and pebbles, some as large as 6 mm in diameter, in a matrix of sparry and microcrystalline calcite, very thin bedded to thick-bedded, gently to strongly crossbedded locally, in places fossiliferous, weathers light gray to grayish white and gray; occurs immediately below upper contact. Limestone, tan, light-brown, and gray, medium-crystalline, consists of fossil fragments in a sparry calcite matrix, thin to thick-bedded, locally strongly to gently crossbedded, locally contains sparse oolites and thin beds of bluish-gray chert; weathers gray and brownish gray. Thin, less than 3 feet thick, beds of light brown dolomite occur locally in middle and lower parts of formation. A light-gray finely crystalline silty limestone occurs locally. Flatiron (Zelostrophia) (Zelostrophia) perrinitensis (Easton) occur in upper 40 feet. Locally unit is deeply weathered to reddish-brown clayey residuum containing chert and silicified fossils. Base of formation not exposed.



EXPLANATION

Qal	Alluvium
Pca	Caseville Formation
UNCONFORMITY	
Mgd	Glen Dean Limestone
Mh	Hardinsburg Sandstone
Mgh	Haney Limestone Member
Mgb	Big Clifty Sandstone Member
Mg	Girkin Formation
Mgs	Ste. Genevieve Limestone

FAULT

STRUCTURE CONTOURS

CONTACT

ABANDONED QUARRY

Dashed where approximately located; short dashed where inferred; dotted where concealed. U, upthrown side; D, downthrown side.

Structure contours drawn on base of Big Clifty Sandstone Member of Galesburg Formation. Long dashed where control less accurate. Short dashed where datum is above land surface. Hashmarks indicate closed basin. Contour interval 50 feet.

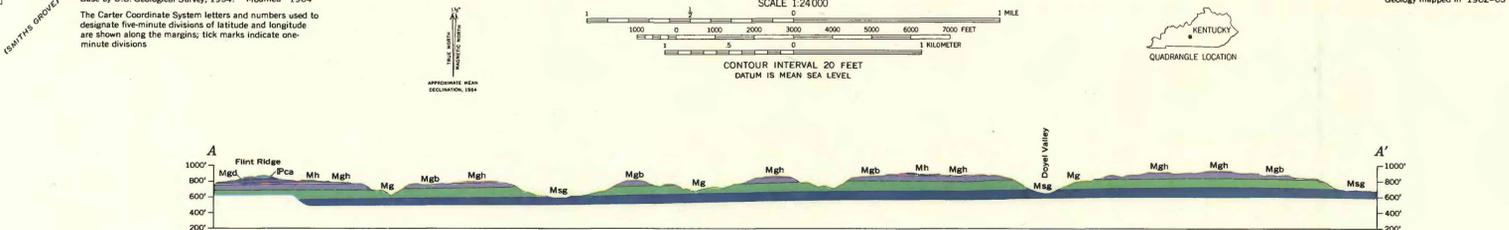
ECONOMIC GEOLOGY

Most of the quadrangle lies within the boundaries of Mammoth Cave National Park, and very little exploration for petroleum has taken place in the last few years. A few holes have been drilled, and oil and gas were produced from below the Chattanooga Shale of Devonian age in the extreme northeast corner of the quadrangle, but at present there are no producing wells.

Limestone has been quarried from the Girkin Formation and Ste. Genevieve Limestone, but all operations are now inactive. At one time sandstone from the Hardinsburg was mined on Flint Ridge.

Within Mammoth Cave National Park there are several tens of miles of explored cave passages and probably an equal amount of unexplored passages. Most of the caves occur in the lower part of the Girkin Formation and throughout that part of the Ste. Genevieve Limestone which occurs at or above water level of the Green River. There are several underground streams, one of which is accessible from Mammoth Cave.

In addition to Mammoth Cave, which occurs on Mammoth Cave Ridge, there are explored caves on Flint Ridge, on the south side of Woolsey Valley, northwest of Three Sisters Island on the north side of the Green River, and at Highland Springs.



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