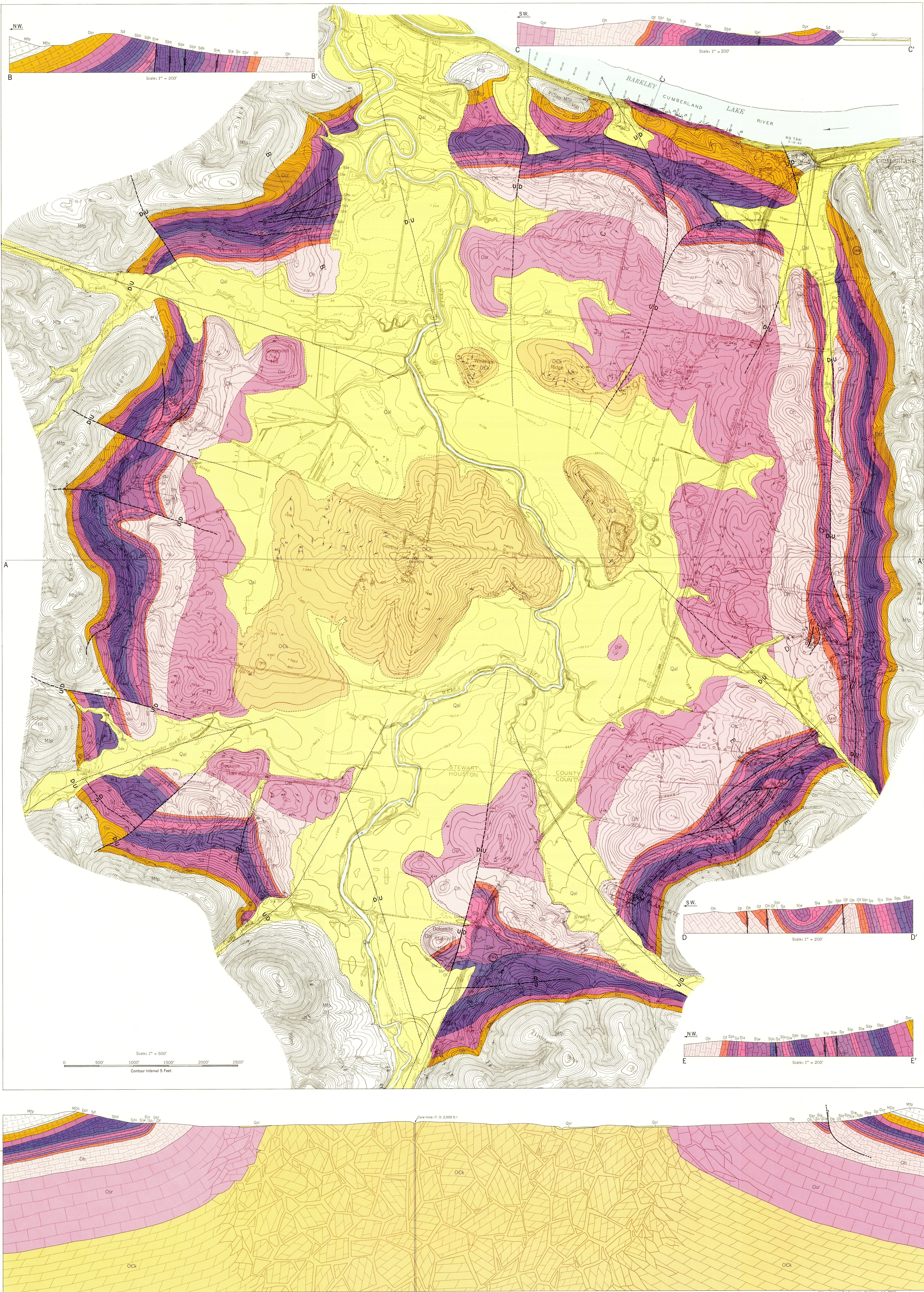




- EXPLANATION**
- Alluvial Deposits**
Flood plain deposits of the Cumberland River consist of clay and silt, light to medium-gray and yellowish-orange; with lenses of quartz sand and chert sand, gray to brownish-orange, fine to coarse-grained; chert and quartz gravel, gray to yellowish-orange and yellowish to reddish-brown. Thickness as much as 80 feet.
- Fort Payne Formation, New Providence Shale, and Chattanooga Shale**
Fort Payne Formation
Argillaceous or siliceous limestone and calcareous siltstone, brownish-gray to light olive gray, fine-grained, thin to thick-bedded. Weathers to two markedly different units, an upper serpy chert and a lower bedded chert.
Upper serpy chert consists of masses of banded, fine-grained, rough and porous, pale-orange and yellowish-brown chert. Upper part of this unit also may contain nodules and beds of streaked, fossiliferous chert. Thickness about 100 feet.
Lower bedded chert consists of layers of dark-gray, streaked, nonfossiliferous chert, which breaks into a rubble of blocks. Partial weathering of the original calcareous siltstone in this zone yields blocks, forming a core of medium-gray siltstone surrounded by a yellowish-brown peripheral band, resembling weathered Hermitage Formation. Thickness about 280 to 400 feet.
Estimated thickness of formation 380 to 500 feet.
- New Providence Shale**
Shale, medium-gray and greenish-gray with thin zones of reddish-brown; at base is olive-gray and light brownish-gray, fine-grained limestone. Thickness 0 to 20 feet. Beneath the New Providence, or at the base of the Fort Payne where the New Providence is absent, is greenish-gray shale or mudstone (Mauzy Shale), 1 to 4 feet thick, containing phosphatic nodules.
- Chattanooga Shale**
Shale, carbonaceous, grayish-black, fissile, pyritic. Thickness 15 to 58 feet; averages 25 to 30 feet. Mapped separately (M.D.) only in cross sections.
- Thickness of Fort Payne, New Providence, and Chattanooga 400 to 500 feet.**
- Camden, Harriman, and Ross Formations**
The Camden and Harriman Formations are lithologically identical, and not enough fossils are locally present to form a convenient basis for subdivision. Increase exposure of the Ross Formation, however, it is mapped with the Camden and Harriman. Combined thickness of Camden, Harriman, and Ross about 100 feet.
- Camden and Harriman Formations**
These formations consist of siliceous limestones which have been largely replaced by chert. Limestone is gray to light olive-gray, micrograined to fine-grained, thin to medium-bedded, siliceous and glauconitic. Chert is light-gray to white with light-gray, yellowish to grayish-brown, and yellowish-gray specks and mottlings (surfaces stained pale to pink yellowish-orange and yellowish-brown), bedded and blocky (beds 2 to 6 inches thick), dense and siliceous, conchoidal fracture, with white to light-gray tripolitic clay.
- Combined thickness of both formations 50 to 95 feet.**
- Ross Formation**
Birdsong Shale Member at top is calcareous shale with thin beds of argillaceous limestone, fine to coarse-grained, very thin to thin-bedded; both lithologies light olive and greenish-gray, glauconitic, fossiliferous. Thickness 15 to 40 feet.
- Rockhouse Limestone Member** at base is limestone, light olive and greenish-gray to light brownish-gray with pink to reddish-brown grains, fine to coarse-grained and coarsely crystalline, medium-bedded, glauconitic, fossiliferous, with thin shale partings. Thickness 10 to 20 feet.
- Thickness of formation about 45 feet.**
- Decatur Limestone**
Limestone, gray to light olive-gray, pale-olive, and yellowish to greenish-gray with varied concentrations of reddish-brown and reddish-orange grains, fine to coarse-grained (coarser grains prominent), medium to thick-bedded. Shale, pale-olive, moderate to thick-bedded, medium-bedded, glauconitic, fossiliferous, with thin shale partings. Thickness about 70 feet.
- Brownspout Formation**
Lobelyville Member is argillaceous limestone, fine to coarse-grained, very thin to medium-bedded, and calcareous shale, both lithologies light olive-gray to yellowish-gray and dusky-yellow with scattered streaks and mottlings of grayish red-purple, fossiliferous. Thickness 15 to 46 feet.
- Bob Limestone Member** is light olive-gray to light yellowish-gray, medium to coarse-grained, medium to thick-bedded, with thin partings of light olive-gray argillaceous limestone and shale. Thickness 10 to 20 feet.
- Beech River Member** is argillaceous limestone, fine to medium grained, thin to medium-bedded, and calcareous shale, both lithologies light olive-gray to yellowish-gray and dusky-yellow with scattered streaks and mottlings of grayish red-purple, fossiliferous. Basal 10 feet consists of light olive-gray and greenish-gray to grayish red-purple, fine to medium-grained, medium-bedded limestone. Thickness of member 14 to 35 feet.
- Thickness of formation about 55 to 75 feet.**
- Dixon Formation**
Limestone, argillaceous, grayish-red to dark reddish-brown and grayish-olive to greenish-gray, fine to medium-grained, thin to medium-bedded, with shale and mudstone; shale zone at top about 3 feet thick, upper part light-gray, lower part dark reddish-brown. Formation grades into underlying Lego Limestone. Thickness 0 to 50 feet.
- Lego Limestone and Waldron Shale**
Lego Limestone is pale to moderate reddish-brown with a few olive-gray and greenish-gray beds, fine-grained with medium to coarse calcitic crystals, medium-bedded, evenly bedded. Shale interbeds near top. Thickness 10 to 40 feet.
- Waldron Shale** is calcareous shale with thin beds of limestone, light olive-gray and greenish-gray, fossiliferous. Thickness probably 2 to 3 feet.
- Laurel Limestone**
Limestone, light olive-gray to brownish and yellowish-gray, dusky-yellow and reddish-brown, fine-grained with medium to coarse calcitic crystals, medium-bedded, evenly bedded, with some dark yellowish-orange argillaceous partings. Thickness 20 to 40 feet.
- Osgood Formation**
Calcareous shale with thin beds of argillaceous limestone, grayish-red and light to dark reddish-brown, light olive-gray and yellowish-gray. Thickness 20 to 43 feet.
- Brassfield Limestone**
Limestone, light-gray to light olive-gray and pale-olive to dusky-yellow, fine to coarse-grained, thin to medium-bedded, some beds coarsely crystalline (especially the basal few feet), with lenses of dense chert, thin partings of greenish-gray shale common. Thickness 17 to 21 feet.
- Fernvale Limestone**
Limestone, grayish-yellow and yellowish-orange with pale-orange and pale reddish-orange grains, fine to medium-grained, some beds coarsely crystalline, thin to medium-bedded, irregularly bedded. Thickness 25 to 44 feet.
- Hermitage Formation**
Shale and limestone, sandy and silty, light to dark-gray (weathers to pale to dark yellowish-brown siltstone and sandstone); limestone is very fine to medium-grained, thin-bedded to laminated. Residuum includes large siliceous masses and fine-grained siliceous material. Thickness 200 to 300 feet.
- Stones River Group**
In the Central Basin of Tennessee the Stones River Group is subdivided largely on the basis of alternating sequences of thin-bedded and medium- to thick-bedded limestone into the Carter, Lennon, Ridley, Pierce, and Murfreesboro Limestones. In the West Creek Basin the Stones River Group exhibits the same alternation of lithologies, but the number and sequence of units are not the same and the individual formations cannot be recognized at many exposures.
- Medium- to thick-bedded limestone is pale to dark yellowish-brown and yellowish to brownish-gray (weathers light to medium-gray), cryptograin (weathers light to medium-gray), thin-bedded limestone is light- to medium-gray, pale to dark yellowish-brown and brownish-gray, cryptograin to coarse-grained, contains thin shale partings (in subsurface) that are not everywhere apparent in weathered surface exposures.
- Thickness of Group about 1,000 feet.**
- Knox Dolomite**
Dolomite, yellowish and brownish-gray to light olive-gray, gray and dusky-yellow, thin to very thick-bedded, micrograined to coarse-grained, with a few partings of grayish-green shale interbedded with limestone, pale-orange to brownish and yellowish-gray and yellowish-brown, fine-grained. Formation intensely brecciated. Exposed thickness at least 600 and possibly 2,000 feet.
- Legend:**
Contact, dashed where approximate
Fault, dashed where approximate, dotted where concealed; U upthrown side, D downthrown side
Fault, arrow indicates relative movement (shown in cross sections only)
Strike and dip of beds
Normal
Overturned
Vertical
Horizontal

GEOLOGIC MAP OF WELLS CREEK BASIN

By
Herbert A. Tiedemann, Charles W. Wilson, Jr., and Richard G. Stearns
1968