

Series	Formation	Member or unit	Miners' terms	Columnar section	Description**	Thickness in feet			
UPPER ORDOVICIAN	Maquoketa Shale	Brainard	Shale or slate		Clay shale, dolomitic, yellowish-green to grayish-green and pale blue, soft; plastic if wet; nonfossiliferous.	34+			
					Shale, olive-gray to olive-black, silty; interbedded dusky yellowish-brown to dark-yellowish-brown fine- to coarse-grained crystalline and granular argillaceous fossiliferous limy dolomite and dolomitic limestone.	10-20			
					Shale, brownish-black to dusky yellowish-brown, silty; containing black specks and fossil markings; interbedded limy dolomite and dolomitic limestone as above; locally interbedded yellowish-brown dolomitic siltstone; phosphatic pellets and small fossils common to abundant in lower 4 ft.	25-40			
	MIDDLE ORDOVICIAN	Dolomite	Stewartville	Noncherty unit		DEPAUPERATE ZONE			
						Dolomite, yellowish-gray to moderate-yellowish-orange, fine- to medium-grained, crystalline and granular, fossiliferous; interbedded dusky yellowish-brown to pale-yellowish-brown fossiliferous dolomitic shale; <i>Lingula iowensis</i> common.	35-40		
						CAPROCK UNIT FIRST OPENING*			
						Dolomite, yellowish-gray to pale-yellowish-brown, fine-grained, crystalline, dense, fossiliferous, vuggy; locally containing yellowish-orange limy porous places.	27-36		
						SECOND OPENINGS* Dolomite as above; locally limy; <i>Receptaculites oweni</i> common. UPPER RECEPTACULITES ZONE	16-19		
			Galena	Prosser	Cherty unit	Drab		Dolomite, pale-yellowish-brown and grayish-orange, fine-grained, crystalline, dense, fossiliferous; moderate-yellowish-brown limy dolomite where porous; locally dolomitic limestone; THIRD OPENING* gastropods common in upper 10 ft.; few silicified fossils in lower 10 ft.	27-38
								UPPER FLINT OPENING* Dolomite, pale yellowish-brown to light olive-gray, fine-grained, dense, crystalline, vuggy; locally pale yellowish-brown to light olive-gray, fine- to coarse-grained, crystalline, fossiliferous limestone; light gray to light brownish-gray chert common to abundant in discreet nodules and parallel to bedding. <i>Receptaculites oweni</i> common in lower 8 ft. LOWER FLINT OPENINGS* MIDDLE RECEPTACULITES ZONE	38-40
Dolomite, light-olive-gray to pale-yellowish-brown, dense, fine-grained, crystalline, siliceous; chert as above.								7	
Dolomite, pale-yellowish-brown to light-olive-gray, fine-grained, dense, crystalline, vuggy; locally pale-yellowish-brown to light-olive-gray fine- to coarse-grained crystalline fossiliferous limestone; sparse light-gray to pale-yellowish-brown chert.								20-24	
Dolomite, yellowish-gray and pale yellowish-brown and local yellowish-orange, fine-grained, crystalline, fossiliferous; locally limestone as above; rare chert nodules near top and bottom; <i>Receptaculites</i> common.								15-20	
MIDDLE ORDOVICIAN	Dolomite	Cherty unit	Drab		LOWER RECEPTACULITES OPENING* Dolomite as above; locally limestone as above; light-gray and light-brownish-gray chert abundant; <i>Receptaculites</i> common in upper 5 ft.	16-19			
					Dolomite, pale-yellowish-brown, medium- to fine-grained, crystalline, vuggy, fossiliferous; locally mottled grayish-brown limestone.	8-10			
					Dolomite, pale-yellowish-brown to moderate-yellowish-brown, medium- to fine-grained, crystalline, vuggy, fossiliferous; locally limestone; pale-blue-green and greenish-yellow shale.	7-11			
					Dolomite and (or) limestone, medium-dark-gray to light-olive-gray, medium- to coarse-grained, fossiliferous; pale-blue-green and grayish-green shale abundant.	20-23			
					Limestone, dark-yellowish-brown to pale-yellowish-brown, sublithographic to medium-grained, crystalline, argillaceous, fossiliferous; locally dolomitic and dolomite; dusky brown to grayish-brown, limy shale; chert nodules 4-6 ft. below top.	15-18			
					Shale, dark-greenish-gray to olive-gray; greenish-gray, fine-grained limestone; bentonite layer near base; phosphatic near top.	7-10			
					Limestone, moderate-yellowish-brown and dark-yellowish-brown, sublithographic to medium-grained; brownish-black limy shale at base and top; locally dolomitic.	0.1-1.5			
					Limestone, light-olive-gray to olive-gray and commonly pale-yellowish-brown at the top, sublithographic to medium-grained, granular, argillaceous, fossiliferous; locally dolomitic in the upper beds; light olive-gray shale common.	28-32			
					Dolomite, light-olive-gray to medium-gray and commonly pale-yellowish-brown in upper beds, fine-grained, granular, argillaceous, fossiliferous; locally limy in upper beds; phosphatic nodules and quartz sand near base.	20-26			
					Shale, greenish-gray and grayish-green, sandy; contains FeS <sub>2</sub> and fine- to coarse-grained rounded to subrounded quartz sand.	2-4			
UPPER ORDOVICIAN	Maquoketa Shale	Brainard	Shale or slate		Sandstone, quartz, yellowish-gray, coarse- to fine-grained, rounded to subrounded, friable; locally having silica cement; argillaceous and fine- to coarse-grained at the top; commonly stained pale yellowish-orange to moderate brown by hydrous oxides of iron.	45-85+			
						94+			
						224-235			
						109-117			
						115-120			
						35-60			
						34+			

\* Openings are joints enlarged by solution. They commonly occupy the same stratigraphic positions through the zinc-lead district of Wisconsin, Illinois and Iowa. Lead ore was mined in many of the openings.

\*\* Descriptions are for wet fresh surfaces. Colors are from the "Rock color chart." (Goddard and others, 1948)

COLUMNAR SECTION OF ROCKS OF ORDOVICIAN AGE IN THE DUBUQUE NORTH QUADRANGLE, IOWA-WISCONSIN-ILLINOIS