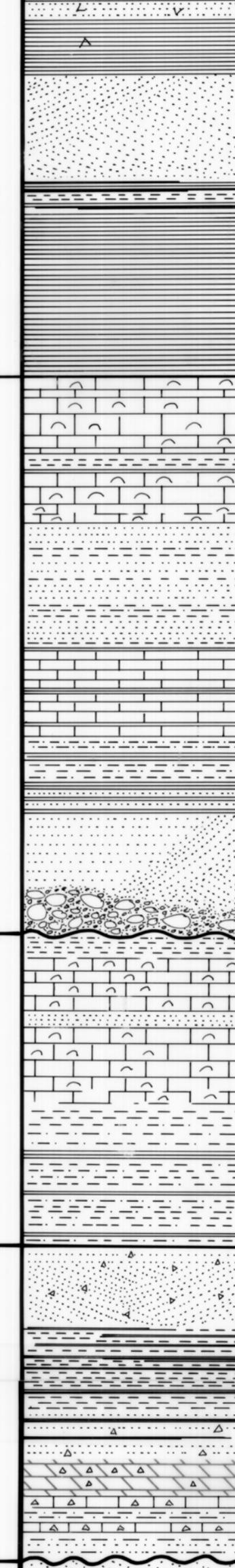
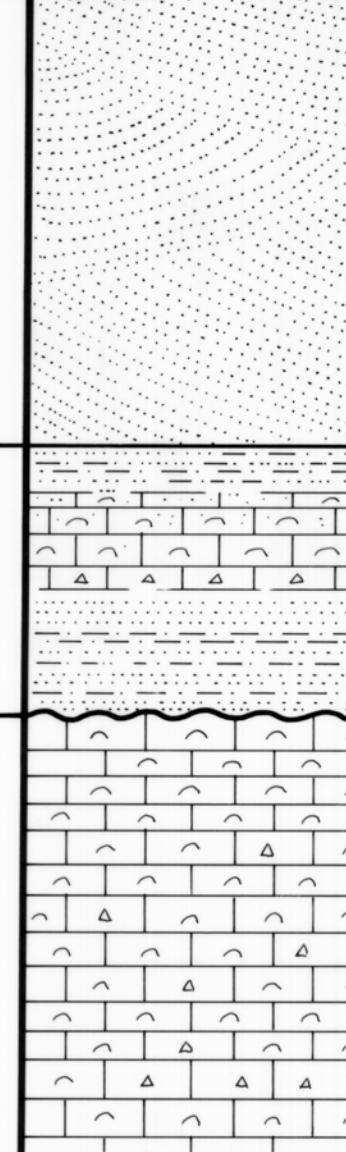
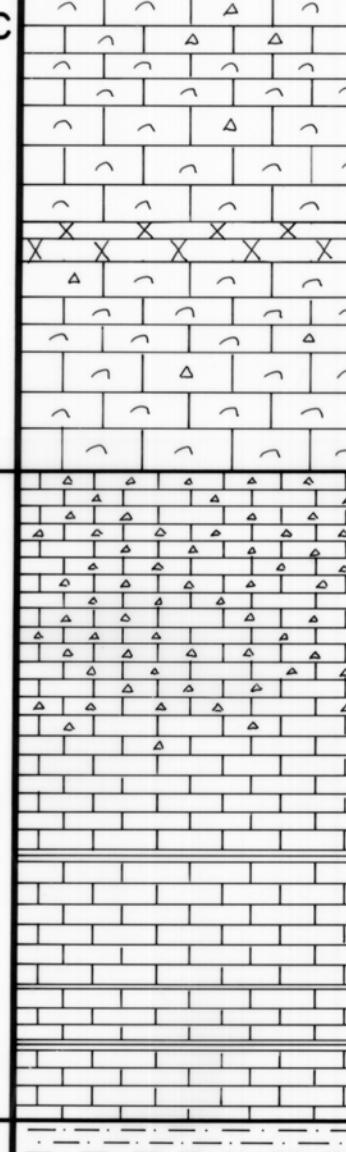
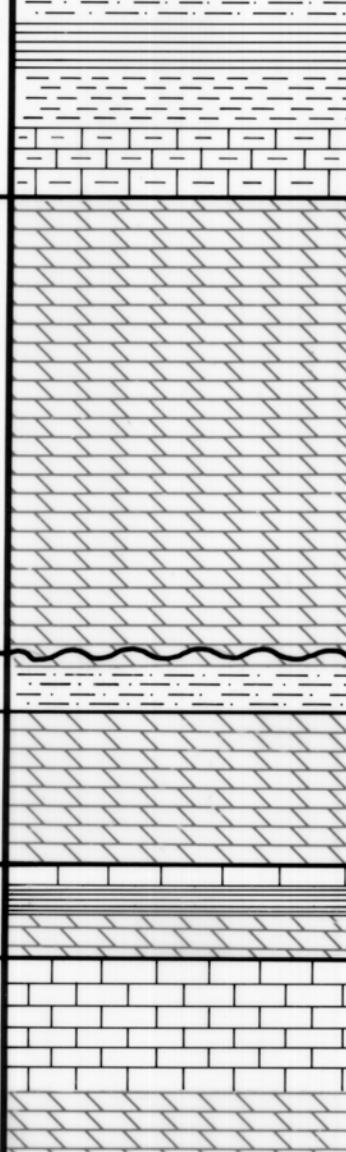
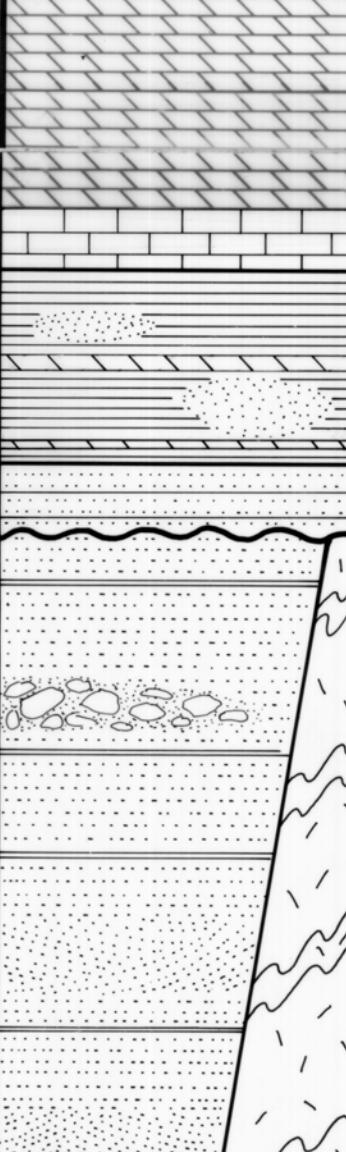
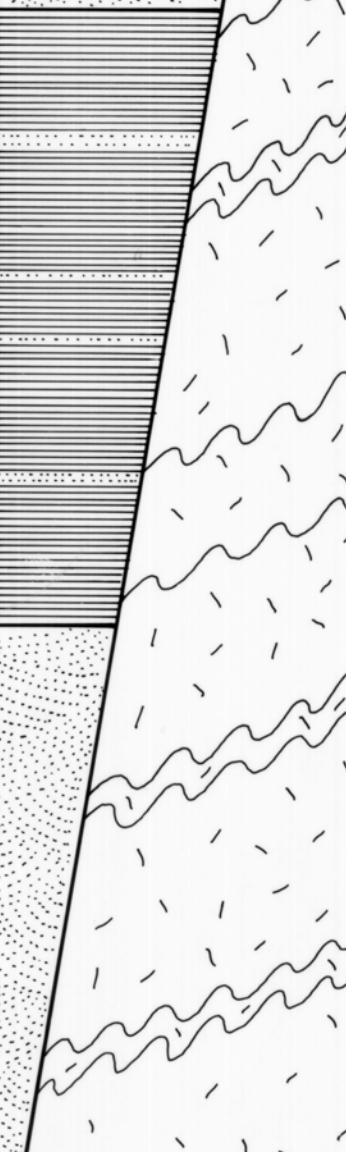
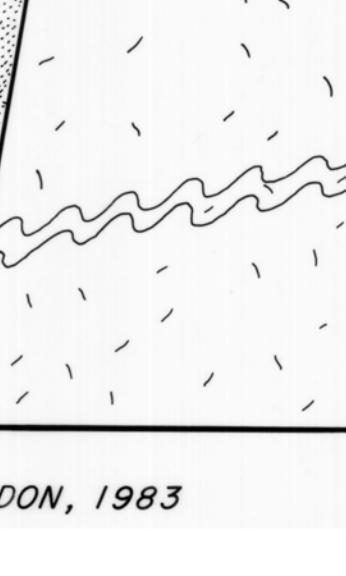


## STRATIGRAPHIC COLUMN OF THE ARGENTA-MELROSE AREA

ERA	PERIOD	SYMBOL	LITHOLOGY	THICKNESS (feet)	UNIT	DESCRIPTION
Cenozoic	Tertiary	Qal			Quaternary alluvium	Transported gravel, sand, and silt along present-day stream courses.
		Qf			Quaternary alluvial fans	
		Qvf			Quaternary valley fill	Sandy soil and gravel. Forms broad, graded surfaces locally cut by recent stream channels.
		Qt			Quaternary talus	Rock slides and talus accumulations beneath steep rock faces.
		Qm			Quaternary moraine	Glacial moraine often representing more than one period of glaciation.
		QTc			Quaternary-Tertiary cover-undivided	Slope wash, soil, weathered talus, residual fragments and reworked Tertiary sediments.
		TcgI			Tertiary conglomerate	Bedded tertiary gravels well-cemented with sandy calcite.
		Tg			Tertiary gravels	Alluvial and sediment gravels of rounded cobbles and pebbles of Bell and Paleozoic quartzites and minor Paleozoic limestones with tuffaceous sandstones, siltstones, and conglomerate includes equivalents of Paleogene Bonanza formation and Neogene St. Malo Creek formation.
		Tv			Tertiary volcanic rocks	Mostly dark basalt flows (olivine common). Minor reddish scoria, pink to reddish rhyolite flows (often flow banded), white to pale buff rhyolite airfall tuff. Rare andesite agglomerate and flows.
	E. Tertiary to L. Cret.	TKi			Tertiary-Cretaceous undivided granitic intrusion	Tertiary-Cretaceous undivided granitic intrusive rocks.
Mesozoic	Lower Cretaceous to Upper Cretaceous	Ki			Cretaceous intrusion	Granitic (mostly quartz-monzonites) intrusive rocks of the Pioneer batholith and McCarthy Mountain stock.
		Kc		2000+ (Brumbaugh, 1973) 4000+ (Myers, 1952) 6000-6500 (Peters, 1971) 6100+ (Sharp, 1970) 4000-5000 (Theodosis, 1956)	Colorado Group undivided	Thick sequence of tuffaceous-rich clastics. Greenish-gray to light-yellowish-gray to grayish-white tuffaceous, subgray wacke, tuffaceous sandstone; quartz sandstone, and tuff containing local conglomerate lenses. Interbedded with grayish-green, greenish-blue, dark-gray mudstone and siltstone (in part tuffaceous). Locally contains plant fragments.
		Kc				Massive cobble conglomerate. Rounded to subrounded cobbles of chert and quartz arenite up to 7 inches in diameter. Matrix is a poorly sorted medium- to fine-grained "salt and pepper" conglomerate reaches a maximum thickness (~50 feet) along Cherry Creek. Thin to north and south and is present as localized lenses elsewhere in the area.
		Kc				Gray, grayish-green, and minor dull maroon argillites. Thin- to thick-bedded, dense, well indurated. Interbedded carbonaceous dolomite and silty shales, mudstones, thinly bedded to thin-bedded. Minor olive-gray to bluish-gray. Salt-and-pepper sandstone. Thin- to thick-bedded, fine- to medium-grained. Minor porcelanite. Tuffaceous component to many of the units.
		Kk		1,000+ (Brumbaugh, 1973) 1,350 ± (Myers, 1952) 800-900 (Peters, 1971) 1,412 (Sharp, 1970) 500-600 (Theodosis, 1956)	Kootenai formation	Pale yellowish- to greenish-gray "salt and pepper" sandstone (subfeldspathic lithic arenite). Thin- to thick-bedded, commonly cross-bedded. Interbedded with greenish-gray carbonaceous mudstones (very thin- to thin-bedded) and grayish-black, well indurated, fissile carbonaceous shale. Black calcareous shale.
		Kk				Light gray- to yellow-orange weathering dense dolomite (biomicrite, calcarenite) with thin shale interbeds. Thin- to massive-bedded.
		Trd		500± (Brumbaugh, 1973) 438 (Hobbs, 1968) 800-900 (Myers, 1952) 600-650 (Peters, 1971) 530-780 (Sharp, 1970) 275-450 (Theodosis, 1956)	Dinwoody formation	Red, maroon, and green silty-shale, mudstone, and siltstone. Very thin- to thin-bedded. Thin interbeds of quartz arenite. Several zones of grayish- to yellow-brown coarse- to medium-grained lithic sandstone (salt and pepper). Thin- to thick-bedded, cross-laminated. Interbedded with red and green mudstone.
		Pp		300+ (Brumbaugh, 1973) 400-450 (Hobbs, 1968) 285-410 (Myers, 1952) 150-200 (Peters, 1971) 360 (Sharp, 1970) 185-372 (Theodosis, 1956)	Phosphoria formation	Based chert pebble conglomerate lenses up to 12 feet thick.
		Pq		300-500 (Brumbaugh, 1973) 650 (Myers, 1952) 650 ± (Peters, 1971) 931 (Sharp, 1970) 220-450 (Theodosis, 1956)	Quadrant quartette	Map unit contains 0-100 feet of red carbonaceous siltstone and mudstone of the Jurassic Morrison (?) formation. Upper member: Gray to brown weathering fossiliferous limestone (bivalve sparite calcaranites) and carbonaceous dolomite. Thin- to thick-bedded. Abundant Lingula sp. and Mytilina sp.
Paleozoic	Middle Permian to Lower Mississippian	M-IPa		300± (Hobbs, 1968) 240-550 (Myers, 1952) 350± (Peters, 1971) 275-353 (Sharp, 1970) 219-383 (Theodosis, 1956)	Amsden formation	Lower: Dark gray to blue-gray dense fossiliferous limestone (biomicrite). Thin- to thick-bedded chert nodules and beds common. Maroon and green silty-slates with yellow-green, and maroon interbeds. Gradually sandy towards top grades into Quadrant formation. Lower: Basal red siltstone. Thin-bedded with rare internal cross-laminations. Low porosity. Grayish- to pale red siltstone. Very thin-bedded poorly exposed contact metamorphosed to hornfelses and talcites.
		Mmc		1,700± (Hobbs, 1968) 1,300± (Myers, 1952) 1,120± (Sharp, 1970) 900-1,000 (Theodosis, 1956)	Mission Canyon limestone	Light-gray to medium-gray fossiliferous limestone (biomicrite calcaranite), thick- to massively bedded, granular to coarsely granular. Minor thin-bedded dolomitic limestone. Common oolitic and pseudo-oolitic limestone consisting of crinoidal debris. Common black and brown nodular and bedded cherty zones (increase upwards). Low porosity. Recrystallizes to massive white marble.
		Mmu		900± (Hobbs, 1968) 750-950 (Myers, 1952) 850+ (Sharp, 1970)	Lodgepole limestone	Upper: Bluish-gray limestone, thin- to medium-bedded, cherty, dense cyclic repetitions of thin- to thick-bedded, dense fragmental and crinoidal limestone towards top (fossiliferous dolomite). Lower: Dark blue-gray micrite and dolomite interbedded with thin calcareous shale partings. Thin-bedded, dense, fine-grained. Rare discoidal chert nodules parallel to bedding.
		Mml		175± (Myers, 1952) 350-400 (Hobbs, 1968)	Madison formation	Upper: Black to gray-black saccular dolomite, thin- to massive-bedded, variable amounts of interbedded limestone and limy dolomite. Fettid odor, minor calcite-filled limestone breccia with moderate porosity. Lower: Dark gray, sandy saccular dolomite. Thin- to massive-bedded dolomite, very thin-bedded dolomitic limestone, 'vugular dolomite'. Discoidal chert nodules (parallel to bedding) and 'spaghetti structure' common throughout. ('spaghetti structure' is lighter-colored dolomite replacement of stromatoporoids and Amphipora).
		Dt		491+ (Wilson, 1952) 600 (Hobbs, 1968) 650-700 (Myers, 1952)	Red Lion formation	Tan, purple, and purplish-gray siltstone. Thin-bedded upper part medium gray, fine- to coarse-crystalline dolomite.
		Dj		209 (Hanson, 1952)	Pilgrim limestone	Light gray to medium-gray dolomitic limestone with light brownish-gray microcrystalline dolomitic limestone mottling. Fine- to coarse-crystalline dolomite. Increasingly sandy towards top.
		Erl		126 (Hanson, 1952)	Park shale	Light gray to medium dark gray sandy dolomite. Thin-fissile greenish-gray dolomite base and dolomitic sandstone lenses near top. Chert mottles and nodules. 'Gritty' weathering due to disseminated quartz grains. Low porosity.
		Epi		800+	Meagher limestone	Gray to black limestone and dolomitic limestone with gray dolomitic mottling. Weathered light-gray to brownish dolomite. Local wormholes, wavy laminations, crossbeds, intraformational conglomerate. Fine- to coarsely crystalline dolomite.
		Epa		(Hobbs, 1968)	Hesmark formation	Greenish- to brownish- to purplish-gray micritic shale with variable amounts of finely interbedded brownish dolomite and lenses of brown glauconitic dolomite.
		Ch		604 (Hanson, 1952)		Poorly exposed.
Precambrian	Middle Cambrian	Eme		200± (Myers, 1952)	Wolsey shale	Greenish- to brownish- to purplish-gray micritic shale with variable amounts of finely interbedded brownish dolomite and lenses of brown glauconitic dolomite.
	Middle Cambrian	Ew		271 (Hanson, 1952)	Flathead quartzite	Poorly exposed.
	Middle Cambrian	Ef		71 (Hanson, 1952)	Crystalline basement rock	Reddish-pink to light tanish-gray vitreous quartzite and siliceous sandstone. Thin- to thick-bedded. Middle part thin-bedded with purple shale partings and interbeds. Common cross-bedding and ripple marks.
	Middle Proterozoic	pEb3		4,000-5,000± (Myers, 1952)	Belt Supergroup (Upper Missoula Group equivalents?)	Pale red to light gray vitreous orthoquartzite with minor interbedded micaceous argillite and local cobble conglomerate. Thin- to very thick-bedded, asymmetrical ripple marks, thin sets of cross-lamination. Fine- to coarse-grained, moderately well sorted, subrounded, moderately well sorted.
	Middle Proterozoic	pEb2		700+ (Hobbs, 1968)	Belt Supergroup (Upper Missoula Group equivalents?)	Varicolored micaceous argillite with minor interbedded subarkose (red, green, and gray). Distinctly laminated to thin-bedded. Asymmetrical ripple marks, polygonal mudcracks, rare mudflasts.
	Middle Proterozoic	pEb1		2,000-2,500+ (Myers, 1952)	Belt Supergroup (Upper Missoula Group equivalents?)	Reddish, purplish, and pinkish feldspathic quartzite. Thick- to very thick-bedded. Ubiquitous cross-laminations, rare argillite chips, rare scour and fill structures. Medium to coarse-grained, subangular to subrounded, moderately well sorted.
	Archean	pEg		2,000+ (Hobbs, 1968)	Crystalline basement rock	Sillimanite-garnet-biotite quartzofeldspathic gneiss and schist.