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Paleozoic rocks measured southwest of Pocatello, Idaho

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All Paleozoic systems are represented in the nearly 20,000 feet of rock measured in the Deep Creek Mountains and Bannock Range southwest of Pocatello, Idaho, as part of the geologic mapping of the Rockland and Arbon quadrangles, Idaho (fig. 1). Because the data fill a void in regional stratigraphic knowledge, a preliminary description of these rocks seems warranted. The upper half of the measured section has been discussed briefly in an earlier paper (Carr and Trimble, 1961), in which the name Deep Creek Formation was introduced. The Mississippian and younger rocks, including the Lodgepole Limestone, Deep Creek Formation, Great Blue Limestone, Manning Canyon Shale, and Oquirrh Formation, will not be discussed further here.

Pre-Mississippian rocks constitute a sequence of formations that has been recognized widely in southeastern Idaho and northeastern Utah. The rocks of Cambrian age, except for the Brigham Quartzite, are not designated by formational names, although they resemble, in composition and faunal content, the well known Cambrian section of northern Utah and southeastern Idaho originally described by Walcott (1908). Direct correlation with that section may be possible later. Cambrian rocks are overlain by the Garden City Limestone, the Swan Peak Quartzite, and the Fish Haven Dolomite of Ordovician age, the Laketown Dolomite of Silurian age, and the Jefferson Dolomite of Devonian age.

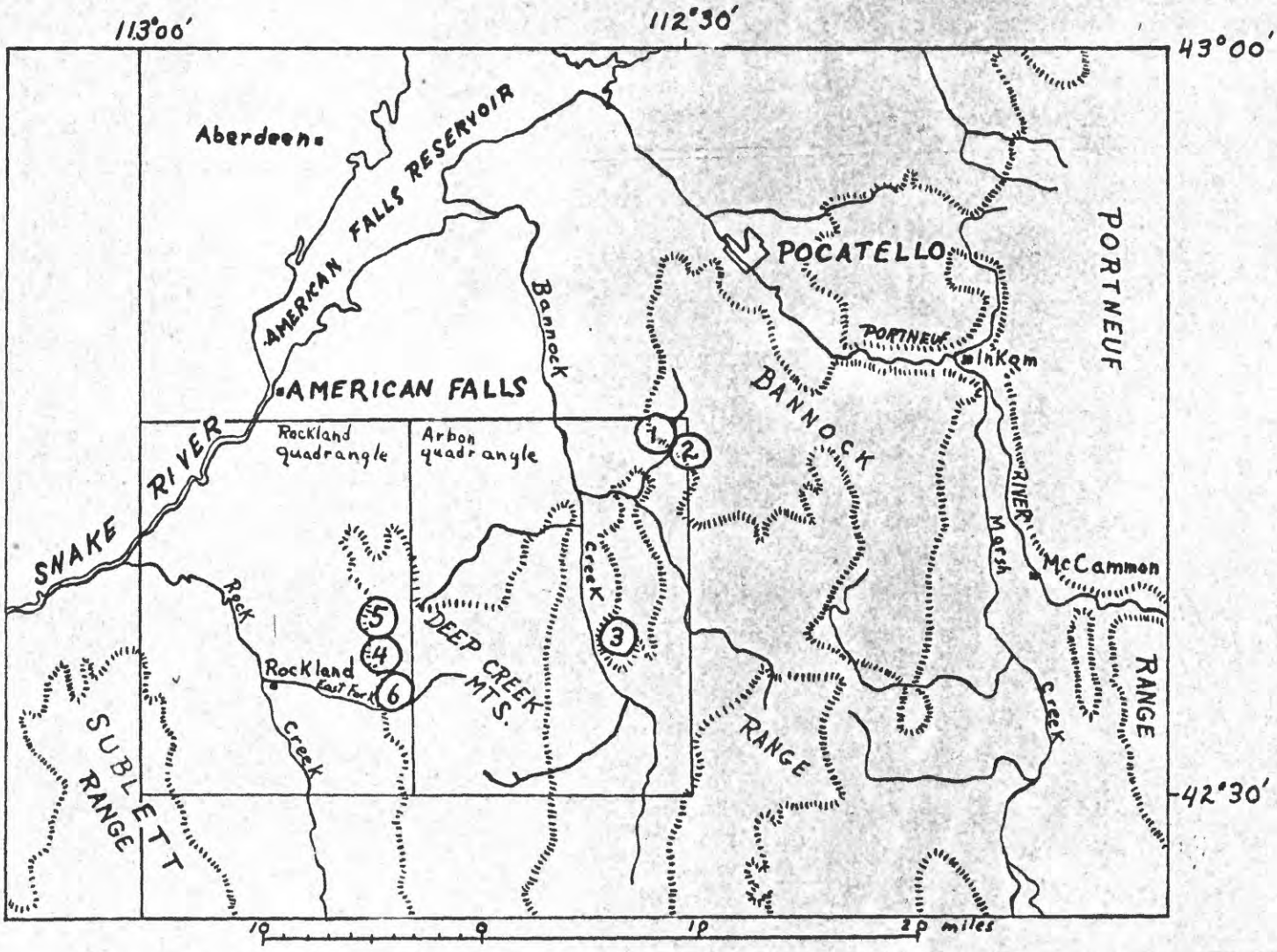

Fig. 1. — Location of measured sections of Paleozoic rocks in the Rockland and Arbon quadrangles, Idaho.

The measured section shown graphically in figure 2 is a composite of 6 sections measured at different places in the two quadrangles (fig. 1). Condensed descriptions of the rocks of these sections are given below. Most of the measured sections described here are considered representative of the unit, except that there may be considerable variation in the character of the unit in different parts of the area. Not included because the sections were incomplete, or because they were not measured, are total sections of the Brigham Quartzite, units C, G, and H of the Cambrian rocks, the Garden City Limestone, and the Swan Peak Quartzite. Estimates of the thicknesses of these rocks are included, however.

References cited

Carr, W. J., and Trimble, D. E., 1961, Upper Paleozoic rocks in the Deep Creek Mountains, Idaho, in Short papers in the geologic and hydrologic sciences: U.S. Geol. Survey Prof. Paper 424-C, p. C181-C184.

Walcott, C. D., 1908, Nomenclature of some Cambrian Cordilleran formations: Smithsonian Misc. Coll., v. 53, no. 1, p. 1-12.

Measured section no. 6: Begins above fault breccia at southwest tip of ridge above road into Buck Canyon, in NW 1/4 NW 1/4 sec. 1, T. 10 S., R. 31 E., and ends at top of hill, altitude about 7,750 ft, in NW 1/4 SE 1/4 sec. 31, T. 9 S., R. 32 E Rockland quadrangle, Idaho

	Thickness (feet)
Top of measured section	
Oquirrh Formation (unit D)	
Limestone, gray, sandy; weathers tan. Contains fusulinids and gastropods	21
Chert, tan to gray, bedded in layers 2 to 8 in. thick	40
Limestone, gray to tan, silty and sandy to very sandy; weathers tan; interlayered locally with bedded chert and a few sandstone layers. Some bioclastic limestone. Fusulinids abundant at many horizons	838
Limestone, gray to tan-gray, weathering tan to brown, with many gray cherty layers and nodules; bioclastic limestone at base	104
Chert, tan to gray, bedded in layers 1 to 6 in. thick with interbeds of tan sandy limestone becoming increasingly abundant near top	85
Total unit D measured	1,088
Oquirrh Formation (unit C)	
Limestone, gray to dark-gray, silty, rough weathering; upper part almost a coquina of brachiopods and fossil hash	4
Limestone, gray to light-gray or tan, mostly tan weathering; some slabby and platy; fusulinids in lower part	337

quirrh Formation (unit C)--Continued	Thickness (feet)
Limestone, cherty, slabby; tan to brown chert layers 1 to 5 in. thick, increase in abundance upwards----------	23
Limestone, gray to light-gray or tan, mostly sandy, weathers to light gray to tan; contains a few beds of coarse bioclastic limestone and locally minor chert; fusulinids, brachiopods, and bryozoa in lower part----------	556
Conglomerate, chert and limestone granules in gray sandy limestone matrix, underlain by tan calcareous sandstone that forms ledge----------	9
Limestone, gray to dark bluish-gray, mostly silty and sandy, weathers tan in upper part and mostly gray in the lower part; bioclastic layers in lower part; fusulinids, brachiopods and corals in lower part----------	723
Conglomerate, chert granule to pebble, in limestone matrix; weathers drab gray----------	10
Limestone, dark blue-gray, weathering blue-gray; a layer of tan to pinkish platy sandy limestone in lower part--------	41
Limestone, gray, mostly silty and sandy, weathers tan to gray. Zone of slender tapering horn corals near base----------	135
Limestone, dark blue-gray to nearly black; lower third thin bedded, upper part massive; weathers light gray to sooty black; tan irregular chert balls at top----------	73
Total unit C measured----------	1,911

Oquirrh Formation (unit B)	Thickness (feet)
Limestone, gray to light gray, sandy to very sandy, weathering tan to gray; some nodules of gray, brown, and tan chert; fusulinids near top; large (Caninia?) corals near base and about 230 feet above base----------	799
Total unit B measured----------	799
Oquirrh Formation (unit A)	
Limestone, light gray to gray or blue-gray, upper part silty and sandy; much bioclastic limestone; some chert----	238

Base of section--fault breccia at southwest toe of ridge north of Buck Canyon.

Measured section no. 5: Begins in saddle north of Water Canyon in NW 1/4 NE 1/4 sec. 26, T. 9 S., R. 31 E. and continues in secs. 23 and 24 to crest of divide, thence northward along divide in NW 1/4 SE 1/4 sec. 24, except for upper part of Manning Canyon Shale, which was measured north of Well Canyon beginning in saddle near center of sec. 23, T. 9 S., R. 31 E., Rockland quadrangle, Idaho.

	Thickness (feet)
Oquirrh Formation (unit B)	
Limestone, gray to tan-gray, silty to sandy; tan weathering; tan and gray chert nodules in lower part; abundant large (*Caninia*?) corals in lower 20 feet	
Oquirrh Formation (unit A)	
Limestone, light-gray to gray, silty in upper part, some silty and sandy patches and partings; local nodules and stringers of tan and gray chert, especially in upper part; weathers tan to gray----------	151
Limestone, mostly gray, fine- to coarse-grained; some bioclastic layers; weathers light gray to tan; some chert nodules and stringers; corals and bryozoa in lower part---	309
Quartzite, light-gray, weathering tan; limy, fine-grained; and limestone, sandy; streaked, weathering tan and gray---	30
Limestone, light-gray to gray; silty in upper part, sandy in lower part; weathers light gray to tan; locally abundant tan chert in nodules, lenses, and bands and stringers 0.5 to 3 in. thick----------	579

Oquirrh Formation (unit A)--Continued	Thickness (feet)
Limestone, gray, coarse-grained, and light tan massive quartzite. Lower quartzite 10 to 20 feet thick----------	40
Total unit A measured----------	1,109
Total Oquirrh Formation measured----------	4,907
Manning Canyon Shale (upper shale member)	
Quartzite and sandstone, tan, and dark shale and shaly argillite with a few interbeds of silty gray and bioclastic limestone in upper part----------	157
Limestone, gray to dark gray, silty, weathering tan to purplish; with some tan quartzite and sandstone----------	112
Sandstone, varicolored, calcareous to noncalcareous, interbedded with tan silty limestone, dark gray shale, tan to purplish siltstone, and minor bioclastic and conglomeratic limestone----------	300
Siltstone, tan to pinkish, calcareous, and gray to tan silty limestone. Brachiopods common----------	63
Limestone, brownish-gray, with much fossil debris, and shaly argillite; some reddish fine-grained sandstone and tan to pinkish siltstone in upper part----------	89
Shale and shaly argillite, black, interbedded in upper part with brown argillaceous limestone and in central part with gray-green to brown quartzitic siltstone. A layer of oolitic phosphate rock, 6 to 18 in. thick, about 100 feet above base----------	340

Manning Canyon Shale (upper shale member)--Continued	Thickness (feet)
Quartzite, tan to olive-brown, with some ferruginous sandstone, and in the lower part some interbedded shale and rusty sandy argillite----------	31
Shale, black, with interbedded argillite, olive-gray siltstone, and in the lower part some limestone and a few thin beds of tan quartzite and brown sandstone----------	71
Total upper shale member measured----------	1,163
(Middle limestone member)	
Limestone, gray, weathering light gray; medium- to coarse-grained; a few scattered black chert nodules-------	68
Note: A fault here cuts out an unknown but probably not large amount of section.	
Limestone, gray and dark gray to black, fine-grained, weathering light gray, interbedded silty limestone and coarse- to medium-grained limestone with much fossiliferous debris. Much black chert and black dolomite that resembles chert----------	385
Limestone, light gray to tan, silty, with dark-gray cherty layers becoming more abundant upward----------	384
Total middle limestone member measured-------	837
(Lower shale member)	
Shale, black to gray, brownish, or greenish, with interbeds of brown sandy and argillaceous limestone in upper and middle part, and brown quartzite in the lower part. Abundant concretions of dense black limestone in lower part----------	429
Total lower shale member measured----------	429
Total Manning Canyon Shale measured----------	2,429
Great Blue Limestone--base of section.	

Measured section no. 4: Begins about 100 feet northwest of benchmark 5422 in N. 1/2 sec. 35, T. 9 S., R. 31 E., north side of Hunter Canyon, Rockland quadrangle, Idaho.

Top of section in saddle 1,000 feet southwest of peak 7018	Thickness (feet)
Manning Canyon Shale	
Shale, and chert, black	
Great Blue Limestone	
Limestone, blue-gray to light gray or tan, fine- to coarse-grained, chert as layers, stringers, and nodules; many large horn corals in upper part	500
Shale, dark gray with interbeds of gray to blue-gray/limestone, thin-bedded medium- to coarse-grained	192
Limestone, gray to dark-gray and blue-gray, fine- to coarse-grained, chert lenses nodules and stringers mostly in lower two-thirds, Gigantoproductid zone about two-thirds above the base	183
Shale or siltstone, purplish gray, cherty	10
Limestone, dark blue-gray to gray, dark chert nodules and bands, many large horn corals	308
Total Great Blue Limestone measured	1,193
Deep Creek Formation (upper member)	
Limestone, dark gray, weathering blue gray, fine-grained, interbedded with blue-gray medium- to coarse-grained limestone	93
Limestone, gray to dark gray and blue gray; some silty and fine sandy partings; many black chert bands and layers especially in lower two-thirds	447

Deep Creek Formation (upper member)--Continued	Thickness (feet)
Limestone, gray to pinkish gray and greenish, thin-bedded, platy; a little black chert----------	442
Limestone, gray to dark gray and blue gray, silty in lower part, some black chert in nodules and in bands as much as 1.5 feet thick----------	521
Total upper member measured----------	1,503
Deep Creek Formation (lower member)	
Limestone, silty, and limestone, gray to dark gray, with a few interbeds of siltstone; a few irregular bands of black chert----------	49
Siltstone, limy, and limestone, silty, light gray to tan, weathering light brown to orange; thin-bedded; a few nodules and bands of black chert----------	384
Limestone, silty, gray to black; a few purplish beds--------	130
Shale and siltstone, light grayish brown, orange stain on some bedding planes; a few thin chert layers----------	199
Total lower member measured----------	762
Total Deep Creek Formation measured----------	2,265
Lodgepole Limestone	
Limestone, gray to black, weathering gray to light brownish-gray; fine-grained; beds 2 in. to 1 ft thick; some well-preserved corals and brachiopods----------	178
Dolomite, light bluish-gray, fine sandy textured; a few bands and nodules of black chert in upper part; some fossil debris and small corals----------	190
Total Lodgepole Limestone measured----------	368

Measured section no. 3: About 2 miles north of Pauline, Idaho in N 1/2 SE 1/4 sec. 35, T. 9 S., R. 33 E., and 6 miles north of Pauline, in SE 1/4 sec. 11, SW 1/4 sec. 12, T. 9 S., R. 33 E., Arbon quadrangle, Idaho.

Top of section about 400 feet southwest of hill 5951.

	Thickness (feet)
Lodgepole Limestone	
Limestone, dark blue-gray	
Jefferson Dolomite	
Dolomite, light bluish-gray to gray, some finely laminated; a few thin beds of tan quartzite and dolomitic sandstone--	344
Quartzite, light tan, fine-grained, with some dolomitic sandstone----------	14
Dolomite, dark gray to black, with a few beds of gray to light gray; fine- to medium-grained, some beds laminated. Amphipora in basal beds----------	542
Total Jefferson Dolomite measured----------	900
Laketown Dolomite	
Dolomite, light gray to dark gray, weathering light gray to gray, local mottling----------	410
Dolomite, light gray to light tan, weathering light gray, fine- to medium-grained----------	726
Total Laketown Dolomite measured----------	1,136
Fish Haven Dolomite	
Dolomite, mostly gray to dark gray, fine- to medium-grained, mottled weathering----------	507

Fish Haven Dolomite--Continued	Thickness (feet)
Dolomite, dark-gray to gray, fine- to medium-grained; chert nodules and stringers mainly in the lower part; small white horn corals and other fossil forms stand out in strong contrast to dark dolomite----------	353
Sandstone, tan to light-gray, very dolomitic----------	19
Total Fish Haven Dolomite measured----------	879

Swan Peak Quartzite

Quartzite, white, medium-grained, well sorted

Measured section no. 2: Begins at toe of spur on boundary between secs. 8 and 17, T. 8 S., R. 34 E., on Midnight Creek, Arbon quadrangle, Idaho.

Partial section of Cambrian rocks

Top of section on divide about 1/4 mile east of quadrangle boundary.

	Thickness (feet)
Unit G. Note: At least several hundred feet more of quartzite are present, which could not be measured here.	
Quartzite, tan, fine- to medium-grained, with a few interbeds of tan dolomitic sandstone in lower part----------	238
Dolomite, gray to very light tan, weathering cream, sugary and sandy, in ledges 1 to 3 feet thick----------	133
Sandstone, tan to pinkish, some beds dolomitic, fine- to coarse-grained, very slabby, some crossbedding----------	123
Dolomite, gray to dark gray, weathering tan to gray; lower part silty and sandy----------	112
Sandstone, tan and red, slightly calcareous, fine- to medium-grained, grading up into tan quartzite----------	164
Total measured unit G----------	770
Unit F Note: About 100 feet of limestone cut out by fault.	
Dolomite, pinkish to light-gray and grayish-tan, fine- to coarse-grained, with some blue-gray limestone and thin brown chert seams----------	132
Limestone, pale pink or grayish-pink to gray to light gray, fine-grained, some oolitic----------	92
Note: Fault about here cuts out about 100 feet of thin-bedded sandy limestone.	

Unit F--Continued	Thickness (feet)
Sandstone, tan, brown, and reddish, slightly calcareous, fine-grained, slabby	82
Limestone, blue-gray to gray with silty partings, some intraformational conglomerate in lower half, some finely oolitic; grades upward into sandy dolomite	135
Total unit F measured	441
Unit E	
Limestone, varicolored pastel, with some intraformational conglomerate and interbedded micaceous siltstone and tannish-green shale; gray limestone in lower part	149
Shale, tan-green, and thin-bedded tan fine-grained calcareous sandstone and siltstone and varicolored pastel limestone	35
Limestone, gray to blue-gray with much intraformational conglomerate, interbedded with greenish-gray fine-grained limestone and tan to greenish calcareous fine-grained sandstone, siltstone, and shale	225
Shale, tannish-green, interbedded with gray oolitic limestone with some intraformational conglomerate and some greenish nodular limestone	154
Limestone, blue-gray, thin-bedded, oolitic, with tan and reddish silty partings	133
Argillite and siltstone, drab green, with a few beds of gray limestone in upper part	47

Unit E--Continued	Thickness (feet)
Limestone, gray, oolitic, with gray-green limestone, locally nodular, interbedded with greenish-tan siltstone and shaly siltstone	127
Shale, olive-drab, and some gray and greenish-gray limestone, some oolitic, with a little intraformational conglomerate	91
Quartzite, brown to reddish, fine- to medium-grained, slabby, with a few gray limestone interbeds in upper part	155
Shale, drab green, with some interbedded red-brown quartzite and sandstone	57
Limestone, blue-gray, platy with yellowish silty partings and laminae. A few interbeds of oolitic limestone in upper part	112
Claystone and shaly argillite, olive drab, with some gray oolitic limestone, tan fine-grained sandstone, and green limestone nodules	198
Limestone, gray, oolitic, with a few algal nodules about 0.5 in. in diameter	52
Siltstone, greenish-tan, micaceous, with some gray oolitic limestone and dense greenish nodular limestone	85
Limestone, blue-gray, oolitic, interbedded with some platy limestone and some intraformational conglomerate	34
Siltstone and claystone, greenish-tan to olive, micaceous, with some interbeds of blue-gray platy limestone	149
Total unit E measured	1,801

	Thickness (feet)
Unit D	
Limestone, gray to blue-gray, locally oolitic, with some yellowish-tan silty partings and laminae; some intraformational conglomerate----------	734
Total unit D measured----------	734

Measured section No. 1: NW 1/4 NE 1/4 sec. 7, T. 8 S., R. 34 E., northeast corner of Arbon quadrangle, Idaho.

Partial section of Cambrian rocks

Top of section probably cut off by fault

Unit B	
Quartzite, light tan to gray and brown, fine- to medium-grained, in beds a foot or less in thickness----------	115
Unit A	
Argillite, olive drab to brown, shaly, some beds micaceous, with a few beds of reddish-brown quartzite----------	183
Siltstone, olive, gray-green, purplish, and tan, with beds of tan to brown sandstone, tan shaly argillite, and a few beds of greenish micaceous quartzite----------	153
Quartzite and sandstone, tan to brown or reddish-brown, with some beds of tan argillaceous siltstone----------	30
Total unit A measured----------	366

Brigham Quartzite

Fig. 2. – Columnar section of Paleozoic rocks

62-135