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Title of article Stratigraphy and structure of metamorphosed Upper Paleozoic rocks near Mountain City, Nevada

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APPENDIX A

FOSSILS FROM THE BANNER FORMATION

(Compiled by W.J. Sando)

USGS Loc. No. 17662-PC (Shipment No. MD-57-38): Near quarter corner secs. 2 and 11, T. 45 N., R. 53 E., Mountain City quadrangle. Identifications by W.H. Hass, and J.W. Huddle (12-6-71)(conodonts) and Helen Duncan (7-1-60), revised by W.J. Sando (corals) and B.R. Wardlaw (conodonts)(4-4-84).

CAVUSGNATHUS ALTUS Harris and Hollingsworth

GENICULATUS sp.

GNATHODUS COMMUTATUS Branson and Mehl

CANADIPHYLLUM sp.

EKVASOPHYLLUM? sp.

AGE: Coral Zone IIIC, IIID, or IV of Sando and Bamber (1979).

Late Mississippian (middle or late Meramecian). Conodonts are middle Meramecian to Chesterian. Composite dating indicates middle Meramecian (= Mamet Zone 14).

USGS Loc. N. 19526-PC (Shipment No. MD-59-25): Coordinates N 2,573,700', E 383, 300', Owyhee quadrangle. Identifications by Helen Duncan (8-1-60), revised by W.J. Sando (4-4-84).

CANADIPHYLLUM sp.

AGE: Probably Late Mississippian (Meramecian).

USGS Loc. No. 19527-PC (Shipment No. MD-59-25): Station 138 of Coats, Owyhee quadrangle. Identifications by Helen Duncan (8-1-60), revised by W.J. Sando (4-4-84).

SIPHONODENDRON of S. WHITNEYI of Meek

CANADIPHYLLUM sp.

AGE: Coral Zone IIID or IV of Sando and Bamber (1979). Late Mississippian (middle or late Meramecian).

USGS Loc. No. 19528-PC (Shipment No. MD-59-25): 200 ft south of Coats Station 138, Owyhee quadrangle. Identifications by Helen Duncan (8-1-60), revised by W.J. Sando (4-4-84).

SIPHONODENDRON of S. WHITNEYI of Meek

AGE: Coral Zone IIID or IV of Sando and Bamber (1979). Late Mississippian (middle or late Meramecian).

USGS Loc. No. 21588-PC (Shipment No. SW-62-23): Coordinates N 4.04, E 0.20; SW¼ SE¼ SE ¼ sec. 8, T. 46 N., R. 55 E., Mountain City quadrangle. Identifications by W.J. Sando 4-2-71, revised 4-4-84).

MULTITHECOPORA sp.

CANADIPHYLLUM sp.

ACROCYATHUS sp. (cerioid)

SIPHONODENDRON 2 spp.

AGE: Coral Zone IIIID of Sando and Bamber (1979). Late Mississippian (middle Meramecian).

USGS Loc. No. 22813-PC (Shipment No. SW-67-2): NW¼ NE¼ sec. 9, T. 45 N., R. 53 E., Owyhee quadrangle. Identifications by Helen Duncan (8-30-67), revised by W.J. Sando (4-4-84).

CANADIPHYLLUM sp.

SIPHONODENDRON cf. S. WHITNEYI of Meek

DORLODOTIA sp.

AGE: : Coral Zone IIID of Sando and Bamber (1979). Late Mississippian (middle Meramecian).

USGS Loc. No. 28314-PC (Shipment No. WMR-82-1): Sec. 17, T. 46 N., R. 55 R., Mountain City quadrangle. Identification by W.J. Sando (2-8-82).

SIPHONODENDRON cf. S. OCULINUM Sando

AGE: Coral Zone IIIA of Sando and Bamber (1979). Late Mississippian (early Meramecian).

Coats Field N. 60NC-34 (Shipment No. SW-60-3): Coordinates 2,573,800 N., 383,800 E., Owyhee quadrangle. Identification by W.J. Sando (8-6-71, revised 4-4-84).

CANADIPHYLLUM sp.

AGE: Probably Late Mississippian (Meramecian).

APPENDIX B

a) Nelson Formation (and sill in Banner Formation)

	Flow	Sill	Sill or Flow	Flow
SiO_2	48.2	45.0	47.8	48.8
Al_2O_3	19.0	13.9	16.1	18.5
FeO*	10.3	10.5	11.0	9.39
MgO	3.84	5.18	6.36	4.76
CaO	9.56	11.5	10.6	9.07
Na_2O	4.19	4.01	2.55	4.03
K_2O	0.68	2.00	0.40	0.39
TiO_2	2.51	2.04	2.11	2.34
P_2O_5	0.38	0.53	0.45	0.48
MnO	0.15	0.14	0.19	0.17
L.O.I.	0.86	4.56	1.84	1.82
Total	99.67	99.36	99.40	99.75

b) Reservation Hill Formation

	Lower Thick Greenstone (unit MPg)			Upper Thick Greenstone (unit MPg)		Thin interlayer in MPpct unit
SiO_2	48.6	46.5	46.3	55.0	52.9	50.1
Al_2O_3	15.8	15.5	14.3	17.7	16.6	14.7
FeO*	13.1	10.7	11.6	7.80	8.08	12.6
MgO	5.68	9.63	11.0	3.62	5.75	6.07
CaO	7.31	7.54	8.13	5.84	4.65	5.92
Na_2O	3.78	1.86	2.53	5.85	4.12	4.45
K_2O	0.26	0.75	1.26	1.20	3.39	0.11
TiO_2	1.97	1.24	1.18	0.84	2.47	2.32
P_2O_5	0.49	0.14	0.13	0.38	0.39	0.34
MnO	0.17	0.17	0.22	0.14	0.11	0.23
L.O.I.	2.43	5.56	1.88	1.08	1.56	2.97
Total	99.37	99.59	98.53	99.45	99.27	99.81

b) (continued)

	Metagabbro				
	Thin Interlayers in MPpct unit		Chilled Border	Medium Grained	Chilled Border
SiO_2	49.2	49.2	46.9	50.9	50.4
Al_2O_3	15.9	16.2	12.4	15.1	18.5
FeO*	9.94	10.4	17.1	10.3	9.39
MgO	5.40	6.48	5.30	6.91	4.76
CaO	10.3	10.4	9.39	10.9	9.07
Na_2O	2.61	4.09	3.29	3.20	4.03
K_2O	1.43	0.24	0.15	0.10	0.39
TiO_2	2.47	1.22	3.87	1.29	2.34
P_2O_5	0.73	0.16	0.21	0.12	0.57
MnO	0.15	0.21	0.27	0.18	0.10
L.O.I.	0.94	1.19	1.06	0.86	1.82
Total	99.07	99.79	99.94	99.86	98.98

c) Relict Clinopyroxene in Metagabbro

SiO_2	52.27
Al_2O_3	2.60
FeO*	7.53
MgO	16.31
CaO	19.02
Na_2O	0.35
K_2O	0.02
TiO_2	0.65
P_2O_5	0.00
MnO	0.19
Total	98.94

n = 3 grains (19 points)

a)

	Hornblende	Biotite
Location	41°53.12'N 115°49.26'W	41°53'N 115°49'W
K_2O (%)	.879	8.99
$^{40}Ar^*$(mole/g)	$1.763 + 10^{-10}$	$1.480 + 10^{-9}$
$^{40}Ar^*$/total ^{40}Ar	.743	.938
Age	134.2 ± 1.5 Ma	110.9 ± 2.1 Ma

b)

Aluminous Actinolite

Electron microprobe analyses of amphibole are in Little (1983)
Analytical techniques given in Miller and Sutter (1982)

Location: 41° 56.75'N; 115° 48.63'W; J = 0.004248

Temp (°C)	Apparent Age (Ma)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	^{39}Ar (% total)	^{40}Ar (%)	$^{39}Ar_k$ ($+10^{-12}$mole)	Apparent K/Ca (mole/mole)
750	99.83 ± 3.12	69.98	8.65	.214	4.8	19.2	.069	.0057
850	119.16 ± 3.05	97.22	79.05	.295	7.1	16.6	.103	.0062
975	106.64 ± 2.19	68.70	63.18	.201	13.8	20.9	.201	.0079
1100	116.81 ± 1.33	39.08	69.07	.097	61.6	40.4	.899	.0072
Fuse	113.69 ± 8.87	288.83	290.4	1.00	7.3	5.4	.093	.0014

Total gas age = 116.17 Ma

Preferred age = 116.81 ± 1.33 Ma

APPENDIX D

Chainman Shale.

In the map area, over 90% of the Chainman Shale consists of medium gray to black argillite and silty argillite. Most of these phyllitic rocks contain abundant graphite, some are pyritic, and many are slightly calcareous. Most argillite is massive, but rarely it contains thin beds or fine parallel laminations. Commonly, a few 3-10cm thick turbidite(?) beds of brownish calcareous siltstone occur in what are otherwise monotonously argillaceous sequences. Less commonly, massive or partly laminated sandstone beds, 10-20cm thick (rarely 1-2m thick), are interbedded with argillite. In one location, 15m of sandy conglomerate is interbedded with argillite. This conglomerate unit consists of several amalgamated beds that are internally graded and stratified and which contain rounded pebbles of mostly chert and lesser quartzite and argillite.

Less than 10% of the Chainman Shale in the map area consists of 1-7m thick beds of limestone that are generally interbedded with argillite. Massive, dark to light gray, impure silty limestone and powdery graphitic limestone are most common, but thin-bedded white to light gray limestone is also present. Parts of the Chainman Shale consist of intercalated thick beds of argillite, parallel- and cross-laminated fine calcareous limestone and impure silty limestone.

Reservation Hill Sequence

Chert-Argillite

In the structurally lowest and highest recognized thrust plates in the RHS, and in lower parts of the central thrust plate, ribbon chert (18%) and siliceous argillite (13%) are interbedded with rare, thin to medium-thick sandstone beds and constitute about 31% of the RHS in the map area. Chert overlies and is locally interbedded with greenstone near the base of the middle thrust plate. Ribbon chert consists of sharply and rhythmically interbedded sequences in which light greenish-grey chert beds, 1-5 cm thick, alternate with argillite partings generally less than 1 cm thick. These rocks locally contain recrystallized tests of radiolaria or are finely laminated. Rare laminae and thin to thick beds of limestone interbedded with chert-argillite are possibly calcareous pelagic ooze or lime-mud turbidites.

Siliclastic Turbidites

Siliciclastic turbidites interbedded with a greater amount of argillite overlie chert-argillite in the middle thrust plate and make up about 20% of the RHS. The turbidites generally occur as large lens-shaped bodies consisting of several-meter-thick beds and amalgamated sequences of such beds forming sections up to several tens of meters thick. The thick beds are poorly graded, massive and resemble facies B of Ricci-Lucci (1975). Less common medium/thin beds are well graded with Ta-e Bouma sequences in which the Tb-e divisions are much thinner than the Ta division and which resemble facies C of Ricci-Lucci (1975).

Limestone Turbidites

About 36% of the RHS in the map area consists of lenticular bodies of limestone turbidites and calcareous argillite or siltstone interbedded with much thicker units of dolomitic quartz arenite. These rocks occur north and south of the Hicks Mountain pluton and are in Tertiary fault contact with a large body of greenstone and siliciclastic turbidites of the middle thrust plate, which they structurally overlie. One sequence of limestone turbidites, up to 40 m thick, varies laterally in thickness and bedding characteristics and generally shows thinning-upward sequences capped by calcareous argillite. Other sequences are 2-13 m thick lenses within dolomitic quartz arenite. Thick-bedded limestone turbidites (35-130 cm thick) are graded and have Ta-e Bouma sequences in which the Tb-d divisions are thicker than the a division. Such beds commonly are amalgamated into massive sequences. Most limestone turbidites are medium-bedded (10-30 cm thick). These graded, tabular beds have Tb-e or Ta-e Bouma sequences and are capped by 2-15 cm of dark, slightly calcareous argillite. Thick beds of calcareous argillite occur interbedded with or intertongue with limestone turbidites and with lenses of silty limestone up to 1 m thick.

Dolomitic Quartz Arenite

Thick units of laminated, thin bedded, or massive dolomitic quartz arenite occur interbedded with limestone turbidite bodies and with several 1-4 m thick marker beds of chert-argillite. On a smaller scale, thin to thick beds of dolomitic quartz arenite are locally interbedded with limestone turbidite beds. The most common sedimentary structures in the dolomitic quartz arenite are light-colored bands of fine (and lesser medium) sandstone, 3-20 mm thick, alternating sharply with less abundant laminae of dark gray siltstone. The sandstone bands are well-sorted, ungraded, and are locally cross-laminated.