E X P L A N A T I O N

Wiseman and eastern Survey Pass quadrangles
1971

U.S. GEOLOGICAL SURVEY
OPEN FILE MAP

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Contact, dashed where approximate, queried where inferred, dotted where concealed.

Fault — U on upthrown side, D. Dashed where approximate.

Thrust fault — Sawteeth on upper plate. Dashed where approximate, queried where inferred, dotted where concealed.

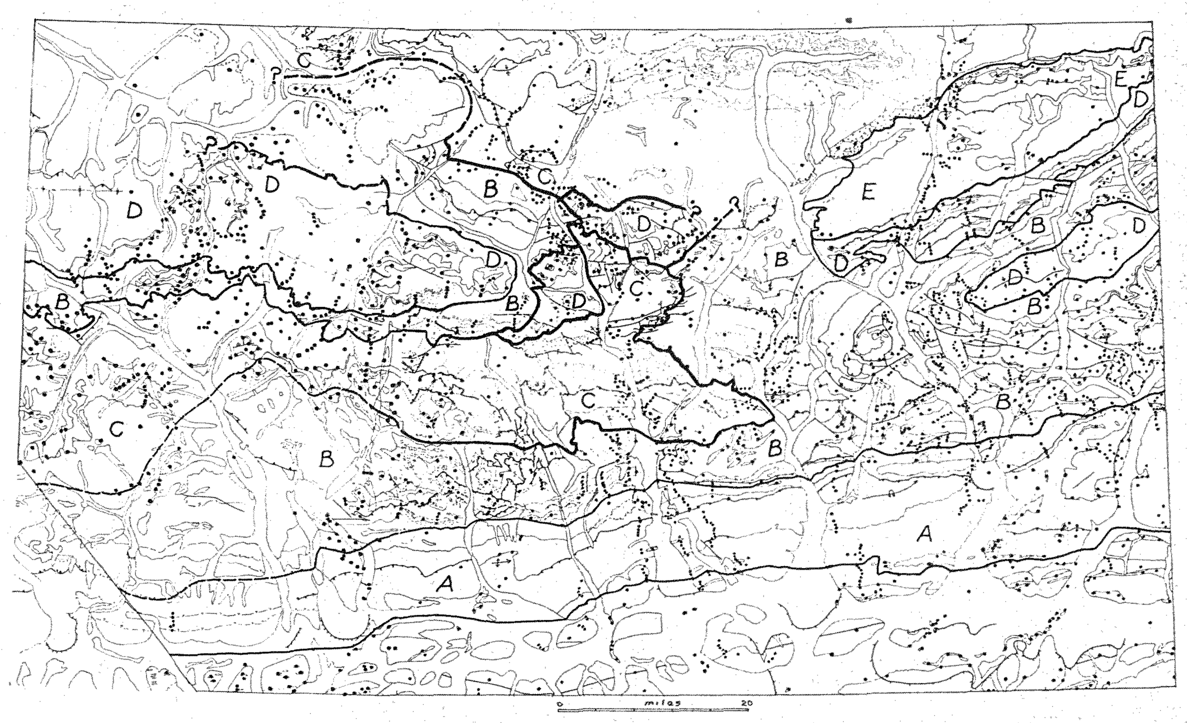
Axis of anticline

Axis of syncline

•17 Fossil locality

+2 K/Ar age sample locality

Locality of thermally metamorphosed rocks. B Biotite in schist and quartzite   T Tactite in marble



Location of field control and of areas of different facies in pre-Mississippian rocks.

Field stations shown by dots; rock sequences by letters.

Characteristic rock units of each sequence. Sequences are in part separated by faults, but in part interfinger and contain subordinate amounts of other units.

A (schist)	B (chloritic, dolomitic)	C (shale, massive ls.)	D (calcareous clastics)	E (volcanic rocks, phyllite)
Dgm, Dgg	Dhf	DKh Dhf	Dhf	↑
Dsm	Dc, Dpp, Dcs Dcc, Dgs, Dfs, Dps Dskd, DsK	↑ hiatus ↓ DsK	Dc Dfc, Dls, Db DsK	hiatus ? ↓ Pzv, Pzps

Potassium-argon ages of mica in granitic rocks

Analyses by: H.H. Thomas, R.F. Marvin, Paul Elmore and H. Smith, 1963

Map No.	Field No.	Mineral	Percent K2O	Ar^{40}_{rad} ppm	Percent Ar^{40}_{rad}	Apparent age (millions of years)
1	62ARr 192	Biotite	9.10	0.0475	96	86 ± 4
2	62ABe 264	Biotite	8.85	0.0471	94	88 ± 4
2	62ABe 264	Muscovite	10.30	0.0573	96	92 ± 5

K^{40} decay constants: $\lambda_e = 0.585 \times 10^{-10}$ per year
$\lambda_\beta = 4.72 \times 10^{-10}$ per year
Abundance ratio: $K^{40} = 1.22 \times 10^{-4}$ gram per gram K

Potassium-argon age of hornblende in mafic rocks

Argon measurement and age calculation by Marvin Lanphere
Potassium measurement by H.C. Whitehead

Map No.	Field No.	Mineral	Percent K2O	Ar^{40}_{rad} moles/gm $\times 10^{-10}$	Ar^{40}_{rad} / Ar^{40}_{total}	Calculated age (millions of years)
3	58ARr 8a (Sta. W29)	hornblende	0.94	5.733	0.93	373 ± 15

K^{40} decay constants: $\lambda_e = 0.585 \times 10^{-10}$ per year
$\lambda_\beta = 4.72 \times 10^{-10}$ per year
Abundance ratio: $K^{40}/K = 1.19 \times 10^{-4}$ atom percent

QUATERNARY

Moraine

Qu — Unconsolidated deposits
Alluvium and glacial deposits.

UNCONFORMITY

CRETACEOUS

Kg / Kgg — Granitic rocks
Kg: granite and quartz monzonite, porphyritic to gneissic. Mica dated as Late Cretaceous by K/Ar method.
Kgg: granitized quartzite composed of quartz, fractured K-spar, muscovite, minor biotite.

Kqc — Quartz pebble conglomerate
Conglomerate of quartz and schist clasts; sandstone; coal.

UNCONFORMITY

Kc — Igneous pebble conglomerate
Plant fragments and pelecypods of Cretaceous age.

Km — Mudstone and graywacke
Ammonites and pelecypods of Early Cretaceous (Albian?) age.

JURASSIC ?– PERMIAN ?

JPv / JPc — Volcanic rocks and chert
JPv: pyroxene andesite, basalt, diorite and diabase
JPc: red, green and gray argillite and chert.

MESOZOIC OR PALEOZOIC

MzPzg / MzPzv — Mafic rocks
MzPzv: basalt, andesite and greenstone.
MzPzg: mafic greenschist.

PERMIAN ?– DEVONIAN ?

Pzl / PzP / Pzg — Phyllite and graywacke
Pzp: black phyllite and slate and gray green schistose sandstone
Pzg: gray green micaceous lithic graywacke. Clasts of quartz, chert, slate and rare feldspar. Occurs east of Mettenpherg Creek.
Pzl: silicified limestone west of Mettenpherg Creek. May be equivalent to part of unit Dsm.

MISSISSIPPIAN

Ml — Lisburne Group
Light gray crinoidal limestone and dolomite in lower part; dark gray cherty limestone in upper part.
Mississippian brachiopods and gastropods at Amawk Ck.

MK — Kayak Shale
Black shale; ferruginous crinoidal limestone near top; quartzite and granule conglomerate at base east of North Fork of Koyukuk.

UNCONFORMITY ? EAST OF NORTH FORK OF KOYUKUK

Upper Devonian

DK — Kanayut Conglomerate
Gray green massive quartz-chert pebble conglomerate; quartzite and sandstone; shale. Conglomerate absent south of Hunt Fork, Till and Yenituk Creeks

Dhss / Dhf / Dhl — Hunt Fork Shale
Black shale, slate and phyllite; interbedded brown fine-grained sandstone and quartzite; lenses of brown muddy limestone. Basal quartzite, grit and sheared quartz-chert-slate pebble conglomerate shown by symbol.
Dhss: gray green, brown-weathering, thin-bedded, limonitic, partly calcareous sandstone; minor slate-pebble conglomerate. Gradational with Kanayut Conglomerate.
Dhl: limestone.

DKh — Sandstone and shale
Undifferentiated brown-weathering gray green sandstone and shale (Dhss), and quartzite with minor conglomerate (DK). West of Unakserak River mapped mainly by photointerpretation.

UNCONFORMITY

DEVONIAN ?

Dgq / Dqg / Dgm — Quartz-mica schist
Dgm: dark gray mica schist, quartz-mica schist and phyllite.
Dgq: rusty weathering quartz-mica schist and quartzite.
Dgg: undifferentiated mica schist and mafic greenschist.

DEVONIAN ?

Dgc / B — Schist and quartzite undifferentiated
Quartz-mica schist (Dgm), chlorite-carbonate schist (Dccm) and chlorite schist and quartzite (Dcm). In part thermally metamorphosed
Mapped mostly by photointerpretation.
B: biotite schist locality

DsKm — Skajit Limestone (DsK) and calcareous schist (Dsm) undifferentiated
Mapped only by photointerpretation. Identifiable limestone beds shown by dotted lines.

DEVONIAN

lower Upper Devonian

Dcm / Dc / Dcb — Chloritic phyllite and quartzite
Dc: gray, green and yellow shale and phyllite; purple and green phyllite; schistose, feldspathic chloritic quartzite and green quartz-chert pebble conglomerate and grit shown by pattern
Devonian (?) crinoids and brachiopods on Unakserak River.
Dcb: black silicious siltstone. May be unconformable on rest of unit.
Dcm: metamorphic rocks. Green chloritic schist, phyllite and quartzite-conglomerate
unit Dc included in upper part of unit Dpp.

Dsc — Schistose sandstone and conglomerate
Ferruginous gray-green and yellow sandstone and conglomerate; partly calcareous or sideritic; chloritoid and muscovite.

Dpp / Dpl — Purple and green phyllite and siltstone
Dpp: purple, black and green phyllite; purple, green, gray and brown, partly calcareous, chloritic and limonitic, feldspathic laminated siltstone. Minor conglomerate of quartz, chert, limestone and shale pebbles.
Typically weathers gray-green and purple.
Grades south into chlorite schist.
Dpl: dark gray shaly limestone; weathers gray and pink.
Lower Upper Devonian corals west of Allen River.

Dcs / Dccs / Dcsb / Dcl — Chloritic siltstone
Dcs: gray-green and brown slate, phyllite and chloritic laminated siltstone; dark gray phyllite and siltstone. Minor quartz grit and conglomerate.
Typically weathers dull brown and gray.
Dccs: partly calcareous gray-green slate, phyllite and chloritic siltstone.
Dcsb: black siltstone; black and gray laminated siltstone and black phyllite around Wiseman Creek.
Dcl: dark gray platy limestone. Lower Upper Devonian corals east of Glacier River.

UNCONFORMITY ?

Middle ? Devonian

Dbm / Dl / Dlb / Dfc / Dfs / Dls / Dsm / Db / Dbl / Dbs — Ferruginous siltstone and black limestone
Dfc: light brown and orange weathering, gray calcareous siltstone and phyllite. Minor sandstone, conglomerate and dark gray phyllite. Conglomerate of limestone pebbles shown by symbol.
Middle or Upper Devonian brachiopods near Pingaluk River.
Dfs: light brown and orange weathering gray siltstone and phyllite. Limestone-pebble conglomerate.
Dl: limestone; dark gray, shaly.
Dls: gray, silty, thin-bedded micaceous limestone; partly calcareous siltstone and phyllite. Weathers brown and orange
Dlb: limestone; dark gray, thick-bedded, gray-weathering, to black, thin-bedded, orange-weathering; interbedded with black phyllite and calcareous siltstone.
Middle or lower Upper Devonian corals and stromatoporoids near Clear River and Allen River.
Db: black limestone interbedded with black siltstone and phyllite; weathers pink, orange, gray and black. Limestone locally thin-bedded and fissile, locally thick-bedded.
Dbs: black siltstone, differentiated locally.
Dbl: limestone.
Dsm: light brown weathering calcareous schist interbedded with gray quartz-mica schist and marble.
Dbm: black schistose siltstone.

DsKd / DsK / DsKl / T — Skajit Limestone
Gray, thin- to thick-bedded marble. Upper part contains pebbles of limestone and dolomite (shown by symbol)
DsKd: gray, very fine-grained, orange-weathering dolomite at top of formation
DsKl: basal ? orange-weathering dolomite.
Middle (?) Devonian corals near Hunt Fork River.
T: green tactite locality

Dccm / Dcc / Dcl — Chloritic phyllite and carbonate rocks
Dcc: green, partly calcareous phyllite, siltstone and grit; white and black siltstone; thin beds of limestone and orange-weathering very fine-grained dolomite. Probably in part altered mafic sills. Conglomerate of limestone and dolomite pebbles shown by symbol.
Typically weathers banded green and orange, but includes some light brown weathering rocks and greenish gray rocks probably of units Dfc and Dgs.
Dcl: gray to orange-weathering limestone and marble. Probably equivalent to top beds of Skajit Limestone.
Dccm: green chlorite schist, greenschist, dark gray mica schist and chloritic quartzite with thin beds of marble and dolomite.
Probably grades upward into chloritic schist unit Dcm

Dgg / Dgs — Graywacke and slate
Dgs: brown schistose, partly calcareous graywacke and conglomeratic graywacke with clasts of quartz, chert, labile rocks and mafic igneous rocks; brown slate; soft green calcareous slate and phyllite interbedded with quartz-chert-pebble conglomerate and lenses of coquina.
Middle or lower Upper Devonian brachiopods in green phyllite near John River.
Dgg: gray-green slate; gray-green graywacke with mafic rock clasts; quartz-chert-pebble conglomerate.

Dps / Dv — Purple and green slate and volcanic rocks
Dps: purple and green slate and phyllite.
Dv: mafic volcanic stretched conglomerate and breccia; grades into dark green phyllite composed of sheared volcanic fragments.

LOWER PALEOZOIC

Pzps / Pzvp — Phyllitic siltstone
Pzps: black and gray laminated phyllitic siltstone; gray phyllite; minor sandstone and graywacke.
Pzvp: black phyllitic siltstone, purple and green phyllite and volcanic and mafic intrusive rocks, undifferentiated.

Pzv — Volcanic and mafic intrusive rocks
Dark green andesitic and basaltic volcanic conglomerate interlayered with black and green phyllite. Gabbro and diorite sills and dikes.
Hornblende from dike at Boreal Mtn dated as Middle Devonian by K/Ar method.

MISSISSIPPIAN AND DEVONIAN FOSSILS

Identified by J.T. Dutro Jr., J.W. Huddle, and W.A. Oliver Jr.

Locality No.	Field Number	Fossils	Age	Map unit
30	58ABe 13	gastropods	Early Miss. ?	Ml
31	58ABe 12	brachiopods; gastropods	Late Miss.	Ml
37	59ARr 494	corals, crinoids	Miss. ?	Ml
38	59ARr496G	corals	Sil.-late Paleozoic	Ml
38	59ARr 496X	horn coral (float)	Early Miss. ?	MK?
1	24AS 16	brachiopods	late Late Dev.	DKh
7	53APa 207	brachiopods	late Late Dev.	DKh
8	53APa 204	brachiopods	late Late Dev.	DKh
9	53APa 208	pelecypods, plants	?	DKh
5	53APa 200	coral ?	?	Dhf
6	53APa 202	brachs, clams	late Late Dev.	Dhf
6	53APa 206	brachs, gastropods	late Late Dev.	Dhf
17	59ARr 211	bivalves	?	Dhf
33	59ABe 360	corals	early Late Dev.	Dhl
34	58ABe 47	crinoid columns	?	Dhf
13	62ARr 123	corals	?	Dhl
4	24AMt 8	crinoids, corals, brachiopods	Middle Dev. ? ? Devonian ?	Dc ? (location approx)
25	59ABe 225	corals, Amphipora	Middle or early Late Dev.	Dpl
28	59AKm 40	corals	early Late Dev.	Dpl
29	59ABe 166	corals	Dev.-Sil.	Dpl
29	59ARr 173	corals	Dev.-Sil.	Dpl
29	65ARr 29	Amphipora ?	Devonian ?	Dpl
35	59ABe 397	stromatoporoid	Devonian ?	Dcl
36	59ARr 320	brachiopods	Devonian ?	Dcl
39	59ARr 439	corals	early Late Dev.	Dcl
40	59ARr 390	corals, brachs.	early Late Dev.	Dcl
26	65ABe 29C	corals, Amphipora	Middle or early Late Dev.	Dlb
27	65ABe 29E	corals	Dev.-Sil.	Dlb
32	59ABe 348	corals	Middle ? or early Late ? Dev.	Dlb
10	62ABe 374	brachiopods	late Middle or early Late Dev.	Dlb
22	65ABe 7B	brachiopods		Dlb
23	65ABe 24	brachiopods		Db
24	65ABe 21	corals brachiopods conodonts	Devonian Middle or early Late Dev. late Middle or early Late Dev.	Dlb
2	62ARr 53	brachiopods	late Middle or early Late Dev.	Dfc
3	62ARr 55	brachiopods		Dfc
11	62ARr 84	brachiopods		Dfc
12	62ARr 82A	brachiopods		Dfc
15	51APa 22	brachiopods		Dgs
18	51AMg 13	brachiopods		Dgs
20	51AMg 14	brachiopods		Dgs
20	65ABe 7E	brachiopods		Dgs
21	65ABe 7D	brachiopods	Late Dev.	Dgs
22	65ABe 7A	brachiopods	late Middle or early Late Dev	Dgs
16	59AKm 74	gastropods	?	Db
19	59AKm 54A	crinoid debris	?	Dbl
14	51ABe 21	corals	Middle ? Dev.	DsK

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