Table 5. Early fossil collections from the west-central part of the Howard Pass quadrangle, Alaska—Continued.

[Letters in field number refer to collector: (A)La, A.H. Lachenbruch; AMg, M.D. Mangus; K, AKt, B.H. Kent, Jr.; R, ARr, H.N. Reiser; T, (A)Tr, I.L. Tailleur. *Many collections in the west-central Howard Pass quadrangle published by Elder and others (1989) are mislocated; these locations have been replotted herein using the original field station maps and notes. No., number; indet., indeterminate; loc., locality]

Locality No., map unit	Quadrangle, latitude/ longitude	Fossils [field station No. (field collection. No.); USGS collection No.]	Age	Remarks (see "References cited" following section on biostratigraphic data)
161 Mlri?	**Howard Pass C-5** 68°43'19"/ 158°53'24"	Spores: Well-preserved assemblage including *Hymenozonotriletes lepidophytus* Kedo [65ATr55.1, 55.2]	late Late Devonian (upper Famennian or Strunian).	Identified by R.A. Scott, USGS, April 1970, unpublished fossil report on shipments A-65-5D, 6D. Sample from clay shale, mudstone, and siltstone associated with hematitic quartz-pebble conglomerate and sandstone (to south) and carbonaceous shale interbedded with carbonaceous chert (to north). Spore-bearing strata included here with unit Mlri but may be previously unrecognized, unnamed older unit underlying unit Mlri. Similar rocks produced an identical spore assemblage 5.6 km east of the map area (65ATr122; Howard Pass C-2 quadrangle).
162 Kop	**Howard Pass C-5** 68°45'/ 158°48'32"*	Bivalves: *Buchia sublaevis* Keyserling [51T51 (51ATr177F); 23574]	early Early Cretaceous (early Valanginian).	Elder and others, 1989, table 1, loc. 95. Fossils occur in a section of dark clay shale with 30% very fine grained, dark-gray, rippled to even-bedded sandstone.
163 Mlri	**Howard Pass C-5** 68°32'49"/ 158°49'12"	Ammonoid cephalopod: *Münsteroceras* sp. [51T106 (51ATr392); 13240-PC]	Early Mississippian (late Tournaisian).	Gordon, 1957, p. 6, 13–15, 18. Both fossils from thinly interbedded gray-black chert, limestone, and calcareous shale. Sample 51ATr392 is from 440 ft stratigraphically below base of 105-ft–thick igneous sill; 51ATr393 is from 30 ft above sill.
		Ammonoid cephalopod: *Protocanites*? sp. [51T106 (51ATr393); 13241-PC]	Probably Early Mississippian (Tournaisian?).	
164 JPe	**Howard Pass C-5** 68°34'41"/ 158°46'37"	Bivalve: *Monotis* sp. cf. *alaskana* Smith [51K133 (51AKt169); 24052]	Late Triassic (Norian)	Identified by B. Kummel, December 1952, unpublished fossil report on shipment A-52-9. Fossil from limestone bed with abundant *Monotis* sp.
165 JTro	**Howard Pass C-5** 68°36'25"/ 158°44'17"	Bivalve: *Monotis subcircularis* Gabb [51K117 (51AKt150); 24051]	Late Triassic (Norian)	Identified by B. Kummel, December 1952, unpublished fossil report on shipment A-52-9. Fossil from gray coquinoid limestone interbedded with chert.
166 JTro	**Howard Pass C-5** 68°34'01"/ 158°44'02"	Bivalve: *Halobia cordillerana* Smith [51K103 (51AKt135); 24050]	Late Triassic (Carnian)	Identified by B. Kummel, December 1952, unpublished fossil report on shipment A-52-9. Fossil from light gray limestone associated with shale.
167 KJo	**Howard Pass C-5** 68°44'24"/ 158°25'44"*	Bivalves: *Buchia sublaevis* Keyserling ?*B. keyserlingi* (Lahusen) [51T77 (51ATr266F); 23577]	early Early Cretaceous (early Valanginian).	Elder and others, 1989, table 1, loc. 99, and Jones and Grantz, 1964, p. 1464–65. Bivalves at this locality originally identified (by R. Imlay, USGS, 1952) as *B. rugosa* (Fischer) of Late Jurassic age, but reassigned to *B.* cf *sublaevis* by Imlay in 1964. Fossils occur in coquinoid limestone.
168 KJo	**Howard Pass C-5** 68°44'13"/ 158°25'48"*	Bivalve: *Buchia sublaevis* Keyserling [51T75 (51ATr257F); 23697]	early Early Cretaceous (Valanginian)	Elder and others, 1989, table 1, loc. 99. Bivalves at this locality originally identified (by R. Imlay, USGS, 1952) as *B. rugosa* (Fischer) of Late Jurassic age, but reassigned to *B.* cf *sublaevis* by Imlay in 1964. Fossils occur in 1-m-thick bed of coquinoid limestone.

Table 5. Early fossil collections from the west-central part of the Howard Pass quadrangle, Alaska—Continued.

[Letters in field number refer to collector: (A)La, A.H. Lachenbruch; AMg, M.D. Mangus; K, AKt, B.H. Kent, Jr.; R, ARr, H.N. Reiser; T, (A)Tr, I.L. Tailleur. *Many collections in the west-central Howard Pass quadrangle published by Elder and others (1989) are mislocated; these locations have been replotted herein using the original field station maps and notes. No., number; indet., indeterminate; loc., locality]

Locality No., map unit	Quadrangle, latitude/ longitude	Fossils [field station No. (field collection. No.); USGS collection No.]	Age	Remarks (see "References cited" following section on biostratigraphic data)
169 Kon	**Howard Pass C-5** 68°42'25"/ 158°27'36"*	Bivalve: *Buchia crassicollis solida* (Lahusen) [51T72 (51ATr231F); 23576]	early Early Cretaceous (middle to late Valanginian).	Elder and others, 1989, table 1, loc. 96. Fossils occur in section of well-indurated, medium-yellow sandstone, in ≈1-m-thick beds, interbedded with shale and siltstone.
170 Koi	**Howard Pass C-5** 68°41'46"/ 158°28'26"*	Bivalve: *Buchia crassicollis solida* (Lahusen) [51T69 (51ATr209F); 23575]	early Early Cretaceous (middle to late Valanginian).	Elder and others, 1989, table 1, loc. 94. Bivalves at this locality originally identified (by R. Imlay, USGS, 1952) as ?*B.subokensis* (Pavlow) and *B.* cf *B. uncitoides* (Pavlow) and assigned a Berriasian age. Fossils occur in a 5-m-thick zone of rippled sandstone, in 2- to 4-m-thick beds; shells are abundant and in parallel alignment.
		Bivalve: *Buchia* cf. *volgensis* (Lahusen) [65Tr46.2; M2944]	early Early Cretaceous (Berriasian)	Elder and others, 1989, table 1, loc. 98. *Buchia* from medium-bedded "rhythmites" (of sandstone and shale), at least several hundred meters above base of formation.
171 Koi	**Howard Pass C-5** 68°41'02"/ 158°23'56"	Bivalve: ?*B.subokensis* (Pavlow) [51K56 (51AKt57F)]	early Early Cretaceous (Berriasian?)	Near (perhaps equivalent to) M1268 in Elder and others, 1989, table 1, loc. 97. Fossil occurs in a section of greenish sandstone interbedded with shale.
172 Koi	**Howard Pass C-5** 68°40'26"/ 158°28'01"*	Bivalve: *Buchia crassicollis solida* (Lahusen) [51K67 (51AKt72F); 24041]	early Early Cretaceous (middle to late Valanginian).	Elder and others, 1989, table 1, loc. 93. Fossil occurs in a section of interbedded sandstone and shale.
173 JTRo	**Howard Pass C-5** 68°32'42"/ 158°35'42"	Bivalve: *Monotis* cf. *subcircularis* Gabb [65Tr61.2; M2982]	Late Triassic (late Norian)	Identified by N.J. Silberling, USGS, November 1965, unpublished fossil report on shipment A-65-13M. Fossil from gray, platy-bedded, *Monotis*-bearing limestone, locally silicified, near top of Otuk Formation.
174 PMk	**Howard Pass C-5** 68°31'55"/ 158°28'19"	Ammonoid cephalopod: *Bollandites kiligwae* Gordon, n. sp. [51Tr89 (51ATr319); 13204-PC]	Late Mississippian (middle Visean; Meramecian).	Gordon, 1957, p. 6, 7, 13-15, 18. Fossil from calcareous concretion in interbedded black chert and shale, about 150 ft above base of exposed section.
175 PMk	**Howard Pass C-5** 68°31'08"/ 158°32'10"	Nautiloid cephalopod: *Cycloceras* sp. Ammonoid cephalopod: *Ammonellipsites polaris* Gordon, n. sp. [50T219 (50ATr300F); 11857-PC]	Early Mississippian (early Visean; middle or late Osagean).	Gordon, 1957, p. 6, 13-15, 17. Fossils from isolated 125-ft section of black platy shale containing calcareous nodules.
		Coiled nautiloid cephalopod Form recalls the genera *Millkoninckioceras*, *Subvestinautilus*, and *Lispoceras*, but fits none of them perfectly. [77Tr12G; 28594-PC]	Early Mississippian (early Visean; middle or late Osagean).	Identified by M. Gordon, Jr., USGS, July 1982, unpublished fossil report on shipment NPRA-81-1. Fossil from black siliceous shale, impure chert, and limestone; same locality as 50T219.
176 JTRo	**Howard Pass C-5** 68°30'47"/ 158°34'08"	Bivalve: *Monotis subcircularis* Gabb [51R101 (51ARr141); 24053]	Late Triassic (Norian)	Identified by B. Kummel, December 1952, unpublished fossil report on shipment A-52-9. Fossil from thinly interbedded chert and shale.

Table 5. Early fossil collections from the west-central part of the Howard Pass quadrangle, Alaska—Continued.

[Letters in field number refer to collector: (A)La, A.H. Lachenbruch; AMg, M.D. Mangus; K, AKt, B.H. Kent, Jr.; R, ARr, H.N. Reiser; T, (A)Tr, I.L. Tailleur. *Many collections in the west-central Howard Pass quadrangle published by Elder and others (1989) are mislocated; these locations have been replotted herein using the original field station maps and notes. No., number; indet., indeterminate; loc., locality]

Locality No., map unit	Quadrangle, latitude/ longitude	Fossils [field station No. (field collection. No.); USGS collection No.]	Age	Remarks (see "References cited" following section on biostratigraphic data)
177 JTRo	**Howard Pass C-5** 68°30'32"/ 158°34'26"	Bivalve: *Monotis subcircularis* Gabb [51R101 (51ARr142); 24054]	Late Triassic (Norian)	Identified by B. Kummel, December 1952, unpublished fossil report on shipment A-52-9. Fossil from black massive chert.
178 Koi	**Howard Pass C-4** 68°40'16"/ 157°48'47"*	Bivalve: *Buchia crassicollis solida* (Lahusen) [49AMg46; 24657]	early Early Cretaceous (middle to late Valanginian).	Elder and others, 1989, table 1, loc. 101.
179 Koi	**Howard Pass C-4** 68°33'47"/ 157°55'19"*	Bivalves: *Buchia okensis* (Pavlow) *Buchia subokensis* (Pavlow) [49La38 (49ALa74F); 21821]	early Early Cretaceous (Berriasian)	Elder and others, 1989, table 1, loc. 102; Jones and Grantz, 1964. Bivalves at this locality originally identified (by R. Imlay, USGS, 1950) as *B. crassicollis* Keyserling of Valanginian age. Fossils occur in section of graywacke and shale.
180 JTPii	**Howard Pass C-4** 68°32'10"/ 157°51'22"	Bivalve: *Monotis subcircularis* Gabb [51T97(51ATr344); 24049]	Late Triassic (Norian)	Identified by B. Kummel, December 1952, unpublished fossil report on shipment A-52-9. Fossil occurs in very fine grained, dark-green to dark-brown sandstone containing abundant shell fragments.
181 Koi	**Howard Pass C-3** 68°34'23"/ 157°46'44"*	Bivalve: *Buchia crassicollis solida* (Lahusen) [50K233 (50AKt285); 22522]	early Early Cretaceous (middle to late Valanginian).	Elder and others, 1989, table 1, loc. 99. Fossil from fine-grained, dark-gray-green, micaceous graywacke.
182 KJo	**Howard Pass C-3** 68°37'30"/ 157°35'17"*	Bivalve: *Buchia crassicollis solida* (Lahusen) [50K164 (50AKt219F); 22519]	early Early Cretaceous (middle to late Valanginian). .	Elder and others, 1989, table 1, loc. 100. Fossil from medium-grained, dark-gray-green graywacke.
183 KMi	**Howard Pass C-3** 68°38'28"/ 157°28'08"*	Bivalve: *Buchi*a sp. [50K210 (50AKt257); 22521]	Jurassic or Cretaceous	Elder and others, 1989, table 1, loc. 104. Fossil from thin-bedded, fine-grained, gray-green graywacke with local iron staining.
184 Kop	**Howard Pass C-3** 68°36'58"/ 157°28'41"*	Bivalve: *Buchia crassicollis solida* (Lahusen) [50K135 (50AKt185); 22518]	early Early Cretaceous (middle to late Valanginian).	Elder and others, 1989, table 1, loc. 104. Fossil from cherty, medium-grained, dark-green graywacke.
185 KJo	**Howard Pass C-3** 68°36'/ 157°30'22"*	Bivalve: *Buchia sublaevis* Keyserling [50T115 (50ATr166F); 22507]	early Early Cretaceous (early Valanginian).	Elder and others, 1989, table 1, loc. 103; Jones and Grantz, 1964. Bivalves at this locality originally identified (by R. Imlay, USGS, 1952) as *B. aff. B. bronni* (Rouiller) of Late Jurassic age, but reassigned to *B.* cf. *sublaevis* by Imlay in 1964. Fossils occur in float of coquinoid limestone.
186 JDbc	**Howard Pass B-4** 68°24'11"/ 158°14'42"	Brachiopods: *Aulacella*? sp. rhynchonelloid, indet. *Cyrtospirifer* sp. spiriferoid, indet. "*Athyris*" (*Angelica*-type) [77Tr15.2; 10353-SD]	Late Devonian (probably Famennian)	Identified by J.T. Dutro, Jr., USGS, February 1981, report on shipment NPRA-81-1. Fossils from rubble of calcareous arenite associated with mafic igneous rocks.

Table 5. Early fossil collections from the west-central part of the Howard Pass quadrangle, Alaska—Continued.

[Letters in field number refer to collector: (A)La, A.H. Lachenbruch; AMg, M.D. Mangus; K, AKt, B.H. Kent, Jr.; R, ARr, H.N. Reiser; T, (A)Tr, I.L. Tailleur. *Many collections in the west-central Howard Pass quadrangle published by Elder and others (1989) are mislocated; these locations have been replotted herein using the original field station maps and notes. No., number; indet., indeterminate; loc., locality]

Locality No., map unit	Quadrangle, latitude/ longitude	Fossils [field station No. (field collection. No.); USGS collection No.]	Age	Remarks (see "References cited" following section on biostratigraphic data)
187 JTRo	**Howard Pass B-3** 68°28'08"/ 157°45'47"	Bivalve: *Monotis subcircularis* Gabb [51T102 (51ATr367); 24036]	Late Triassic (Norian)	Identified by B. Kummel, December 1952, unpublished fossil report on shipment A-52-10. Fossil from section of shale and sandstone containing a few interbeds and concretions of calcareous shale. Exact location of sample along line of traverse is uncertain.
188 KDe (KJo?)	**Howard Pass B-3** 68°24'50"/ 157°12'04"*	Bivalve: *Buchia rugosa* (Fischer) [51T010 (51ATr19F); 23598]	Late Jurassic (Kimmeridgian)	Elder and others, 1989, table 1, loc. 109. Bivalves at this locality were originally identified (by R. Imlay, USGS, 1952) as *B. bronni* (Rouiller) and *B.* cf. *mosquenensis* (von Buch) of Late Jurassic age; "probable" but "poorly preserved" *B.* cf. *mosquensis* was confirmed by by Imlay in 1964. *B. mosquensis* and *B. concentrica* reported from this locality in Imlay and Detterman (1973, p. 26, loc. 4). Fossils from lenses of poorly developed pelecypod coquina within pebbly siltstone.