

GEOLOGICAL
SURVEY
OF
CANADA

DEPARTMENT OF MINES
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PAPER 63-4

ILLUSTRATIONS OF CANADIAN FOSSILS
JURASSIC OF WESTERN AND ARCTIC CANADA

Hans Frebald



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By

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1964

This report contains illustrations of most of the stratigraphically important Jurassic index fossils of Western and Arctic Canada and is designed for the use of geologists in the field. Detailed information on the illustrated fossils may be found in the publications listed in the Bibliography.

The relative stratigraphic position and age of the fossils can be seen from the plate descriptions and Table I.

Illustrations of Canadian Fossils

JURASSIC OF WESTERN AND ARCTIC CANADA

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EPOCH	STAGES	RICHARDSON AND BRITISH MOUNTAINS REGION	CANADIAN ARCTIC ISLANDS	SOUTHERN YUKON	WESTERN & INTERIOR PARTS OF BRITISH COLUMBIA	ROCKY MOUNTAINS	SOUTHERN PLAINS	
CRET.	BERRIASIAN	Buchia okensis	Tollia spp. Buchia fischeriana Buchia piochii		Buchia okensis	Present		
	AQUILONIAN	Buchia fischeriana Buchia piochii	Buchia fischeriana Buchia piochii		Not known Buchia cf. blanfordiana	Titanites occidentalis, Buchia piochii		
UPPER JURASSIC	PORTLANDIAN OR LOWER VOLGIAN				Buchia mosquensis			
	UPPER KIMMERIDGIAN	Buchia mosquensis Buchia spp.	Buchia mosquensis Buchia spp.			Buchia mosquensis	Present	
	MIDDLE KIMMERIDGIAN			Not known	Not known			
UPPER JURASSIC	LOWER KIMMERIDGIAN UPPER OXFORDIAN	Amoeboceras sp., Buchia concentrica	Amoeboceras sp., Buchia concentrica		Amoeboceras spp., Buchia concentrica	Amoeboceras spp., Buchia concentrica		
	LOWER OXFORDIAN	Cardioceras spp.	Cardioceras aff. mirum		Cardioceras spp.	Cardioceras spp., Goliaticeras cf. crassum		
JURASSIC	MIDDLE AND UPPER CALLOVIAN	Not known	Not known		Not known	Not known	Not known	
	LOWER CALLOVIAN	Cadoceras septentrionale	Cadoceras septentrionale		Lilloettia lilloettensis	Imlayoceras miltense		
		Keplerites not known	Keplerites not known	Keplerites not known	Not known	Keplerites aff. K. tychonis	Keplerites mclearni	K. mclearni
		Cadoceras spp.	Cadoceras spp.	Cadoceras spp.		Warrenoceras henryi Paracephalites glabrescens, P. hashimotoi		

Doreopierites (stratigraphic position doubtful)

MIDDLE		LOWER JURASSIC		HETTANGIAN	
BATHONIAN	Cadoceras spp.	Arctioceras ishmae	Arctioceras sp.	?	Present
	Arctioceras kochi	Arctioceras ishmae	Arctioceras sp.		
	Cadoceras crassum?	Arctiocephalites spp.	Arctiocephalites sp.		
	Arctiocephalites elegans	Cranoc. vulgaris	Arctiocephalites sp.		
UPPER BAJOCIAN	Not known	Not known	Approximate position of <i>Arctioceras isertii</i> and <i>A. modestum</i>		
MIDDLE BAJOCIAN	Not known	Not known			
LOWER BAJOCIAN	Erycites cf. howelli and Pseudoloceras sp.	Leioceras opalinum, Pseudoloceras m'clintocki, O. jacksoni	Possibly present in part	Stephanoceras spp., Chondroceras spp.	Stephanoceras spp., Stemmatoceras spp., Teloceras spp., Chondroceras spp.
	Pseudoloceras sp.	Pseudoloceras compactile, Catacoeloceras spinatum	Grammoceras aff. G. fallaciosum	Tmetoceras regleyi	Not known
TOARCIAN	Dactyloceras sp.	Dactyloceras commune	?	Dactyloceras spp., Harpoceras cf. exaratum, Fanninoceras spp.	Grammoceras boreale
PLIENSBACHIAN	Amaltheus sp.	Not known	Amaltheus stokesi, Arctioceras spp., Leptaleoceras sp.	Amaltheus stokesi, Arctioceras spp., L. pseudoradians	Amaltheus sp.
	Probably absent	Absent	Productyloceras sp.	Productyloceras davoei, Bechei	Absent
				Lower Pliensbachian Fauna possibly present on Queen Charlotte Islands	
SINEMURIAN	Arctioasteroceras jeletzkyi, Oxynoticeras oxynotum		Probably absent	Asferoceras sp.	
	Arctites s.l.	Arctites s.l.	Arctioceras sp. Paracorniceras cf. grunndense	Arctioceras sp., Coronoceras bisulcatum	Arctioceras spp.
HETTANGIAN	Not known	Not known	Psiloceras ? cf. erugatus	Schlotheimia cf. acuticosta	Absent

G S C

TABLE I. OUTLINE OF THE JURASSIC SYSTEM IN CANADA

Plate I

HETTANGIAN AND SINEMURIAN

- Figs. 1a, b. Psiloceras canadense Frebold. 1a, lateral view; 1b, venter. Holotype, GSC No. 11206. Hettangian. Tyaughton Creek, Tyaughton Lake map-area, British Columbia.
- Figs. 2a, b. Psiloceras canadense Frebold. 2a, lateral view; 2b, venter. Paratype, GSC No. 11206D. Hettangian. Same locality as fig. 1.
- Fig. 3. Psiloceras canadense Frebold. Lateral view. Paratype, GSC No. 11206E. Hettangian. Last Creek, Tyaughton Lake map-area, British Columbia.
- Fig. 4. Psiloceras canadense Frebold. Venter and asymmetric suture line. Paratype, GSC No. 11206F. Hettangian. Same locality as fig. 3.
- Fig. 5. Psiloceras canadense Frebold. Lateral view. Paratype, GSC No. 11206G. Hettangian. Same locality as fig. 1.
- Figs. 6a, b, c. Schlotheimia cf. acuticosta S.S. Buckman. 6a, lateral view; 6b, venter; 6c, cross-section. GSC No. 11231. Hettangian. Last Creek, Tyaughton Lake map-area, British Columbia.
- Figs. 7a, b. Vermiceras scylla (Reynes). 7a, lateral view; 7b, venter. GSC No. 11227. Lower Sinemurian. Gate Creek, Tyaughton Lake map-area, British Columbia.
- Fig. 8. Vermiceras scylla (Reynes). Lateral view. GSC No. 11236. Lower Sinemurian. Same locality as fig. 7.
- Fig. 9. Vermiceras latisulcatum (Quenstedt). Venter and asymmetric suture line. GSC No. 11239. Lower Sinemurian. Last Creek, Tyaughton Lake map-area, British Columbia.
- Figs. 10a, b. Oxynoticeras oxynotum (Quenstedt). 10a, lateral view; 10b, venter. Hypotype. GSC No. 14632. Upper Sinemurian. Bug Lake area, Aklavik Range, N.W.T.
- Fig. 11. Oxynoticeras oxynotum (Quenstedt). Lateral view. Hypotype. GSC No. 14631. Upper Sinemurian. Bug Lake area, Aklavik Range, N.W.T.
- Figs. 12a, b. Gleviceras? sp. indet. 6a, lateral view; 6b, venter. GSC No. 14636. Bug Lake area, Aklavik Range, N.W.T.



Plate II

SINEMURIAN

- Figs. 1a, b. Arctoasteroceras jeletzkyi Frebold. 1a, lateral view; 1b, venter. Holotype, GSC No. 14623. Upper Sinemurian, Oxynotum zone. South of Bug Lake, Aklavik Range, N.W.T.
- Figs. 2a, b. Arctoasteroceras jeletzkyi Frebold. 2a, lateral view; 2b, venter. Paratype, GSC No. 14628. Upper Sinemurian, Oxynotum zone. South of Bug Lake, Aklavik Range, N.W.T.
- Fig. 3. Echioceras sensu lato sp. indet. Lateral view. GSC No. 14638. Upper Sinemurian, Raricostatum zone. Bug Creek Canyon, Aklavik Range, N.W.T.
- Fig. 4. Echioceras sensu lato sp. indet. Venter. GSC No. 14640. Same stratigraphic position and locality as fig. 3.
- Fig. 5. Arietites sensu lato gen. et sp. indet. Lateral view. GSC No. 14618. Lower Sinemurian. Near head of second northern tributary to Rat River, Richardson Mountains, Yukon.
- Fig. 6. Coroniceras bisulcatum (Bruguière). Cross-section. GSC No. 11244. Lower Sinemurian. Last Creek Tributary, Tyaughton Lake map-area, British Columbia. See lateral views on Pl. III, fig. 1 and Pl. IV, fig. 1a, and venter on Pl. IV, fig. 1b.
- Figs 7a, b-9. Trigonia littlei Frebold. 7a, interior right valve; 7b, exterior left valve; 8, exterior right valve; 9, exterior left valve. 7a, b, Holotype. GSC No. 13720. 8, 9, Paratypes, GSC Nos. 13722 and 13721. Sinemurian Coquina bed on ridge northeast of Parks station, Salmo area, British Columbia.

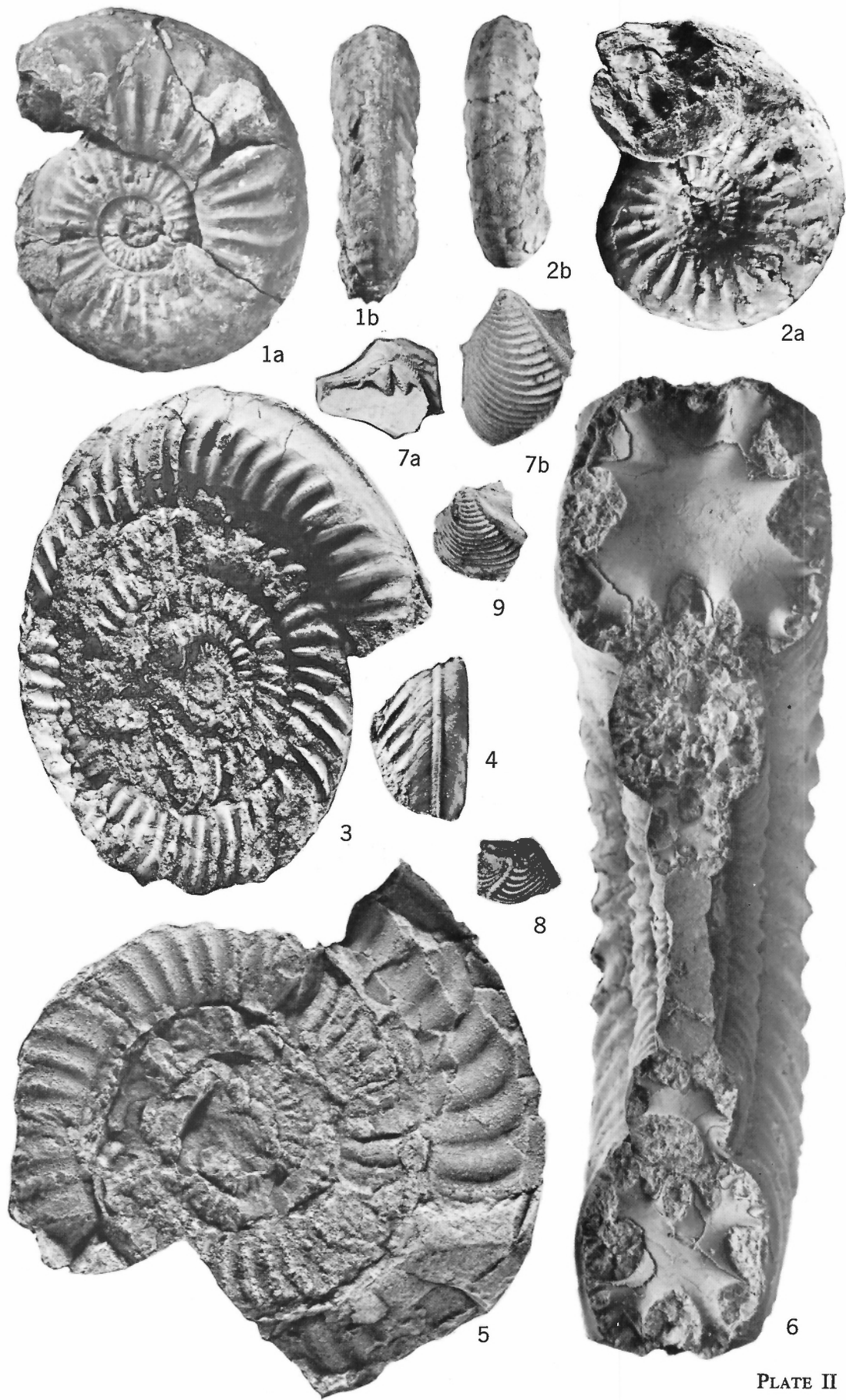
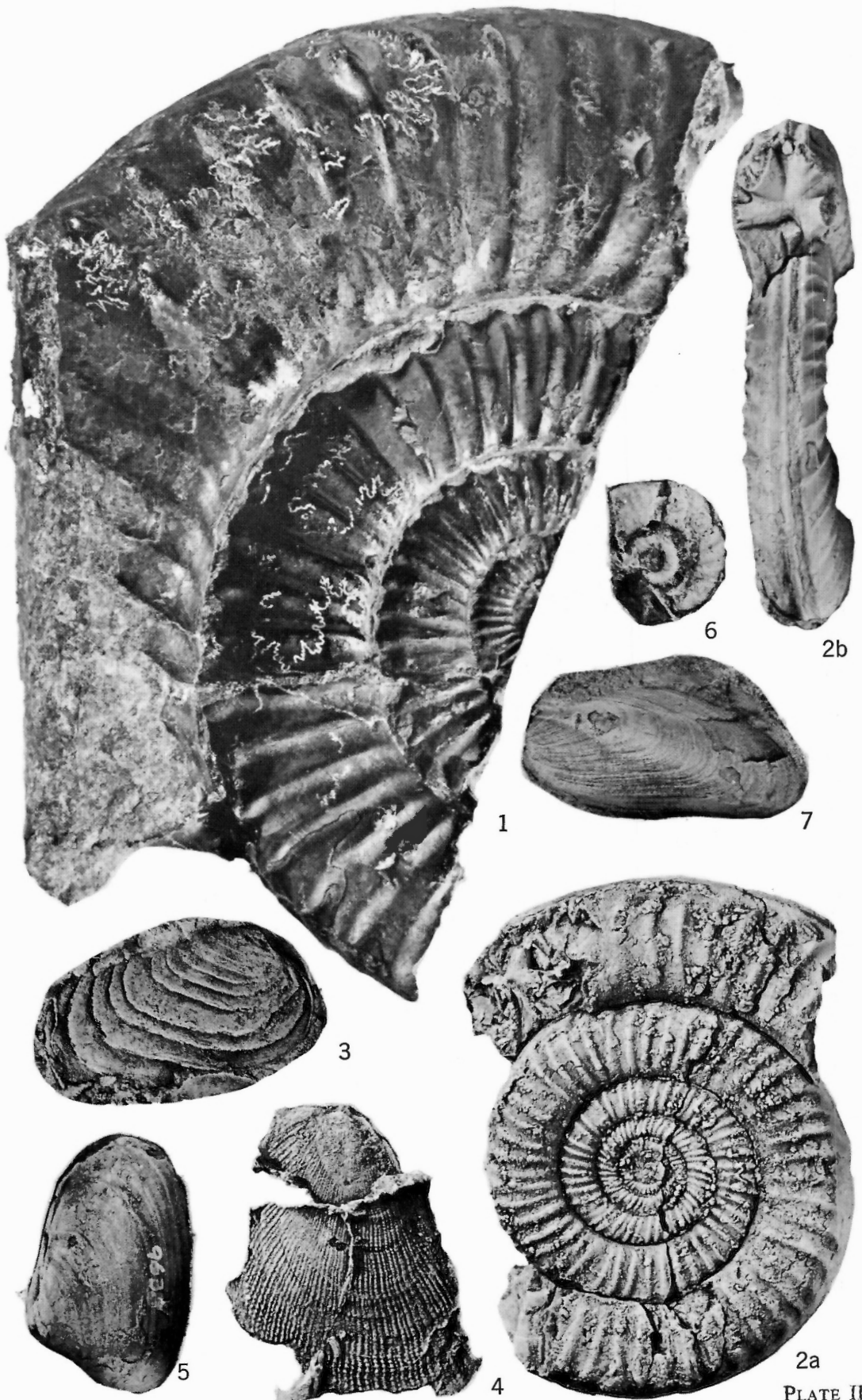


Plate III

HETTANGIAN(?) AND SINEMURIAN

- Fig. 1. Coroniceras bisulcatum (Bruguière). Lateral view. GSC No. 11244. Lower Sinemurian. Last Creek tributary, Tyaughton Lake map-area, British Columbia. See lateral view of entire specimen and venter on Pl. IV, fig. 1a, b; cross-section on Pl. II, fig. 6.
- Figs. 2a, b, Paracorniceras cf. gmündense (Opperl). 2a, lateral view; 2b, venter and cross-section. GSC No. 15969. Laberge Group, Sinemurian. Atlin District, Lat. 59°15'N, Long. 133°45'W, British Columbia.
- Fig. 3. Cardinia aff. regularis Terquem. Right valve. GSC No. 13717. Coquina bed on ridge northeast of Parks station. Sinemurian. Salmo area, British Columbia.
- Fig. 4. Lima aff. compressa Terquem. Right valve. GSC No. 13732. Same stratigraphic position and locality as fig. 2.
- Fig. 5. Pleuromya cf. P. gregaria (Zieten). Left valve. GSC No. 9638. Laberge Group, Lower Lias. Laberge area, Yukon.
- Fig. 6. Psiloceras cf. P. erugatus (Bean). Lateral view; GSC No. 9640. Laberge Group, Hettangian?. Laberge area, Yukon.
- Fig. 7. Modiola mandannaense Lees. Left valve. GSC No. 9632. Laberge Group, Lower Lias. Laberge area, Yukon.



2a
2b
PLATE III

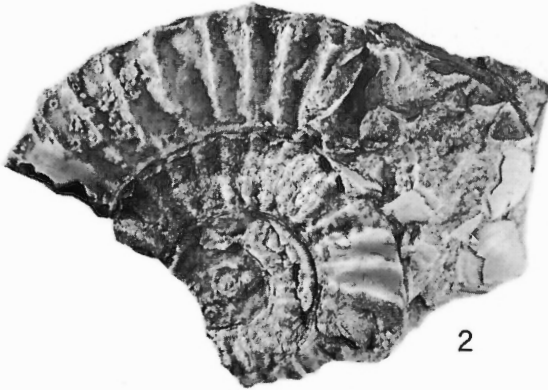
Plate IV

SINEMURIAN

- Figs. 1a, b. Coroniceras bisulcatum (Bruguière). 1a, lateral view of entire specimen, about 1/2 of natural size; 1b, venter. GSC No. 11244. Lower Sinemurian. Last Creek tributary, Tyaughton Lake map-area, British Columbia. See lateral view of part of specimen on Pl. III, fig. 1, cross-section on Pl. II, fig. 6.
- Fig. 2. Arnioceras? sp. indet. Lateral view. University of Alberta collection. Lower Sinemurian. West slope of Cascade Mountain, Banff National Park, Alberta.
- Fig. 3. Arniotites kwakiutlanus Crickmay. Lateral view. GSC No. 13713. Lower Sinemurian. Archibald Creek, Salmo area, British Columbia.



1a



2



3



1b

Plate V

SINEMURIAN AND PLEINSBACHIAN

- Fig. 1. Liparoceras (Becheiceras) cf. bechei (Sowerby). Lateral view. GSC No. 15972. Pliensbachian. South of west end of King Salmon Lake, Tulsequah area, British Columbia. See venter and cross-section on Pl. VI, fig. 1.
- Fig. 2. Gryphaea rockymontana Warren. Lateral view of left valve. GSC No. 12871. Fernie Group. Sinemurian. Crow Phosphate Mine, British Columbia.
- Figs. 3, 4. Oxytoma cygnipes Phillips. Left valves. GSC Nos. 12875, 12872. Fernie Group. Oxytoma bed, top of Nordegg Member, Sinemurian. Top of mountain immediately south of Marble Mountain, Alberta.
- Fig. 5. Arnioceras sp. Lateral view. GSC No. 9641. Laberge Group. Sinemurian. Laberge area, Yukon.
- Fig. 6. Trigonia aff. T. costatula Lycett. Right valve. GSC No. 9635. Laberge Group, Lower Lias. Laberge area, Yukon.
- Fig. 7. Pholadomya donacina Voltz var. obliquitruncata Goldfuss. Left valve. GSC No. 9636. Laberge Group. Lower Lias. Laberge area, Yukon.

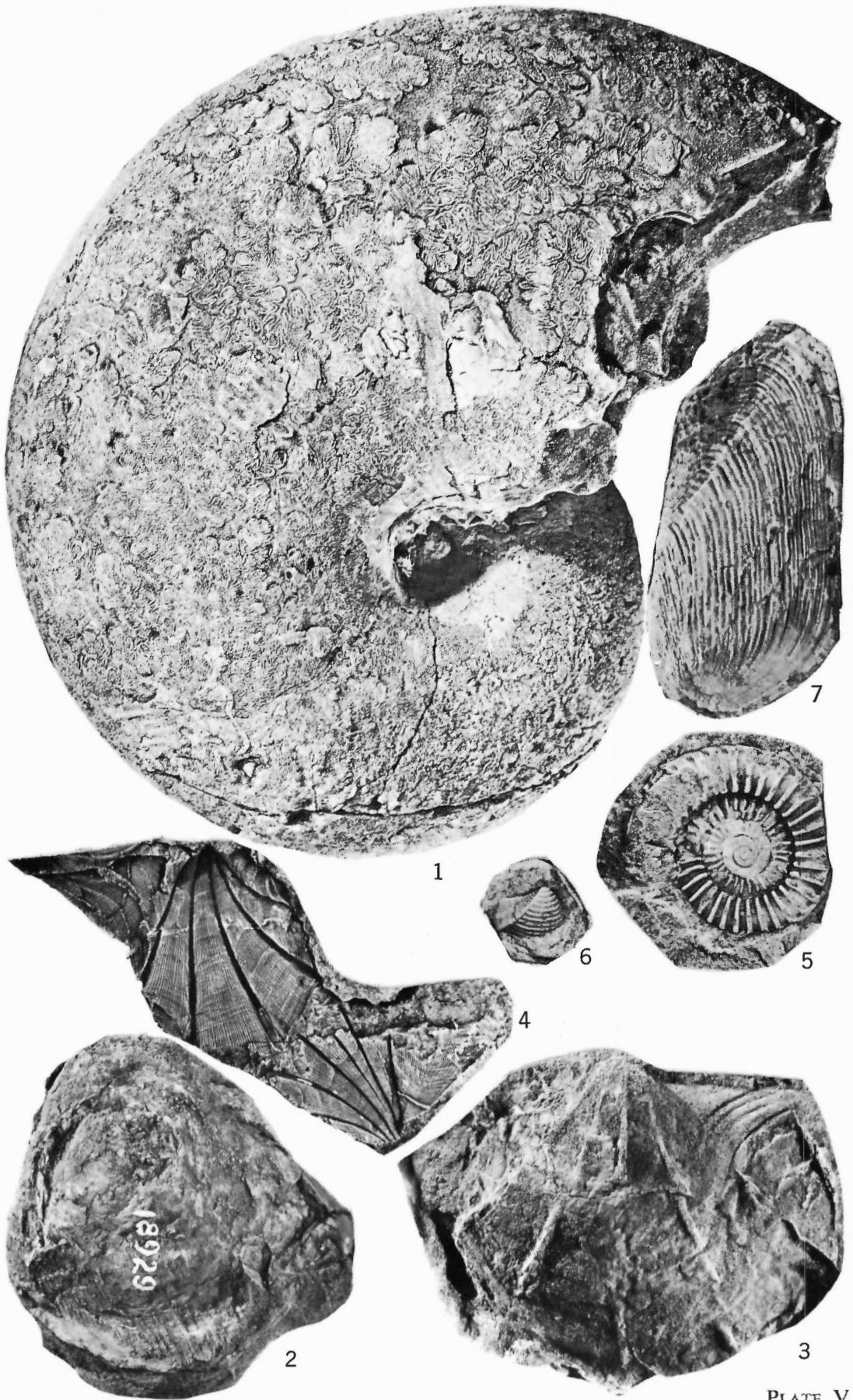


PLATE V

Plate VI

PLIENSBACHIAN

- Fig. 1. Liparoceras (Becheiceras) cf. L. bechei (Sowerby). Cross-section and venter. GSC No. 15972. Pliensbachian. South of west end of King Salmon Lake, Tulsequah area, British Columbia. See lateral view on Pl. V, fig. 1.
- Fig. 2. Arietoceras cf. A. gerardi Monestier. Lateral view. GSC Nos. 15994, 15995. Pliensbachian. South fork of Ball Creek, Telegraph Creek area, British Columbia.
- Fig. 3. Arietoceras algovianum (Opperl). Lateral view. GSC No. 15985. Pliensbachian. Same stratigraphic position and locality as fig. 2.
- Fig. 4. Arietoceras algovianum (Opperl). Venter. GSC No. 15984. Same stratigraphic position and locality as fig. 2.
- Fig. 5. Leptaleoceras pseudoradians (Reynès). Lateral view. GSC No. 15991. Pliensbachian. Same stratigraphic position and locality as fig. 2.
- Fig. 6. Amaltheus stokesi (Sowerby). Lateral view. GSC No. 15976. Pliensbachian. 1/2 mile southwest of Harrison Lake, Tulsequah area, British Columbia.
- Fig. 7. Amaltheus stokesi (Sowerby). Lateral view. GSC No. 15977. Pliensbachian. Grizzly Glacier, Telegraph Creek area, British Columbia.
- Fig. 8. Arietoceras cf. A. algovianum (Opperl). Lateral view. GSC No. 15988. Same stratigraphic position and locality as fig. 7.
- Fig. 9. Productylioceras davoei (Sowerby). Lateral view. GSC No. 15982. Same stratigraphic position and locality as fig. 1.
- Fig. 10. Arietoceras cf. A. algovianum (Opperl). Cross-section and venter. GSC No. 15987. Same stratigraphic position and locality as fig. 7.
- Fig. 11. Leptaleoceras pseudoradians (Reynès). Lateral view. GSC No. 15998. Laberge Group. Pliensbachian. Between Idaho Hill and Mount Bush, Whitehorse Map-area, Yukon.
- Fig. 12. Leptaleoceras pseudoradians (Reynès). Lateral view. GSC No. 15997. Same stratigraphic position and locality as fig. 11.
- Fig. 13. Amaltheus stokesi (Sowerby). Lateral view. GSC No. 15973. Same stratigraphic position and locality as fig. 6.

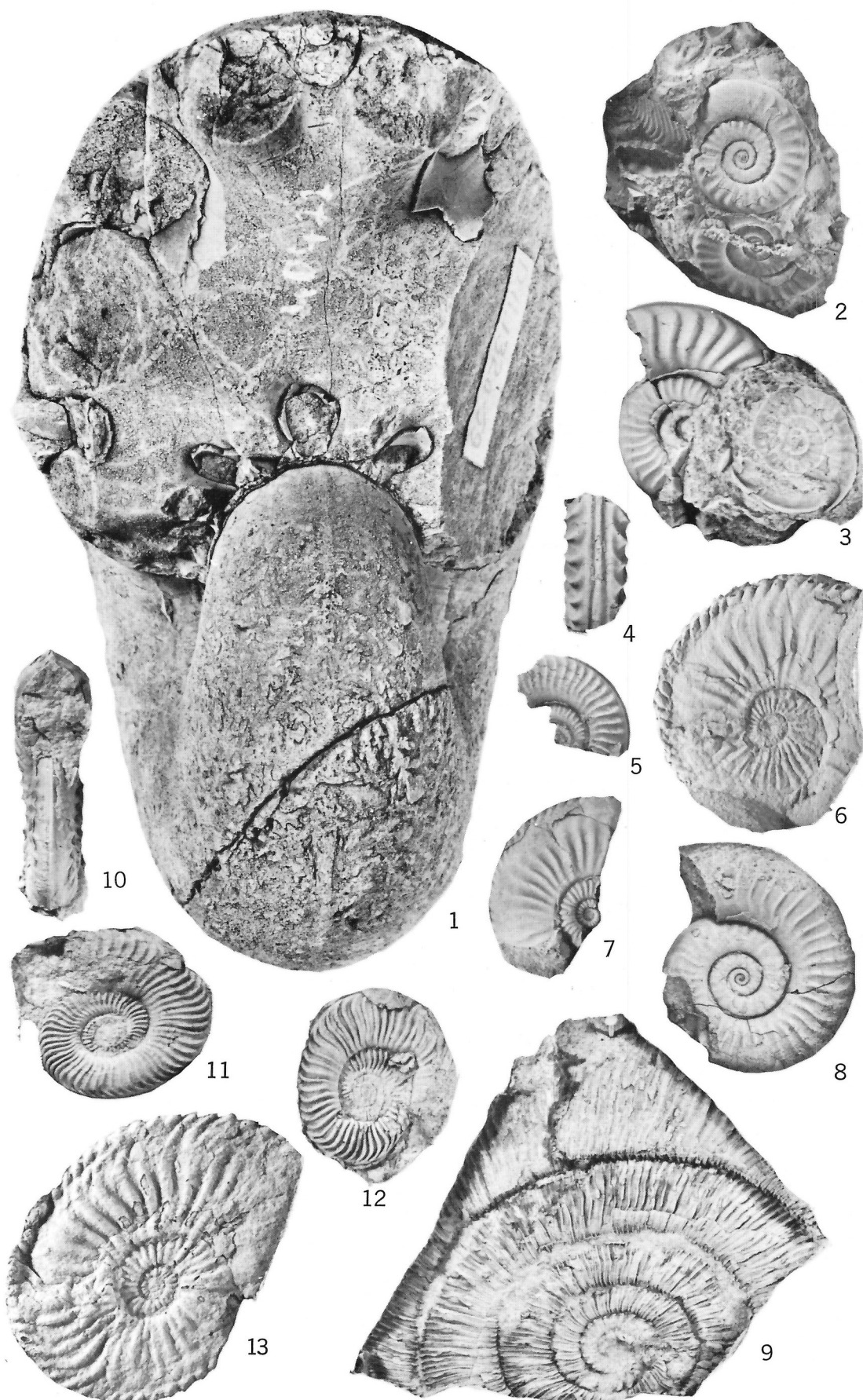


Plate VII

TOARCIAN

- Figs. 1a, b. Dactyloceras kanense McLearn. X2 of natural size. 1a, lateral view; 1b, venter. GSC No. 6485. Maude Formation. Toarcian. Whiteaves Bay, Queen Charlotte Islands.
- Figs. 2a, b. Dactyloceras kanense McLearn. X2 of natural size. 2a, lateral view; 2b, cross-section. GSC No. 6484. Same stratigraphic position and locality as fig. 1.
- Figs. 3a, b. Dactyloceras kanense McLearn. X2 of natural size. 3a, lateral view; 3b, venter. GSC No. 6486. Same stratigraphic position and locality as fig. 1.
- Fig. 4. Dactyloceras kanense McLearn. Lateral view. Holotype, GSC. No. 9051. Same stratigraphic position and locality as fig. 1.
- Figs. 5a, b. Peronoceras cf. subarmatum (Young and Bird). 5a, lateral view; 5b, venter and cross-section. GSC No. 5825. Fernie Group. Toarcian. Upper Red Deer River, Alberta.
- Figs. 6a, b. Dactyloceras commune (Sowerby) var. 6a, lateral view; 6b, venter. GSC No. 13356. Wilkie Point Formation. Toarcian. 1 mile north of Mould Bay weather station, Prince Patrick Island.
- Fig. 7. Dactyloceras commune (Sowerby) var. Lateral view. GSC No. 13359a. Wilkie Point Formation. Toarcian. 3 miles southeast of Mould Bay weather station, Prince Patrick Island.
- Figs. 8a, b, c, d, e. Catacoeloceras spinatum (Frebald). 8a, lateral view; 8b, rubber cast showing spines; 8c, d, venter; 8e, cross-section. Holotype, GSC No. 13361 a-c. Wilkie Point Formation. Toarcian. 3 3/4 miles northeast of Mould Bay weather station, Prince Patrick Island.
- Fig. 9. Dactyloceras commune (Sowerby) var. Venter and cross-section. GSC No. 13357a. Same stratigraphic position and locality as fig. 7.
- Fig. 10. Peronoceras cf. subarmatum Young and Bird. Lateral view. GSC No. 12878. Fernie Group. Toarcian. Opposite George Creek Valley, Alberta.
- Fig. 11. Catulloceras(?) sp. indet. Lateral view. GSC No. 16020, Laberge Group. Probably Upper Toarcian. Lat. 59°36'30"N, Long. 134°16'20"W. Bennett area, British Columbia.
- Figs. 12a, b. Catacoeloceras polare (Frebald). 12a, lateral view; 12b, venter. GSC No. 14644. Toarcian. East of Eureka weather station, Fosheim Peninsula, Ellesmere Island.
- Figs. 13a, b. Catacoeloceras spinatum (Frebald). 13a, lateral view; 13b, venter. Paratype, GSC No. 13364. Same stratigraphic position and locality as fig. 8.
- Fig. 14. Cucullaea sp. Left valve. GSC No. 13373. Same stratigraphic position and locality as fig. 8.
- Fig. 15. Protocardia striatula (Phillips). Right valve. GSC No. 13378. Same stratigraphic position and locality as fig. 8.
- Fig. 16. Cucullaea sp. Left valve. GSC No. 13374. Same stratigraphic position and locality as fig. 8.
- Fig. 17. Pleuromya sp. aff. simplex Warren. Left valve. GSC No. 13375. Wilkie Point Formation. Toarcian. East of Landing Lake, Prince Patrick Island.

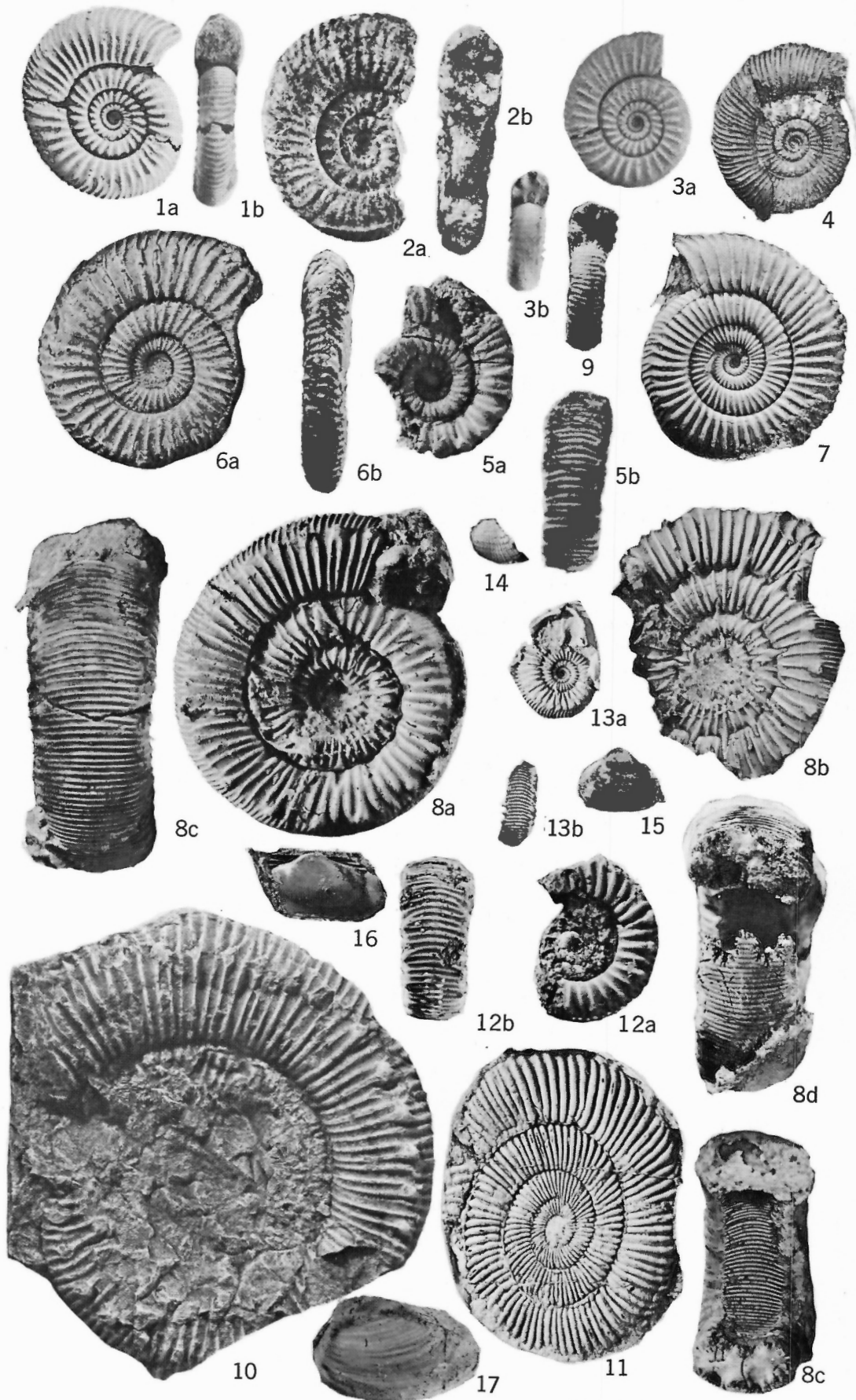
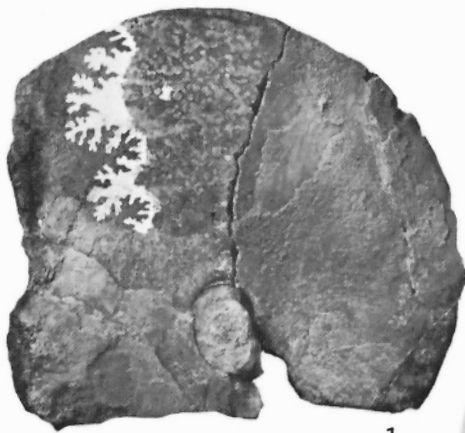


PLATE VII

Plate VIII

TOARCIAN

- Fig. 1. Fanninoceras fannini McLearn. Lateral view. GSC No. 6495. Maude Formation. Toarcian. Ells Bay, Queen Charlotte Islands.
- Figs. 2a, b. Fanninoceras carlottense McLearn. 2a, lateral view; 2b, venter. Holotype, GSC No. 4878. Maude Formation. Toarcian. Probably Ells Bay, Queen Charlotte Islands.
- Fig. 3. Fanninoceras fannini McLearn. Venter. Holotype, GSC No. 9054. Maude Formation. Toarcian. Ells Bay, Queen Charlotte Islands. See lateral view on Pl. IX, fig. 5.
- Figs. 4a, b. Harpoceras propinquum (Whiteaves). 4a, lateral view; 4b, venter. Lectotype, GSC No. 4877. Maude Formation. Toarcian. Probably Whiteaves Bay, Queen Charlotte Islands.
- Figs. 5a, b. Harpoceras allifordense McLearn. 5a, lateral view; 5b, cross-section. Holotype, GSC No. 9053. Maude Formation. Toarcian. Whiteaves Bay, Queen Charlotte Islands.
- Figs. 6a, b. Harpoceras propinquum (Whiteaves). X.59 of natural size. 6a, lateral view; 6b, venter and cross-section. GSC No. 6490. Same stratigraphic position and locality as fig. 5.
- Fig. 7. Harpoceras propinquum (Whiteaves). Lateral view. GSC No. 6491. Same stratigraphic position and locality as fig. 5.
- Fig. 8. Fanninoceras fannini McLearn. Lateral view. Holotype, GSC No. 9054. Same stratigraphic position and locality as fig. 3.



1



3



2a



2b



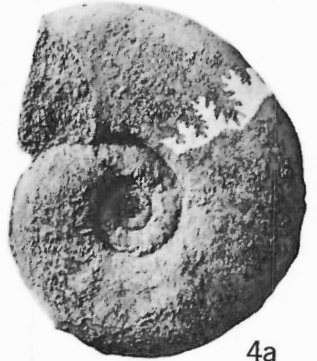
4b



5a



8



4a



5b



6a



6b



7

Plate IX

TOARCIAN AND LOWER BAJOCIAN

- Figs. 1, 2. Harpoceras cf. exaratum Young and Bird. Lateral views. GSC Nos. 12877, 12880. Fernie Group. Toarcian, Canyon Creek, Moose Mountain area, Alberta.
- Fig. 3. Harpoceras sp. X2 of natural size. Lateral view. GSC No. 6489. Maude Formation. Toarcian. Whiteaves Bay, Queen Charlotte Islands.
- Fig. 4. Fanninoceras kunae McLearn var. crassum. Lateral view. Paratype. GSC No. 6517. Maude Formation. Toarcian. Ells Bay, Queen Charlotte Islands.
- Fig. 5. Fanninoceras fannini McLearn. Lateral view. Holotype, GSC No. 9054. Same stratigraphic position and locality as fig. 4. See venter on Pl. VIII, fig. 3.
- Fig. 6. Pleydellia? sp. indet. Lateral view. GSC No. 14672. Jaeger Formation. Lower Bajocian. 2 miles east of Success Point, Cameron Island.
- Figs. 7a, b. Grammoceras? sp. indet. 7a, lateral view; 7b, venter. GSC Nos. 14674, 14676. Toarcian. East of Eureka weather station, Fosheim Peninsula, Ellesmere Island.
- Fig. 8. Grammoceras aff. G. fallaciosum (Bayle). Lateral view. GSC No. 16015. Upper Toarcian. Five Finger Rapids on Lewes River, British Columbia.
- Fig. 9. Grammoceras boreale (Whiteaves). Lateral view. Holotype, GSC No. 9703. Laberge Group. Toarcian. Rink Rapids. Lat 60°20'N, Long. 136°30'W. Yukon.

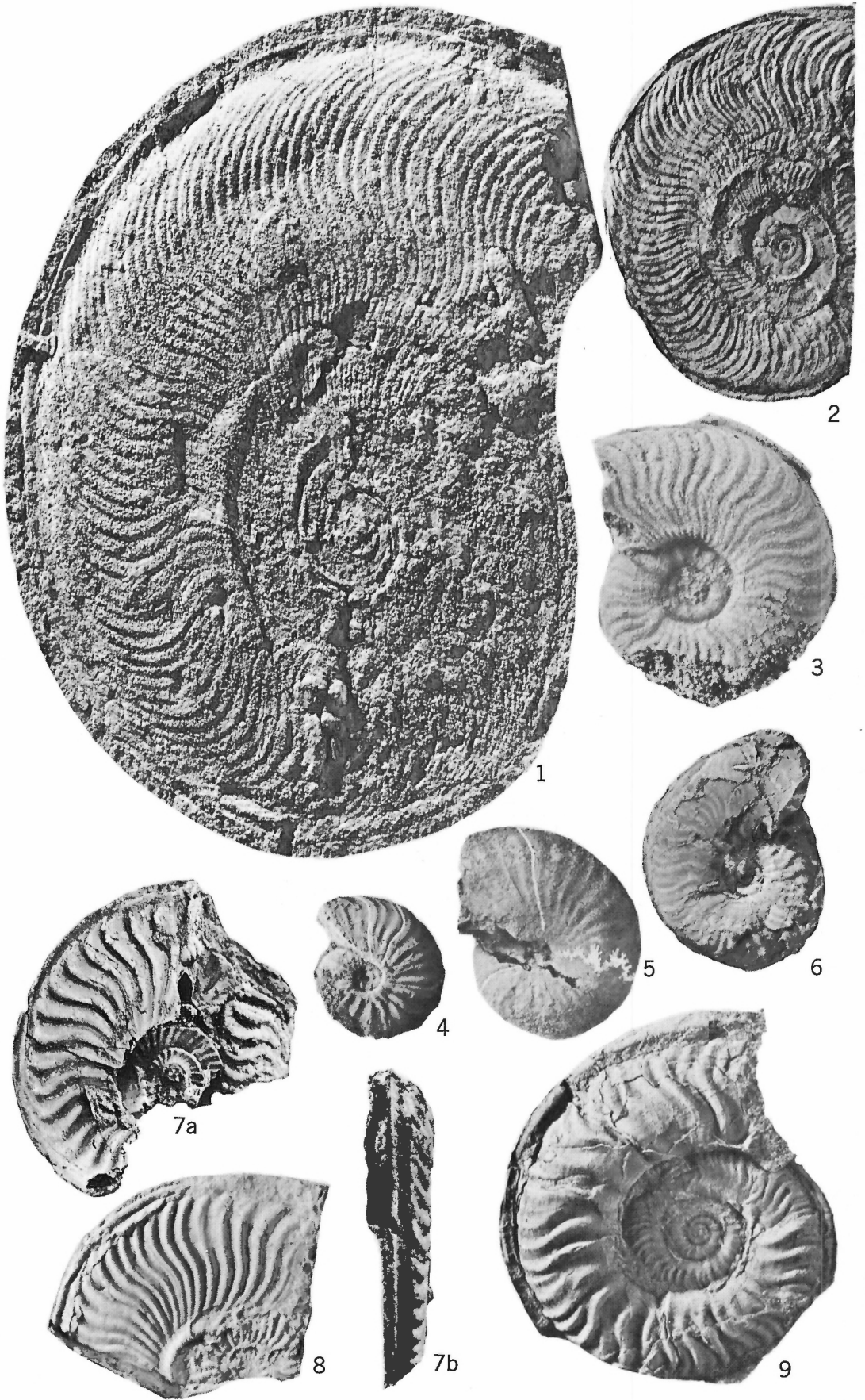


PLATE IX

Plate X

LOWER BAJOCIAN

- Figs. 1, 2, 3a, b, c. Leioceras opalinum (Reinecke). 1, 2, 3a, lateral views; 3b, cross-section of 3a; 3c, venter of 3a. GSC Nos. 13380, 13379, 13384. Wilkie Point Formation. Lower Bajocian. 1 mile east of Wilkie Point, Prince Patrick Island.
- Figs. 4a-8b. Pseudolioceras m'clintocki (Haughton). 4a, 5, 6a, 7, 8a, lateral views; 4b, 6b, 8b, cross-sections and venters. GSC Nos. 14659, 14656, 14654, 14653, 14655. Wilkie Point Formation. Lower Bajocian. About 9 miles east of west coast, Mackenzie King Island.
- Fig. 9. Pseudolioceras cf. m'clintocki (Haughton). Lateral view. GSC No. 14670. Same stratigraphic position and locality as figs. 4a-8b.
- Fig. 10. Leioceras opalinum (Reinecke). Cross-section and venter of a larger specimen. GSC No. 14648. Wilkie Point Formation. Lower Bajocian. North side of Marie Bay, Melville Island.
- Figs. 11, 12a, b. Oxytoma jacksoni (Pompeckj). 11, left valve; 12a, exterior right valve; 12b, inner side of 12a. GSC Nos. 13389, 13390. Wilkie Point Formation. Lower Bajocian. East side of Intrepid Inlet, 10 miles north of Cape Canning, Prince Patrick Island.

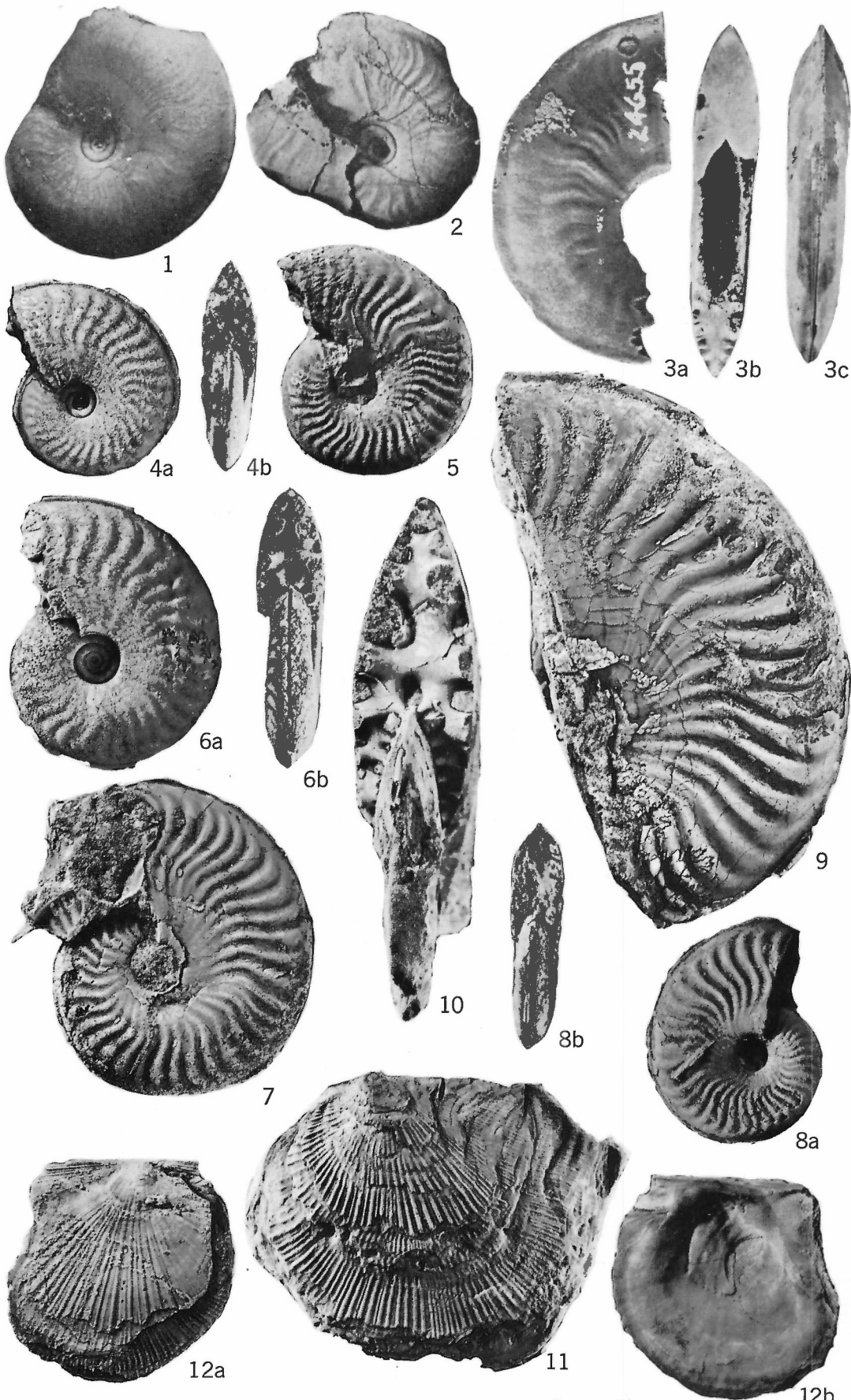


PLATE X

Plate XI

LOWER BAJOCIAN

- Figs. 1a, b. Pseudolioceras cf. m'clintocki (Haughton). 1a, lateral view; 1b, cross-section and venter. GSC No. 14661. Wilkie Point Formation. Lower Bajocian. About 9 miles east of west coast, Mackenzie King Island.
- Fig. 2. Leioceras opalinum (Reinecke). Lateral view. GSC No. 13381. Wilkie Point Formation. Lower Bajocian. 1 mile east of Wilkie Point, Prince Patrick Island.
- Figs. 3, 4. Tmetoceras regleyi Dumortier. 3, lateral view; 4, venter of small specimen enlarged. GSC No. 11215. Lower Bajocian. Northwest ridge of Troitsa Peak, Whitesail Lake area, British Columbia.
- Fig. 5. Oxytoma jacksoni (Pompeckj). GSC No. 13391. Wilkie Point Formation. Lower Bajocian. East side of Intrepid Inlet, Prince Patrick Island.
- Fig. 6. Oxytoma septentrionalis (Haughton). Left valve. GSC No. 13394. Wilkie Point Formation. Lower Bajocian. 1 mile east of Wilkie Point, Prince Patrick Island.
- Fig. 7. Goniomya cf. v. scripta (Sowerby). Left valve. GSC No. 13396. Same stratigraphic position and locality as fig. 6.
- Fig. 8. Erycites cf. E. howelli (White). Venter. GSC No. 15139. Probably lower Bajocian. About 12 miles west-southwest of Bonny Lake, Yukon.



1a



1b



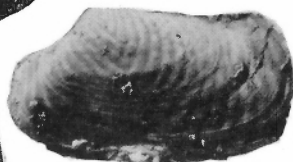
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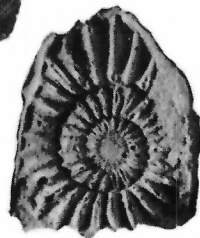
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8



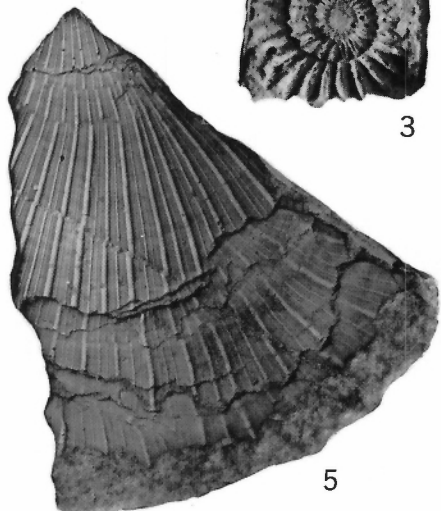
7



3



4



5

Plate XII

MIDDLE BAJOCIAN

- Fig. 1. Guhsania bella McLearn. Lateral view. Holotype, GSC No. 7710. Talus of the middle sedimentary division of Hazelton Group. Middle Bajocian. 1 mile southeast of Silver Lake, Hudson Bay Mountain, British Columbia.
- Figs. 2a, b. Sonninia gracilis (Whiteaves). 2a, lateral view; 2b, cross-section. Holotype, GSC No. 4809. Fernie Group. Middle Bajocian. 3 miles north of Devils Point, Lake Minnewanka, Alberta.
- Figs. 3a, b. Sonninia sp. indet. 2a, lateral view; 2b, cross-section and part of venter. GSC No. 12882. Same stratigraphic position and locality as fig. 2.

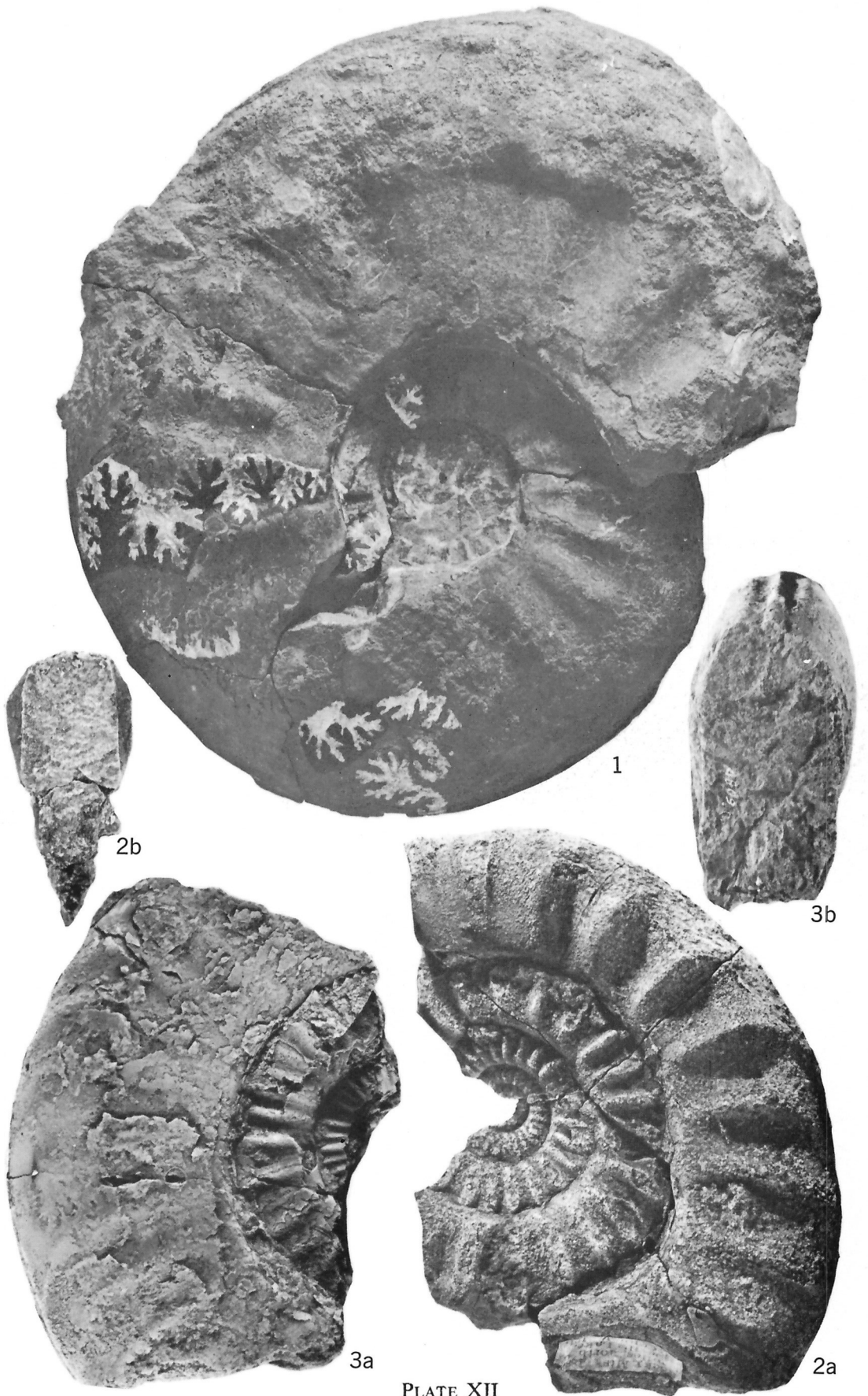
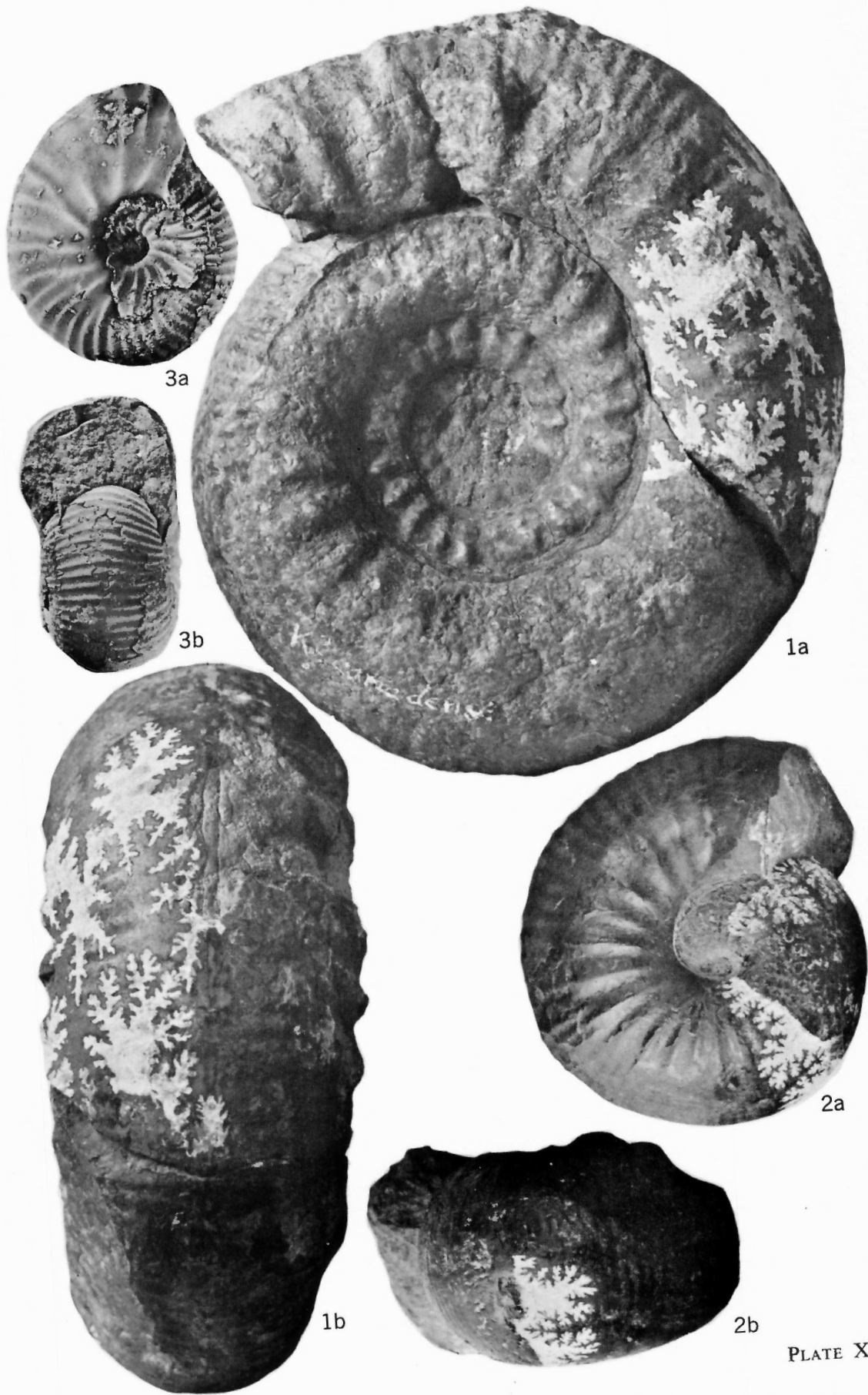


PLATE XII

Plate XIII

MIDDLE BAJOCIAN

- Figs. 1a, b. Stemmatoceras palliseri McLearn. 1a, lateral view; 1b, venter. Holotype, Univ. Alberta collections, Jr. 115. Fernie Group, Rock Creek Member. Middle Bajocian. Upper Whitehorse River, Mountain Park area, Alberta.
- Figs. 2a, b. Chondroceras defontii (McLearn). 2a, lateral view; 2b, venter. Holotype, GSC No. 9009. Lower Yakoun Formation. Middle Bajocian. Richardson Bay. South side of Maude Island. Queen Charlotte Islands.
- Figs. 3a, b. Chondroceras allani (McLearn) var. 3a, lateral view; 3b, venter. GSC No. 12893. Fernie Group, Rock Creek Member. Middle Bajocian. Ribbon Creek, Alberta.



3a

3b

1a

2a

1b

2b

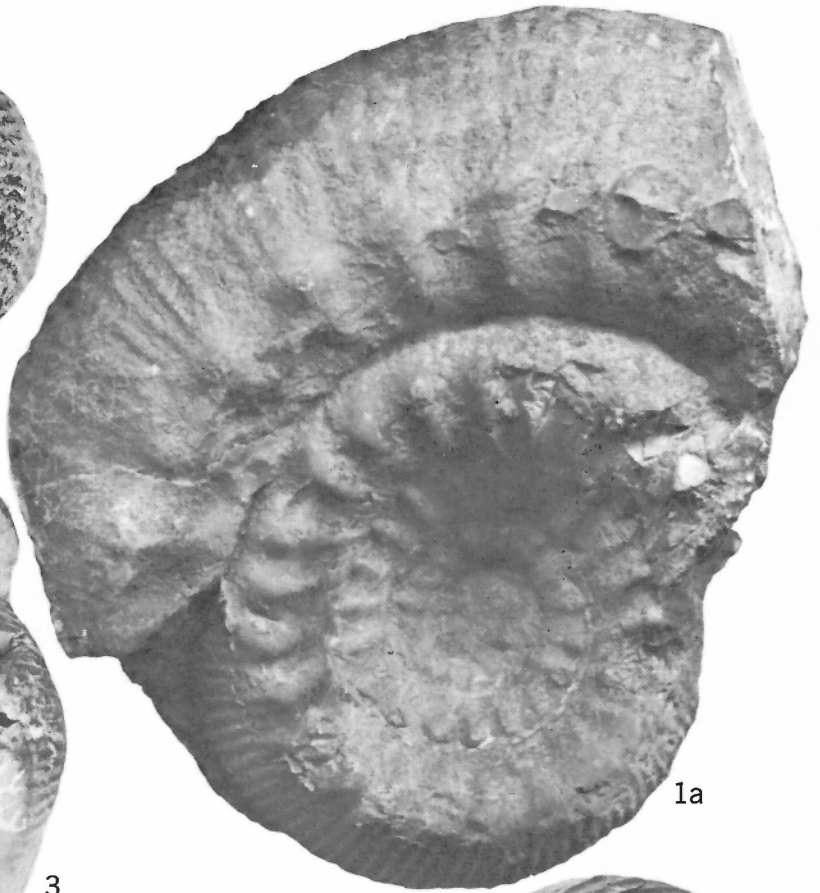
Plate XIV

MIDDLE BAJOCIAN

- Figs. 1a, b. Teloceras dowlingi McLearn. 1a, lateral view; 1b, venter and suture line of penultimate whorl. Holotype, GSC No. 9050. Fernie Group, Rock Creek Member. Middle Bajocian. Kananaskis River, Alberta.
- Figs. 2a, b. Chondroceras marshalli (McLearn) var. 2a, lateral view; 2b, cross-section and venter. GSC No. 12891. Fernie Group, Rock Creek Member. Middle Bajocian. Ribbon Creek, Alberta.
- Fig. 3. Chondroceras colnetti (McLearn). Oblique view. Holotype, GSC No. 9012. Lower Yakoun Formation. Middle Bajocian. Richardson Bay. South side of Maude Island, Queen Charlotte Islands.
- Figs. 4a, b. Chondroceras ellsii (McLearn). 4a, lateral view; 4b, oblique view. Holotype, GSC No. 9013. Same stratigraphic position and locality as fig. 3.



2a



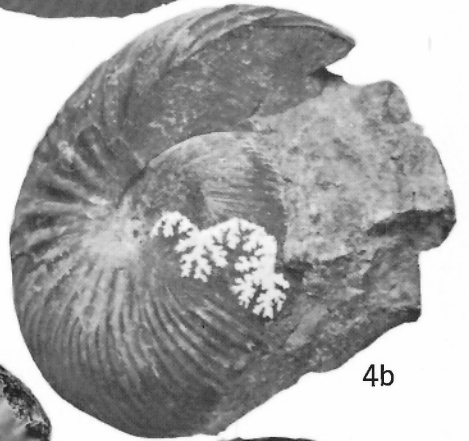
1a



3



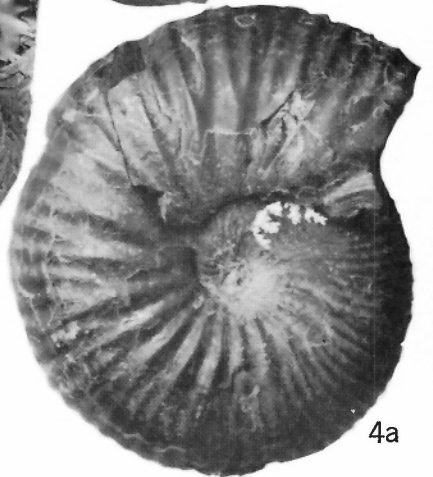
1b



4b



2b



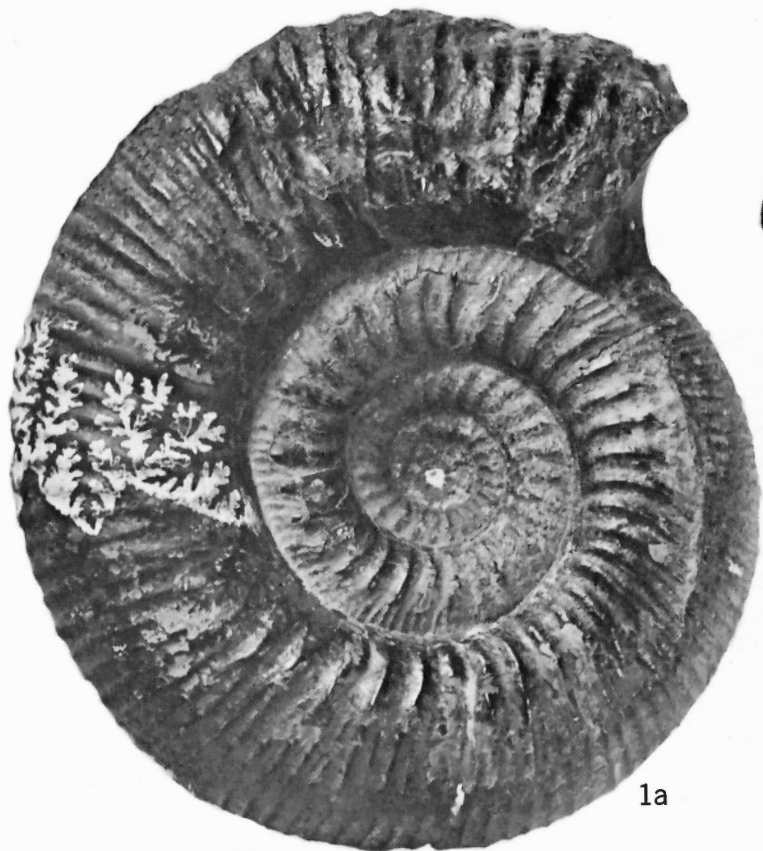
4a

Plate XV

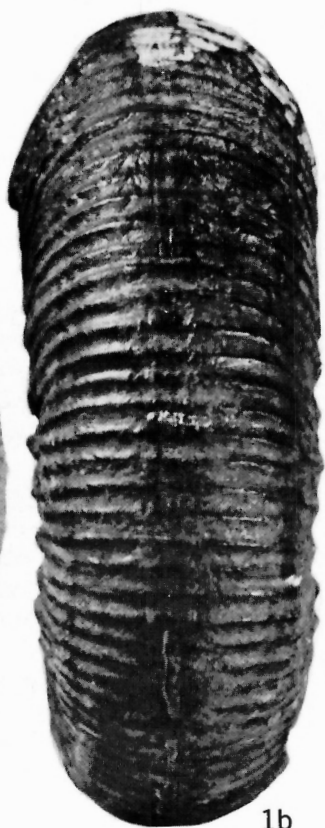
MIDDLE BAJOCIAN

Figs. 1a, b. Stephanoceras caamanoi McLearn. 1a, lateral view; 1b, venter. Holotype, GSC No. 9056. Lower part of Yakoun Formation. Middle Bajocian. Logan Island, Queen Charlotte Islands.

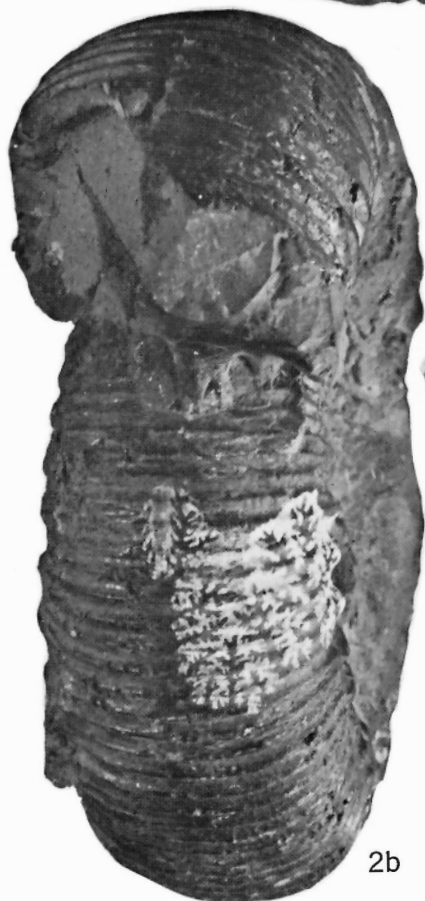
Figs. 2a, b. Stephanoceras skidegatense (Whiteaves). 2a, lateral view (\times nearly $1/2$); 2b, venter (anterior part of last whorl removed). Holotype, GSC No. 5011. Probably lower part of Yakoun Formation. Middle Bajocian. Skidegate Inlet, Queen Charlotte Islands.



1a



1b



2b



2a

Plate XVI

MIDDLE BAJOCIAN

- Fig. 1. Zemistephanus richardsoni (Whiteaves). Lateral view. GSC No. 9006. Lowest part of Yakoun Formation. Middle Bajocian. Northeast shore Mackenzie Bay. Northwest shore of Maude Island, Queen Charlotte Islands.
- Fig. 2. Chondroceras oblatum (Whiteaves). Lateral view. Holotype, GSC No. 4964. Probably lower part of Yakoun Formation. Middle Bajocian. Richardson Bay, south side of Maude Island, Queen Charlotte Islands.
- Figs. 3a, b. Normannites canadensis (McLearn). 3a, lateral view; 3b, venter. Holotype, GSC No. 9019. Lower Yakoun Formation. Middle Bajocian. Mackenzie Bay, north side of Maude Island, Queen Charlotte Islands.
- Fig. 4. Normannites itinsae (McLearn). Lateral view. Holotype, GSC No. 9020. Yakoun Formation. Middle Bajocian. Southernmost of Channel Islands, Skidegate Inlet, Queen Charlotte Islands.
- Figs. 5a, b, c. Normannites mackenzii (McLearn). 5a, lateral view; 5b, venter; 5c, venter, anterior part of last whorl. Holotype, GSC No. 9017. Same stratigraphic position and locality as fig. 3.
- Figs. 6a, b. Normannites altus (McLearn). 6a, lateral view; 6b, venter of penultimate whorl. Holotype, GSC No. 9018. Same stratigraphic position and locality as fig. 3.

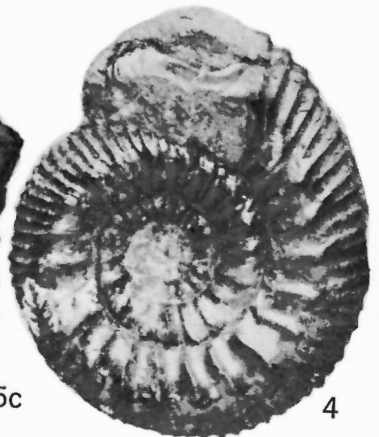
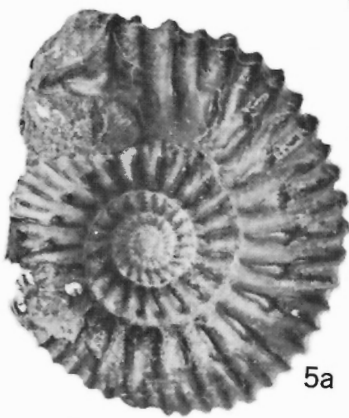
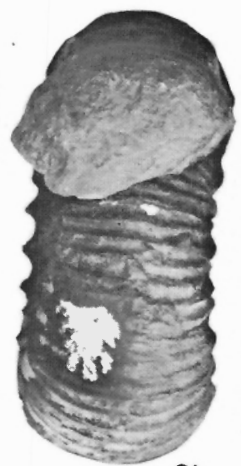
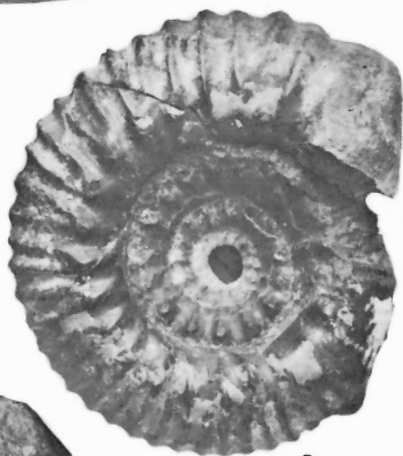
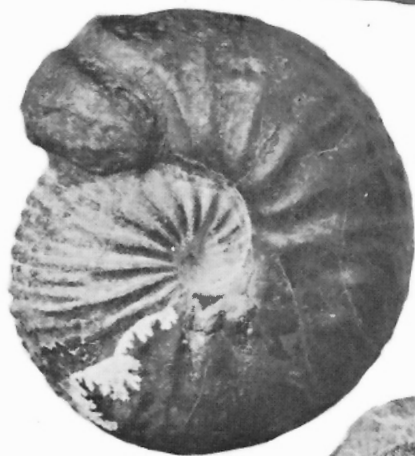


PLATE XVI

Plate XVII

MIDDLE BAJOCIAN AND ?BATHONIAN

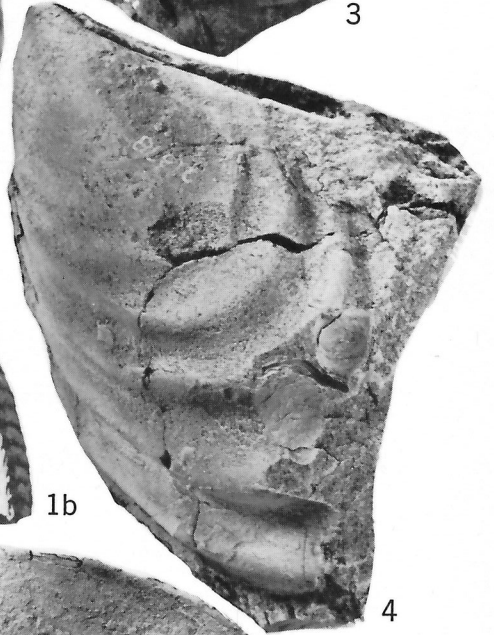
- Figs. 1a, b. Stephanoceras yakounense McLearn. 1a, lateral view; 1b, suture line. GSC No. 6483. Lower part of Yakoun Formation, Middle Bajocian. Skidegate Inlet, Queen Charlotte Islands.
- Figs. 2a, b. Oppelia (Oxycerites) ex gr. fallax (Gueranger) et aspidoides (Oppel). 2a, lateral view; 2b, cross-section and venter. Geol. Dept., Univ. of Alberta. Fernie Group. Bathonian? Headwaters of Smoky River. On Sulphur River, Alberta.
- Fig. 3. Gryphaea cadominensis Warren. Left valve. GSC No. 12894. Fernie Group, Rock Creek Member, Middle Bajocian. Whitehorse River. 4 miles north of Rocky Mountain Park, Alberta.
- Fig. 4. Inoceramus ferniensis Warren. Left valve. GSC No. 18007. Fernie Group, Rock Creek Member. Middle Bajocian. Oldman River Gap. Livingstone Range, Alberta.
- Fig. 5. Oxytoma mclearnii Warren. Left valve. GSC No. 18008. Fernie Group, Rock Creek Member. Middle Bajocian. 1/2 mile east of Burns' coal mine, Alberta.



1a



3



4



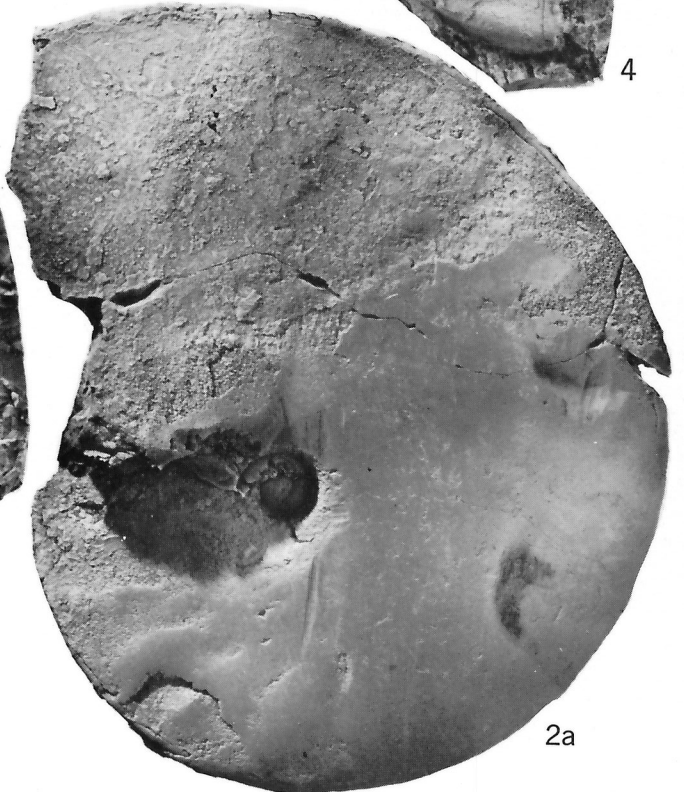
5



1b



2b



2a

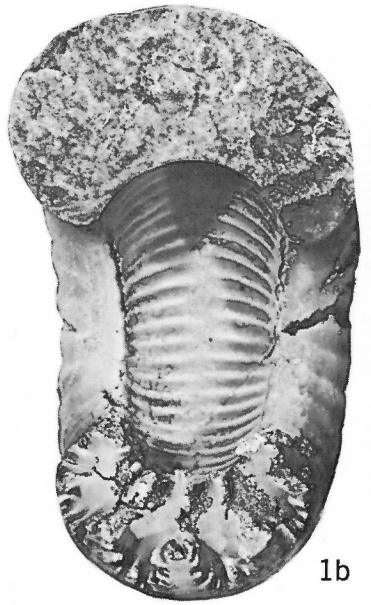
Plate XVIII

APPROXIMATELY BAJOCIAN-BATHONIAN BOUNDARY

- Figs. 1a,b,c. Arkelloceras tozeri Frebold. 1a, lateral view; 1b, cross-section and imprint of venter of penultimate whorl; 1c, venter of last whorl; Paratype, GSC No. 13407. Wilkie Point Formation, Arkelloceras bed. Approximately Bajocian-Bathonian boundary. 10 miles north of Cape Canning, east side of Intrepid Inlet, Prince Patrick Island.
- Figs. 2a,b,c,d. Arkelloceras tozeri Frebold. 2a, lateral view; 2b, lateral view of inner whorls; 2c, venter of 2b; 2d, rubber cast of penultimate whorl. Holotype, GSC No. 13404a. Same stratigraphic position and locality as fig. 1.
- Figs. 3a, b. Arkelloceras tozeri Frebold. Rubber cast. 3a, lateral view; 3b, venter. Paratype, GSC No. 13405. Same stratigraphic position and locality as fig. 1.
- Figs. 4a, b. Arkelloceras mclearnii Frebold. 4a, lateral view of young specimen; 4b, venter of 4a. Paratype, GSC No. 13412. Same stratigraphic position and locality as fig. 1.
- Fig. 5. Arkelloceras mclearnii Frebold. Rubber cast. Venter of young specimen. Paratype, GSC No. 13414. Same stratigraphic position and locality as fig. 1.



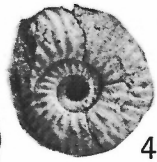
1a



1b



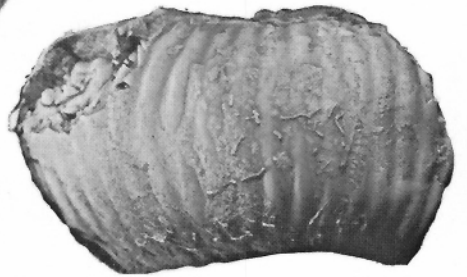
1c



4a



4b



2d



2b

2c

2a



3a



3b



5

Plate XIX

APPROXIMATELY BAJOCIAN-BATHONIAN BOUNDARY

- Figs. 1a, b, c. Arkelloceras tozeri Frebold. 1a, lateral view; 1b, cross-section; 1c (plaster cast), venter of penultimate whorl. Paratype, GSC No. 13409. Wilkie Point Formation, Arkelloceras bed. Approximately Bajocian-Bathonian boundary. 10 miles north of Cape Canning. East side of Intrepid Inlet, Prince Patrick Island.
- Figs. 2a, b, c, d, e. Arkelloceras mclearnii Frebold. 2a, lateral view (without inner whorls); 2b, lateral view of inner whorls; 2c, venter of inner whorl; 2d, venter of inner whorl; 2c, enlarged 2X; 2e, venter of penultimate whorl. Paratype, GSC No. 13411. Same stratigraphic position and locality as fig. 1.
- Figs. 3a, b. Arkelloceras tozeri Frebold. 3a, cross-section; 3b, venter of penultimate whorl (rubber cast). Paratype, GSC No. 13408. Same stratigraphic position and locality as fig. 1.
- Figs. 4a, b, c. Arkelloceras mclearnii Frebold. 4a, lateral view; 4b, venter; 4c, cross-section and venter of inner whorl. Holotype, GSC No. 13410. Same stratigraphic position and locality as fig. 1.
- Figs. 5a, b. Arkelloceras tozeri Frebold. 5a, lateral view; 5b, venter. Paratype, GSC No. 15143. Wilkie Point Formation, Arkelloceras bed. Approximately Bajocian-Bathonian boundary. 11-12 miles north of Cape Canning, Prince Patrick Island.
- Figs. 6a, b. Arkelloceras tozeri Frebold. 6a, lateral view; 6b, venter. Paratype, GSC No. 15141. Same stratigraphic position and locality as fig. 5.
- Fig. 7. Arkelloceras tozeri Frebold. Venter. Paratype, GSC No. 15140. Same stratigraphic position and locality as fig. 5.

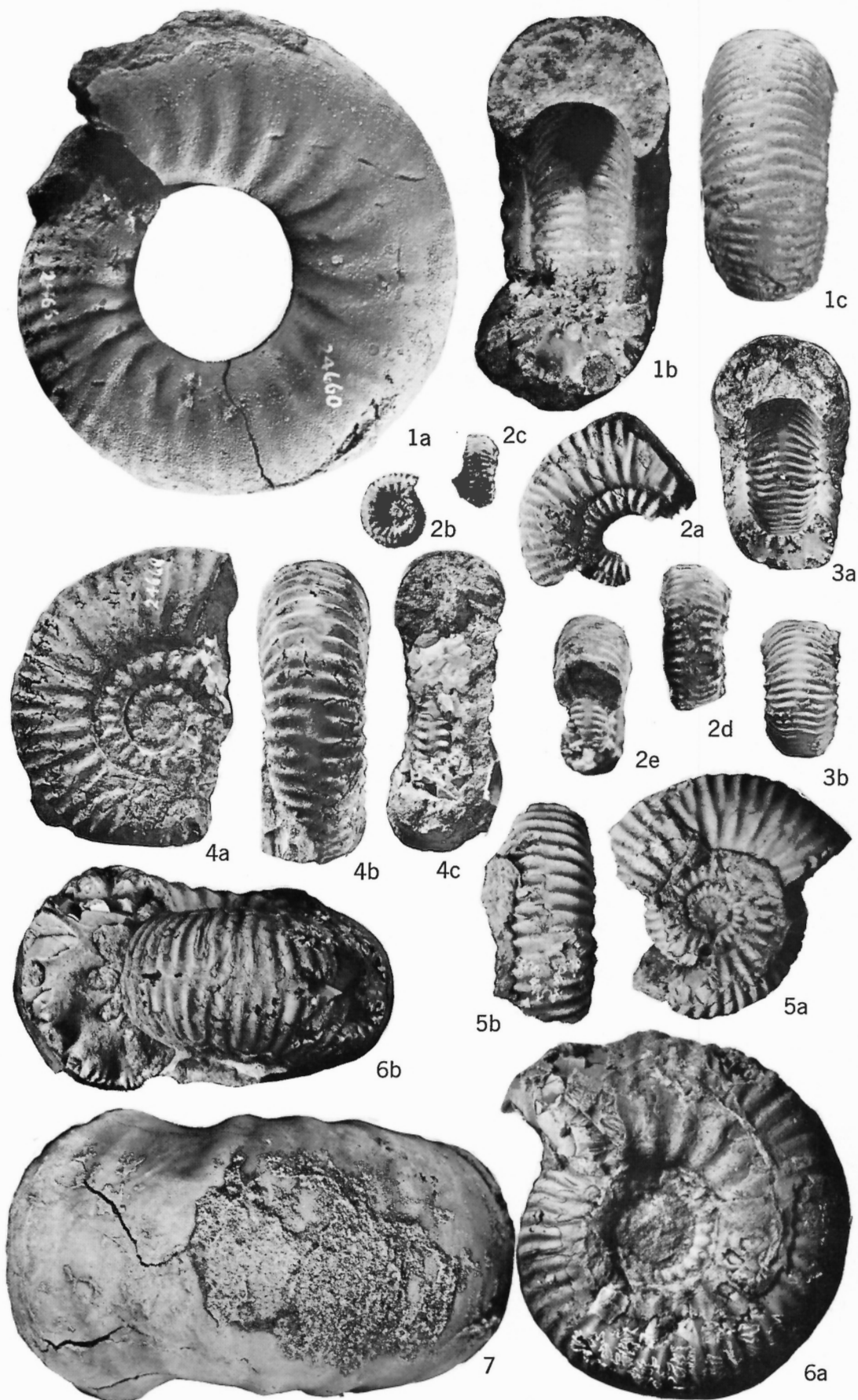


PLATE XIX

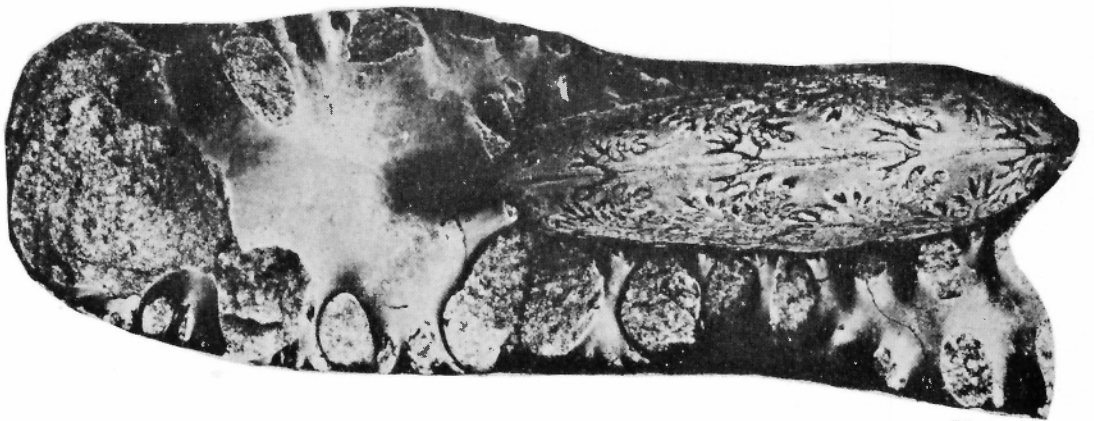
Plate XX

APPROXIMATELY BAJOCIAN-BATHONIAN BOUNDARY

Figs. 1a, b. Zetoceras thorsteinssoni Frebold. 1a, lateral view, X 1 1/2; 1b, cross-section and venter. Holotype, GSC No. 15144. Wilkie Point Formation. Arkelloceras bed. Approximately Bajocian-Bathonian boundary. Intrepid Inlet, 10 miles north of Cape Canning, Prince Patrick Island.



1a



1b

Plate XXI

APPROXIMATELY BAJOCIAN-BATHONIAN BOUNDARY

- Figs. 1a, b, c. Inoceramus lucifer Eichwald. 1a, right valve; 1b, left valve; 1c, front view. GSC No. 13417. Wilkie Point Formation, talus from Arkelloceras bed. Approximately Bajocian-Bathonian boundary. 10 miles north of Cape Canning, east side of Intrepid Inlet, Prince Patrick Island.
- Fig. 2. Inoceramus lucifer Eichwald. Right valve. GSC No. 13423. Same stratigraphic position and locality as fig. 1.
- Figs. 3a, b. Inoceramus lucifer Eichwald. 3a, left valve; 3b, right valve. GSC No. 13416. Same stratigraphic position and locality as fig. 1.



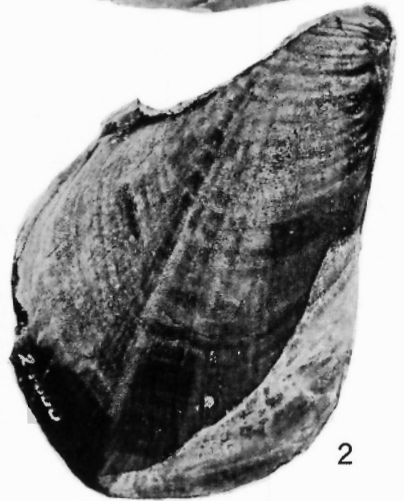
1a



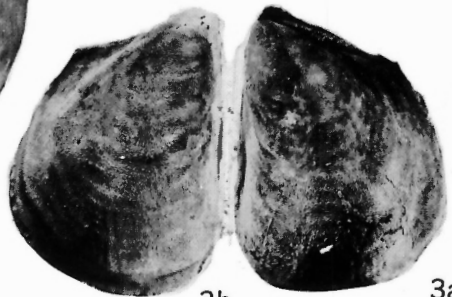
1b



1c



2



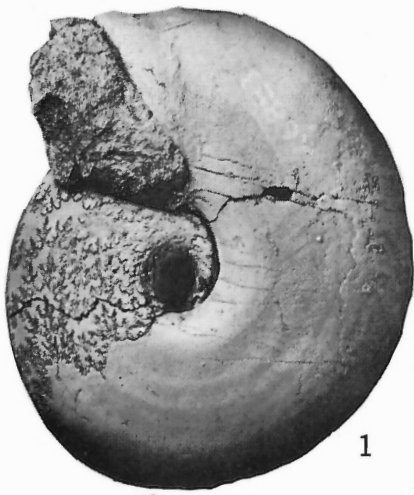
3b

3a

Plate XXII

UPPER BAJOCIAN AND LOWER BATHONIAN

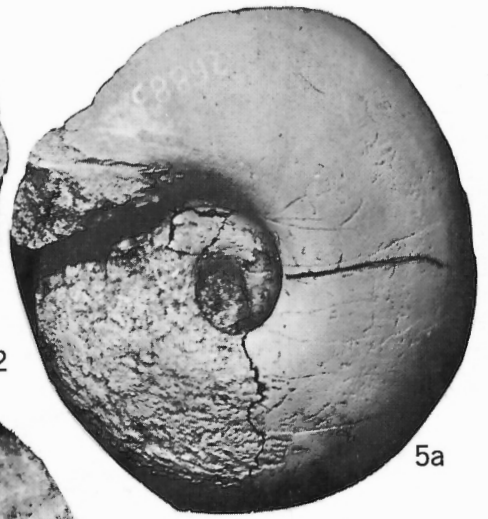
- Fig. 1. Cranocephalites borealis (Spath). Lateral view. GSC No. 15104. Bug Creek Formation. Upper Bajocian. Bug Creek Canyon, Aklavik Range, N. W. T.
- Fig. 2. Cranocephalites borealis (Spath). Cross-section. GSC No. 15101. Same stratigraphic position and locality as fig. 1.
- Fig. 3. Cranocephalites borealis (Spath). Lateral view. GSC No. 15103. Same stratigraphic position and locality as fig. 1.
- Fig. 4. Cranocephalites borealis (Spath). Cross-section and venter. GSC No. 15102. Same stratigraphic position and locality as fig. 1.
- Figs. 5a, b. Cranocephalites warreni Frebold. 5a, lateral view; 5b, cross-section and venter of penultimate whorl. GSC No. 15105. Same stratigraphic position and locality as fig. 1.
- Figs. 6a, b, c. Cranocephalites vulgaris Spath. 6a, lateral view; 6b, venter; 6c, venter of preceding whorl. GSC No. 13401. Wilkie Point Formation. In Talus. Lower Bathonian. 3 miles S30°W east of Mould Bay weather station, Prince Patrick Island.
- Figs. 7a, b, c. Cranocephalites vulgaris Spath. 7a, lateral view; 7b, cross-section and venter; 7c, venter. GSC No. 13398. Same stratigraphic position and locality as fig. 6.



1



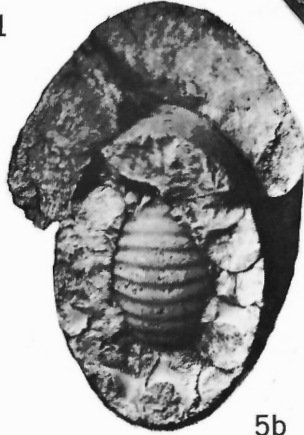
2



5a



3



5b



6a



7b



7a



6b



7c



6c



4

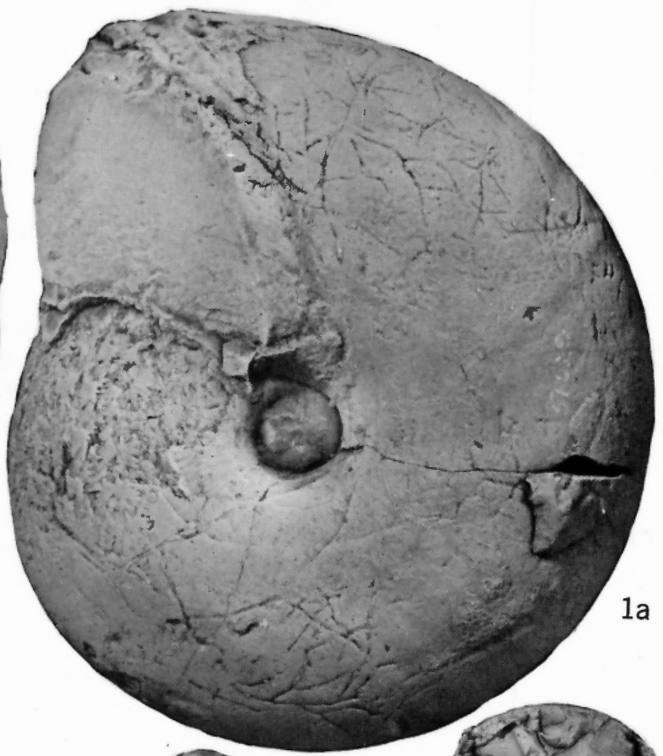
Plate XXIII

MIDDLE BATHONIAN

- Figs. 1a, b. Arctocephalites elegans Spath. 1a, lateral view; 1b, cross-section and venter. GSC No. 17644. Savik Formation. Arctocephalites bed. Middle Bathonian. Strand Fiord, Axel Heiberg Island.
- Figs. 2a, b. Arctocephalites elegans Spath. 2a, lateral view; 2b, cross-section and venter. GSC No. 17640. Same stratigraphic position and locality as fig. 1.
- Figs. 3a, b. Arctocephalites callomoni Frebold. 3a, lateral view; 3b, cross-section and venter. Paratype, GSC No. 17642. Same stratigraphic position and locality as fig. 1.
- Fig. 4. Arctocephalites elegans Spath. Ventral view of mouth. GSC No. 17646. Same stratigraphic position and locality as fig. 1.



1b



1a



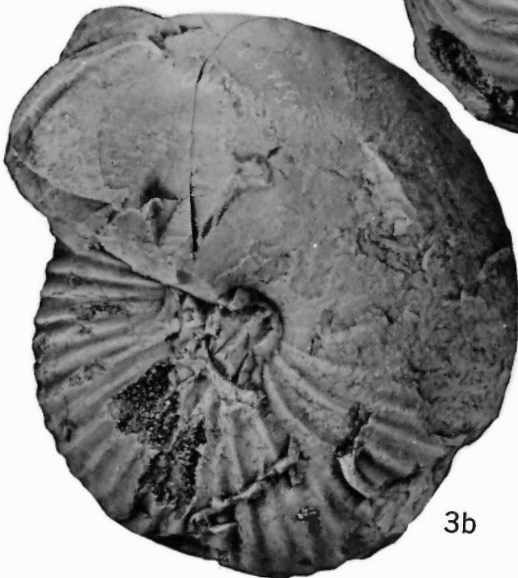
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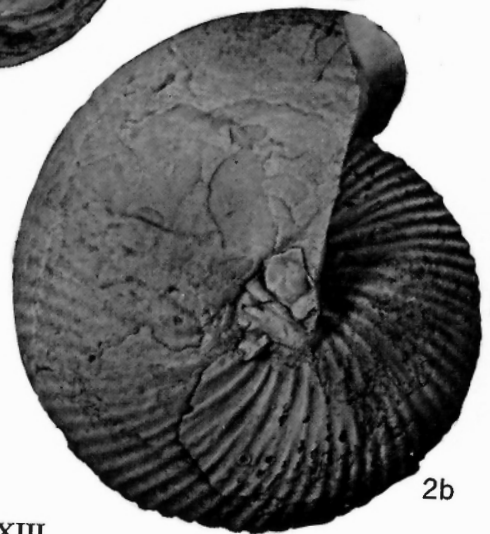
3a



2a



3b

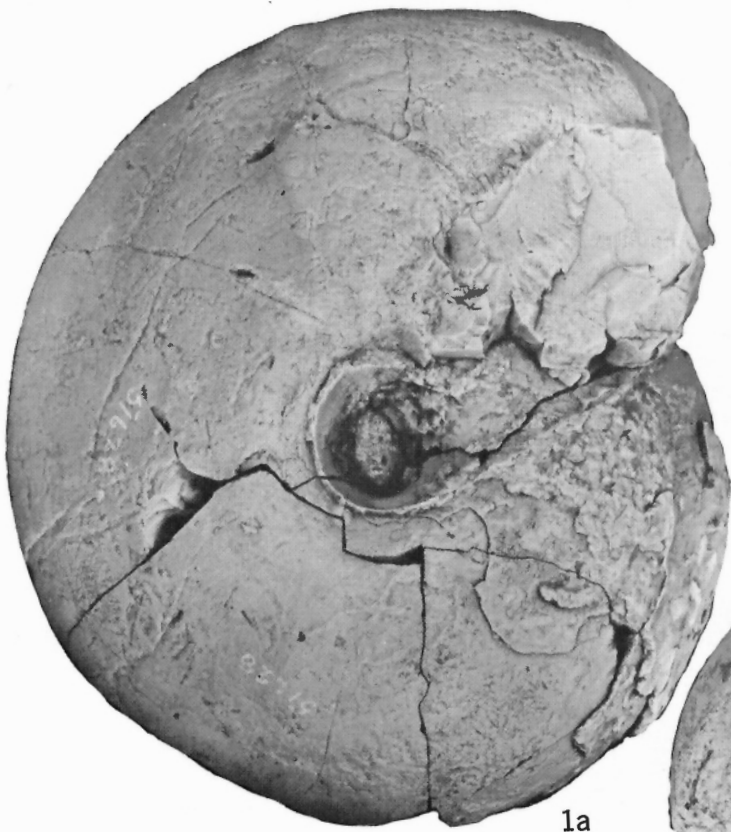


2b

Plate XXIV

MIDDLE AND UPPER BATHONIAN

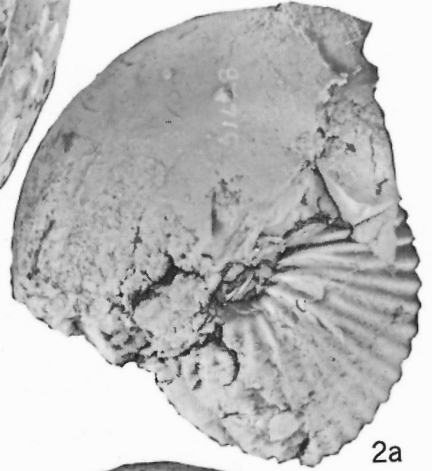
- Figs. 1a, b. Arctocephalites callomoni Frebold. 1a, lateral view; 1b, venter and cross-section. Holotype, GSC No. 17647. Savik Formation, Arctocephalites bed. Middle Bathonian. Strand Fiord, Axel Heiberg Island.
- Figs. 2a, b. Arctocephalites cf. arcticus (Newton). 2a, lateral view; 2b, venter and cross-section. GSC No. 17641. Same stratigraphic position and locality as fig. 1.
- Fig. 3. Arcticoceras ishmae (Keyserling). Lateral view. GSC No. 15121. Wilkie Point Formation. Upper Bathonian. East side of Intrepid Inlet, 10 miles north of Cape Canning, Prince Patrick Island.
- Figs. 4a, b. Arcticoceras ishmae (Keyserling). 4a, lateral view; 4b, venter. GSC No. 1512a. Same stratigraphic position and locality as fig. 3.



1a



2b



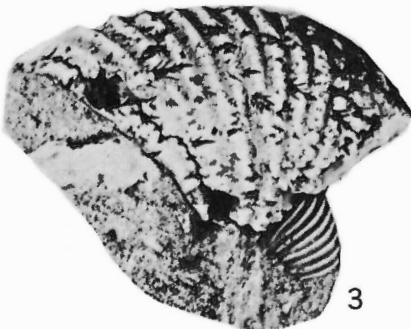
2a



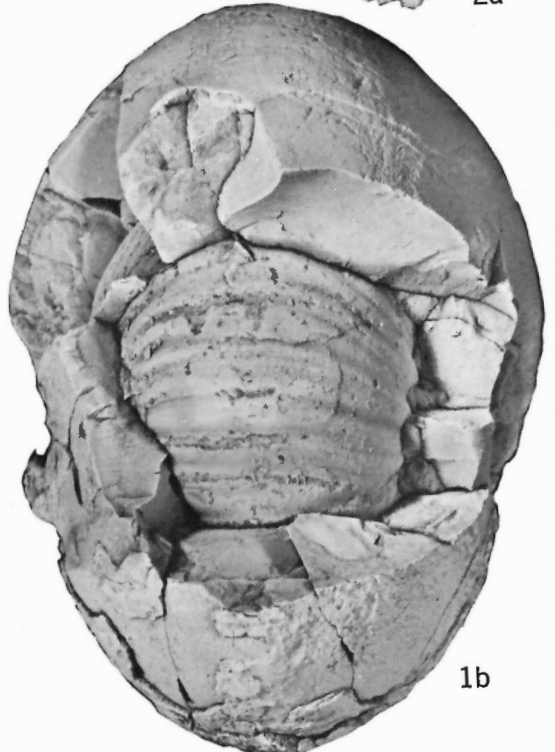
4a



4b



3



1b

Plate XXV

UPPER BATHONIAN - LOWER CALLOVIAN

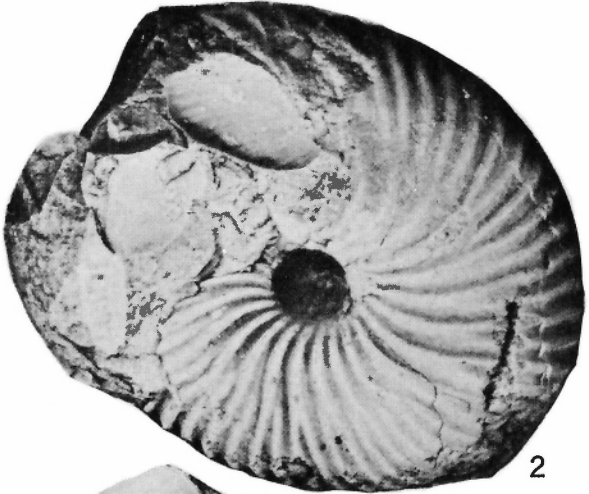
- Figs. 1a, b. Arcticoceras kochi Spath. 1a, lateral view; 1b, venter. GSC No. 15116. Upper Bathonian. Porcupine River, about 9 miles downstream from mouth of Bell River.
- Fig. 2. Arcticoceras kochi Spath. Lateral view. GSC No. 15118. Upper Bathonian. Porcupine River, north of confluence with Bell River.
- Fig. 3. Haidaia billhookensis Crickmay. Left valve. Holotype, GSC No. 9681a. Lower Callovian. Billhook Creek, Harrison Lake area.
- Fig. 4. Haidaia packardi Crickmay. Right valve. Holotype, GSC No. 9682a. .73 of natural size. Lower Callovian. Billhook Creek, Harrison Lake area.
- Fig. 5. Haidaia statluensis Crickmay. Holotype, GSC No. 9673a. .73 of natural size. Lower Callovian. Billhook Creek, Harrison Lake area.



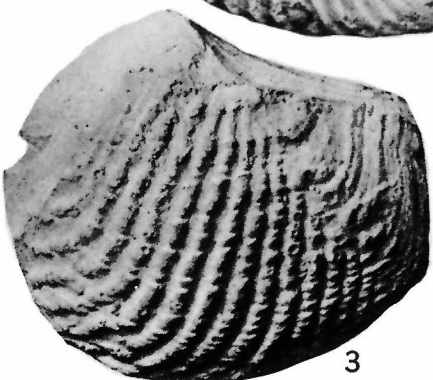
1a



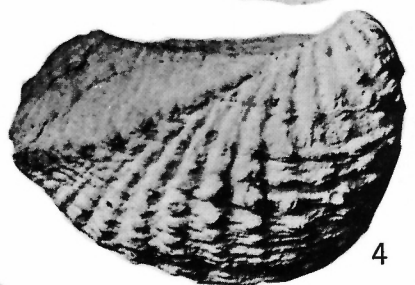
1b



2



3



4

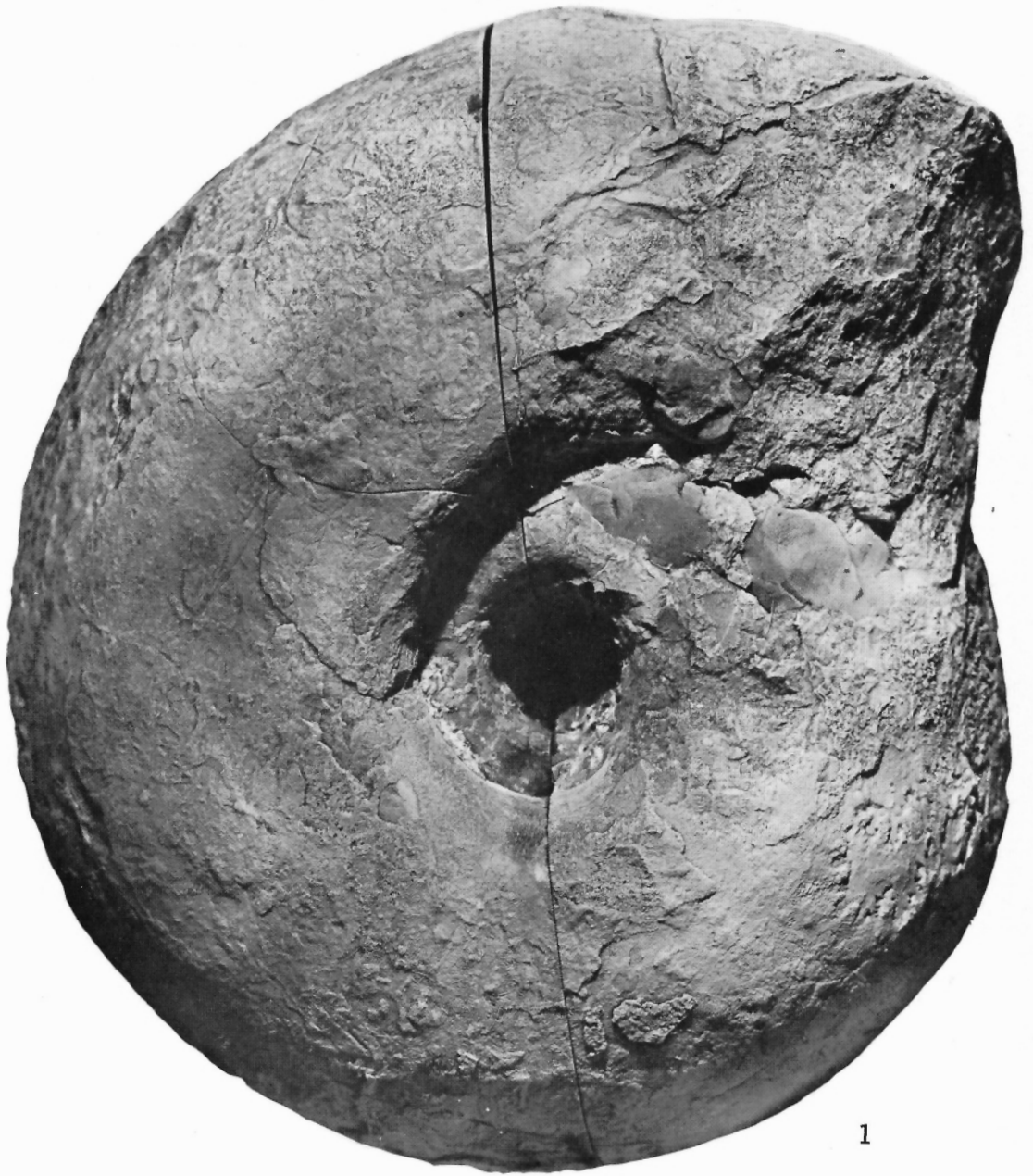


5

Plate XXVI

UPPER BATHONIAN OR LOWER CALLOVIAN

- Fig. 1. Paracephalites hashimotoi Frebold. Lateral view. GSC No. 12903. See cross-section on Pl. XXVII, fig. 1. Fernie Group, Upper Corbula munda beds. Upper Bathonian or lower Callovian. Grassy Mountain, near Blairmore, Alberta.



1

Plate XXVII

UPPER BATHONIAN OR LOWER CALLOVIAN

- Fig. 1. Paracephalites hashimotoi Frebold. Cross-section.
GSC No. 12903. See lateral view on Pl. XXVI, fig. 1.
Ferne Group, Upper Corbula munda beds. Upper
Bathonian or lower Callovian. Grassy Mountain, near
Blairmore, Alberta.



1

Plate XXVIII

UPPER BATHONIAN OR LOWER CALLOVIAN

- Fig. 1. Paracephalites glabrescens Buckman. (Actual diameter is 155 mm). Lateral view. GSC No. 14695. Fernie Group, grey beds. Upper Bathonian or lower Callovian. Near Fording River bridge, 13 miles north of Natal, British Columbia.
- Fig. 2. Paracephalites glabrescens Buckman. Cross-section and venter. GSC No. 12902. Fernie Group, upper part of Corbula munda beds. Upper Bathonian or lower Callovian. Grassy Mountain, near Blairmore, Alberta.
- Fig. 3. Paracephalites hashimotoi Frebold. Cross-section and venter. GSC No. 14701. Same stratigraphic position and locality as fig. 1.
- Figs. 4a,b,c. Paracephalites hashimotoi Frebold. 4a, lateral view of whorl fragment; 4b, lateral view of inner whorl; 4c, venter of inner whorl. Holotype, Univ. Alberta collections and plastotype. GSC No. 14374. Fernie Group, probably uppermost part of Corbula munda beds. Upper Bathonian or lower Callovian. Adanac strip mine, Carbondale area, Alberta.



1



2



3



4a



4b



4c

Plate XXIX

UPPER BATHONIAN OR LOWER CALLOVIAN

- Figs. 1a, b, c. Paracephalites glabrescens Buckman. 1a, lateral view of living chamber; 1b, lateral view of penultimate whorl; 1c, venter of penultimate whorl. GSC No. 14719. Fernie Group, grey beds. Upper Bathonian or lower Callovian. Near Fording River bridge, 13 miles north of Natal, British Columbia.
- Fig. 2. Paracephalites metastatus (Buckman). Lateral view. GSC No. 14700. Fernie Group, grey beds. Upper Bathonian or lower Callovian. Cairn Pass, Alberta.
- Fig. 3. Paracephalites glabrescens Buckman. Lateral view. GSC No. 14705. Fernie Group, Upper Corbula munda beds. Upper Bathonian or lower Callovian. Grassy Mountain, north of Blairmore, Alberta.
- Figs. 4a, b. Corbula munda McLearn. Right valve. 4a, natural size; 4b, enlarged. Holotype, GSC No. 6092. Fernie Group, Corbula munda beds. Upper Bathonian or lower Callovian. Grassy Mountain, north of Blairmore, Alberta.
- Figs. 5a, b. Corbula munda McLearn. Left valve. 5a, natural size; 5b, enlarged. Paratype, GSC No. 6093. Same stratigraphic position and locality as fig. 4.
- Fig. 6. Pleuromya postculminata McLearn. Right valve. Holotype, GSC No. 6089. Same stratigraphic position and locality as fig. 4.
- Fig. 7. Lima albertensis McLearn. Left valve. Holotype, GSC No. 6075. Same stratigraphic position and locality as fig. 4.

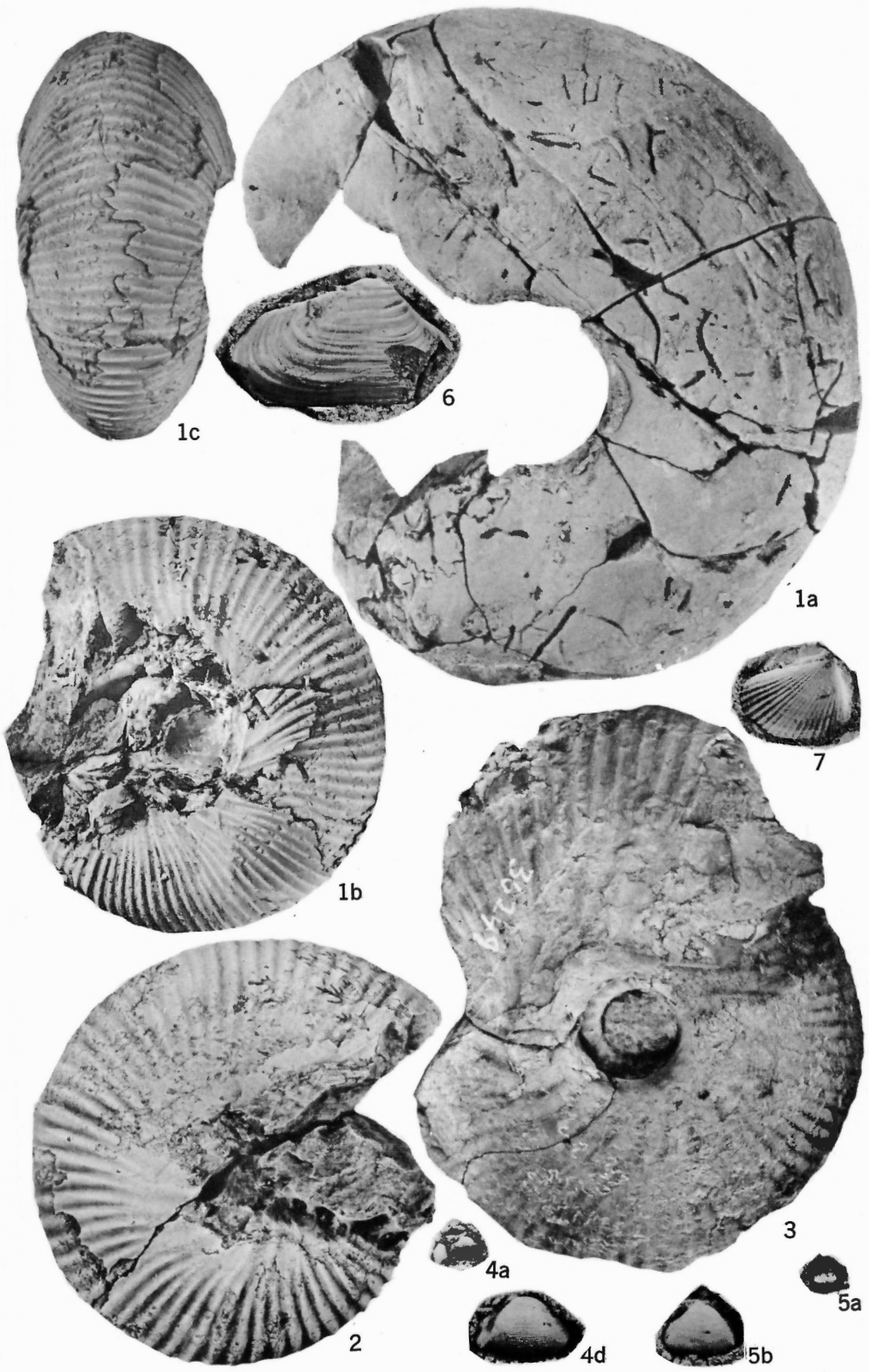


Plate XXX

LOWER CALLOVIAN

- Fig. 1. Warrenoceras henryi (Meek and Hayden). Cross-section and venter. Actual diameter is 155 mm. GSC No. 14690. Fernie Group, Gryphaea bed. Lower Callovian. Grassy Mountain, north of Blairmore, Alberta.
- Fig. 2. Warrenoceras rierdonense (Imlay). Lateral view. GSC No. 14693. Fernie Group, grey beds. Lower Callovian. Cairn Pass, Alberta.
- Fig. 3. Warrenoceras imlayi (Friebold). Lateral view. GSC No. 14720. Fernie Group, grey beds. Lower Callovian. Rock Lake area, Alberta.
- Fig. 4. Warrenoceras? crassicostatum (Imlay). Lateral view. GSC No. 14698. Same stratigraphic position and locality as fig. 2.
- Fig. 5. Warrenoceras? loveanum (Imlay). Lateral view. GSC No. 14699. Same stratigraphic position and locality as fig. 2.

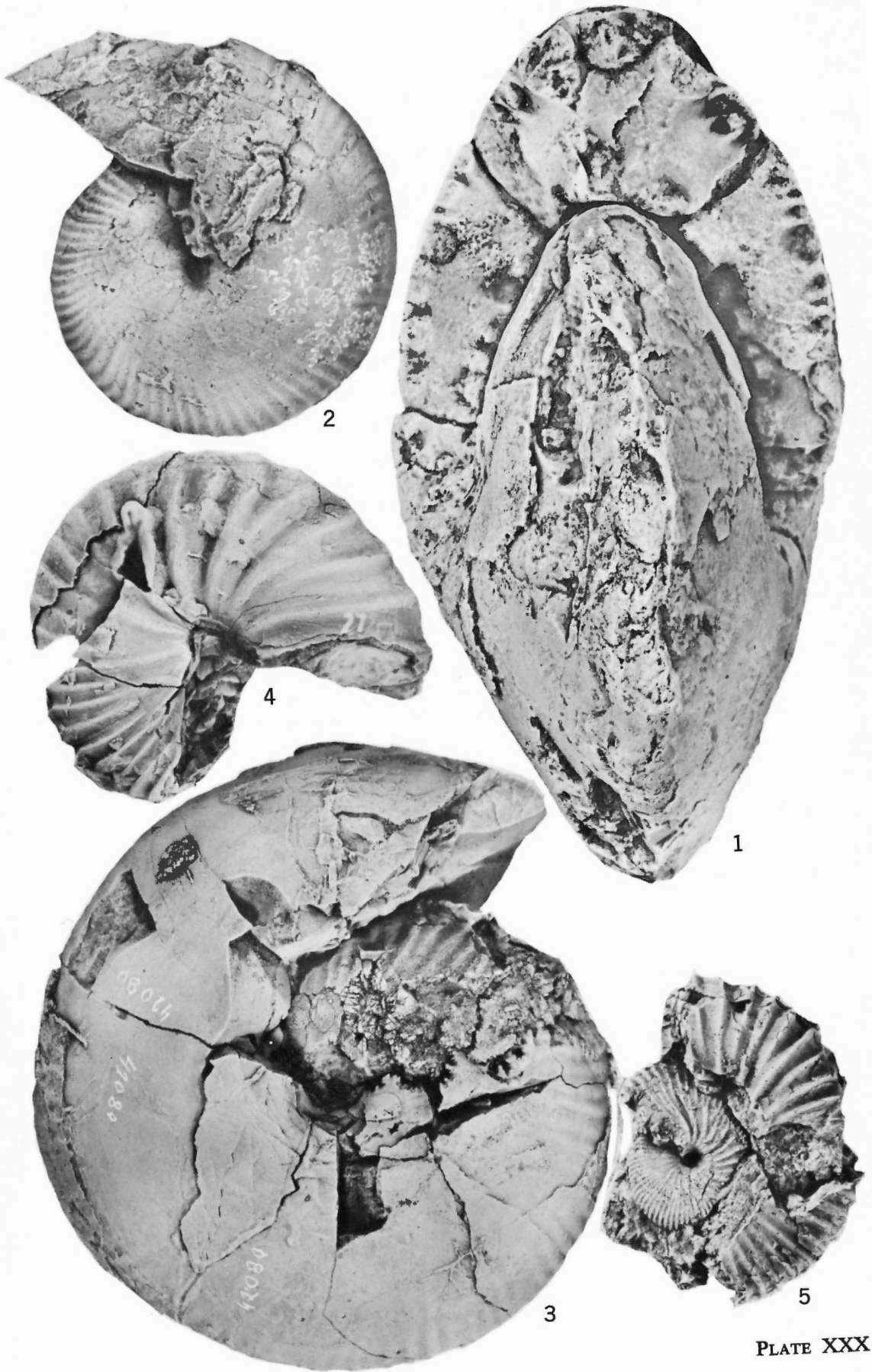


Plate XXXI

LOWER CALLOVIAN

- Figs. 1a, b. Warrenoceras henryi (Meek and Hayden). 1a, lateral view; 1b, venter. GSC No. 14692. Fernie Group, grey beds. Lower Callovian. Cairn Pass, Alberta.
- Fig. 2. Warrenoceras henryi (Meek and Hayden). Lateral view. GSC No. 14689. Same stratigraphic position and locality as fig. 1.
- Fig. 3. Warrenoceras henryi (Meek and Hayden). Lateral view. GSC No. 14688. Fernie Group, grey beds. Lower Callovian. Ram Pass, Rock Lake area, Alberta.
- Fig. 4. Torricellites? spinosum Frebold. Lateral view. Paratype, GSC No. 14710. Same stratigraphic position and locality as fig. 1.
- Figs. 5a, b. Torricellites? spinosum Frebold. Venters at various stages of growth. Holotype, GSC No. 14709. Same stratigraphic position and locality as fig. 1.

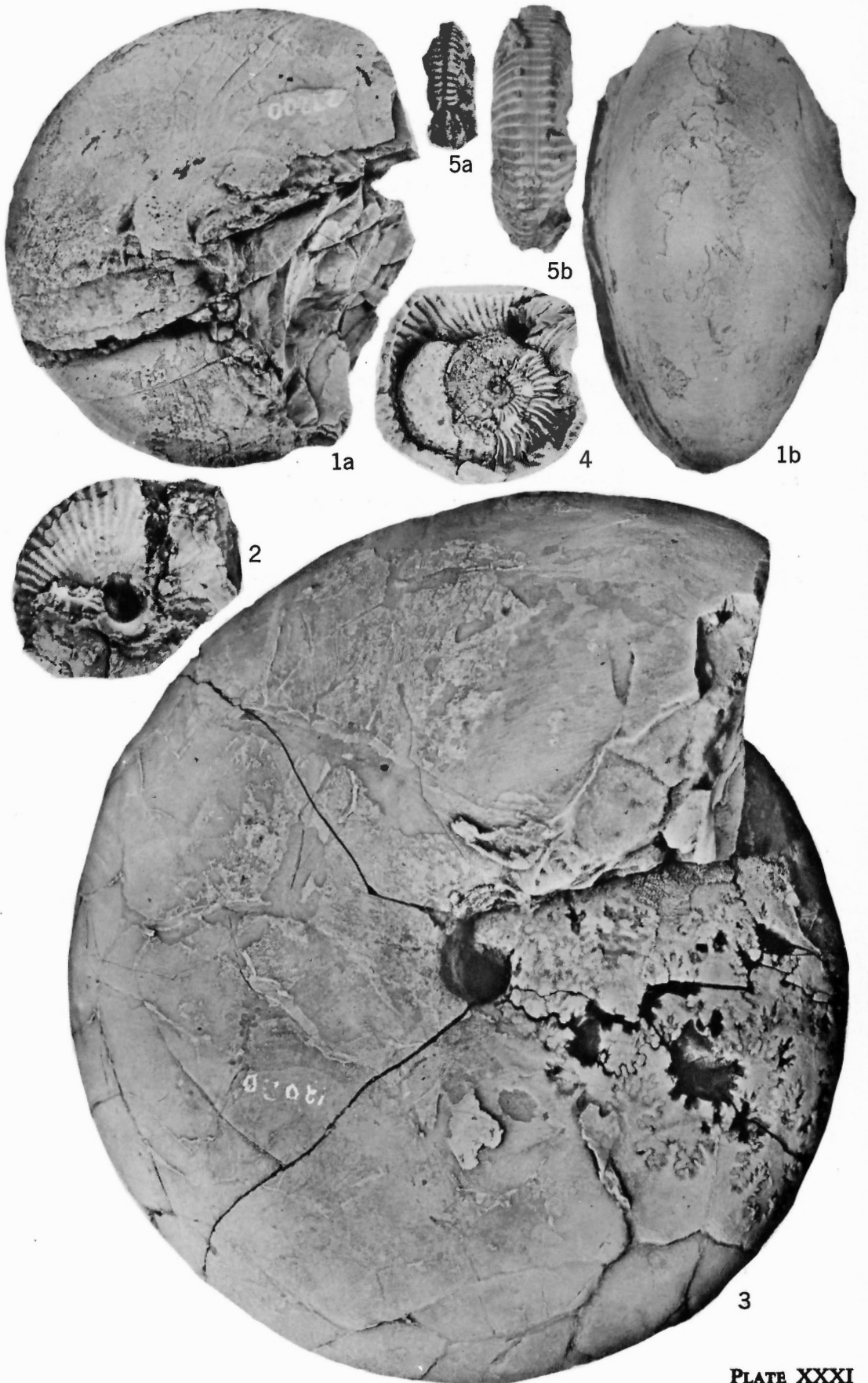


Plate XXXII

LOWER CALLOVIAN

- Fig. 1. Cobbanites engleri (Frebold). Lateral view. Paratype, GSC No. 12907. Fernie Group, Gryphaea bed. Lower Callovian. Grassy Mountain, north of Blairmore, Alberta.
- Figs. 2a, b. Cobbanites sp. 2a, lateral view; 2b, venter. GSC No. 12917. Same stratigraphic position and locality as fig. 1.
- Figs. 3a, b. Cobbanites sp. 3a, lateral view; 2b, venter. GSC No. 12918. Same stratigraphic position and locality as fig. 1.
- Figs. 4a, b. Warrenoceras imlayi (Frebold). 4a, lateral view; 4b, venter. Holotype, GSC No. 12897. Same stratigraphic position and locality as fig. 1.
- Fig. 5. Warrenoceras imlayi (Frebold). Cross-section. Paratype, GSC No. 12901. Same stratigraphic position and locality as fig. 1.
- Fig. 6. Gryphaea impressimarginata McLearn. Left valve. GSC No. 12909. Fernie Group, Gryphaea bed. Lower Callovian. Near Adanac strip mine, Carbondale area, Alberta.
- Fig. 7. Anomia albertensis McLearn. Left valve. Holotype, GSC No. 6081. Same stratigraphic position and locality as fig. 1.
- Fig. 8. Oxytoma blairmorensis McLearn. Left valve. Holotype, GSC No. 6050. Same stratigraphic position and locality as fig. 1.

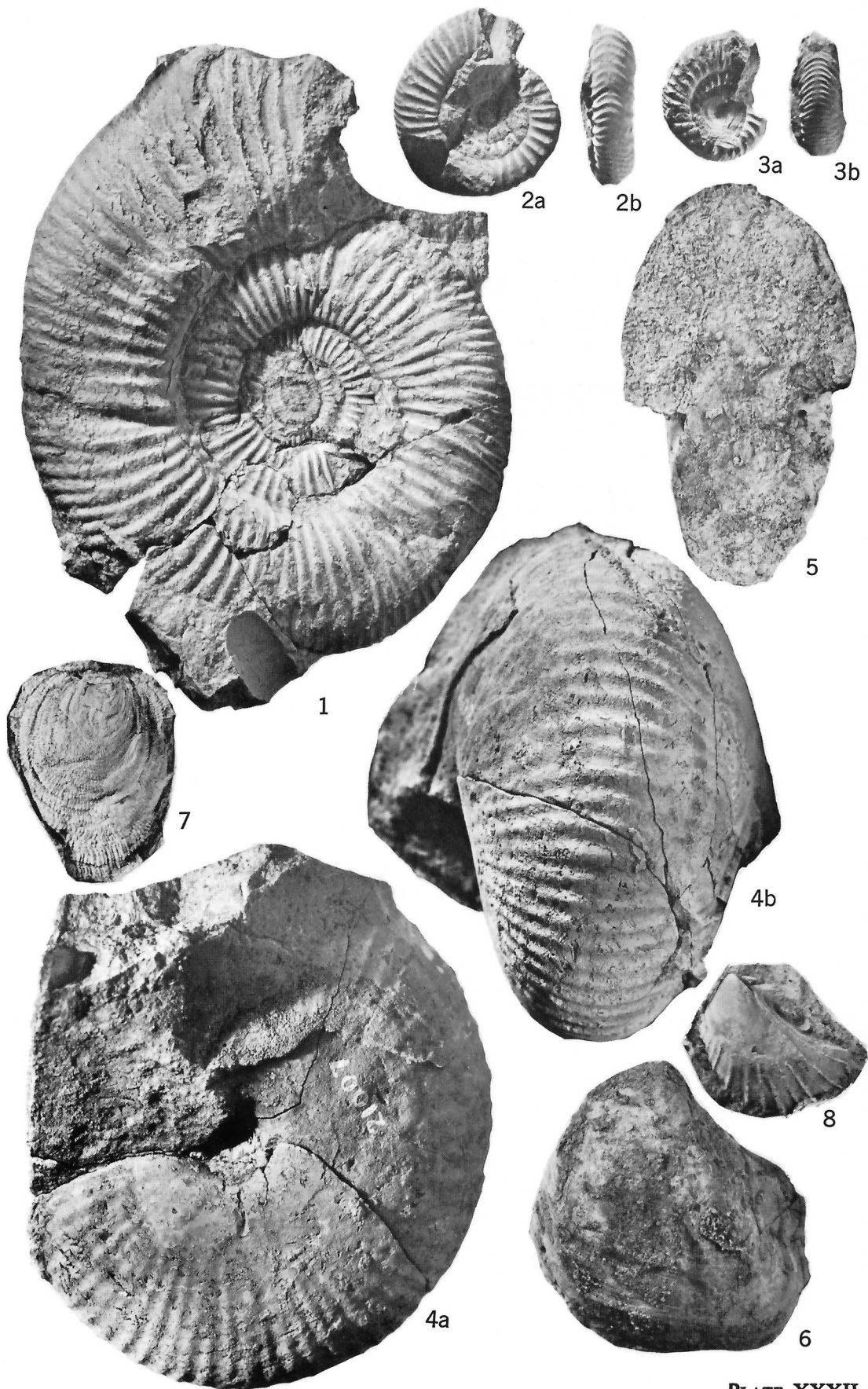


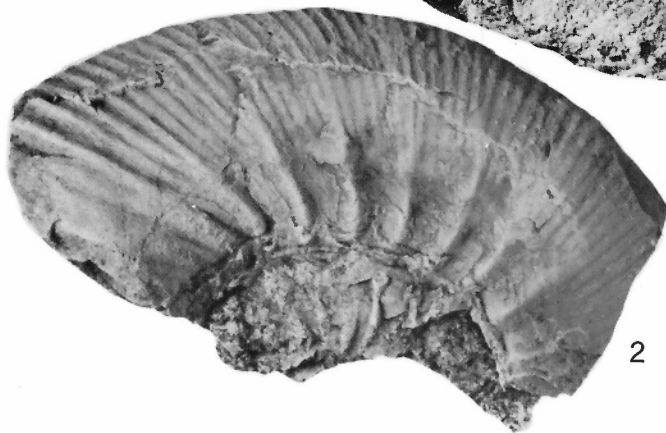
Plate XXXIII

LOWER CALLOVIAN

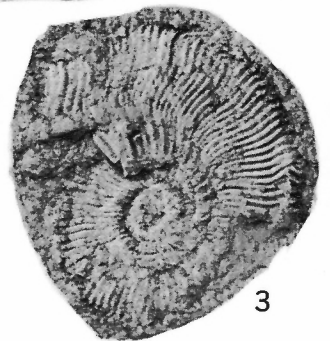
- Fig. 1. Cobbanites engleri (Frebold). Lateral view. Holotype, GSC No. 12906. X about 0.66. Fernie Group, Gryphaea bed. Lower Callovian. Grassy Mountain, north of Blairmore, Alberta.
- Fig. 2. Kepplerites sp. indet. Lateral view. GSC No. 14706. Fernie Group. Gryphaea bed. Lower Callovian. Adanac strip mine road, Carbondale area, Alberta.
- Fig. 3. Kosmoceras (Gulielmiceras) knechteli Imlay. Lateral view. GSC No. 14696. Lower Callovian. Esterhazy Shaft, eastern Saskatchewan.



1



2

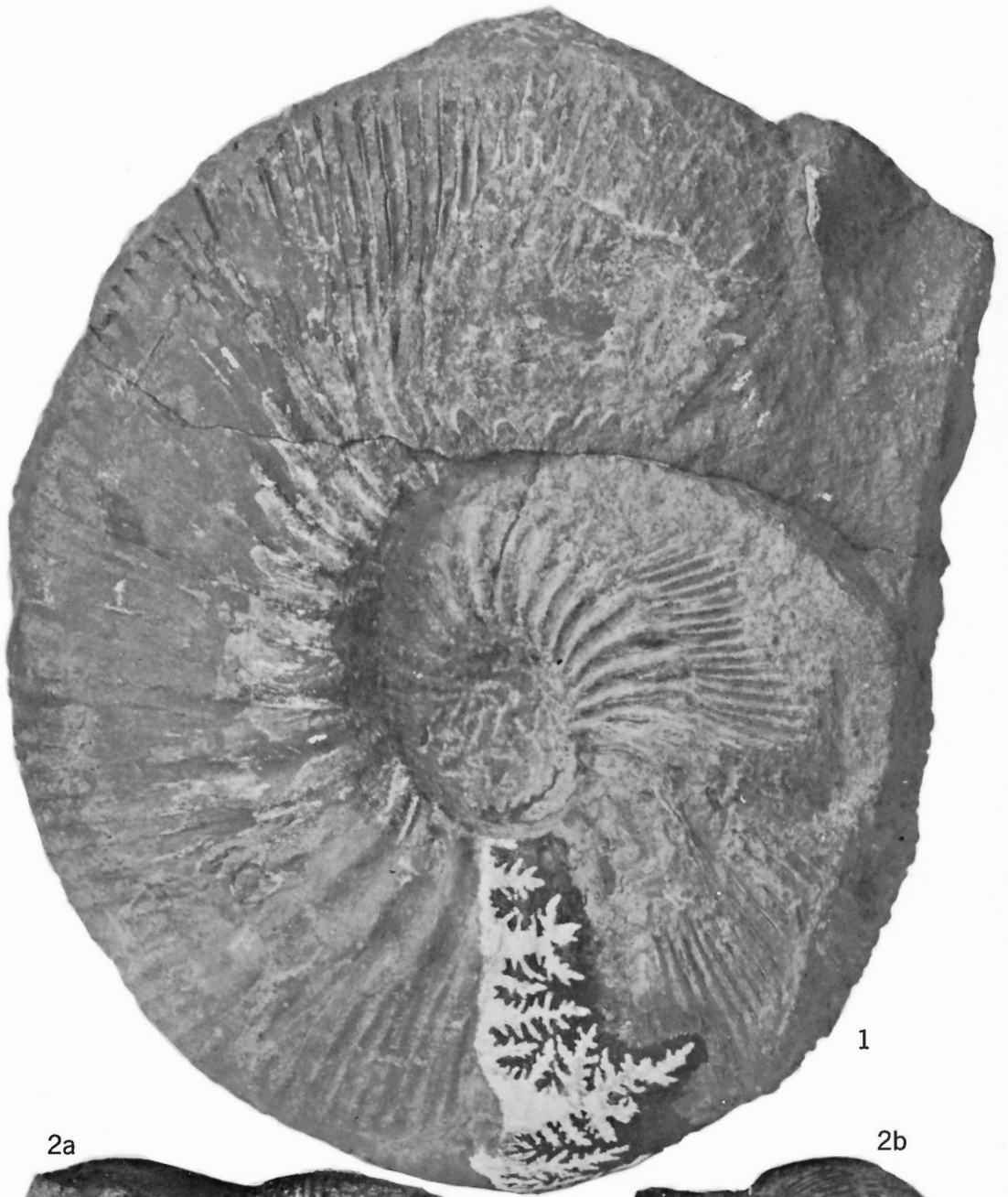


3

Plate XXXIV

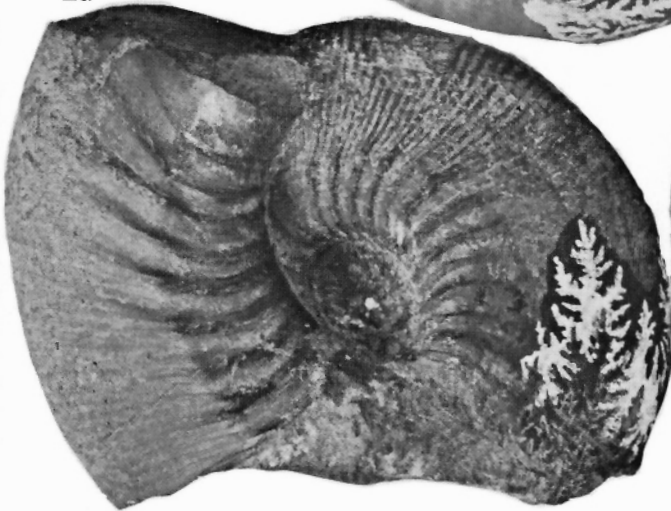
LOWER CALLOVIAN

- Fig. 1. *Keplerites plenus* (McLearn). Lateral view. Holotype, GSC No. 9000. Upper part of Yakoun Formation. Lower Callovian. North shore of Maude Island, Queen Charlotte Islands.
- Figs. 2a, b. *Keplerites mcevoyi* (McLearn). 2a, lateral view; 2b, oblique view. Holotype, GSC No. 5018. Fernie Group. Lower Callovian. Ribbon Creek, Kananaskis River area, Alberta.



1

2a



2b



Plate XXXV

LOWER CALLOVIAN

- Figs. 1a, b. Keplerites gitinsi (McLearn). 1a, lateral view; 1b, cross-section and venter. Holotype, GSC No. 9002. Yakoun Formation. Callovian. Northeast shore of Maude Island, Queen Charlotte Islands.
- Figs. 2a, b. Keplerites torrensi (McLearn). 2a, lateral view; 2b, venter. Holotype, GSC No. 9004. Same stratigraphic position and locality as fig. 1.
- Figs. 3a, b. Keplerites newcombii (Whiteaves). 3a, lateral view; 3b, venter. Holotype, GSC No. 5990. Yakoun Formation. Callovian. Alliford Bay, Queen Charlotte Islands.
- Fig. 4. Oxytoma blairmorensis McLearn. Left valve. Paratype, GSC No. 6050a. Fernie Group, Corbula munda beds. Upper Bathonian or lower Callovian. Grassy Mountain, north of Blairmore, Alberta. Also common in the lower Callovian Gryphaea bed.
- Fig. 5. Ostrea dowlingi McLearn. Right valve. Paratype, GSC No. 6056a. Same stratigraphic position and locality as fig. 4.

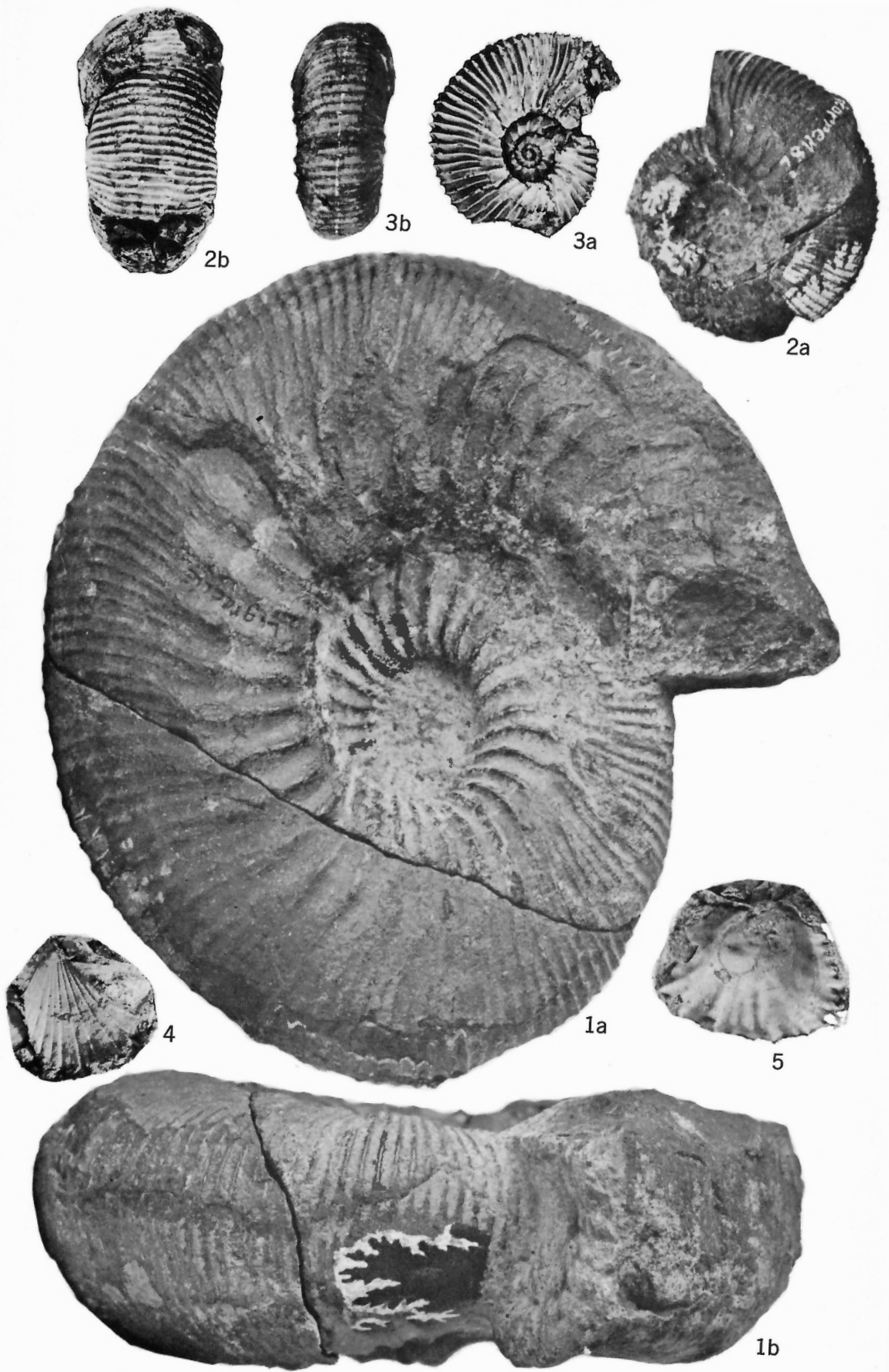


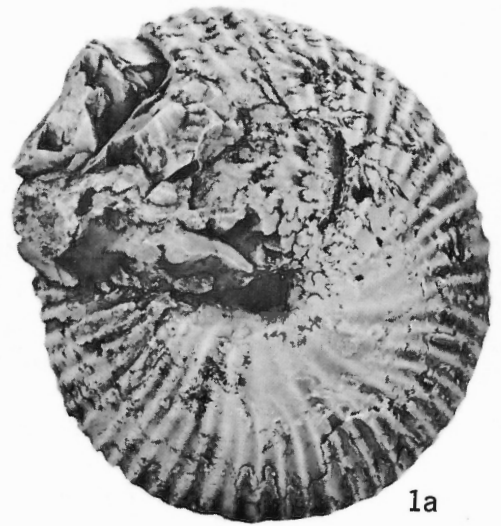
Plate XXXVI

LOWER CALLOVIAN

- Figs. 1a, b, c, d. Imlayoceras miettense Frebold. 1a, lateral view; 1b, venter; 1c, cross-section; 1d, venter of living chamber. Holotype, GSC No. 14707. Fernie Group, Upper Grey beds, zone with large concretions. Lower Callovian. Rocky River, Miette area, Alberta.
- Fig. 2. Kepplerites aff. K. tychonis (Ravn). Lateral view. GSC No. 14715. Fernie Group, 20 feet above Gryphaea bed. Lower Callovian. Grassy Mountain, north of Blairmore, Alberta.
- Figs. 3, 4. Ammonite gen. et sp. indet. Lateral views. GSC Nos. 14714, 14717. Fernie Group, about 20 feet above Gryphaea bed. Lower Callovian. Grassy Mountain, north of Blairmore, Alberta.



1b



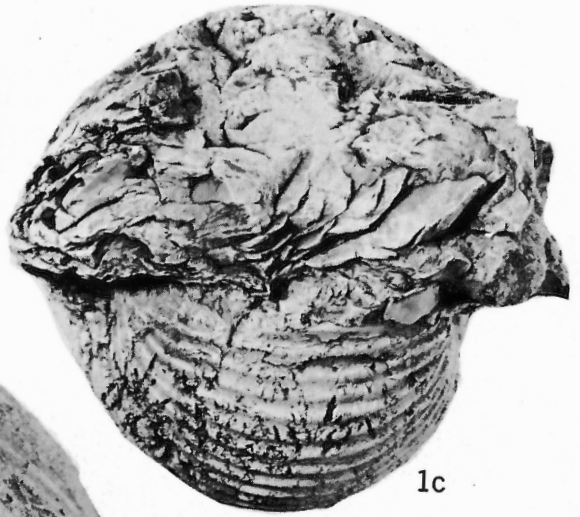
1a



3



4



1c



1d

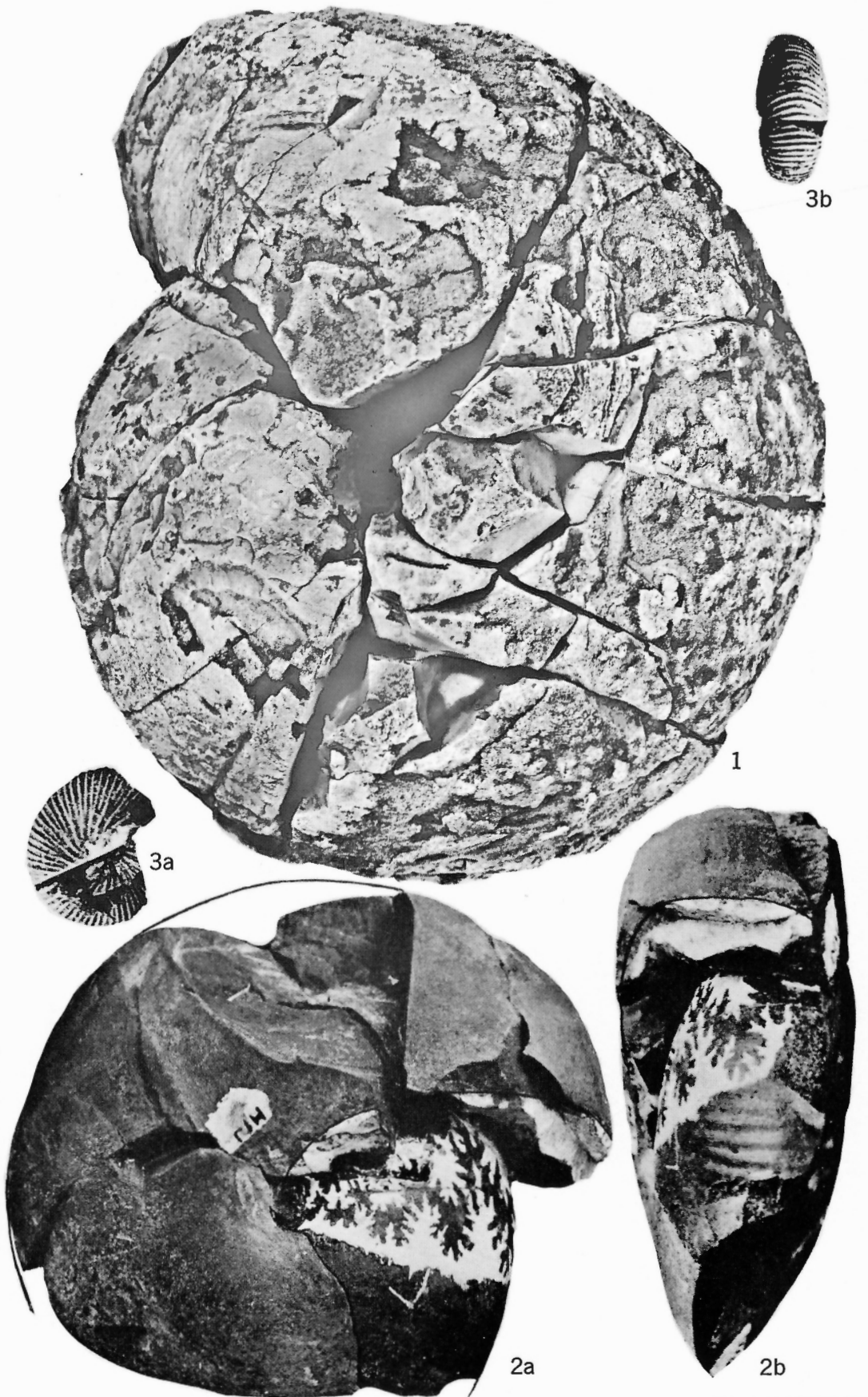


2

Plate XXXVII

LOWER CALLOVIAN

- Fig. 1. Imlayoceras miettense Frebold. Actual diameter: 160 mm. Lateral view of large specimen. Paratype, GSC No. 14694. Fernie Group, Upper Grey beds, zone of large concretions. Lower Callovian. Same specimen as Pl. XXXVIII, fig. 1. North end of De Smet Range, Alberta.
- Figs. 2a, b, Lilloettia lilloetensis Crickmay. 2a, lateral view; 3a, b. 2b, venter and cross-section; 3a, lateral view; 3b, venter of inner whorls. Holotype, GSC No. 9698. Lower Callovian. Billhook Creek, Harrison Lake area, British Columbia.



3b

1

3a

2a

2b

Plate XXXVIII

LOWER CALLOVIAN

- Fig. 1. Imlayoceras miettense Frebold. Actual diameter: 160 mm. Cross-section and venter of large specimen. Paratype, GSC No. 14694. Fernie Group. Upper Grey beds, zone of large concretions. Lower Callovian. Same specimen as Pl. XXXVII, fig. 1. North end of De Smet Range, Alberta.
- Fig. 2. Inoceramus obliquiformis McLearn. Right valve. Holotype, GSC No. 6049. Fernie Group, in talus. (The species is common in Gryphaea bed.) Lower Callovian. Creek north of Blairmore, Alberta.
- Fig. 3. Pleuromya obtusiprorata McLearn. Right valve. Holotype, GSC No. 6087. Fernie Group, Upper Corbula munda and Gryphaea beds. Lower Callovian. Grassy Mountain, North of Blairmore, Alberta.
- Fig. 4. Cucullaea livingstonensis McLearn. Interior right valve. Holotype, GSC No. 6045. Fernie Group, Upper Corbula munda beds. (Common in Gryphaea bed.) Lower Callovian. Grassy Mountain, north of Blairmore, Alberta.

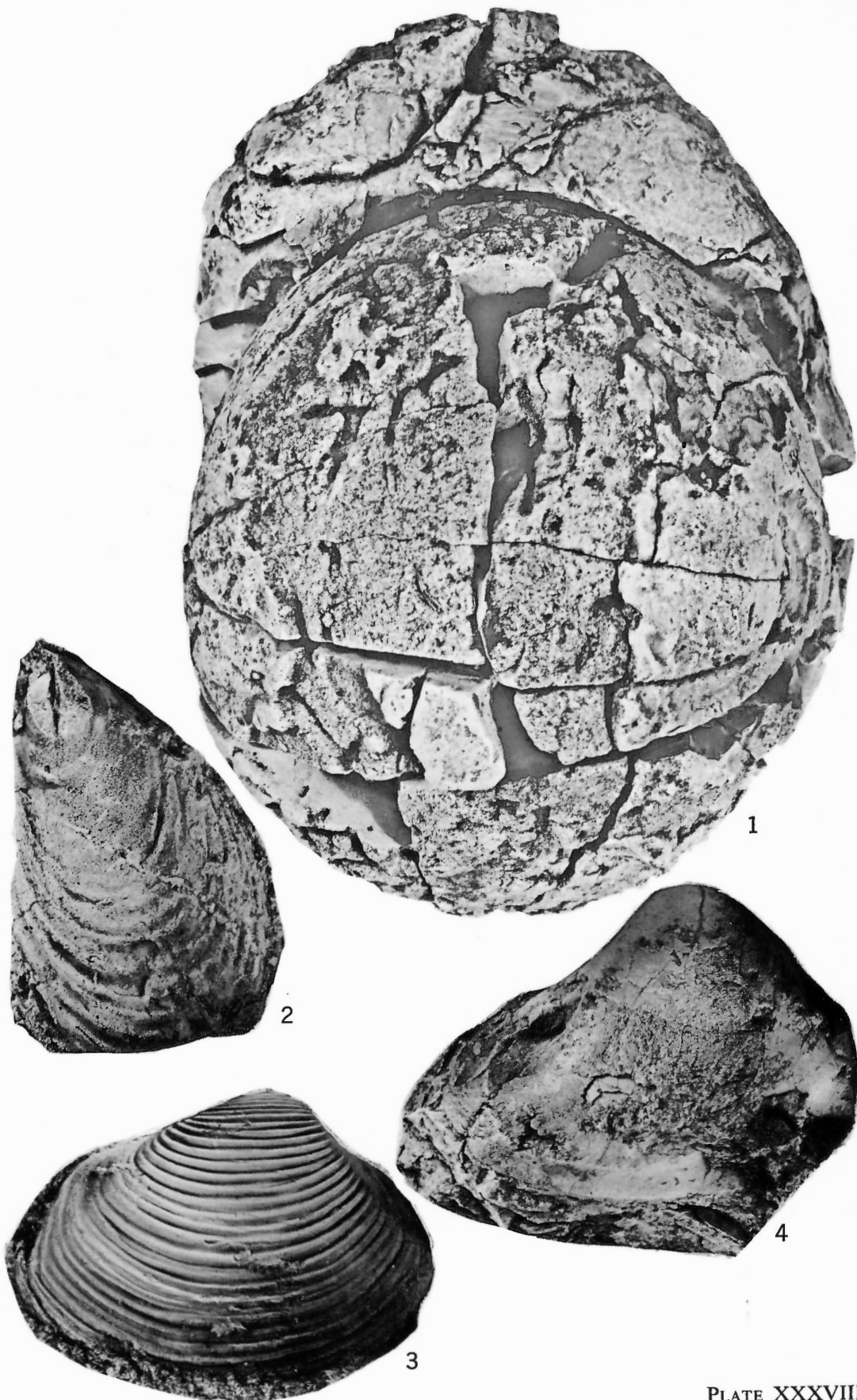
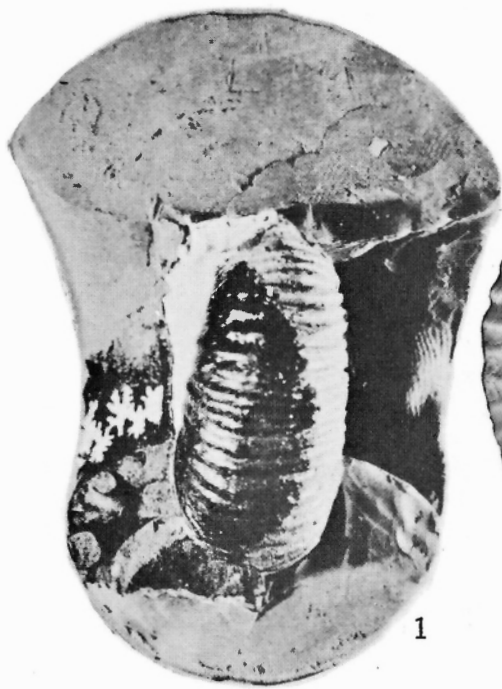


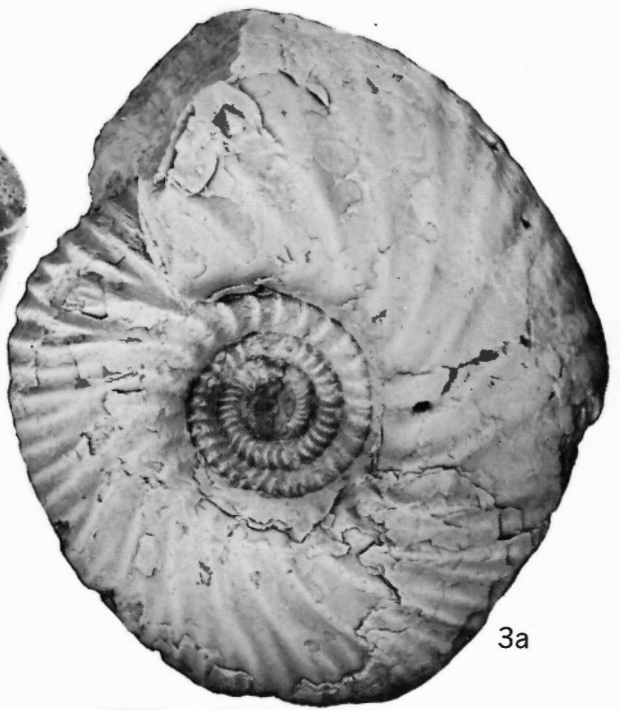
Plate XXXIX

CALLOVIAN

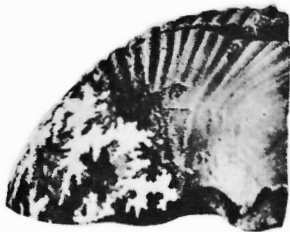
- Fig. 1. Cadoceras brooksi Crickmay. Cross-section and venter. Holotype, GSC No. 9679. Callovian. Deer Creek, west side of Harrison Lake, British Columbia.
- Figs. 2a, b, c. Buckmaniceras buckmani Crickmay. 2a, lateral view; 2b, venter; 2c, lateral view of part of penultimate whorl. Holotype, GSC No. 9674. Billhook Creek, west side of Harrison Lake, British Columbia.
- Figs. 3a, b. Cadoceras barnstoni (Meek). 3a, lateral view; 3b, venter and cross-section. Holotype, GSC No. 4811. Callovian. Mackenzie River region, probably near Porcupine River, Yukon.



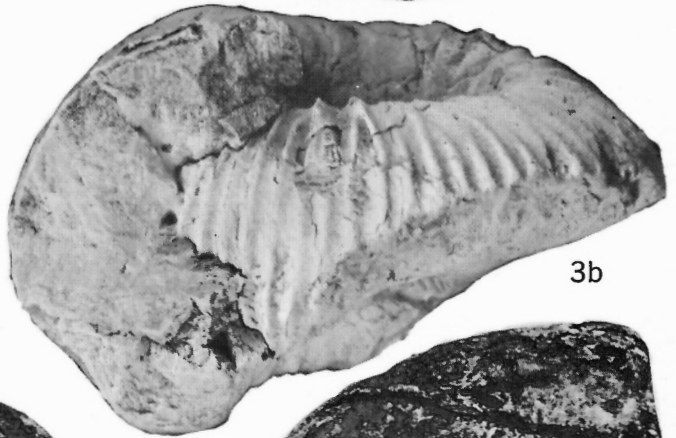
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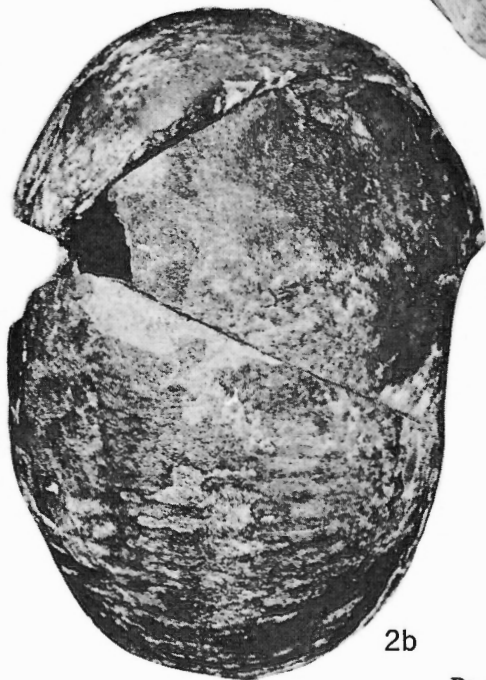
3a



2c



3b



2b

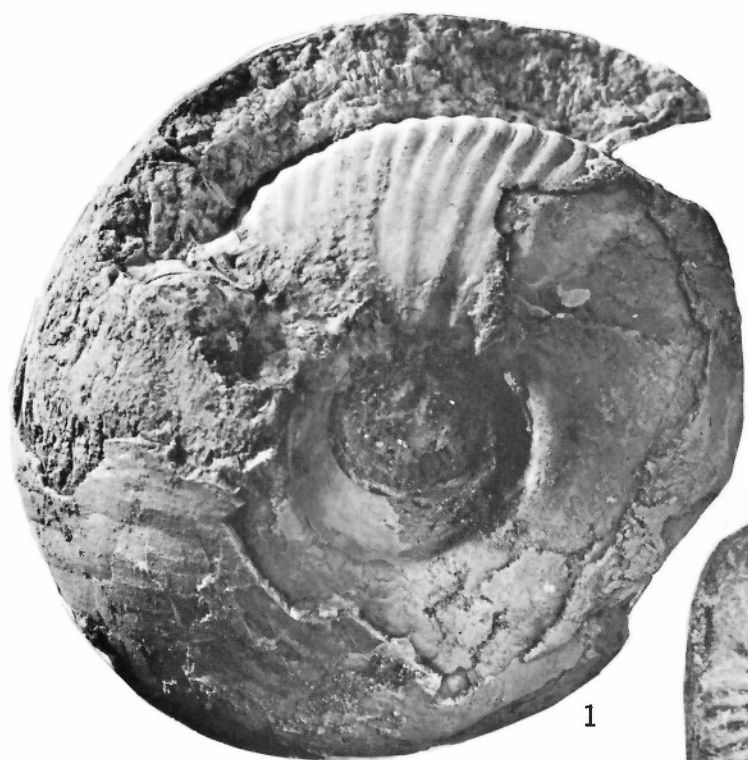


2a

Plate XL

CALLOVIAN

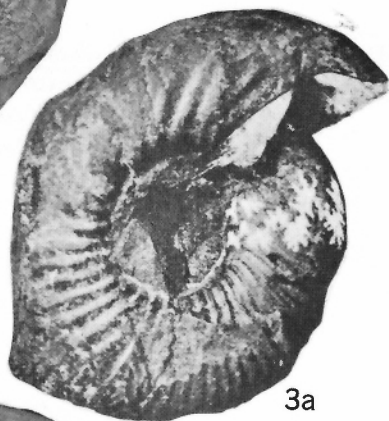
- Fig. 1. Cadoceras arcticum Frebold. Lateral view. Holotype, GSC No. 15127. Jaeger Formation. Callovian. Cornwall Island. See venter and cross-section on Pl. XLI, fig. 2.
- Fig. 2. Cadoceras arcticum Frebold. Lateral view. Paratype, GSC No. 17649. Callovian. Babbage River, Yukon.
- Figs. 3a, b. Paracadoceras harveyi Crickmay. 3a, lateral view; 3b, cross-section and venter. Holotype, GSC No. 9675. Callovian. Deer Creek, west side of Harrison Lake, British Columbia.



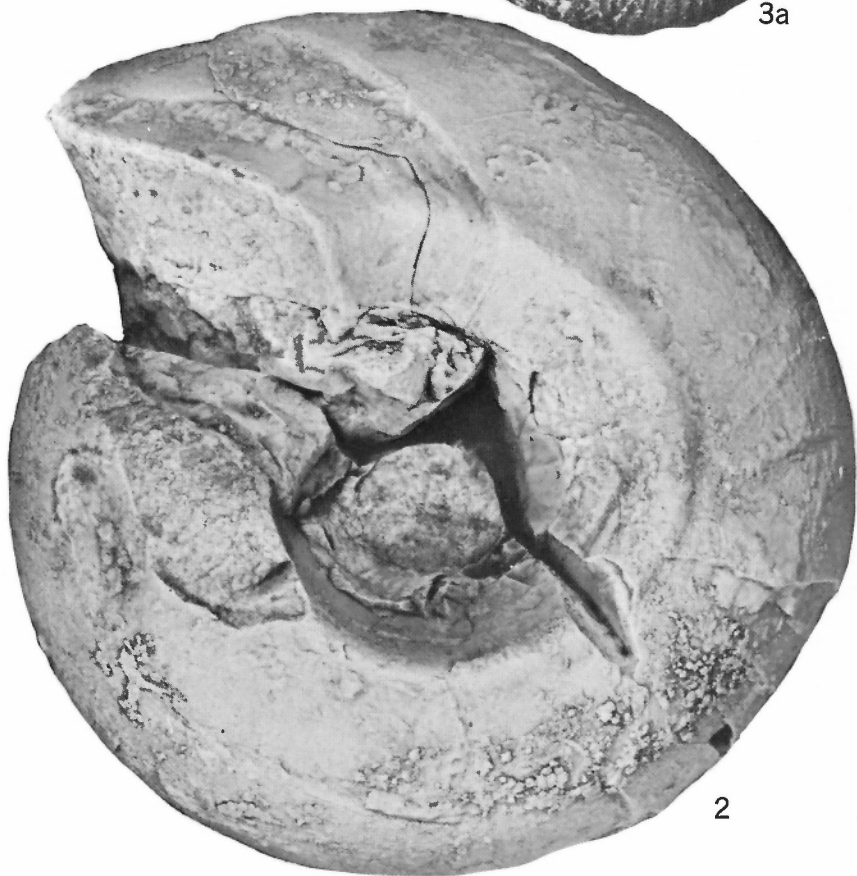
1



3b



3a

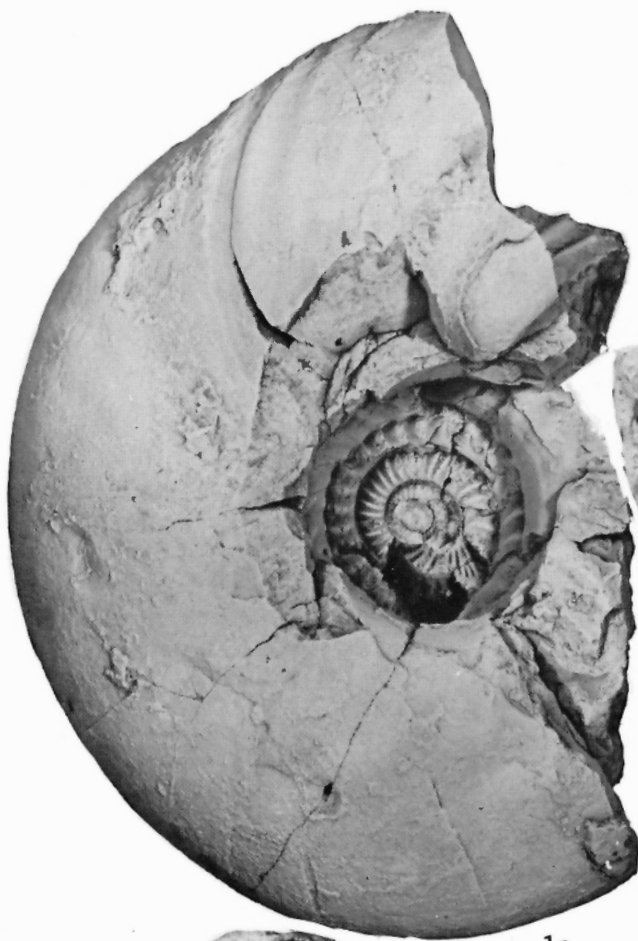


2

Plate XLI

CALLOVIAN

- Figs. 1a,b,c. Cadoceras bodylevskyi Frebold. 1a, lateral view; 1b, venter; 1c, cross-section. Holotype, GSC No. 17666. Savik Formation, lower Cadoceras bed. Callovian. Strand Fiord, Axel Heiberg Island.
- Fig. 2. Cadoceras arcticum Frebold. Cross-section and venter. Holotype, GSC No. 15127. Jaeger Formation, Callovian. Cornwall Island. See lateral view on Pl. XL, fig. 2.



1a



1b



2



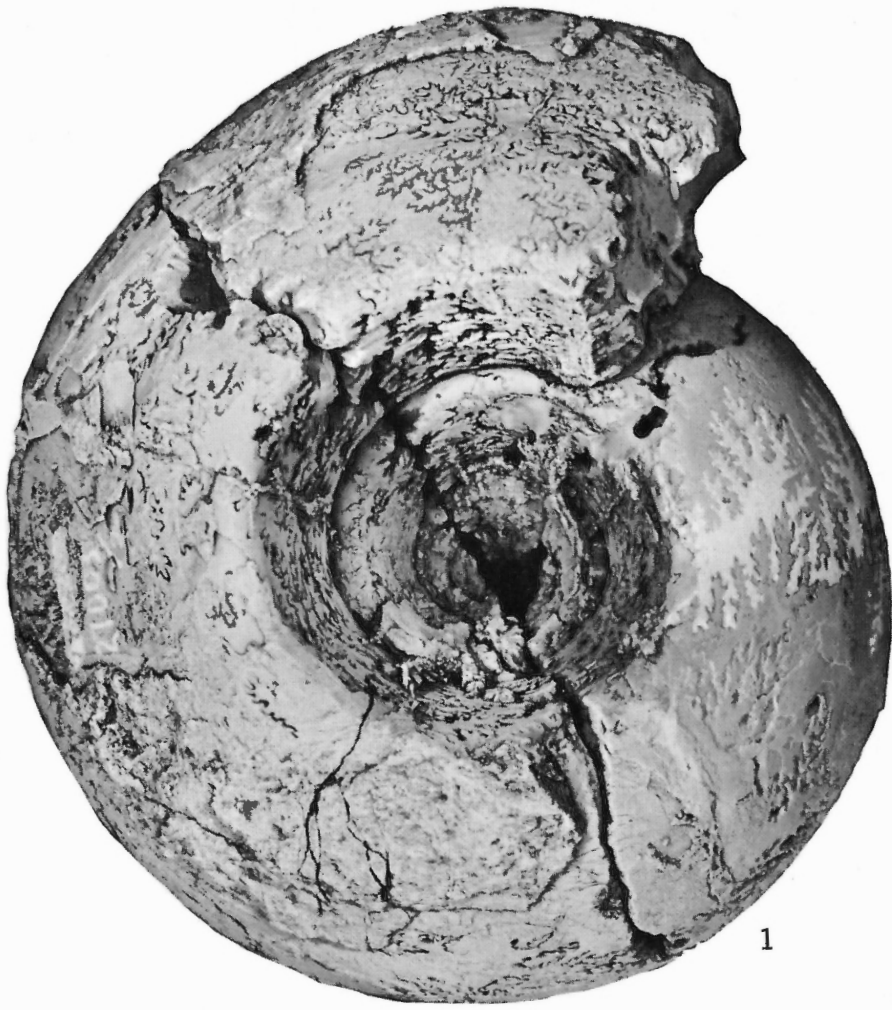
1c

PLATE XLI

Plate XLII

CALLOVIAN

- Fig. 1. Cadoceras septentrionale Frebold var. latidorsata.
Lateral view. GSC No. 17656. Callovian. Aklavik
Range, N.W.T. See venter and cross-section on
Pl. XLIII, fig. 1.
- Figs. 2a, b. Cadoceras cf. falsum Voronets. 2a, lateral view;
2b, venter. GSC No. 17659. Savik Formation, lower
Cadoceras bed. Callovian. Strand Fiord, Axel
Heiberg Island.



1



2a



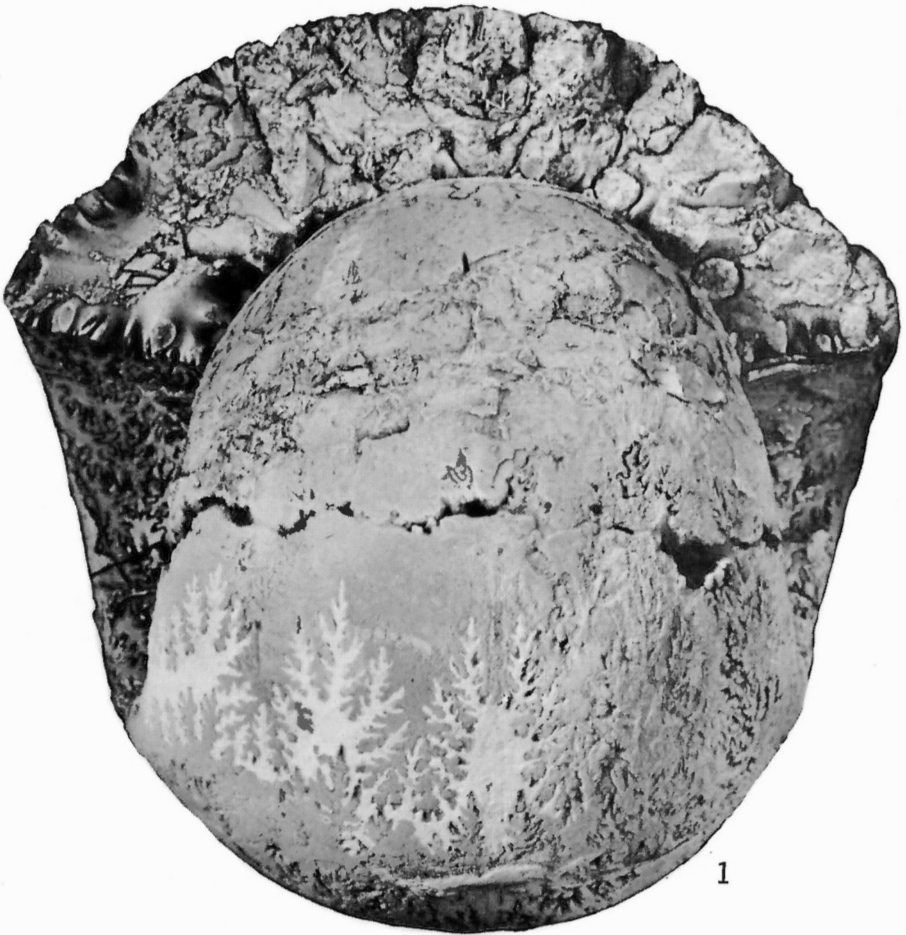
2b

PLATE XLII

Plate XLIII

CALLOVIAN

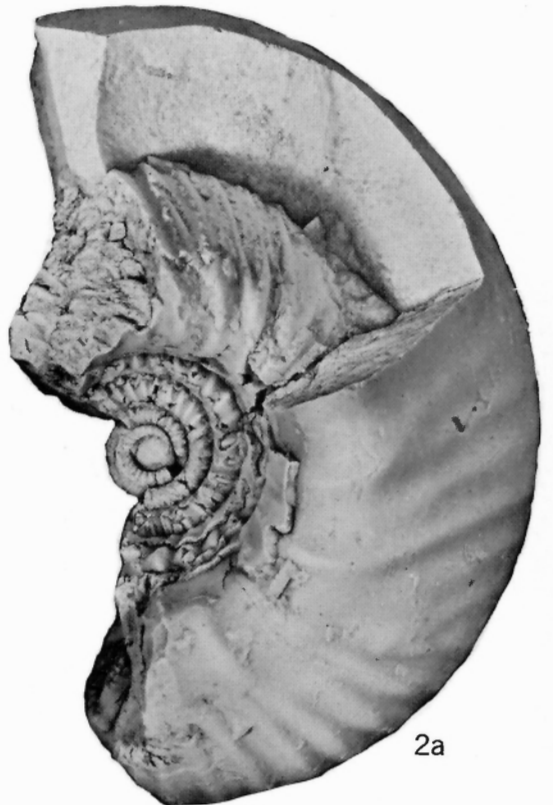
- Fig. 1. Cadoceras septentrionale Frebold var. latidorsata.
Venter and cross-section. GSC No. 17656.
Callovian. Aklavik Range, N.W.T. See lateral view
on Pl. XLII, fig. 1.
- Figs. 2a, b. Cadoceras cf. falsum Voronets. 2a, lateral view;
2b, venter. GSC No. 17661. Savik Formation, lower
Cadoceras bed. Callovian. Strand Fiord, Axel
Heiberg Island.



1



2b



2a

Plate XLIV

CALLOVIAN

- Fig. 1. Cadoceras septentrionale Frebold. Lateral view. Holotype, GSC No. 17651. Savik Formation, upper Cadoceras bed. Callovian. Strand Fiord, Axel Heiberg Island.
- Figs. 2a, b. Cadoceras septentrionale Frebold var. latidorsata. 2a, lateral view; 2b, venter and cross-section. GSC No. 17652. Same locality as fig. 1.
- Fig. 3. Cadoceras septentrionale Frebold. Venter and cross-section. Paratype, GSC No. 17654. Same locality as fig. 1.
- Figs. 4a, b. Cadoceras septentrionale Frebold. 4a, lateral view; 4b, venter and cross-section. Paratype, GSC No. 17657. Same locality as fig. 1.
- Figs. 5a, b. Cadoceras septentrionale Frebold. 5a, lateral view; 5b, venter and cross-section. Paratype, GSC No. 17658. Same locality as fig. 1.



1



5b



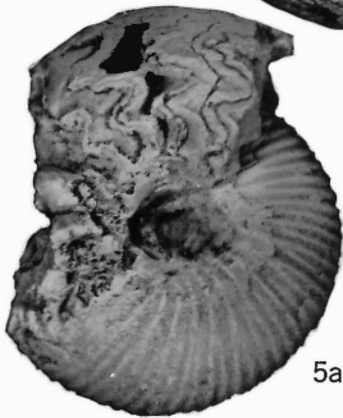
3



2a



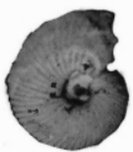
2b



5a



4b



4a

Plate XLV

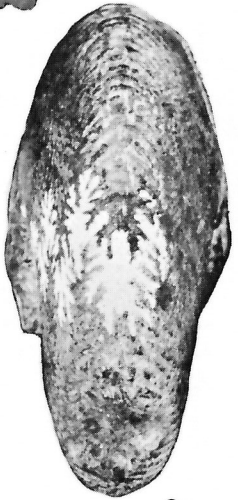
CALLOVIAN

Fig. 1. Cadoceras voronetsae Frebold. Actual diameter = 187 mm. Lateral view. Holotype, GSC No. 17669. Callovian. West of Porcupine River and east of Waters River, Yukon. See cross-section on Pl. XLVI, fig. 1.

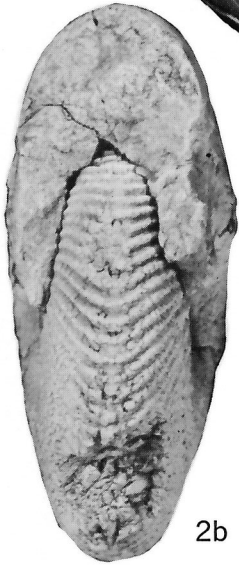
Figs. 2a, b, c. Cadoceras canadense Frebold. 2a, lateral view; 2b, cross-section and venter; 2c, venter. Holotype, GSC No. 17664. Callovian. Aklavik Range, N.W.T.



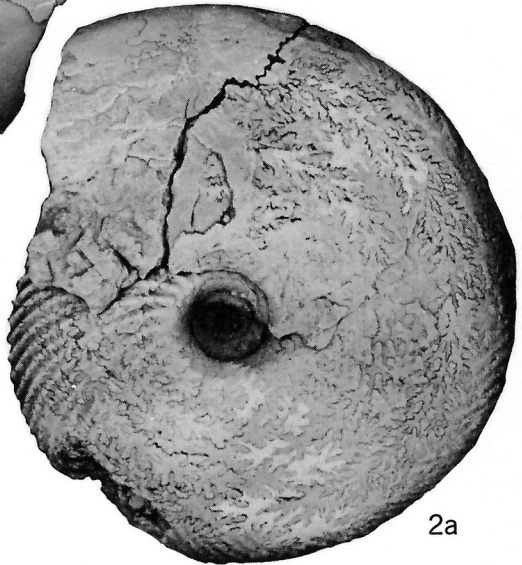
1



2c



2b



2a

Plate XLVI

CALLOVIAN

Fig. 1.

Cadoceras voronetsae Frebold. Cross-section.
Holotype, GSC No. 17669. Callovian. West of
Porcupine River and east of Waters River, Yukon.
See lateral view on Pl. XLV, fig. 1.



1

PLATE XLVI

Plate XLVII

OXFORDIAN - LOWER KIMMERIDGIAN

- Figs. 1a, b. Cardioceras mountjoyi Frebold. 1a, lateral view; 1b, cross-section and venter. Holotype, GSC No. 13895. Fernie Group, Green beds. Oxfordian. Miette area, Rocky River, Alberta.
- Figs. 2a, b. Cardioceras (Scarburgiceras) alphacordatum Spath. 2a, lateral view; 2b, cross-section and venter. Hypotype, GSC No. 13892. Fernie Group, Green beds. Oxfordian. Miette area, Rocky River, Alberta.
- Figs. 3a, b. Cardioceras canadense Whiteaves. 3a, lateral view; 3b, venter. Holotype, GSC No. 7437. Fernie Group. Oxfordian. Fernie area, British Columbia.
- Fig. 4. Cardioceras (sensu lato) sp. indet. Lateral view. GSC No. 13893. Fernie Group. Oxfordian. Cuthead Creek, Banff National Park, Alberta.
- Fig. 5. Amoeboceras sp. indet. Lateral view. GSC No. 15130. Mould Bay Formation. Upper Oxfordian or lower Kimmeridgian. Mackenzie King Island.
- Fig. 6. Amoeboceras sp. indet. Lateral view. GSC No. 15131. Mould Bay Formation. Upper Oxfordian or lower Kimmeridgian. Mackenzie King Island.
- Fig. 7. Buchia concentrica (Sowerby). Left valve; GSC No. 12905. Fernie Group, uppermost part of Green beds. Upper Oxfordian or lower Kimmeridgian. Carbondale River, Alberta.

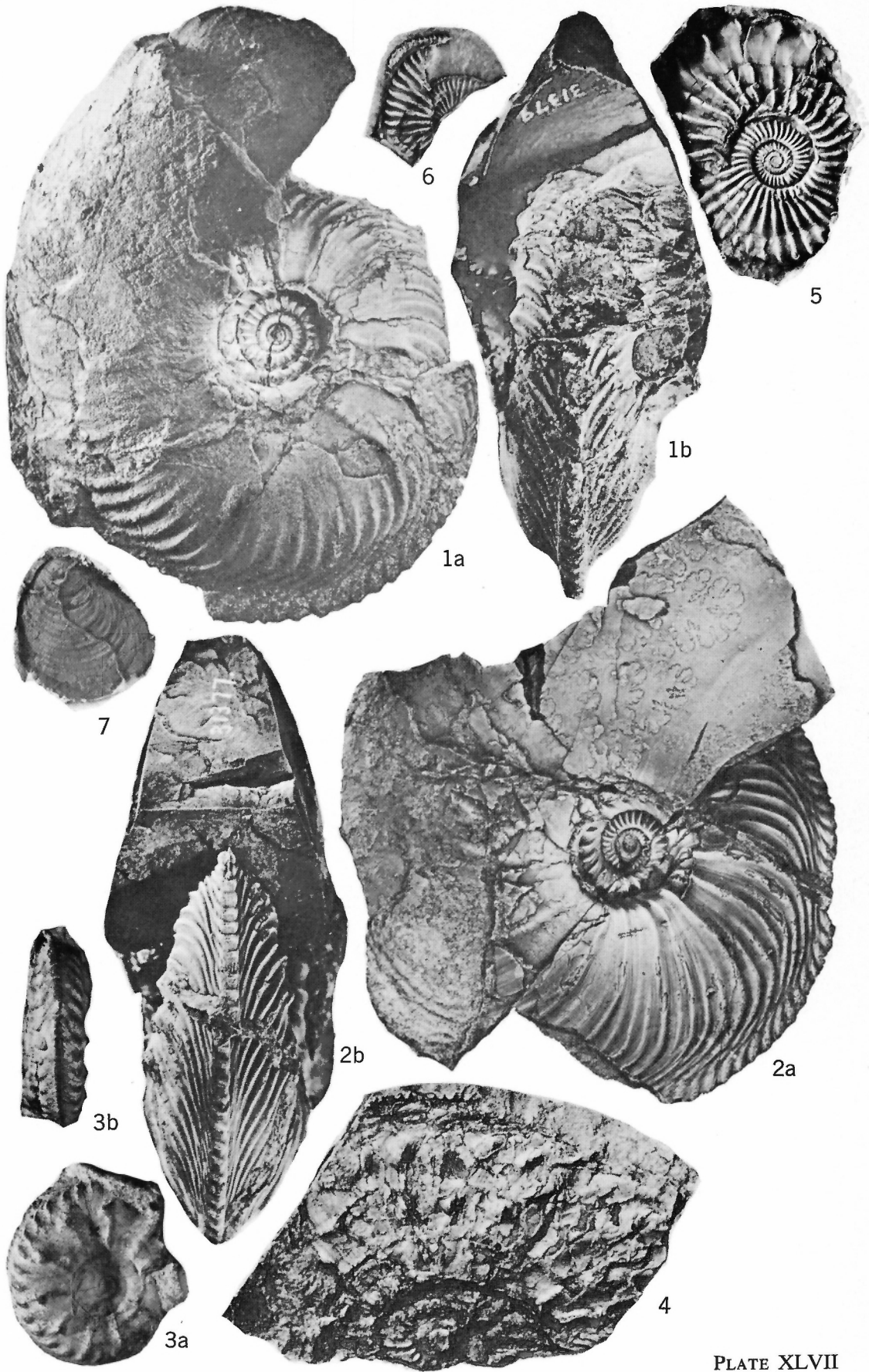
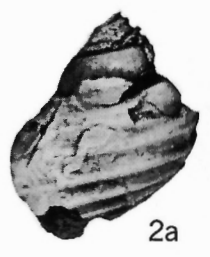
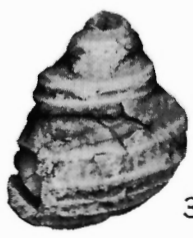
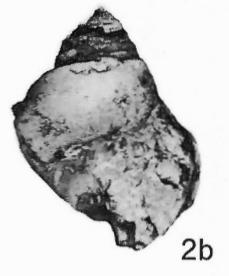
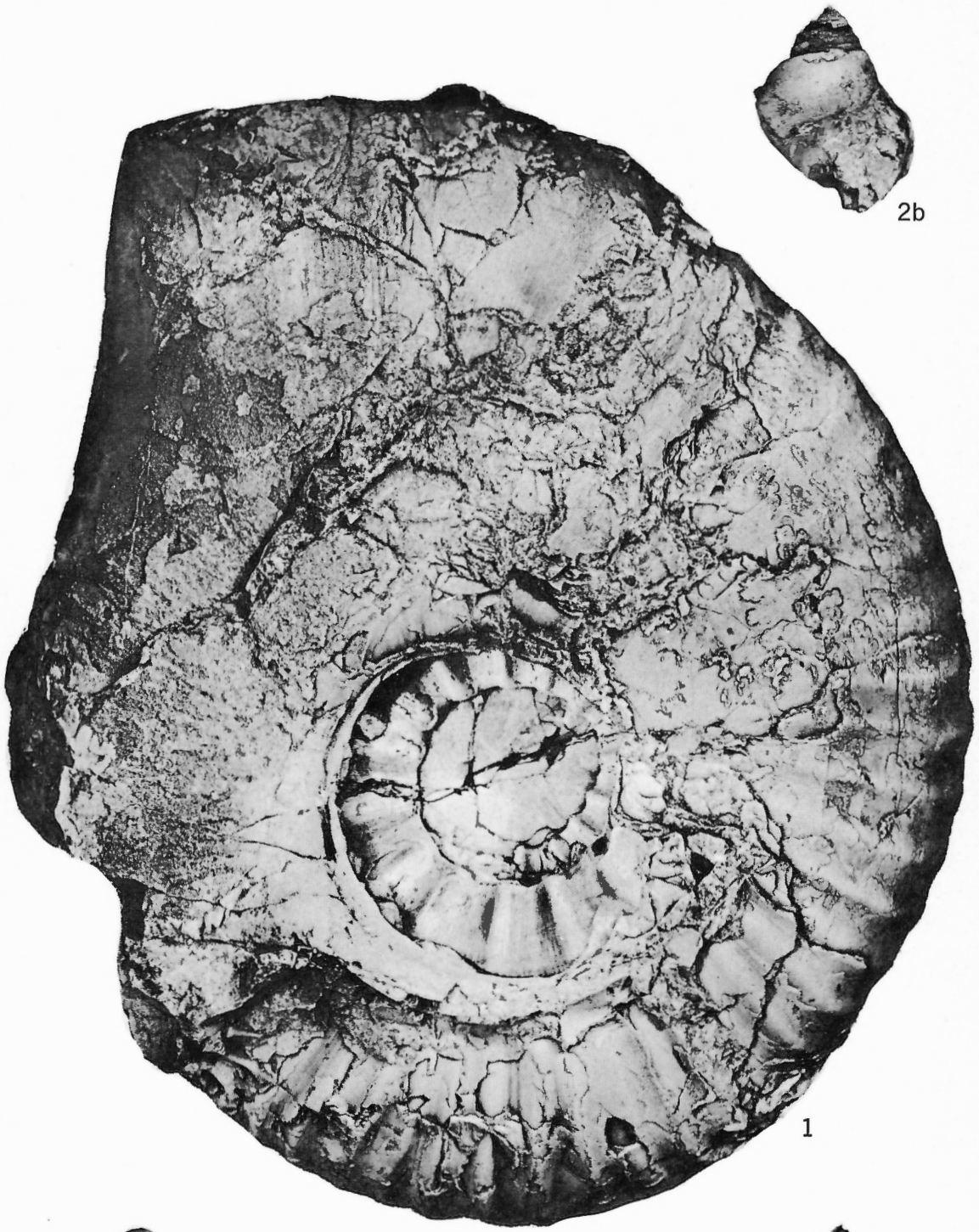


Plate XLVIII

OXFORDIAN

- Fig. 1. Goliathiceras cf. G. crassum (Reeside). Lateral view. GSC No. 13900. Fernie Group, Green beds. Oxfordian. Miette area, Rocky River, Alberta. See cross-section and venter on Pl. XLIX, figs. 1a, b.
- Figs. 2a, b. "Turbo" ferniensis Frebold. Holotype, GSC No. 12895. Fernie Group. Oxfordian. Cascade River, near Bankhead, Banff National Park, Alberta.
- Figs. 3a, b. "Turbo" ferniensis Frebold. Paratype, GSC No. 12896. Fernie Group, Green beds. Oxfordian. Shale quarry in Blairmore, Alberta.



1

2b

3b

3a

2a

Plate XLIX

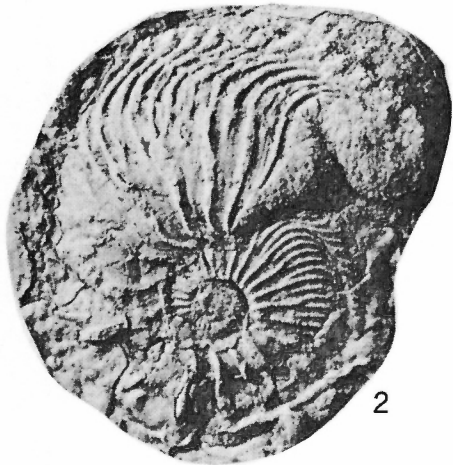
OXFORDIAN - LOWER KIMMERIDGIAN

- Figs. 1a, b. Goliathiceras cf. G. crassum (Reeside). 1a, venter; 1b, cross-section. GSC No. 13900. Fernie Group, Green beds. Oxfordian. Miette area, Rocky River. See lateral view on Pl. XLVIII, fig. 1.
- Fig. 2. Cardioceras (Scarburgiceras) sp. indet. aff. C. mirum Arkell. Lateral view. GSC No. 15128. Savik Formation. Oxfordian. Southwest of Buchanan Lake, Axel Heiberg Island.
- Figs. 3a,b,c, Buchia concentrica (Sowerby) var. erringtoni (Gabb).
d,e,f. 3a, lateral view of exterior left valve; 3b, lateral view of exterior right valve; 3c, anterior view of the exterior of both valves; 3d, oblique posterior view of the same; 3e, hinge margins and beaks from above; 3f, same as 3b, but enlarged 3X. GSC No. 17012. Lower part of Eldorado Group. Lower Kimmeridgian? Tyaughton Lake area, British Columbia.¹

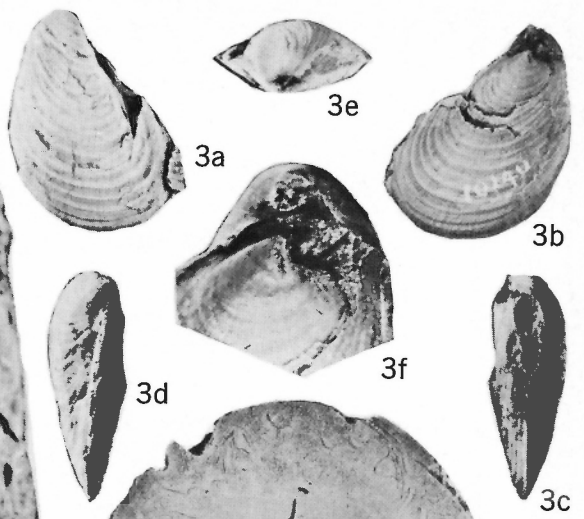
¹ Age determination and identification by J.A. Jeletzky who selected the figured specimen as representative of what he at present considers to be typical of this species and variety.



1a



2



3a

3e

3b

3d

3f

3c



1b

Plate L

MIDDLE KIMMERIDGIAN TO PORTLANDIAN

- Fig. 1. Dorsoplanites sp. indet. Lateral view. GSC No. 15134. Deer Bay Formation. Portlandian? Near Eureka weather station, Ellesmere Island.
- Fig. 2. Buchia mosquensis (von Buch) sensu lato. Lateral view of exterior of left valve. GSC No. 17989. Middle Kimmeridgian to lower Portlandian. West of Richardson Mountains. East of Waters River, Yukon.
- Fig. 3. Buchia mosquensis (von Buch) sensu lato. Lateral view of exterior of internal cast of right valve. GSC No. 17008. From talus of basal Lower Shale-siltstone Division. Middle Kimmeridgian to lower Portlandian. East slope Aklavik Range, about 3/4 mile south of top of Mount Gifford, N.W.T.
- Fig. 4. Buchia mosquensis (von Buch) sensu lato. Lateral view of exterior of left valve. GSC No. 17990. Middle Kimmeridgian to lower Portlandian. Top of Dave Lord Ridge, Yukon.
- Figs. 5a,b,c, Buchia piochii (Gabb) var. mniovnikensis (Pavlov). 5a, lateral view of exterior of left valve; 5b, interior of same; 5c, anterior view of the exterior; 5d, posterior view; 5e, hinge margin and beak from above. GSC No. 17120. From talus of Mould Bay Formation. Upper Portlandian. Mould Bay, Prince Patrick Island, N.W.T.
- Fig. 6. Buchia piochii (Gabb) var. mniovnikensis (Pavlov). Lateral view of the exterior of right valve. GSC No. 17118. About 135 feet above base of Mould Bay Formation. Upper Portlandian. East side of Mould Bay, 2 1/2 miles north of Mould Bay weather station, Prince Patrick Island, N.W.T.
- Figs. 7a,b, Buchia piochii (Gabb) var. mniovnikensis (Pavlov). 7a, lateral view of the exterior of right valve; 7b, interior of same; 7c, anterior view; 7d, beak part of the interior X3; 7e, hinge margin and beak from above. GSC No. 17117. Same stratigraphic position and locality as fig. 6.
- Figs. 8a,b, Buchia piochii (Gabb) var. russiensis (Pavlov). 8a, lateral view of the exterior of left valve; 8b, anterior view of same; 8c, posterior view of same; 8d, hinge margin and beak from above. GSC No. 17119. Same stratigraphic position and locality as fig. 5.
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Age determination and identification of the Buchias by J.A. Jeletzky who selected the figured specimens as representative of what he at present considers to be typical of these species and varieties.

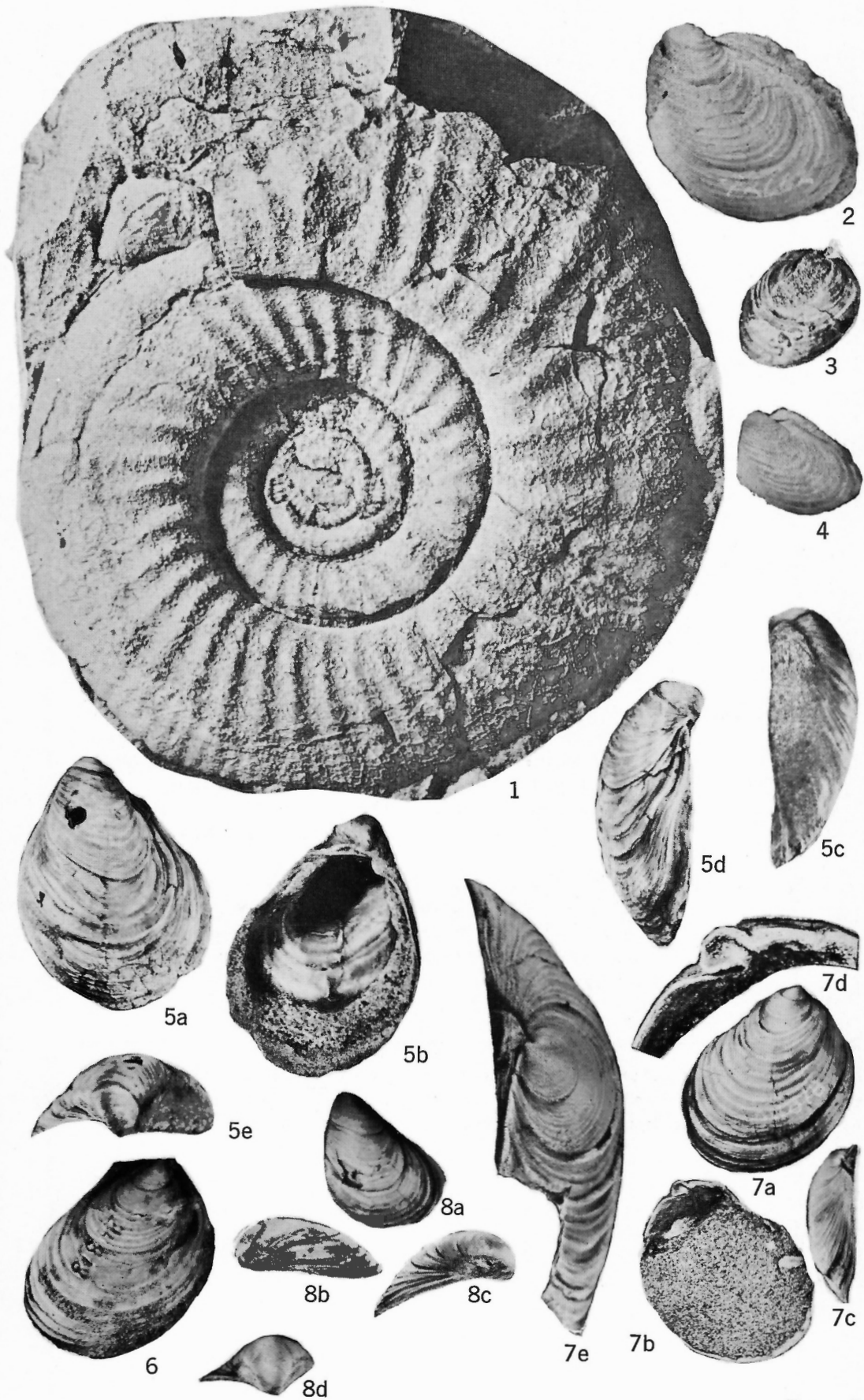


PLATE L

Plate LI

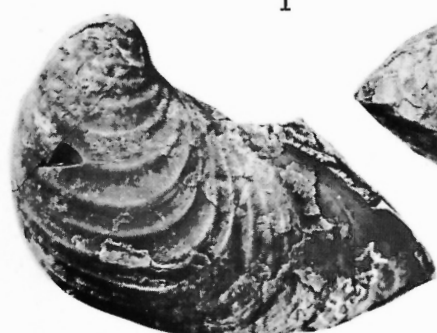
PORTLANDIAN AND AQUILONIAN

- Fig. 1. Titanites occidentalis Frebold. Lower Kootenay Sandstone. Portlandian. Ammonite Gully, Coal Creek, near Fernie, British Columbia.
- Figs. 2a,b,c. Buchia cf. blanfordiana (Stoliczka). 2a, lateral view of exterior of left valve; 2b, lateral view of exterior of right valve and oblique view of interior of hinge margin and beak of left valve; 2c, anterior view of left valve. GSC No. 16584. Upper shale member of Division B. Uppermost Portlandian? West side of Grassy Island. West coast of Vancouver Island.¹
- Figs. 3a,b,c. Buchia cf. blanfordiana (Stoliczka). 3a, lateral view of exterior of left valve; 3b, lateral view of exterior of right valve and beak of left valve; 3c, oblique posterior view of both valves. GSC No. 16578. Uppermost Portlandian? Same locality as fig. 2.¹
- Figs. 4a,b,c. Buchia fischeriana (d'Orbigny). 4a, lateral view of exterior of left valve; 4b, lateral view of exterior of right valve; 4c, anterior view of both valves. GSC No. 17991. Lower shale-siltstone Division. Aquilonian. Southeast shoulder of Mount Gifford, Aklavik Range, Richardson Mountains, N.W.T.¹
- Figs. 5a,b,c. Buchia fischeriana (d'Orbigny). 5a, lateral view of exterior of left valve; 5b, lateral view of exterior of right valve; 5c, anterior view of both valves. GSC No. 17992. Same stratigraphic position and locality as fig. 4.¹

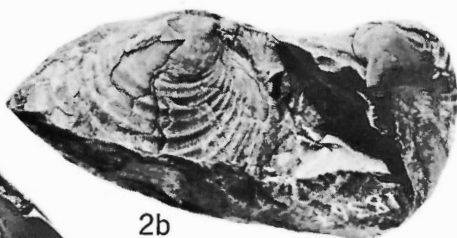
¹The identification and age determination of Buchia cf. blanfordiana and Buchia fischeriana were made by J.A. Jeletzky, who also selected the figured specimens.



1



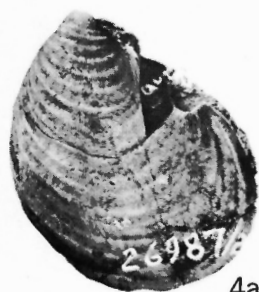
2a



2b



2c



4a



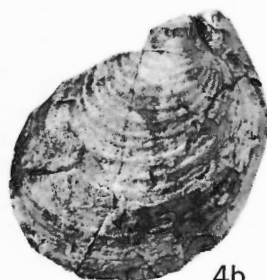
3c



3a



3b



4b



4c



5a



5c



5b