GEOLOGICAL SURVEY OF CANADA

DEPARTMENT OF MINES AND TECHNICAL SURVEYS

PAPER 65-5

ILLUSTRATIONS OF CANADIAN FOSSILS

LOWER CRETACEOUS FLORAS OF WESTERN CANADA

(Report and 16 plates)

W. A. Bell

Price 75 cents

1965

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1965

Illustrations of Canadian Fossils

LOWER CRETACEOUS FLORAS OF WESTERN CANADA

This paper illustrates many of the most commonly occurring, and a few of the more diagnostic megaplant remains that geologists or others are likely to find embedded in Lower Cretaceous strata of Western Canada. Fossil woods, miospores and most algae are excluded, because their identification requires mioscopic examination and study in the laboratory by specialists. Fossil woods and algae generally cannot be classified below family relationships, which militates against their value for refined age interpretations. Miospores, on the other hand, are in many instances superior to megaplants for age correlations, owing to their much greater resistance to modification of form under natural physical and chemical environments, and to their widespread airborne dispersal, whereby they may be incorporated in layered rock of more diverse facies.

Lower Cretaceous deposits the world over are of extraordinary interest from a botanical standpoint, because they contain floras, in which, so far as presently known, angiosperms make their first appearance. This is exemplified in Western Canada by the Blairmore Group of formations. In the type Blairmore area angiosperms are first represented by a single species of dicotyledonous leaf that was found in beds occupying a stratigraphic position about midway in a lower part of the group (the so-called Lower Blairmore Formation). The flora of which it forms a part consists dominantly of ferns, cycadeoids, conifers and Ginkgoales, a number of which are survivors from a flora of the underlying Kootenay Formation. Beds from an upper part of the same Blairmore Group (the so-called Upper Blairmore Formation), carry a flora that, in addition to the dicotyledonous leaf mentioned above, is dominantly angiospermous.

A stratigraphic disconformity, representing an unknown interval of time, may exist between the Lower and Upper components of the Blairmore Group, with their contrasting floras, and if so, stratigraphic relationships of the two floras are comparable in many respects with those existing between floras of the Arundel and overlying Patapsco Formations of the Potomac Group of Maryland, with the important difference, however that the Arundel has as yet not provided either megaplants or miospores that are undoubtedly angiospermous. Megaplant evidence supports an age correlation of the Upper Blairmore with some part of the Patapsco, and both are considered to be Albian.

Recent miospore studies have differentiated the flora contained in a basal part of the Patapsco from that in the upper part, the former being marked by a very small percentage of angiosperms, as contrasted with their dominance in the latter. No angiospermous pollen was detected in the flora of the underlying Arundel Formation.

This evidence, together with reported lack of angiospermous pollen in beds considered to be of Aptian age in other parts of the world, strongly suggests possibility of an early Albian age for at least that part of Lower Blairmore deposits that carries rare angiospermous megaplants. Consequently, until a thorough study has been made of miospore assemblages extracted from Lower Blairmore beds at relevant stratigraphic levels, an age assignment of the whole sequence to the Aptian is no longer justifiable, and in the present paper the age of the whole Lower Blairmore is designated only as Aptian and/or early Albian. Floras of the upper Blairmore, based partly upon presence within them of a few Cenomanian precursors, are considered to be mid- to late Albian. Floras from the Kootenay and correlative formations, underlying the Blairmore Group, are considered to range in age from late Jurassic to Neocomian-Barremian inclusive.

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PLATE I

Neocomian - Barremian

FIGURE 1: Czekanowskia cf. rigida Heer. Hypotype, GSC No. 13485. Nikanassin Formation. Ridge about 1 1/2 miles north of Belcourt Lake, British Columbia, GSC loc. 5127. Collector, D.C. McGregor.

FIGURE 2: Nilssonia schaumburgensis (Dunker) Nathorst. Hypotype, GSC No. 13507. Kootenay Formation. Panther River, Alberta, at first coal seam, GSC loc. 1668. Collector, C.S. Evans.

FIGURE 3: Cladophlebis heterophylla Fontaine. Hypotype, GSC No. 13444. Kootenay Formation. Lyon Creek, 2 miles south of Blairmore, Alberta, below a 2 1/2 inch coal seam at top of formation, GSC loc. 4051. Collector, F.H. McLearn.

FIGURE 4: Nilssonia nigracollensis Wieland. Hypotype, GSC No. 13506, among leaves of Czekanowskia cf. rigida. Hazelton Group, Groundhog coal basin, British Columbia, GSC loc. 509. Collector, G.S. Malloch.

FIGURE 5: Cladophlebis virginiensis Fontaine, forma acuta Fontaine. Hypotype, GSC No. 13442. Kootenay Formation. Corbin, British Columbia, roof of coal seam, GSC loc. 2093. Collector, B.R. McKay.

FIGURE 6: Nilssonia brongniarti (Mantell) Dunker. Hypotype, GSC No. 13511. Tantalus Formation. Mt. Bush, Wheaton River District, Yukon, GSC loc. 372. Collector, D.D. Cairnes.

FIGURE 7: Baiera cf. gracilis (Bean) Bunbury. Hypotype, GSC No. 13479. Hazelton Group. Head of Langlois Creek, British Columbia, Groundhog coal basin, GSC loc. 3171 (=32). Collector, G.S. Malloch.

FIGURE 8: Ginkgo nana Dawson. Hypotype, GSC No. 13477. Nikanassin Formation (upper part). Carson Creek, tributary to Wildhay River, Alberta, GSC loc. 3333. Collector, H.H. Beach.

FIGURE 9: Coniopteris yukonensis Bell. Hypotype, GSC No. 13440. Nikanassin Formation. Kakwa River, sec. 20, tp. 59, rge. 13, W 5th mer., Alberta, GSC loc. 4887. Collector, Triad Oil Company.


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PLATE II

Neocomian - Barremian

FIGURE 1: Coniopteris brevifolia (Fontaine) Bell. Hypotype, GSC No. 13438. Kootenay Formation. Canmore, Alberta, roof of No. 4 coal seam, approximately 1,300 feet above top of basal sandstone of formation, GSC loc. 5229. Collector, Canmore Mines Limited.

FIGURE 2: Baiera cf. gracilis (Bean) Bunbury. Hypotype, GSC No. 13478. Hazelton Group. Southwest side of Seven Sisters Mt., 9 miles from Cedarville, British Columbia, at elevation 4,800 feet, GSC loc. 2325. Collector, E.D. Kindle.

FIGURE 3: Cladophlebis virginiensis Fontaine, forma martiniana Dawson. Hypotype, GSC No. 13446. Hazelton Group. Groundhog coal basin, west slope Goat Mt., British Columbia, GSC loc. 2304. Collector, G.S. Malloch.

FIGURE 4: Coniopteris yukonensis Bell. Hypotype, GSC No. 13439. Tantalus Formation. Roof of Tantalus coal mine, Yukon, GSC loc. 374. Collector, D.D. Cairnes.

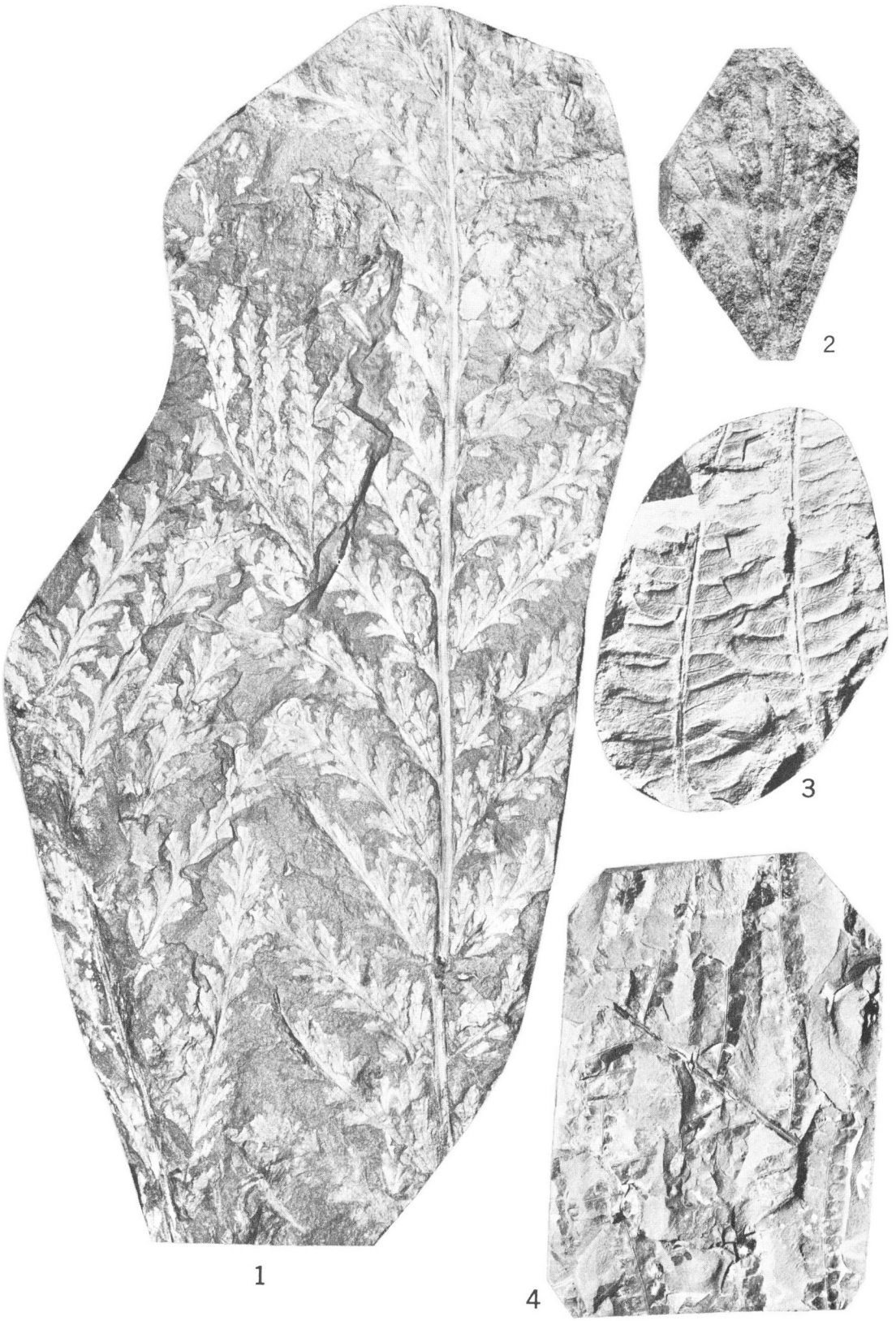
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PLATE III

Neocomian - Barremian

FIGURE 1: Thallites zeilleri (Seward) Harris. Hypotype, GSC No. 13437. Nikanassin Formation. Belcourt Lake area, ridge about 1 1/2 miles north of Belcourt Lake, British Columbia, GSC loc. 5120. Collector, D.C. McGregor.

FIGURE 2: Cladophlebis heterophylla Fontaine. Hypotype, GSC No. 13442, X2 (see Pl. I, fig. 3 for natural size). Kootenay Formation, Lyon Creek, 2 miles south of Blairmore, Alberta, below a 2 1/2 inch coal seam at top of formation, GSC loc. 4051. Collector, F.H. McLearn.

FIGURE 3: Cladophlebis virginiensis Fontaine, forma acuta-dentata Bell. Hypotype, GSC No. 13447. Nikanassin Formation. Ridge about 2 miles northwest of Belcourt Lake, British Columbia, GSC loc. 5140. Collector, D. C. McGregor.

FIGURE 4: Cladophlebis heterophylla Fontaine. Hypotype, GSC No. 13441. Nikanassin Formation. Kakwa River, sec. 20, tp. 59, rge. 13, W 5th mer., Alberta, GSC loc. 4041. Collector, Triad Oil Co.

FIGURE 5: Cladophlebis virginiensis Fontaine, forma martiniana Dawson. Hypotype, GSC No. 13443. Kootenay Formation. Corbin, British Columbia, 15 feet above thick coal of No. 6 mine, GSC loc. 1222. Collector, B.R. McKay.

FIGURE 6: Pityophyllum cf. nordenskiöldi (Heer) Kryshtofovich. Hypotype, GSC No. 13526. Kootenay Formation (Elk conglomerate member). Coal Creek, British Columbia, 2540 to 2550 feet above base of Jurassic 'passage beds', GSC loc. 3754. Collector, C.B. Newmarch.

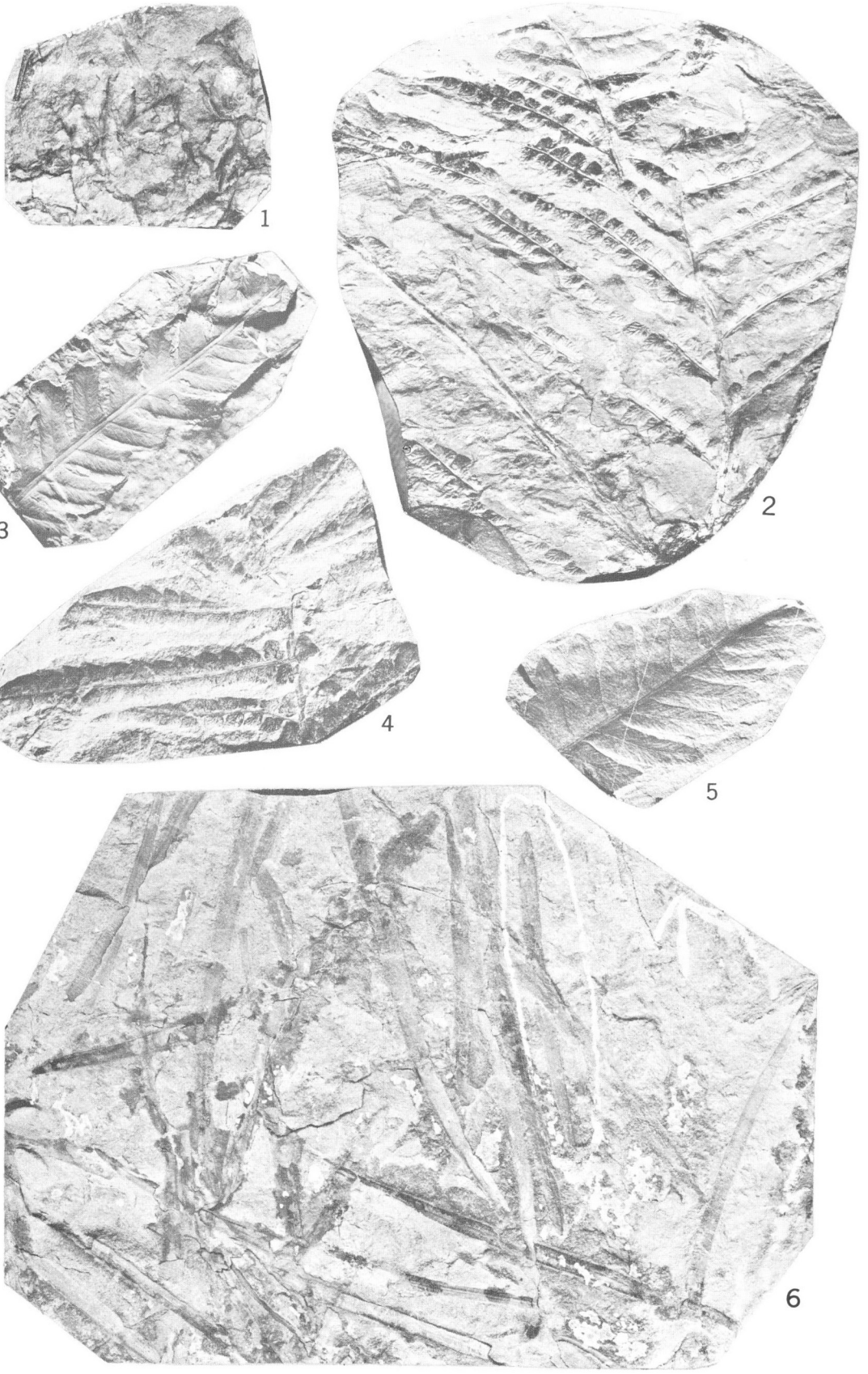
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PLATE IV

Aptian and/or early Albian

FIGURE 1: Gleichenites nordenskiöldi (Heer) Seward. Hypotype, GSC No. 13467. Jackass Mountain Group, Fraser River, east side, 1 1/2 miles south of CNR bridge at Lytton, British Columbia, GSC loc. 3716. Collector, K.C. McTaggart.

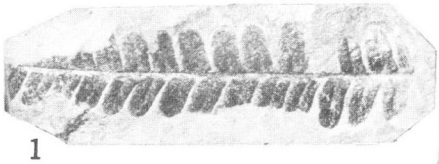
FIGURE 2: Gleichenites giesekianus (Heer) Seward. Hypotype, GSC No. 13469. Luscar Formation. Smoky River, 100 feet above 8 foot coal seam on Abbot Creek, east of Grande Cache, Alberta, GSC loc. 2134. Collector, B.R. McKay.

FIGURE 3: Cladophlebis virginiensis Fontaine, forma acutadentata Bell. Hypotype, GSC No. 13466. Luscar Formation, Kakwa River basin, about 3 miles up small creek entering Mouse Cache Creek from the north, below Dead Horse Meadows, Alberta, GSC loc. 5103. Collector, D.C. McGregor.

FIGURE 4: Coniopteris brevifolia (Fontaine) Bell. Hypotype, GSC No. 13456 (fertile) X2. Luscar Formation, Sphinx Creek, Alberta, 2 2/3 miles from junction with Gregg River, east boundary Miette area, GSC loc. 5062. Collector, D.C. McGregor.

FIGURE 5: Gleichenites nordenskiöldi (Heer) Seward. Hypotypes, GSC No. 14900 and Dictyophyllum fuchsiforme Bell, GSC No. 14901. Hazelton Group. South side Glacier Gulch, near Smithers, above and below coal of Lake Kathlyn, British Columbia, GSC loc. 3299. Collector, E.D. Kindle.

FIGURE 6: Sagenopteris williamsii (Newberry) Bell. Hypotype, GSC No. 13474. Luscar Formation. Ridge above creek entering Mouse Cache Creek from the north below Dead Horse Meadows, Alberta, GSC loc. 5107. Collector, D.C. McGregor.



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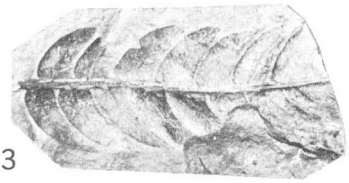

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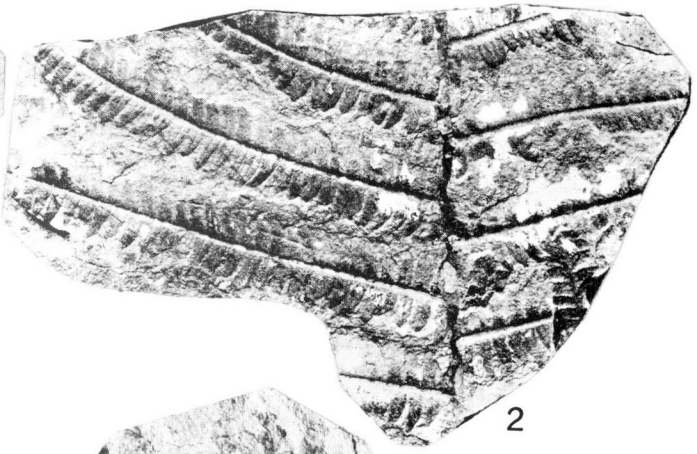

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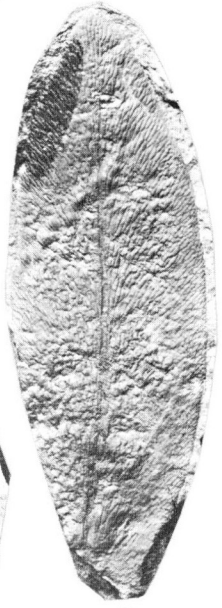

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PLATE V

Aptian and/or early Albian

FIGURE 1: Sagenopteris williamsii (Newberry) Bell. Hypotype, GSC No. 13484. Luscar Formation. Ridge above creek entering Mouse Cache Creek from the north below Dead Horse Meadows, Alberta, GSC loc. 5107. Collector, D.C. McGregor.

FIGURE 2: Sphenopteris (Gleichenites?) erecta Bell. Hypotype, GSC No. 5737, X2. Luscar Formation. Grigsby coal claim, Solomon Creek, Alberta, GSC loc. 347. Collector, J. McVicar.

FIGURE 3: Acrostichopteris foliosa (Fontaine) Berry. Hypotype, GSC No. 13470. Luscar Formation. Brûlé coalfield, Alberta, GSC loc. 1233. Collector, B.R. McKay.

FIGURE 4: Sphenopteris latiloba Fontaine. Hypotype, GSC No. 13450. Luscar Formation. Wildhay River, Alberta, GSC loc. 2054. Collector, B.R. McKay.

FIGURE 5: Ctenopsis insignis Fontaine. Hypotype, GSC No. 13528. Luscar? Formation. Top of ridge, about 1 mile northwest of Belcourt Lake, British Columbia, GSC loc. 5121. Collector, D.C. McGregor.

FIGURE 6: Cladophlebis impressa Bell. Hypotype, GSC No. 5738. Hazelton Group (upper part). Buckley River, British Columbia, GSC loc. 841. Collector, W.W. Leach.

FIGURE 7: Acrostichopteris foliosa (Fontaine) Berry. Hypotype, GSC No. 13449. Luscar Formation, Brûlé coalfield, Alberta, GSC loc. 1233. Collector, B.R. McKay.

FIGURE 8: Cladophlebis impressa Bell. Hypotype, GSC No. 5738, X2 (see Fig. 6 above).

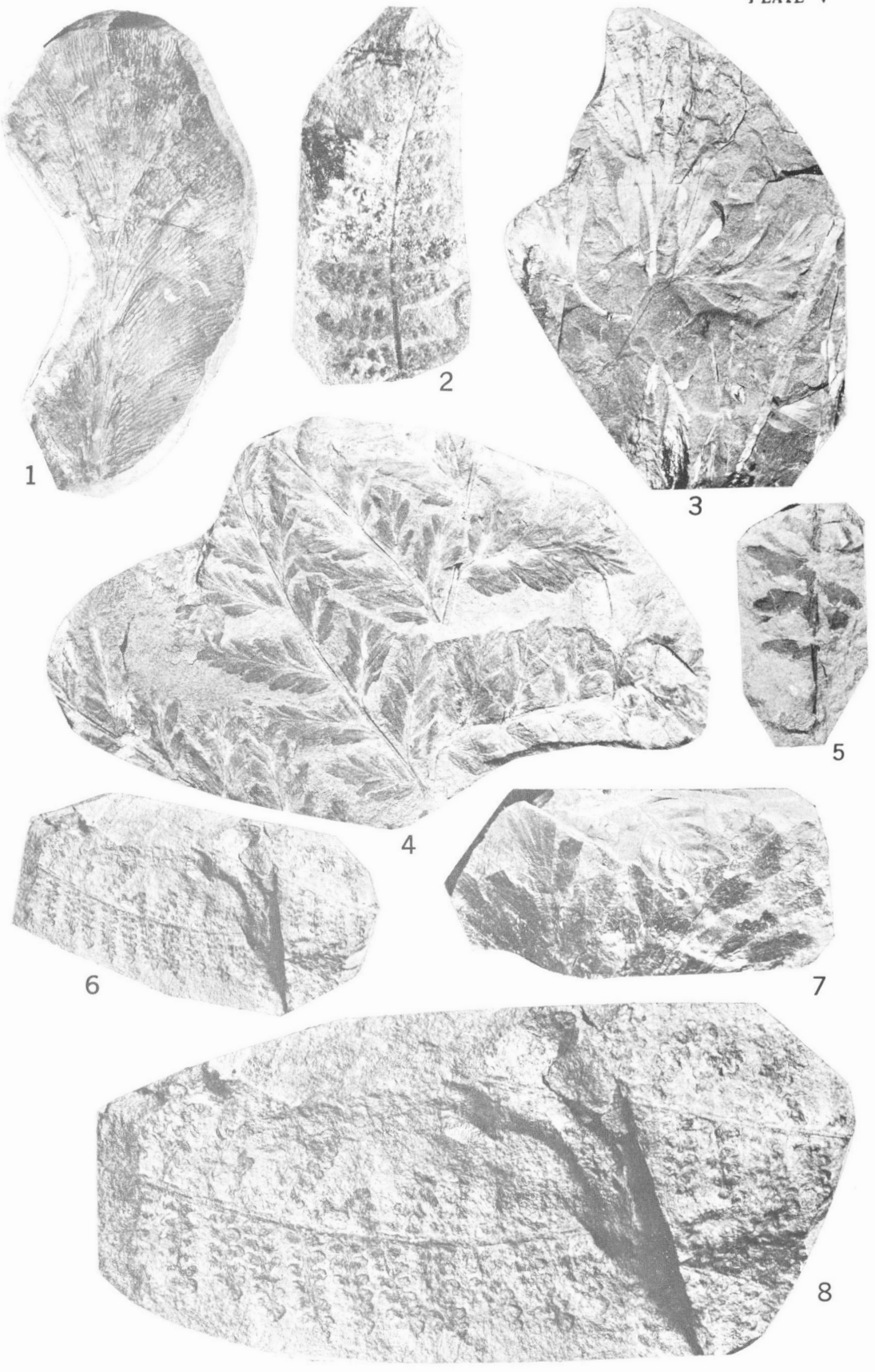
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PLATE VI

Aptian and/or early Albian

FIGURE 1: Onychiopsis psilotoides (Stokes and Webb) Ward. Hypotype, GSC No. 13455. Hazelton Group (upper part). Smithers area, British Columbia, GSC loc. 3318. Collector, E.J. Lees.

FIGURE 2: Sphenopteris bidens Bell. Hypotype, GSC No. 13460. Above it a fertile fragment of Cladophlebis parva Fontaine. Hypotype, GSC No. 13461. Blairmore Group (lower part). Castle River, Alberta, north bank, east of Hell Gate canyon, and west of cable foot bridge on Carbon Hill property, approximately 800 feet above base of group. GSC loc. 4033. Collector, F.H. McLearn.

FIGURE 3: Cladophlebis parva Fontaine. Hypotype, GSC No. 14898, X2. Luscar Formation. Belcourt Lake area, British Columbia, ridge northwest of Belcourt Lake, GSC loc. 5125. Collector, D.C. McGregor.

FIGURE 4: Sphenopteris acrodentata Fontaine. Hypotype, GSC No. 13452. Hazelton Group (upper part). Creek flowing into Skeena River, opposite Hazelton, British Columbia, GSC loc. 2413. Collector, J.E. Armstrong.

FIGURE 5: Klukia canadensis Bell. Hypotype, GSC No. 13471, X2. Blairmore Group (lower part). York Creek, lower part, south of railway and west of Blairmore, Alberta, GSC loc. 4037. Collector, F.H. McLearn.

FIGURE 6: Cladophlebis parva Fontaine. Hypotype, GSC No. 13464. Luscar Formation, Brûlé coalfield, Alberta, GSC loc. 1233. Collector, B.R. McKay.

FIGURE 7: Dictyophyllum fusiforme Bell. Hypotype, GSC No. 13448. Hazelton Group. South side Glacier Gulch, near Smithers, above and below coal of Lake Kathlyn, British Columbia, GSC loc. 3299 (=2374). Collector, E.D. Kindle.

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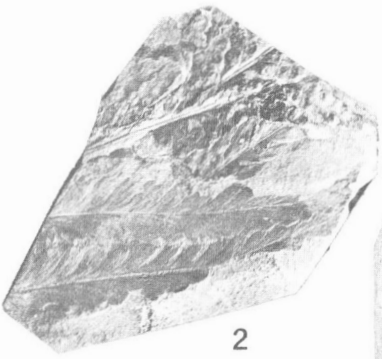

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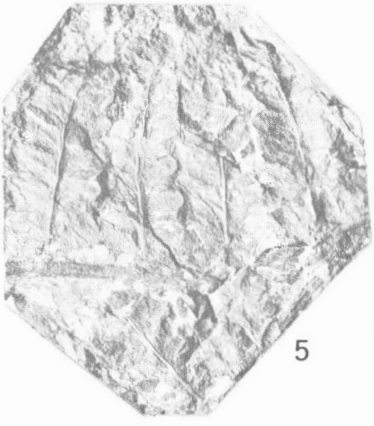

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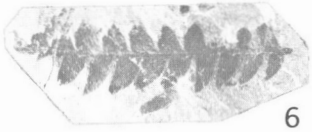

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PLATE VII

Aptian and/or early Albian

FIGURE 1: Sphenopteris acrodentata Fontaine. Hypotype, GSC No. 6566. Gething Formation. In a thinly bedded series with coal seams at north end Coal Ridge, one mile east of British Columbia - Alberta boundary, about lat. 54°10'N, and 75 feet below a massive conglomerate, GSC loc. 4311. Collector, L.D. Burling.

FIGURE 2: Phoenicopsis angustifolia Heer forma media Krasser. Hypotype, GSC No. 13480. Luscar? Formation. Ridge about 1 1/2 miles north of Belcourt Lake, British Columbia, GSC loc. 5120. Collector, D.C. McGregor.

FIGURE 3: Klukia canadensis Bell. Hypotype, GSC No. 13457, X2. Luscar Formation, Wildhay River, Alberta, GSC loc. 2054. Collector, B.R. McKay.

FIGURE 4: Klukia canadensis Bell. Hypotype, GSC No. 13458, X4 (fertile specimen). Blairmore Group, Mill Creek area, Alberta, GSC loc. 3063. Collector, C.O. Hage.

FIGURE 5: Sphenopteris (Ruffordia) göpperti (Dunker) Seward. Hypotype, GSC No. 13453. Luscar Formation. Sphinx Creek, Alberta, 2 2/3 miles from junction with Gregg River, east boundary, Miette area, GSC loc. 5062. Collector, D.C. McGregor.

FIGURE 6: Sphenopteris (Ruffordia) göpperti (Dunker) Seward. Hypotype, GSC No. 5371. Blairmore Group, in beds below base of upper Blairmore, Mill Creek area, Alberta, GSC loc. 3063. Collector, C.O. Hage.

FIGURE 7: Sphenopteris (Ruffordia) göpperti (Dunker) Seward. Hypotype, GSC No. 13454. Luscar Formation, Sphinx Creek, Alberta, 2 2/3 miles from junction with Gregg River, east boundary Miette area, GSC loc. 5062. Collector, D.C. McGregor.

FIGURE 8: Sphenopteris newberryi Bell. Hypotype, GSC No. 13459, X2. Luscar Formation. Kakwa River, about 12 1/2 miles upstream from entry of Lynx Creek, Alberta, GSC loc. 5133. Collector, D.C. McGregor.

FIGURE 9: Gleichenites nordenskiöldi (Heer) Seward. Hypotype, GSC No. 13468. Pasayten Group. Four hundred yards southeast of a 6,900 foot peak, 2 miles north of international boundary-line and about 3 miles west of Pasayten River, British Columbia, at elevation 6,750 feet, GSC loc. 3320. Collector, R.A. Daly.

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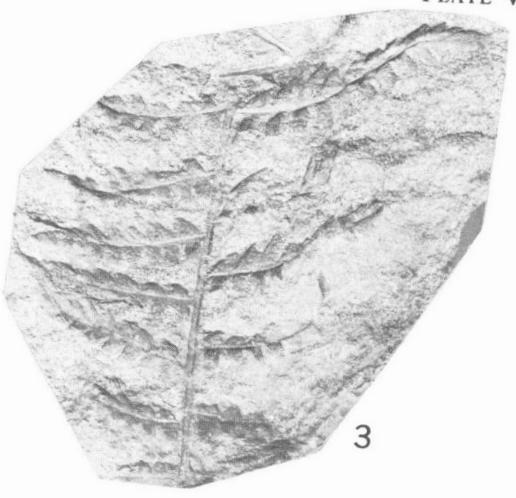

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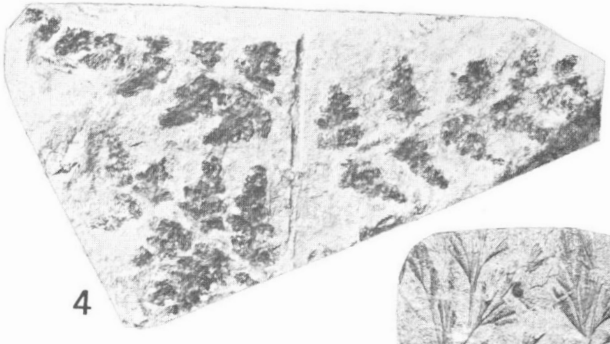

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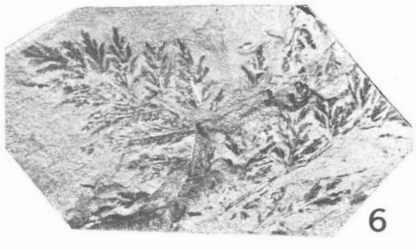

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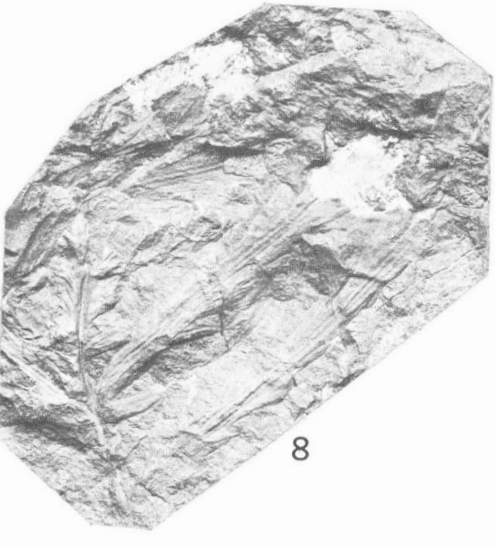

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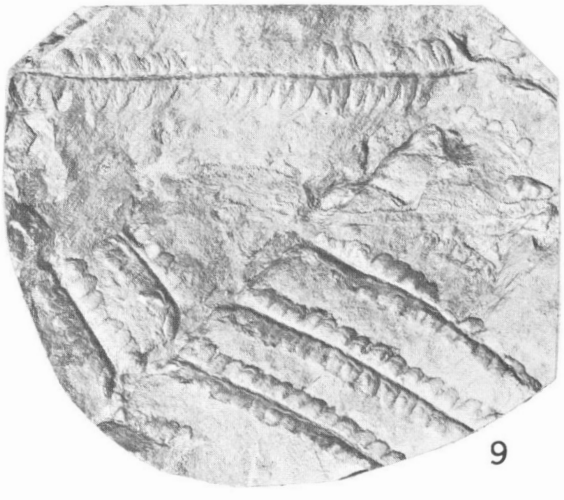

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PLATE VIII

Aptian and/or early Albian

FIGURE 1: Ginkgo pluripartita (Schimper) Heer. Hypotype, GSC No. 13482. Luscar Formation. About 3 miles upstream in second major tributary from south to Kakwa River above Lynx Creek, Alberta, GSC loc. 5105. Collector, D.C. McGregor.

FIGURE 2: Zamites? sp. (Dawson) Bell. GSC No. 13502, and Elatides curvifolia (Dunker) Nathorst. Hypotype, GSC No. 13503. Luscar Formation. Folding Mt. Creek, south bank, 2 1/2 miles upstream from Mystery Lake, Alberta, GSC loc. 5061. Collector, D.C. McGregor.

FIGURE 3: Zamites? sp. (Dawson) Bell. GSC No. 13504. Luscar Formation. Folding Mt. Creek, 2 1/2 miles upstream from Mystery Lake, Alberta, GSC loc. 5061. Collector, D.C. McGregor.

FIGURE 4: Ctenis sp. Bell. GSC No. 13514. Luscar Formation. Ridge northwest of Belcourt Lake, British Columbia, GSC loc. 5125. Collector, D.C. McGregor.

FIGURE 5: Equisetum lyelli Mantell forma burchardti Schenk. Hypotype, GSC No. 13472. Luscar? Formation. Ridge about 1 1/2 miles north of Belcourt Lake, British Columbia, GSC loc. 5120. Collector, D.C. McGregor.

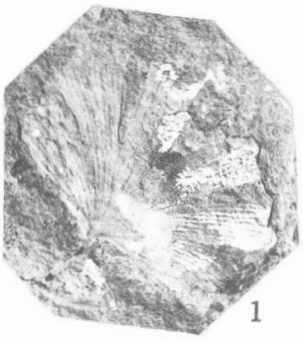
FIGURE 6: Ginkgo pluripartita (Schimper) Heer. Hypotype, GSC No. 13481. Luscar Formation. Ridge about 2 miles northwest of Belcourt Lake, British Columbia, GSC loc. 5140. Collector, D.C. McGregor.

FIGURE 7: Ginkgo pluripartita (Schimper) Heer. Hypotype, GSC No. 13488. Luscar Formation. Ridge about 2 miles northwest of Belcourt Lake, British Columbia, GSC loc. 5140. Collector, D.C. McGregor.

FIGURE 8: Sagenopteris? sp. GSC No. 13487. Luscar Formation. Ridge about 2 miles northwest of Belcourt Lake, British Columbia, GSC loc. 5140. Collector, D.C. McGregor.

FIGURE 9: Nilssonia brongniarti (Mantell) Dunker. Hypotype, GSC No. 13509. Luscar Formation. Kakwa River basin, about 2 miles up small creek entering Mouse Cache Creek from the north below Dead Horse Meadows; Alberta, GSC loc. 5111. Collector, D.C. McGregor.

FIGURE 10: Pseudocycas dunkeriana (Göppert) Florin. Hypotype, GSC No. 13500. Luscar Formation. Ridge about one mile northwest of Belcourt Lake, British Columbia, GSC loc. 5099. Collector, D.C. McGregor.



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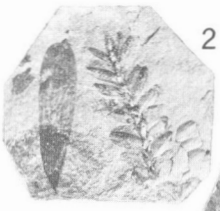

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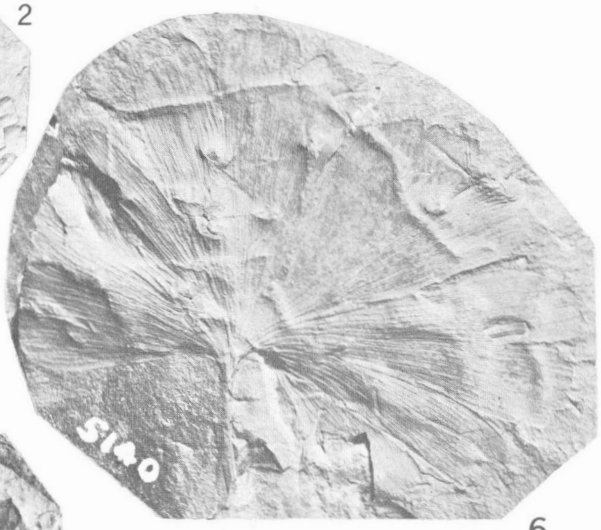

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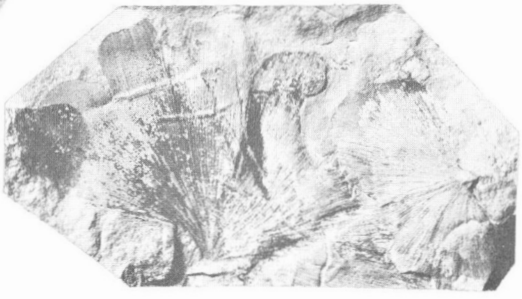

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PLATE IX

Aptian and/or early Albian

FIGURE 1: *Pseudocycas* sp. A Bell cf. *unjiga* (Dawson) Berry. GSC No. 13501. Luscar Formation. Ridge about 2 miles northwest of Belcourt Lake, British Columbia, GSC loc. 5140. Collector, D.C. McGregor.

FIGURE 2: *Ptilophyllum* (*Anomozamites*) *montanense* (Fontaine) Bell. Hypotype, GSC No. 13498. Luscar Formation. Kakwa River basin, about 3 miles up small creek entering Mouse Cache Creek from the north, below Dead Horse Meadows, Alberta, GSC loc. 5137. Collector, D.C. McGregor.

FIGURE 3: *Pterophyllum plicatum* Bell. Hypotype, GSC No. 13492. Commotion Formation. Mt. Torrens, Monkman map-area, British Columbia, GSC loc. 5780. Collector, D.F. Stott.

FIGURE 4: *Pterophyllum plicatum* Bell. Hypotype, GSC No. 13496. Luscar Formation. Kakwa River, Alberta, at small creek entering from north, 12 miles upstream from entry of Lynx Creek, GSC loc. 5122. Collector, D.C. McGregor.

FIGURE 5: *Pterophyllum plicatum* Bell. Hypotype, GSC No. 13490. Luscar Formation. Ridge about 2 miles northwest of Belcourt Lake, British Columbia, GSC loc. 5140. Collector, D.C. McGregor.

FIGURE 6: *Nilssonia california* Fontaine. Hypotype, GSC No. 13510. Luscar Formation. Kakwa River basin, 1 1/2 miles up small creek entering Mouse Cache Creek below Dead Horse Meadows, Alberta, GSC loc. 5113. Collector, D.C. McGregor.

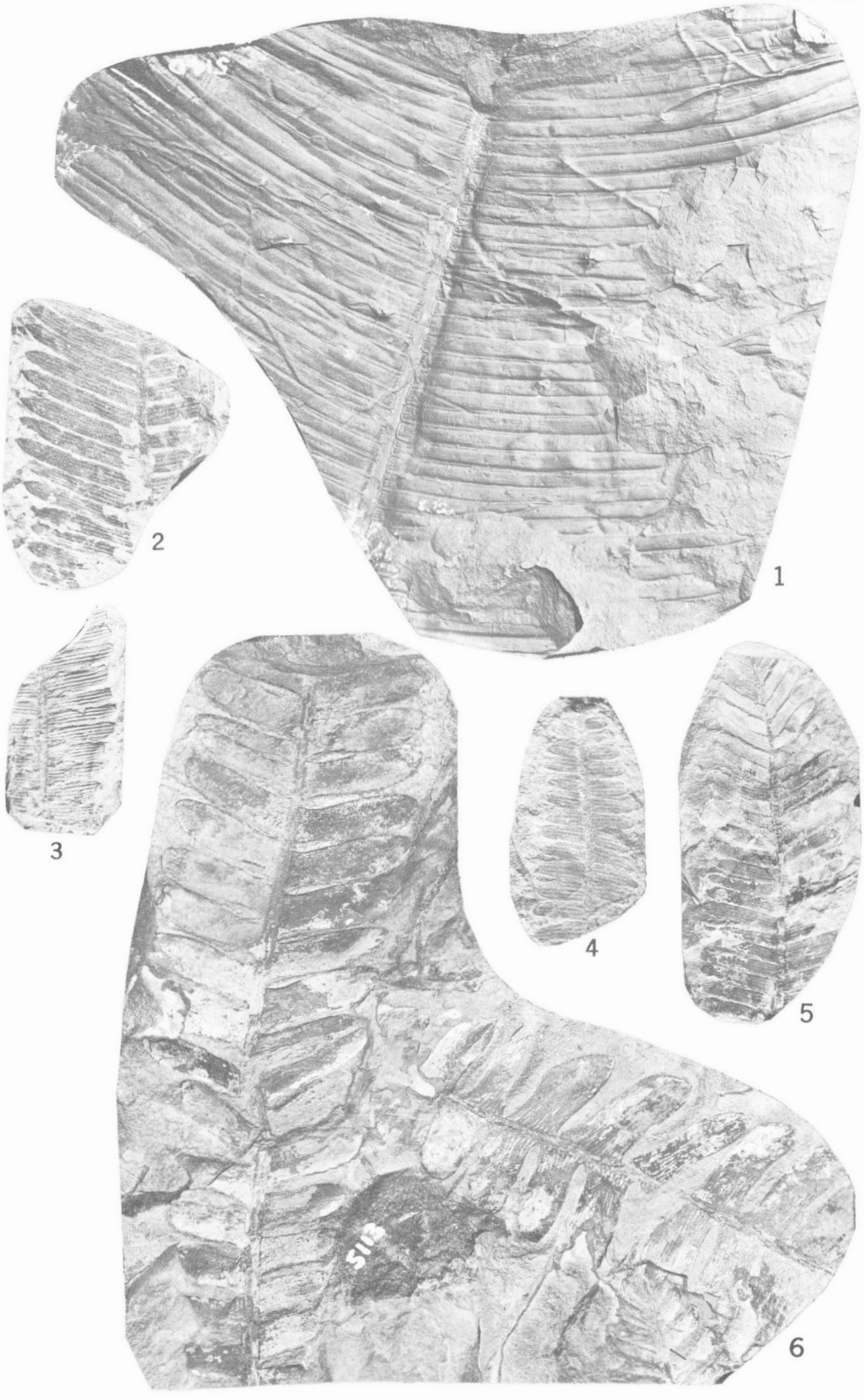
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PLATE X

Aptian and/or early Albian

FIGURE 1: Nilssonia brongniarti (Mantell) Dunker. Hypotype, GSC No. 13508. Luscar Formation. Ridge northwest of Belcourt Lake, British Columbia, GSC loc. 5125. Collector, D.C. McGregor.

FIGURE 2: Pterophyllum rectangulare Bell. Hypotype, GSC No. 13495. Luscar Formation. Stinking Springs Creek, sec. 34, tp. 60, rge. 13, W 5th mer., Alberta, GSC loc. 4888. Collector, Triad Oil Company.

FIGURE 3: Ptilophyllum (Anomozamites) montanense (Fontaine) Bell. Hypotype, GSC No. 13497. Luscar Formation. Kakwa River basin, about 3 miles up small creek entering Mouse Cache Creek from the north below Dead Horse Meadows, Alberta, GSC loc. 5137. Collector, D.C. McGregor.

FIGURE 4: Pterophyllum plicatum Bell. Hypotype, GSC No. 13491. Luscar Formation. Kakwa River, Alberta, about 2 1/2 miles up small tributary creek entering from north below Dead Horse Meadows, GSC loc. 5106. Collector, D.C. McGregor.

FIGURE 5: Pterophyllum validum? Hollick. Hypotype, GSC No. 13499. Luscar Formation. Kakwa River basin, about 2 1/2 miles up small creek entering Mouse Cache Creek from north below Dead Horse Meadows, Alberta, GSC loc. 5104. Collector, D.C. McGregor.

FIGURE 6: Nilssonia canadensis Bell. Hypotype, GSC No. 13512. Hazelton Group. Upper Skeena River, B.C., opposite McEvoy's camp, GSC loc. 7021. Collector, G.S. Malloch.

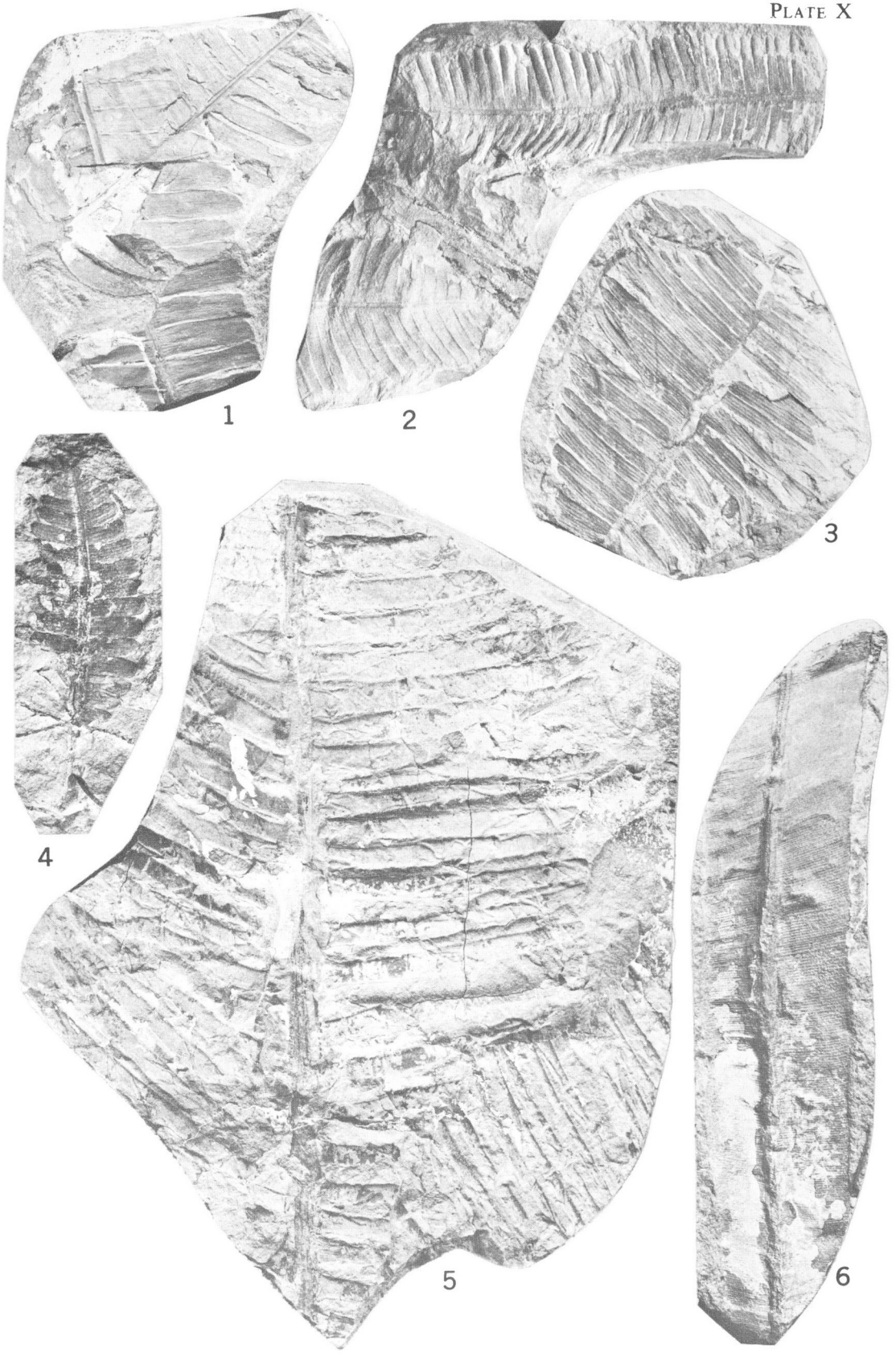
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PLATE XI

Aptian and/or early Albian

FIGURE 1: Pityophyllum cf. nordenskiöldi (Heer) Kryshtofovich. GSC No. 13524. Luscar Formation. Folding Mt. Creek, 100 feet downstream from outcrop of conglomeratic sandstone, Miette map-area, Alberta, GSC loc. 5065. Collector, D.C. McGregor.

FIGURE 2: Pterophyllum rectangulare Bell, Hypotype, GSC No. 13493, and Pityophyllum cf. nordenskiöldi (Heer) Kryshtofovich. GSC No. 13494. Luscar Formation from loc. 5065 as above. Collector, D.C. McGregor.

FIGURE 3: Cladophlebis virginiensis Fontaine, forma acuta-dentata Bell. Hypotype, GSC No. 13451. Second ridge northeast of boundary trail crossing of Torrens River, 2 miles west of British Columbia - Alberta boundary, GSC loc. 5131. Collector, D.F. Stott.

FIGURE 4: Nilssonia canadensis Bell. Hypotype, GSC No. 13513. Luscar Formation. Ridge about 2 miles northwest of Belcourt Lake, British Columbia, GSC loc. 5140. Collector, D.C. McGregor.

FIGURE 5: Elatocladus acifolia Bell. Hypotype, GSC No. 13521. Luscar Formation. Junction of Cabin Creek with Grey River, about 100 feet west of cabin and 100 feet above Cadomin conglomerate, Alberta, GSC loc. 2201 (=1868). Collector, B.R. McKay.

FIGURE 6: Elatocladus brevifolia (Fontaine) Bell. Hypotype, GSC No. 13515. Luscar Formation. Folding Mt. Creek, south bank, 2 1/2 miles upstream from Mystery Lake, Alberta, GSC loc. 5061. Collector, D.C. McGregor.

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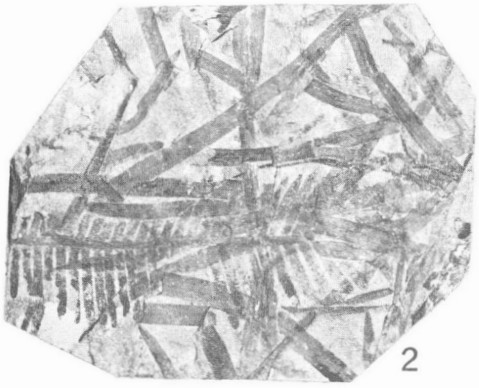

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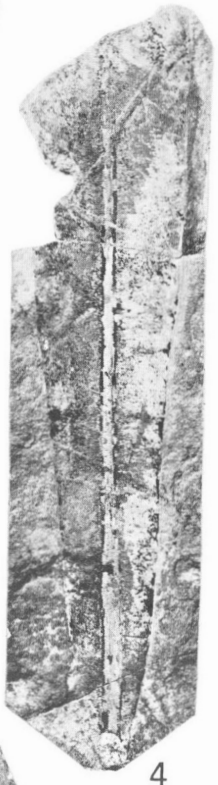

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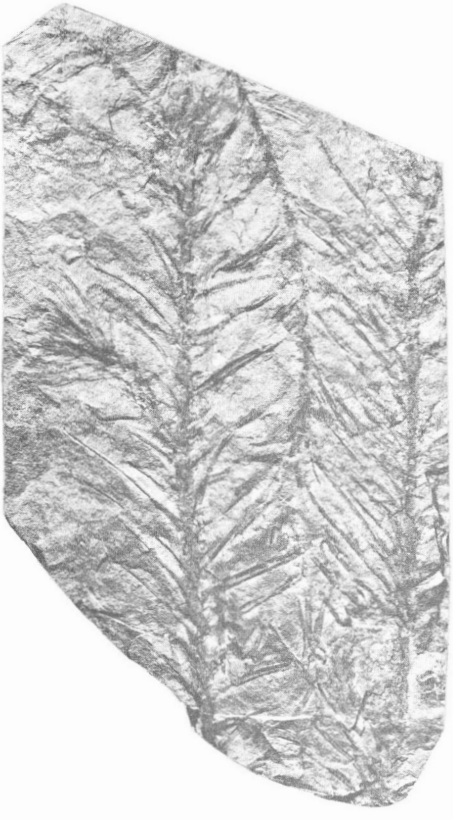

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PLATE XII

Aptian and/or early Albian

FIGURE 1: Sagenopteris mclearni Berry. Hypotype, GSC No. 13476. Blairmore Group (lower part). East slope Ma Butte, 1,305 feet above base, or 545 feet below top of group in area, GSC loc. 4025. Collector, F.H. McLearn.

FIGURE 2: Elatocladus (Torreya?) brevifolia (Fontaine) Bell. Hypotype, GSC No. 13516, X2 (traces of stomatal? grooves and terminal seed?). Luscar Formation, Kakwa River basin, about 12 miles upstream from entry of Lynx Creek, Alberta, GSC loc. 5144. Collector, D.C. McGregor.

FIGURE 3: Elatocladus (Torreya?) brevifolia (Fontaine) Bell. Hypotype, GSC No. 13517. Luscar Formation. Sphinx Creek, 3 miles upstream from junction with Gregg River, Miette area, Alberta, GSC loc. 5064. Collector, D.C. McGregor.

FIGURE 4: Elatides curvifolia (Dunker) Nathorst. Hypotype, GSC No. 13519 (with attached terminal cones). Luscar Formation. Ridge about 2 miles northwest of Belcourt Lake, British Columbia, GSC loc. 5140. Collector, D.C. McGregor.

FIGURE 5: Pagiophyllum sp. GSC No. 13527. Hazelton Group (upper part). South side Glacier Gulch near Smithers, above and below coal of Lake Kathlyn, British Columbia, GSC loc. 3299 (=2374). Collector, E.D. Kindle.

FIGURE 6: Elatides splendida Bell. Hypotype, GSC No. 14899 and Elatides curvifolia (left top) hypotype, GSC No. 13518. Luscar Formation. Sphinx Creek, east bank, 2 1/2 miles upstream from junction with Gregg River, Miette map-area, Alberta, GSC loc. 5063. Collector, D.C. McGregor.

FIGURE 7: Athrotaxites berryi Bell. Hypotype, GSC No. 13522. Luscar Formation. Folding Mt. Creek, 100 feet downstream from outcrop conglomeratic sandstone, Miette map-area, Alberta, GSC loc. 5065. Collector, D.C. McGregor.

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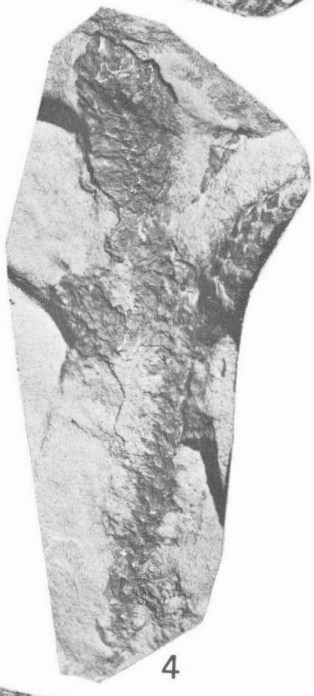

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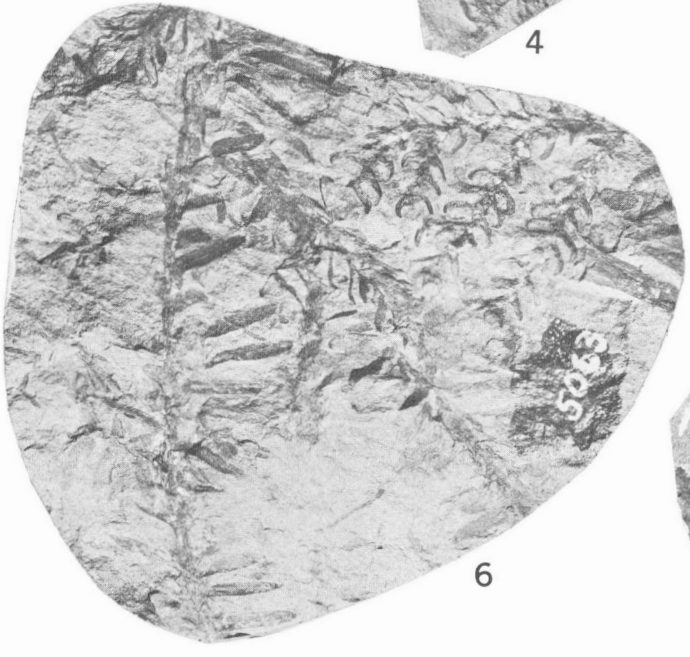

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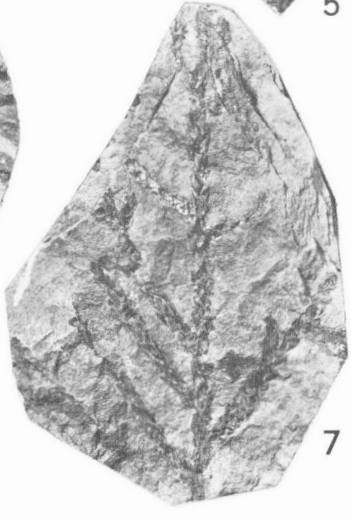

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PLATE XIII

Aptian and/or early Albian

FIGURE 1: Stenorachis striolatus (Heer pars) Nathorst. Hypotype, GSC No. 13473. Luscar Formation. Folding Mt. Creek, Miette map-area, 2 1/2 miles upstream from Mystery Lake, Alberta, GSC loc. 5061. Collector, D.C. McGregor.

FIGURE 2: Athrotaxites berryi Bell. Hypotype, GSC No. 13462. Luscar Formation, North branch Upper Berland River on Forty-foot Falls Creek, Alberta, GSC loc. 3332. Collector, H.H. Beach.

FIGURE 3: Athrotaxites berryi Bell. Hypotype, GSC No. 13525. Luscar Formation, Kakwa River basin, about 25 miles up small creek entering Mouse Cache Creek from the north below Dead Horse Meadows, Alberta, GSC loc. 5139. Collector, D.C. McGregor.

FIGURE 4: Athrotaxites berryi Bell. GSC No. 13525 (Fig. 3), X2.

FIGURE 5: Sapindopsis belviderensis Berry. Hypotype, GSC No. 13547. Luscar Formation. Ridge northwest of Belcourt Lake, British Columbia, GSC loc. 5125. Collector, D.C. McGregor.

FIGURE 6: Podozamites lanceolatus (Lindley and Hutton) Schimper. Hypotype, GSC No. 13529. Luscar Formation. Folding Mt. Creek, Miette map-area, Alberta, GSC loc. 5068. Collector, D.C. McGregor.


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PLATE XIV

Albian

FIGURE 1: Cladophlebis parva Fontaine. Hypotype, GSC No. 13544. Crowsnest Formation. Mill Creek, sec. 7, tp. 1, rge. 6, W 5th mer., Alberta, GSC loc. 5161. Collector, D.K. Norris.

FIGURE 2: Cladophlebis parva Fontaine. Hypotype, GSC No. 13539. Crowsnest Formation. Mill Creek, sec. 7, tp. 1, rge. 6, W 5th mer., GSC loc. 5161. Collector, D.K. Norris.

FIGURE 3: Sapindopsis angusta (Heer) Seward and Conway. Hypotype, GSC No. 13545. Crowsnest Formation. Same locality as for Figure 2 above. Collector, D.K. Norris.

FIGURE 4: Cinnamomoides sp. cf. Cinnamomum newberryi Berry. GSC No. 13531. Commotion Formation. Bullmoose Mt., Dawson Creek map-area, British Columbia, GSC loc. 5650. Collector, D.F. Stott.

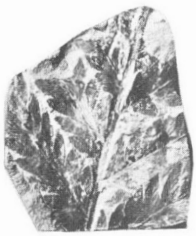
FIGURE 5: Sphenopteris mclearni Bell. Holotype, GSC No. 5834. Blairmore Group (upper part). Mill Creek area, Alberta, GSC loc. 3065. Collector, C.O. Hage.

FIGURE 6: Pseudocycas sp. cf. unjiga (Dawson) Berry. GSC No. 13552. Commotion Formation. Commotion Creek, British Columbia, cut in east bank, 7/8 mile upstream from falls, GSC loc. 4804. Collector, J.E. Hughes.

FIGURE 7: Cinnamomoides sp. cf. Cinnamomum newberryi Berry. GSC No. 13530. Commotion Formation. Bullmoose Mt., Dawson Creek map-area, British Columbia, GSC loc. 5650. Collector, D.F. Stott.

FIGURE 8: Cinnamomoides sp. cf. Cinnamomum newberryi Berry. GSC No. 6640. Crowsnest Formation. Baker's Creek, Alberta, GSC loc. 3135. Collector, C.O. Hage.

FIGURE 9: Sapindopsis angusta (Heer) Seward and Conway, forma magnifolia Berry. Hypotype, GSC No. 13535. Blairmore Group (upper part). Fernie map-area, 4,100 yards in direction north 273° east from mouth of McEvoy Creek, Alberta, GSC loc. 5530. Collector, R.A. Price.



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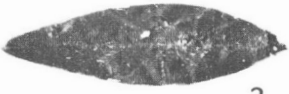

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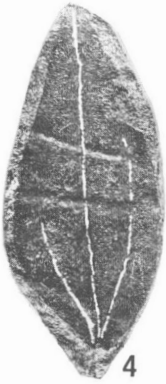

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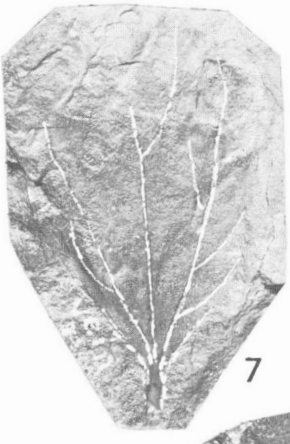

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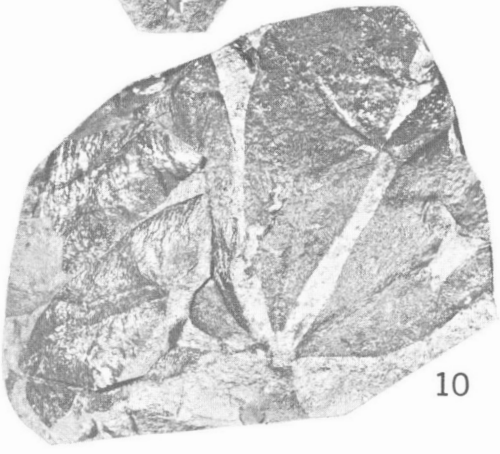

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PLATE XV

Albian

FIGURE 1: Menispermites reniformis Dawson. Hypotype, GSC No. 13550. Commotion Formation. Commotion Creek, Dawson Creek map-area, British Columbia, GSC loc. 5654. Collector, D.F. Stott.

FIGURE 2: Ficus glascoeana Lesquereux. Hypotype, GSC No. 13549. Commotion Formation. Commotion Creek, Dawson Creek map-area, British Columbia, GSC loc. 5654. Collector, D.F. Stott.

FIGURE 3: Celastrophyllum acutidens Fontaine. Hypotype, GSC No. 5902. Crowsnest Formation. Mill Creek, Alberta, 2 to 4 feet below top of formation, GSC loc. 3066. Collector, C.O. Hage.

FIGURE 4: Ficus ovatifolia Berry. Hypotype, GSC No. 13537. Crowsnest Formation, Mill Creek, sec. 7, tp. 1, rge. 6, W 5th mer., Alberta, GSC loc. 5161. Collector, D.K. Norris.

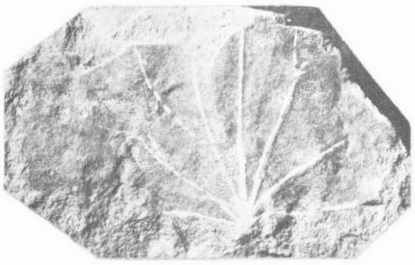
FIGURE 5: Ficus ovatifolia Berry. Hypotype, GSC No. 5882. Blairmore Group (upper part). Ma Butte, about 45 feet below top of group, Alberta, GSC loc. 4022. Collector, F.H. McLearn.

FIGURE 6: Araliaephyllum westoni (Dawson) Bell. Hypotype, GSC No. 13541. Crowsnest Formation. Mill Creek, sec. 7, tp. 1, rge. 6, W 5th mer., Alberta, GSC loc. 5161. Collector, D.K. Norris.

FIGURE 7: Ficus ovatifolia Berry. Hypotype, GSC No. 13548. Commotion Formation. Bullmoose Mt., Dawson Creek map-area, Alberta, GSC loc. 5658. Collector, D.F. Stott.

FIGURE 8: Araliaephyllum westoni (Dawson) Bell. Hypotype, GSC No. 13540. Crowsnest Formation. Mill Creek, sec. 7, tp. 1, rge. 6, W 5th mer., Alberta, GSC loc. 5161. Collector, D.K. Norris.

FIGURE 9: Ficus ovatifolia Berry. Hypotype, GSC No. 13533. Commotion Formation. Bullmoose Mt., Dawson Creek map-area, British Columbia, GSC loc. 5650. Collector, D.F. Stott.



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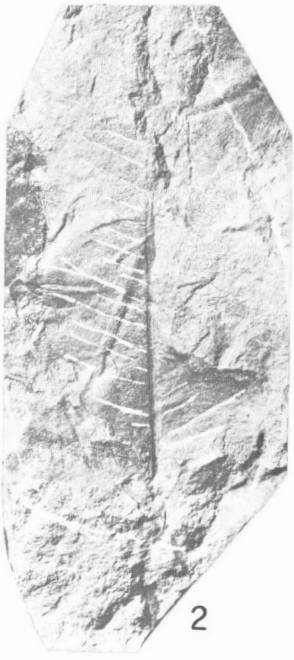

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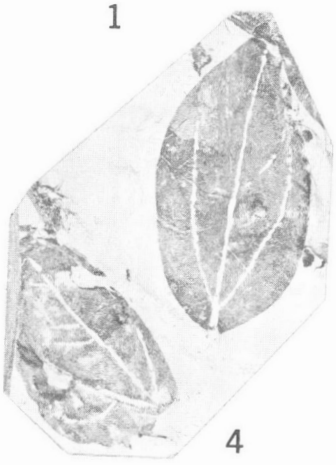

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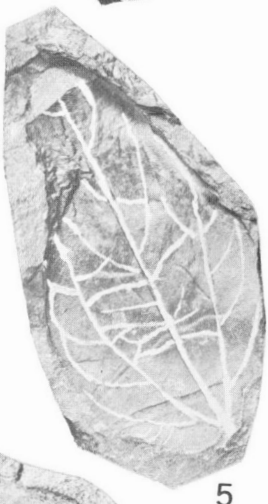

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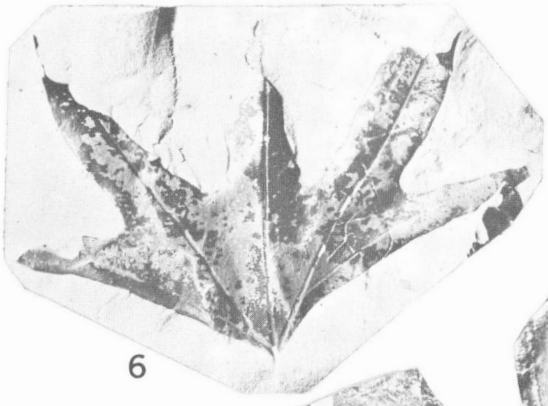

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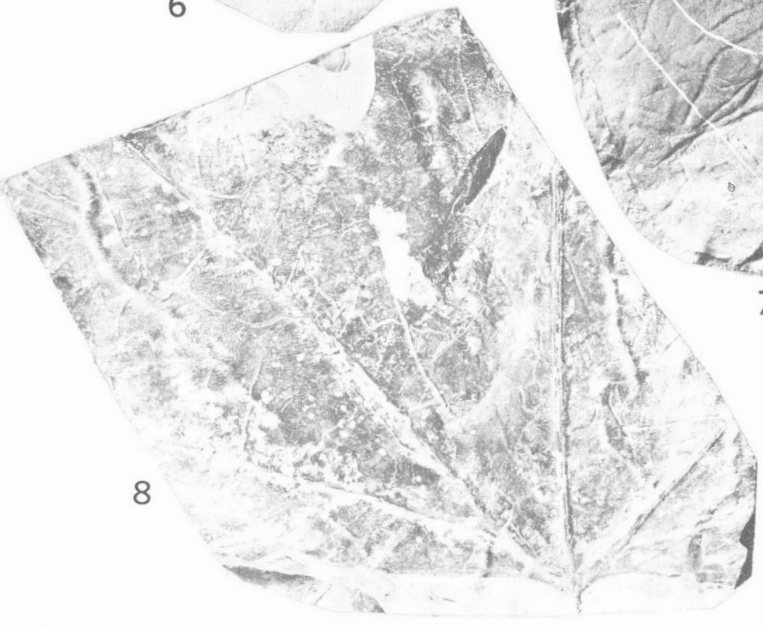

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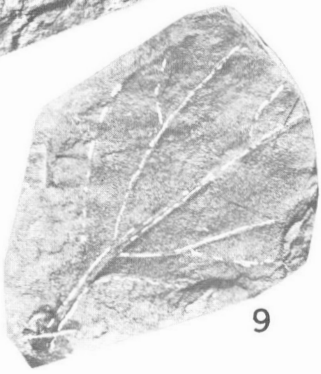

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PLATE XVI

Albian

FIGURE 1: Menispermites reniformis Dawson. Hypotype, GSC No. 14897. Commotion Formation. Commotion Creek, Dawson Creek map-area, British Columbia, cut in bank on east side, 7/8 mile upstream from falls, GSC loc. 4810. Collector, J.E. Hughes.

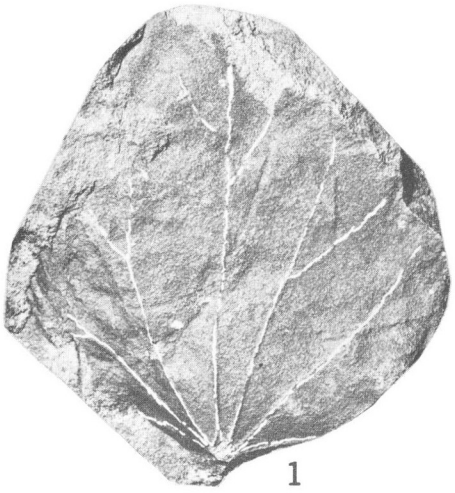
FIGURE 2: Platanus latiloba Newberry. Hypotype, GSC No. 5881. Pasayten Group (upper part). Near crest of northwest spur of mountain northeast of Chuwanten Creek, British Columbia, at elevation 6,950 feet. Collector, H.M.A. Rice.

FIGURE 3: Magnolia sp. cf. lacoeana Lesquereux. GSC No. 13551. Commotion Formation. Commotion Creek, Dawson Creek map-area, British Columbia. GSC loc. 5654. Collector, D.F. Stott.

FIGURE 4: Pseudoprotophyllum boreale? (Dawson) Hollick. Hypotype, GSC No. 13532. Commotion Formation. Bullmoose Mt., Dawson Creek map-area, British Columbia, GSC loc. 5650. Collector, D.F. Stott.

FIGURE 5: Sapindopsis angusta (Heer) Seward and Conway. Hypotype, GSC No. 5874. Blairmore Group (upper part). Mill Creek, Alberta, GSC loc. 1815. Collector, T.C. Weston.

FIGURE 6: Desmiophyllum (Podozamites?) sp. Bell. GSC No. 5863. Blairmore Group (upper part). Mill Creek area, GSC loc. 3065. Collector, C.O. Hage.



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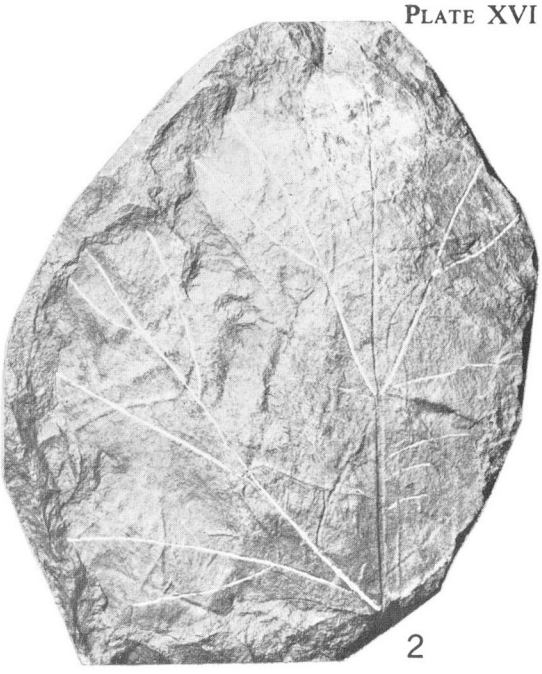

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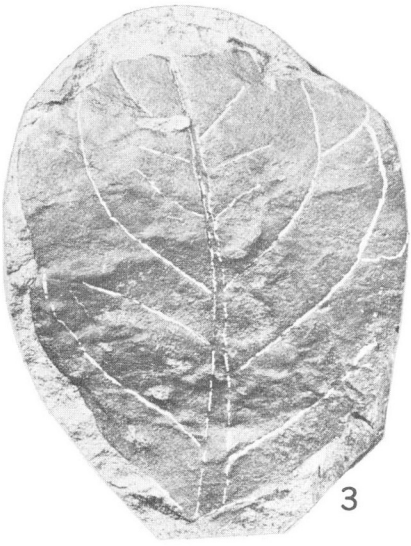

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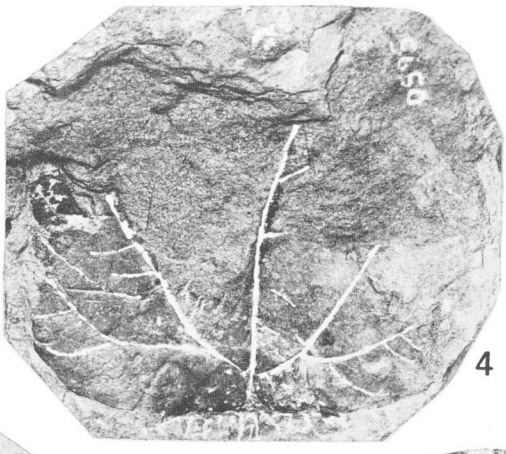

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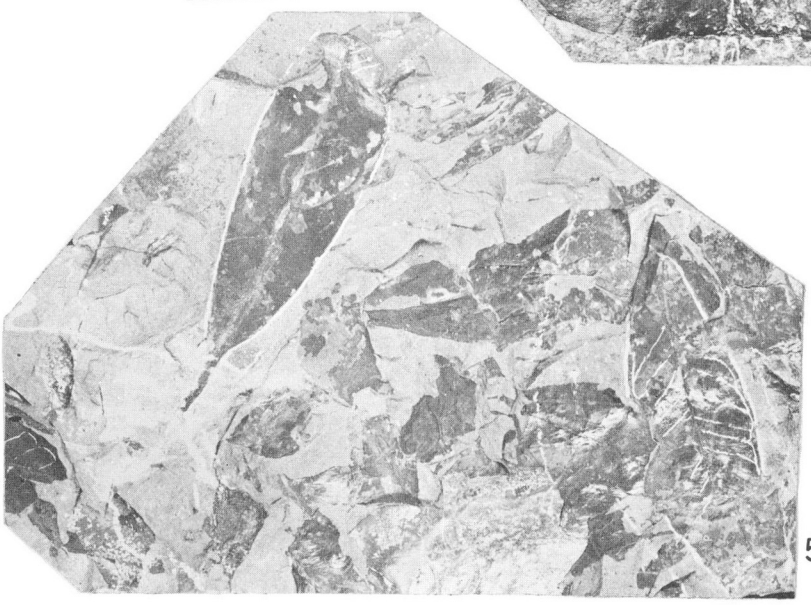

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Illustrations of Canadian Fossils

The following Geological Survey Papers have already been issued under this general title:

Devonian of Western Canada,
Invertebrates - D.J. McLaren and A.W. Norris
Plants - D. C. McGregor
GSC Paper 62-4

Cambrian, Ordovician and Silurian of the Western Cordillera
- B.S. Norford
GSC Paper 62-14

Triassic of Western and Arctic Canada
- E. T. Tozer
GSC Paper 62-19

Jurassic of Western and Arctic Canada
- H. Frebold
GSC Paper 63-4

Early Lower Cretaceous (Berriasian and Valanginian) of the Canadian Western Cordillera, B.C.
- J.A. Jeletzky
GSC Paper 64-6

Lower Cretaceous marine index fossils of the Sedimentary basins of Western and Arctic Canada
- J.A. Jeletzky
GSC Paper 64-11

Triassic, Jurassic, and Lower Cretaceous Spores and Pollen of Arctic Canada
- D.C. McGregor
GSC Paper 64-55