GEOLOGICAL AND NATURAL HISTORY SURVEY OF CANADA.

ALFRED R.C. SELWYN. LL.D., F.R.S., DIRECTOR.

RECONNAISSANCE MAP

OF A PORTION OF THE

ROCKY MOUNTAINS

between latitudes 49° & 51°30'

GEOLOGICALLY COLORED

by

GEORGE M. DAWSON, D.S., F.G.S., &c.

1886.

Scales

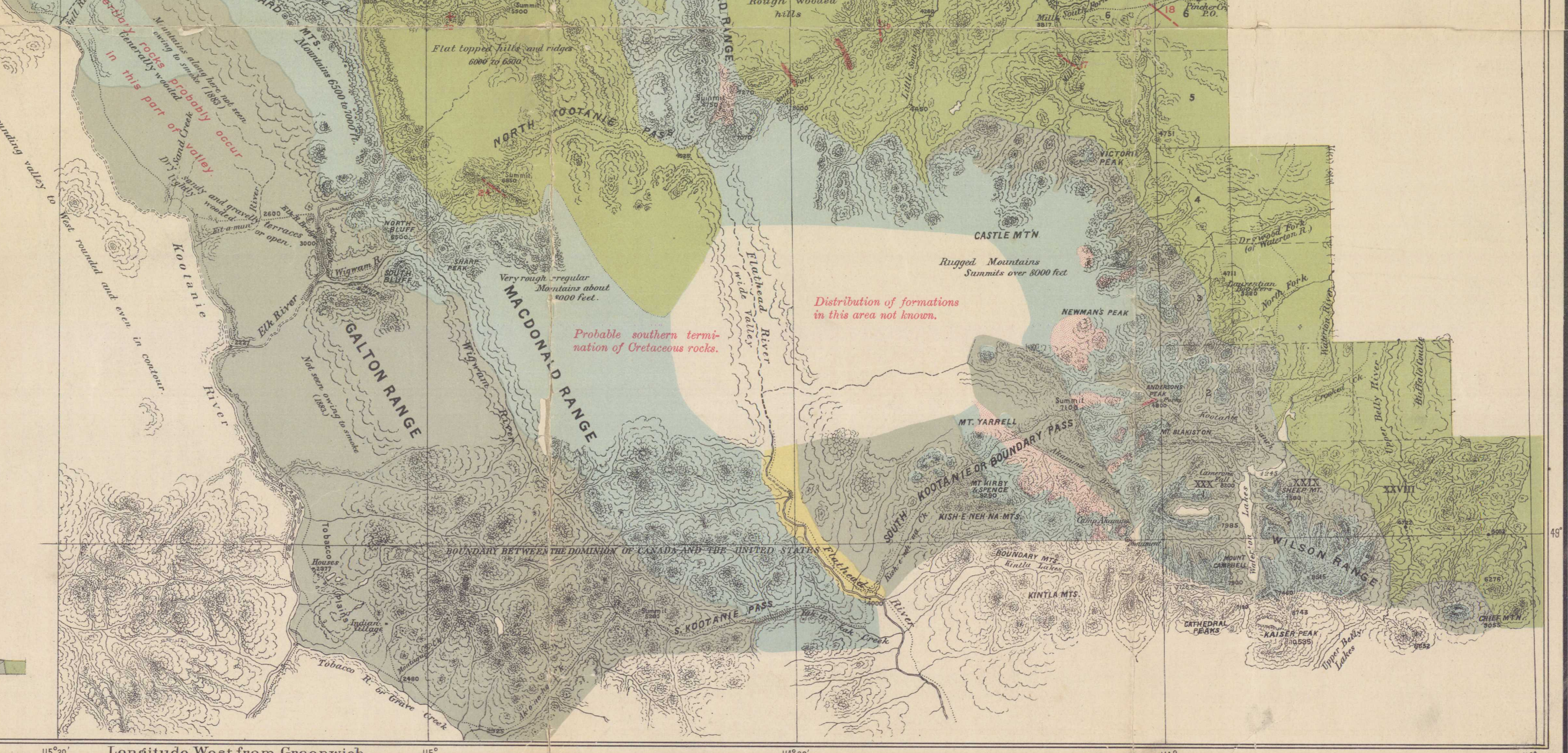
10 5 0 10 20

Geographical Miles

10 5 0 10 20

Statute Miles

Natural Scale $\frac{1}{380,160}$



SOURCES OF INFORMATION.

Surveyed lines by Dominion Lands Branch in eastern Foot-hills and westward in Bow valley to Bow Lakes. Surveys in Bow and Kicking Horse valleys for Canadian Pacific Railway. Lines run in lower parts of Kananaskis and Spray River valleys for Timber Limits. Belt of country contiguous to 49th Parallel from International Boundary Survey maps. Kananaskis Pass, from lakes to Columbia Valley, from Captain Palliser's map, (1865); all other Traverses and Topography from reconnaisance surveys by G. M. Dawson, assisted by J. B. Tyrrell (1883) and J. White (1884) with additions near the Bow valley by R. G. McConnell (1885.)

ELEVATIONS.

Heights are stated in feet above sea-level. With the exception of those along the line of railway they are based on Barometric determinations checked by comparison with Barometric records at Calgary, Benton and Spokan Falls.

LEGEND

- Miocene(?)
- Cretaceous (including Laramie)
- Triassic
- Carboniferous & Devonian (Limestone series)
- Cambrian (Quartzite series)
- Igneous Intrusions
- Agglomerate & ash rocks (Cretaceous)
- Coal Seams

Descriptions of the various coal outcrops marked on the map will be found in the Annual Report for 1885, or the Report of Progress for 1882–84, on the pages indicated below:—

No.	Report	Page
1	See Report 1885,	p. 146 B.
2	" "	p. 129 B.
3	" "	p. 131 B.
4	" "	p. 132 B.
5	" "	p. 133 B.
6	" "	p. 133 B.
7	" "	p. 133 B.
8	" 1882–84,	p. 106 C.
9	" "	p. 104 C.
10	" 1885,	p. 92 B.
11	" "	p. 87 B.
12	" "	p. 87 B.
13	" 1882–84,	p. 103 C.
14	" 1885,	p. 69 B.
15	" 1882–84,	p. 101 C.
16	" 1885,	p. 58 B.
17	" 1882–84,	p. 99 C.
18	" "	p. 98 C.
19	" 1885,	p. 58 B.
20	" "	p. 109 B.
21	" "	p. 110 B.
22	" "	p. 76 B.
23	" "	p. 75 B.
24	" "	p. 64 B.

FOR GEOLOGICAL STRUCTURE OF THE FOOT-HILLS, AND COUNTRY TO THE EAST OF THIS MAP, SEE GEOLOGICAL MAP OF REGION IN VICINITY OF BOW AND BELLY RIVERS.

NOTES.

MIOCENE.

Though provisionally named Miocene, the exact age of the Tertiary sandstones and clays met with on the Flathead River, is unknown. The exposures are few, and the area as represented on the map, is indeterminate. Fragments of drift lignite found in the Kootanie Valley near Bull River, appear to indicate the existence of a second Tertiary area in that vicinity.

CRETACEOUS.

A general section of these rocks is given on page 166 B. It is probable that within the mountain area, the entire Cretaceous series, with the base of the overlying Laramie, is represented, but the information obtained is not yet sufficient to enable the different constituent groups to be distinguished on the map. The greater part of the area of the Cascade, Crow Nest and Elk River troughs, is occupied by the beds of the Kootanie group, or lowest Cretaceous, which occurs in this region beneath the Dakota group. The Kootanie group, is also represented in parts of the adjacent foot-hill region east of the mountains proper, but the overlying groups of the Cretaceous are there, in respect to area, relatively much more important. The areas respectively occupied by some of these groups of the Cretaceous and Laramie in the foot-hills are shown on the Map of the Region in the Vicinity of the Bow and Belly Rivers. (Report of Progress 1882-84.) In the present map they are included under a single colour. The only locality within the mountain area, at which rocks of Laramie age are certainly known, is Oyster Creek, at the source of the North-west Branch of the Old Man River. The rocks of the Kootanie group are sandstones, shales and conglomerates, and its thickness is probably about 9000 feet. Most of the coal-seams within the area of the mountains occur in it. At a horizon not far above the summit of the Kootanie group, an important volcanic intercalation occurs, in the district drained by the head-waters of the Old Man River.

TRIASSIC.

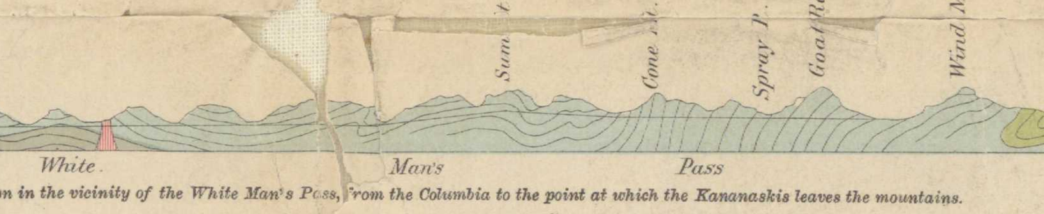
These rocks may in part be referable to the Permian. They appear to be confined to the southern portion of the region, and rest conformably on the upper beds of the great limestone series. They consist chiefly of red and yellowish sandstones and sandy dolomitic limestones. Near, or at the base of the series, a thick bed of amygdaloidal diabase is generally found. The rocks show pseudomorphs of salt crystals, mud-cracks, and other evidences of deposit in a shallow sea separated from the main ocean. Maximum observed thickness, 2000 feet.

DEVONO-CARBONIFEROUS

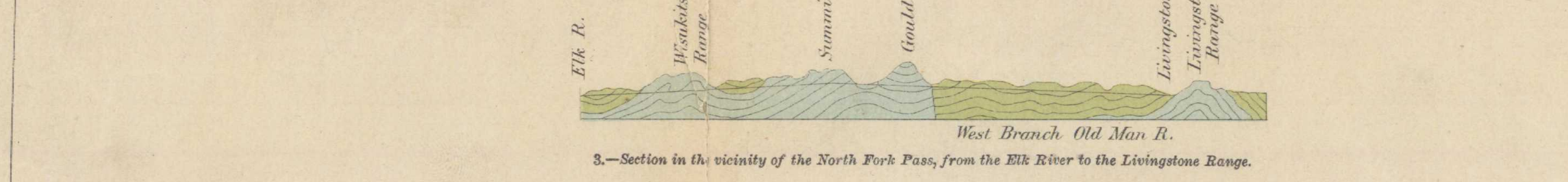
The rocks embraced under this general designation, consist almost entirely of massive grey or bluish limestones. They form many of the most prominent ranges and mountain masses, and have an estimated thickness of 1000 to 4000 feet or more. In the southern part of the district they rest with distinct unconformity on the Cambrian, but to the north-west, there appears to be a considerable volume of intermediate beds of Silurian and possibly also of Cambro-Silurian age. Some beds of Silurian age are known to be included under the blue colour, on the map, in the vicinity of the Kicking Horse River; elsewhere, the fossils obtained from the limestone series are either Devonian or Carboniferous. The upper portion of the limestone is often highly crinoidal, and certain parts of the series are characterized by abundant cherty concretions. The highest beds are yellowish calcareous sandstones and flaggy calcareous shales of dark colour.

CAMBRIAN.

Under this name a great series of beds forming the lowest members of the section in this part of the Rocky Mountains, is classed. The rocks are generally quartzites, quartzose, argillaceous and calcareous shales, and slates of very varied texture and colour. Limestones, conglomerates and bedded greenstones (Diabase?) are also present, but of minor importance. The thickness of the series on Kish-e-neh-na Creek (South Kootanie Pass) is estimated as at least 11,000 feet. In other parts of the district sections showing at least 5000 feet have been examined, but the base of the formation is not anywhere seen. Fossils of Middle Cambrian age have been found on the Vermilion and Kicking Horse passes, in the upper part of the formation as there developed. In lower parts of the series, zones of red beds are prominent. These show pseudomorphs of salt crystals, mud-cracks, and other evidences of conditions similar to those indicated by the Triassic rocks, but no fossils have been obtained from them.

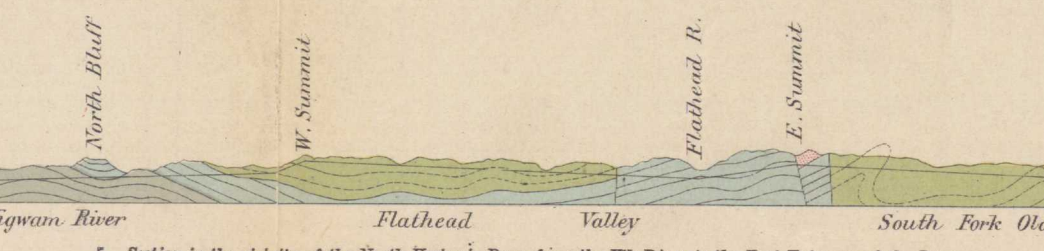


1.—Section from the Columbia to the Bow River, South of the Vermilion Pass.



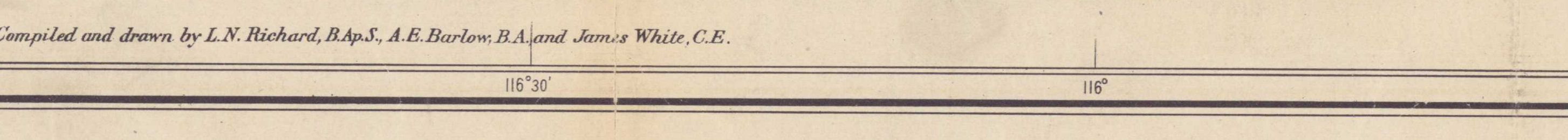
2.—Section in the vicinity of the White Man's Pass, from the Columbia to the point at which the Kananaskis leaves the mountains.

3.—Section in the vicinity of the North Fork Pass, from the Elk River to the Livingstone Range.



4.—Section in the vicinity of Crow Nest Pass, from Elk River to the Livingstone Range.

5.—Section in the vicinity of the North Kootanie Pass, from the Elk River to the East Entrance of the Pass.



6.—Section in the vicinity of the South Kootanie Pass, from the Kootanie River to the lower end of Waterton Lake.

Compiled and drawn by L.N. Richard, B.Ap.S., A.E. Barlow, B.A. and James White, C.E.

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