

Structure sections along lines A-B, C-D, and E-F

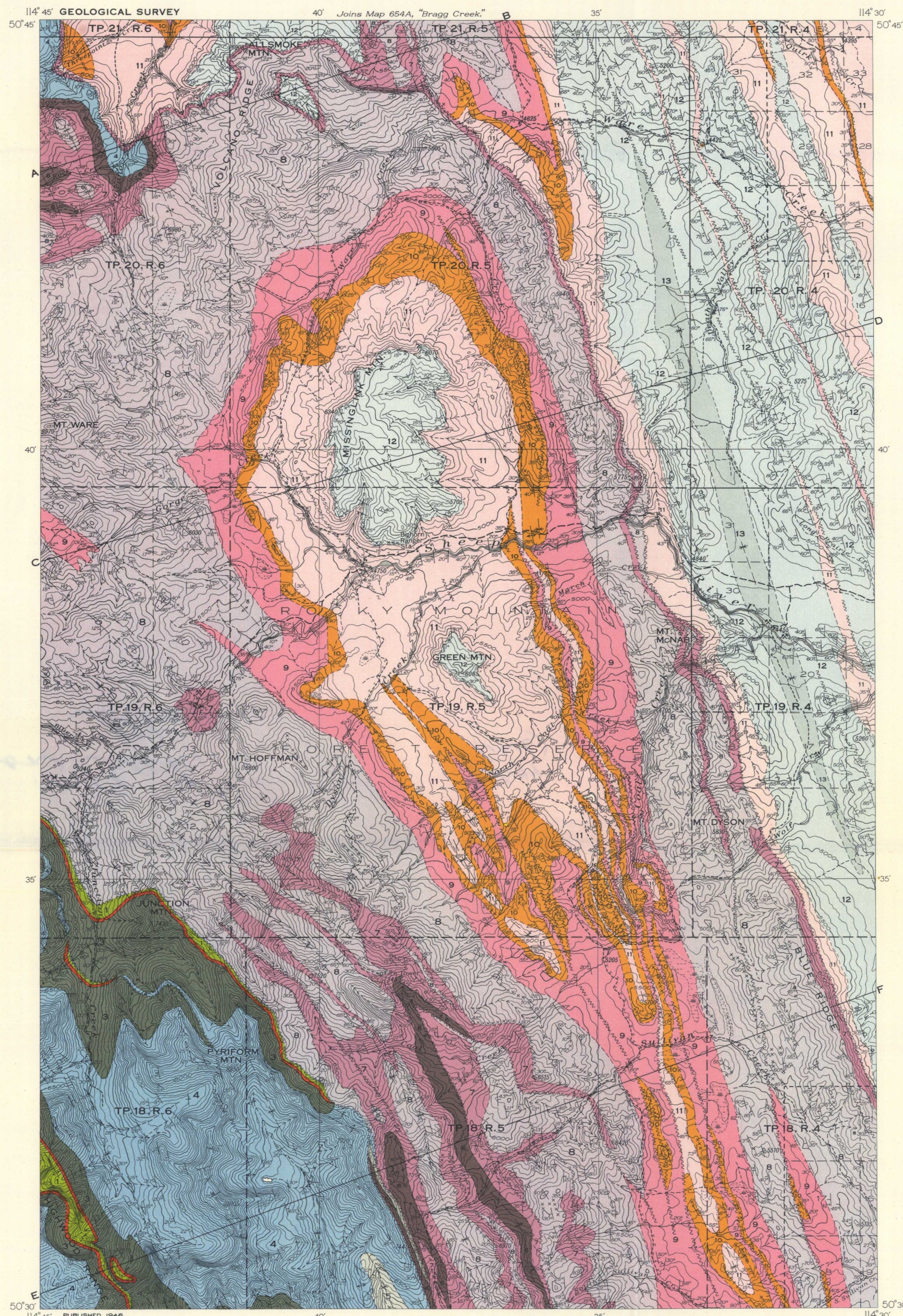
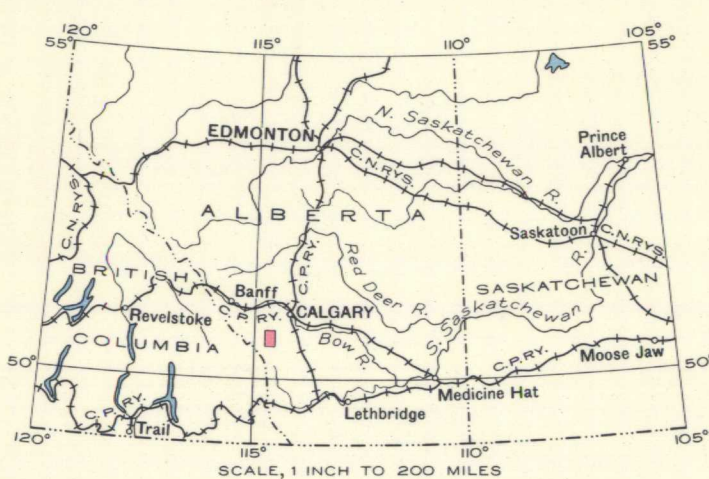
LEGEND

- CRETACEOUS**
- UPPER CRETACEOUS**
- 13 EDMONTON FORMATION: dark and light grey shale with concretions; carbonaceous shale; grey, crossbedded, brown-weathering sandstone; coal. Includes marine beds equivalent to the Bearpaw
- 12 BELLY RIVER FORMATION: crossbedded sandstone, interbedded with grey shale containing a few concretions; thin carbonaceous beds; pebble conglomerate
- 11 WAPIABI (Upper Alberta) FORMATION: dark grey shale and sandy shale with hard limy beds and brown-weathering ironstone concretions
- 10 BIGHORN (Cardium) FORMATION: light grey quartzitic sandstone, dark grey shale, sandy shale, pebble conglomerate
- 9 BLACKSTONE (Lower Alberta) FORMATION: dark grey shale with concretions, sandy shale, thin beds of siliceous sandstone
- LOWER CRETACEOUS**
- 8 BLAIRMORE GROUP: grey and greenish grey crossbedded sandstone; green, grey, and maroon shale; impure limestone; carbonaceous beds; conglomerate
- 7 KOOTENAY FORMATION: dark grey and black shale, sandy shale, brown crossbedded sandstone, coal
- JURASSIC**
- 6 FERNIE FORMATION: mainly dark grey and black marine shale with concretions; brown sandstone, limestone
- CARBONIFEROUS**
- PENNSYLVANIAN (?)**
- 5 ROCKY MOUNTAIN FORMATION: light and dark grey pinkish weathering quartzite, siliceous limestone, chert
- MISSISSIPPIAN AND (?) PENNSYLVANIAN**
- 4 RUNDLE FORMATION: light grey crystalline crinoidal limestone, massive dense limestone, calcareous shale, dolomite, calcareous quartzite (in upper part)
- MISSISSIPPIAN**
- 3 BANFF FORMATION: platy grey calcareous shale, grey argillaceous limestone, crinoidal limestone, cherty limestone
- DEVONIAN**
- 2 EXSHAW FORMATION: black fissile shale, brown-weathering argillaceous limestone
- 1 PALLISER FORMATION: massive dark grey mottled limestone; minor bedded argillaceous limestone

- Rock outcrop, in Mesozoic formations
- Bedding (horizontal, inclined, vertical, overturned)
- Anticlinal axis
- Synclinal axis
- Fault (arrow indicates direction of dip)
- Well (abandoned)
- Coal (pit or mine)
- Road not well travelled
- Trail
- Building
- Telephone line
- Township boundary (surveyed)
- Township boundary (unsurveyed)
- Section line
- Forest Reserve boundary
- Intermittent stream
- Fall
- Marsh
- Sand or gravel
- Contours (interval 100 feet)
- Contours (position approximate)
- Height in feet above mean sea-level

Geology by C.O. Hage, 1941, 1942.

Base-map from surveys and topography by the Topographical Survey, 1941. Cartography by the Drafting and Reproducing Division, 1944.



MAP 827A DYSON CREEK WEST OF FIFTH MERIDIAN ALBERTA

Scale, 1:50,000 or 1 inch to 1 mile

Approximate magnetic declination, 23°30' East.

DESCRIPTIVE NOTES

The map-area contains parts of two topographic units: a Foothills belt, comprising the greater part of the area; and, in the southwest, a mountainous section that forms a part of the eastern range of the Rocky Mountains. The topographic features take their expression from the underlying bedrock. The southwestern, mountainous division is underlain mainly by limestone, dolomite, and quartzite, whereas the rocks of the Foothills belt are sandstones and shales of various degrees of hardness. Within this belt the higher hills are capped by hard, resistant sandstone, whereas the valleys are in most places floored by softer, shaly rocks.

The rocks exposed within the map-area have an aggregate average thickness of 13,500 feet, and range in age from Devonian to late Upper Cretaceous. Only the upper 750 feet of the basal, PALLISER FORMATION (1) is exposed. It consists of dense, massive, dark grey, mottled, cliff-forming limestone overlain by a member 66 feet thick composed of bedded, dense, light grey, argillaceous limestone and calcareous shale with 10 feet of porous, light grey, brown-weathering limestone at its base.

The EXSHAW FORMATION (2) is an excellent horizon marker. It consists of two members of black, fissile, non-calcareous shale, each about 20 feet thick and separated by 20 to 25 feet of dark grey, brown-weathering, argillaceous limestone containing sulphide concretions up to 2 inches in diameter. The formation maintains a thickness of about 60 feet throughout the map-area. A coarse-grained sandstone bed, from 1 to 2 inches thick, lies at the base of the formation and may mark an unconformity.

The BANFF FORMATION (3) consists predominantly of dark grey, calcareous shale, but includes some interbedded limestone. It is about 1,000 feet thick and its contact with the underlying Exshaw formation appears to be gradational.

The RUNDLE FORMATION (4) as exposed in the southwest corner of the map-area, comprises two members. The lower member is 970 feet thick and consists of light grey, coarsely to finely crystalline, crinoidal, cliff-forming limestone and lesser dense, grey limestone containing chert nodules. Porous beds are present at a number of horizons. Contact with the Banff formation is placed at the base of the first thick bed of crystalline, crinoidal limestone. The upper member, 1,706 feet thick, is composed of calcareous shale interbedded with light and dark grey, massive, crystalline limestone, porous limestone, dolomitic limestone, and, towards the top, calcareous quartzite beds. It weathers light brown in contrast with the lower, light grey weathering member. In the northwest corner of the map-area the upper 400 feet of the Rundle is exposed. Here the section contains two porous zones: the upper one, 172 feet from the top, is 10 feet thick and is overlain by dense, dark and light grey, dolomitic limestone; the lower zone is over 50 feet thick, is interstratified with dense, dark grey limestone and shale, and is separated from the upper zone by 120 feet of dense, grey and brownish grey limestone.

The ROCKY MOUNTAIN FORMATION (5) is 232 feet thick along the eastern side of the Rocky Mountains, but is missing on Volcano Creek in the northwest corner of the map-area. It is overlain by Triassic strata a few miles west of the map-area.

The FERNIE FORMATION (6) is composed of two members: a lower one of dark grey to black, fissile, marine shale containing ellipsoidal concretions and a few limestone beds; and an upper one, 90 feet thick, of thinly bedded, brown, fine-grained sandstone interbedded with dark grey shale. The formation is about 310 feet thick on Volcano Creek, but thickens to the west.

The KOOTENAY FORMATION (7) is about 480 feet thick in the northwestern part of the map-area, but thickens to the west and southwest. The base of the formation is a medium-grained, dark brown, pinkish grey weathering sandstone bed, 120 feet thick, that lies with apparent conformity on the Fernie. The top is marked by an erosional unconformity.

The BLAIRMORE GROUP (8) is about 1,970 feet thick. The most characteristic beds, and those most useful as horizon markers, include: a basal conglomerate several feet thick carrying grey, green, and brown chert and quartzite pebbles and overlain by about 240 feet of hard, siliceous, fine- to medium-grained sandstone interbedded with a little dark grey shale and coaly shale; thin beds of limestone, dark grey shale, and calcareous shale characterize the succeeding 200 feet; a fossil zone containing freshwater pelecypods occurs in a grey limestone about 520 feet above the base and is overlain by 3 to 4 inches of black chert pebble-conglomerate; a coarse, thick, feldspathic sandstone, commonly associated with a conglomerate carrying a large proportion of feldspar porphyry pebbles, lies about 800 feet from the top; and another coarse sandstone member composed of white quartz and black chert grains and carrying dark grey and black chert and quartzite pebbles lies about 100 feet from the top of the group. Several beds of maroon shale are present in the upper 400 feet and a thin bed of bentonitic shale usually marks the top.

The BLACKSTONE (Lower Alberta) FORMATION (9) has an estimated thickness of 1,000 feet on Sheep River. At or near the base is a pebble-conglomerate bed about 6 inches thick. The basal part includes thin beds of siliceous sandstone.

The BIGHORN (Cardium) FORMATION (10) is 447 feet thick along Sheep River west of Gorge Creek. There it contains four sandstone members and five beds of conglomerate, whereas east of Gorge Creek the formation is 400 feet thick and contains three sandstone members, each overlain by pebble-conglomerate.

The WAPIABI (Upper Alberta) FORMATION (11) has an estimated thickness of about 1,900 feet.

The BELLY RIVER FORMATION (12) is about 2,200 feet thick. It is composed of two members. The lower one, 400 feet thick, consists of brackish water sandstones interbedded with dark grey, laminated shales and includes the transition beds from the underlying, marine Wapiabi. The sandstones increase in thickness to the west and the westerly sections show a bed about 170 feet thick close to the base. The upper or principal member consists of coarse- to medium-grained, grey, freshwater sandstone beds 3 to 30 feet thick, interstratified with dark grey, chunky shale. The shales in the upper part are lighter in colour than in the lower part, are bentonitic, and contain irregular calcareous concretions. Thin pebble-conglomerate beds are present at several horizons.

The EDMONTON FORMATION (13) has a maximum thickness in the map-area of about 800 feet. The lower 250 feet consists of dark grey shale containing reddish brown ironstone concretions and is interbedded with grey sandstone and coal seams. In the higher beds the shales are light coloured and bentonitic. The base of the formation has been placed arbitrarily at a 12-inch coal seam that lies 160 feet below an oyster bed several feet thick.

Within the map-area are parts of at least four fault blocks. From west to east these are: the Rocky Mountain thrust block of Palaeozoic strata containing two large anticlines, of which the eastern one passes into a thrust fault to the north; the Dyson Mountain thrust block occupying the greater part of the map-area and marked on its east side by Blue Ridge, Mount Dyson, Mount McNab, and the range of high hills north of Sheep River to Allsmoke Mountain; Barwell Mountain thrust block, named from Barwell Mountain immediately north of the map-area, occupying an exposed width of about 3 miles to the east of the Dyson Mountain fault block; and an unnamed eastern fault block broken by several subsidiary thrusts and located in the northeastern part of the map-area.

The most promising oil structure within the map-area lies on the west side of the large syncline in the Dyson Mountain thrust block and is referred to as the Sullivan Creek anticline. It is a large antical structure modified by smaller folds and faults. Sullivan Creek No. 1 well, drilled in 1943 and located on this structure 2 miles south of the map-area, encountered the top of the Palaeozoic limestone at a depth of 2,375 feet and drilled into it 1,215 feet without encountering any appreciable porosity.

Coal seams occur in the Kootenay and Edmonton formations. The upper 200 feet of the Kootenay contains seams of good bituminous coal that range in thickness from 3 to 11 feet. The basal Edmonton contains several coal seams interbedded with dark grey shale and sandstone. On Wolf Creek, ten seams have an aggregate thickness of 23 feet in a section of beds 200 feet thick. Only two of these are over 3 feet thick.

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