

INTERPRETATION OF A STEREO PAIR OF CROSS MOUNTAIN, COLORADO*

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THE photographs used in this examination were flown for the Conservation Service under Project ALJ in 1938 on a scale of 1:31,680. They are composite verticals taken with a four-lens camera, the resulting obliques being rectified into vertical negatives before matching and assembly. Since the angle of the camera lens remains unchanged in the transposition from the very low oblique to vertical, each photograph comprising the composite has slight distortion, but this is not considered sufficient to interfere with the reconnaissance interpretation.

In order to give a more complete picture, annotations from adjacent photos along the line of flight and from adjoining flight lines have been added to the stereo pair. The central portion of each photo was employed in the interpretation as far as possible. Numbers of the stereo pair are 13438 and 13439, and those of the other photos: 13437 and 13440 along the line of flight; 13689 to 13691 on the east side lap; and 13480 to 13482 on the west side lap.

CROSS MOUNTAIN UPLIFT

Cross Mountain is a sharply defined local uplift which rises as a rather isolated fold from the low country of the Yampa River valley in the south-central part of Moffat County in the northwestern corner of Colorado. The area of the photos depicts the northern end of the structure in the south part of T-7-N and the north part of T-6-N R-98-W.

The uplift lies near the west end of the Axial Basin anticline, a broad low arch extending eastward some 40 miles from the easternmost point of the Uintas. Cross Mountain is a northwesterly trending elongated dome. The long axis is approximately 11 miles in length and the short diameter about 4 miles. The Cross Mountain axis is obliquely transverse to the general direction of the main fold and it is believed that the same stresses responsible for the Uinta uplift caused local warping in this immediate area and swung the Cross Mountain fold to the southeast.

The older sedimentary rocks (appearing on the stereo pair) which have been elevated by the sharp accentuation of the Axial Basin anticline as represented here by Cross Mountain, range in age from the Pre-Cambrian quartzite to the sandstones and limestones of the early Pennsylvanian. On the west flank of the structure, a strike fault with a dip of about 70 degrees to the west has down-faulted rocks from the Mancos shale to the Weber sandstone. These sediments which lie too far to the west to be indicated on the stereo pair, outcrop in bands against the west side of the fault in a sharp syncline separating Cross Mountain from the eastern end of the Uinta Mountains.

The high angle of the fault plane suggests an origin by nearly vertical tensional stresses rather than by compressive folding forces. An entire structural picture of this particular fault area is not included in the stereo pair but can be viewed in the flight strip adjoining to the west. Other faulting on Cross Mountain is of smaller magnitude and importance.

Early Cambrian and Pre-Cambrian red quartzite and sandstones with an estimated thickness of more than 12,000 feet occupy the core of Cross Mountain. The Devonian to later Cambrian sediments rest unconformably on the

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See facing page for legend.

early Cambrian and are mapped as a unit; these rocks vary in thickness up to 200 feet and include white sandstone which weathers red and rusty brown to gray, red and green shales and pink limestone.

An unconformity exists between the Devonian beds and the overlying Mississippian. The latter group is about 600 feet thick and consists of conglomerate at the base grading upwards into coarse sandstone and capped by gray cherty limestone. The crest and the greater part of the flanks of Cross Mountain are expressed by the limestone which is the probable equivalent of the Madison in other areas.

Overlying the Mississippian limestones with conformable relationship are older Pennsylvanian beds containing gray limestone, red and gray sandstone, gray shale and thin coal seams with a total thickness of about 525 feet.

The Browns Park formation of the Miocene lies with angular unconformity on all rocks from the Pre-Cambrian to the Eocene inclusive and conceals the lower part of Cross Mountain on the north, east and south. The fact that the uplift is an integral part of the Axial Basin anticline can only be determined by outcrops of older sediments far out on the flanks. The Browns Park is at least 1,200 feet thick and consists of a basal conglomerate followed by a succession of white sandstones and occasional cherts.

REFERENCES

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



CROSS MOUNTAIN AREA, COLORADO GEOLOGIC FORMATIONS

Quaternary	Alluvium	Stream deposits	Qal
Tertiary	Miocene	Browns Park formation (unconformity)	Tbp
Carboniferous	{ Pennsylvanian	Older Pennsylvanian	Cop
	{ Mississippian	Madison ls. (equivalent) (unconformity)	Cm
Devonian to	Later Cambrian	Shale & sandstone (unconformity)	D-C
Early Cambrian &	Pre-Cambrian	Red quartzite & sandstone	C

ESTIMATION OF DIP

- ⊕ Horizontal or less than 1°
- | 1° to 3°
- ≡ 3° to 10°
- ≡≡ 10° to 25°
- ≡≡≡ Over 25°
- ⊕ Vertical
- ⊕ Overturned
- |^{ts} Topographic slope representing structure

LEGEND

-  Anticlinal axis
-  Formation contact
-  Inferred contact
-  Normal fault
-  Probable fault
-  Intermittent stream
-  Secondary roads, trails