PRELIMINARY REPORT ON THE GEOLOGY OF A PORTION OF THE SE¼ LYON QUADRANGLE, MONTANA-IDAHO

by

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The SE¼ of the Lyon quadrangle is in southwestern Montana and eastern Idaho between meridians 111° 45' W. and 111° 30' W. and parallels 44° 30' N. and 44° 45' N. The area includes a portion of the Centennial Mountain Range, which forms the Continental Divide west of Yellowstone Park, a portion of Centennial Valley, and hilly terrain north of Centennial Valley. The climate of the region is relatively arid; the annual rainfall ranges from 10 to 15 inches.

A remarkably varied and complete stratigraphic sequence is exposed in the quadrangle. The oldest rocks are greenstone schists, gneisses, and highly contorted marbles of pre-Cambrian age. These rocks are unconformably overlain by the Cambrian Flathead quartzite, which is in turn overlain by progressively younger Paleozoic and Mesozoic sedimentary rocks and Tertiary sedimentary and volcanic rocks.

The portion of the quadrangle shown on the accompanying map has been studied in considerable detail but does not contain a complete stratigraphic section. In it the rock units shown in the attached stratigraphic table have been recognized and mapped.

A major normal fault bounds the north side of the east-west Centennial Range near the Upper Red Rock Lake and swings southwest, entering the map area in the vicinity of Odell Creek. Displacement along the fault may be 2,000 feet or more. Several minor normal faults are present. Displacement along them is less than a few hundred feet.

The major normal faulting probably began in Upper Cretaceous time. Some evidence indicates that it was initiated in post-Bear River and pre-Mesaverde time, although subsequent movement has undoubtedly taken place. The Centennial Range is strongly asymmetric as a result of its fault-block structure. The crest of the range lies far north of the main axis of uplift. The southern slopes of the range are dominantly dip-slopes of Paleozoic and Mesozoic sedimentary rocks. Because of this structure large amounts of phosphate, in the phosphatic members of the Phosphoria formation, are exposed or lie at relatively shallow depth.

Extensive lake beds and lava flows cap the Paleozoic and Mesozoic rocks both north and south of the Centennial Range, and little of the structure of the underlying rocks can be determined. The lavas are part of the Yellowstone Park volcanic province, and some of the individual flows can be traced to the Park.