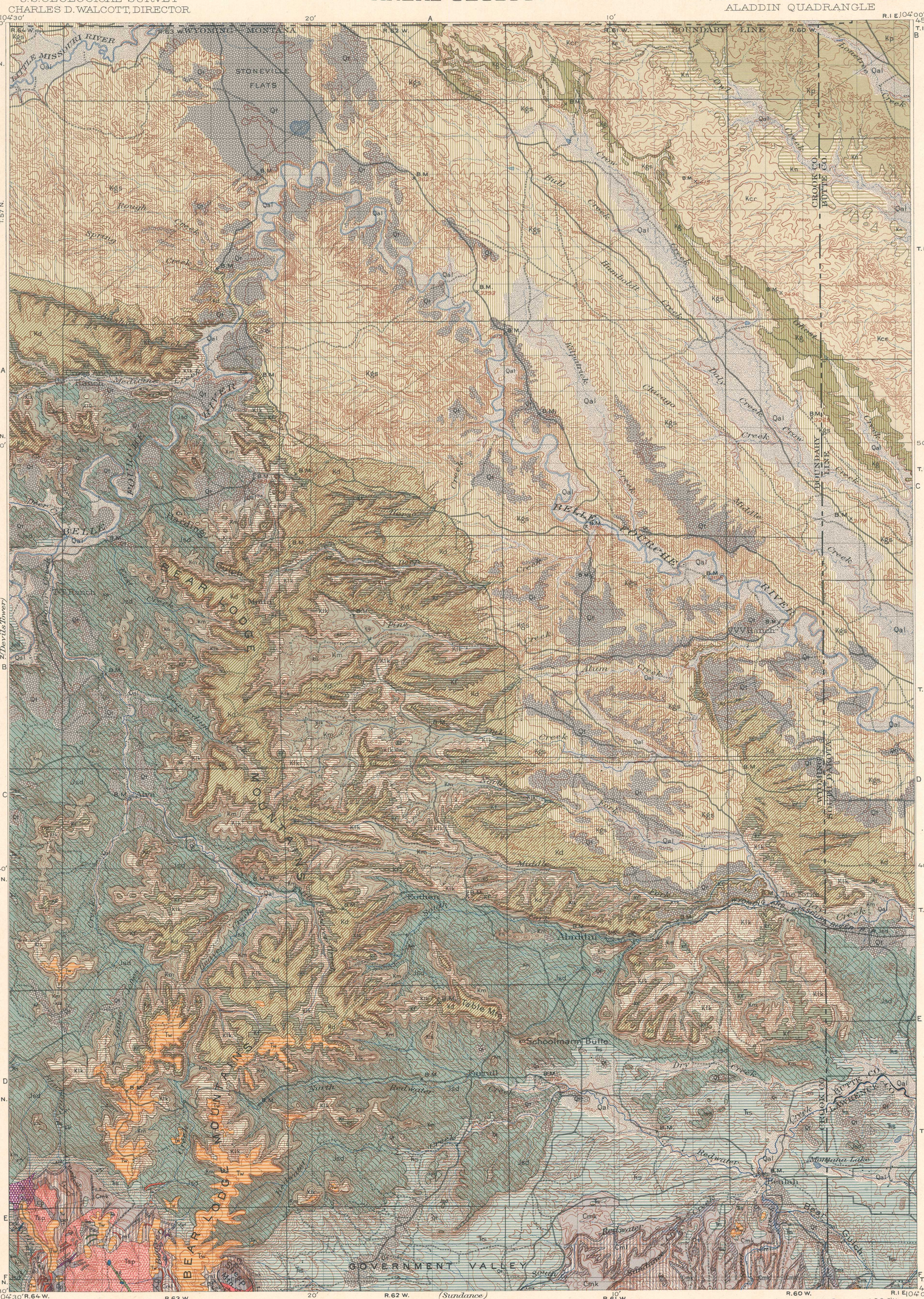
U.S. GEOLOGICAL SURVEY
CHARLES D. WALCOTT, DIRECTOR

AREAL GEOLOGY

WYOMING-SOUTH DAKOTA-MONTANA
ALADDIN QUADRANGLE



E.M. Douglas, Geographer in charge.
Triangulation by A.F. Dunnington.
Topography by W.H. Herron.
Surveyed in 1901.

APPROXIMATE MEAN DECLINATION 1902.

Scale $\frac{1}{125000}$

Contour interval 50 feet.
Datum is mean sea level.
Edition of Aug 1905.

DIAGRAM OF TOWNSHIP.

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Geology by N.H. Darton and C.C. O'Harra.
Surveyed in 1902.

LEGEND

(continued)

IGNEOUS ROCKS

(Areas of igneous rocks are shown by patterns of triangles and rhombs)

TERTIARY

- Tp — Phonolite
- Nepheline-syenite-porphyry
- Pseudo-leucite-porphyry
- Tsp — Syenite-porphyry

ALGONKIAN

- Ag — Granite *(coarse grained, inclosed in syenite-porphyry)*

Faults

(20° Strike and dip of stratified rocks

Sections

Coal mines

LEGEND

SEDIMENTARY ROCKS

(Areas of subaqueous deposits are shown by patterns of parallel lines; subaerial deposits by patterns of lots and circles)

QUATERNARY

Recent

- Qal — Alluvium *(sand and loam, only the larger deposits represented)*

Pleistocene

- Qt — Older terrace deposits *(gravel and loam)*

TERTIARY

- Tw — Sand, gravel, and conglomerate *(possibly of White River age)*

UNCONFORMITY

CRETACEOUS

Upper Cretaceous

- Kp — Pierre shale *(dark-gray shale and clay with concretions)*
- Kn — Niobrara formation *(tiny shale and impure chalk)*
- Kcr — Carlile formation *(gray shale and thin sandstone)*

Benton group

- Kg — Greenhorn limestone *(impure slabby limestone)*
- Kgs — Graneros shale *(dark fissile shale)*

Lower Cretaceous

- Kd — Dakota sandstone *(brownish sandstone mostly massive)*
- Kf — Fuson formation *(shale and sandstone)*
- Klk — Lakota sandstone *(massive buff sandstone with coal bed locally near base)*
- Km — Morrison shale *(massive sandy shale, gray, greenish, and maroon)*

UNCONFORMITY ?

JURASSIC

- Jsd — Sundance formation *(buff sandstone and red and greenish-gray shale)*

UNCONFORMITY

TRIASSIC ?

- Trs — Spearfish formation *(red sandy shale with beds of gypsum; "Red beds")*

CARBONIFEROUS

Permian ?

- Cmk — Minnekahta limestone *(very thin-bedded gray limestone)*
- Co — Opeche formation *(bright-red sandy shale)*

Pennsylvanian

- Cml — Minnelusa sandstone *(gray, red, and buff, limy sandstone)*

Mississippian

- Cp — Pahasapa limestone *(massive gray limestone; possibly includes at its base a representative of the Englewood limestone)*

UNCONFORMITY

ORDOVICIAN

- Ow — Whitewood limestone *(massive buff limestone)*

CAMBRIAN

- Ꞓd — Deadwood formation *(brown sandstone and green shale)*

Legend is continued on the left margin.