

EXPLANATION

Lower Mississippian (Pleistocene?) Recent

- Qal Alluvium
- Qta Terrace gravels

Upper Cambrian

- Mp Pahasapa Limestone
Massive buff limestone
- MDe Englewood Formation
Slabby, pabbly, lavender limestone
- Cd Deadwood Formation
Conglomerate, sandstone, and glauconitic sandstone

UNCONFORMITY

Pegmatite, showing dip where known
L, layered pegmatite; Z, zoned pegmatite; G, gneissic pegmatite; others, homogeneous pegmatite. Numbers designate bodies of pegmatite referred to in text.

Quartz veins

Amphibolite

STRATIGRAPHY WEST OF GRAND JUNCTION FAULT
Darker color indicates areas of abundant outcrop

- Mayo Formation
Quartz-mica-feldspar schist and variegated schist containing garnet, staurolite, and sillimanite
- Crow Formation
Variegated schist and gneiss composed of amphibole, carbonate, cordierite, feldspar, biotite, altopais, and quartz
- Bigtown Formation
bs, predominantly quartz-mica-feldspar schist
bbs, predominantly quartz-mica schist containing garnet bit, meta-iron-formation
- Louis Formation
Thin-bedded biotite-garnet schist and massive mica schist, which locally contain staurolite, and cordierite, chlorite abundant in the northern part of the quadrangle
- Vanderlehr Formation
vs, variegated schist, gneiss, and quartzites; va, amphibole schist

STRATIGRAPHY EAST OF GRAND JUNCTION FAULT
Darker color indicates areas of abundant outcrop

- Quartzite and quartz-mica schist
Medium to thick-bedded; locally contains sillimanite and andalusite
- Quartz-biotite-garnet schist
Thin-bedded, dark-colored quartz-biotite-garnet schist but contains much quartz-biotite and quartz-biotite-muscovite schists as well as minor amounts of other rock types
- Mica schist
Massive mica schist containing staurolite, andalusite, garnet, and cordierite; locally the mica schist contains thin garnet-rich beds
- Quartzite
Massive quartzite and thin-bedded biotite-garnet schist

qtz
Quartzite
Massive quartzite and thin-bedded biotite-garnet schist

Contact, showing dip
Long dashed where approximately located; short dashed where inferred

Limit of area of abundant outcrop

Fault, showing dip where known
Long dashed where approximately located; short dashed where inferred; quarrel where doubtful. U, upthrown side; D, downthrown side

PLANAR STRUCTURES
MAY BE COMBINED WHERE STRUCTURES ARE PARALLEL

- Inclined Vertical
- Strike and dip of beds
- Overturned beds not indicated
- Inclined Vertical
- Strike and dip of older foliation
- Inclined Vertical
- Strike and dip of younger foliation
- Strike and dip of joints
- Strike and dip of slip cleavage
- Strike and dip of axial plane

LINEAR STRUCTURES
MAY BE COMBINED WITH ANY OF THE ABOVE PLANAR FEATURES

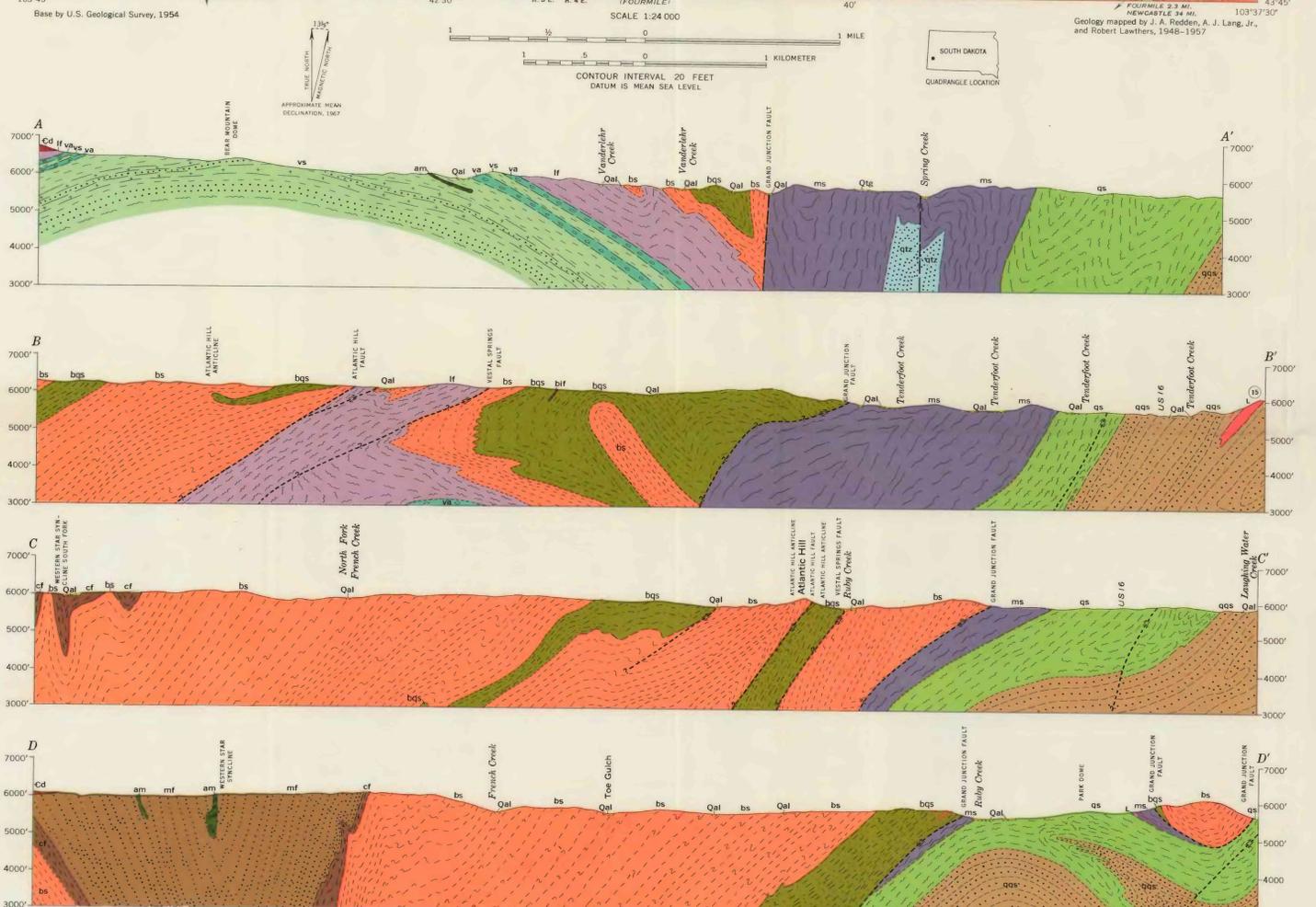
- Direction and plunge of lineation
P, elongate pebbles; E, fine-grained ellipsoids; B, end of boudin; FF, foliation fold
- Direction and plunge of fold axis

INTERSECTION OF ANY STRUCTURAL SYMBOLS INDICATES THAT READINGS WERE MADE AT POINT OF INTERSECTION

- Vertical shaft
- Inclined shaft
- Caved shaft
- Adit Cave adit
- Open cut
- Trench
- Mine
- Prospect pit
- Staurolite zone
- Sillimanite zone
- Boundary of metamorphic zone

List of mines and prospects

- Big Spar No. 1 (F-8)
- Crown (F-7)
- Dorothy (G-9)
- Echo (G-7)
- February Mica Lode (C-9)
- Goldfish (G-5)
- Grand Junction (E-3)
- Hard Scrabble (B-5)
- Highland Lode or Ross (D-9)
- Highview (C-5)
- High Climbs (G-2)
- Hunter-Louis (G-2)
- Inca (C-9)
- Lucky Bird (B-7)
- Minnie May (F-8)
- Milton (F-4)
- Newark (D-9)
- Old Bill (F-4)
- Onyota (F-8)
- Pendocott (B-6)
- Pine Tree (E-5)
- Rachel D. (F-7)
- Rough Rider (B-6)
- Sagwan (C-3)
- Sunrise (E-5)
- Tenderfoot Spud (G-3)
- Walsh (E-8)
- Western Star (A-7)
- Wilhelm (E-4)
- Wildon (C-8)



**GEOLOGIC MAP AND SECTIONS OF THE BERNE QUADRANGLE
BLACK HILLS, SOUTH DAKOTA**