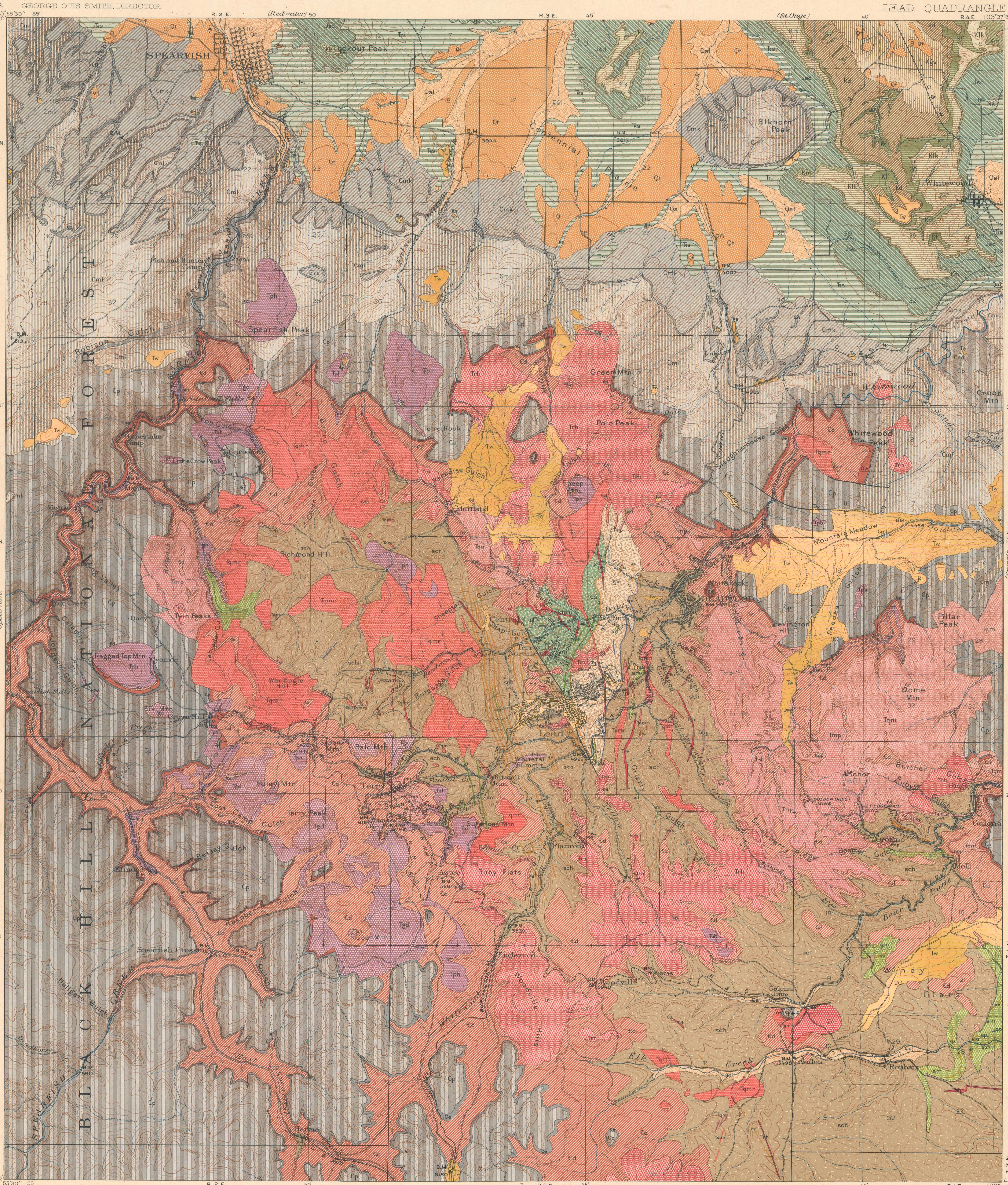
DEPARTMENT OF THE INTERIOR
ALBERT B. FALL, SECRETARY
U.S. GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR

AREAL GEOLOGY

SOUTH DAKOTA
LEAD QUADRANGLE

(Redwater) 103°55'30" 44°30' 55' R.2 E. (Redwater) 50' R.3 E. 45' (St. Onge) 40' R.4 E. 103°37'30" 44°30' (Saint Onge)



(Deadwood 1/125000) 44°15' 103°55'30" 55' R.2 E. 50' (Deadwood 1/125000) R.3 E. 45' 40' R.4 E. 103°37'30" 44°15'

E.M. Douglas, Geographer.
Triangulation by Frank Tweedy.
Topography by W.H. Herron and Arthur Stiles.
Surveyed in 1897.
Partial revision in 1913 by R.W. Berry.

TRUE NORTH MAGNETIC NORTH 15½°
APPROXIMATE MEAN DECLINATION, 1920.

Scale $\frac{1}{62500}$

1 ½ 0 1 2 3 4 Miles
1 ½ 0 1 2 3 4 5 Kilometers

Contour interval 50 feet.
Datum is mean sea level.
Edition of Nov. 1921.

Cambrian and later rocks by Sidney Paige and N.H. Darton.
Pre-Cambrian rocks by Sidney Paige.
Surveyed in 1911-1915.

EXPLANATION

SEDIMENTARY ROCKS

System	Series	Symbol	Formation
QUATERNARY	Recent	Qal	Alluvium
QUATERNARY	Pleistocene	Qt	Older terrace deposits
TERTIARY	Oligocene (White River group)	Tw	Brule clay and Chadron formation undifferentiated
CRETACEOUS	Upper Cretaceous (Colorado group)	Kgs	Graneros shale
CRETACEOUS	Upper Cretaceous	Kd	Dakota sandstone
CRETACEOUS	Lower Cretaceous	Kf	Fuson shale *OVERLAP SOUTHWARD*
CRETACEOUS	Lower Cretaceous	Klk	Lakota sandstone *OVERLAP SOUTHWARD*
CRETACEOUS?	Lower Cretaceous?	Km	Morrison shale *UNCONFORMITY*
JURASSIC	Upper Jurassic	Jsd	Sundance formation *UNCONFORMITY*
TRIASSIC?		Ꞃs	Spearfish formation
CARBONIFEROUS	Permian?	Cmk	Minnekahta limestone
CARBONIFEROUS	Permian?	Co	Opeche formation
CARBONIFEROUS	Pennsylvanian	Cml	Minnelusa sandstone
CARBONIFEROUS	Mississippian	Cp	Pahasapa limestone
CARBONIFEROUS	Mississippian	Ce	Englewood limestone *UNCONFORMITY*
ORDOVICIAN	Upper Ordovician	Ow	Whitewood limestone *UNCONFORMITY*
CAMBRIAN	Upper Cambrian	Ꞓd	Deadwood formation

PRE-CAMBRIAN SEDIMENTARY AND IGNEOUS ROCKS

System	Group	Symbol	Rock
ALGONKIAN		qp	Quartz-pyrite replacement veins
ALGONKIAN	Igneous rocks	am	Amphibolite
ALGONKIAN	Metamorphosed sedimentary rocks	cs	Calcareous schist*
ALGONKIAN	Metamorphosed sedimentary rocks	gs	Garnetiferous schist
ALGONKIAN	Metamorphosed sedimentary rocks	ag	Amphibole-garnet schist
ALGONKIAN	Metamorphosed sedimentary rocks	qz	Quartzite
ALGONKIAN	Metamorphosed sedimentary rocks	sch	Slate and mica schist*

IGNEOUS ROCKS

System	Symbol	Rock
QUATERNARY	Qr	Rhyolite tuff and obsidian
TERTIARY	Tph	Phonolite
TERTIARY	Tgd	Grorudite
TERTIARY	Tqmr	Quartz monzonite and rhyolite porphyries
TERTIARY	Tmp	Monzonite porphyry
TERTIARY	Trh	Rhyolite
TERTIARY	Tqm	Quartz monzonite porphyry

Faults

Concealed faults
(covered by younger deposits)

See large map for descriptions of formations.

* *Calcareous and magnesian schists are interbedded in the mica schist west of fault near Lead.*