COLUMNAR SECTION SHEET

GENERALIZED SECTION FOR THE OELRICHS QUADRANGLE.

SCALE: 1 INCH=500 FEET.

Period.	Formation Name.	Symbol	Thickness in Feet.	Columnar Section.	Depth to Dakota Sandstone.	Character of Rocks.	Character of Topography and Soils.
EOCENE (OLIGOCENE)	Brule clay.	Eb	0–115		3000	Pinkish-buff sandy clay.	Bad lands.
	Chadron formation.	Ec	0–100			Sand and sandy clay with limestone at the top.	Bad lands.
CRETACEOUS	Pierre shale.	Kp	1300		2800 2600 2400 2200 2000 1800 1600	Principal horizon of limestone lenses, giving rise to "tepee buttes." Dark-gray shale or clay, weathering brown or buff and containing many fossiliferous concretions. Widely scattered concretions which give rise to "tepee buttes." Black fissile shale containing numerous concretions, in part cone-in-cone.	Small sharp hills, "tepee buttes." Wide rolling plains with shallow valleys and low ridges. Soil thin, clayey, and infertile. Supports thin growth of grass. Small sharp hills, "tepee buttes."
	Niobrara formation.	Kn	100–200			Gray calcareous shale, weathering yellow, and impure chalk filled with *Ostrea congesta* near the top.	Valleys or flats with fertile soil.
	Carlile formation.	Kcr	500		1400 1200 1000	Light-colored shale with numerous large concretions. Gray shale with sandy shale and thin sandstone layers. Bed of impure limestone.	Low rocky ridges and bare shale slopes.
	Greenhorn limestone.	Kg	35		800	Thin-bedded, hard limestone, weathering creamy white, and filled with *Inoceramus labiatus*.	Small bare ridges.
	Graneros shale.	Kgs	900		600 400 200 0	Dark shale, very fissile below, with scattered concretions.	Wide valleys with thin sterile soil except where covered by alluvium.
	Dakota sandstone.	Kd	150			Sandstone, thin bedded above, very massive below.	Rocky slopes and cliffs. Soil very thin.
	Fuson formation.	Kf	80			Massive, buff to purple, sandy shale.	Slopes below cliffs of sandstone.
	Minnewaste limestone.	Kmw	25			Light-gray limestone.	Even surfaces nearly bare.
	Lakota formation.	Klk	300			Massive, cross-bedded sandstone and shale.	Rocky slopes and high cliffs. Soil very thin.
JURATRIAS — JURASSIC	Unkpapa sandstone.	Ju	100–200			Fine-grained, massive sandstone, white, pink, purple, and buff.	Bare cliffs.
	Sundance formation.	Jsd	250			Greenish-gray shale with thin limestone beds. Red sandy shale, buff sandstone, and thin beds of limestone.	Long slopes with much talus cover.
TRIASSIC?	Spearfish shale. ("Red Beds.")	Jsf	400			Red sandy shale with gypsum beds.	Wide red valley with poor soil.
CARBONIFEROUS — PERMO-CARB.	Minnekahta limestone.	Cmk	50			Thin-bedded gray limestone.	Rocky slopes and cliffs.
	Opeche formation.	Co	100			Red sandy shale and red sandstone.	Slopes below cliffs.
	Minnelusa sandstone.	Cml	430			Reddish, buff, white, and gray sandstone, with some shale and limestone in upper portion.	Canyon walls.
	Pahasapa limestone.					Massive gray limestone.	Does not reach the surface.

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U. S. GEOLOGICAL SURVEY
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ILLUSTRATION SHEET

SOUTH DAKOTA-NEBRASKA
OELRICHS QUADRANGLE

FIG. 3.—"HOGBACK" OF DAKOTA SANDSTONE.

Buffalo Gap, S. Dak.; looking southwest. The surfaces sloping steeply to the left are the bedding surfaces of the upturned Dakota sandstone.

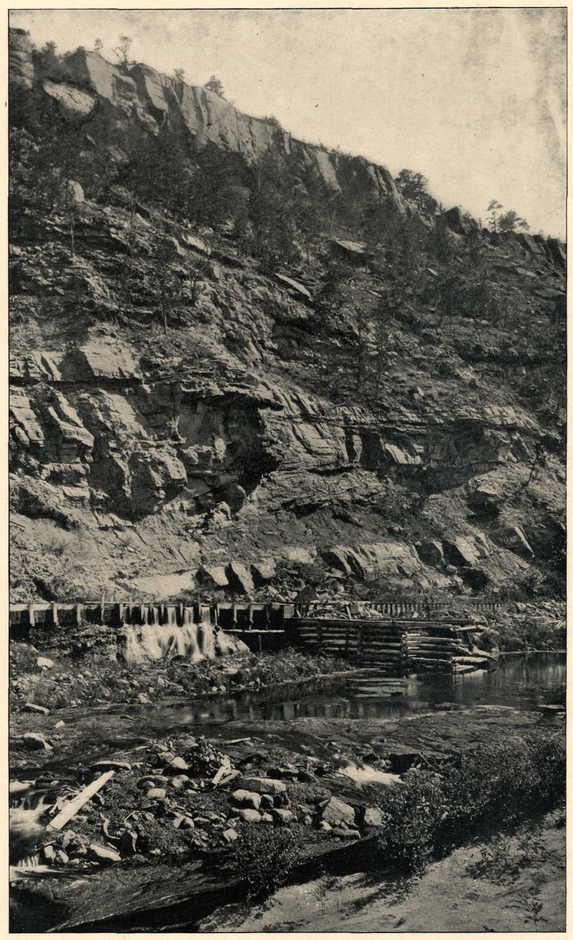

FIG. 4.—EXPOSURE OF DAKOTA SANDSTONE, FUSON FORMATION MINNEWASTE LIMESTONE, AND LAKOTA FORMATION.

At Evans quarry, south wall of Fall River Canyon, 4 miles below Hot Springs, S. Dak. The capping rock is Dakota sandstone.

FIG. 5.—AN AGGLOMERATE OF OSTREA CONGESTA SHELLS.

A typical fossil of the Niobrara formation.

FIG 6.—INOCERAMUS LABIATUS.

The typical fossil of the Greenhorn limestone.

FIG. 7.—LAKOTA SANDSTONE LYING UNCONFORMABLY ON UNKPAPA SANDSTONE.

North wall of Sheps Canyon, south of Hot Springs, S. Dak.

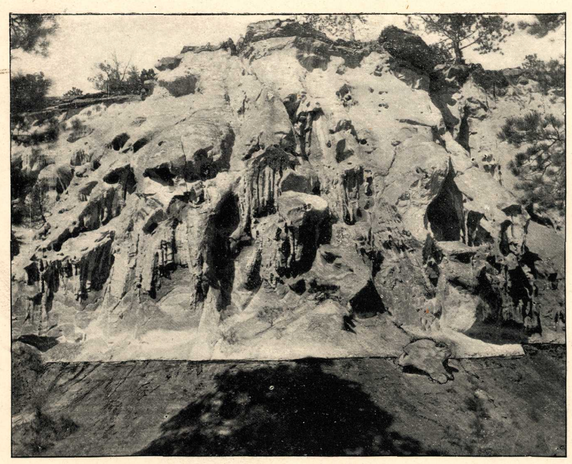

FIG. 8.—UNCONFORMABLE CONTACT OF SUNDANCE FORMATION ON SPEARFISH SHALE, "RED BEDS."

Seven miles south of Hot Springs, S. Dak.

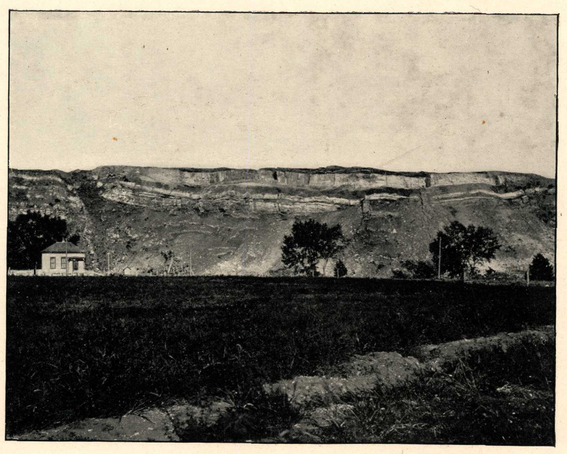

FIG. 9.—GYPSUM BEDS IN SPEARFISH SHALE.

Cliff on Cold Brook, near Hot Springs, S. Dak.

FIG. 10.—A TYPICAL "TEPEE BUTTE."

Due to a limestone lens, which contains numerous shells of Lucina occidentalis, in Pierre shale.