

120 and 121 W., and the complete survey of the fifth standard parallel and of the fifteenth guide meridian as far north as the fifth standard parallel. No surveys were made by the Land Office in this region between 1875 and 1880.

In addition to these parties, H. R. Durkee and William Cleburne, of the Union Pacific Railroad, collected important paleontologic material, and private parties of Prof. O. C. Marsh worked in the Wasatch beds near Evanston for short periods during one or more years in the early seventies.

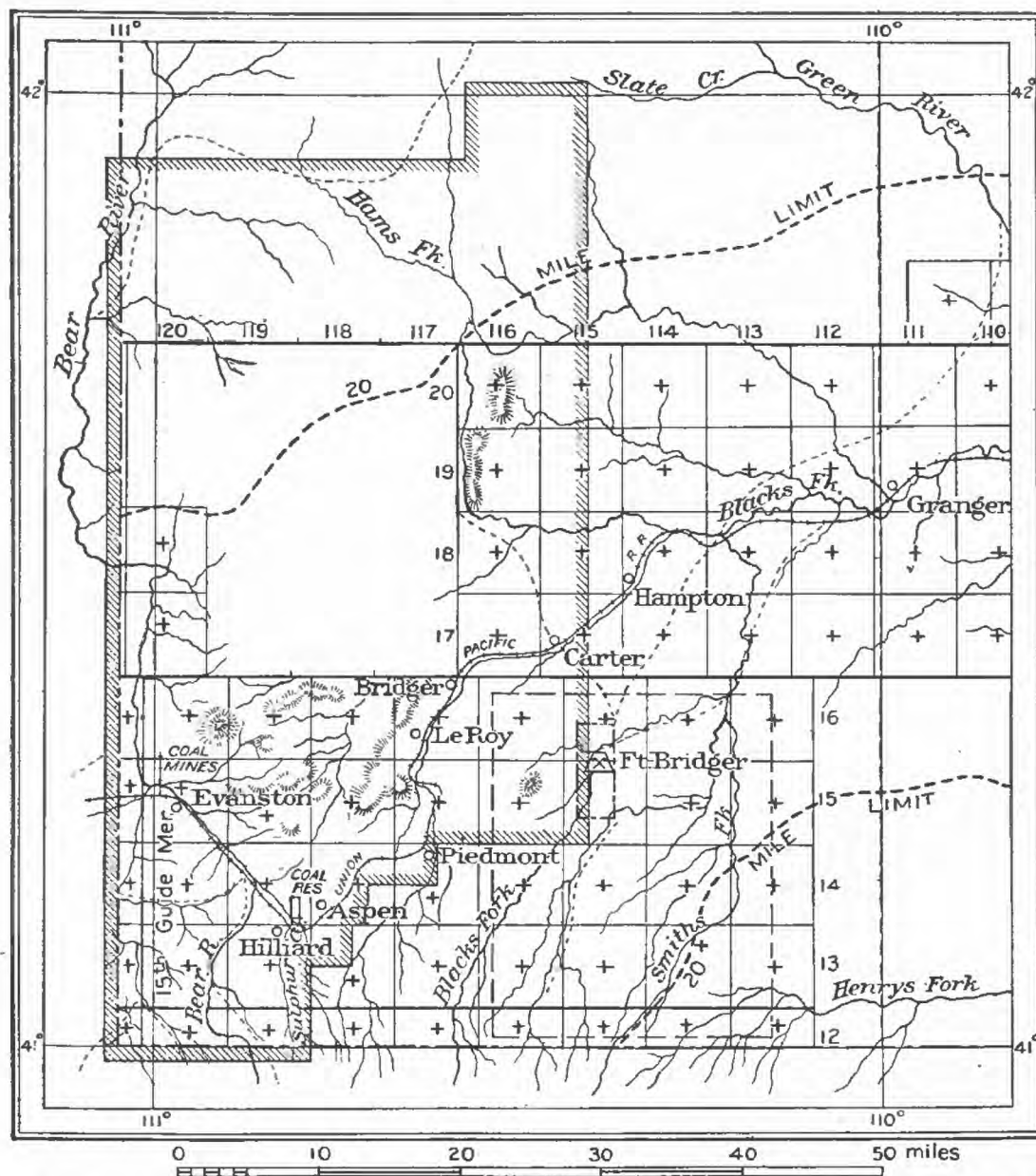
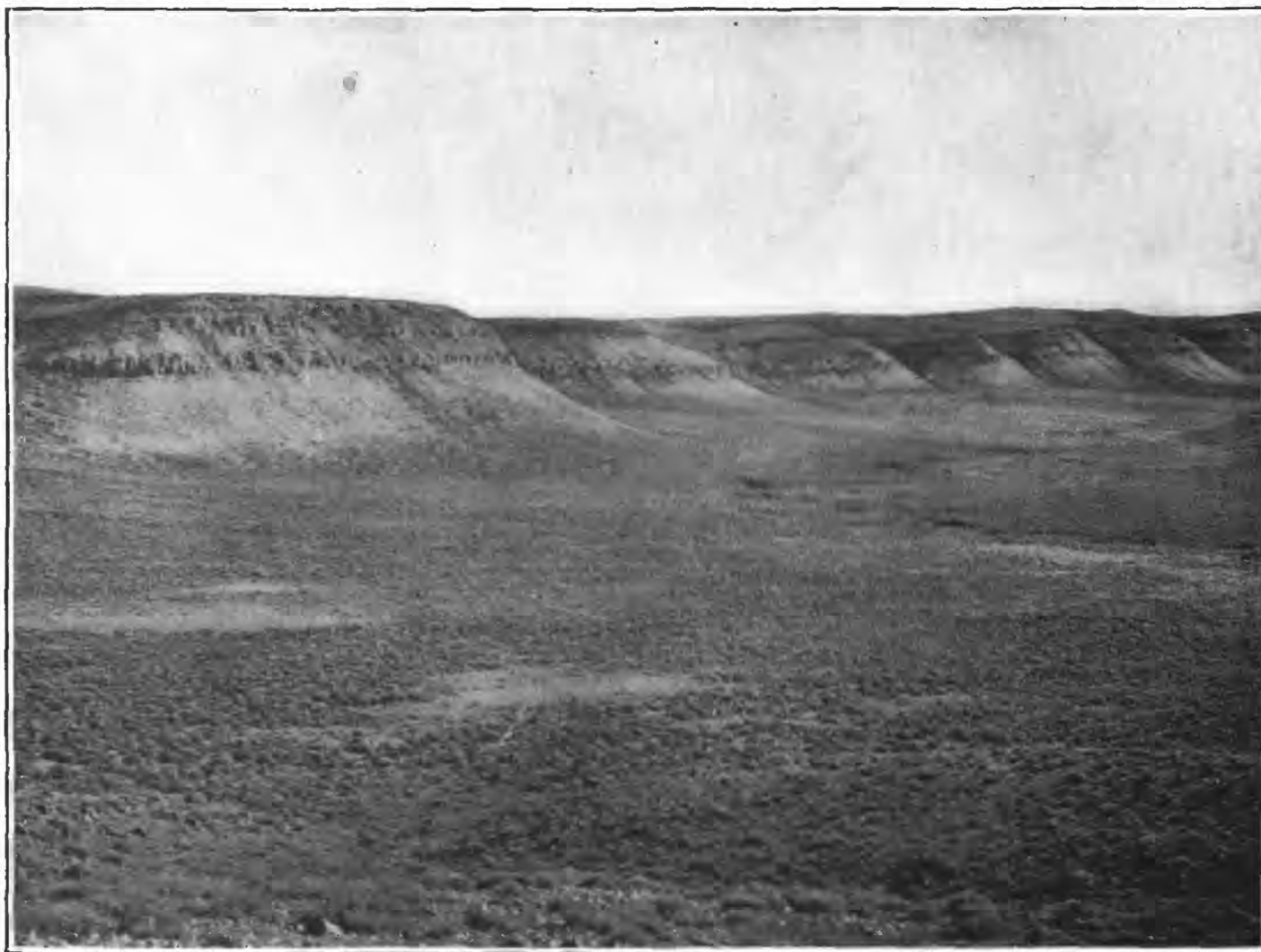


FIG. 2.—Copy of portion of the Land Office map of Wyoming published in 1876, with addition of boundaries of Pl. III, showing extent of surveys of 1871-1874. Townships marked with + were completely subdivided at that time. These surveys are, on the whole, very accurate. The remainder of the area treated in this report was surveyed in 1881-1882. These surveys, with the exception of those of W. J. Boland in Rs. 117-119 W., Tps. 17-19 N., and Rs. 117-118 W., T. 20 N., are entirely fraudulent.

Geographically, the result of surveys of this period was a considerable refinement of the broad outlines of the topography obtained by the explorations of the first period. The Union Pacific Railroad surveys yielded a considerable amount of detailed information concerning the region along the line of the railroad, which,



A. TERRACE AND ESCARPMENT TOPOGRAPHY OF NEARLY HORIZONTAL EOCENE BEDS.

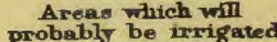
Five miles east of Kemmerer, Wyo., E. $\frac{1}{4}$ sec. 14, T. 21 N., R. 115 W. The strata exposed in the face of the escarpment belong to the Green River Eocene.

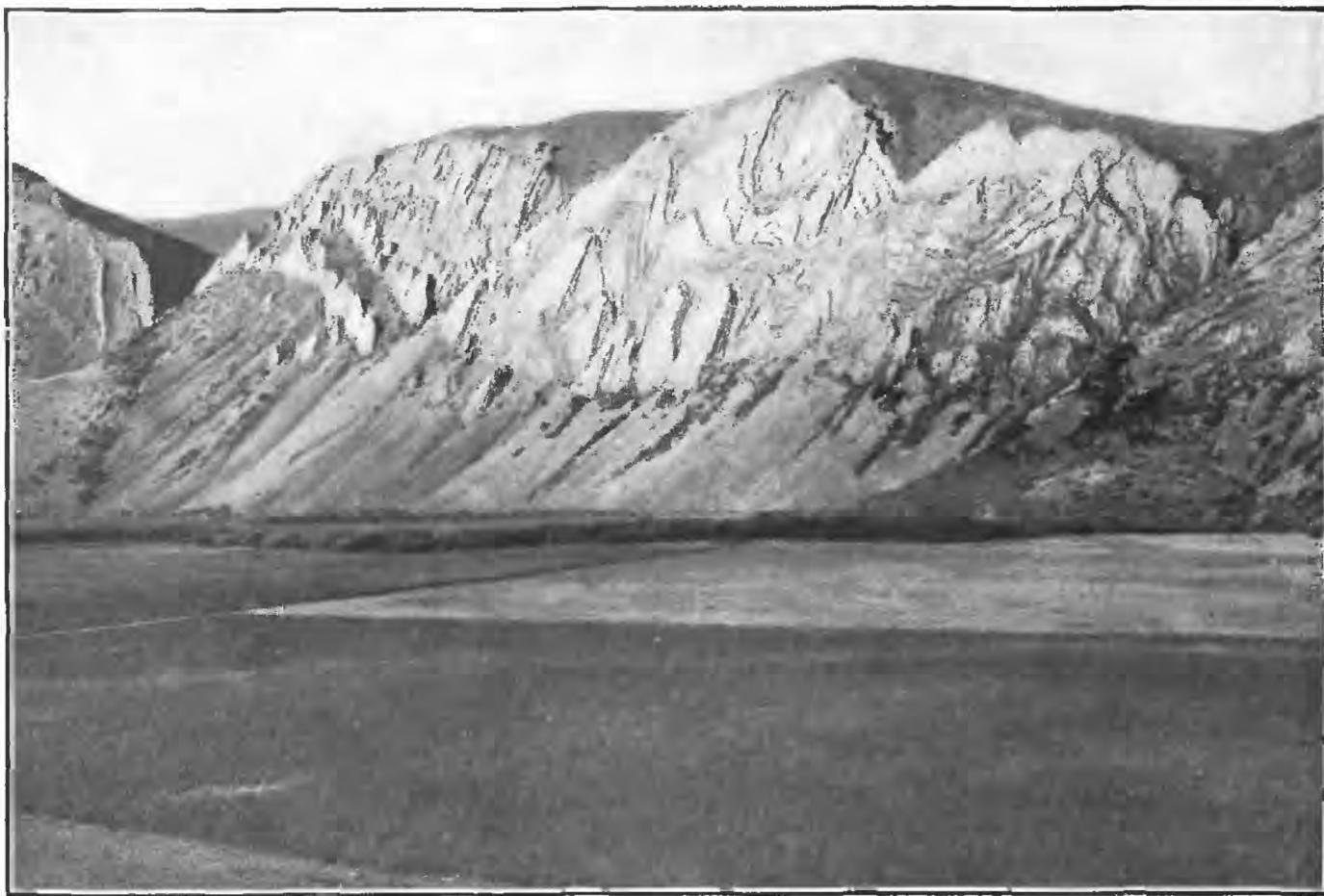


B. HOGBACK TOPOGRAPHY OF INCLINED PRE-EOCENE BEDS.

Near Hinshaw ranch, sec. 22, T. 16 N., R. 118 W. On extreme left is hill of horizontal upper Wasatch or Knight. The pronounced thick white sandstone capping the second hogback is the Lazeart sandstone, which marks the base of the Adaville formation. On the extreme right, in the distance, is Oyster Ridge, and between is Mammoth Hollow, underlain by Hilliard shales.

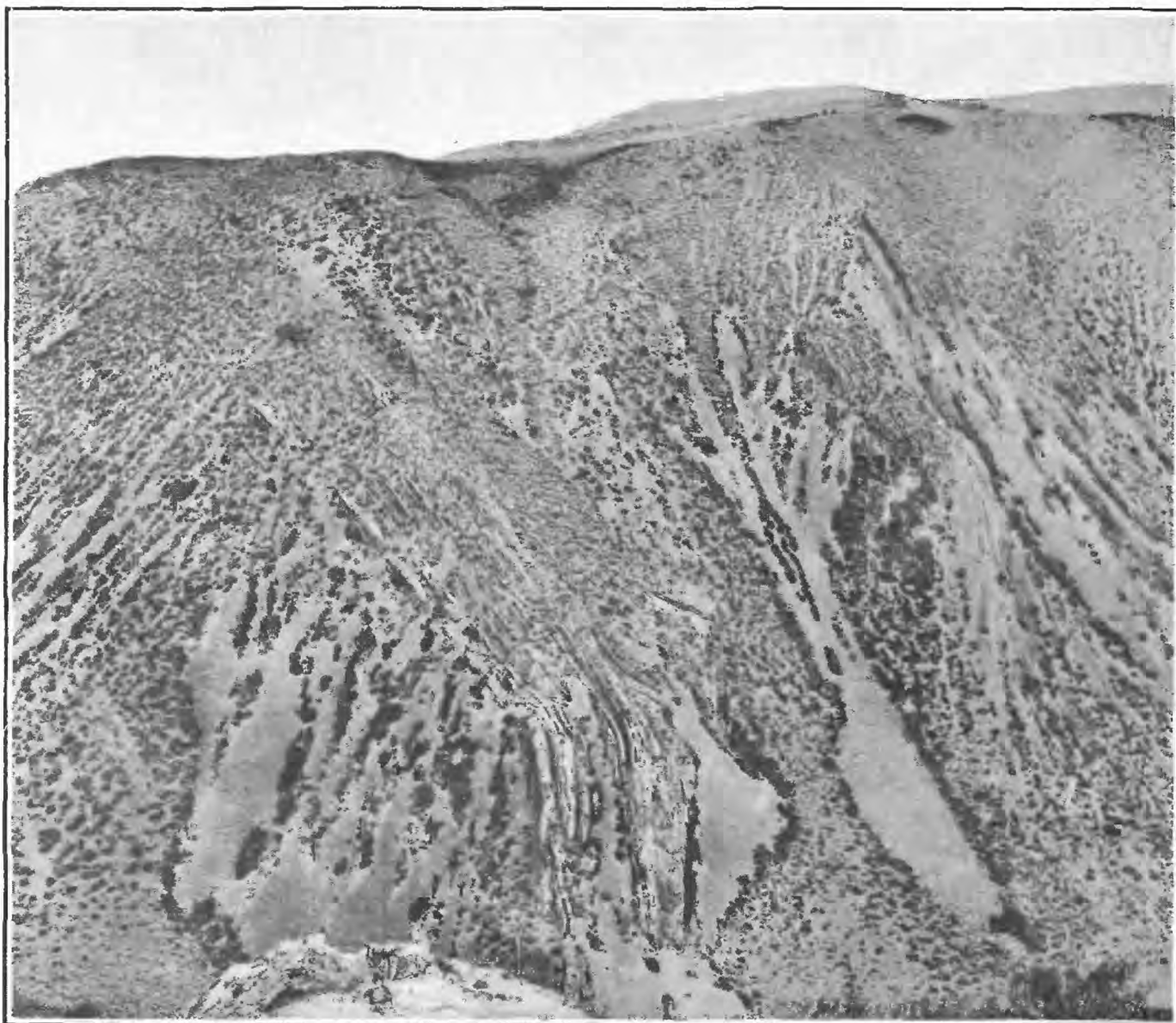
CHARACTERISTIC TOPOGRAPHIC TYPES.





A. EAST SIDE OF ROCK CREEK AT PORTER RANCH, 1 MILE NORTH OF NUGGET STATION, WYOMING.

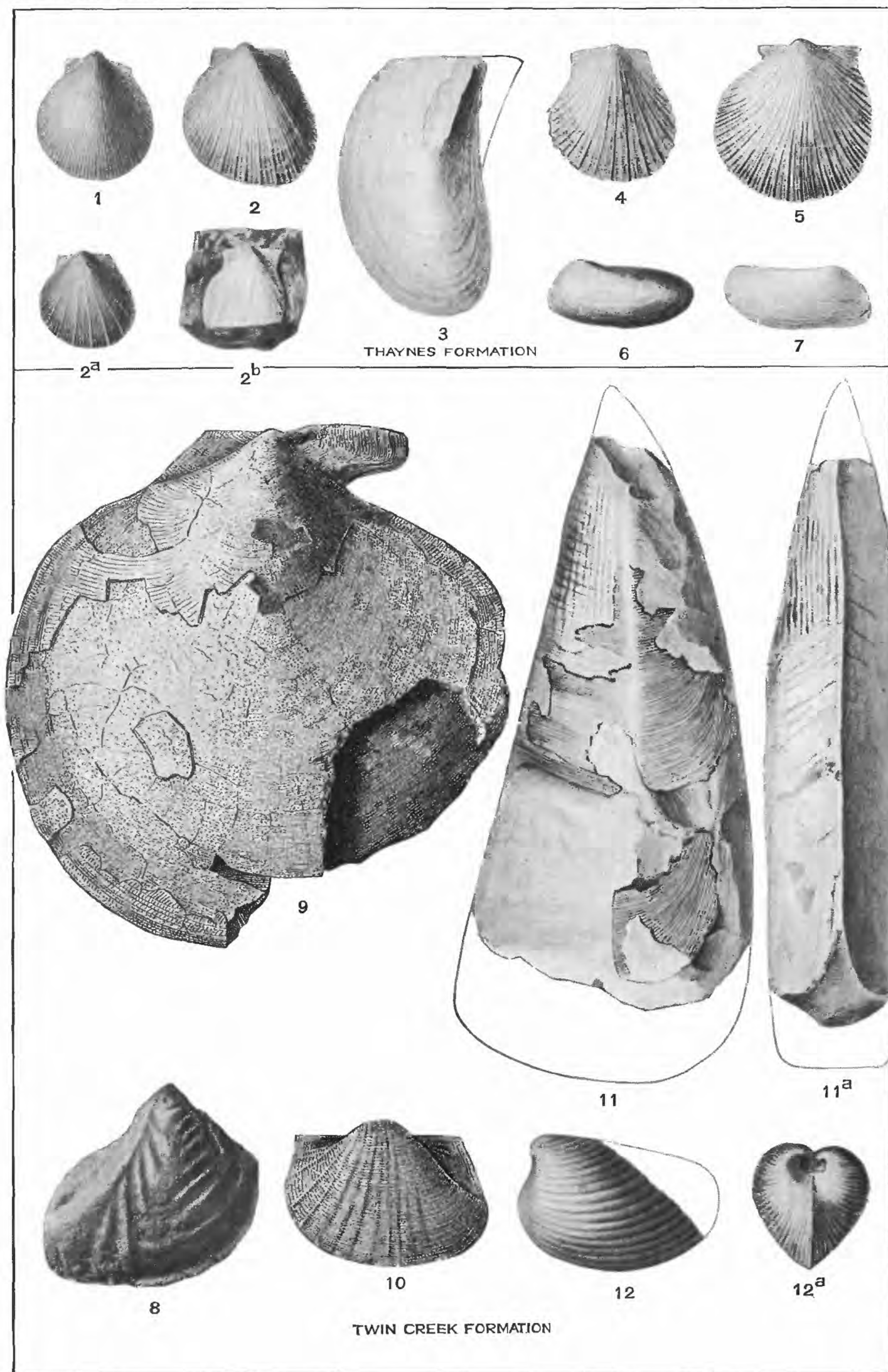
Thin-bedded fossiliferous limestone. These beds here occur on the eastern flank of a slightly overturned anticline. The view also shows the vegetation of this region, the barren uplands covered sparingly with sagebrush, the willow fringe along Rock Creek, and in the foreground the irrigated meadow of wild grass partially mowed.



B. EAST SIDE OF ROCK CREEK, NORTH SIDE OF SHEEP CANYON, 3 MILES NORTH OF NUGGET STATION, WYOMING.

Thin-bedded fossiliferous limestone. The vertical limestone in the center yielded the fossils listed from Sheep Canyon. The Woodside red beds occur just below this layer to the left. Note the hillside covered with sage and haw bushes.

OUTCROPS OF THAYNES FORMATION.



1. *Aviculopecten curtocardinalis* Hall & Whitf. (After Hall and Whitfield.)
- 2, 2a, 2b. *Aviculopecten occidentalis* Meek. (After Meek.)
3. *Myalina permiana* (Swallow). (After Hall and Whitfield.)
4. *Aviculopecten parvulus* Hall & Whitf. (After Hall and Whitfield.)
5. *Aviculopecten weberensis* Hall & Whitf. (After Hall and Whitfield.)

6. *Myacites inconspicuus* Meek. (After Meek.)
7. *Sedgwickia concava* M. & H. (After Hall and Whitfield.)
8. *Trigonia quadrangularis* Hall & Whitf. (After Stanton.)
9. *Camptonectes bellistriatus* (Meek). (After Stanton.)
10. *Cucullæa hagvei* Meek. (After Stanton.)
- 11, 11a. *Pinna kingii* Meek. (After Meek.)
- 12, 12a. *Pleuromya weberensis* Meek. (After Meek.)

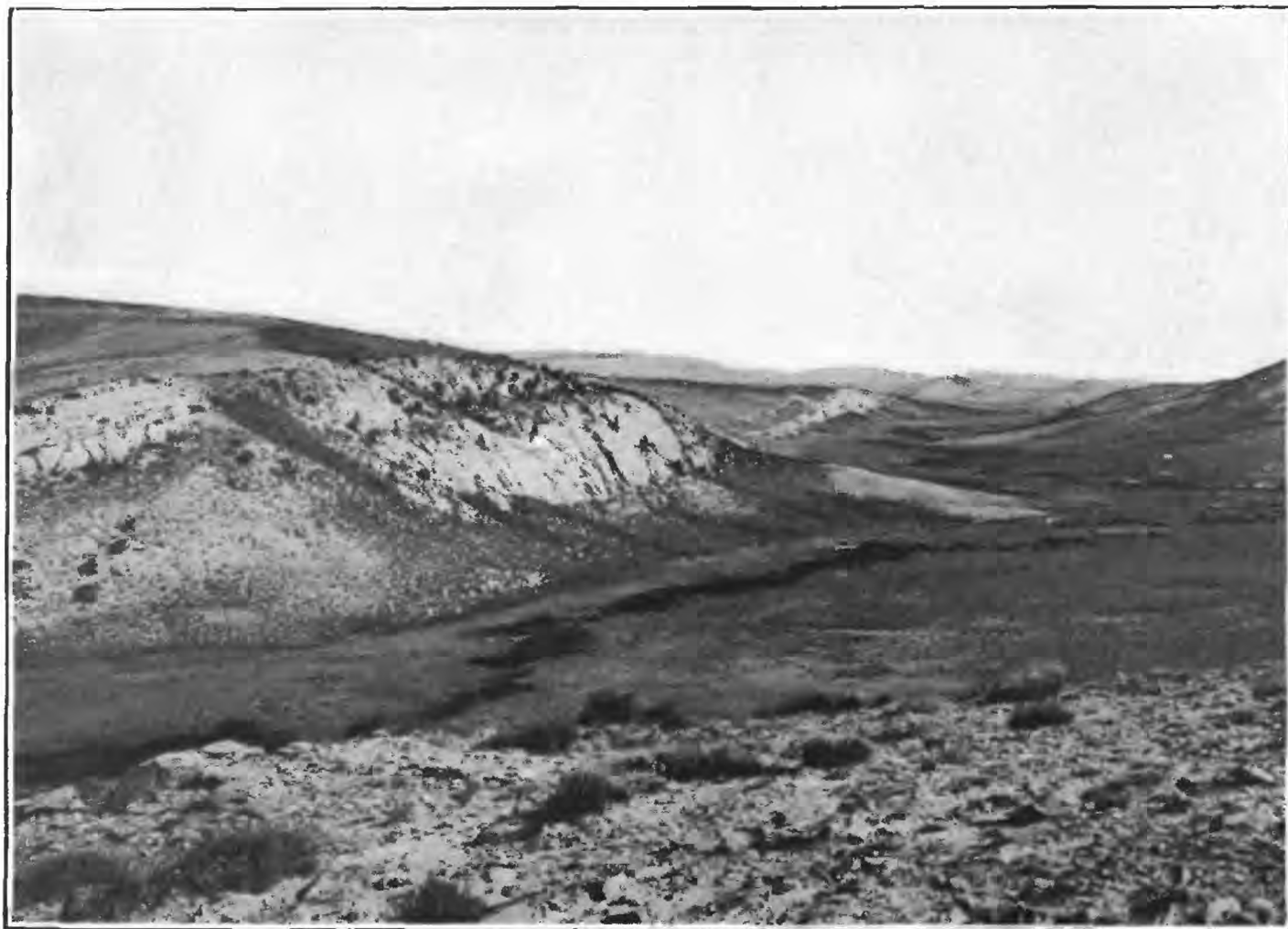
(Specimens 1, 3, 4, 5, 7 from southeast of Salt Lake City, Utah; 2, 2a, 2b, 6, 11, 11a, 12, 12a from Weber Canyon, Utah; 8 from 2½ miles west of Nugget Station, Wyoming; 9 from Bighorn Mountains, 10 miles from Yellowstone National Park, Wyoming.)

FOSSILS CHARACTERISTIC OF THAYNES AND TWIN CREEK FORMATIONS.



A. "FOSSIL CUT," A NOTED LOCALITY OF THE BEAR RIVER FORMATION.

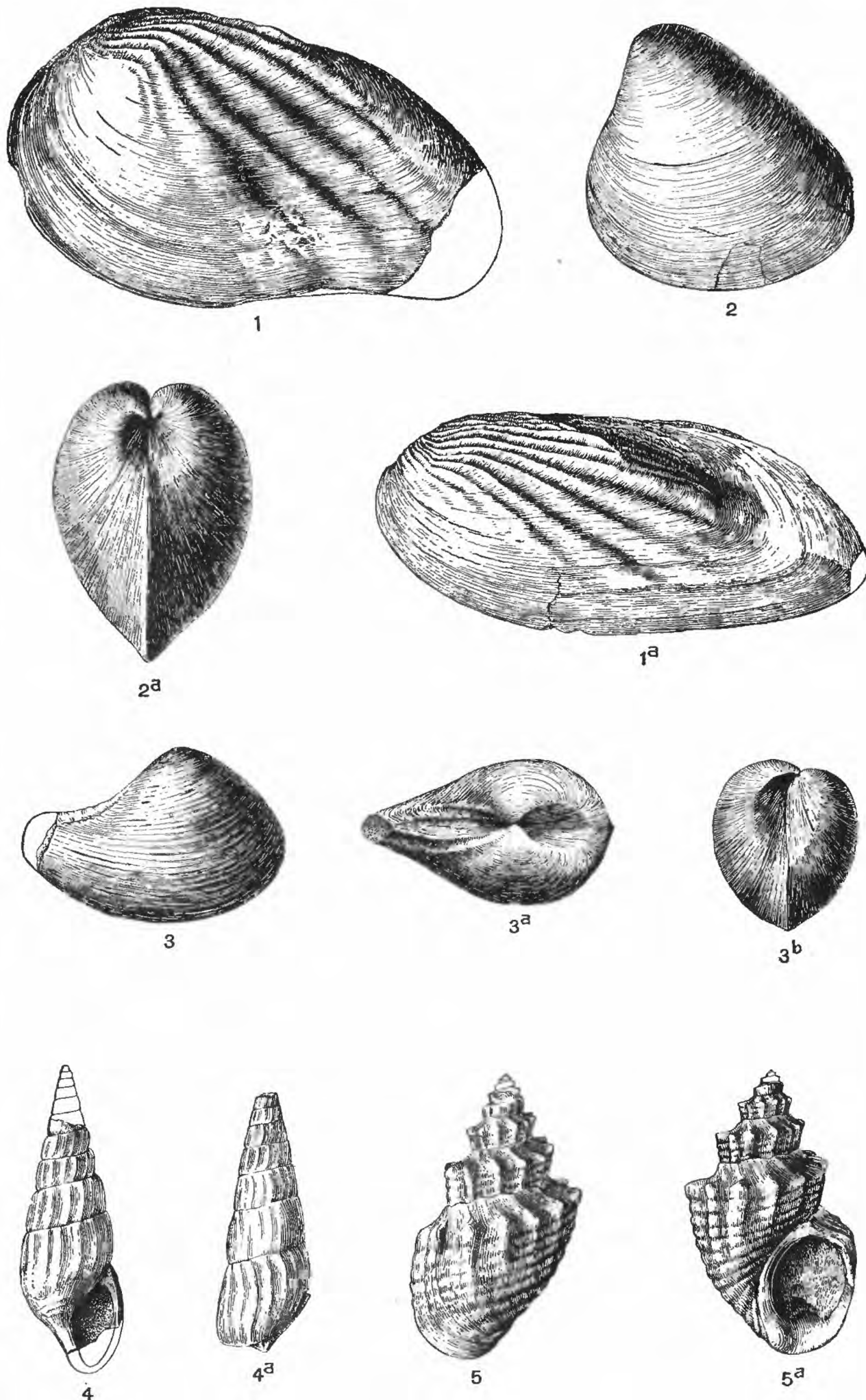
Just west of old Bear River City on Sulphur Creek, sec. 29, T. 14 N., R. 119 W., Uinta County, Wyo. Alternate strata of very fossiliferous shale and dark-colored shaly limestone. The apparent eastward dip is due to position of strata on upper flank of an overturned syncline. The true angle of dip is about 135° . The flexing of the beds to the west at the surface is due to hill creep, and does not indicate an "anticlinal fold," as has been repeatedly suggested.



B. LAZEART SANDSTONE AT LAZEART MINE, UINTA COUNTY, WYO.

View north, showing typical exposures. Note fringe of willows along creek and rock cedar on face of sandstone exposure.

OUTCROPS OF BEAR RIVER FORMATION AND LAZEART SANDSTONE AT THE TYPE LOCALITIES.

1, 1a. *Unio belliplicatus* Meek.1, 2a. *Corbicula durkeei* Meek.3, 3a, 3b. *Corbicula pyriformis* Meek.4, 4a. *Pachymelania cleburni* White.5, 5a. *Pyrgulifera humerosa* Meek.

(Copies of White's figures of specimens from Sulphur Creek, Wyoming, and 7 miles north of Evanston, Wyo.)

FOSSILS CHARACTERISTIC OF BEAR RIVER FORMATION.

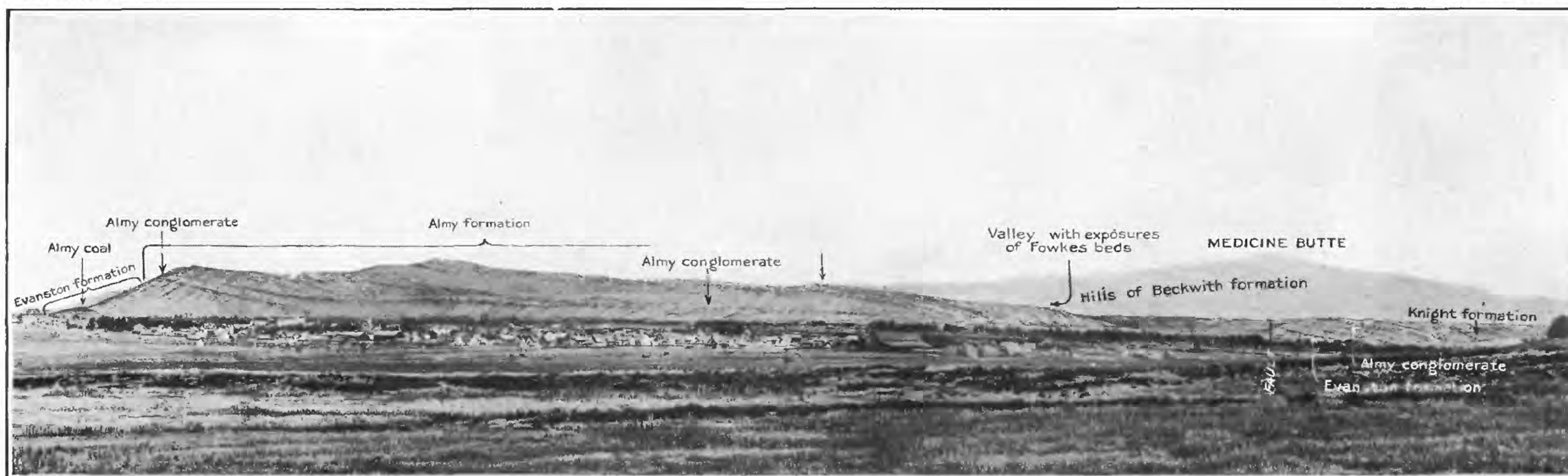


1



1a

1, 1a. *Inoceramus exogyroides* Meek and Hayden, from sandstone lentil in Hilliard formation on Hams Fork, sec. 27, T. 22 N., R. 116 W.



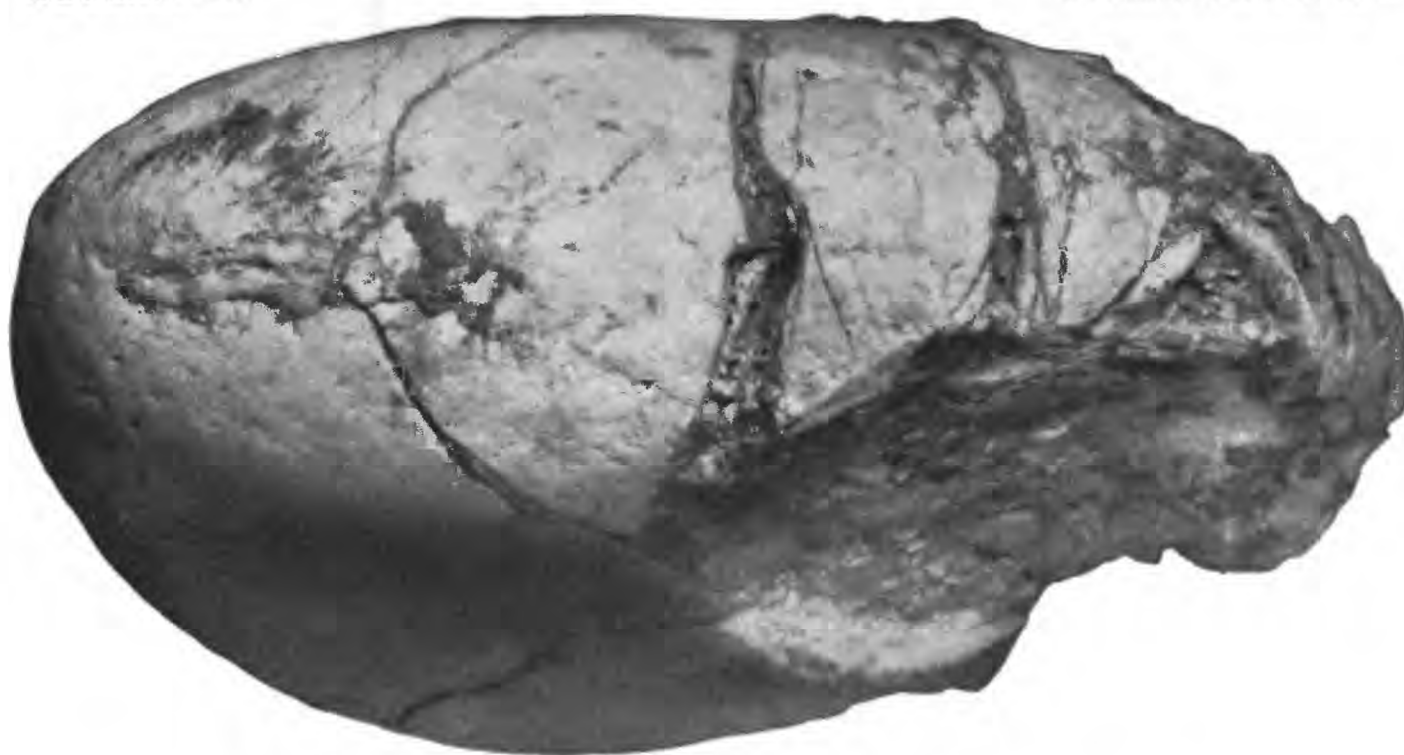
A. AT EVANSTON, WYO.



B. DETAIL OF PROMINENT HILL AT LEFT OF VIEW A.

The line of parting between Evanston and Almy formations lies between the points A and B. Upper beds are conglomeratic Almy; lower, Evanston. Slack pile at foot of hill in foreground marks site of old mine No. 2. The hills across the irrigated bottom of Bear River are composed of nearly horizontal strata belonging to Knight formation.

RELATIONS OF EVANSTON AND ALMY FORMATIONS AT THE TYPE LOCALITY.

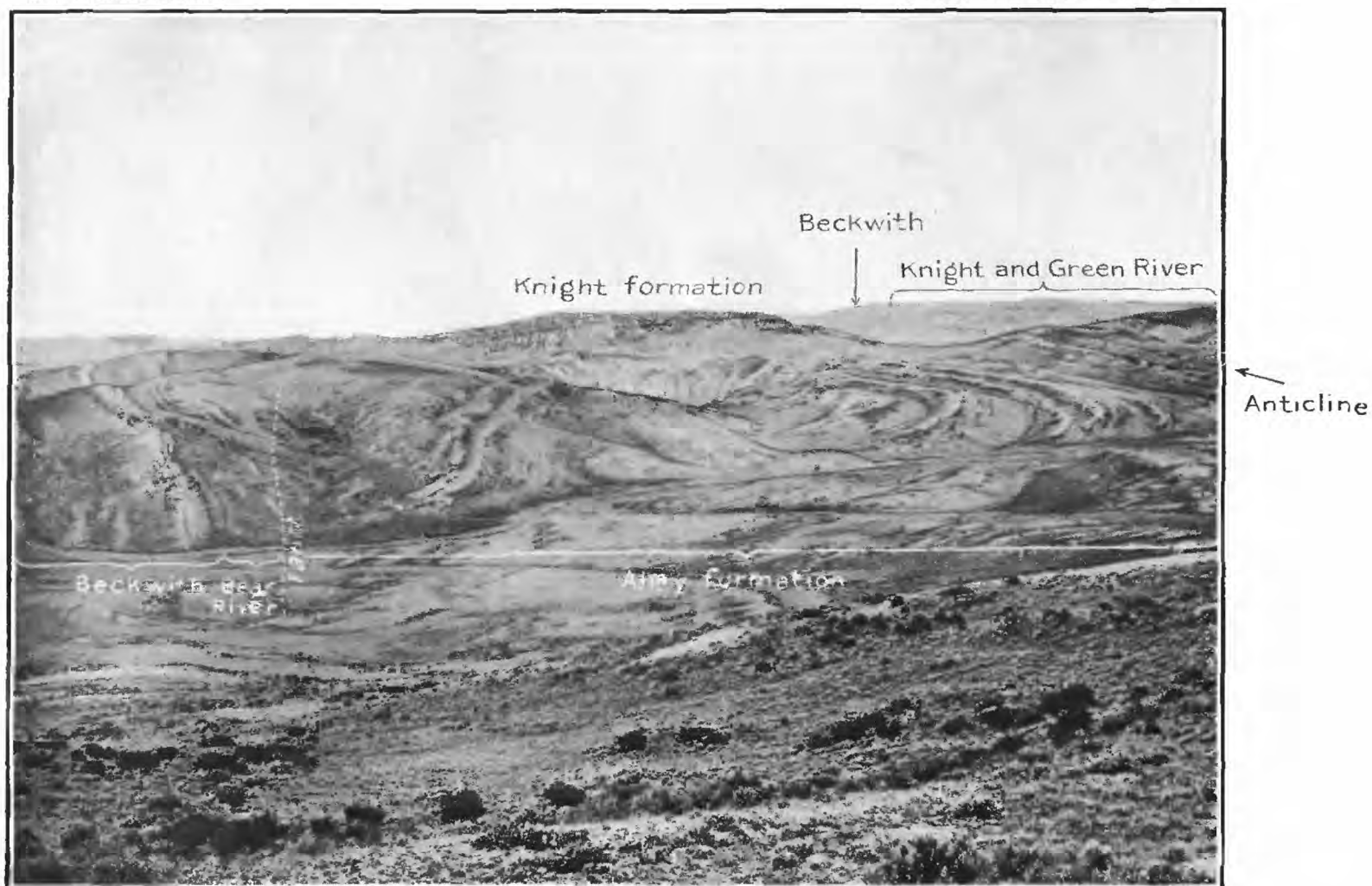


A. CRUSHED AND RECEMENTED PEBBLE FROM LOCALITY BELOW; $\frac{5}{8}$ OF NATURAL SIZE.



B. SW. $\frac{1}{4}$ SEC. 25, T. 20 N., R. 120 W.

ALMY CONGLOMERATE.



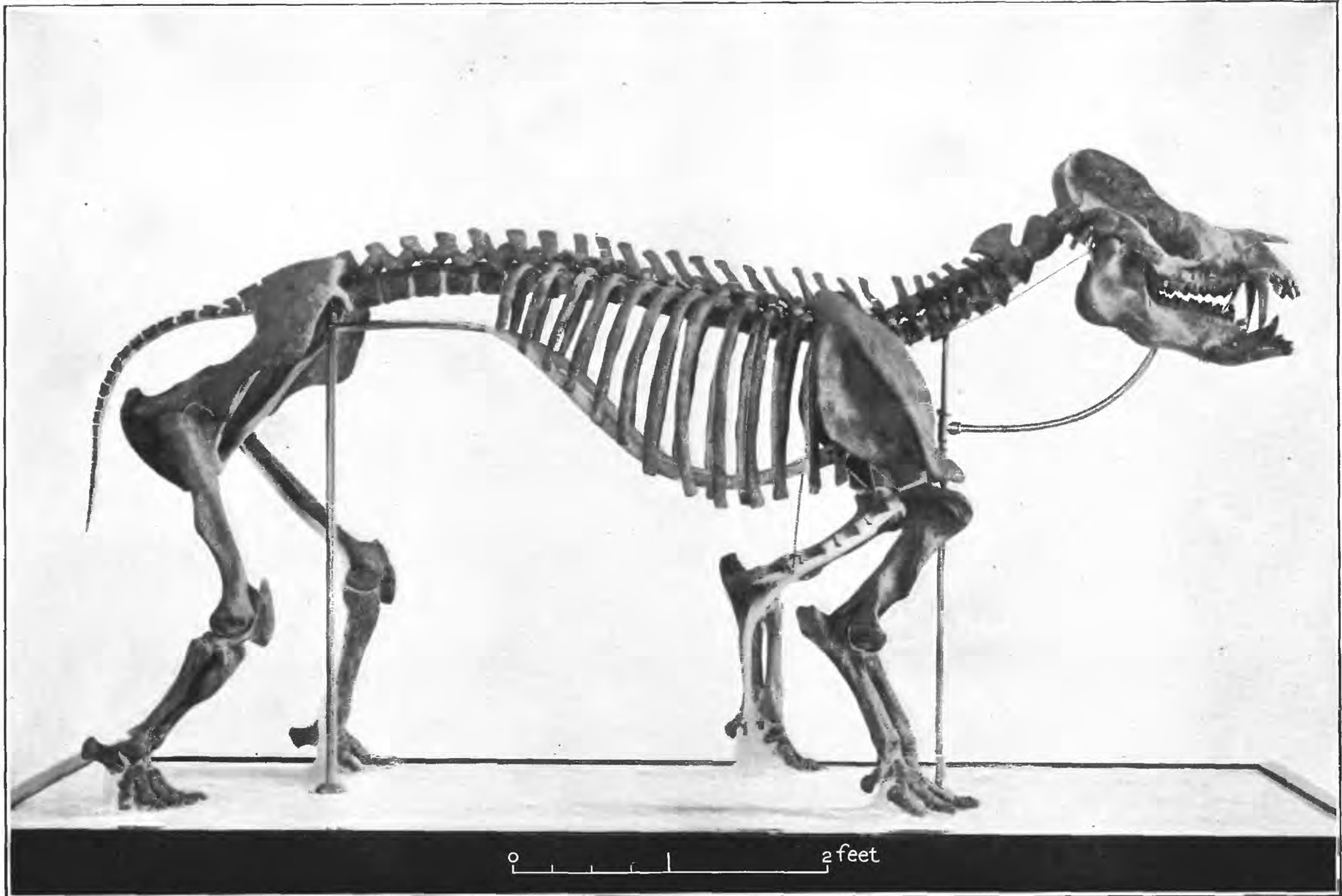
A. VIEW SHOWING RELATION OF BEDS NEAR AND EAST OF MEDICINE BUTTE FAULT, JUST NORTH OF WHITNEY CANYON.

Note Almy beds with Knight beds unconformable in the distance. This angular unconformity is also well marked just east of the anticline in the Almy beds.



B. TYPICAL LOWER KNIGHT BADLANDS, SW. $\frac{1}{4}$ SEC. 25, T. 20 N., R. 120 W.

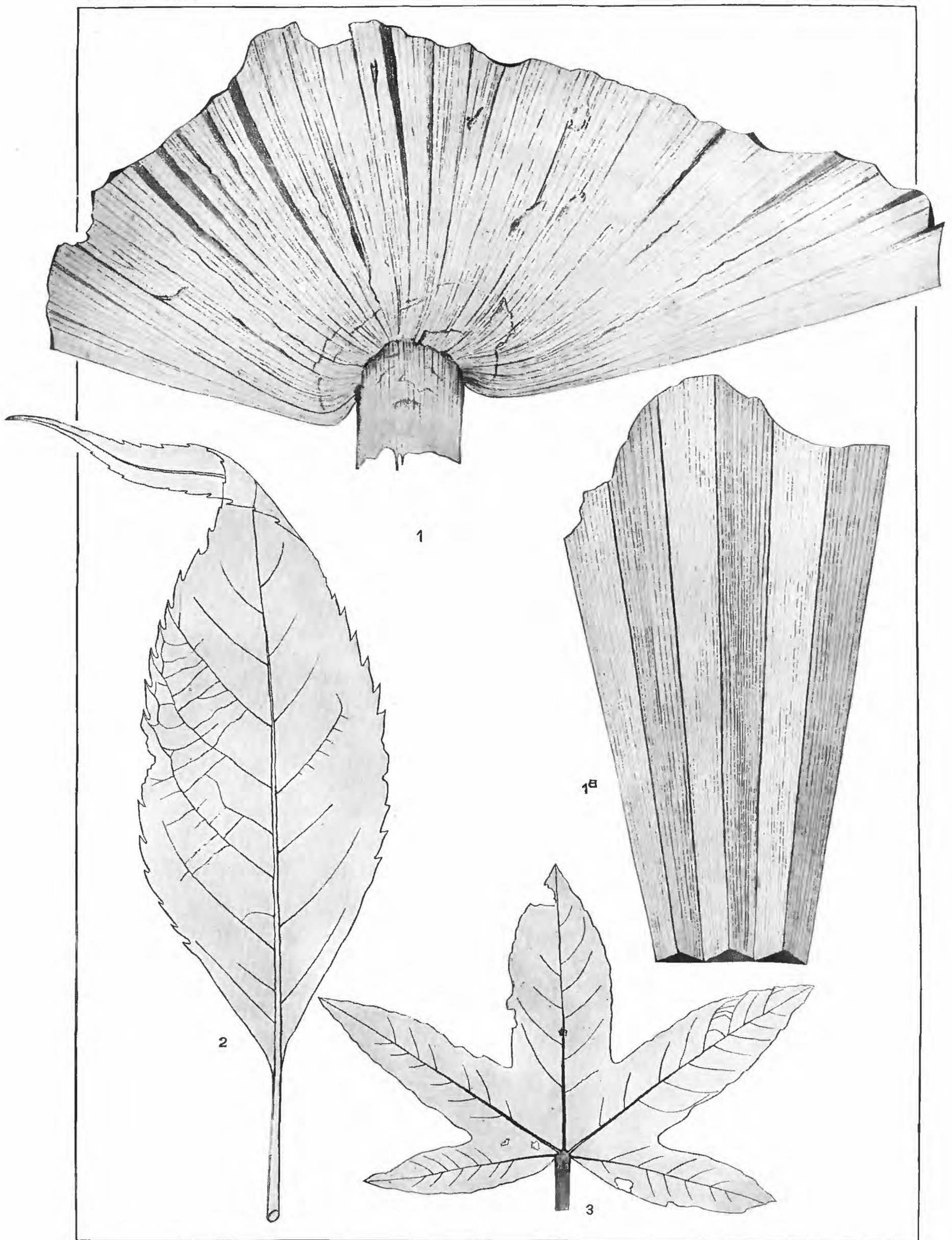
OUTCROPS OF ALMY AND KNIGHT FORMATIONS.



ONE OF THE CHARACTERISTIC MAMMALS OF THE KNIGHT FORMATION OR "CORYPHODON BEDS." FIRST FOUND NEAR EVANSTON, WYO.

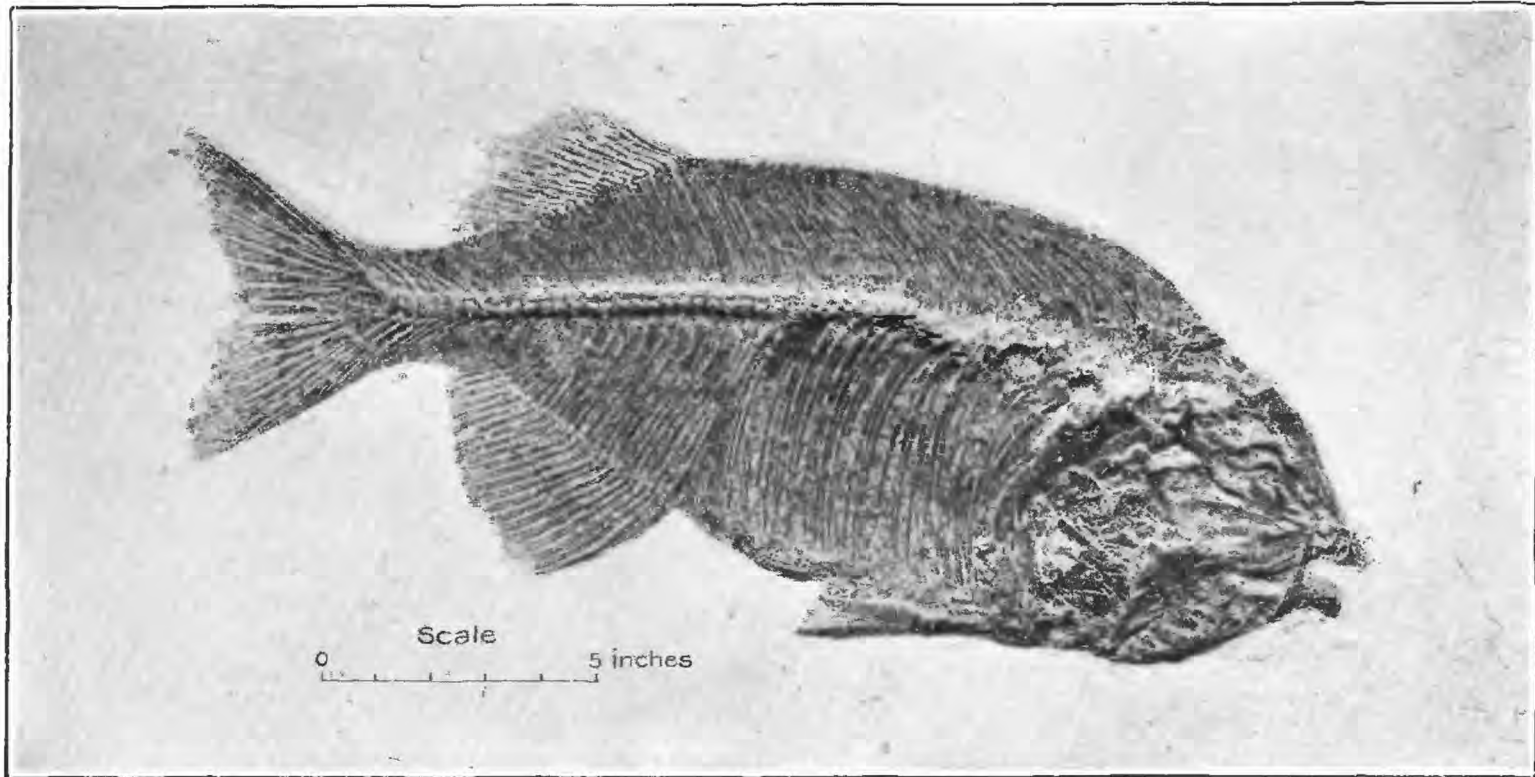
Composite of nine individuals collected in Bighorn basin, Wyoming, by American Museum party under Dr. J. L. Wortman, and mounted by Mr. Hermann under the direction of Dr. Henry F. Osborn. Original in American Museum of Natural History. Length from incisors to perpendicular of tail, 7 feet 9 $\frac{1}{4}$ inches; height at withers, 3 feet 4 $\frac{1}{2}$ inches.

CORYPHODON RADIAN S COPE.



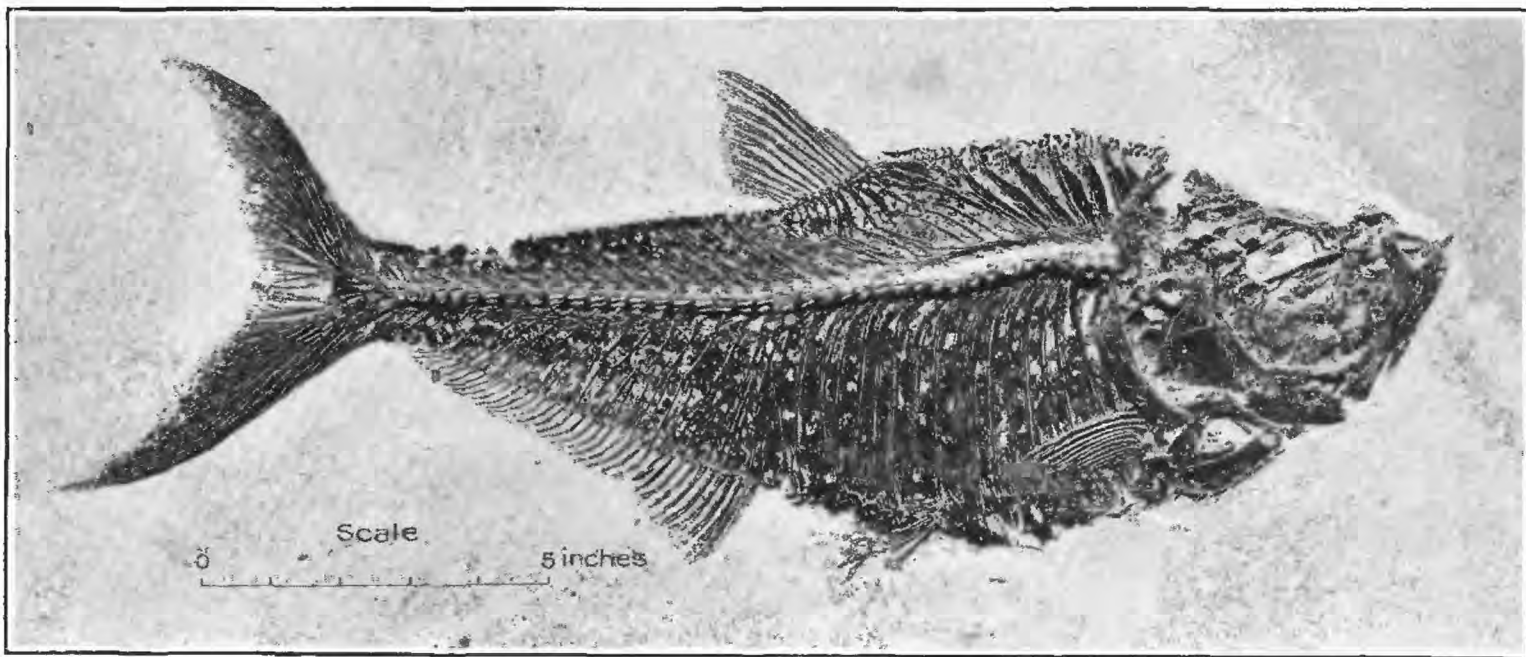
1, 1a. *Flabellaria florissanti* Lesq. 2. *Euonymus flexifolius* Lesq. 3. *Liquidambar europæum* Al. Br.
(Copies of Lesquereux's figures of specimens from Fossil, Wyo.)

FOSSIL LEAVES FROM GREEN RIVER FORMATION.



A. PHAREODUS ENCAUSTIS (COPE).

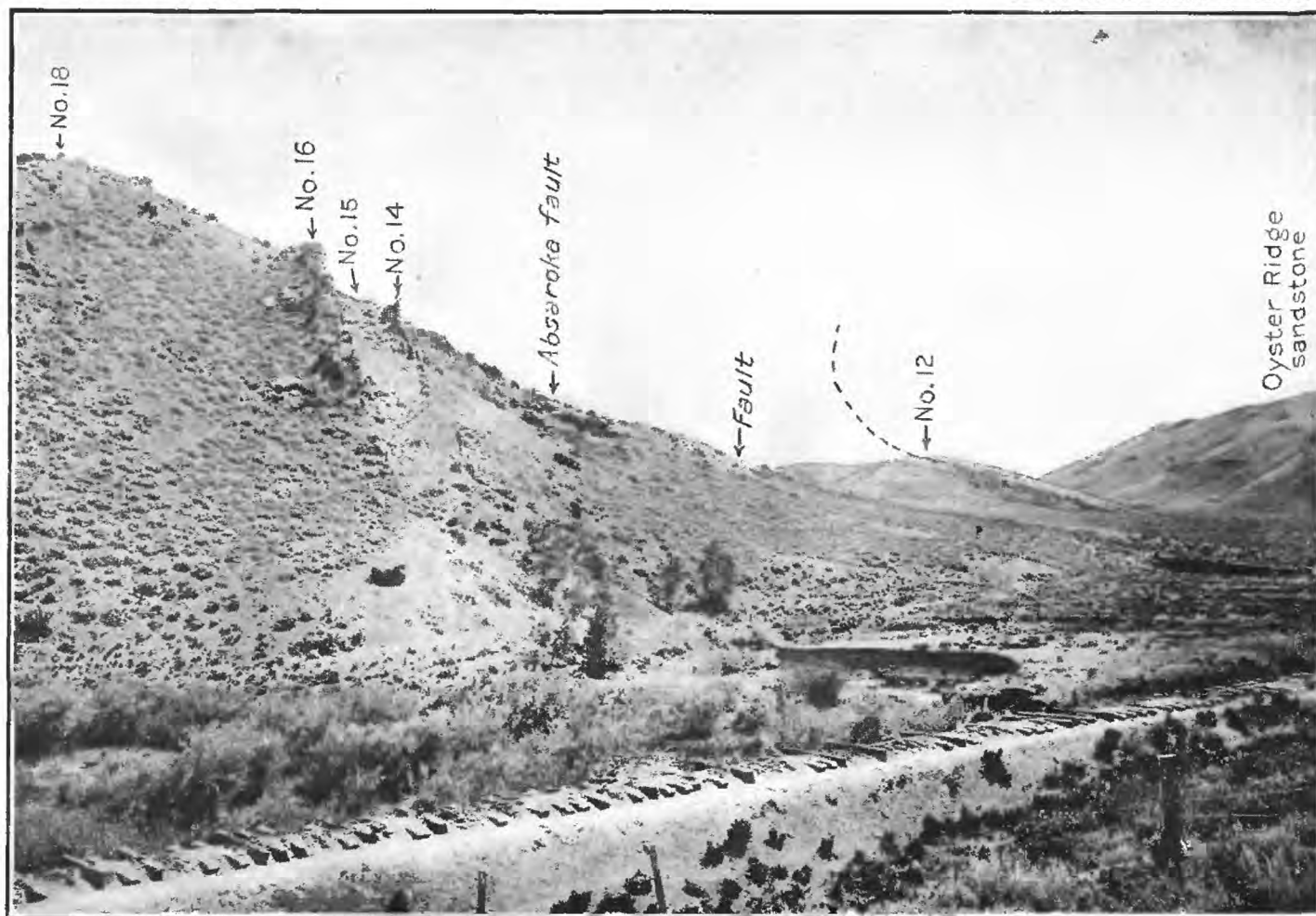
Photograph of specimen in U. S. National Museum from Fossil, Wyo.



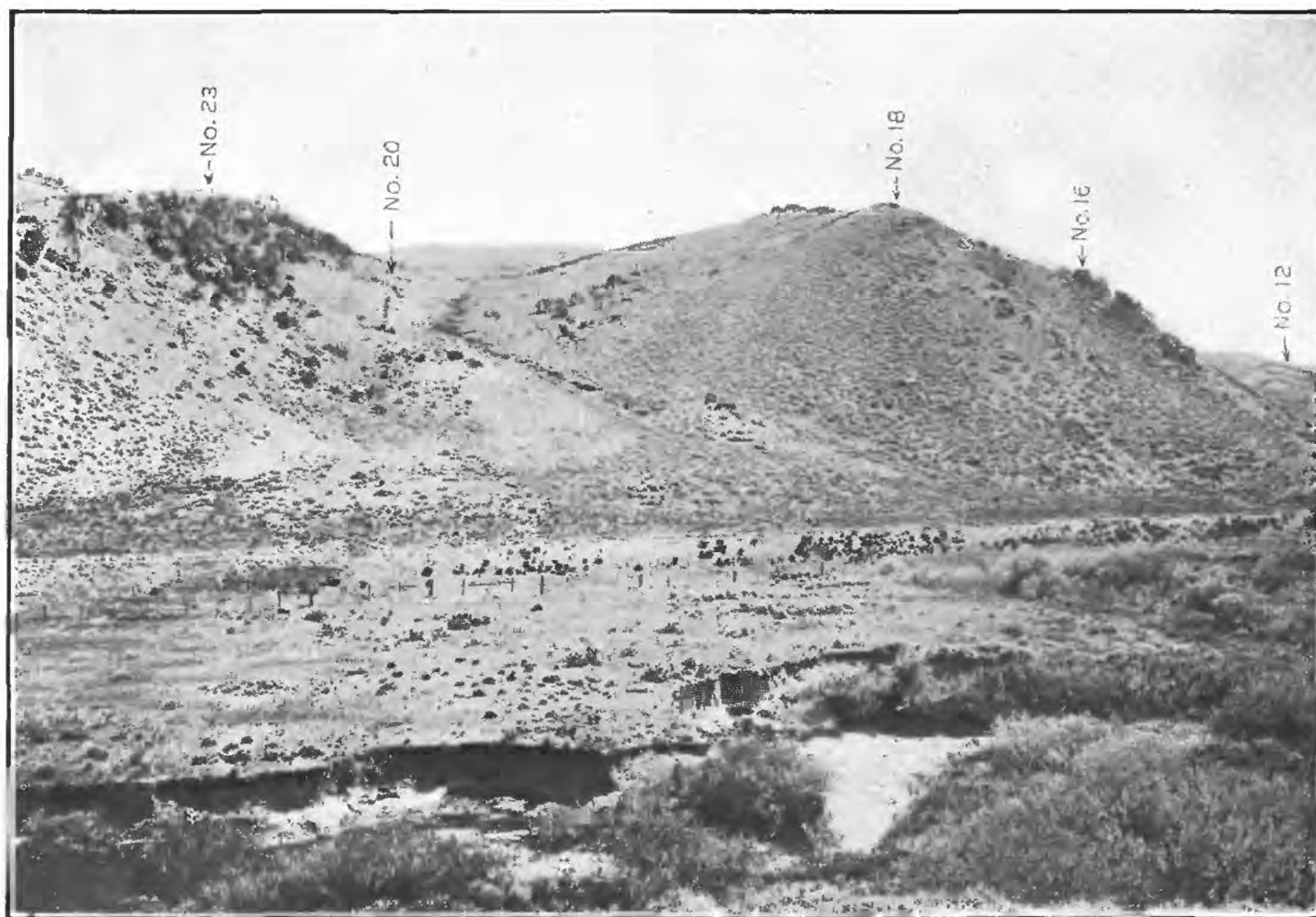
B. DIPLOMYSTUS DENSATUS COPE.

Photograph of specimen in U. S. National Museum from Fossil, Wyo.

FOSSIL FISH FROM GREEN RIVER FORMATION.



A

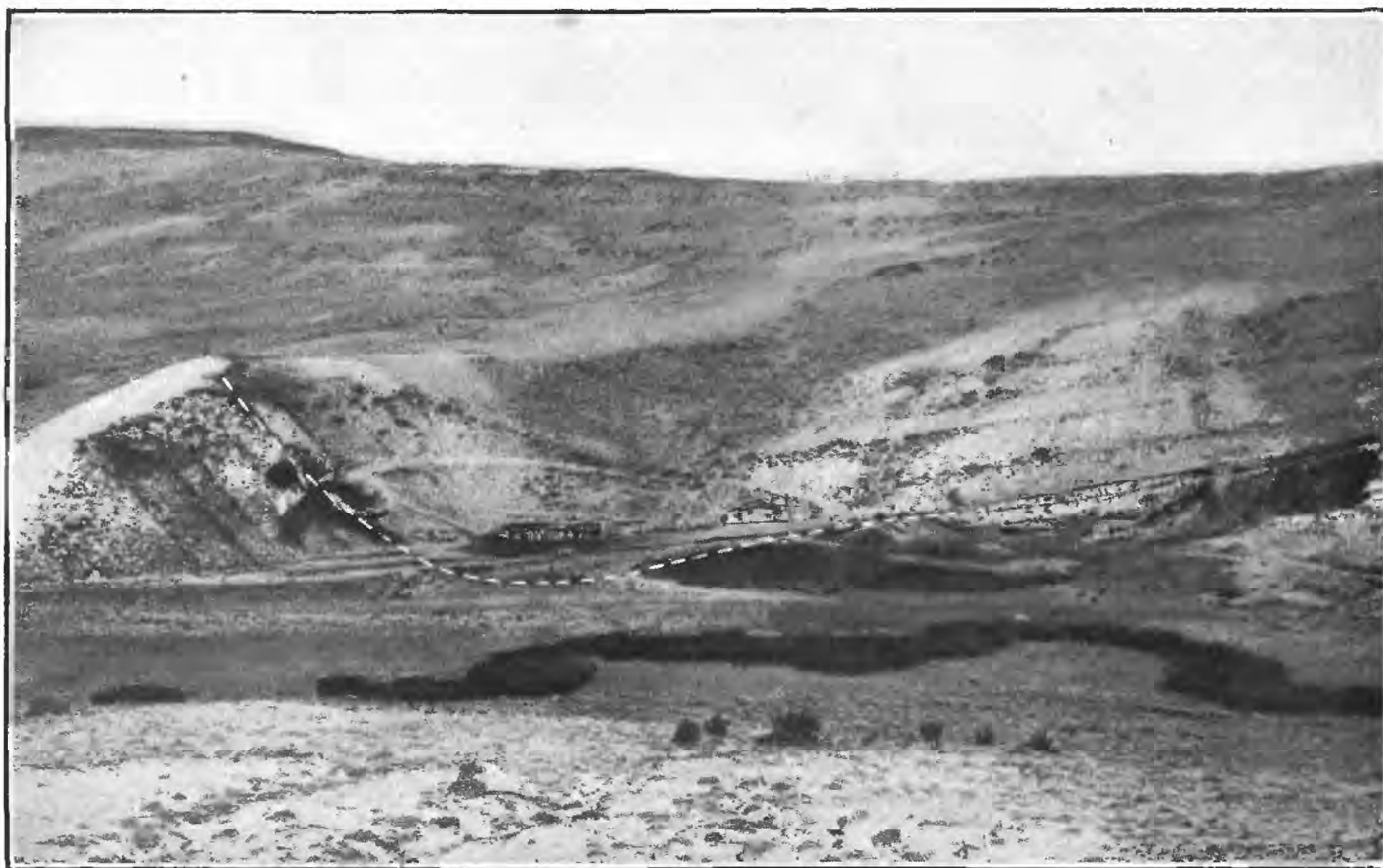


B

VIEWS SHOWING RELATION OF BEDS IN EASTERN PORTION OF MEEK'S SECTION AT OLD BEAR RIVER CITY, WYO.

Compare with fig. 5 (p. 101). The numbers are those used in Meek's original description.

SULPHUR CREEK SECTION.



A. LAZEART SYNCLINE AT LAZEART COAL MINE, SE. $\frac{1}{4}$ SW. $\frac{1}{4}$ SEC. 8, T. 15 N., R. 118 W.

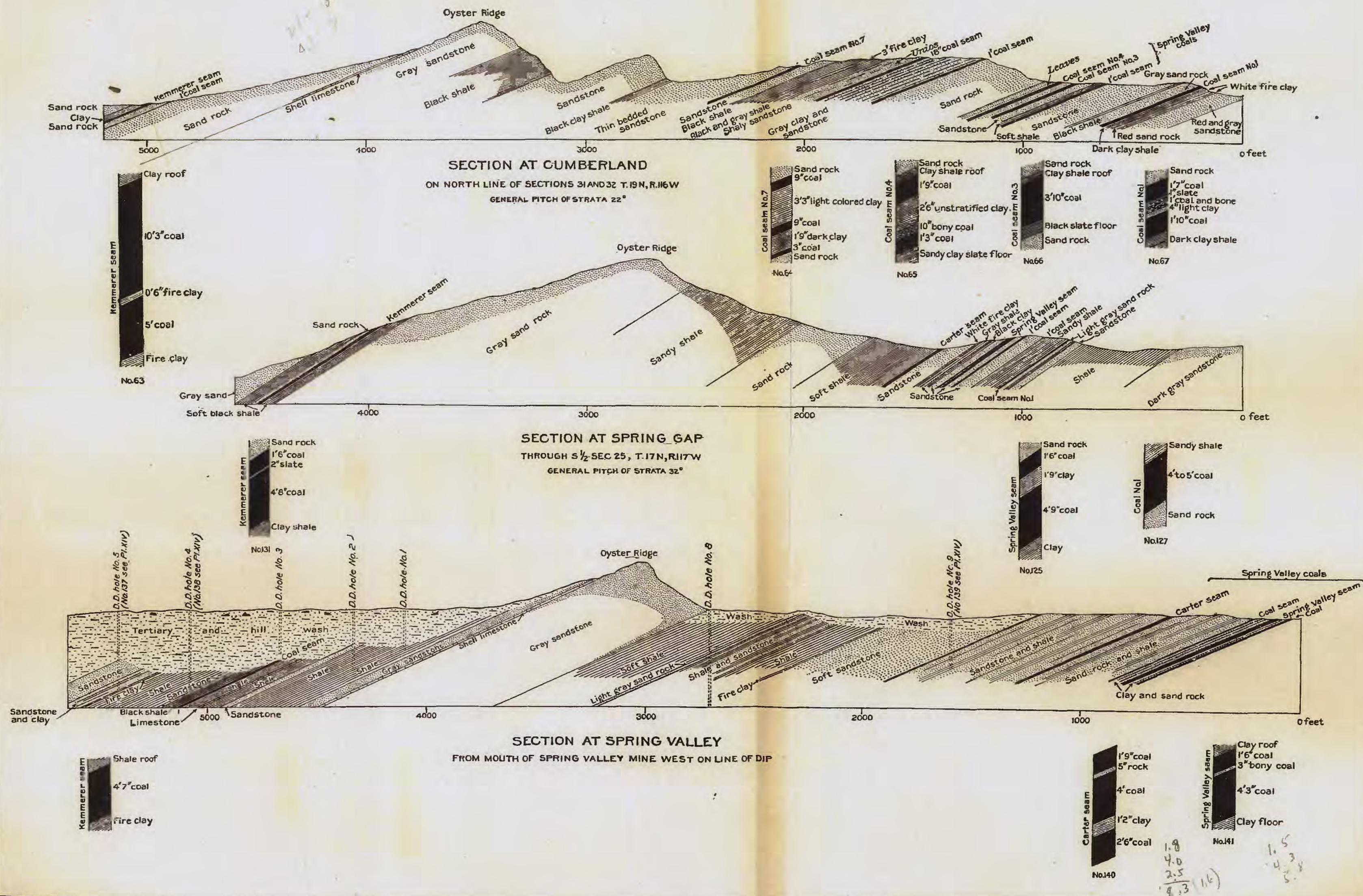
The white sandstone underlies the Adaville coal seam, here 35 feet thick. The beds forming the upper part of the hill are horizontal Knight.



B. SYNCLINE 1 MILE SOUTHWEST OF CARTER OIL SPRING.

Prominent white sandstone is Oyster Ridge sandstone. Vegetation largely sage, with occasional haw bushes, and with exceptional clump of quaking aspen in the head of the hollow in the right foreground.

STRUCTURE.



SECTIONS OF COAL-BEARING FRONTIER FORMATION IN UINTA COUNTY, WYO.

By Union Pacific Coal Company, 1904.

NW CORNER
SEC. 1, T. 25, RANGE 38 E.

Duplex U.S.S. 1739

Brooklyn U.S.S. 1742

New York U.S.S. 49

Chieftain U.S.S. 50

Nevada U.S.S. 1738

Sentinel U.S.S. 60

Golden Gate U.S.S. 61

Blair U.S.S. 66

Befiance U.S.S. 59

Bangor

U.S.S. 1740

Glory U.S.S. 44

Antelope U.S.S. 1736

Poor

Sapphire

Homestake U.S.S. 63

Western Soldier U.S.S. 43

April

Last Chance U.S.S. 42

Summit

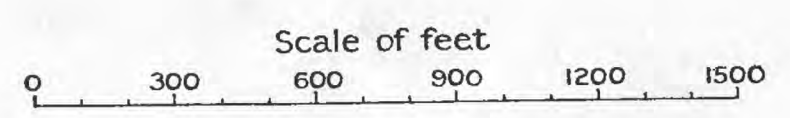
Ophir

Savage

GULCH

HICKEY TUNNEL

CHIATOVICH TUNNEL





1, 1a. *Ostrea soleniscus* Meek, from horizon of sandstone lentil in Hilliard formation north of Hams Fork, southwest corner sec. 33, T. 23 N. R. 116 W.

2. *Inoceramus umbonatus* Meek and Hayden, from 2 miles southwest of Altamont.

FOSSILS FROM HILLIARD FORMATION.

