

# Utah

Sandstone and Dinosaur


大陸砂岩と恐竜



攻撃斜面

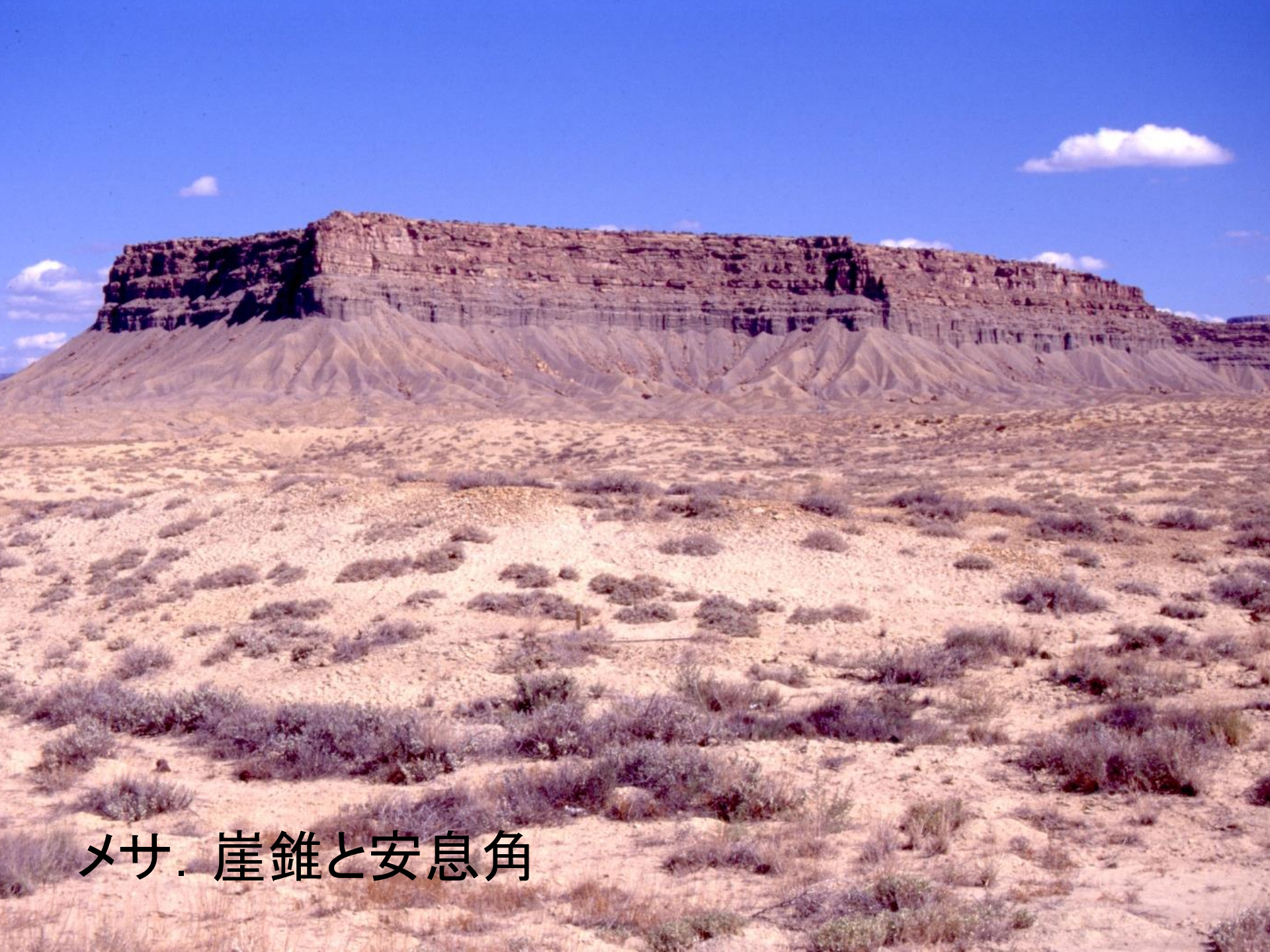
滑走斜面

Deadhorse Point, 著しく蛇行したColorado River



ジョン・ウェインがつくった多数の映画の舞台になった Monument Valleyは、二畳紀の砂岩と泥岩(De Chelly Sandstone)がつくる荒々しい地形である。

堅い地層が浸食に抗して、いくつものテーブル状の高まりを生じている。テーブルの広さが崖の高さをしのぐものをメサ(mesa)、同程度のものをビュート(butte)という。



メサ、崖錐と安息角



Arches, UT Delicate Archは、ジュラ紀の  
Entrada Sandstone がつくる浸食地形である。



インディアンが、むかし、砂漠ニスを削って書いた  
ペトログリフ



Zionには、大規模な斜交層理をなす三畳紀～  
ジュラ紀のNavajo Sandstoneが露出している。(St.  
Georgeの北東60km)

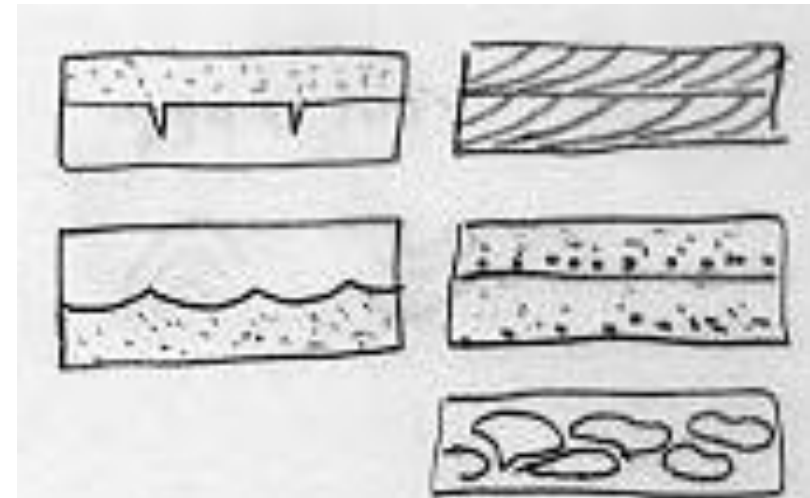



ひと組の斜交層理面は下方で一つの面に収斂するが、上方では上位の収斂面に断ち切られている



# 地層の上下判定法

1. 斜交層理 cross stratification
2. 級化層理 graded bedding
3. リップルマーク ripple marks
4. 乾裂 mud cracks
5. ソールマーク sole mark
6. 枕状溶岩 pillow lava





Bryce Canyonは、始新世の湖成石灰岩  
Claron Formationがつくる**バッドランド**である。  
白・ピンク・赤の色彩が美しい。（Cedar City  
の東90km）

# 海成層と陸成層

- 海の底に堆積した地層を海成層という.
- 陸上に堆積した地層を陸成層という.
- したがって、湖の底に堆積した地層は陸成層という.
- 水底に堆積したことを強調するときは、水成層という言葉をつかう.

## Moab Fault

A dramatic break in the earth's surface occurred here about six million years ago. Under intense pressure, unable to stretch, the crust cracked and shifted. Today, the highway (below) parallels this fracture line, called the Moab Fault.

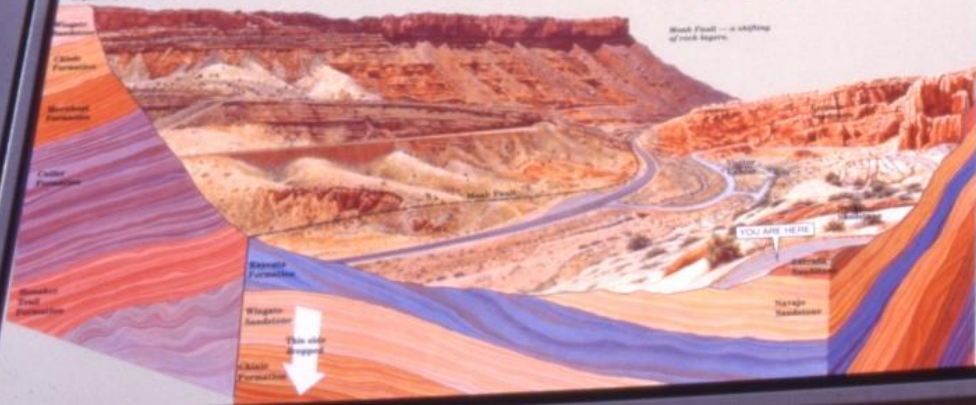
After the rock layers shifted, the east wall of the canyon where you are standing ended up more than 2,600 feet (792 meters) lower than the west side (across the highway).



Individual rock layers no longer line up horizontally on either side of the fault. The rock on the left may make sense to the geologist, but it usually doesn't make sense to the hiker. The fault about 2000 years ago before the fault.

Moab Fault — a shifting of rock layers.

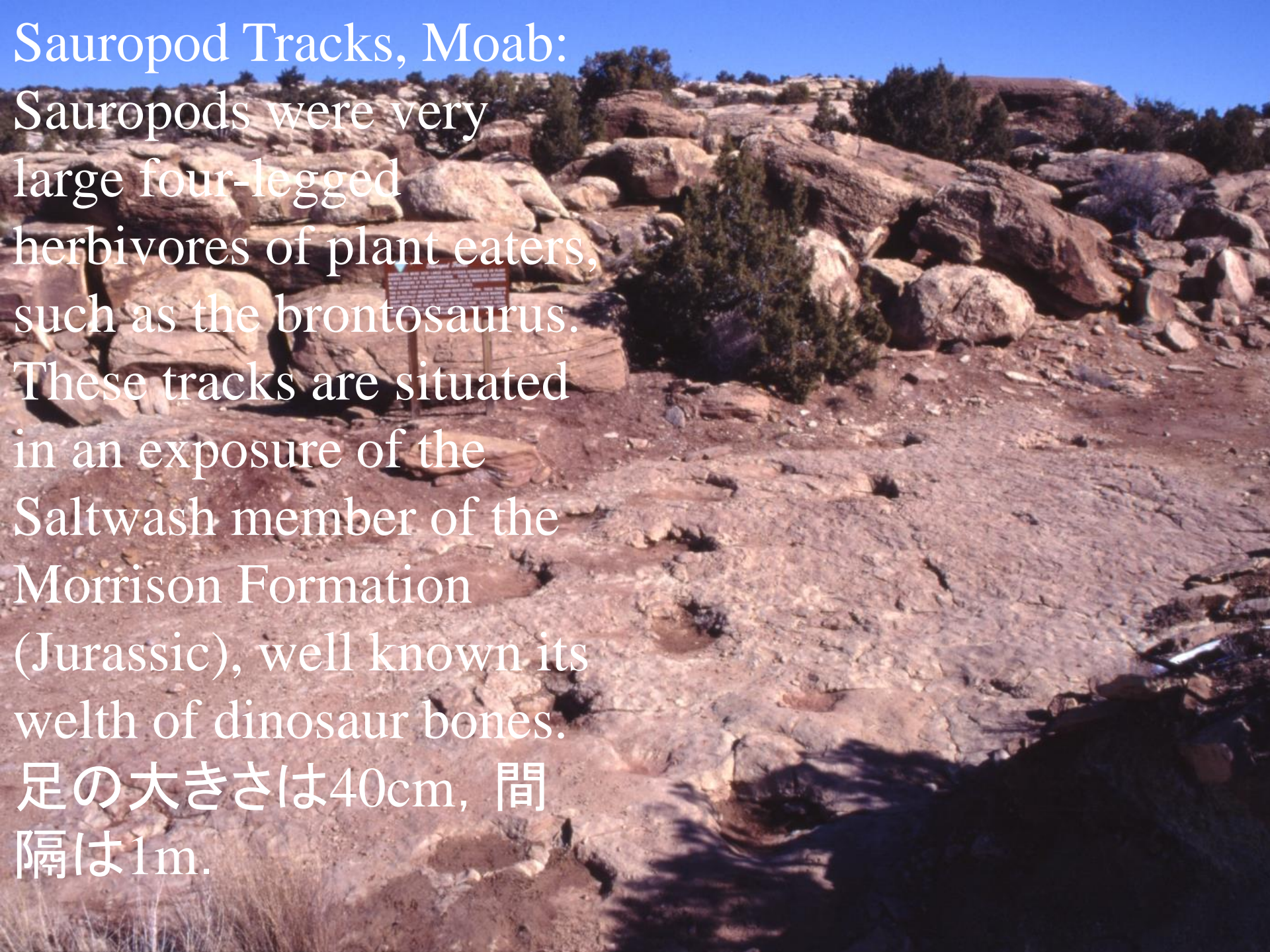
Sequence of Rock Layers



# Sauropod Tracks, Moab:

Sauropods were very large four-legged herbivores of plant eaters, such as the brontosaurus. These tracks are situated in an exposure of the Saltwash member of the Morrison Formation (Jurassic), well known its welth of dinosaur bones.

足の大きさは40cm, 間隔は1m.







Dinosaur National Monument, Vernal, UT



### A TILTED RIVER CHANNEL

The tilted bed of sandstone was once being filled in  
at the bottom of a shallow lake.

The river channel was a flood plain.

At the top, the river channel is a meandering  
stream. Below, the channel is a straight  
river. The sandstone is a flood plain  
deposit.



The rising sea level created this  
meandering stream in this  
channel. Perhaps a short  
time later, the sea level  
rose again, forcing the  
river to flow straight  
and cutting down the channel  
below. Some partial channels  
remained in this area. The  
bones were completely buried.

Millions of years later, the  
bones were exposed by







Upheaval Dome, salt dome or meteorite impact?