

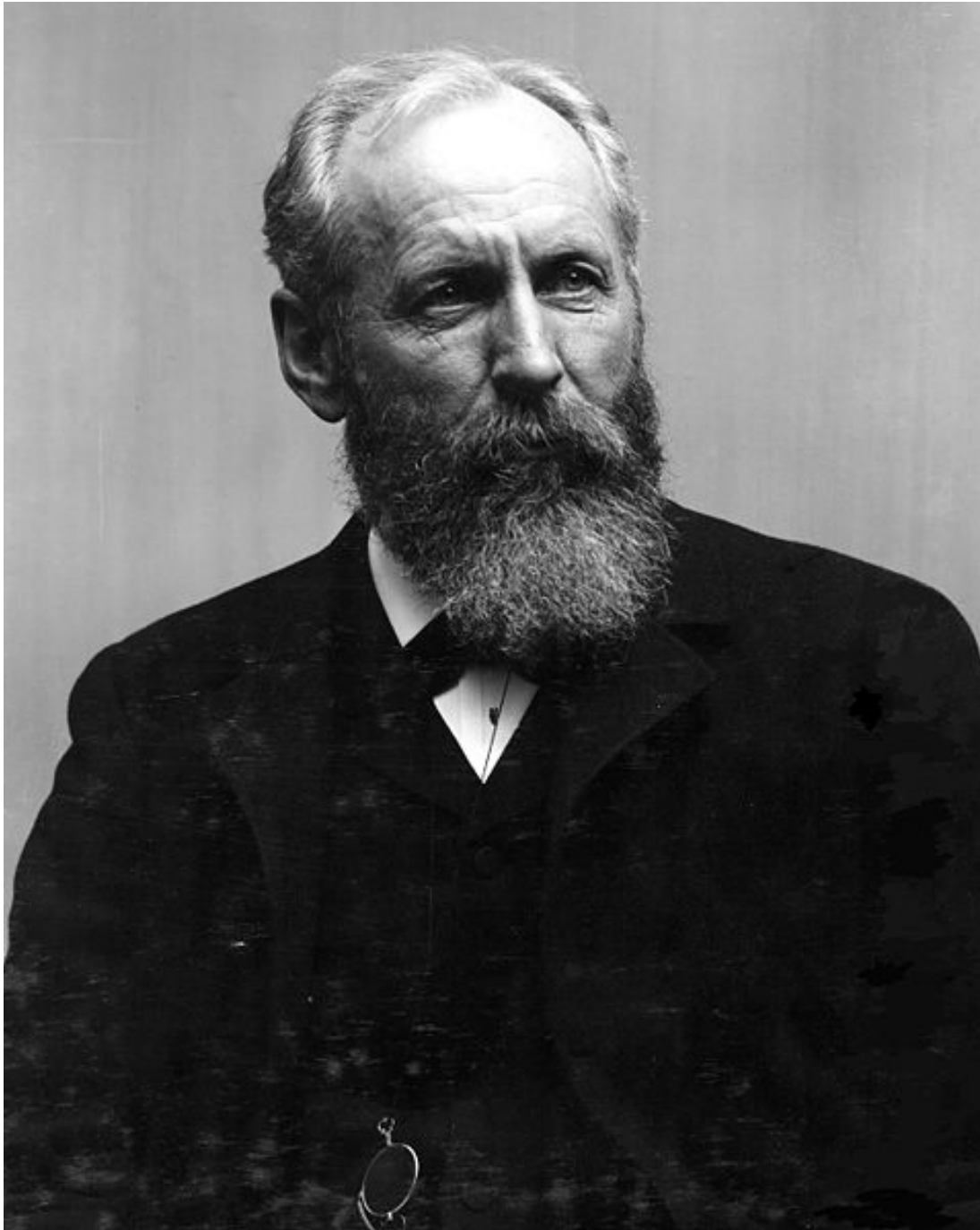
# The importance of field work, with an example from G.K. Gilbert's experience in the Bonneville basin

C.G. Jack Oviatt

Kansas State University



- G.K. Gilbert
- field observations and interpretations



Gilbert in the field

Gilbert's  
scientific honesty



# Gilbert's travels in the Bonneville basin



part of Gilbert's  
route in 1879

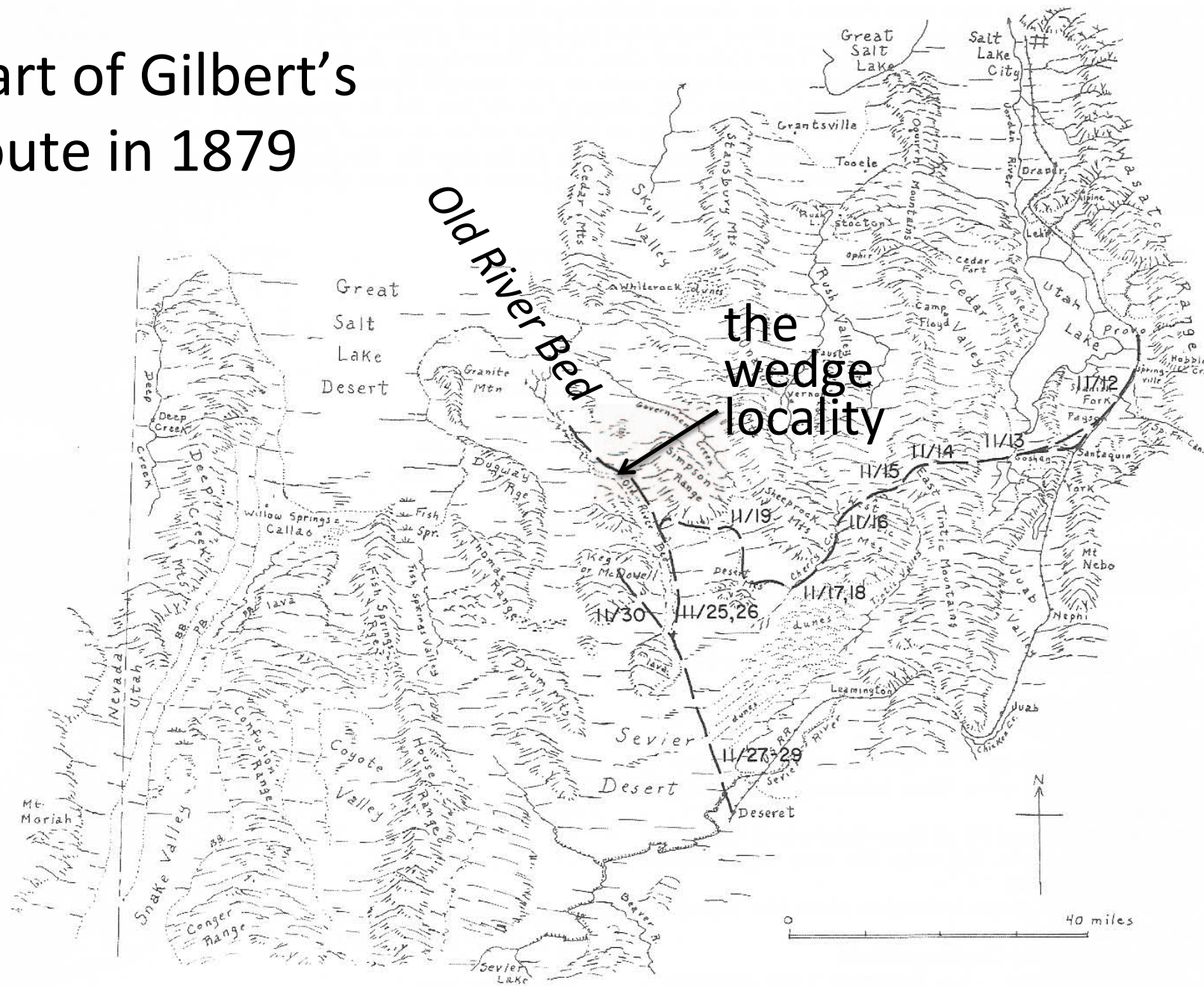
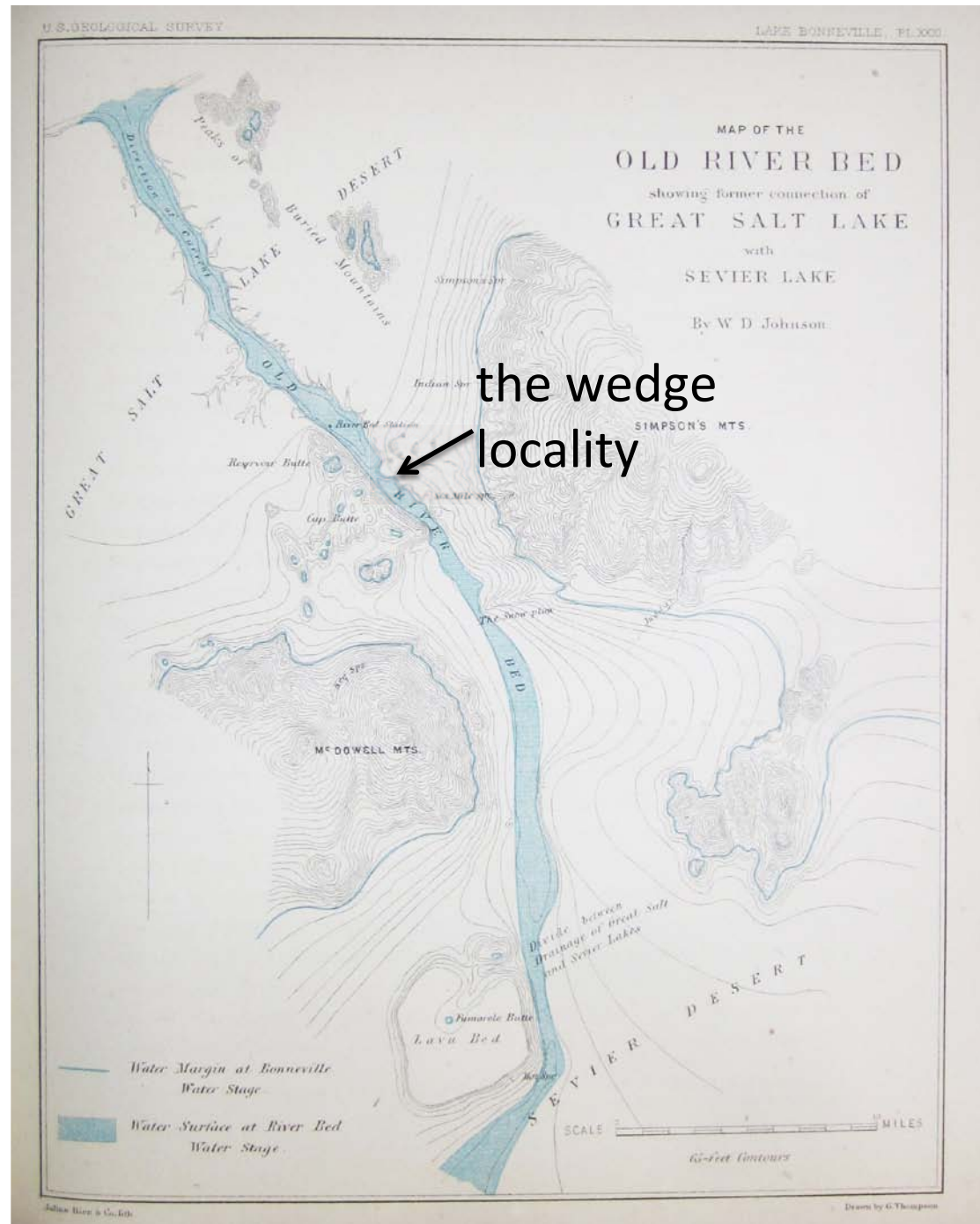
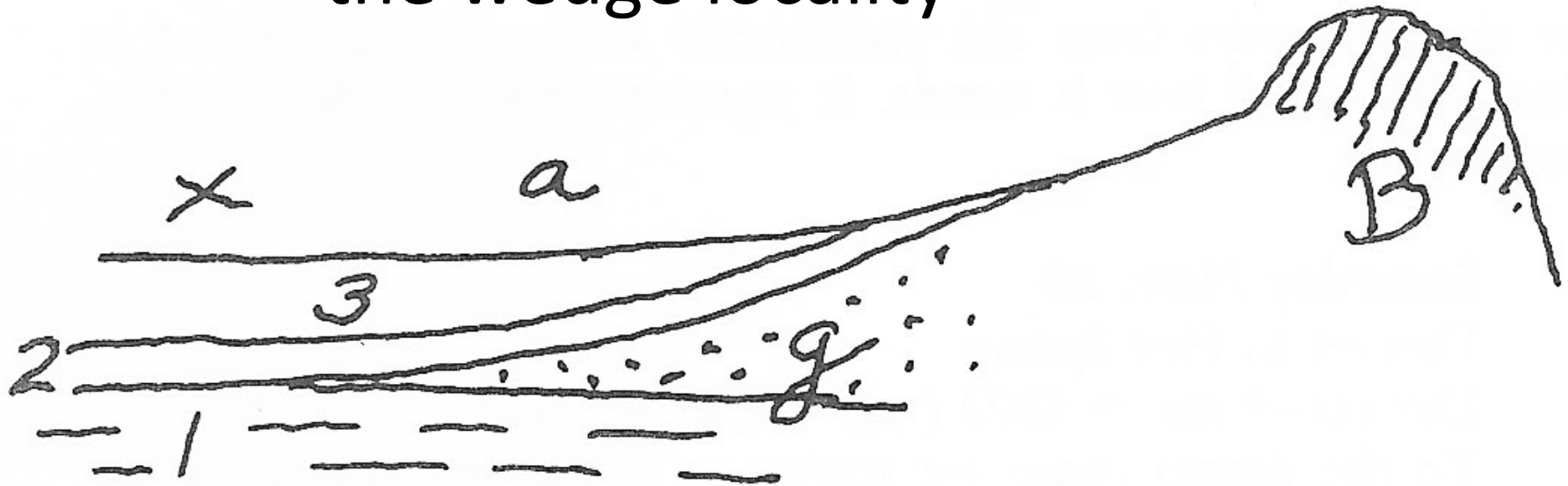


FIGURE 11A.—Landform map showing Gilbert's routes Nov. 1 to 30, 1879.



Gilbert, 1890, Lake Bonneville, USGS Monograph 1

# Gilbert's field drawing of the wedge locality



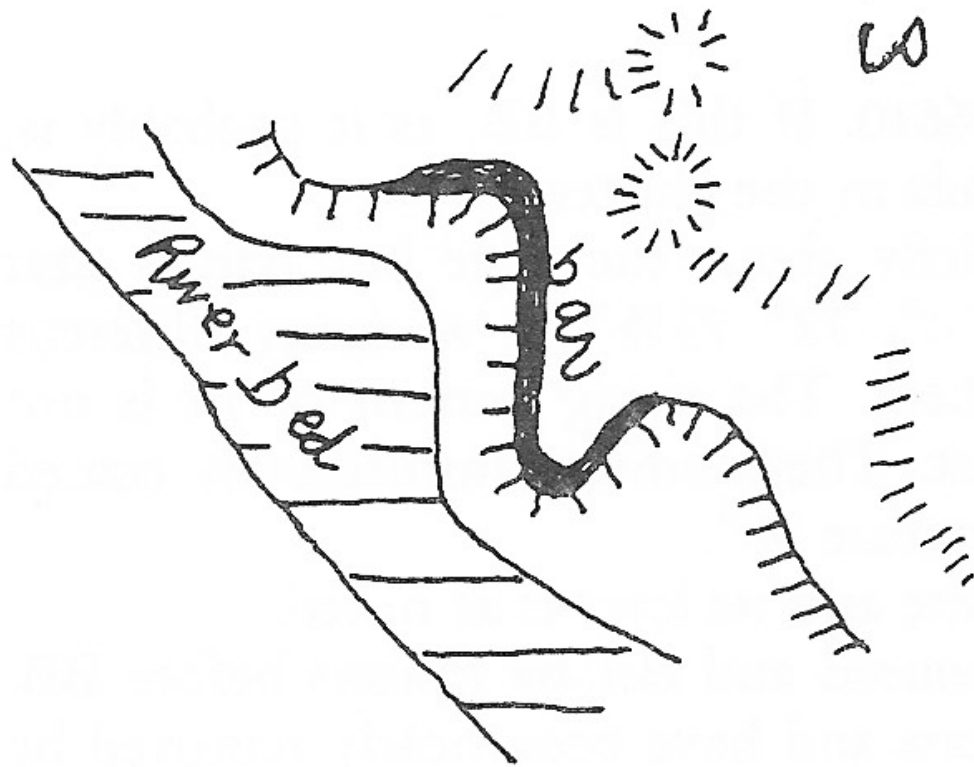
- 3 sand
- 2 white clay [white marl]
- g gravel wedge
- 1 yellow clay
- B volcanic rock

Gilbert's sketch map of  
the wedge locality

Map

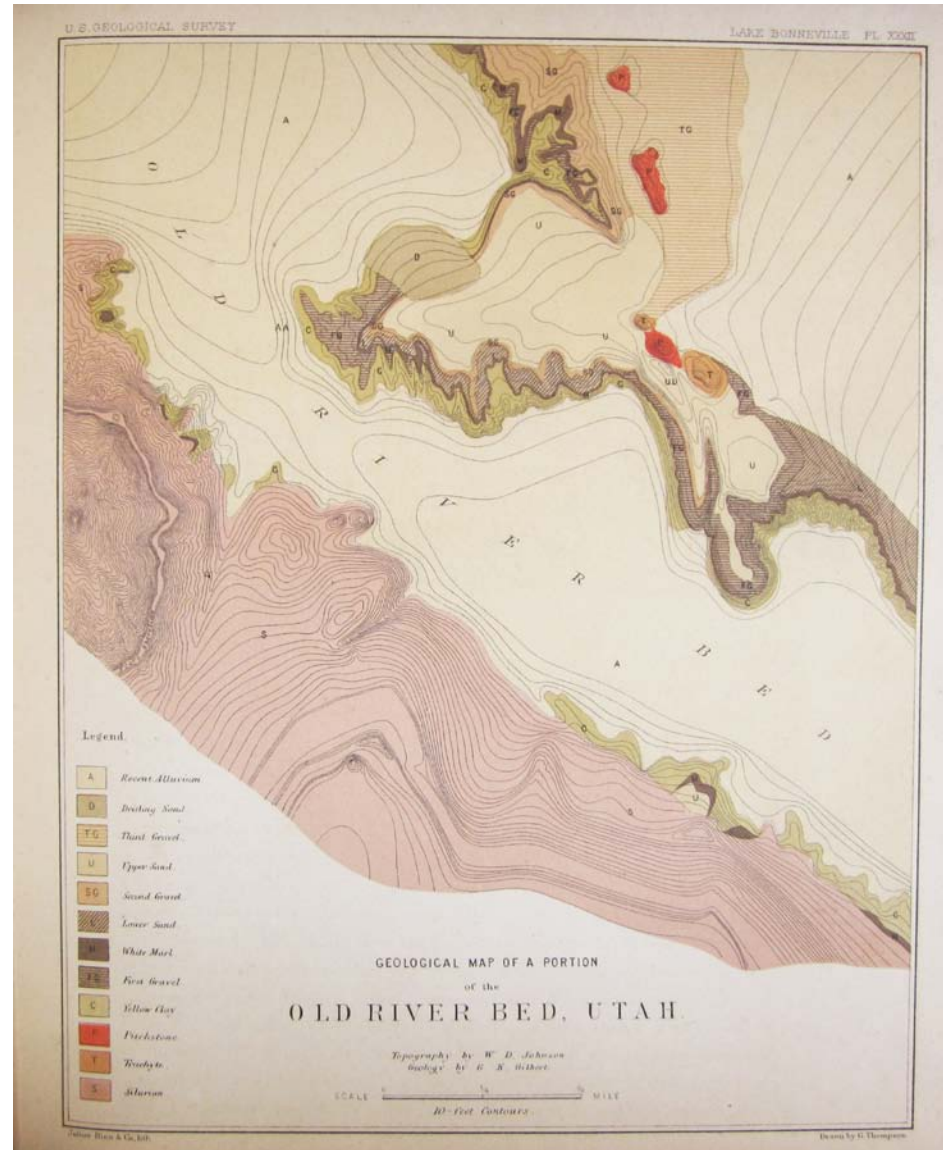
The black band

is gravel

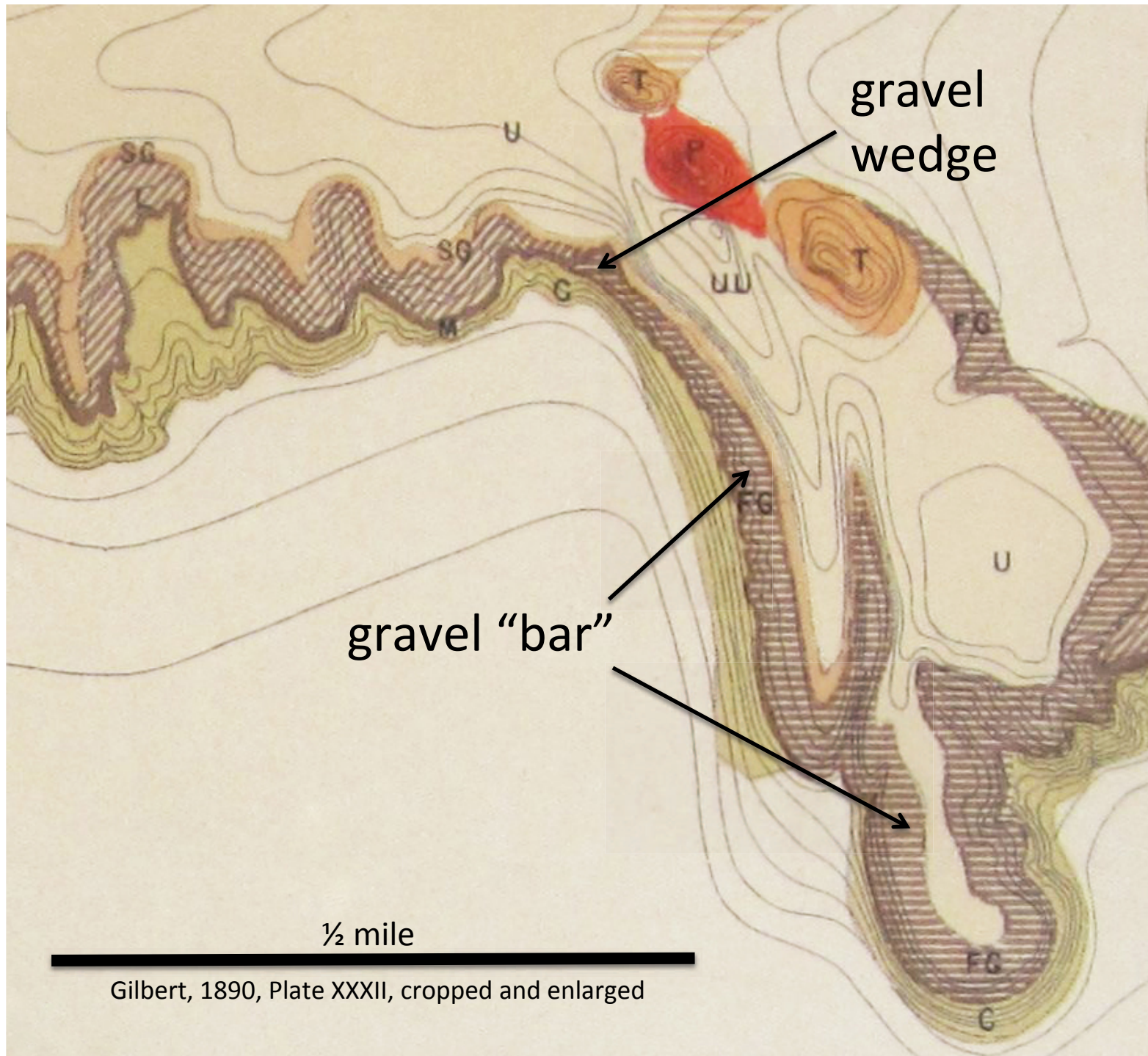




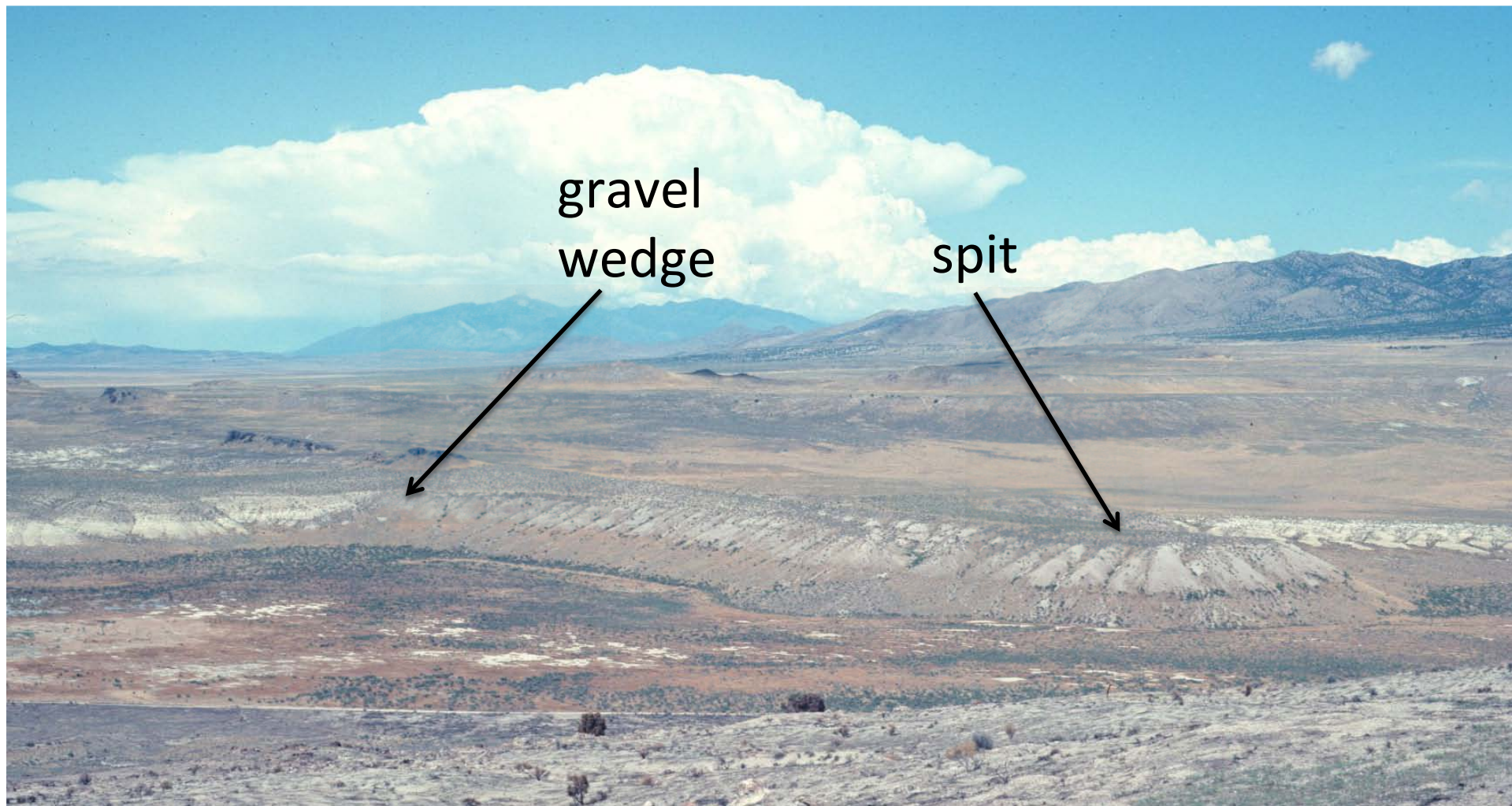
# Gilbert's plane-table and alidade map of the wedge locality



Gilbert, 1890, Lake Bonneville, USGS Monograph 1





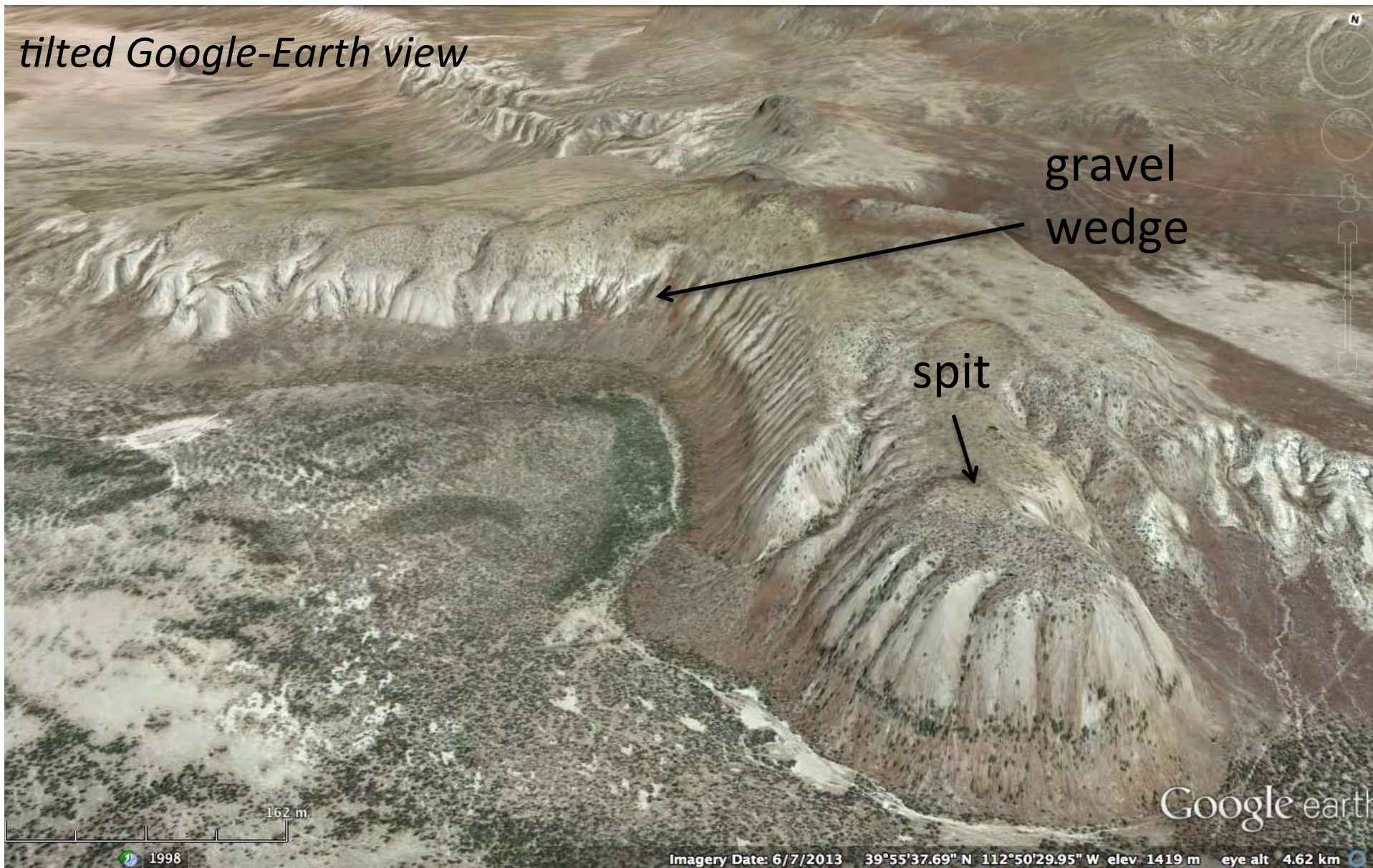




*tilted Google-Earth view*

gravel  
wedge

spit





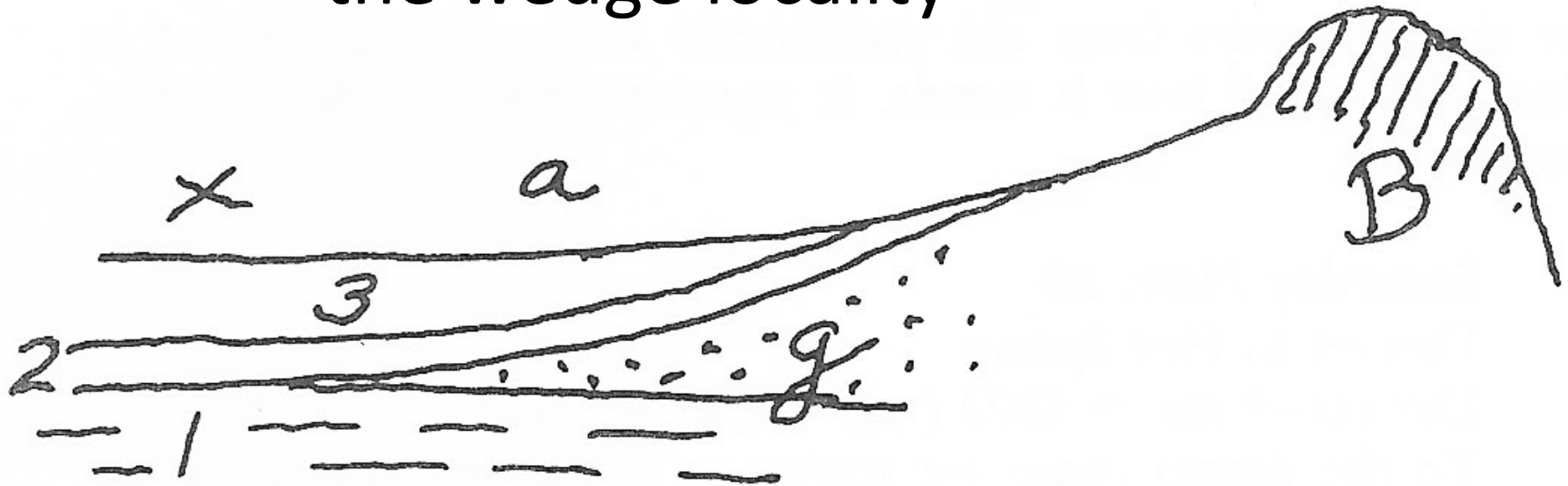
*from Gilbert's 1879 field notes:*

“The wedge of gravel is 45 ft thick where it disappears under the bluff. The white [clay or marl] has risen to the hill top.”

“The bar is cemented on top and at some places on its edges bears a great deal of tufa.”

Gilbert was convinced the yellow clay  
was deposited in a deep lake  
– a lake that was almost as deep as the  
white-marl (white-clay) lake.

# Gilbert's field drawing of the wedge locality



- 3 sand
- 2 white clay [white marl]
- g gravel wedge
- 1 yellow clay
- B volcanic rock

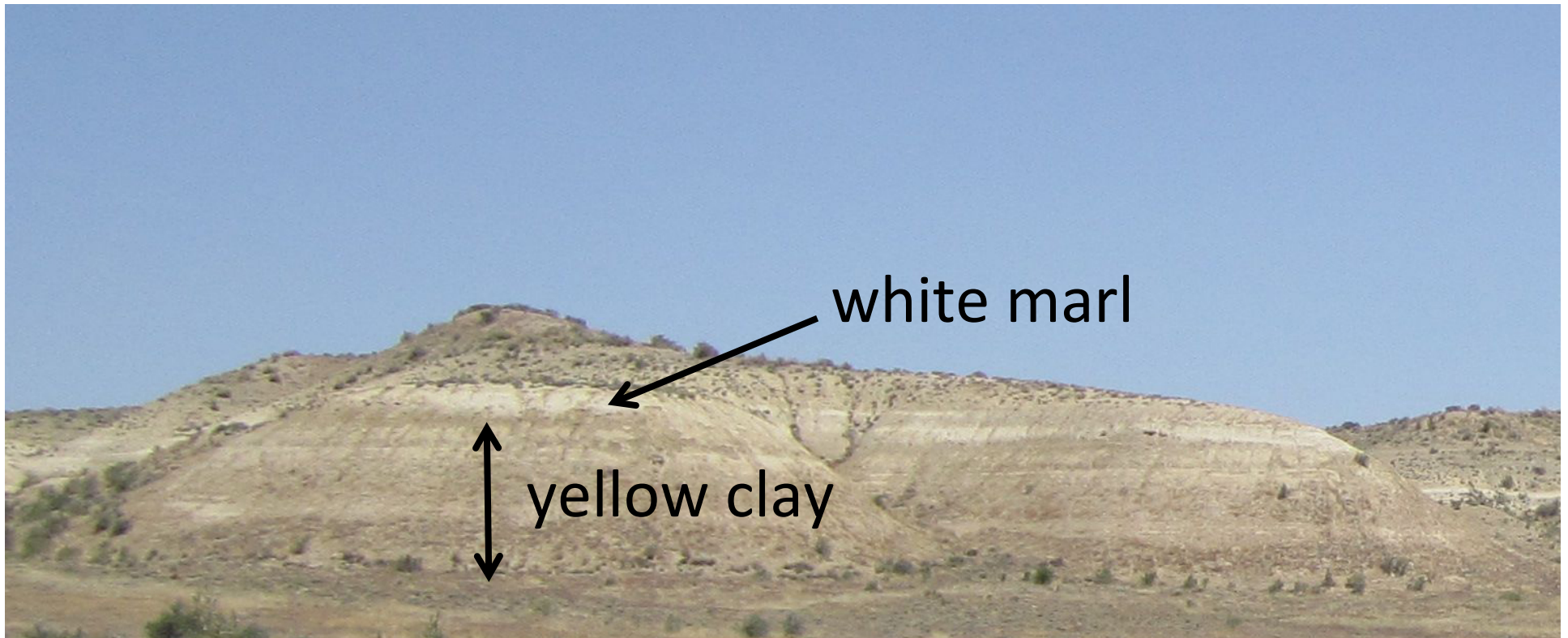
*from Gilbert's 1879 field notes:*

“It appears then that the water fell between the Yellow clay epoch and White clay epoch . . . It stood at this level long enough to form the bar.”



*from Gilbert's 1879 field notes:*

“This divides the Bonneville epoch into two parts, separated by a period of less flood.”



from *Gilbert's 1879 field notes*:

“The coincidence [that is, that the yellow clay is much thicker than the white marl] correlates the later epoch with the Reindeer epoch.”

what's the Reindeer epoch?

from: *MacLean, A Manual of the Antiquity of Man, 1878*

VII Iron Epoch

VI Bronze Epoch

V Neolithic Epoch

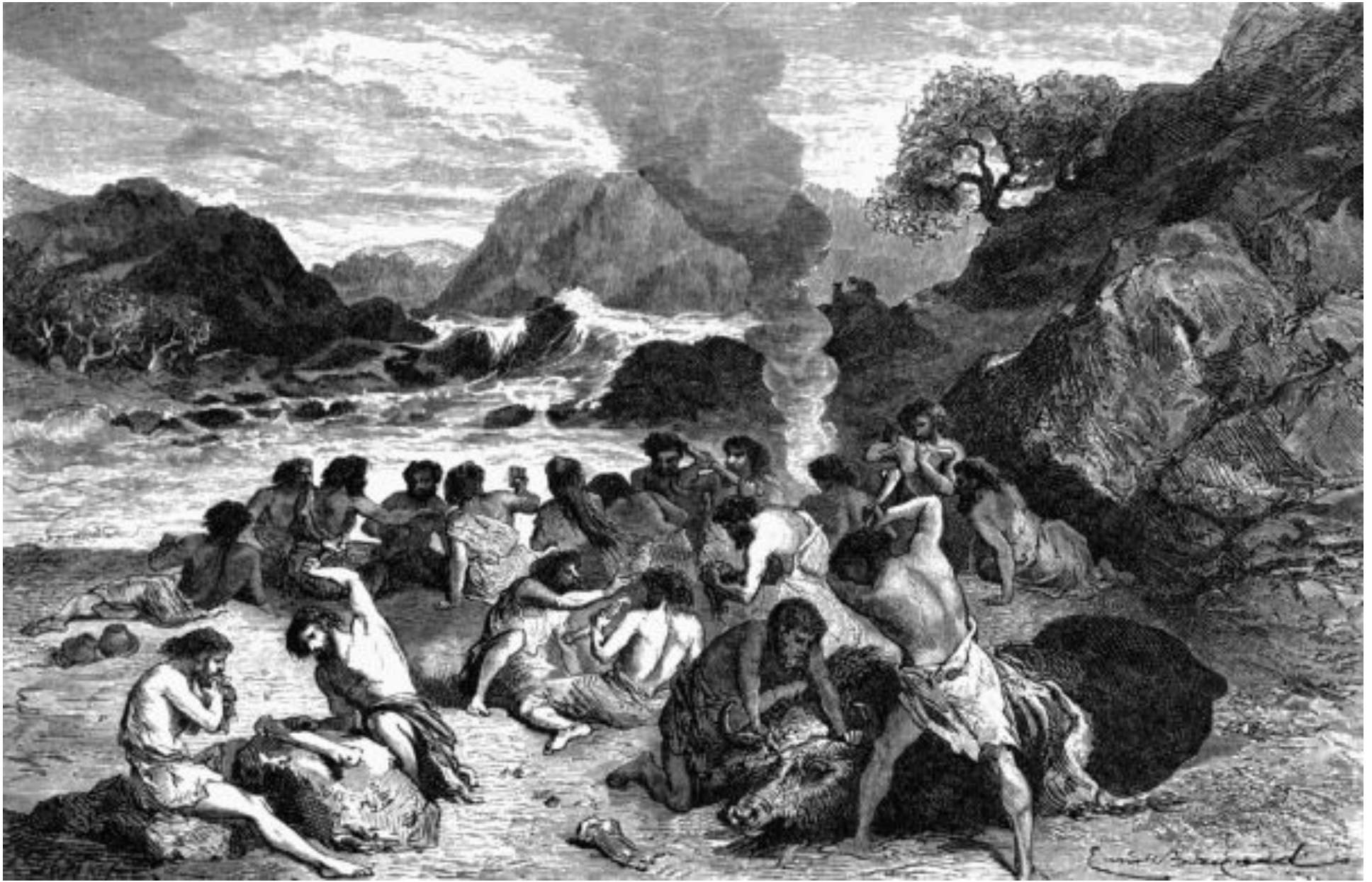
IV Reindeer Epoch – “when the glaciers again advanced”

III Interglacial Epoch – “that period between the glacial and the second advance of the ice”

II Glacial Epoch – “man was forced to contend with the great ice-fields”

I Pre-glacial Epoch – “antedating the glaciers of the post-tertiary”





A Feast during the Reindeer Epoch. Fig. 41, Louis Figuier, 1870, Primitive Man

**Gilbert's likely, but not  
explicitly stated, correlation of  
the “ages of man” with Lake  
Bonneville stratigraphy**

Reindeer Epoch            white marl

Interglacial Epoch            wedge gravel

Glacial Epoch            yellow clay

the contrast between field observations  
and published interpretations

*from Gilbert's 1890 monograph:*

“The form of the one [the gravel mass in the bar] . . . , the associated tufa, and the preponderance of boulders of local derivation, indicate shore action, **but is possible that an interlacustrine river was the agent of transportation.**”

# Gilbert's interpretations

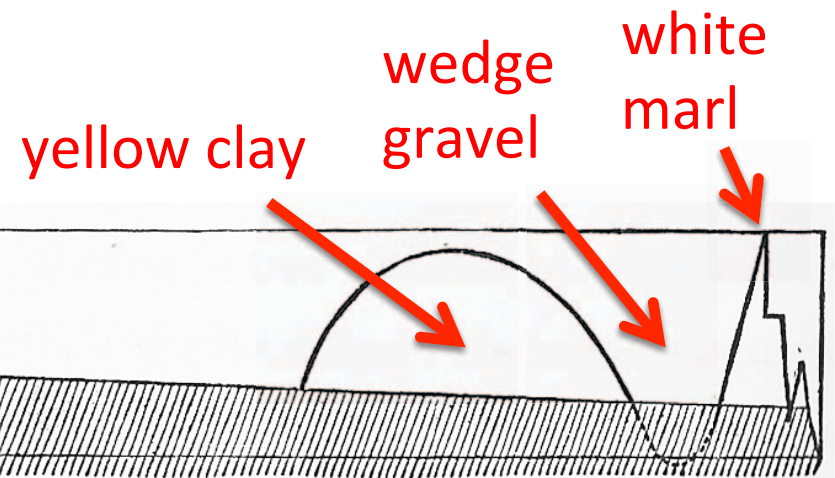
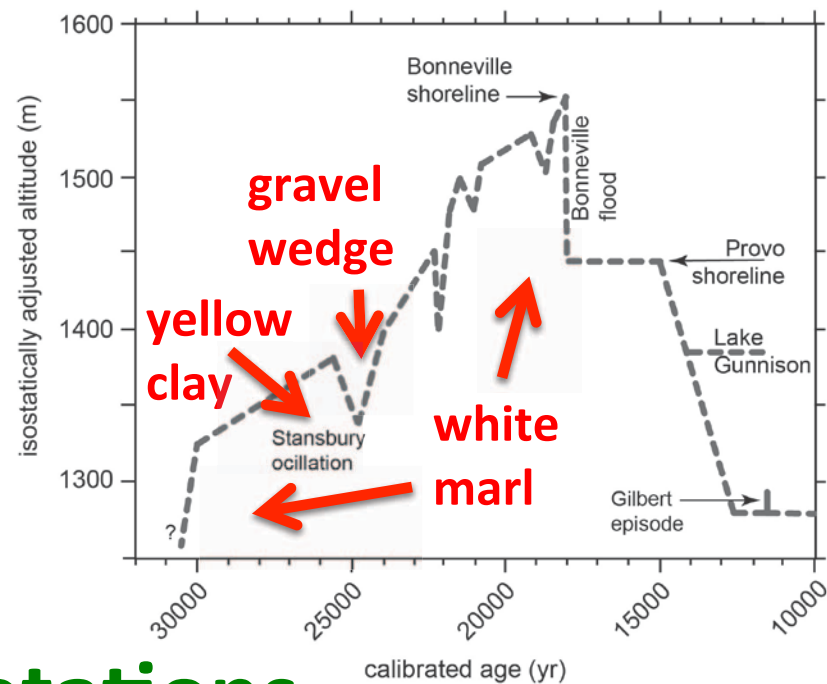


FIG. 34.—Rise and Fall of water in the Bonneville Basin.



# 2013 interpretations

Gilbert's field observations were better than his published interpretations.





don't let interpretations override  
solid field observations

photo by Holly Godsey