

Dept of Earth Sciences and Petroleum  
College of Science  
Salahaddin University – Erbil



Module: Subsurface (Lab.)  
4<sup>th</sup> Year Students  
Second Semester (2022 – 2023)

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Week 5

## Burial History Curve

# Outline

- How to construct a burial history curve

# Learning Outcome

By the end of this lab students will learn about

- Constructing a Burial history curve for a formation(s)

What is burial history?

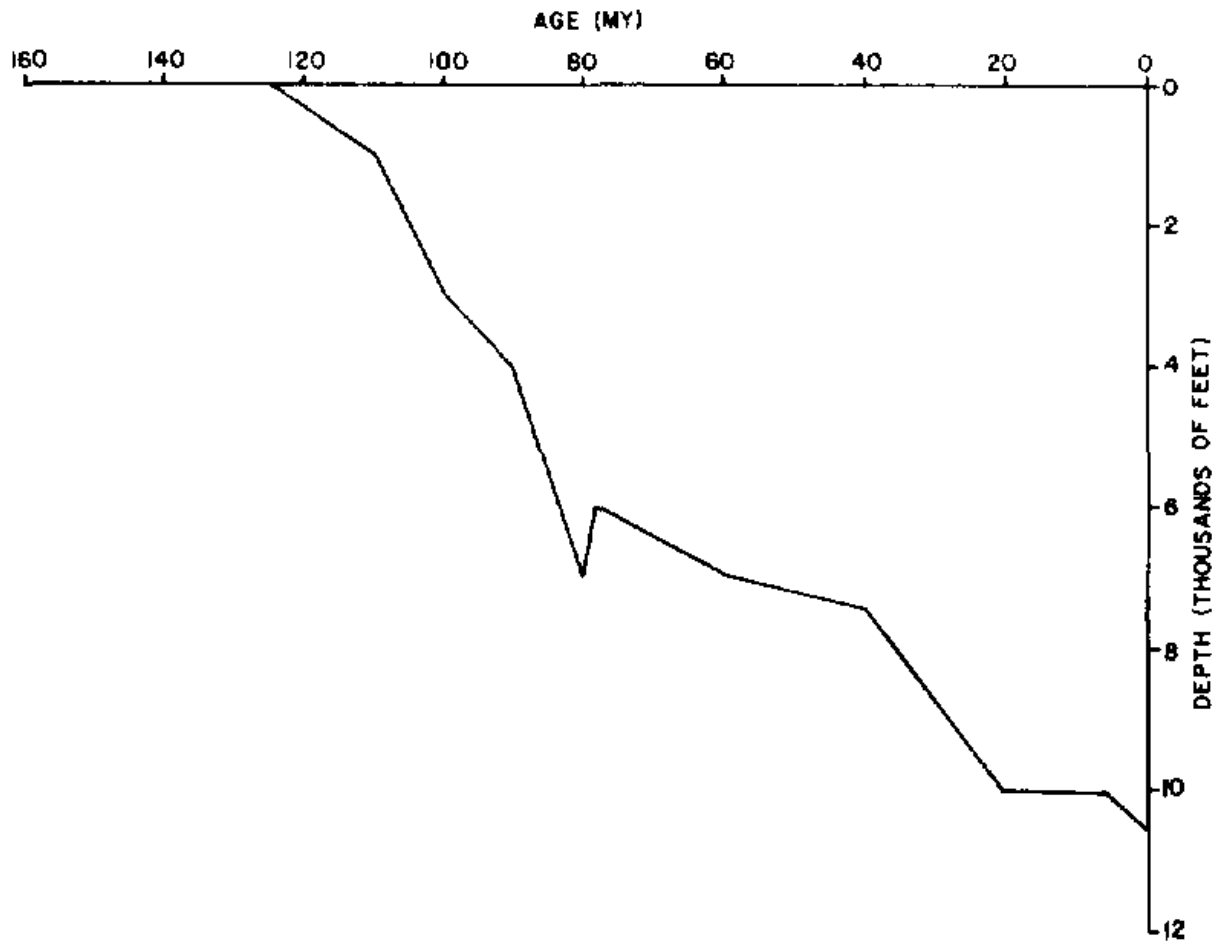
Burial histories are normally reconstructed at one (or more) discrete locations, and diagrams are plotted that show the depth of any significant rock unit as a function of time.

What is usually available is information on geologic age and depth of burial. Clearly, geologic age provides time.

To construct a burial history information is required about:

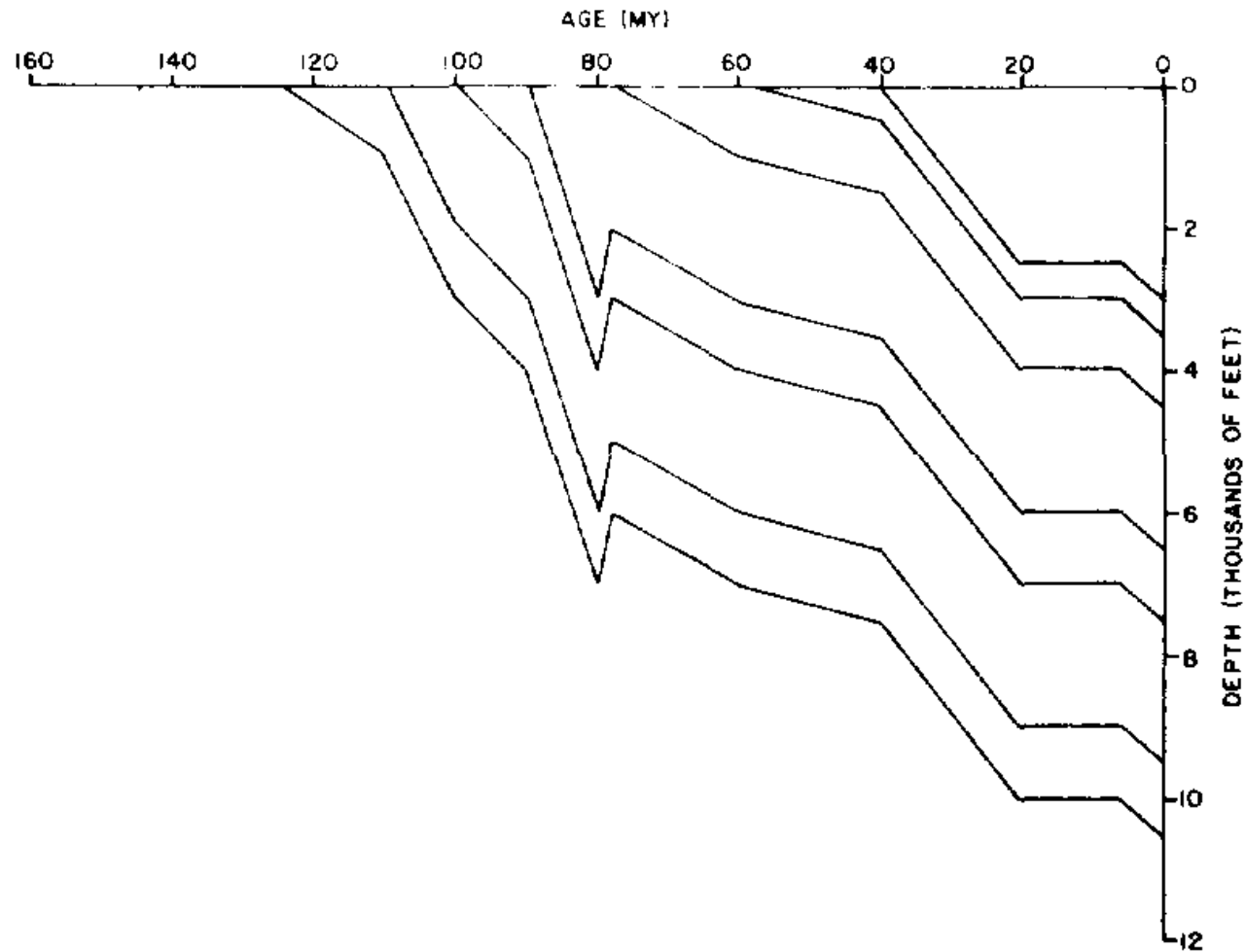
- age of deposition and thickness of stratigraphic units;
- age and duration of periods of nondeposition or erosion; and
- thickness of the eroded intervals.





Depositional and tectonic history of a Lower Cretaceous sediment.

a Lower Cretaceous sediment was deposited 125 m.y. B.P. at the sedimentary surface (depth = 0). Since its deposition the sediment has had the time-depth history as shown by the solid line in the figure, moving from left to right. Its history consisted of continual deposition at varying rates until 80 m.y. B.P., at which time a brief (2 m.y.) uplift occurred in which the sediment was raised from a depth of 7,000 ft to 6,000 ft. Uplift was followed by renewed subsidence until a depositional hiatus was reached at 20 m.y. B.P. The hiatus persisted until 6 m.y. B.P., when subsidence commenced again. The sediment is at present (time = 0 m.y. B.P.) at a depth of 10,500 ft.



As illustrated, any shallower strata will have depth-time lines subparallel with the first line, commencing with their deposition.

Depositional and tectonic history of several sedimentary horizons.

The time-depth history line reflects:

- deposition rate (either high or low deposition rate),
- uplift and erosion, and
- nondeposition or hiatus.

Exercise 1: From the following data, construct the burial history for Formation 'A'.

<u>Formation</u>	<u>Bottom Depth (m)</u>	<u>Age (M.Y.)</u>
I	592	2
H	619	2.4
G	692	3.4
F	802	4.5
E	834	5.5
D	927	16.2
C	1093	22
B	1434	49
A	2043	65

*Remember 65 M.Y. ago Formation 'A' started to deposit.*

## Complete burial history for Formation 'A'

<u>Events</u>	<u>Time (M.Y.)</u>	<u>Bottom Depth (m)</u>
Present-day	0	2043
I	2	1451
H	2.4	1424
G	3.4	1351
F	4.5	1241
E	5.5	1209
D	16.2	1116
C	22	950
B	49	609
A	65	0

Exercise 2:

From the data given in exercise 1, construct the burial history for **all the Formations**.

## References:

- Barker, C., (Editor), 1996, Thermal Modeling of Petroleum Generation: Theory and Application. Developments in Petroleum Science, v.45, 512 p.
- Roberts, L. N. R., Debra K. Higley, D. K., and Mitchell E. Henry, M. E., 2005, Input Data Used to Generate One-dimensional Burial History Models, Central Alberta, Canada. Open-File Report 2005-1412, U.S. Geological Survey, 11 p.
- Waples, D. W., 1980, Time and Temperature in Petroleum Formation: Application of Lopatin's Method to Petroleum Exploration. The American Association of Petroleum Geologists Bulletin, v. 64, No. 6, p. 916-926.