

University of Anbar

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4th Stage

Quaternary

Lecture 1: Quaternary– General View

Quaternary

Quaternary : is the most recent geological period of time in Earth's history, spanning the last two million years and extending up to the present day.

The Quaternary period is subdivided into the Pleistocene (“Ice Age”) and the Holocene (present warm interval) epochs, it covering the past 10 000 years, The Quaternary period characterized by a series of large - scale environmental changes that have extremely affected and shaped both landscapes and life on Earth.

Revised to 2.6 m.y.

Era	Period	Epoch		
Cenozoic	Quaternary	Holocene		
		Pleistocene	2 m.y.	
	Neogene	Pliocene	5 m.y.	
		Miocene	24 m.y.	
	Tertiary	Oligocene		37 m.y.
				58 m.y.
		Paleogene	Eocene	58 m.y.
			Paleocene	66 m.y.

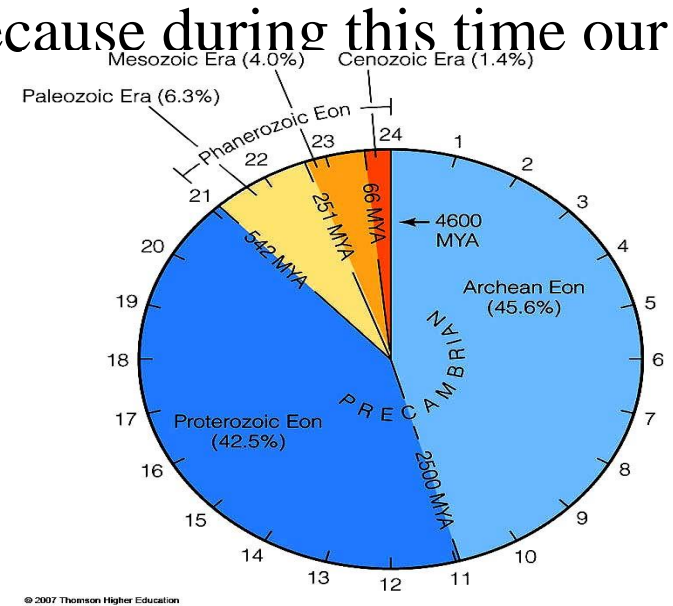
EXTINCTIONS AND GEOLOGICAL TIME

Explanation of names

Fourth Period	QUATERNARY	PERIOD
Third Period	TERTIARY	
Chalk Deposits	CRETACEOUS	SECONDARY
Jura Mountains	JURASSIC	
Three fold division	TRIASSIC	
Perm	PERMIAN	
Coal beds	CARBONIFEROUS	
Devon, UK	DEVONIAN	PRIMARY
Celtic tribe	SILURIAN	
Celtic tribe	ORDOVICIAN	
Roman name Wales	CAMBRIAN	

If all our geologic time represented by a 24-hour clock, the Pleistocene is only 38 seconds long :

- but they are very important seconds, because during this time our species evolved *Homo sapiens*



The difficulties in studying Quaternary are , the complex Interpretations for relations and actions that happened before the Quaternary period , because the Quaternary features covered most of that old features .

The importance of studying Quaternary

- 1- Modern landscapes, both physical and biotic (at the polar and northern latitudes), have been strongly effected by Quaternary glaciations and associated environmental changes
- 2 - Relation studying : Resource management (e.g. groundwater, peat extraction, mining, soil, Environmental management) may be more useful by an understanding of glaciology, Quaternary geology, and Quaternary paleo climates .
- 3 - The Quaternary is the period of Humans
- 4- The recent past may hold the key to the near future : some Questions can be asked depending on what happened in past to give us the actions may happen in future because natural variation can be analysis of climatic and environmental records for the late Quaternary;

And can give some answers about these important questions :

A- Is the current increase in global temperature a temporally ?

B- Will global warming shut down oceanic circulation, and initiate a new Ice Age ?

C- can the Previous “super interglacials” may be good indicators for current ‘global warming.

Quaternary Studying History :

Hotton 1795 : studied The Erratic bodies of Glaciers .

Vaiant 1815 – 1821 : make some maps to the Glaciers at Alps .

Desnoyers: 1829 : First one give the name of Quaternary . To sediments above Tertiary sediments at Paris Basin .

Agussiz 1837 : First Pioneer at Quaternary science .

Lyell 1839 : Give the name of Pleistocene – most recent) when he discovered some new fossils

Forbes 1846 : He said (the Pleistocene = Glaciations) and after the Pleistocene another period called it Holocene – holly Recent

Walther Penk 1909 : He give names to subdivide periods to Quaternary of Alps Area

Name of Quaternary Periods in the north half Earth

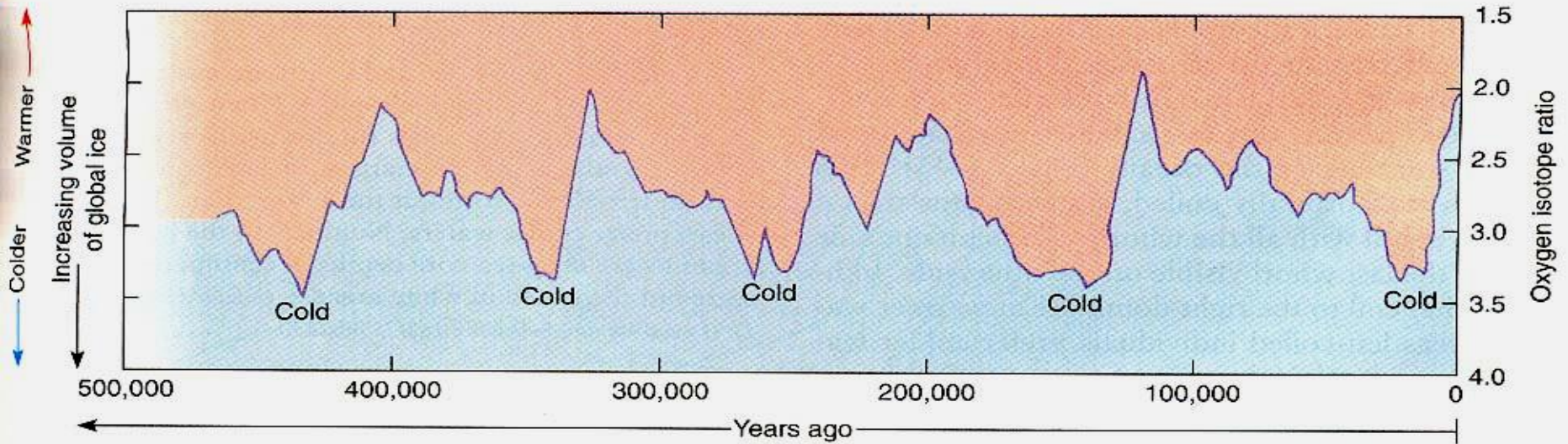
North America	Alpine Region	Years before Present
WISCONSINIAN	Würm	— 10,000
Sangamon	Riss-Würm	— 75,000
ILLINOIAN	Riss	— 125,000
Yarmouth	Mindel-Riss	— 265,000
KANSAN	Mindel	— 300,000
Aftonian	Günz-Mindel	— 435,000
NEBRASKAN	Günz	— 500,000
Pre-Nebraskan	Pre-Günz	— 1800,000

**Gunz
(Nebraskan)**

**Mindel
(Kansan)**

**Riss
(Illinoian)**

**Wurm
(Wisconsinan)**



One of the most clear features of the Quaternary is the periodic build-up of major continental ice sheets and mountain ice caps in many parts of the world during long glacial stages, divided by warm episodes (interglacial) of shorter duration, when temperatures were similar to or higher than today.

The most problems in quaternary sub-periods

- 1 – The small size of the features around all the world .
- 2 – The Pleistocene very short period that mean the fossils and the developing very rare so most of Quaternary sediment with out any fossils
- 3 – Most of fossils being at marine cores but this (very recent science)
- 4 – The locality of the Quaternary features with no wide distribution and the ability to change within one area

References

Glacial and Quaternary Geology

http://www.colby.edu/geology/GE354/Index_GE354.html

Internet Remote Sensing Lectures sites