

Lecture 20

Origin of the atmosphere (Chap. 10)

The carbon cycle and long-term climate
(Chap. 8 of the textbook: p.158-170)

EON	GLACIATIONS	ERA	Duration in millions of years	Millions of years ago	
PHANEROZOIC		CENOZOIC	65	65	
		MESOZOIC	188	251	
		PALEOZOIC	293	544	
PRECAMBRIAN	Late Proterozoic glaciations	Neoproterozoic	330	800	
		Mesoproterozoic	700	1600	
		Paleoproterozoic	900	2500	
	Huronian glaciations	LATE	500	3000	
		MIDDLE	400	3400	
		EARLY	400	3800	
	HADEAN			800	4600

end of last ice-age; begin civilization

beginning of modern era of ice-ages

asteroid impact; death of dinosaurs

“Cambrian explosion”
multicellular animal fossils

Snowball Earth episodes #2
life survives in pockets

oldest fossil visible to naked eye
rise of atmospheric oxygen
(greatest global pollution event;
deadly to nearly all existing life)

Snowball Earth episodes #1

life! (single-cell microbes)

formation of Earth-Moon
system

Earth is unfathomably old
most of Earth history is very alien

Geological Time: Fig 8-11

Geological Time: Fig 8-11

EON	GLACIATIONS	ERA	Duration in millions of years	Millions of years ago
PHANEROZOIC		CENOZOIC	65	65
		MESOZOIC	186	251
		PALEOZOIC	283	544
PRECAMBRIAN	PROTEROZOIC	Neoproterozoic	380	900
		Mesoproterozoic	700	1600
		Paleoproterozoic	900	2500
		LATE	500	3000
		MIDDLE	400	3400
	ARCHEAN	EARLY	400	3800
	HADAEN		800	4600

