

An aerial photograph of a vast, arid landscape. The foreground and middle ground are dominated by a dry, cracked lake bed or salt flat, with intricate patterns of white and light brown soil. Several dark, winding paths or tracks cut through the cracked earth, leading towards the horizon. In the far distance, a range of rugged, snow-capped mountains is visible under a clear blue sky.

GEOGRAFIA CUATERNARULUI

Tutore curs:

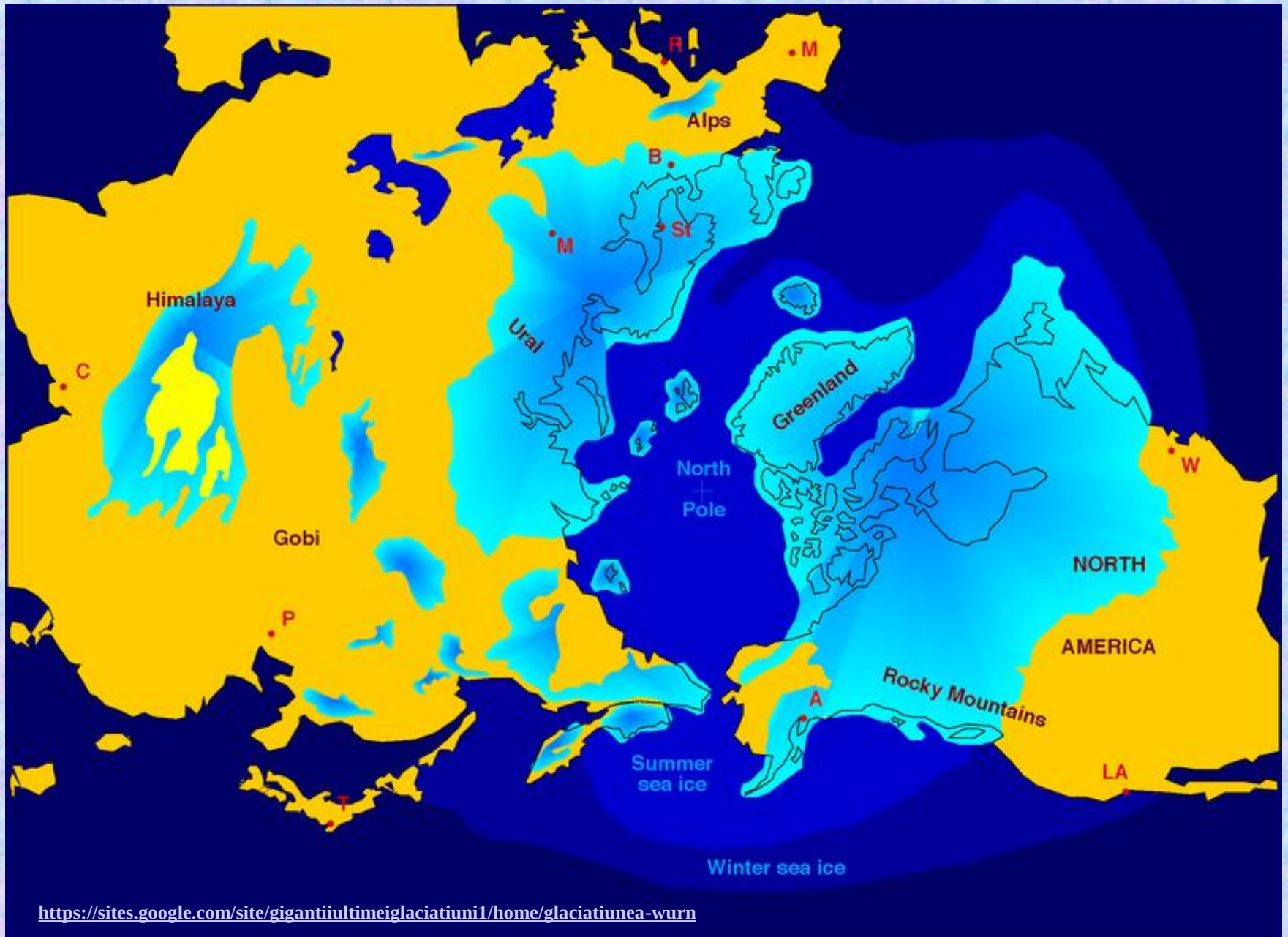
Conf. univ. dr. Marian ENE

**DEFINIREA
TEMPORALĂ
ȘI
STRUCTURALĂ
A
CUATERNARULUI**

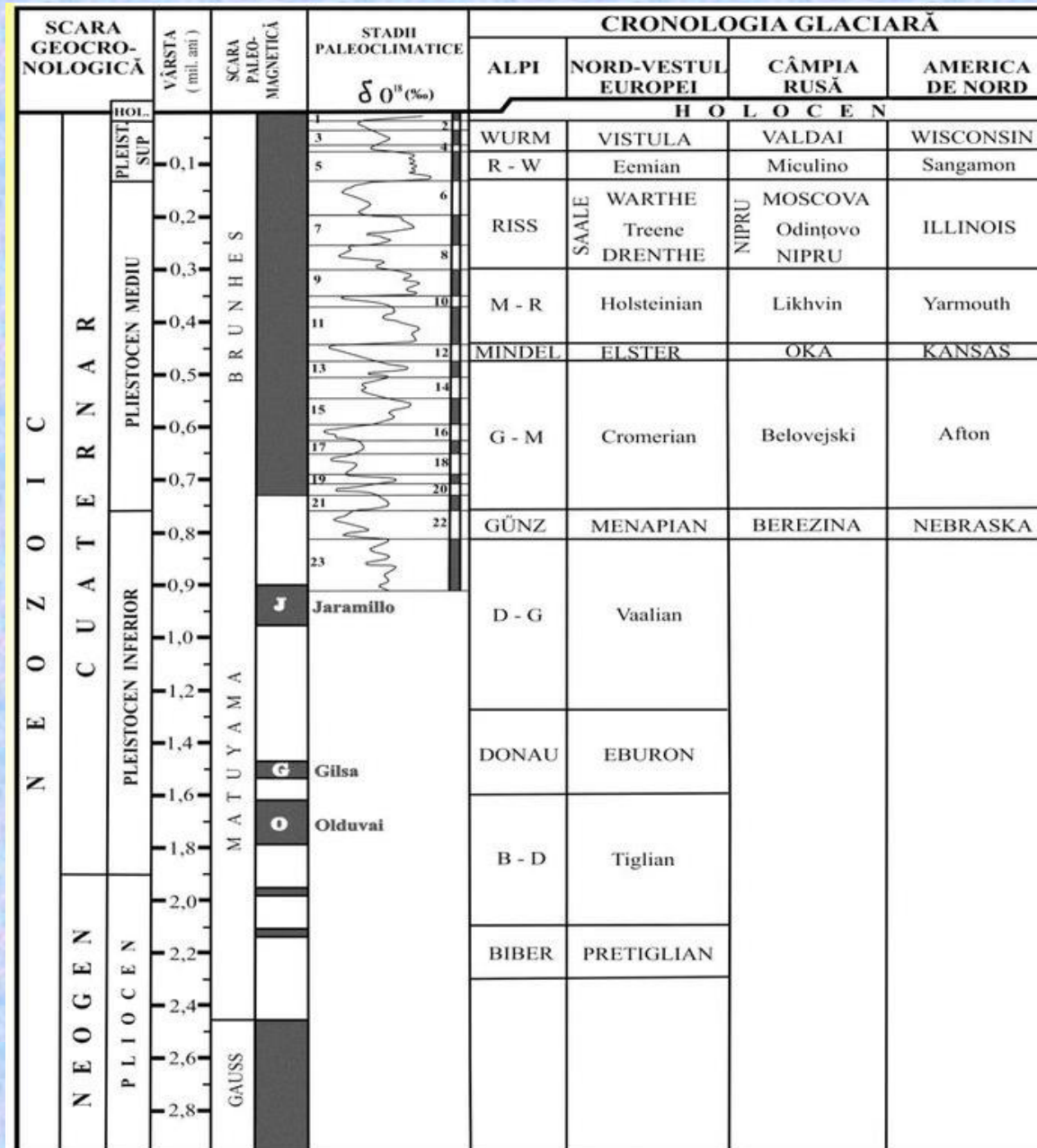
➤ o răcire climatică majoră în urmă cu circa 2 mil. ani



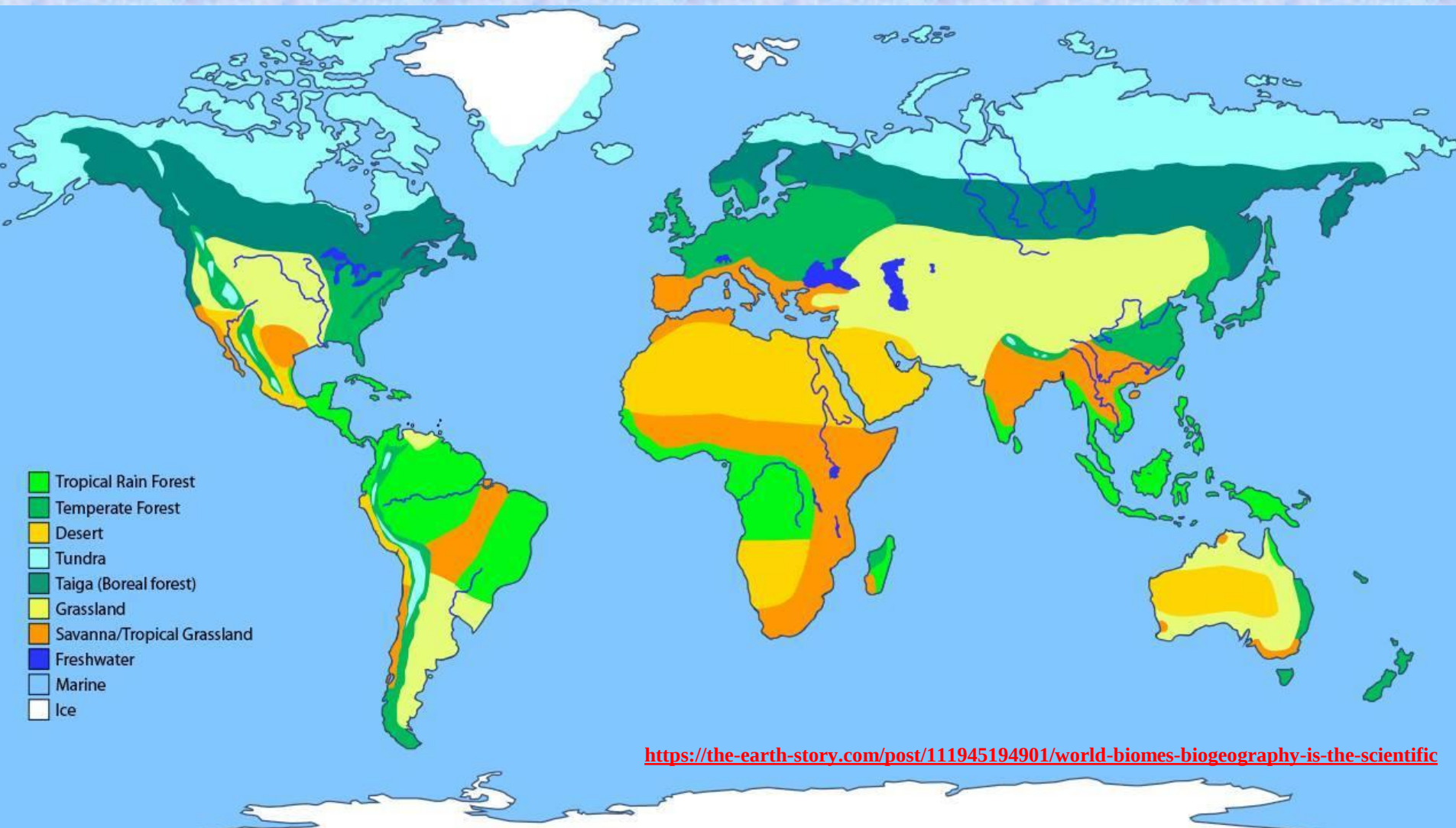
➤ acumulări imense de gheață



➤ fenomen repetabil de-a lungul istoriei geologice



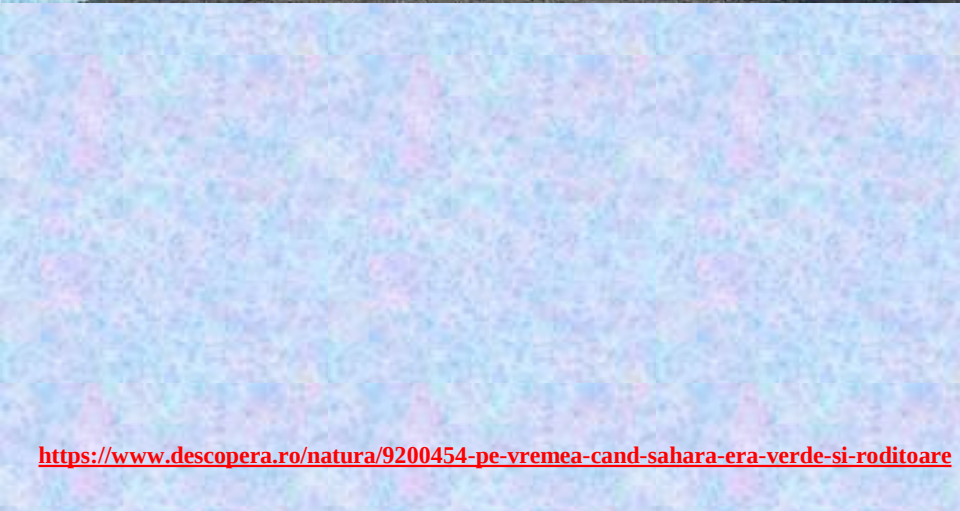
➤ fenomen cu importanță deosebită în definitivarea structurii fizico-geografice a Terrei



➤ fenomenul glaciar – manifestat direct sau indirect la nivelul Terrei



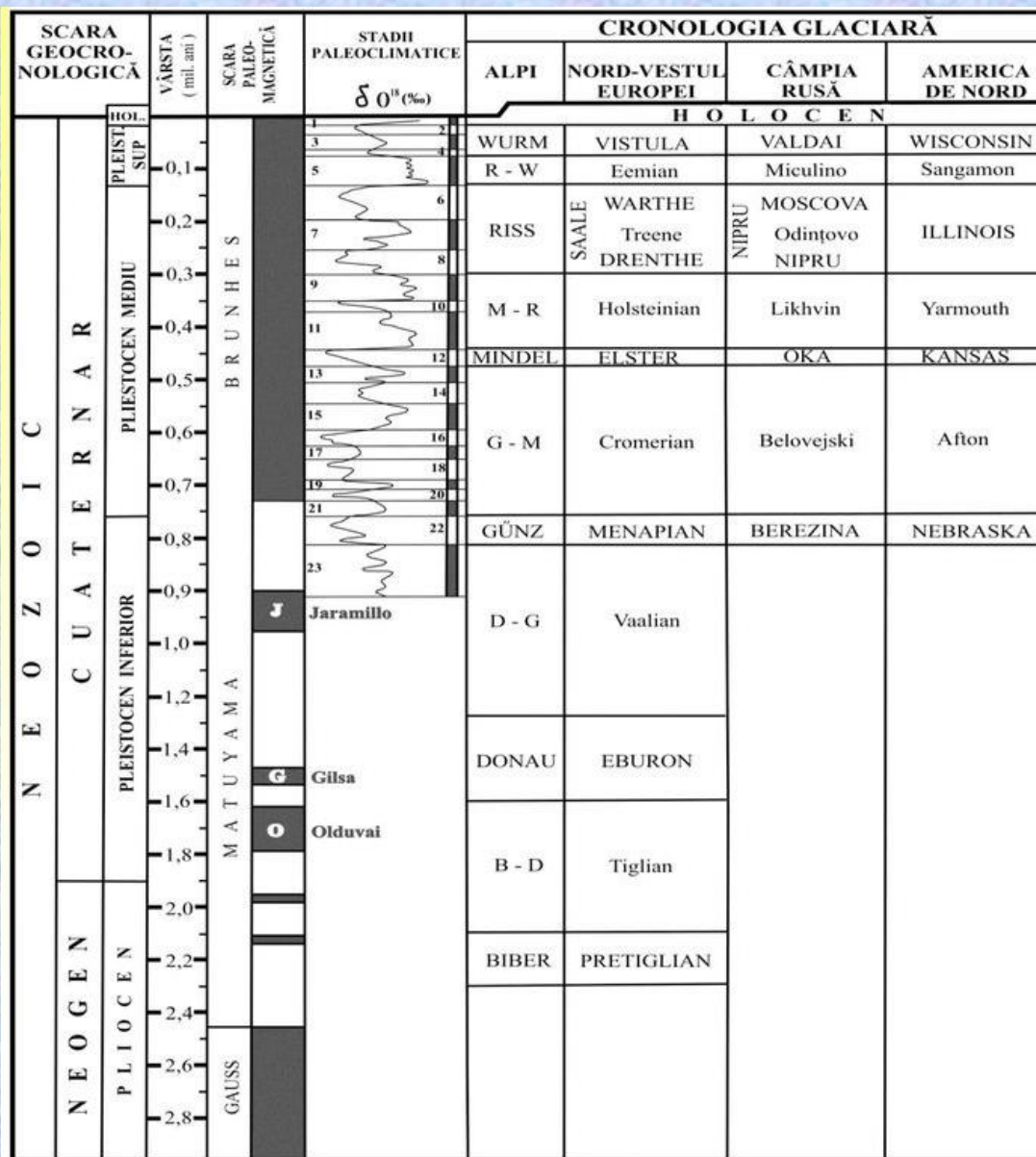
https://www.tripadvisor.com/LocationPhotoDirectLink-g312851-d7592289-i303434923-Glaciur_Sur-El_Calafate_Province_of_Santa_Cruz_Patagonia.html



<https://www.descopera.ro/natura/9200454-pe-vremea-cand-sahara-era-verde-si-roditoare>



➤ alternanțele de faze – consecințe asupra componentelor de mediu



➤ Cuaternarul – apariția OMULUI



**CUM A EVOLUAT
PĂMÂNTUL PÂNĂ
ACUM?**

PĂMÂNTUL – GENEZĂ ȘI EVOLUȚIE

14-13 miliarde ani – Big Bang-ul: într-o nanosecundă (10^{-9} secunde) a rezultat un Univers cu diametrul de sute de milioane de km



PĂMÂNTUL – GENEZĂ ȘI EVOLUȚIE

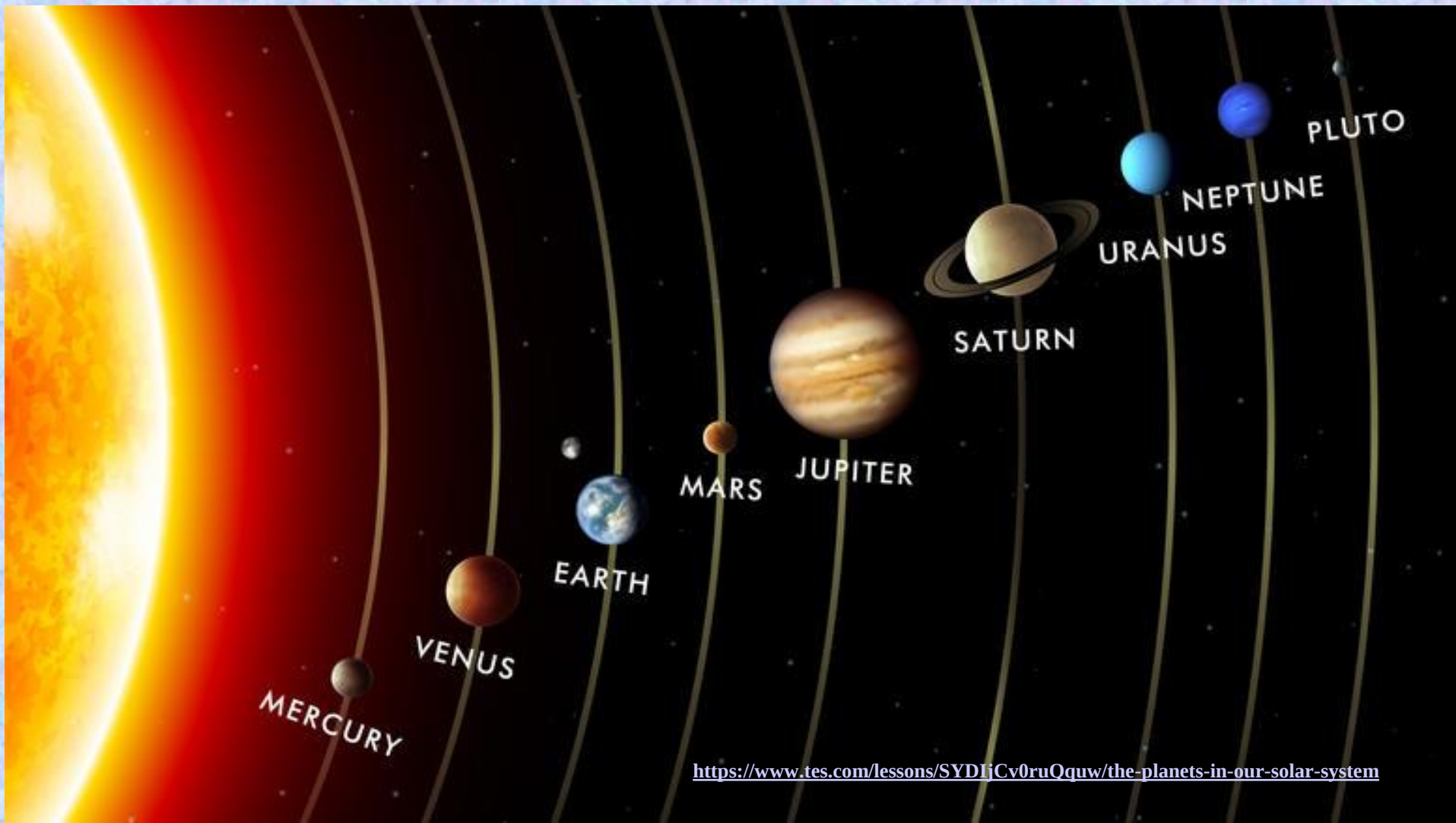


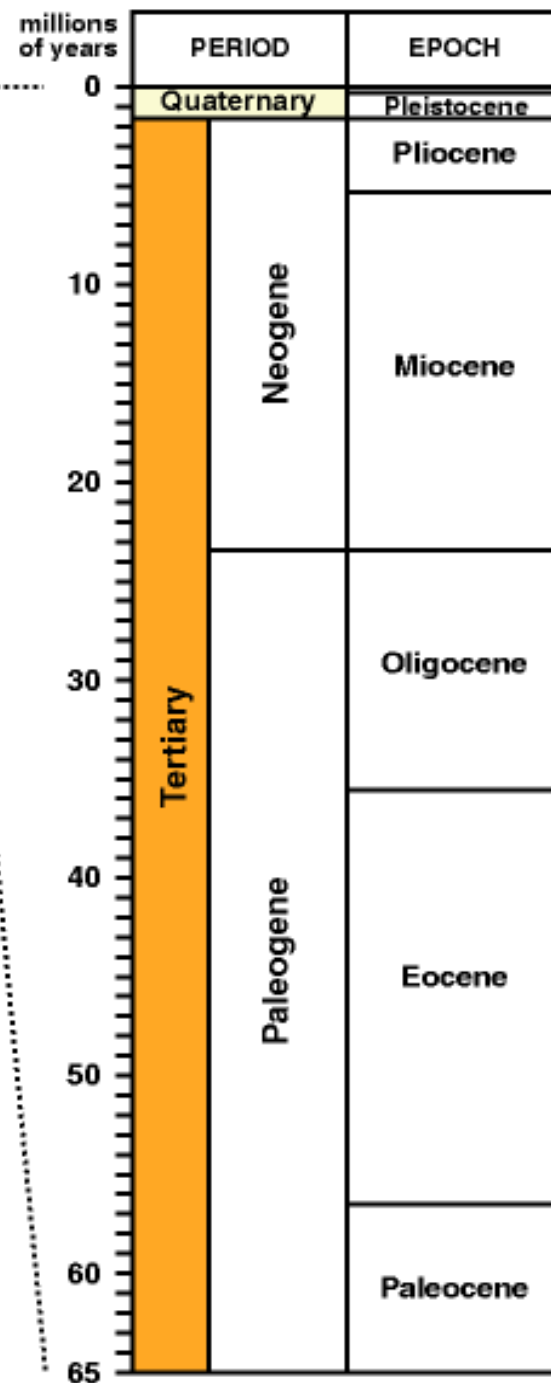
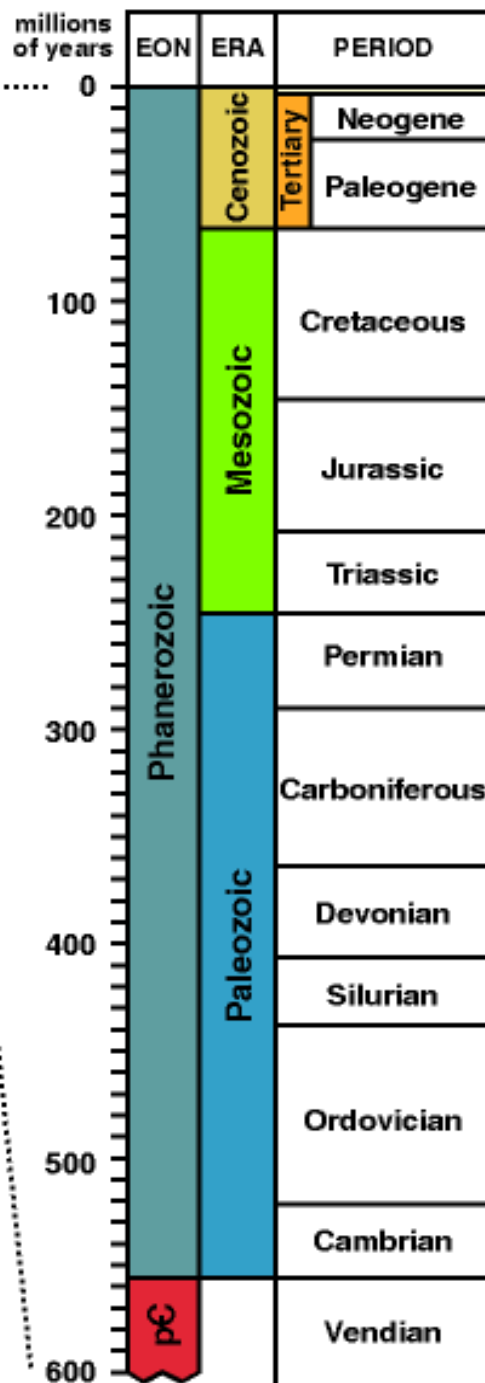
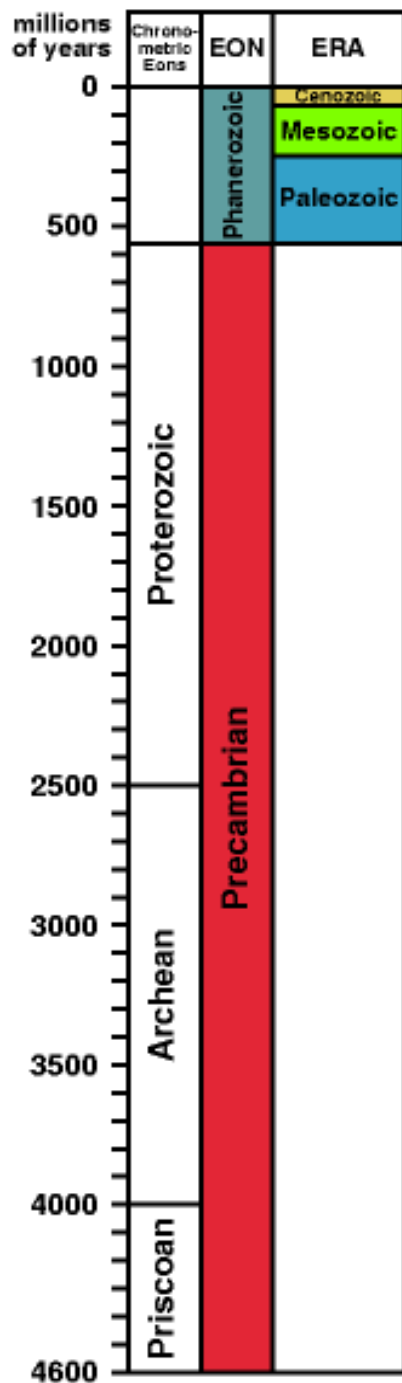
<https://playtech.ro/2019/de-ce-e-aproape-imposibil-sa-vezi-centrul-galaxiei-noastre/>

PĂMÂNTUL – GENEZĂ ȘI EVOLUȚIE

4,65 miliarde ani – A luat naștere Sistemul Solar într-unul din brațele galaxiei Calea Lactee, cu proto-Soarele în centrul său înconjurat de protoplanete, planetoizi

4,6 miliarde ani – Se formează sistemul de planete ca urmare a procesului de acreție:





← Holocene/Recent
<10000 years

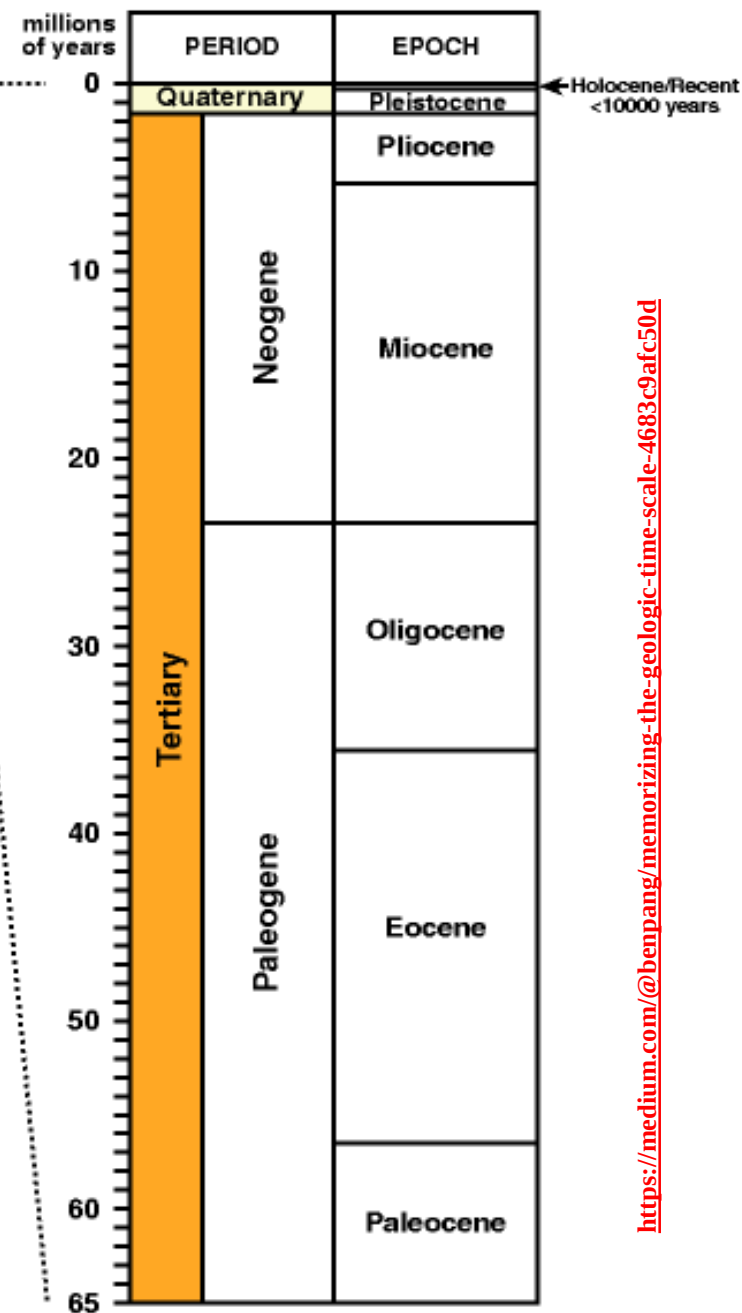
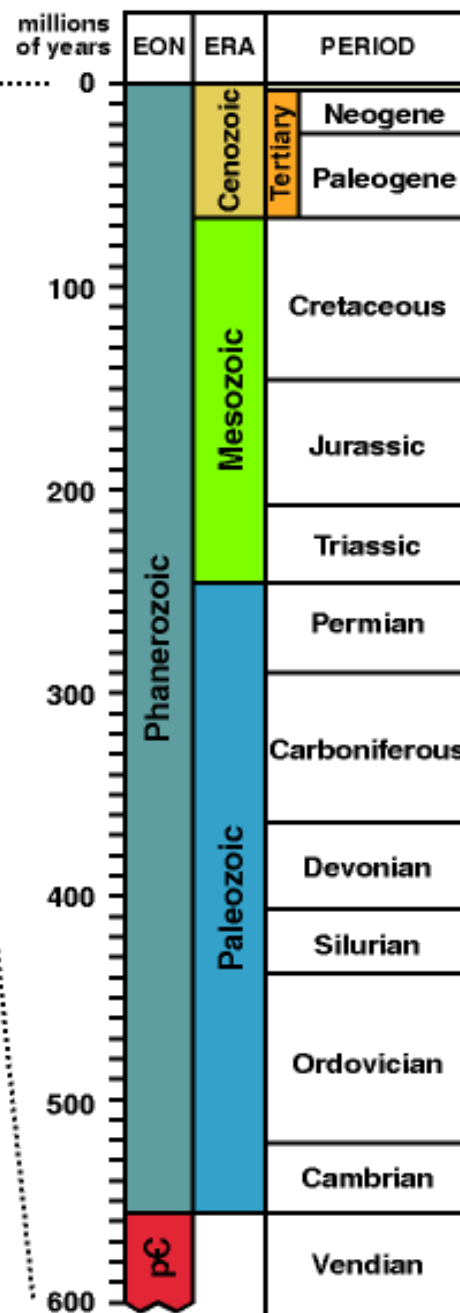
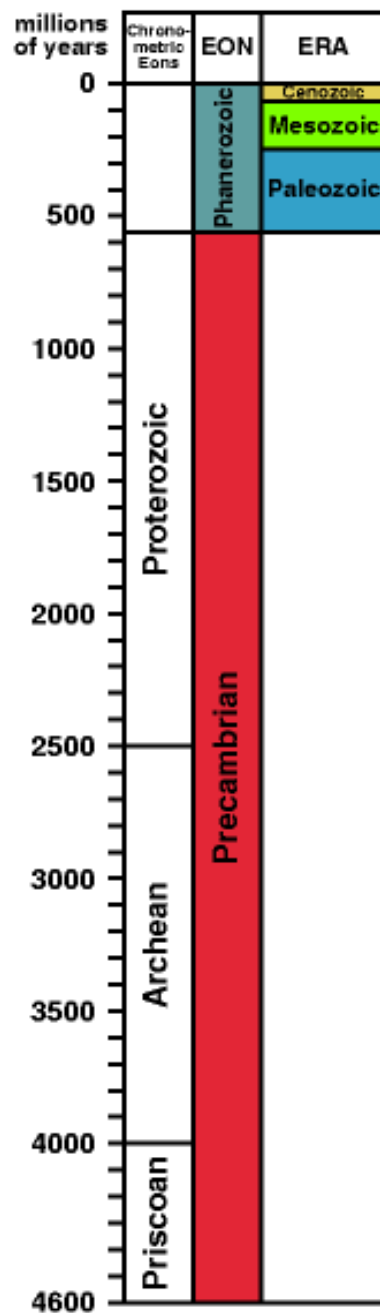
SCARA GEOCRONOLOGICĂ

EON	ERĂ	PERIOADĂ (SISTEM)	EPOCĂ (SERIE)	VÂRSTA (ETAJ)/SUBETAJ, alte denumiri	Vârsta (M.a.)	Ciclu tectonic	Faze tectogenetice	Evoluția vieții (principale etape)	EON	ERĂ	PERIOADĂ (SISTEM)	EPOCĂ (SERIE)	VÂRSTA (ETAJ)/SUBETAJ, alte denumiri	Vârsta (M.a.)	Ciclu tectonic	Faze tectogenetice	Evoluția vieții (principale etape)		
PHANEROZOIC	NEOZOIC	Cuaternar	Holocen	Tarantian	0,0117	ALPIN	valahă	Evoluția omului	PALEOZOIC	PALEOZOIC	Permian	Lopingian	Changhsingian	251,0	HERCINIC	← thuringiană	Extincție majoră		
			Pleistocen	Tyrrenian	0,126								Guadalupian	Wuchiapingian				260,4	
				Ionian	0,781									Capitanian				265,8	
				Calabrian	1,806									Roadian				268,0	
				Gelasian	2,588									Kungurian				270,0	
		Neogen	Pliocen	Placenzian (Plaisancian)	Romanian (Levantian)		3,600	Cisuralian				Artinskian	275,6	← saalică		Diversificarea reptilelor			
				Zanclean	Dacian		5,332					Sakmarian	284,4						
				Messinian	Pontian		7,246					Aselian	294,6						
				Tortonian	Pannonian (Meotian)		11,61					Tournaisian	299,0						
				Serravalian	Helvetian		13,82					Gzhelian	303,4						
	Miocen		Langhian	Badenian	15,97		Carbonifer	Pennsylvanian (Superior)			Superior	Kasimovian	307,2	← asturică	Primele reptile				
			Burdigalian	Carpatian	20,43							Moscovian	311,7						
			Aquitanian	Ottangian	23,03							Bashkirian	318,1						
			Chattian	Eggenburgian	28,4							Serpukhovian	328,3						
			Rupelian	Egerian	33,9							Visean	345,3						
	Paleogen	Oligocen	Priabonian	37,2	Devonian		Superior	Famennian			359,2	← bretonă	Primii amfibieni						
			Bartonian	40,4				Frasnian			374,5								
			Lutetian	48,6				Givetian			391,8								
			Ypresian	Cuisian				55,8			Eifelian			397,5					
			Ilardian	58,7				Emsian			407,0								
		Eocen	Thanetian	58,7	Silurian		Pridoli(ian)	Ludfordian			416,0	← ardenică	Primele plante terestre vasculare						
			Selandian	61,1				Ludlow(ian)			418,7								
			Danian	Montian				65,5			Gorstian			421,3					
			Maastrichtian	70,6				Homerian			422,9								
			Campanian	83,5				Shinarumpian			426,2								
	Cretacic	Superior	Santonian	85,8	Ordovician		Wenlock(ian)	Telychian			428,2	← taconică	"Explozia" metazoarelor						
			Coniacian	88,6				Rhuddanian			436,0								
			Turonian	93,6				Hirnantian (Ashgillian)			439,0								
			Cenomanian	99,6				Katian (Caradocian)			443,7								
			Albian	112,0				Sandbian (Caradocian)			445,6								
		Inferior	Barremian	125,0	Cambrian		Superior	Drumian (Amgalan)			455,8	← salairă (sardă)	Primii pești						
			Hauterivian	130,0				Stage 10 (Fengshanian, Doolgellian)			460,9								
			Valanginian	133,9				Stage 9 (Jiangshanian, Franconian)			468,1								
			Berriasian	140,2				Palbian (Dresbachian)			471,8								
			Purbechian	145,5				Guzhangian (Mayaian)			478,6								
	Jurasic	Superior	Rhaetian	150,8	Proterozoic superior		Ediacaran (Vendian)	Sinian			488,3	← baikaliană	Primele chordate						
			Kimmeridgian	155,6				Proterozoic mediu			Tonian			Stage 8 (Greenvillian)	492,0				
			Oxfordian	161,2										Proterozoic inferior	Statherian	Palbian (Dresbachian)	496,0		
			Callovian	164,7												Archaic superior	Tonian	Palbian (Dresbachian)	499,0
			Bathonian	167,7														Archaic mediu	Tonian
Bajocian		171,6	Archaic inferior	Tonian	Palbian (Dresbachian)	506,5													
Aalenian		175,6			Archaic timpuriu	Tonian	Palbian (Dresbachian)	510,0											
Toarcian		183,0					Archaic timpuriu	Tonian	Palbian (Dresbachian)	515,0									
Pliensbachian		189,6							Archaic timpuriu	Tonian	Palbian (Dresbachian)	521,0							
Sinemurian		196,5									Archaic timpuriu	Tonian	Palbian (Dresbachian)	528,0					
Hettangian	199,6	Archaic timpuriu	Tonian	Palbian (Dresbachian)									542,0						
Triasic	Superior			Rhaetian	203,6	Proterozoic superior							Ediacaran (Vendian)	Sinian	542,0	← Assyntică (cadomiană)	Fauna de Ediacara		
				Norian	206,5		Proterozoic mediu	Tonian						Stage 8 (Greenvillian)	492,0				
				Carnian	216,5				Proterozoic inferior	Statherian				Palbian (Dresbachian)	496,0				
				Ladinian	222,7						Archaic superior	Tonian		Palbian (Dresbachian)	499,0				
		Muschelkalk	237,0	Archaic mediu	Tonian									Palbian (Dresbachian)	503,0				
Anisian	245,9	Archaic inferior	Tonian			Palbian (Dresbachian)							506,5						
Olenekian (Scythian)	249,5					Archaic timpuriu	Tonian	Palbian (Dresbachian)					510,0						
Werraian (Bundschuhian)	251,0							Archaic timpuriu	Tonian	Palbian (Dresbachian)			515,0						
Induan	255,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	521,0						
Griesbachian	259,6			Archaic timpuriu	Tonian							Palbian (Dresbachian)	528,0						
Artinskian	265,8	Archaic timpuriu	Tonian									Palbian (Dresbachian)	542,0						
Permian	268,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	492,0						
Carbonifer	270,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	496,0						
Devonian	275,6									Archaic timpuriu	Tonian	Palbian (Dresbachian)	499,0						
Silurian	278,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	503,0						
Ordovician	280,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	506,5						
Proterozoic superior	282,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	510,0						
Proterozoic mediu	284,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	515,0						
Proterozoic inferior	286,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	521,0						
Archaic superior	288,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	528,0						
Archaic mediu	290,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	542,0						
Archaic inferior	292,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	492,0						
Archaic timpuriu	294,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	496,0						
Archaic timpuriu	296,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	499,0						
Archaic timpuriu	298,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	503,0						
Archaic timpuriu	300,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	506,5						
Archaic timpuriu	302,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	510,0						
Archaic timpuriu	304,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	515,0						
Archaic timpuriu	306,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	521,0						
Archaic timpuriu	308,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	528,0						
Archaic timpuriu	310,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	542,0						
Archaic timpuriu	312,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	492,0						
Archaic timpuriu	314,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	496,0						
Archaic timpuriu	316,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	499,0						
Archaic timpuriu	318,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	503,0						
Archaic timpuriu	320,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	506,5						
Archaic timpuriu	322,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	510,0						
Archaic timpuriu	324,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	515,0						
Archaic timpuriu	326,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	521,0						
Archaic timpuriu	328,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	528,0						
Archaic timpuriu	330,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	542,0						
Archaic timpuriu	332,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	492,0						
Archaic timpuriu	334,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	496,0						
Archaic timpuriu	336,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	499,0						
Archaic timpuriu	338,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	503,0						
Archaic timpuriu	340,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	506,5						
Archaic timpuriu	342,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	510,0						
Archaic timpuriu	344,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	515,0						
Archaic timpuriu	346,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	521,0						
Archaic timpuriu	348,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	528,0						
Archaic timpuriu	350,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	542,0						
Archaic timpuriu	352,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	492,0						
Archaic timpuriu	354,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	496,0						
Archaic timpuriu	356,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	499,0						
Archaic timpuriu	358,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	503,0						
Archaic timpuriu	360,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	506,5						
Archaic timpuriu	362,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	510,0						
Archaic timpuriu	364,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	515,0						
Archaic timpuriu	366,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	521,0						
Archaic timpuriu	368,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	528,0						
Archaic timpuriu	370,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	542,0						
Archaic timpuriu	372,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	492,0						
Archaic timpuriu	374,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	496,0						
Archaic timpuriu	376,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	499,0						
Archaic timpuriu	378,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	503,0						
Archaic timpuriu	380,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	506,5						
Archaic timpuriu	382,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	510,0						
Archaic timpuriu	384,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	515,0						
Archaic timpuriu	386,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	521,0						
Archaic timpuriu	388,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	528,0						
Archaic timpuriu	390,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	542,0						
Archaic timpuriu	392,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	492,0						
Archaic timpuriu	394,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	496,0						
Archaic timpuriu	396,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	499,0						
Archaic timpuriu	398,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	503,0						
Archaic timpuriu	400,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	506,5						
Archaic timpuriu	402,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	510,0						
Archaic timpuriu	404,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	515,0						
Archaic timpuriu	406,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	521,0						
Archaic timpuriu	408,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	528,0						
Archaic timpuriu	410,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	542,0						
Archaic timpuriu	412,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	492,0						
Archaic timpuriu	414,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	496,0						
Archaic timpuriu	416,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	499,0						
Archaic timpuriu	418,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	503,0						
Archaic timpuriu	420,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	506,5						
Archaic timpuriu	422,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	510,0						
Archaic timpuriu	424,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	515,0						
Archaic timpuriu	426,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	521,0						
Archaic timpuriu	428,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	528,0						
Archaic timpuriu	430,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	542,0						
Archaic timpuriu	432,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	492,0						
Archaic timpuriu	434,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	496,0						
Archaic timpuriu	436,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	499,0						
Archaic timpuriu	438,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	503,0						
Archaic timpuriu	440,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	506,5						
Archaic timpuriu	442,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	510,0						
Archaic timpuriu	444,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	515,0						
Archaic timpuriu	446,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	521,0						
Archaic timpuriu	448,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	528,0						
Archaic timpuriu	450,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	542,0						
Archaic timpuriu	452,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	492,0						
Archaic timpuriu	454,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	496,0						
Archaic timpuriu	456,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	499,0						
Archaic timpuriu	458,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	503,0						
Archaic timpuriu	460,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	506,5						
Archaic timpuriu	462,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	510,0						
Archaic timpuriu	464,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	515,0						
Archaic timpuriu	466,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	521,0						
Archaic timpuriu	468,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	528,0						
Archaic timpuriu	470,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	542,0						
Archaic timpuriu	472,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	492,0						
Archaic timpuriu	474,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	496,0						
Archaic timpuriu	476,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	499,0						
Archaic timpuriu	478,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	503,0						
Archaic timpuriu	480,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	506,5						
Archaic timpuriu	482,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	510,0						
Archaic timpuriu	484,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	515,0						
Archaic timpuriu	486,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	521,0						
Archaic timpuriu	488,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	528,0						
Archaic timpuriu	490,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	542,0						
Archaic timpuriu	492,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	492,0						
Archaic timpuriu	494,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	496,0						
Archaic timpuriu	496,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	499,0						
Archaic timpuriu	498,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	503,0						
Archaic timpuriu	500,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	506,5						
Archaic timpuriu	502,0					Archaic timpuriu	Tonian					Palbian (Dresbachian)	510,0						
Archaic timpuriu	504,0							Archaic timpuriu	Tonian			Palbian (Dresbachian)	515,0						
Archaic timpuriu	506,0									Archaic timpuriu	Tonian	Palbian (Dresbachian)	521,0						
Archaic timpuriu	508,0			Archaic timpuriu	Tonian							Palbian (Dresbachian)	528,0						
Archaic timpuriu	510,0	Archaic timpuriu	Tonian									Palbian (Dresbachian)	542,0						

4,6 – 3,8 miliarde ani (Hadean) – Pământul evoluează de la stadiul de protoplanetă la cel de planetă.

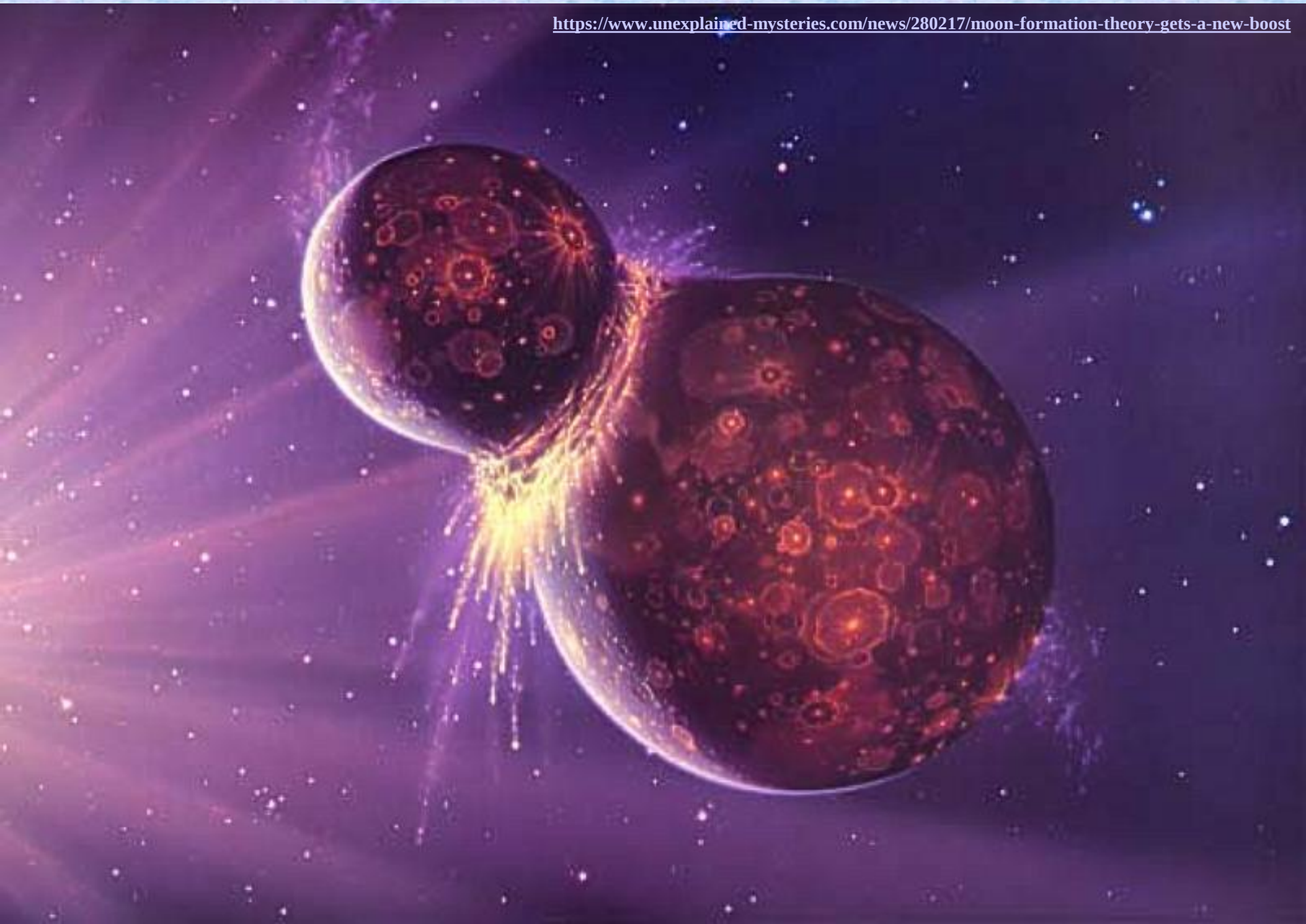
<https://www.popsci.com/science/article/2012-06/fyi-what%E2%80%99s-hottest-earth-has-ever-gotten/>



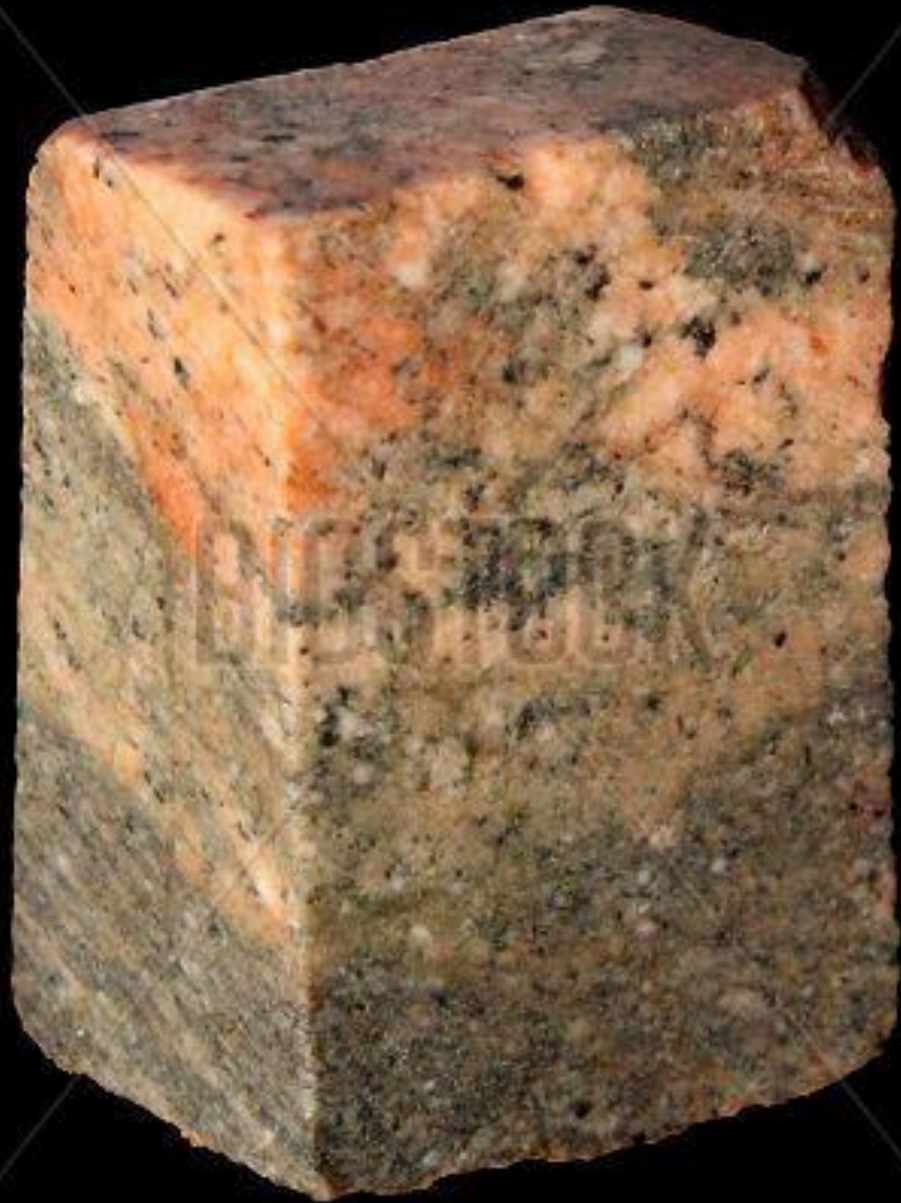


4,5 miliarde ani – Pământul este lovit de un planetoid. Se formează Luna.

<https://www.unexplained-mysteries.com/news/280217/moon-formation-theory-gets-a-new-boost>

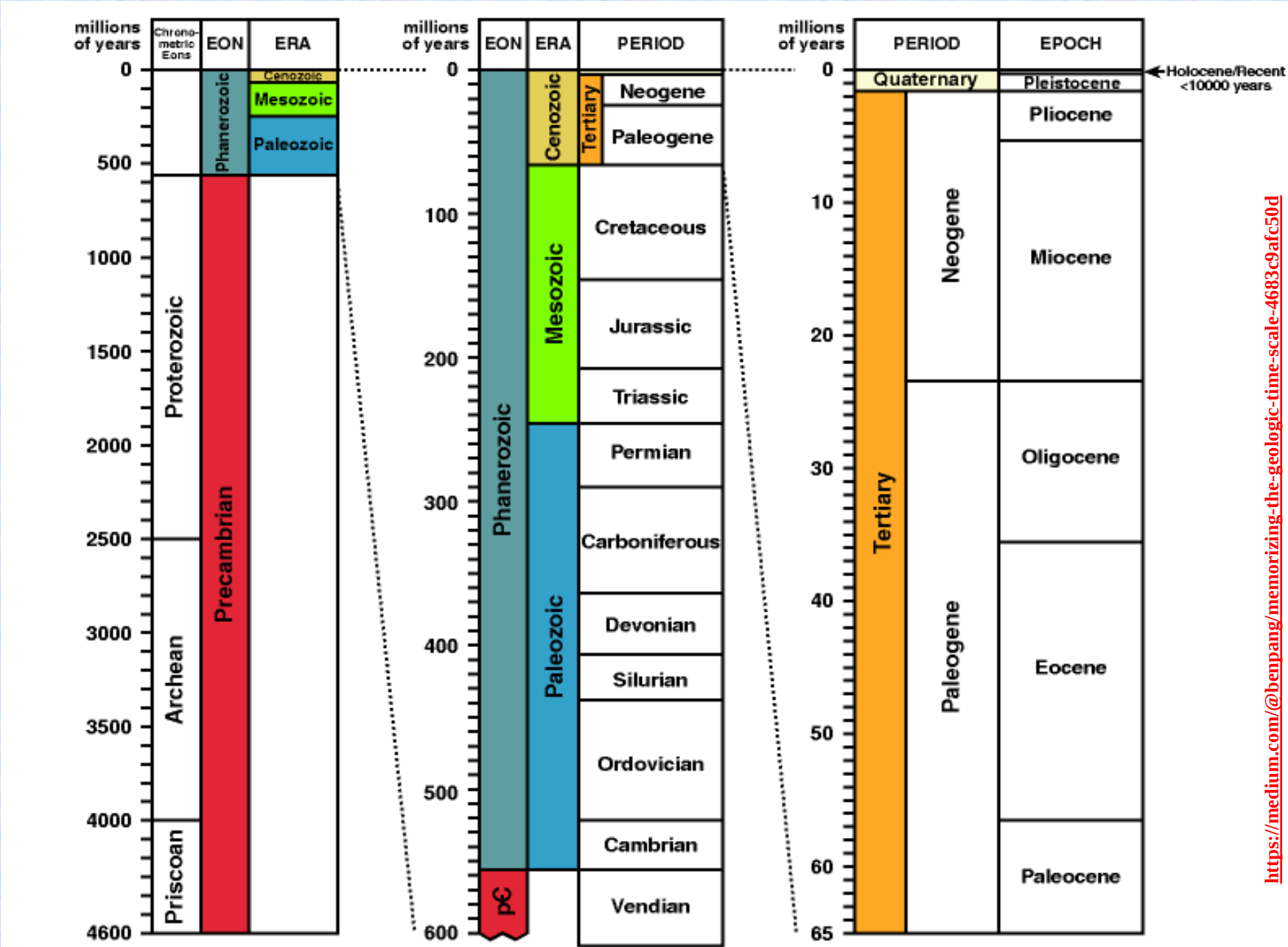






<https://www.bigstockphoto.com/image-57392648/stock-photo-oldest-rock-on-earth-the-acasta-river-gneiss-4030-million-years-old%21>

Arhaic - 3,8 – 2,5 miliarde ani: se consolidează scoarța terestră; se formează bazinele oceanice; se formează atmosfera terestră.

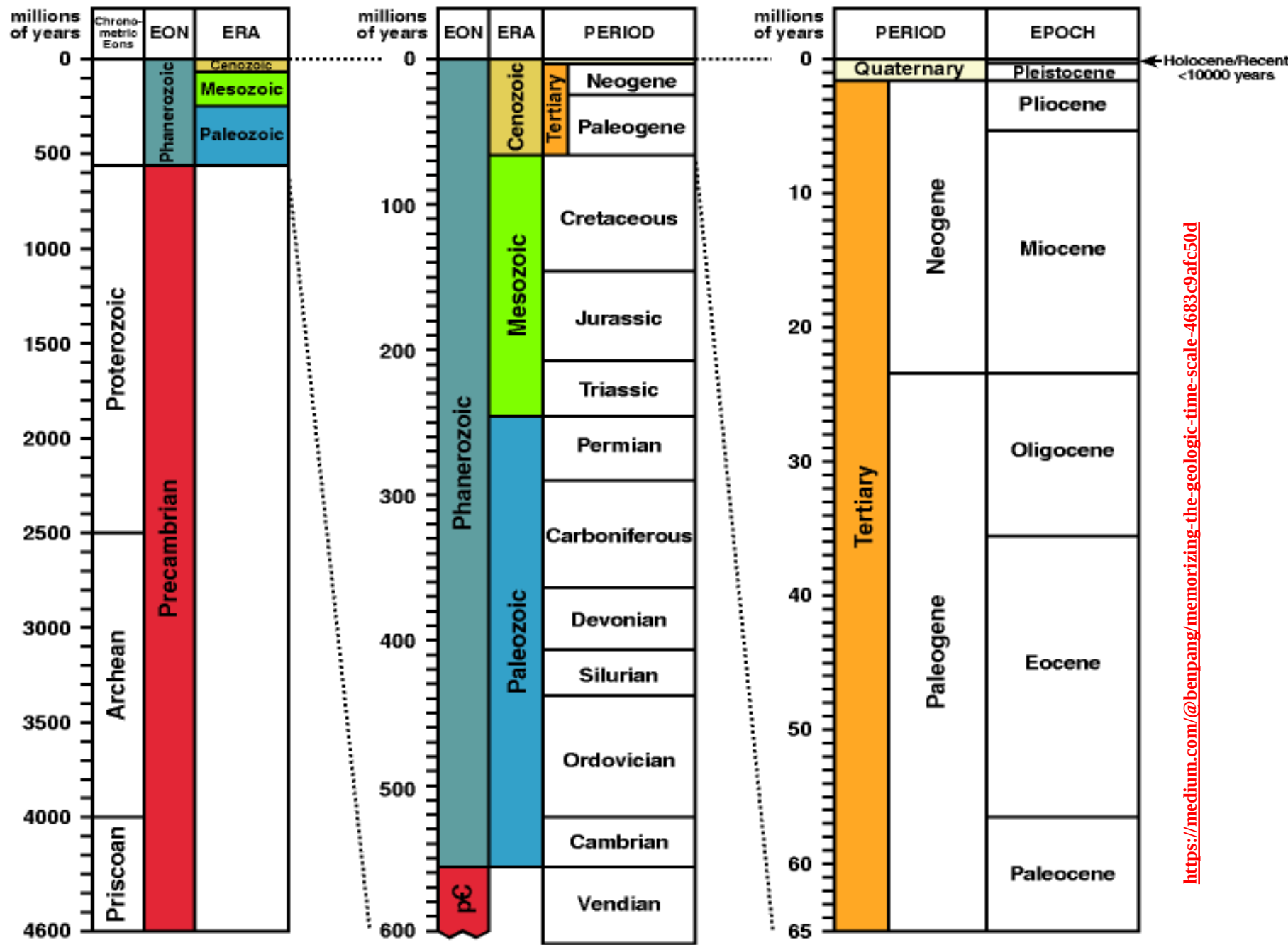




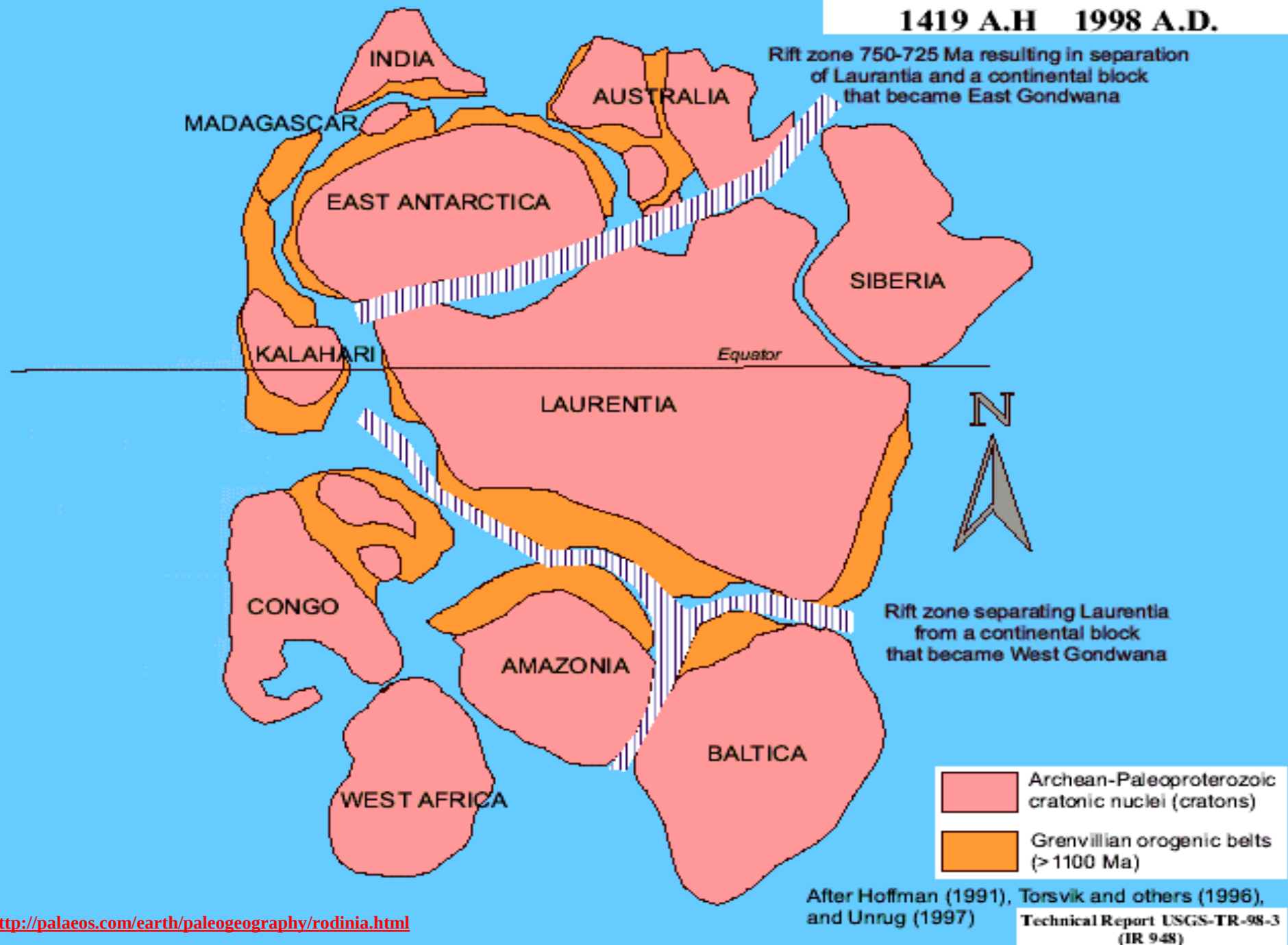




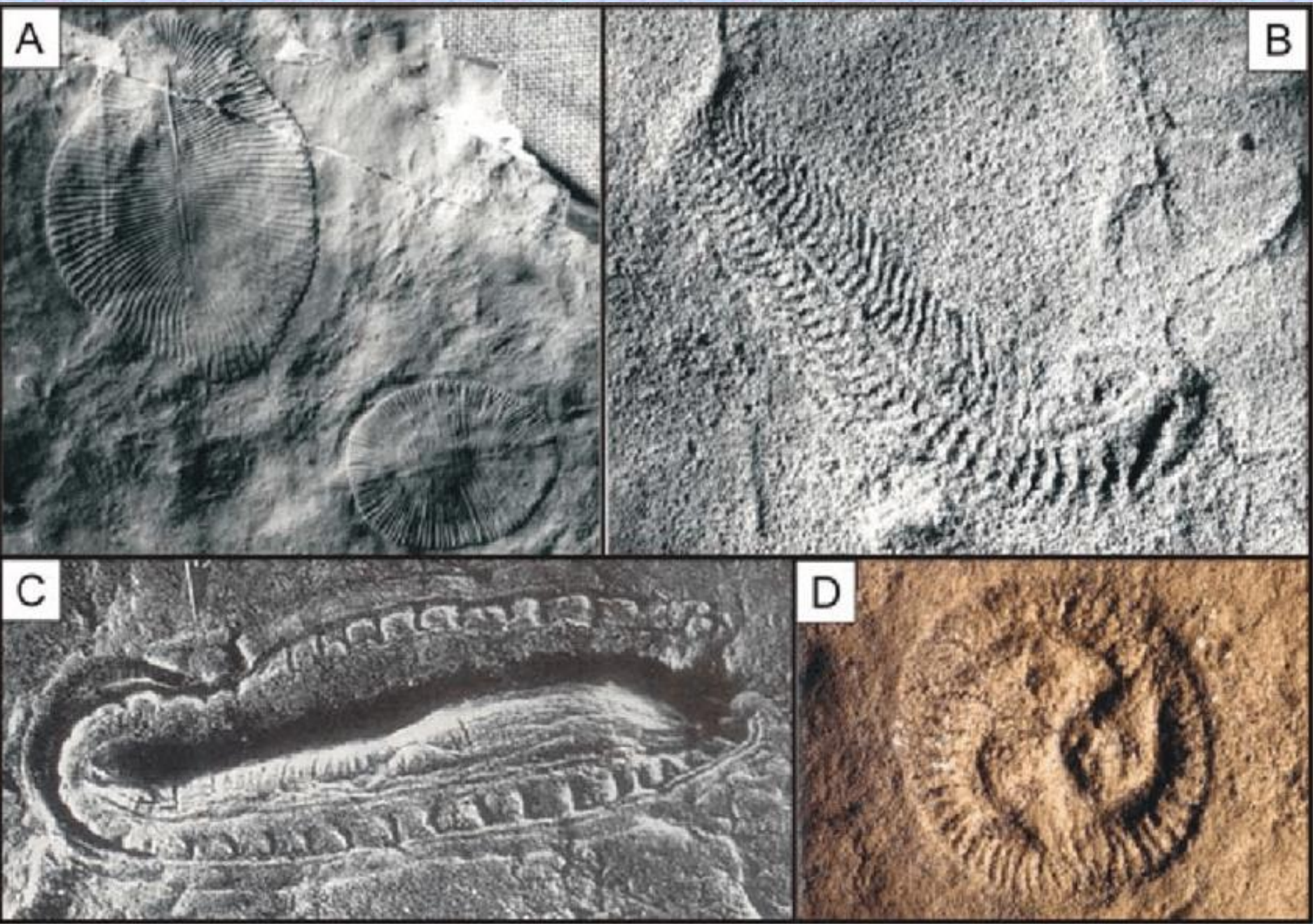
PROTEROZOIC – 2,5 – 0,57 miliarde ani.

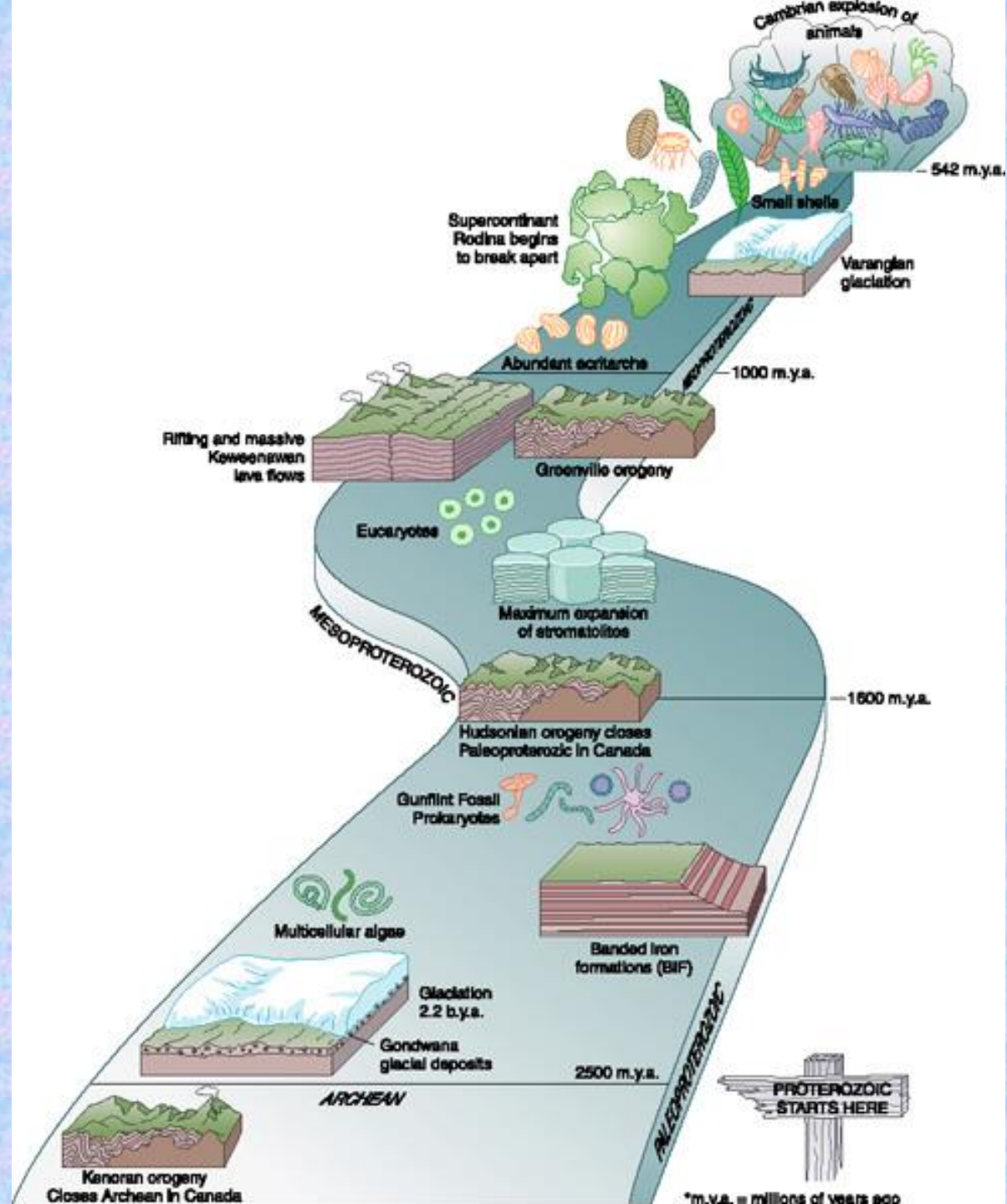




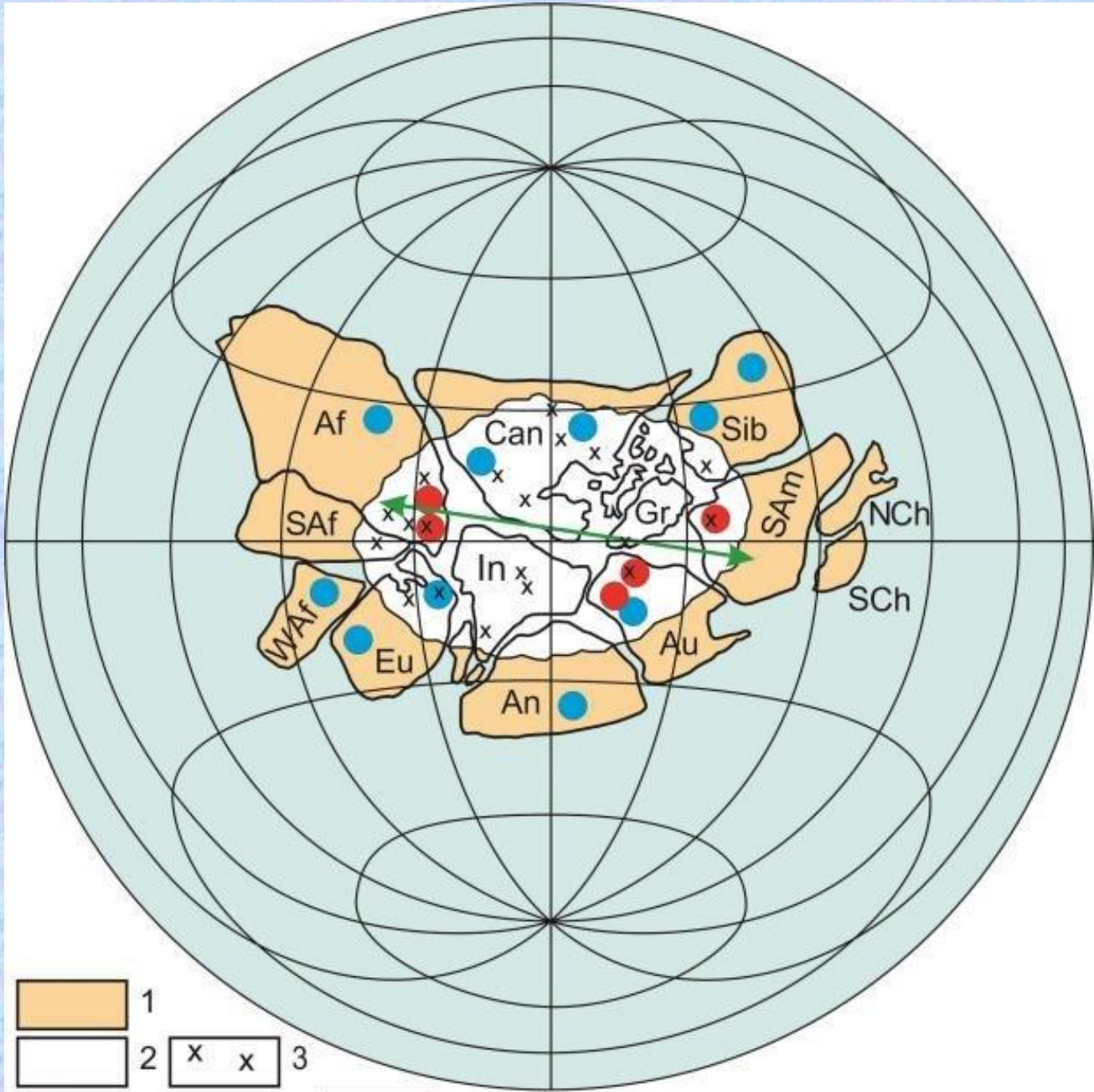






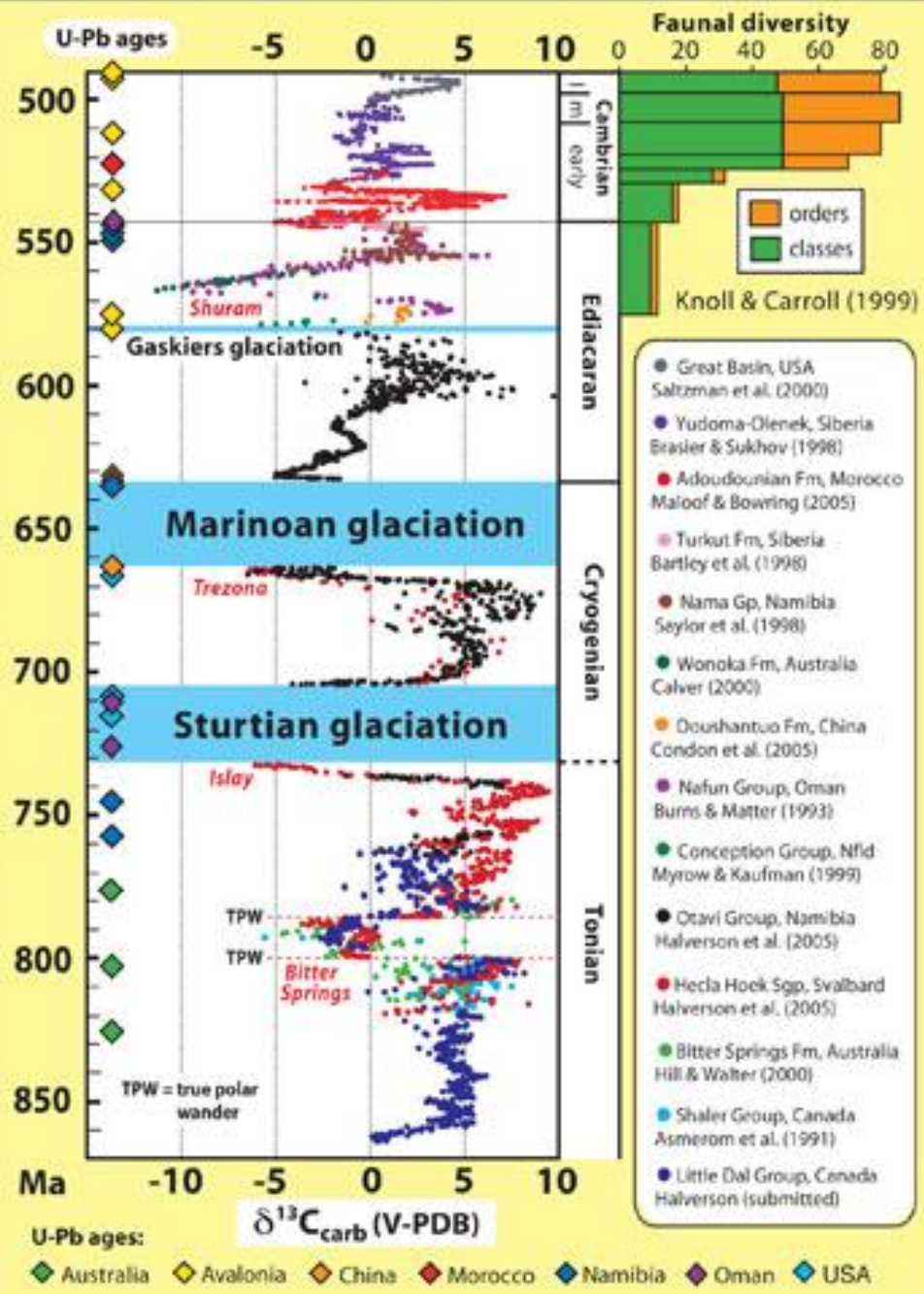
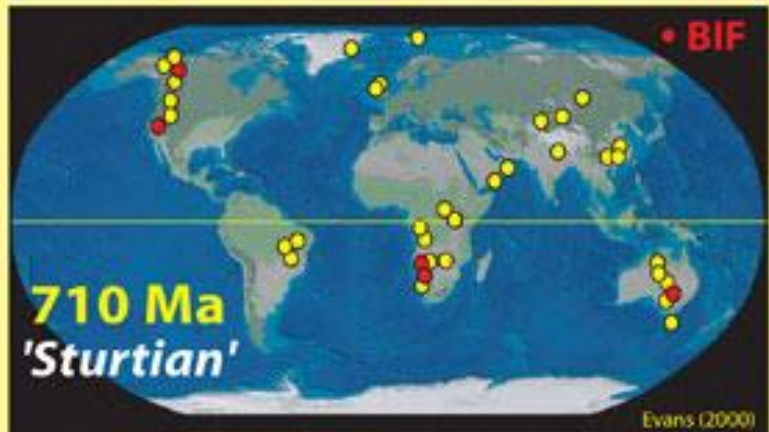


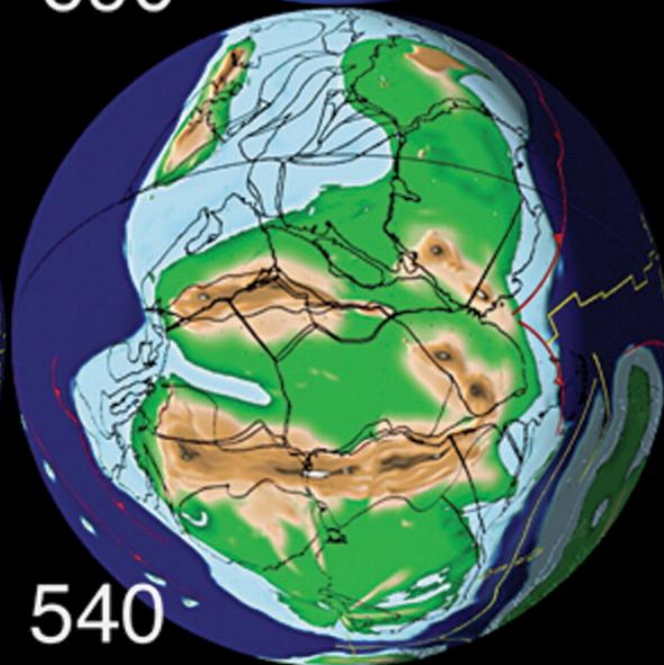
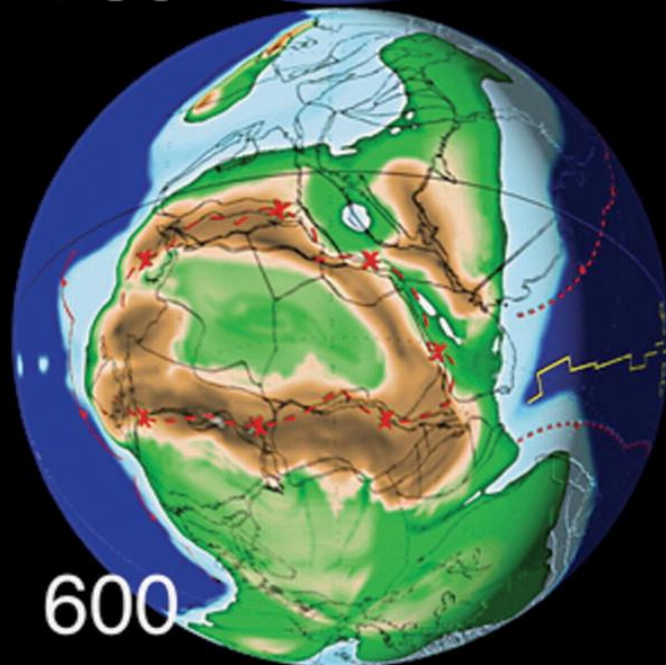
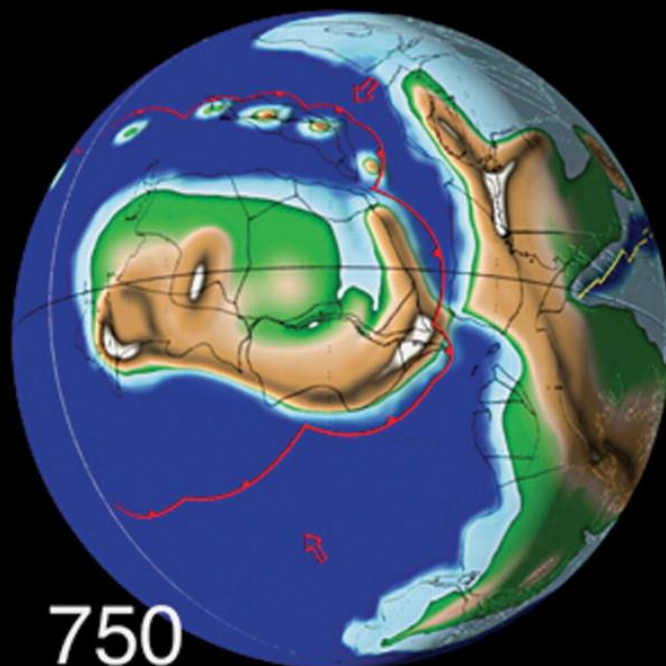
Glaciațiunea Huroniană – 2,3 – 2,0 mld. ani



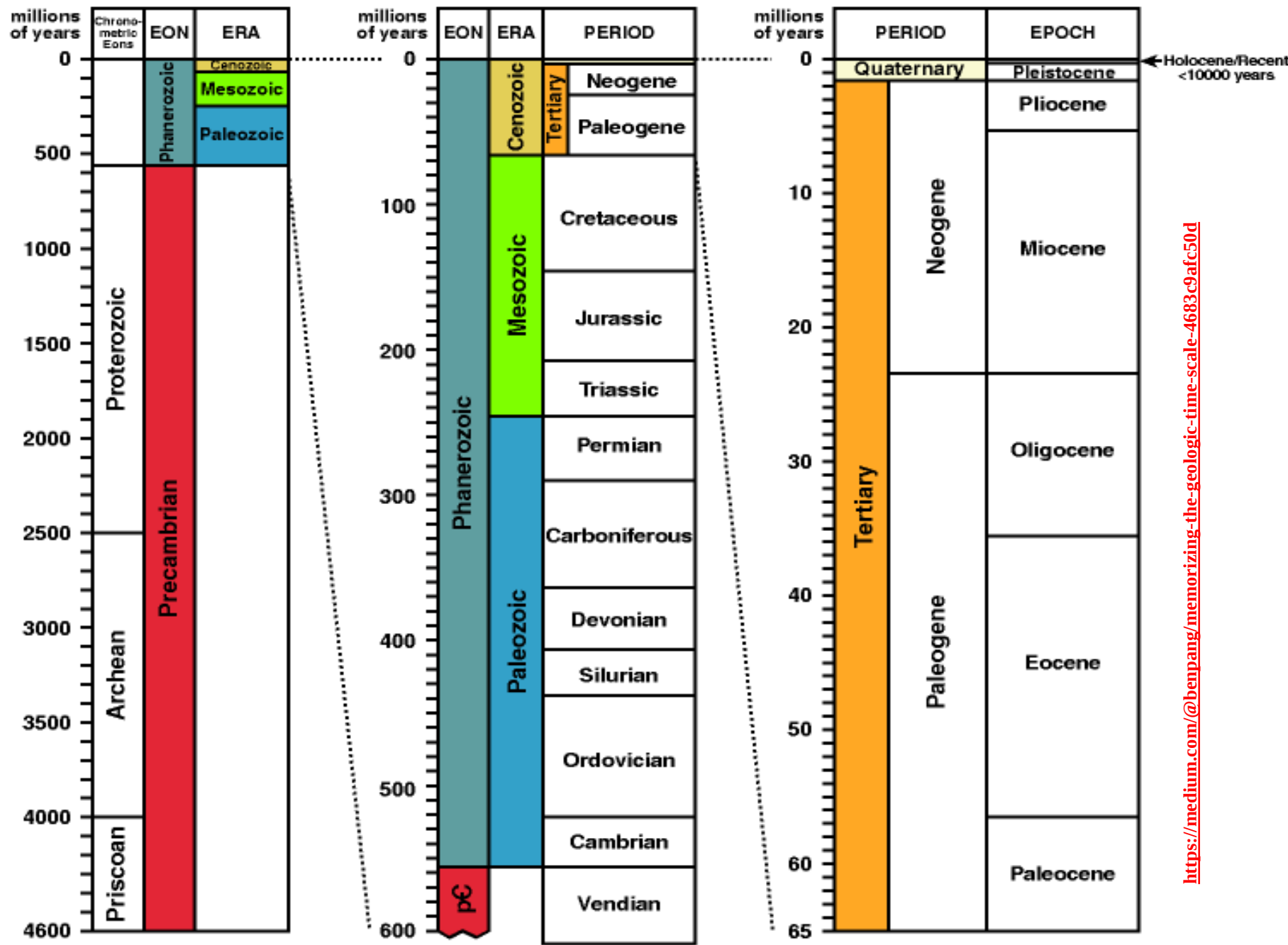
Glaciațiunea din Ptz. superior – 950-615 mil. ani

<http://www.snowballearth.org/week1.html>

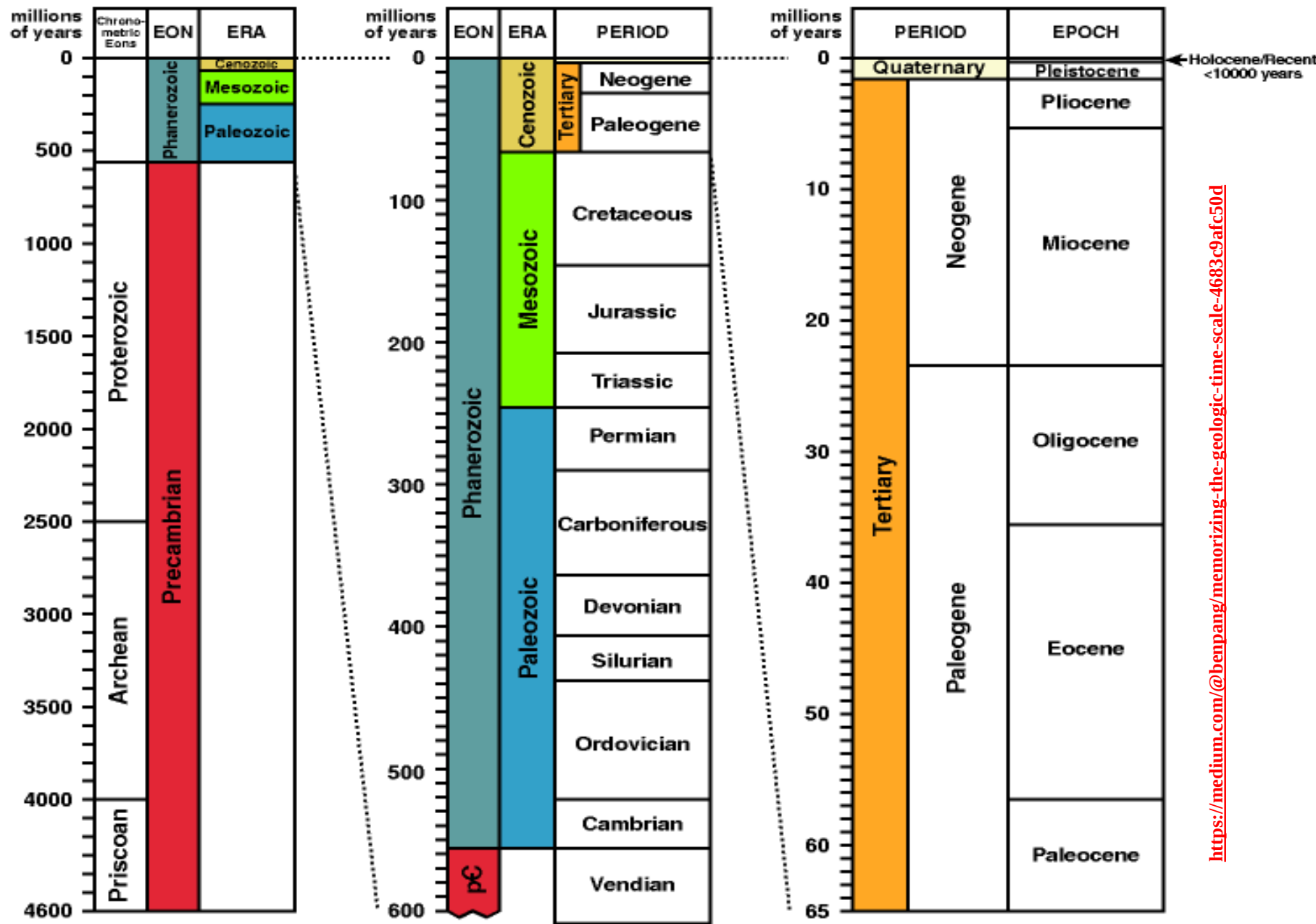




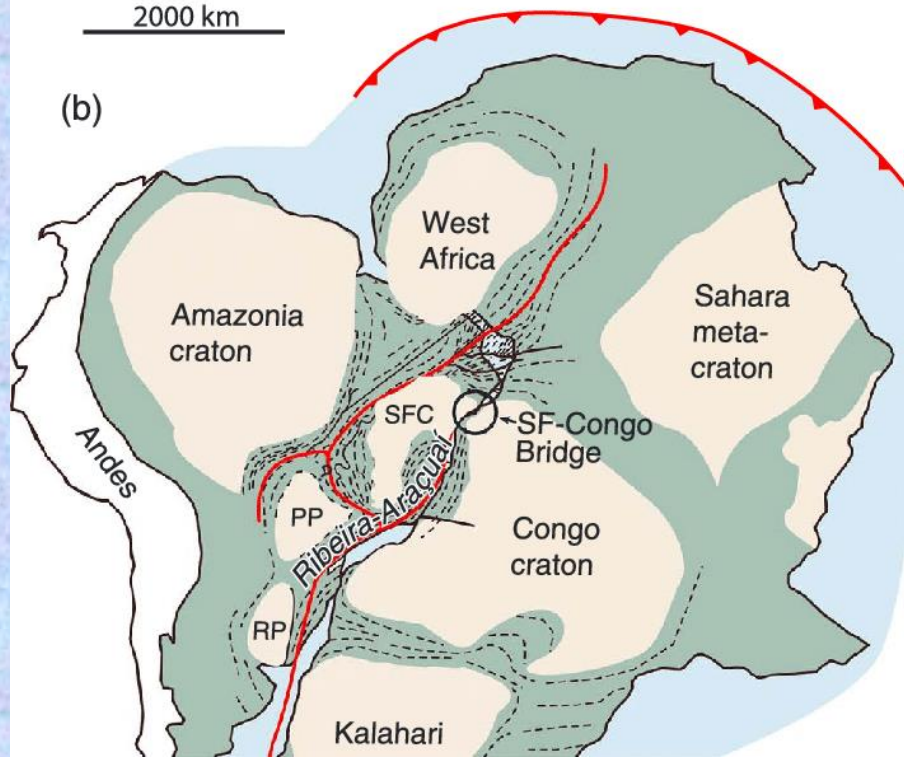
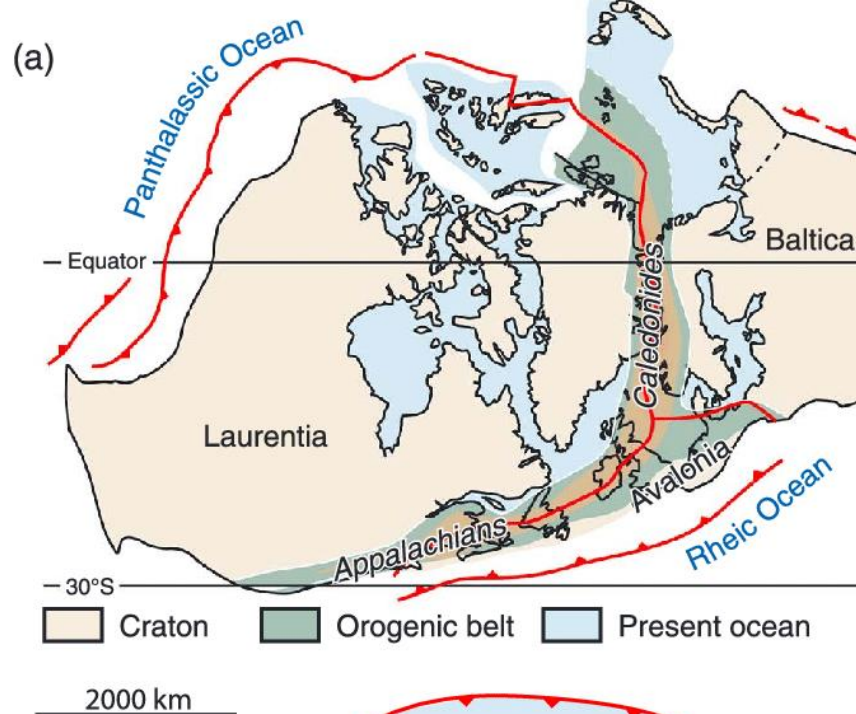
Eonul Phanerozoic: 570 mil. ani - Prezent



PALEOZOIC: 570 – 245 mil. ani (era pădurilor luxuriante de ferigi arborescente; era trilobiților)

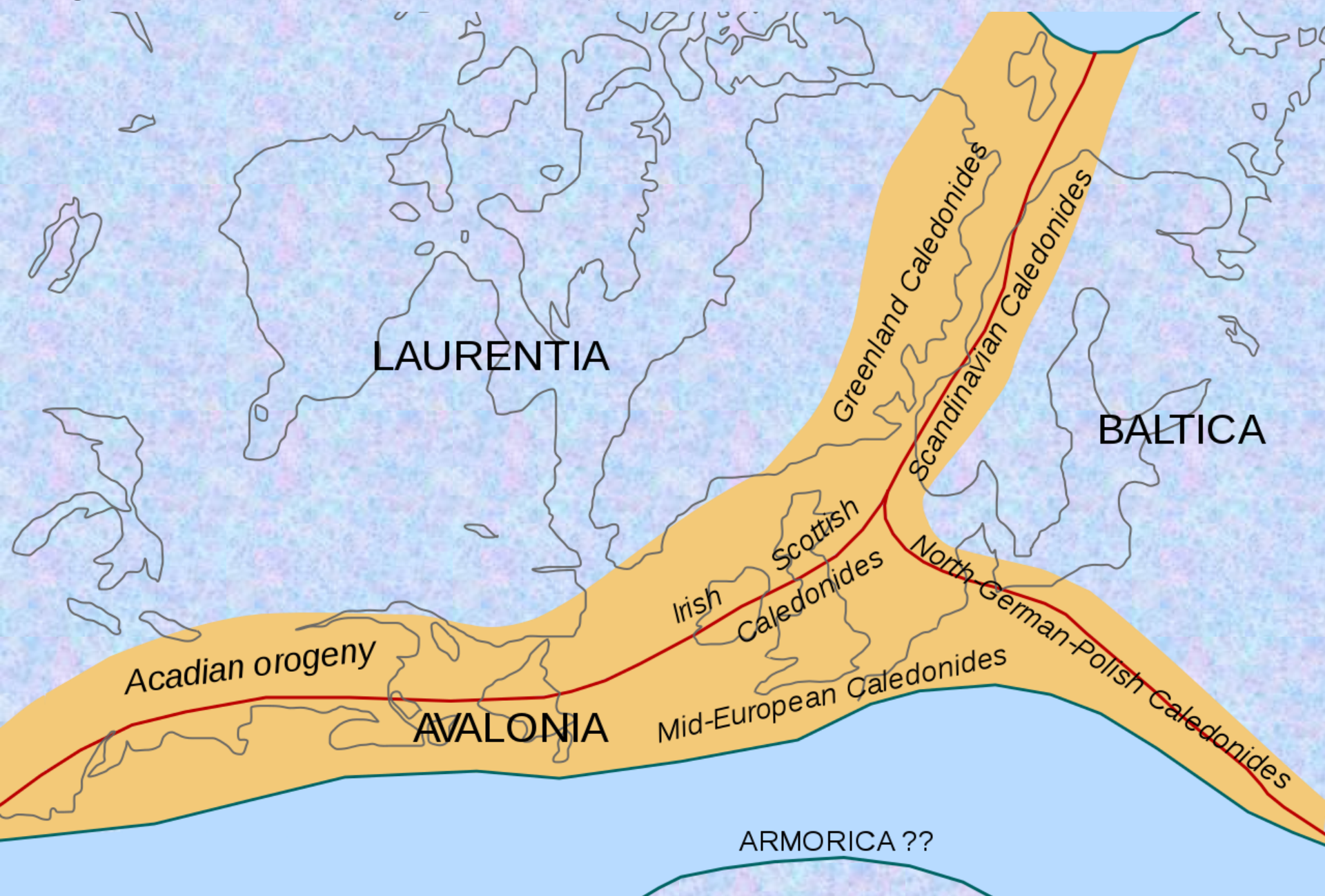


Orogeneza caledoniană (450-400 mil. ani)



https://www.researchgate.net/figure/General-setting-at-420-Ma-of-a-the-Caledonian-Appalachian-belt-based-on-Torsvik-et_fig1_320214785

Orogeneza caledoniană (450-400 mil. ani)





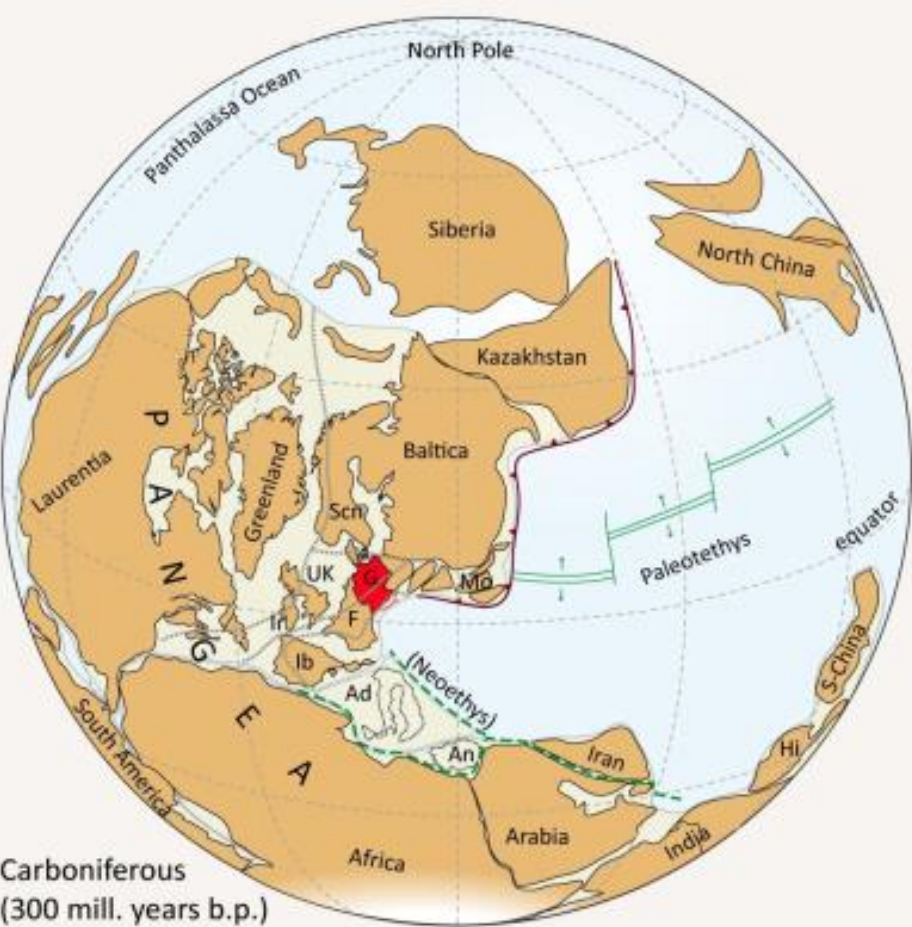
Early Devonian (400Ma)

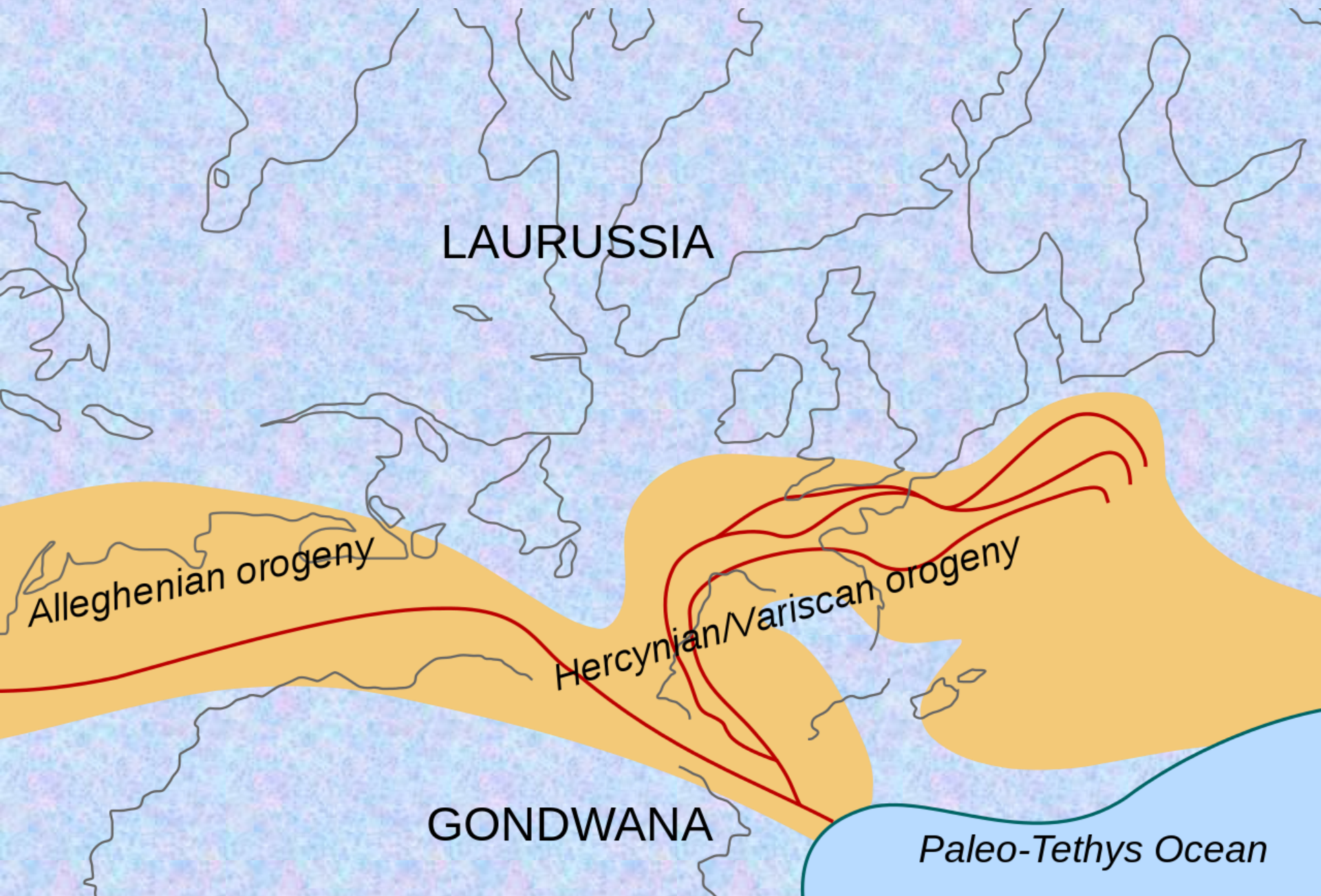
GONDWANA

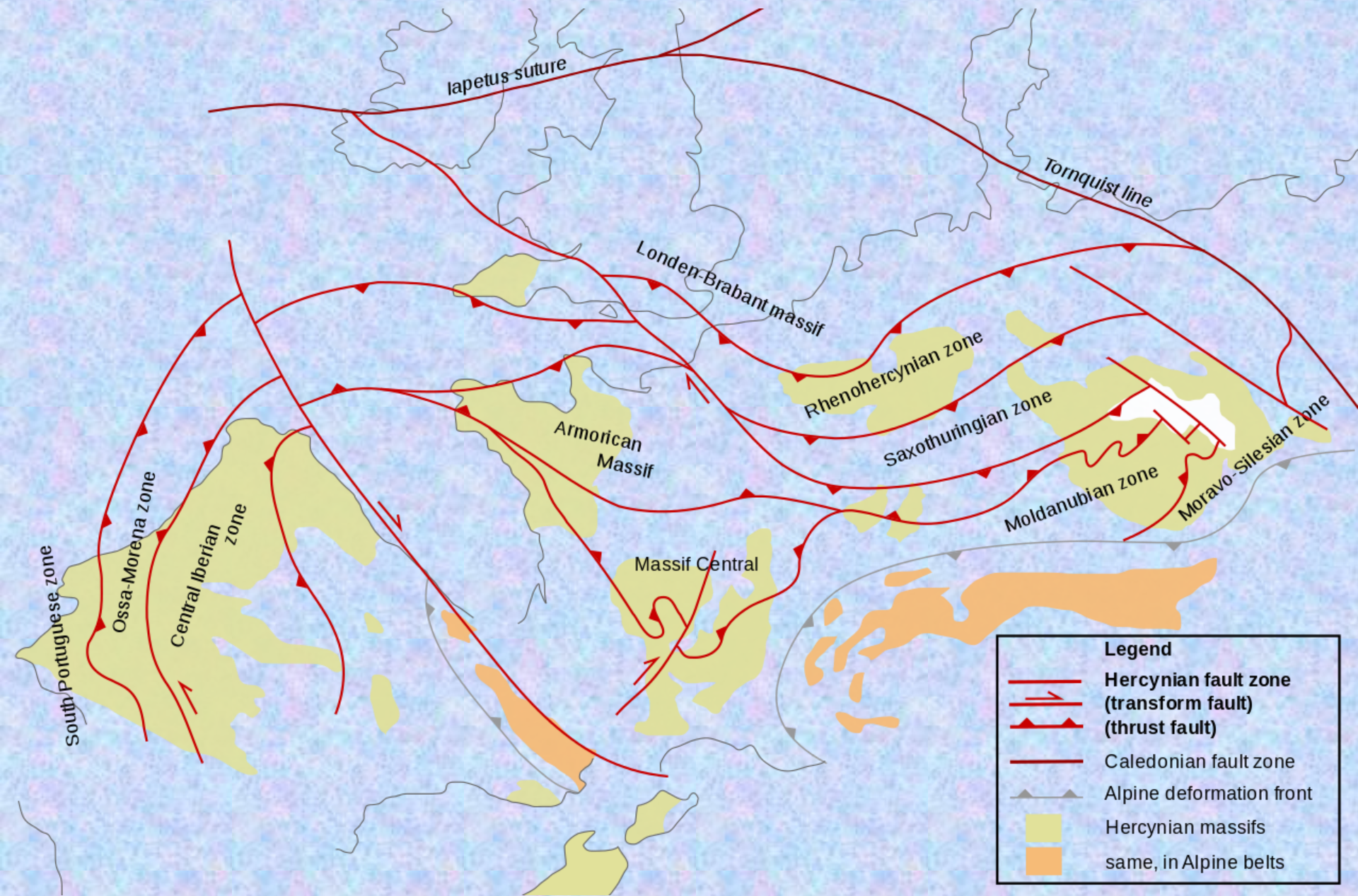


Orogeneza hercinică (300-250 mil. ani)

https://www.zi-online.info/en/artikel/zi_Current_clay_potential_in_Germany_Part_3_Raw_materials_from_the_2672932.html





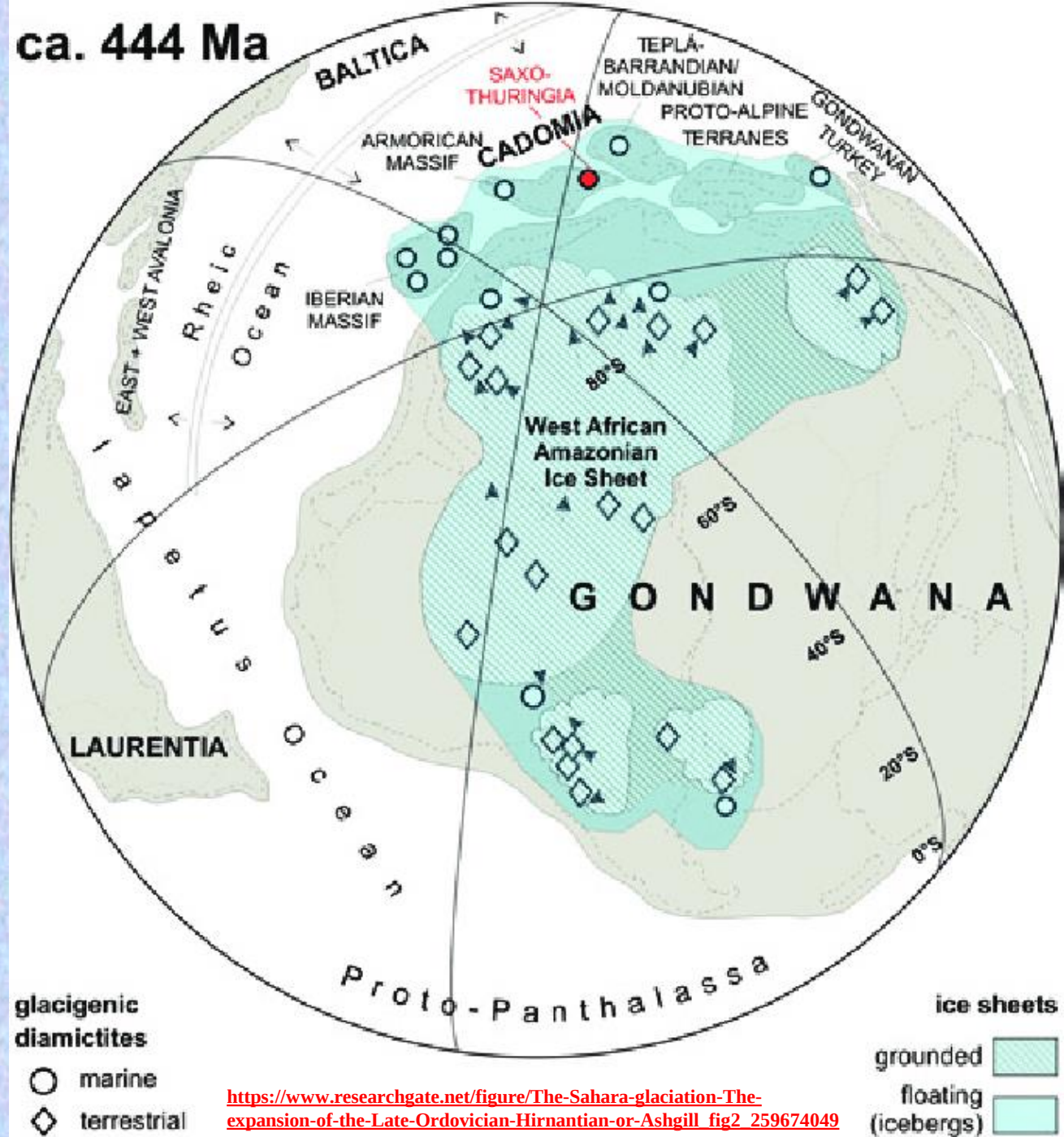




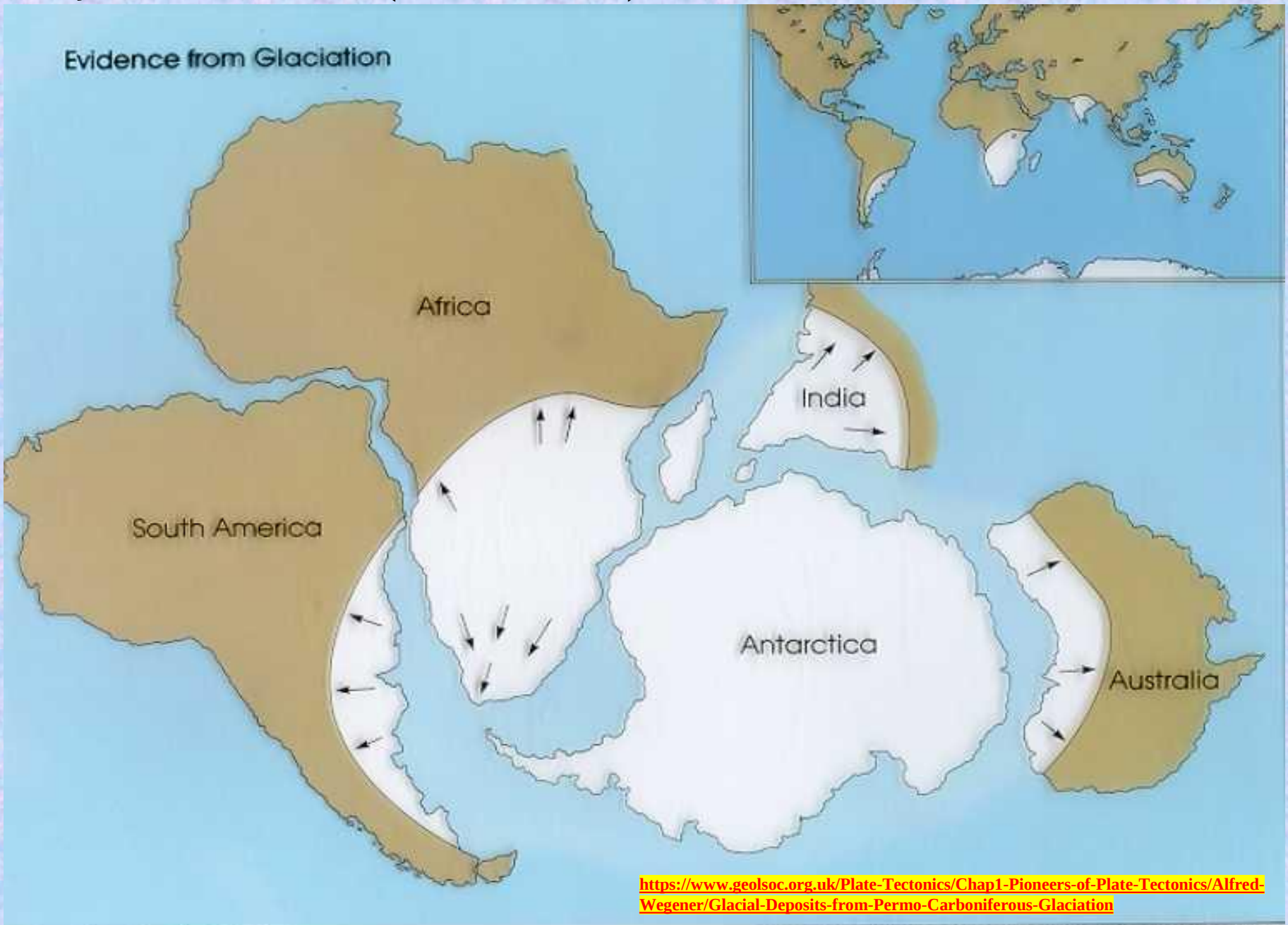
<https://www.wikiwand.com/ro/Europa>

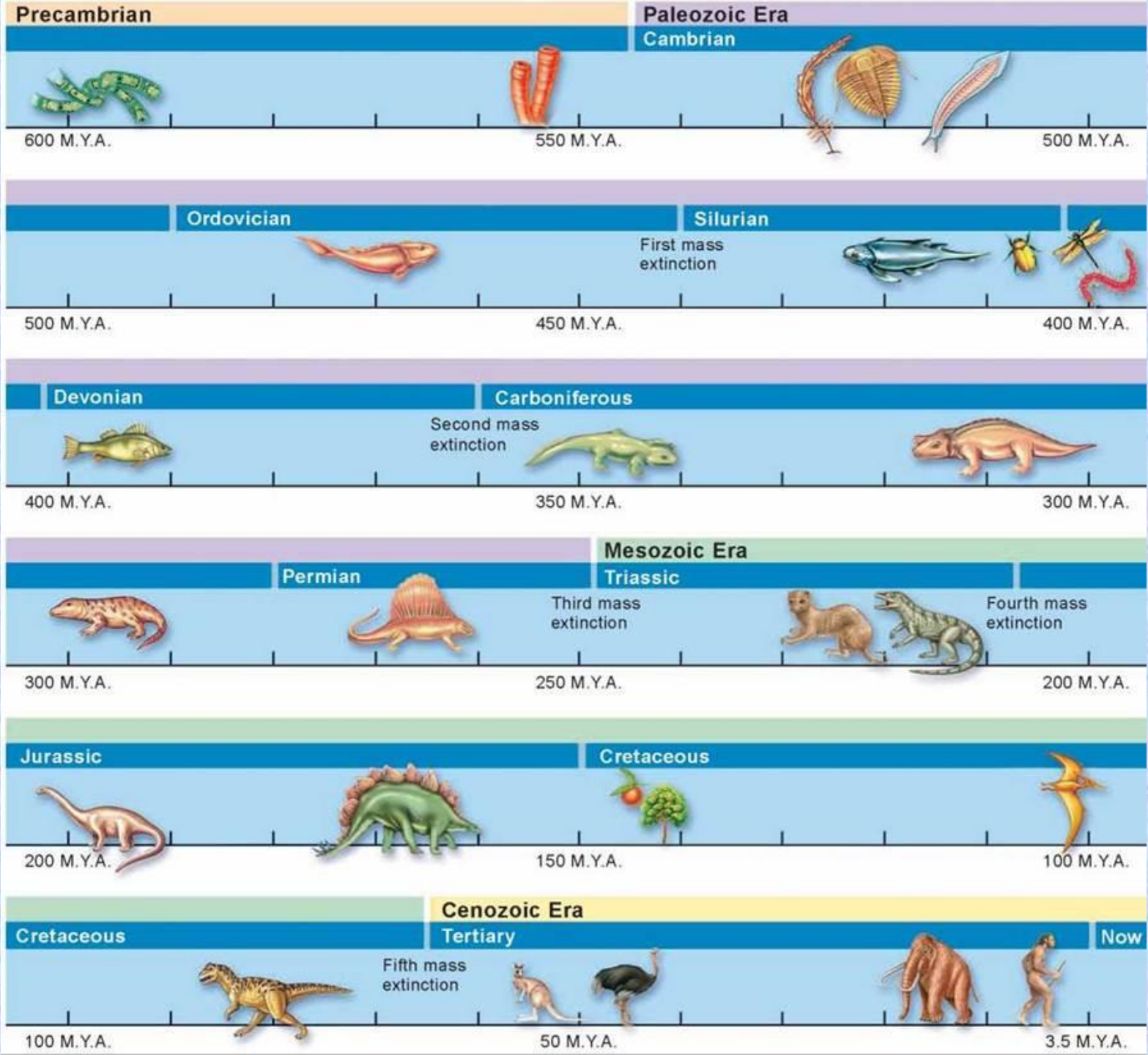


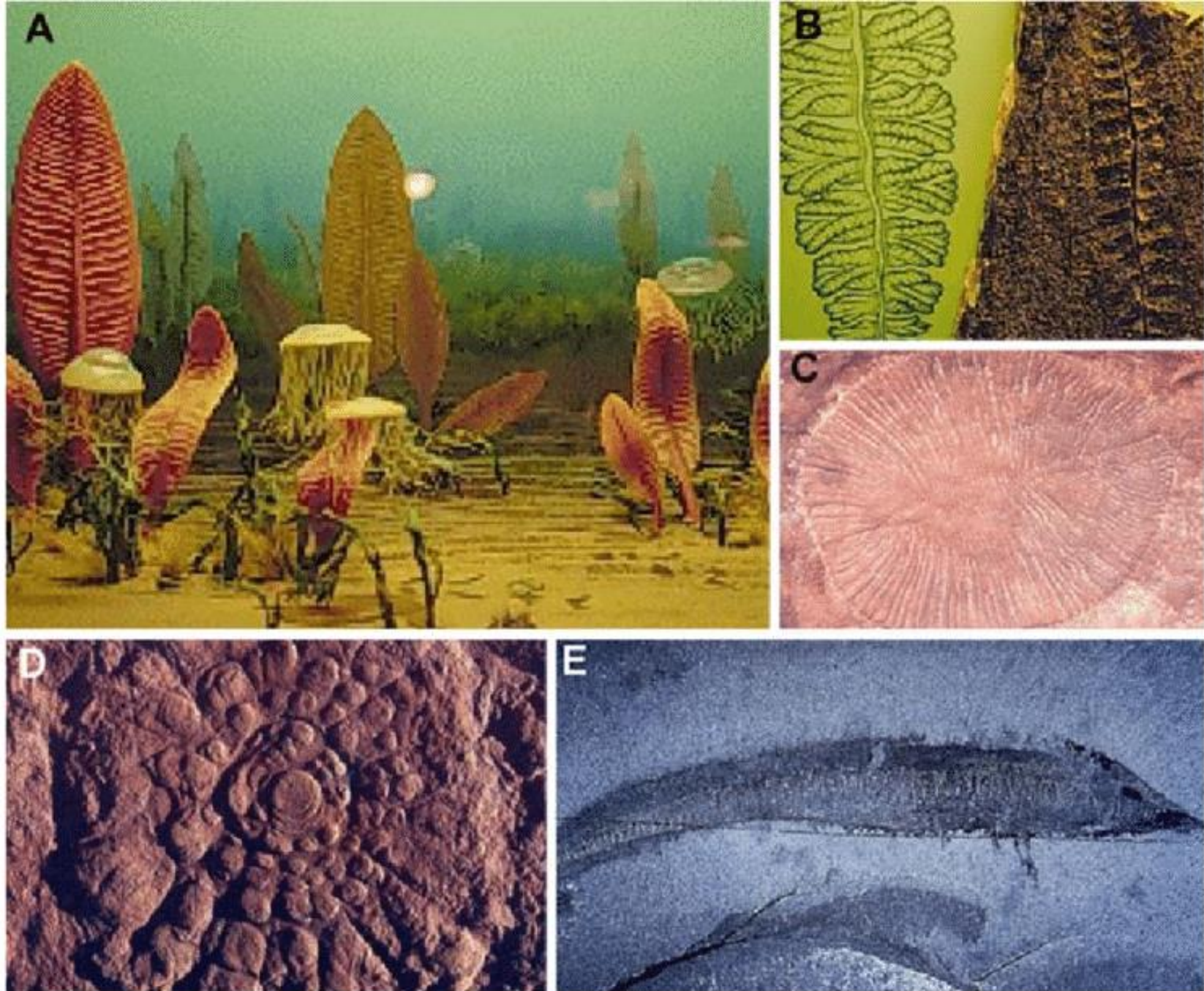
Glaciațiunea Ordoviciană



Glaciațiunea Gondwaniană (310-270 mil. ani)







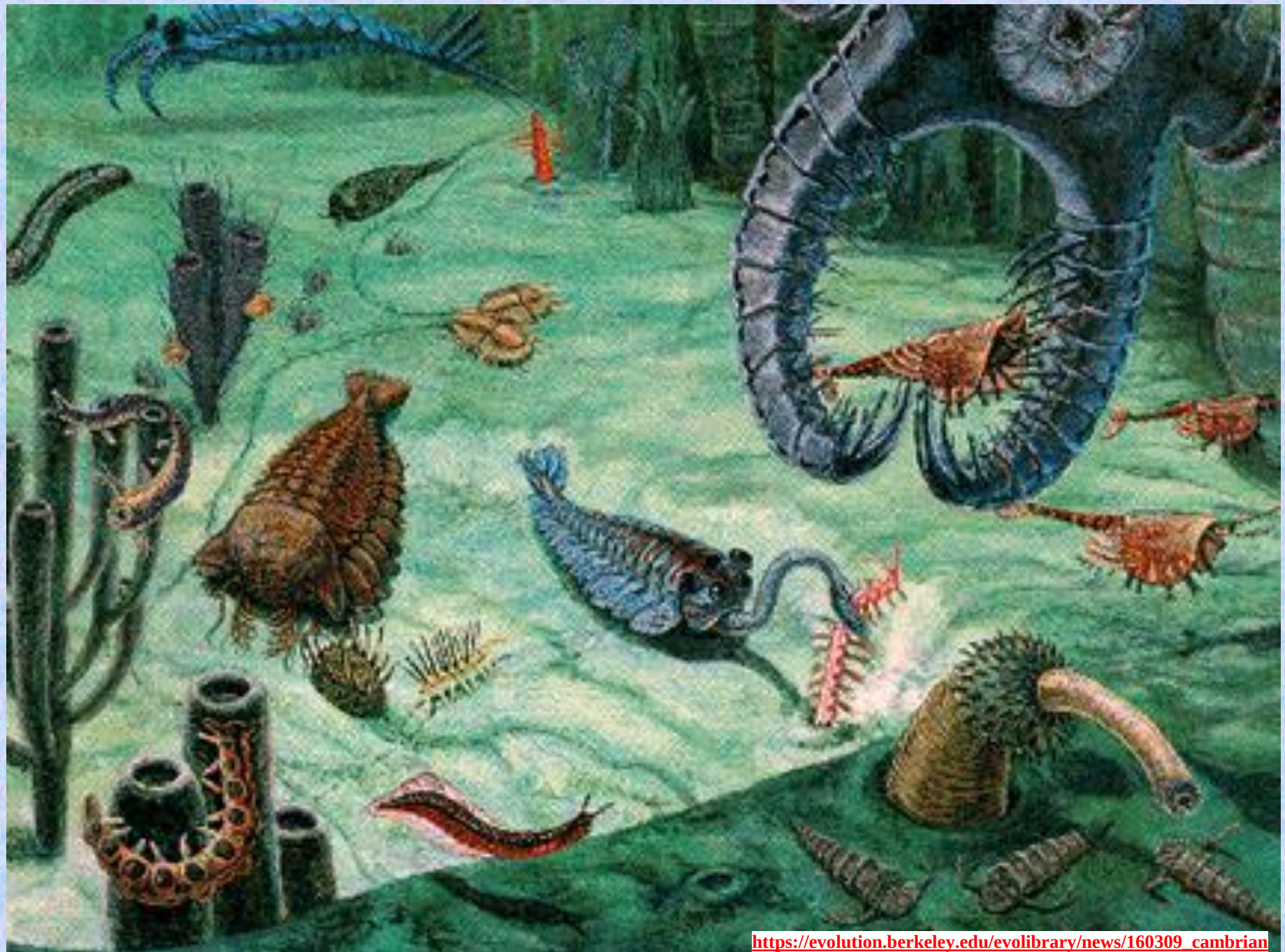


(a)



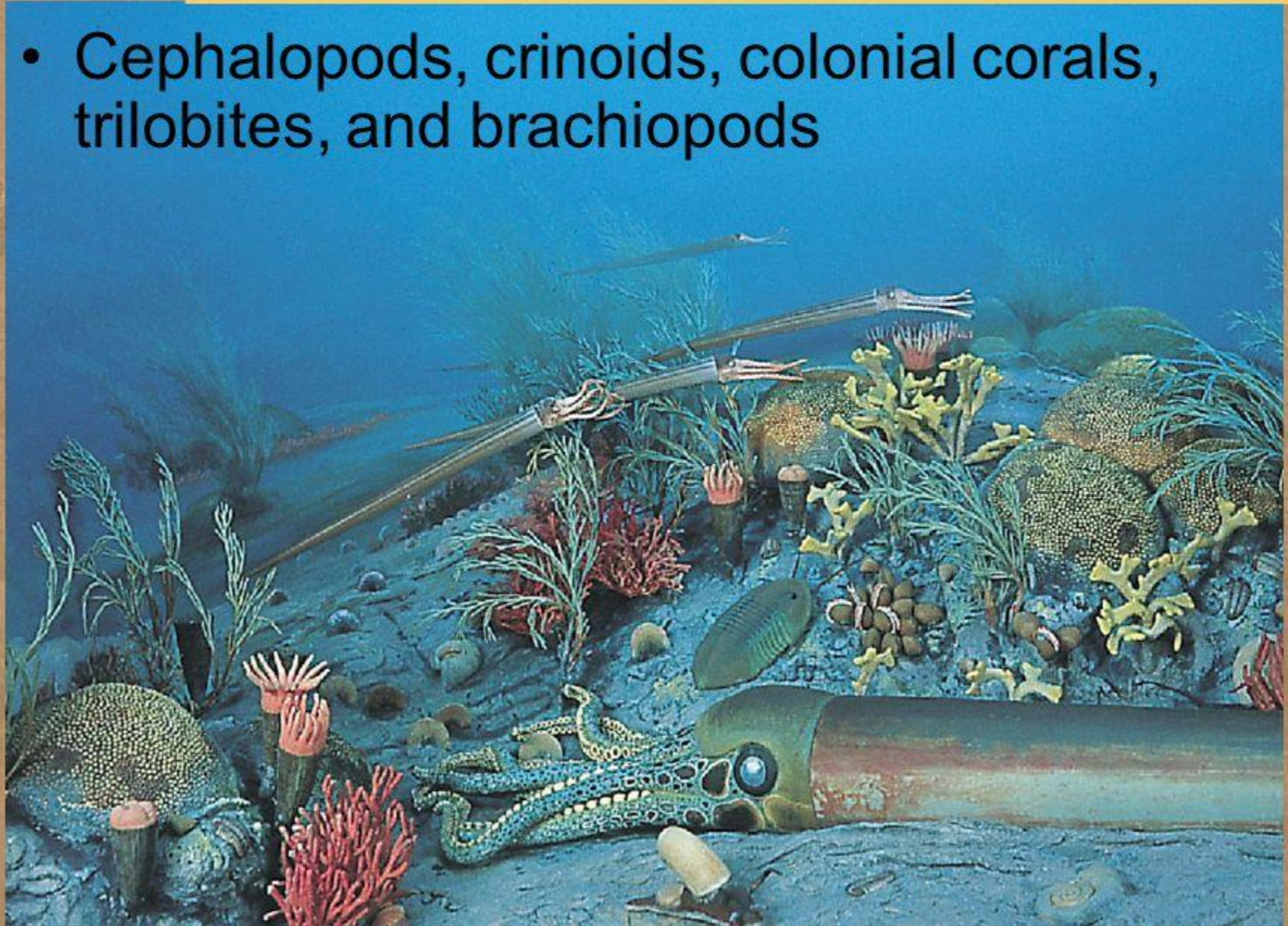
(b)

Cambrian



Middle Ordovician Seafloor Fauna

- Cephalopods, crinoids, colonial corals, trilobites, and brachiopods



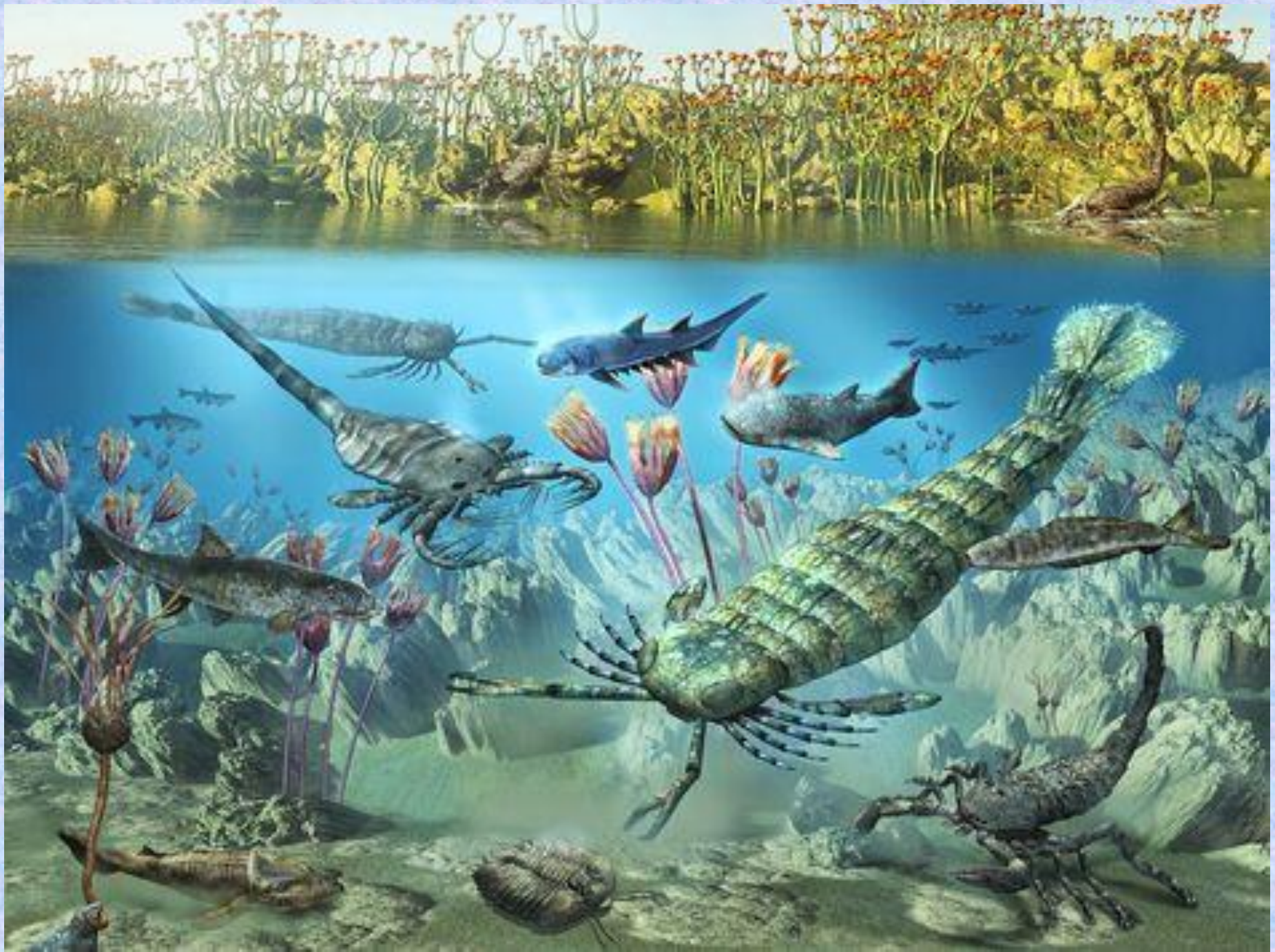


PRIMA EXTINCȚIE

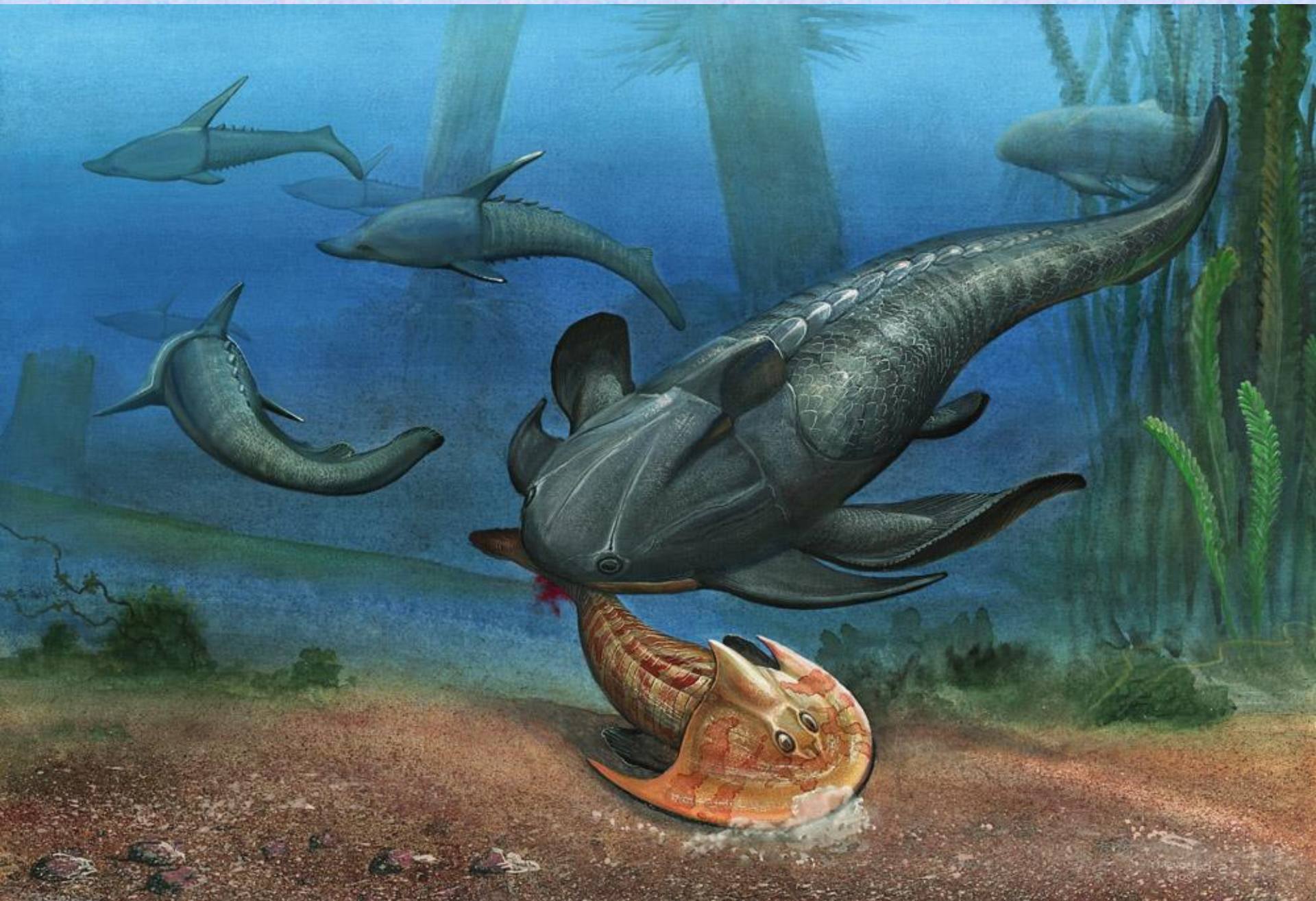
<https://asgardia.space/en/news/Bad-News-Mass-Extinction-Already-Underway>

Silurian

<https://ro.pinterest.com/pin/638596422144748892/?lp=true>

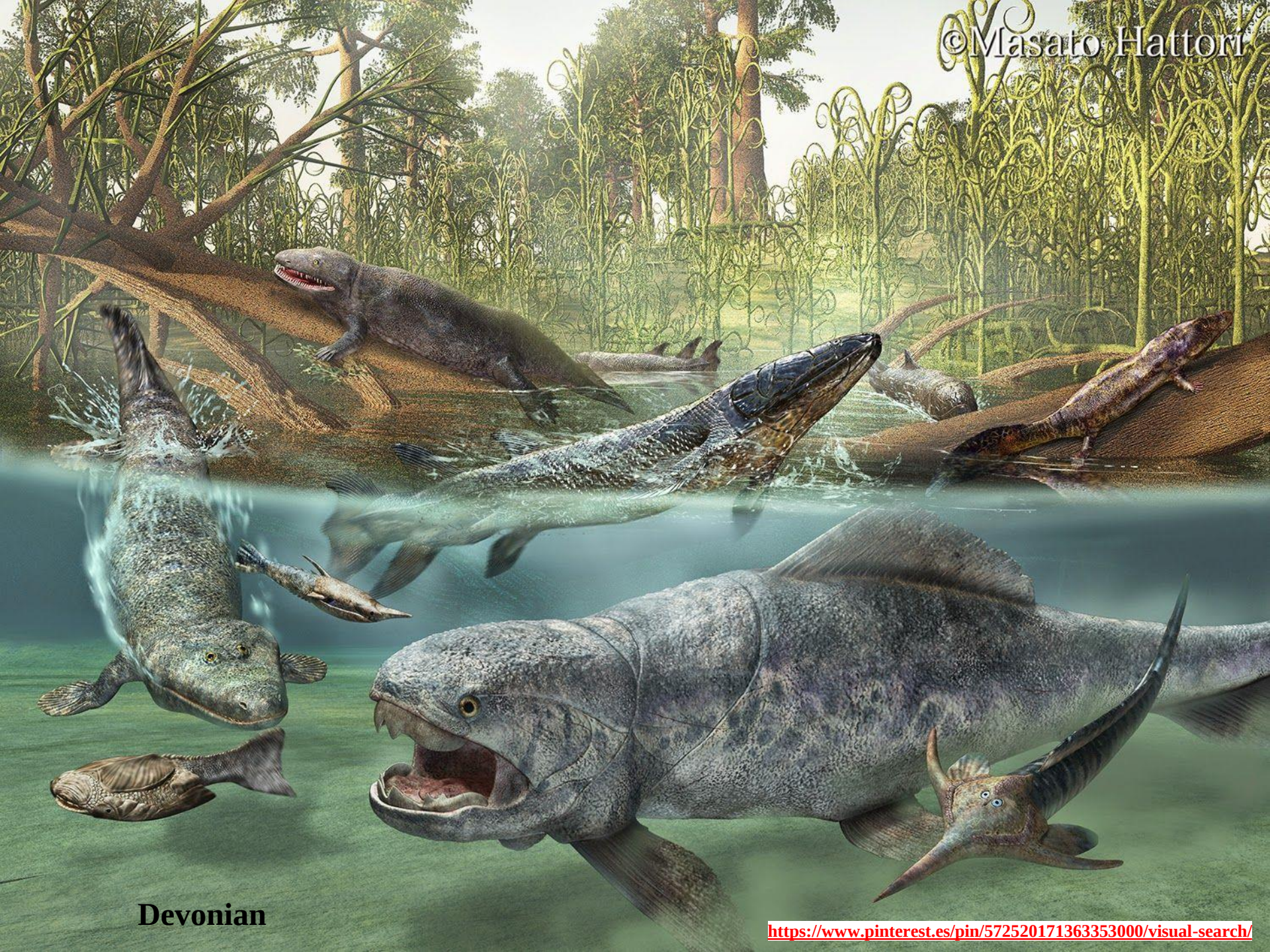


Devonian



Devonian





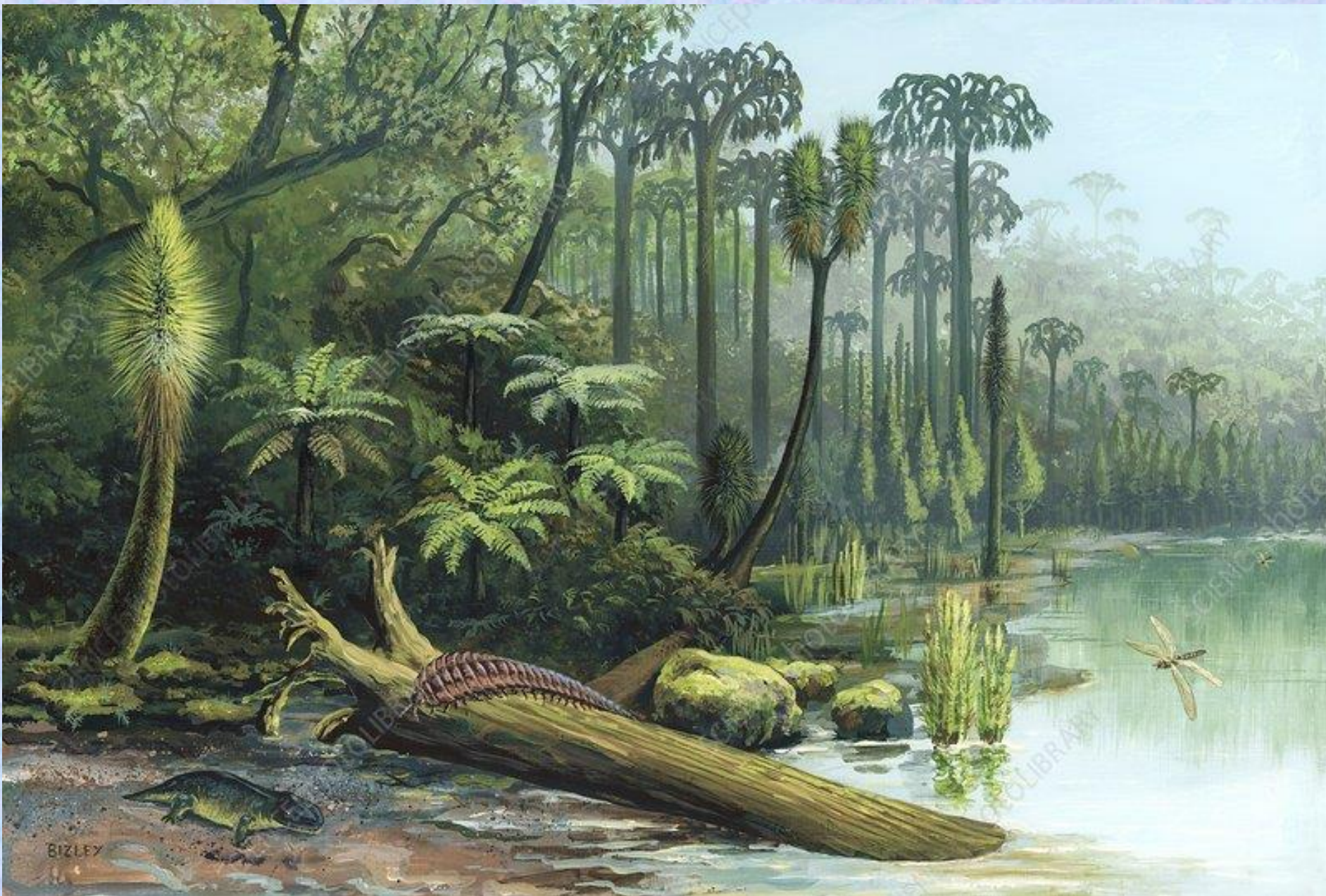
Devonian



A DOUA EXTINCȚIE

<https://asgardia.space/en/news/Bad-News-Mass-Extinction-Already-Underway>

Carbonifer



<https://www.sciencephoto.com/media/518677/view/carboniferous-landscape-artwork>

Carbonifer



"Eryops in Carboniferous swamp"
Copyright © Walter Myers
<http://www.arcadiastreet.com>

Carbonifer



Permian



Permian



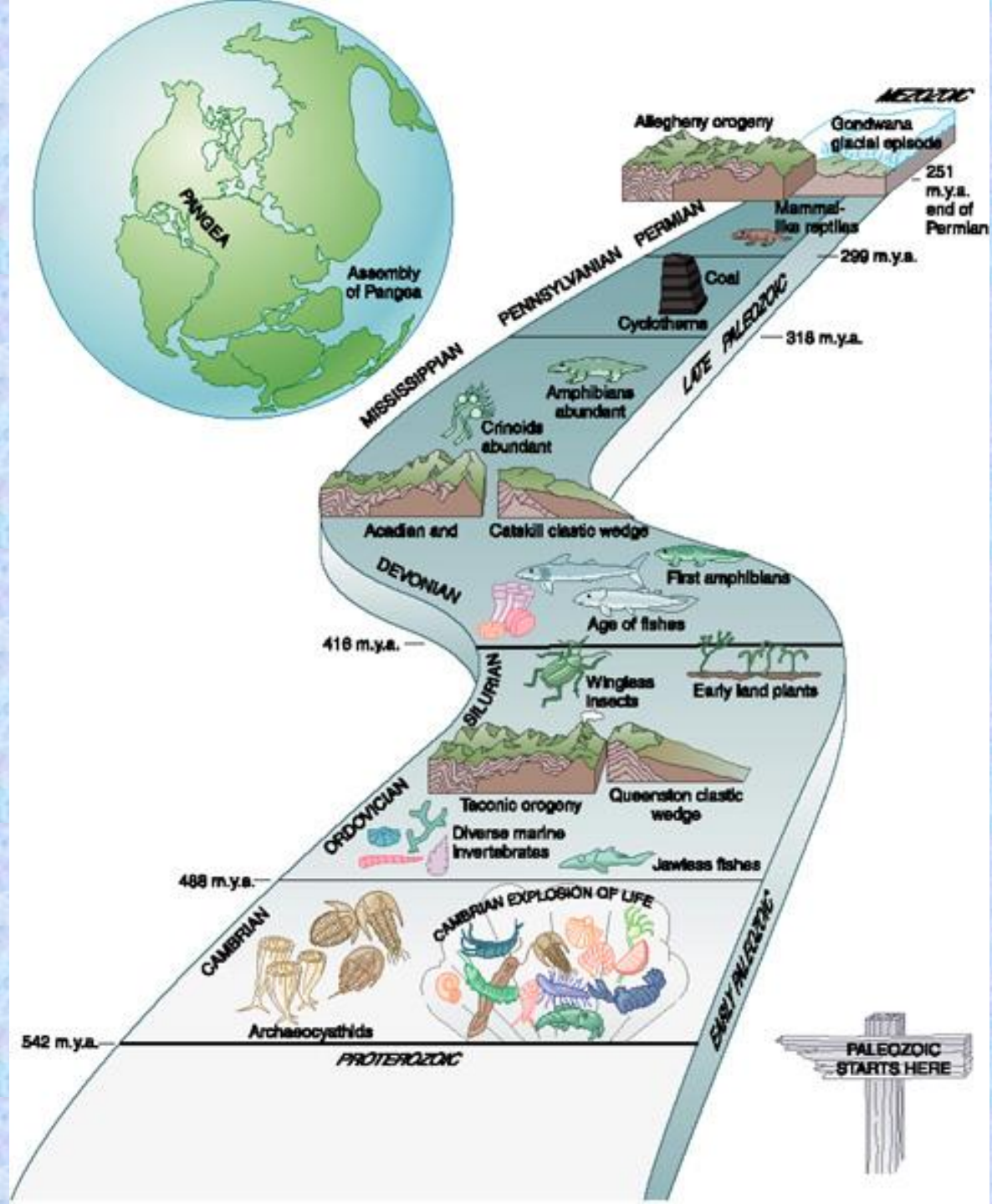
[https://www.mozaweb.com/Extra-3D_scenes-Permian flora and fauna-368763](https://www.mozaweb.com/Extra-3D_scenes-Permian_flora_and_fauna-368763)

A TREIA EXTINCȚIE



<https://www.newscientist.com/article/2150939-the-mass-extinction-that-might-never-have-happened/>









**MULȚUMESC
PENTRU
ATENȚIE!**

Conf. univ. dr. Marian ENE