UVIC

Junior UNIVERSITY

PRE-UNIVERSITY
SUMMER SCHOOL
IN ENGLISH

Vic, 1 - 12 July 2013

(09.00 - 14.00, Monday - Friday)

Vic Urban Fossil Geocaching

This Dossier contains:

- A) Contents
- B) Geological ages of the world
- C) Animal phylogeny or family tree
- D) Building material used in Vic
- E) Urban geocaching handouts
- F) Vic city map

A) Contents:

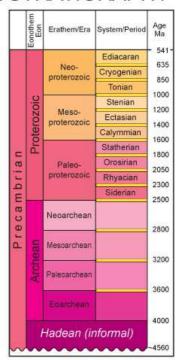
- 1) 1st day session
 - GPS and geocaching explanation
 - Fossils and building materials introduction
 - Get into teams with 1 x GPS and camera
 - Mode of action
 - o Enter GPS coordinates and find the geocaching
 - o Take photo of fossil and surroundings
 - o Fill-in the handout for each fossil
 - o Repeat the previous steps for each geocaching
 - o Mark a cross on the map for each fossil found
 - Geocaching session around Vic
- 2) 2nd day session
 - Ppt session with all Vic's geocaching dossier. At every geocaching people have to say if they found the fossil
 - Make a ranking of teams
 - Each team must prepare a paper about the geocaching session:
 - O What is the most beautiful fossil for you?
 - o Did you have discovered any new place in Vic?
 - O Which place in Vic did you like the best?, Why?
 - ... and explain it in the classroom

PHANEROZOIC and PRECAMBRIAN CHRONOSTRATIGRAPHY

Eonothe	Erathem Era	System	Series/Epoch	Stage/Age	Age
			Holocene		0.0118
		Quaternary		Upper	0.126
		ter	Pleistocene	"lonian"	10.4.000000000
		Jua	Pleistocene	Calabrian	0.781 1,806
		_		Gelasian	2,588
			-	Piacenzian	3.600
			Pliocene	Zanclean	5.333
		Ф		Messinian	SHAR
	()	len		Tortonian	7,246
	enozoic	Veogene	Wasses	Serravallian	11.63
	Z (ž	Miocene	Langhian	13.82
	0 1			Burdigalian	15.97
	е			Aquitanian	20.44
	O		24	Chattian	23.03
			Oligocene	Rupelian	28.1 33.9
				Priabonian	12195-200
		ene		Bartonian	37.8 ±0.5
		oge	Eocene	Lutetian	41.2 ±0.5
		Paleogene		Ypresian	47.8 ±0.2
		۵		Thanetian	56.0
			Paleocene	Selandian	59.2
				Danian	61.6
				Maastrichtian	66.0 ±0.05
0				Campanian	72.1 ±0.2
0			Upper	Santonian	83.6 ±0.2
anerozoic		Cretaceous		Coniacian	86.3 ±0.5
er				Turonian	89.8 ±0.3
_				Cenomanian	93.9 ±0.2
ha		ac		Albian	100.5 ±0.4
۵		Cret	Lower	Aptian	113.0 ±0.4
				Barremian	126.3 ±0.4
	ozoic			Hauterivian	130.8 ±0,5
				Valanginian	133,9 ±0.6
				Berriasian	139.4 ±0.7
		Jurassic		Tithonian	145.0 ±0.8
			Upper	Kimmeridgian	152.1 ±0.9
				Oxfordian	157.3±1.0
				Callovian	163.5 ±1.1
	e s			Bathonian	166.1 ±1.2
	Σ		Middle	Bajocian	168.3 ±1.3
				Aalenian	170.3 ±1.4
				Toarcian	174.1 ±1.0
				Pliensbachian	182.7 ±0.7
			Lower	Sinemunan	190.8 ±1.0
				CONTRACTOR OF THE PARTY OF THE	199,3 ±0.3
				Hettangian Rhaetian	201.3 ±0.2
		riassic		D. Darameters	~ 209.5
			Upper	Norian	~ 228.4
				Carnian	237.0±1.0
		īä	Middle	Ladinian	241.5 ±1.0
					The State of
		H	a di mana	Anisian Olenekian	247.1±0.2

Eonothem	Erathem Era	System	Serie	s/Epoch	Stage/A	ge Age	
ш				· ·	Changhsin	252.2 ±0	,5
			Lop	ingian	Wuchiapin	254.2 ±0	.3
			_		Capitan	259.8 ±0	.4
		=	Cum	lalumian	THE RESERVE THE PARTY OF THE PA	265.1 ±0	.4
		Permian	Guadalupian		Wordia	268.8 ±0	.5
	250	em			Roadia	272.3 ±0	.5
	ic	ď.	Cisuralian		Kungun	279.3 ±0	.6
	0 Z 0				Artinski	290.1 ±0	.2
					Sakmar	295.5 ±0	.4
	9				Asselia	298.9 ±0	.2
	m	/aia		Upper	Gzhelia	303.7 ±0	. 1
	۵	뙭	Penn- Ivaniar		Kasimov		
		ᆲ	Pe	Middle	Moscov	an 315.2 ±0	
63		핓	0.77	Lower	Bashkiri		
) i (ě	å ⊆	Upper	Serpukho	330.9 ±0	
anerozoic		ပိ	lissii ppia	Middle	Visea	346.7 ±0	
0			≥ 8	Lower	Toumais	346.7 ±0	
ø			10	e de la companya de l	Famenn	ian	
an			U	pper	Frasnia	372.2 ±1	
_		a			Givetia	382.7 ±1	
٩		illo	M	iddle	Eifelia	387.7 ±0	3.0
		Devonian			Emsia	393.3 ±1	
			Lower		Pragia	407.6 ±2	2.6
					Lochkov	410.8 ±2	2.8
		Silurian	P	ridoli	Logino	419.2 ±3	3.2
			Pridoli Ludlow		Ludford	423.0 ±2	2.3
					Gorstia	425.6 ±0	0.5
			_		Homeri	427.4 ±0) 5
			Wenlock		-create and a supplemental of the supplemental	430.5 ±0).7
					Sheinwoo	433.4 ±0	3.0
			Llandovery		Telychi	438.5 ±1	
				idovery	Aeronia	440.8 ±1	12
					Rhuddar	443.8 ±1	
			Upper		Himant	445.2 ±1	1
		Ordovician			Katian	453.0 ±0).7
					Sandbia	458.4 ±0	
			Middle		Darnwil	467.3 ±1	
					Daping	470.0 ±1	
			16	ower	Floiar	477.7 ±1	
			-5//////	Tremado	cian 485.4 ±1		
		THE THE			Stage	10 ~ 489.5	
			Fur	ongian	Jiangsha	nian ~ 494	
					Paibia	n ~ 497	
					Guzhang	gian ~ 500.5	
		pri	Se	Series 3	Drumia	~ 504.5	
		Cambriar			Stage	5 - 509	
		Ö	0-	ries 2	Stage	4 ~ 514	
			36	1105 Z	Stage	3 ~ 521	
			Terror		Stage		
			Terreneuvian		Fortuni		

This chart was drafted by Gabi Ogg.



Units of the international chronostratigraphic scale with estimated numerical ages from the GTS2012 age model.

Colors are according to the Commission for the Geological Map of the World.

Subdivisions of the Phanerozoic are formally defined by a Global boundary Stratotype Section and Point (GSSP) at each lower boundary. Thick yellow lines between stages on this diagram denote GSSPs approved by the International Commission on Stratigraphy (ICS) and ratified by the International Union of Geological Sciences (IUGS).

Precambrian units are formally defined by absolute age (Global Standard Stratigraphic Age — GSSA), with the exception of the Ediacaran System defined by a basal GSSP.

Numerical ages assigned to unit boundaries are subject to revision upon formal decision or revision of GSSPs and when enhanced radio-isotopic and cyclostratigraphy studies enable improvements to the age models.

Stratigraphic information and details on international and regional geologic units can be found on the websites of the ICS (www.stratigraphy.org) and the Geologic TimeScale Foundation (https://engineering.purdue.edu/stratigraphy).

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Figure 1. Geological ages of the world

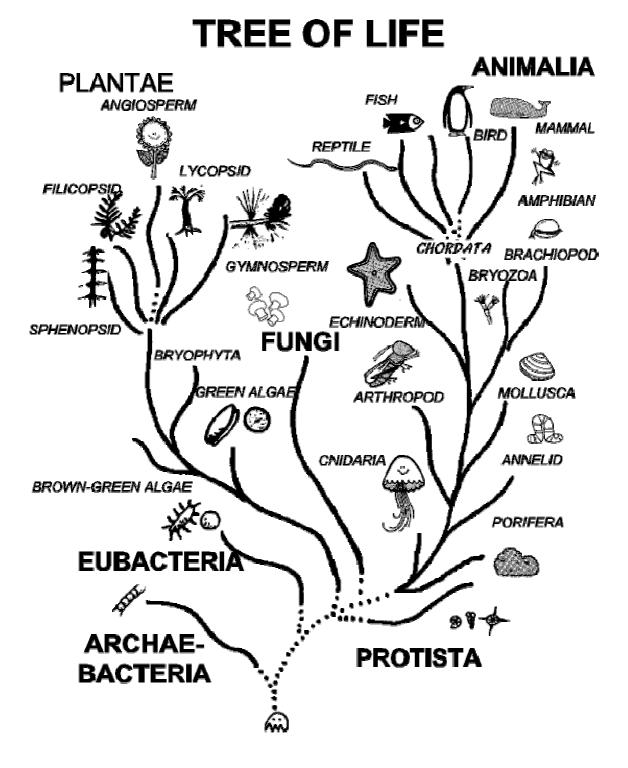


Figure 2. Animal phylogeny or family tree, diagramming the relationships among phyla of living animals.

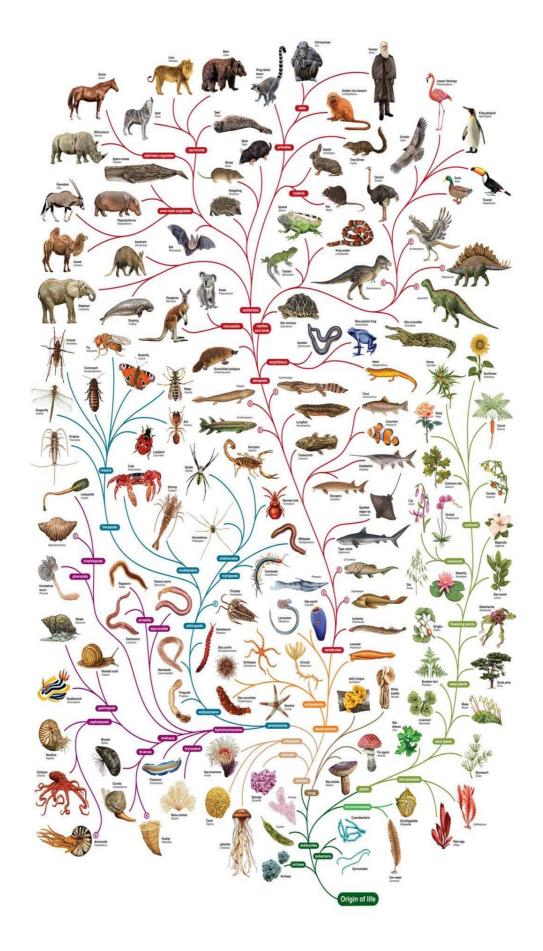


Figure 3. Animal phylogeny or family tree, diagramming the relationships among phyla of living and death animals.

D) Building fossil material used in Vic

1) Sant Vicenç de Castellet Stone

This limestone material is formed of calcium carbonate, with quartz, silica and magnesium carbonate. The Sant Vicenç stone is a packstone of nummulites, discocyclina, rhodophycea red algae, echinoderm remains and other wildlife formed in the carbonated interior sea of the **Eocene** Ebre basin. Its color is dark grey and the fossils are white color.

Sant Vicenç de Castellet (Barcelona) has special geological conditions that has allowed limestone extraction over a long time.

2) Ulldecona stone

Ulldecona stone is **aptian** rudist limestone and its common name is "pedra de la Cènia". Rudists are an extinct group of marine heterodont bivalves that arose during the **Jurassic** and became so diverse during the **Cretaceous** that they were major reef-building organisms in the Tethys Ocean. Its color is yellow to brown

There are four extraction and stone preparation businesses around Ulldecona (Tarragona). The total stone extraction is 2500 cubic meters a month with 150 people working on it.

3) Rojo Ereño or Rojo Bilbao

People have exploited **cretacic** limestones from Ereño (Urdaibai, Vizcaya) since Roman times. Rojo Ereño is famous for its high fossil content especially rudists with white and grey colours included in a characteristic red matrix.

Calcite is the most abundant mineral (87%) followed from quartz (8%), potasium feldspars (3%) and 1% of hematite (iron oxide) responsible for the red colour.

4) Girona stone

Sedimentary limestone with a lot of fossils like nummulites. Nummulites are the only fossils in this stone, depending of de section nummulites are spherical or elliptical. Its color is light grey.

Calcium carbonate is the most important component, quartz (made up of a continuous framework of SiO_4), and feldspars (a group of silicates) are also in the Girona stone composition.

A lot of buildings are made with nummulitic limestone: Girona cathedral, some parts of Palau de la Generalitat and Pedralbes monastery in Barcelona and Keops Pyramid in Egypt.

Tavertet stone is a variety of **Eocene** nummulitic limestone from Tavertet (Osona) with which Vic's cathedral was built.

E) Urban geocaching handouts

Geocaching identificator: G4

Coordinates/Location: 41°55'53.05"N; 2°14'44.01"E. On a wall





a) b)

Geocaching identificator: 7M

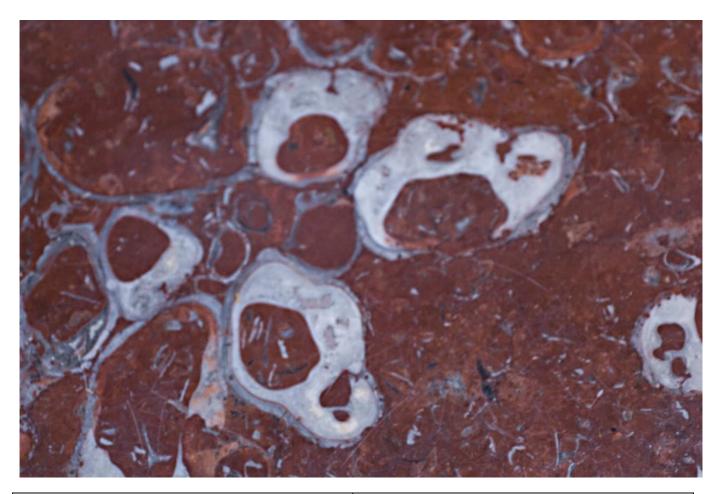
Coordinates/Location: 41°55′52.61″N; 2°14′58.23″E. On the steps of a building



Animal phylogeny/name	
Extinct or not?	
Age (in million years)	
Building material	
Other fossils in the same place?	

Geocaching identificator: BB

Coordinates/Location: 41°55'55.22"N; 2°15'5.62"E. In the entrance hall of a building



Animal phylogeny/name	
Extinct or not?	
Age (in million years)	
Building material	
Other fossils in the same place?	

Geocaching identificator: 9KK

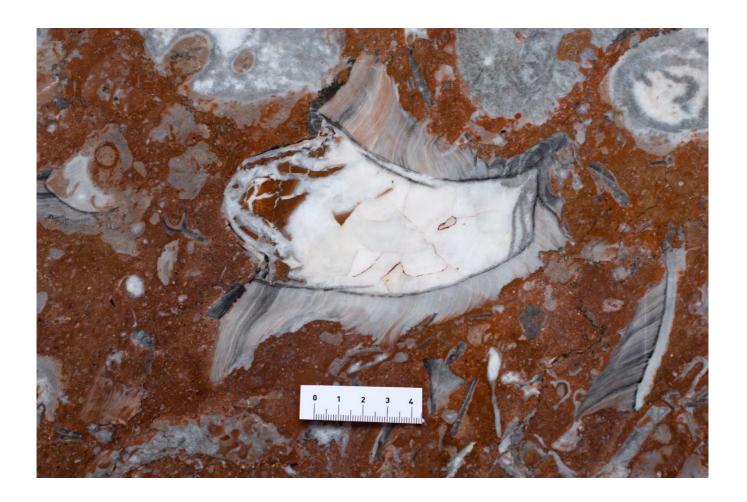
Coordinates/Location: 41°55′59.00″N; 2°15′20.87″E. On a wall of a school



Animal phylogeny/name	
Extinct or not?	
Age (in milion years)	
Building material	
Other fossils in the same place?	

Geocaching identificator: H0

Coordinates/Location: 41°55′54.37″N; 2°15′19.20″E. On the wall of a store



Animal phylogeny/name	
Extinct or not?	
Age (in million years)	
Building material	
Other fossils in the same place?	

Geocaching identificator: 99

Coordinates/Location: 41°55′51.69″N; 2°15′20.64″E. In the entrance of a store



Animal phylogeny/name	
Extinct or not?	
Age (in million years)	
Building material	
Other fossils in the same place?	

Geocaching identificator: 6Y

Coordinates/Location: 41°55′50.75″N; 2°15′24.28″E. In the cobblestone



Animal phylogeny/name	
Extinct or not?	
Age (in million years)	
Building material	
Other fossils in the same place?	

Geocaching identificator: KW

Coordinates/Location: 41°55'47.14"N; 2°15'20.39"E. In the cobblestone



Animal phylogeny/name	
Extinct or not?	
Age (in million years)	
Building material	
Other fossils in the same place?	

Geocaching identificator: R9

Coordinates/Location: 41°55'46.60"N; 2°15'19.98"E. In the entrance of a building



Animal phylogeny/name	
Extinct or not?	
Age (in million years)	
Building material	
Other fossils in the same place?	

Geocaching identificator: MLC

Coordinates/Location: 41°55'42.57"N; 2°15'18.88"E. In the paving stone



Animal phylogeny/name	
Extinct or not?	
Age (in million years)	
Building material	
Other fossils in the same place?	

Geocaching identificator: 710

Coordinates/Location: 41°55'38.31"N; 2°15'22.11"E. On the wall of a building



Animal phylogeny/name	
Extinct or not?	
Age (in million years)	
Building material	
Other fossils in the same place?	

Geocaching identificator: JVF

Coordinates/Location: 41°55'41.47"N; 2°15'18.57"E. In the front of a big building



Animal phylogeny/name	
Extinct or not?	
Age (in million years)	
Building material	
Other fossils in the same place?	

Geocaching identificator: 564

Coordinates/Location: 41°55'48.98"N; 2°15'13.82"E. In the paving stone





a) b)

Animal phylogeny/name for a) for b)	
Extinct or not?	
Age (in million years) for a) for b)	
Building material for a) for b)	
Other fossils in the same place?	

Geocaching identificator: U7

Coordinates/Location: 41°55'49.58"N; 2°15'13.69"E. In the front of a store



Animal phylogeny/name	
Extinct or not?	
Age (in million years)	
Building material	
Other fossils in the same place?	

Geocaching identificator: D9

Coordinates/Location: 41°55'49.3

0"N; 2°15'12.14"E. In the paving stone



by:

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