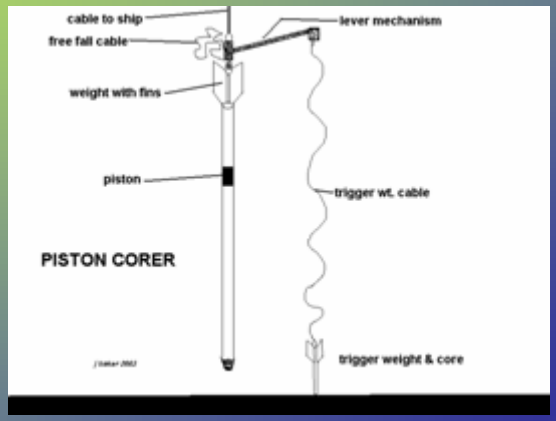
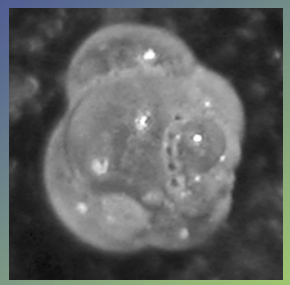
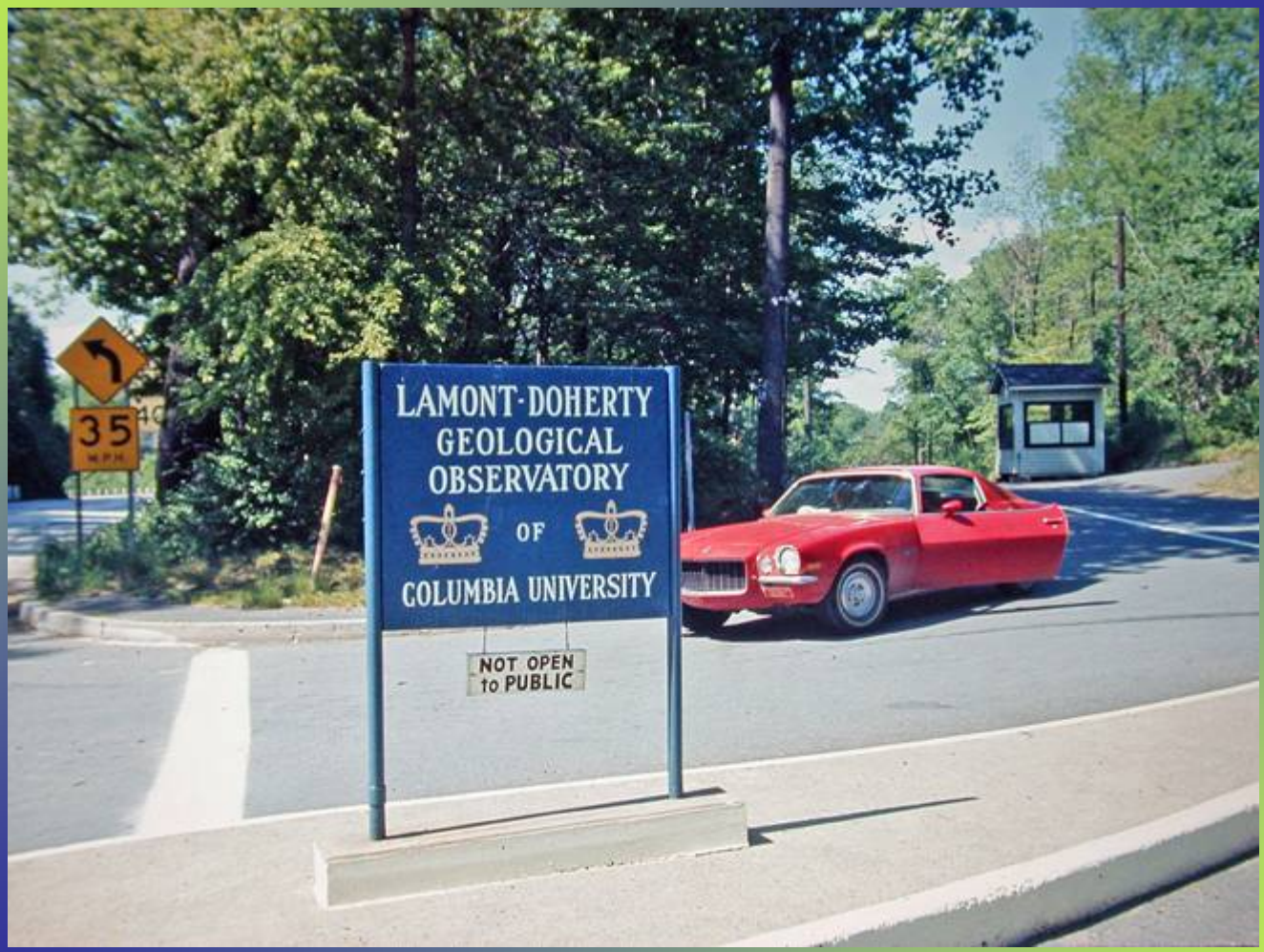


Deep Sea Coring Of Ocean Floor Sediments

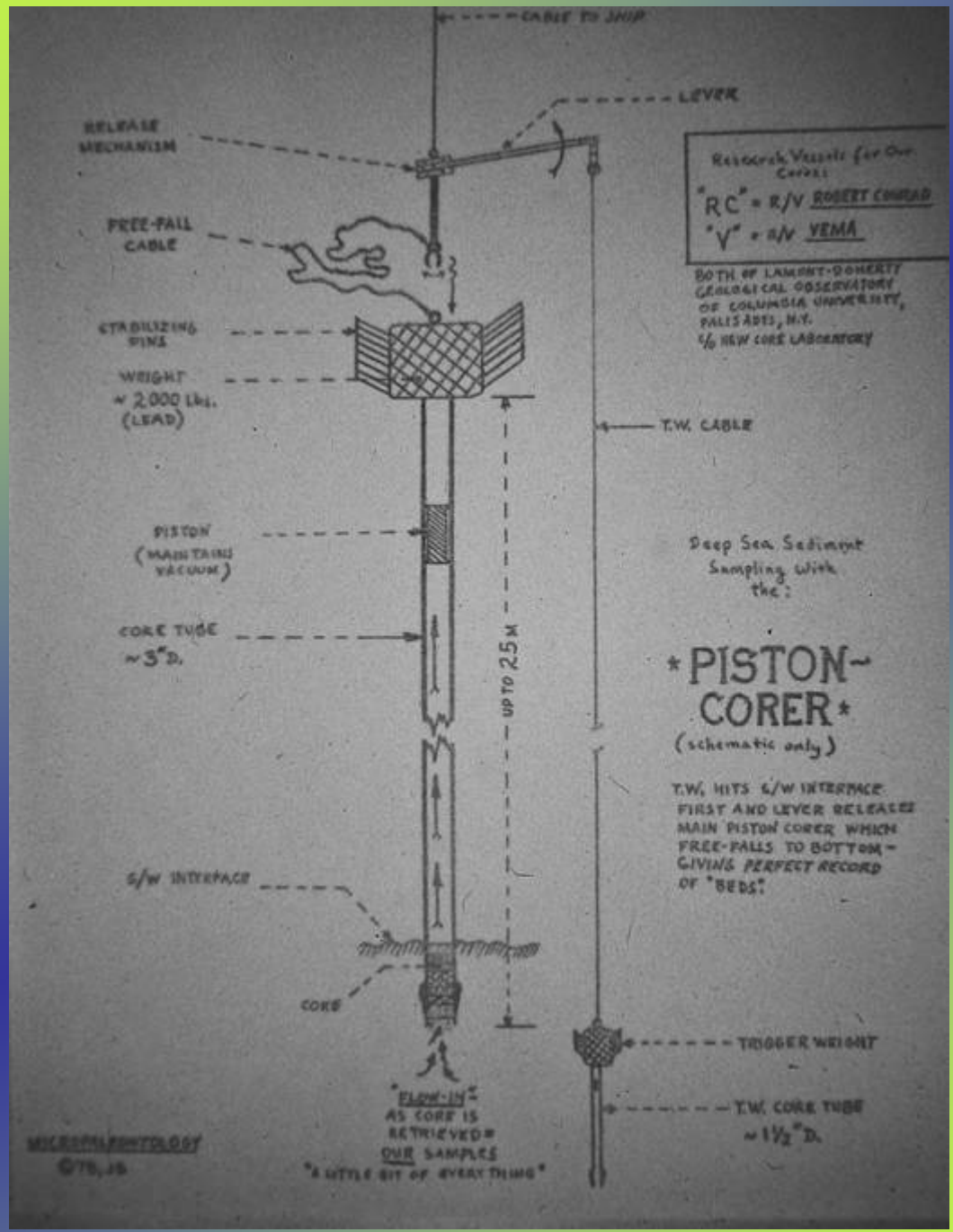


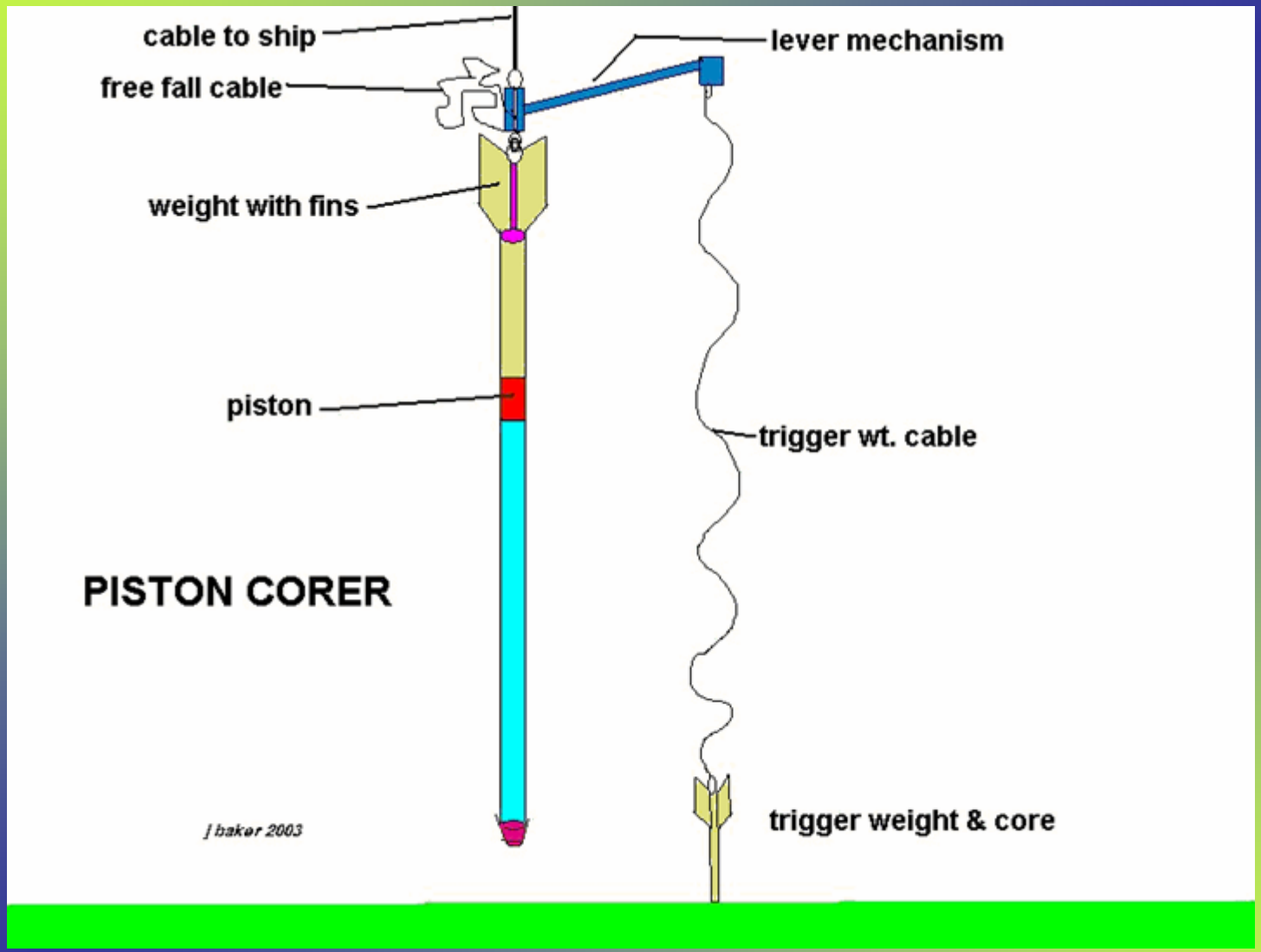
John Baker


LAMONT-DOHERTY
GEOLOGICAL
OBSERVATORY
OF
COLUMBIA UNIVERSITY
NOT OPEN
to PUBLIC
35


ROBERT D. CONRAD

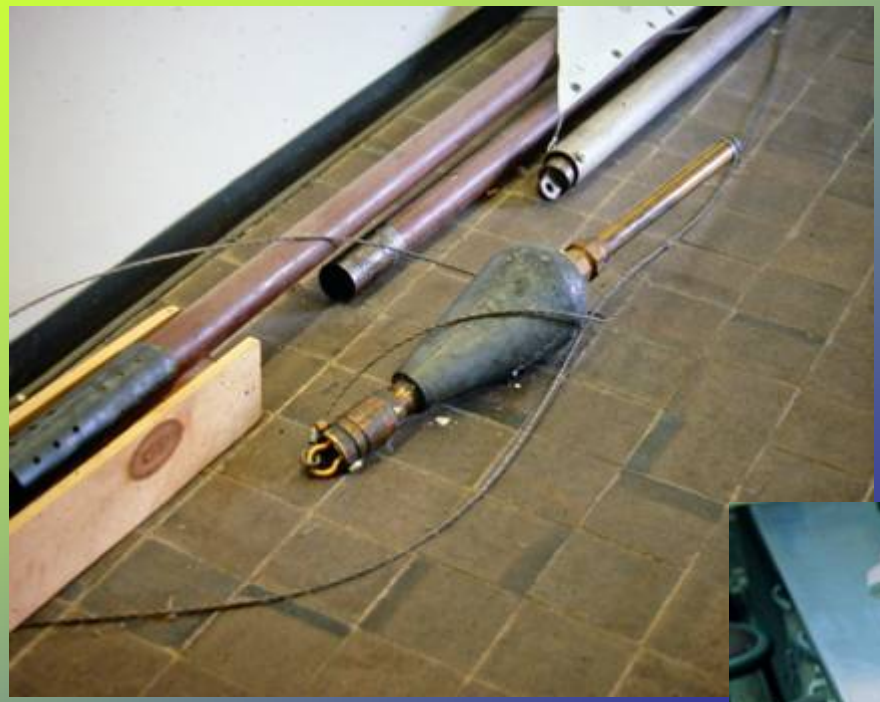
RS VEMA of Columbia University's Lamont-Doherty Earth Observatory


CABLE TO SHIP
LEVER
RELEASE MECHANISM
FREE-FALL CABLE
STABILIZING FINS
WEIGHT ~ 2,000 lbs. (LEAD)
T.W. CABLE
PISTON (MAINTAINS VACUUM)
CORE TUBE ~3" D.
UP TO 25 M
S/W INTERFACE
CORE
TRIGGER WEIGHT
T.W. CORE TUBE ~1½" D.
"FLOW-IN" AS CORE IS RETRIEVED = OUR SAMPLES "A LITTLE BIT OF EVERYTHING"
MICROPALEONTOLOGY ©'75, JS
Research Vessels for Our Cores:
"RC" = R/V ROBERT CONRAD
"V" = R/V VEMA
BOTH OF LAMONT-DOHERTY GEOLOGICAL OBSERVATORY OF COLUMBIA UNIVERSITY, PALISADES, N.Y.
C/O NEW CORE LABORATORY
Deep Sea Sediment Sampling with the:
PISTON-CORER
(schematic only)
T.W. HITS S/W INTERFACE FIRST AND LEVER RELEASES MAIN PISTON CORER WHICH FREE-FALLS TO BOTTOM - GIVING PERFECT RECORD OF "BEDS"


cable to ship
free fall cable
lever mechanism
weight with fins
piston
trigger wt. cable
PISTON CORER
j baker 2003
trigger weight & core

Piston Core Model @ Lamont

Trigger Wt.Corer & Results



Core Storage

At ‘NEW CORE LAB’

‘Picking’

Plankton Net


ECOPHENOTYPIC VARIETIES
Emiliania huxleyi
cold
warm
LDEO

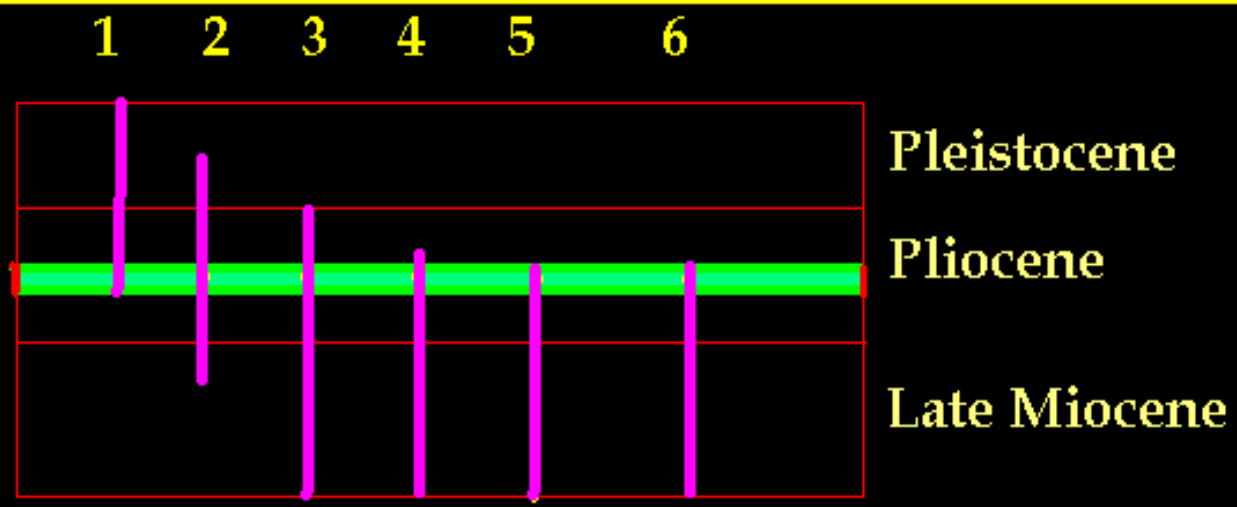
Index ('Key") Fossils

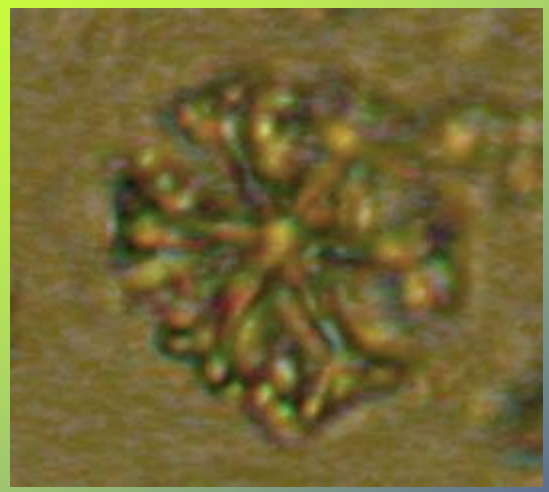
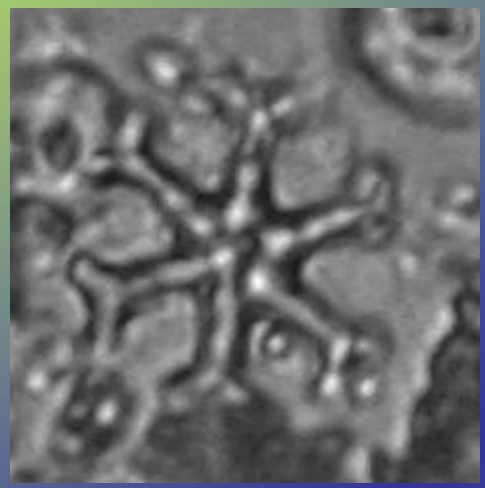
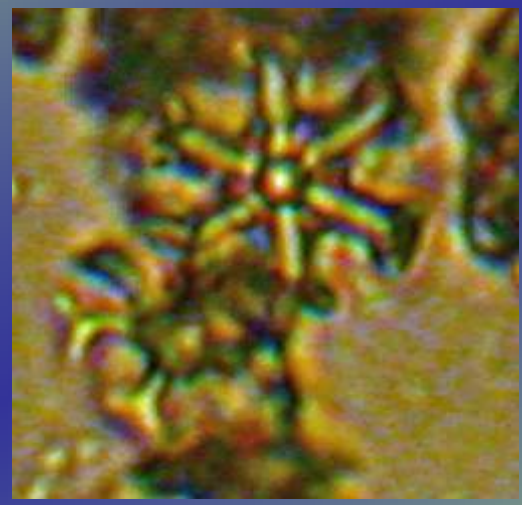
1. Short Geologic Time Range

2. Wide Geographic Range

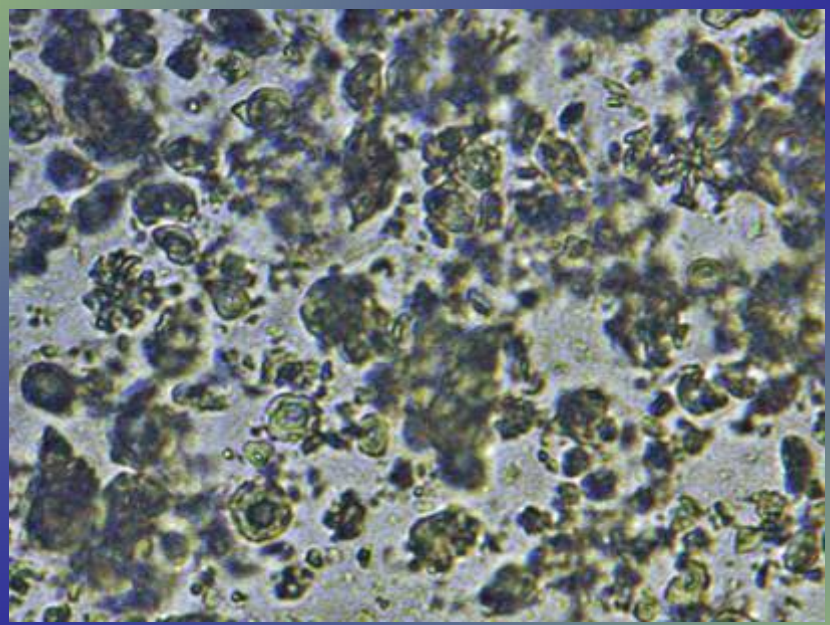
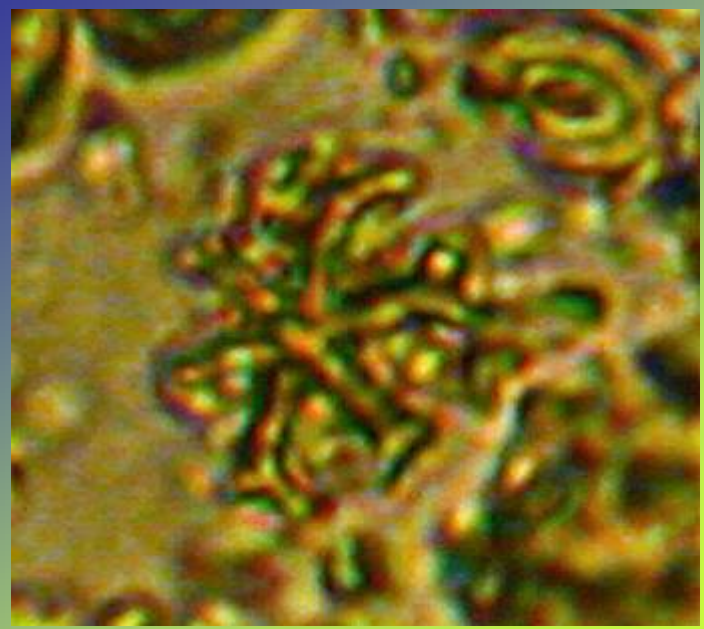
3. Easily Recognized

4. Common

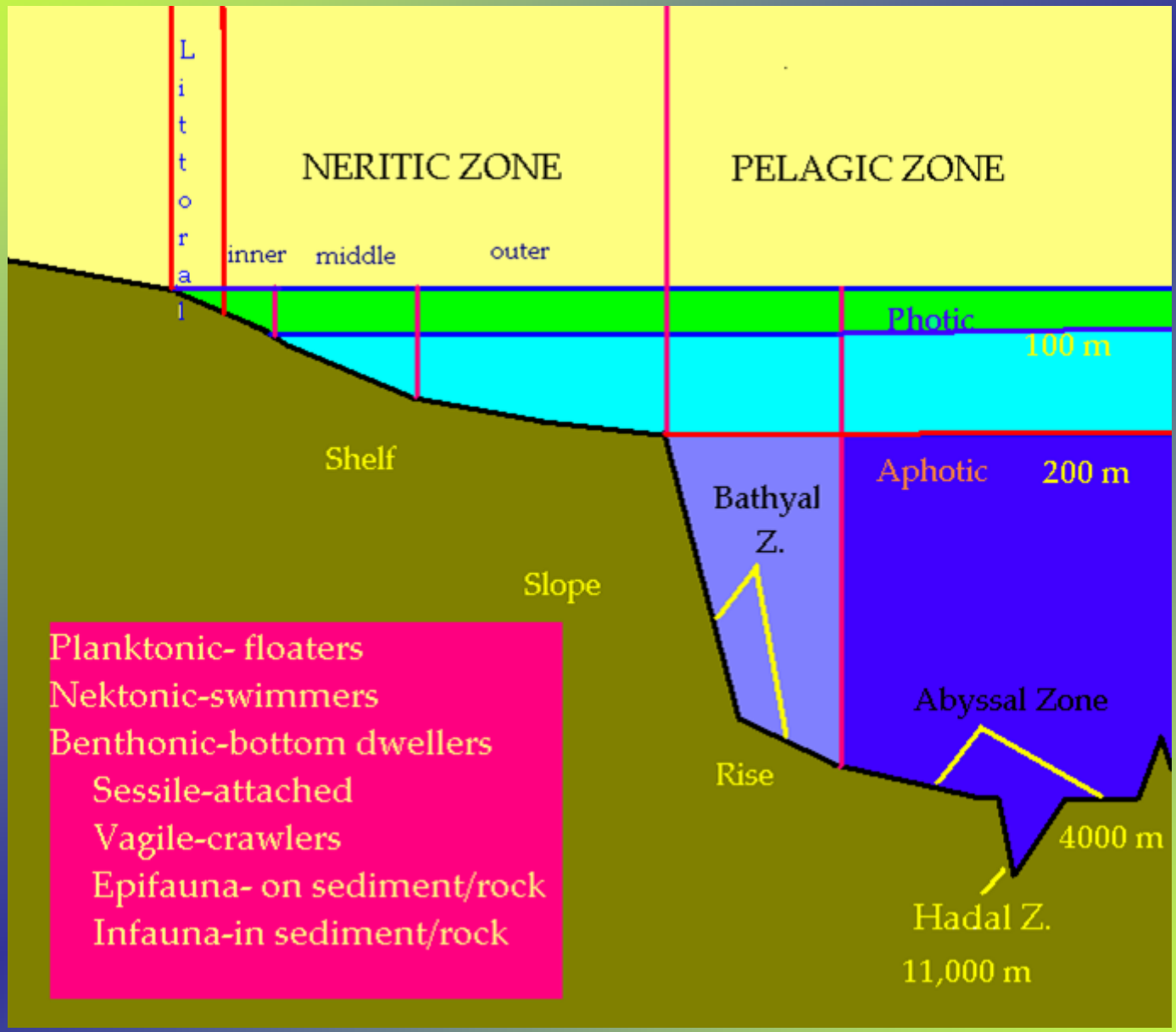


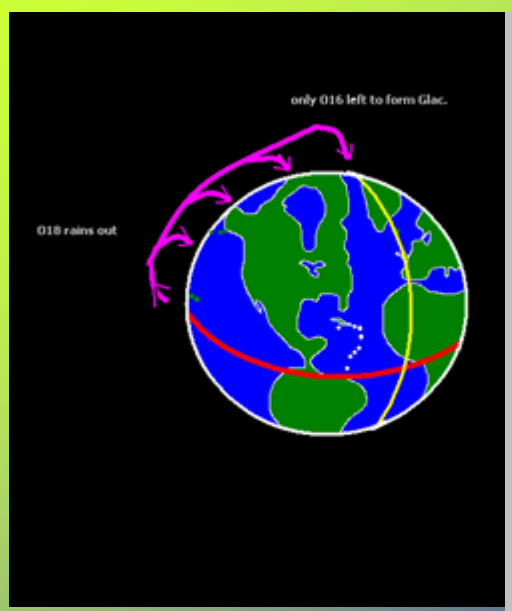




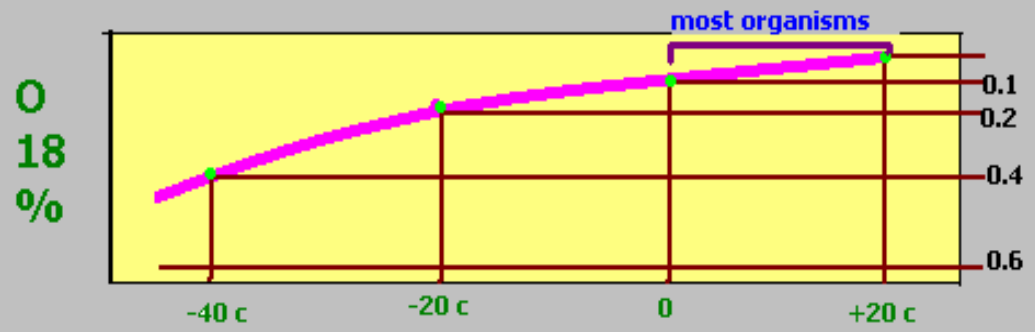
Miocene: *Discoaster challengeri*

RC-12-306, 26 S, 37 E, 2501 M

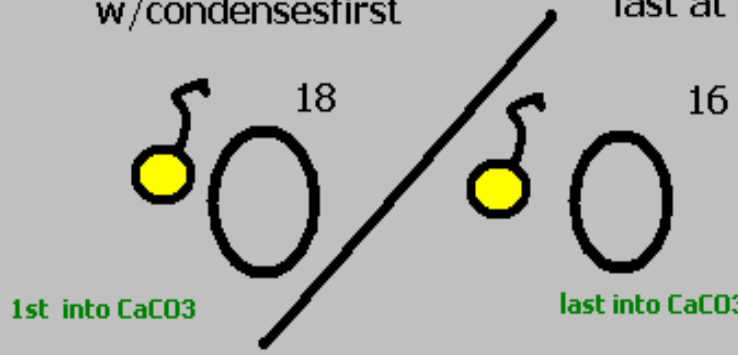

Littoral
NERITIC ZONE
PELAGIC ZONE
inner
middle
outer
Photic
100 m
Shelf
Aphotic
200 m
Bathyal Z.
Slope
Abyssal Zone
Rise
4000 m
Hadal Z.
11,000 m
Planktonic- floaters
Nektonic-swimmers
Benthonic-bottom dwellers
Sessile-attached
Vagile-crawlers
Epifauna- on sediment/rock
Infauna-in sediment/rock



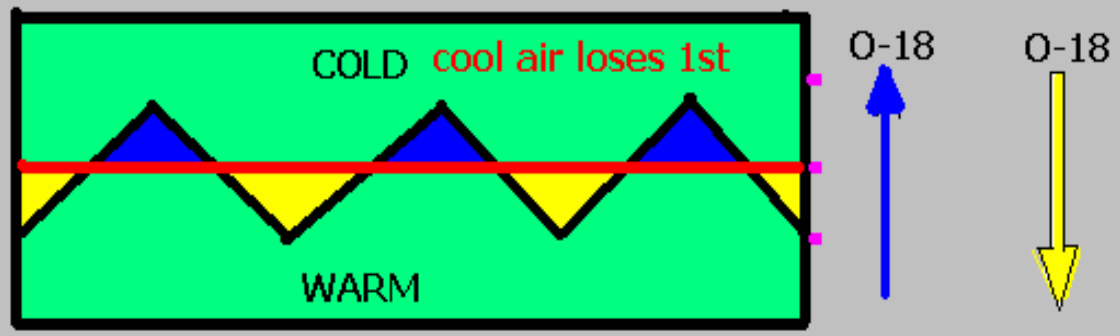


heavier isotope, air
H20
w/condensesfirst

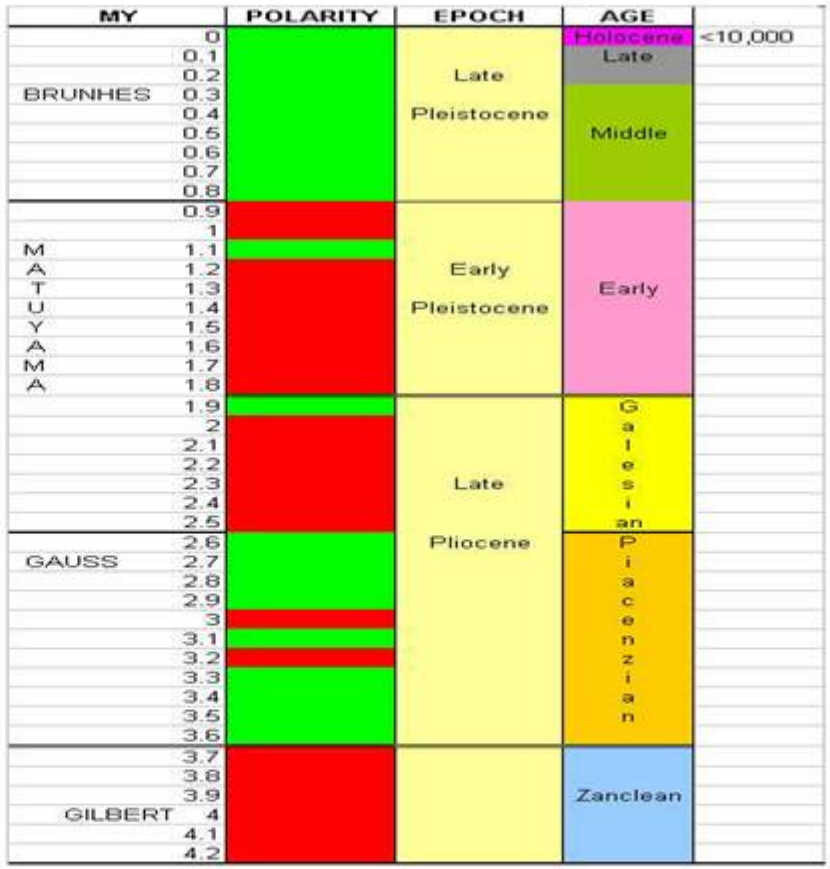
lighter isotope, air
H20 W more 16 rains out
last at poles



1/1000=0.1%
6/1000=0.6%

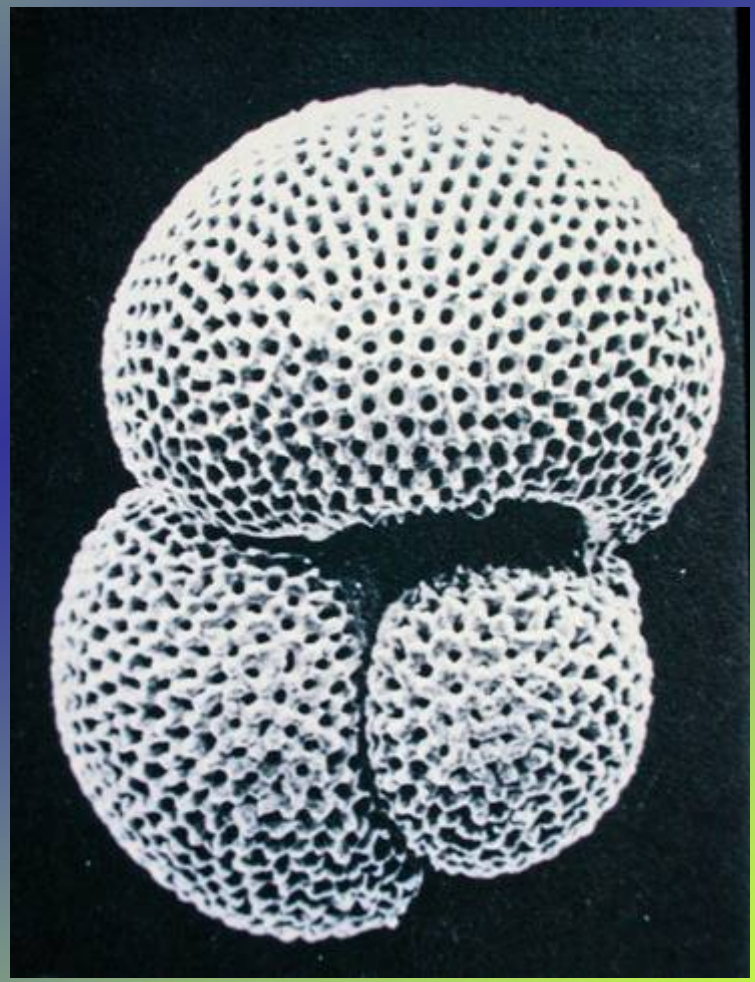


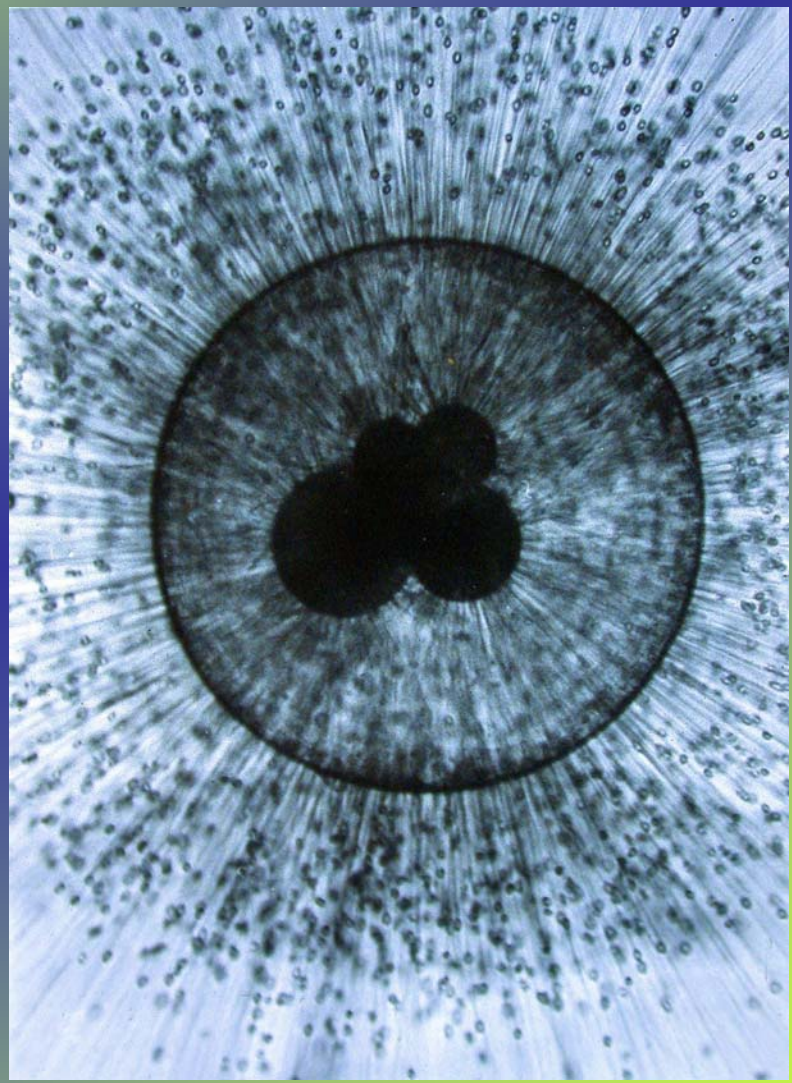
Pliocene-Pleistocene Time Scale



MY	POLARITY	EPOCH	AGE	
0			Holocene	<10,000
0.1			Late	
0.2		Late		
BRUNHES 0.3				
0.4		Pleistocene	Middle	
0.5				
0.6				
0.7				
0.8				
0.9				
1				
M 1.1				
A 1.2		Early	Early	
T 1.3				
U 1.4		Pleistocene		
Y 1.5				
A 1.6				
M 1.7				
A 1.8				
1.9			G a l e s i an	
2				
2.1				
2.2		Late		
2.3				
2.4				
2.5		Pliocene		
2.6			P i a c e n z i a n	
GAUSS 2.7				
2.8				
2.9				
3				
3.1				
3.2				
3.3				
3.4				
3.5				
3.6				
3.7				
3.8			Zanclean	
3.9				
GILBERT 4				
4.1				
4.2				

Globigerinoides sacculifer



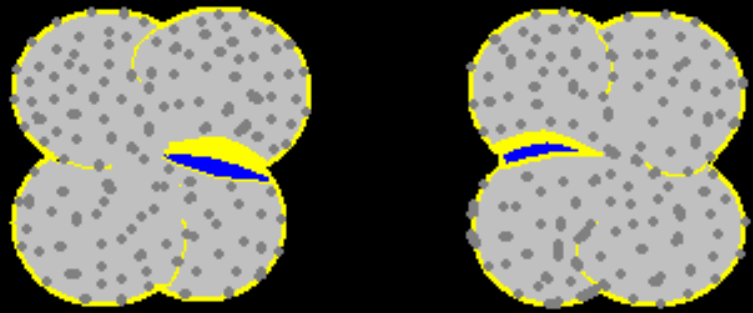


Zooxanthellae

Neogloboquadrina pachyderma

Neogloboquadrina pachyderma

umbilical view

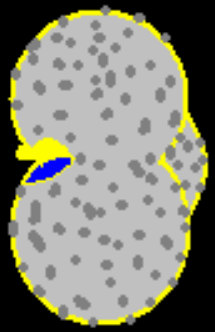


L/S

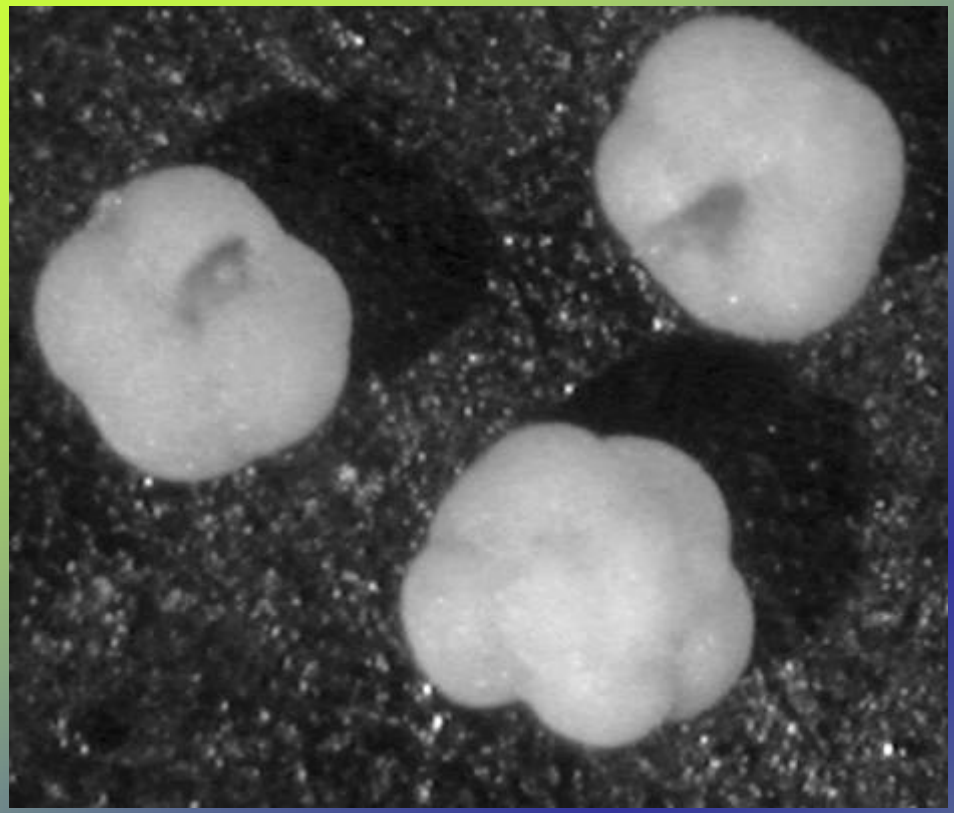
COOLER

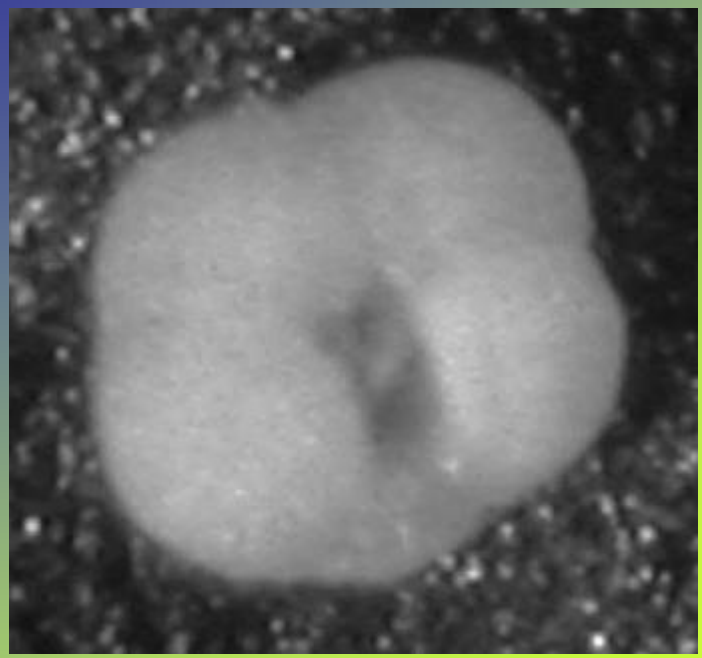
R/D

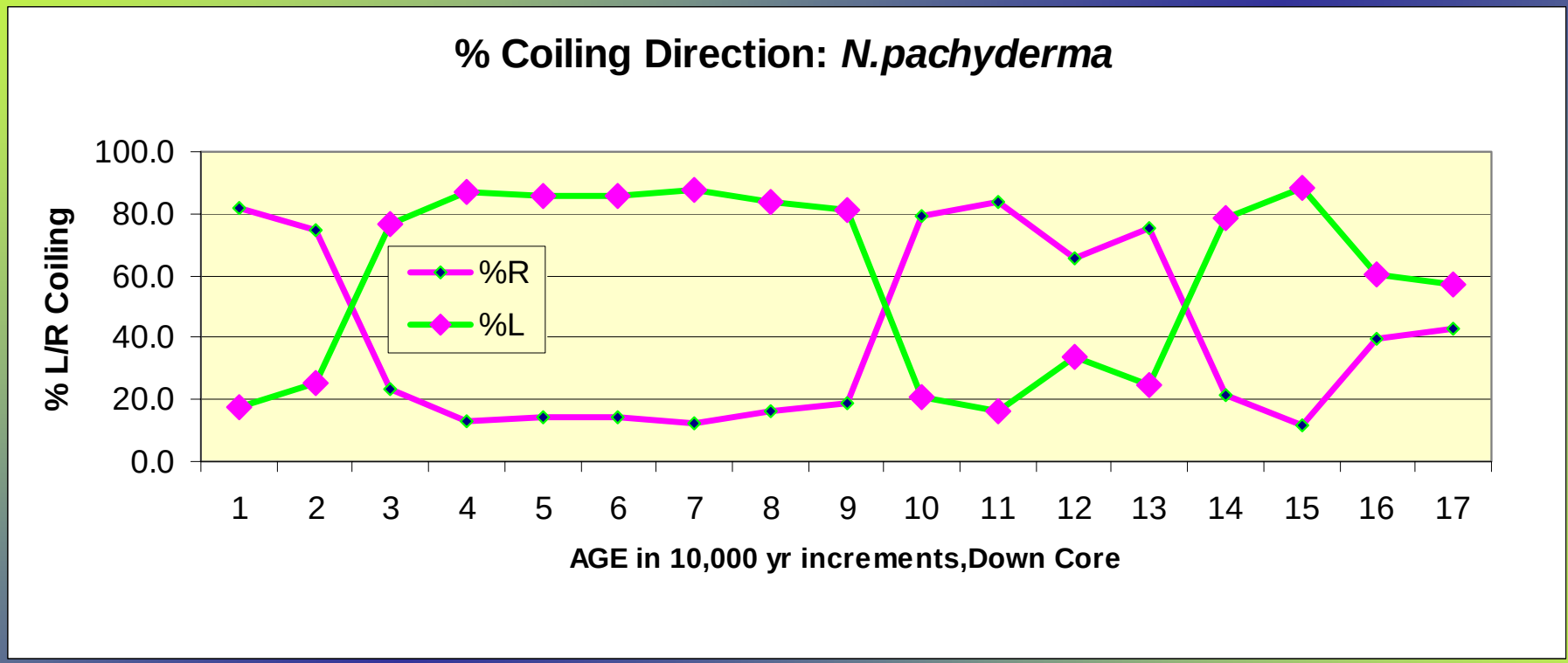
WARMER

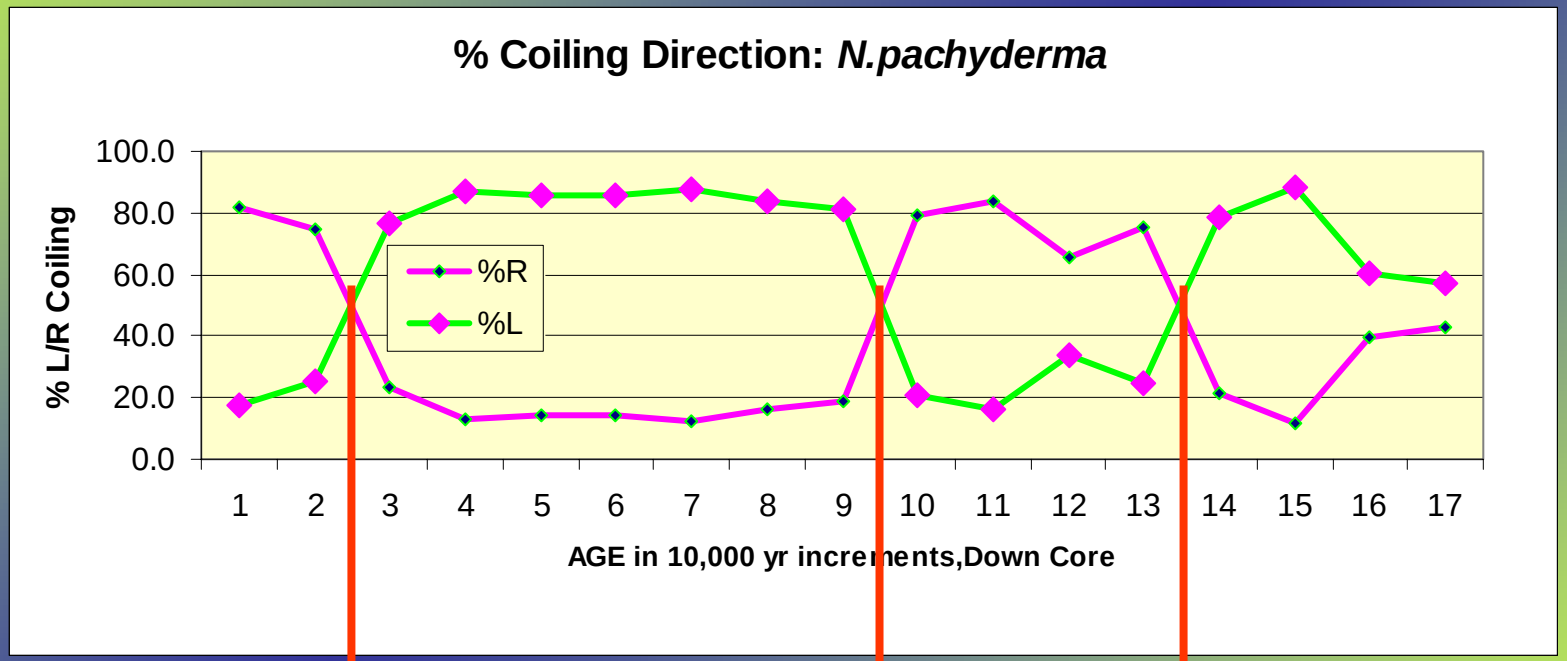


side view L/S

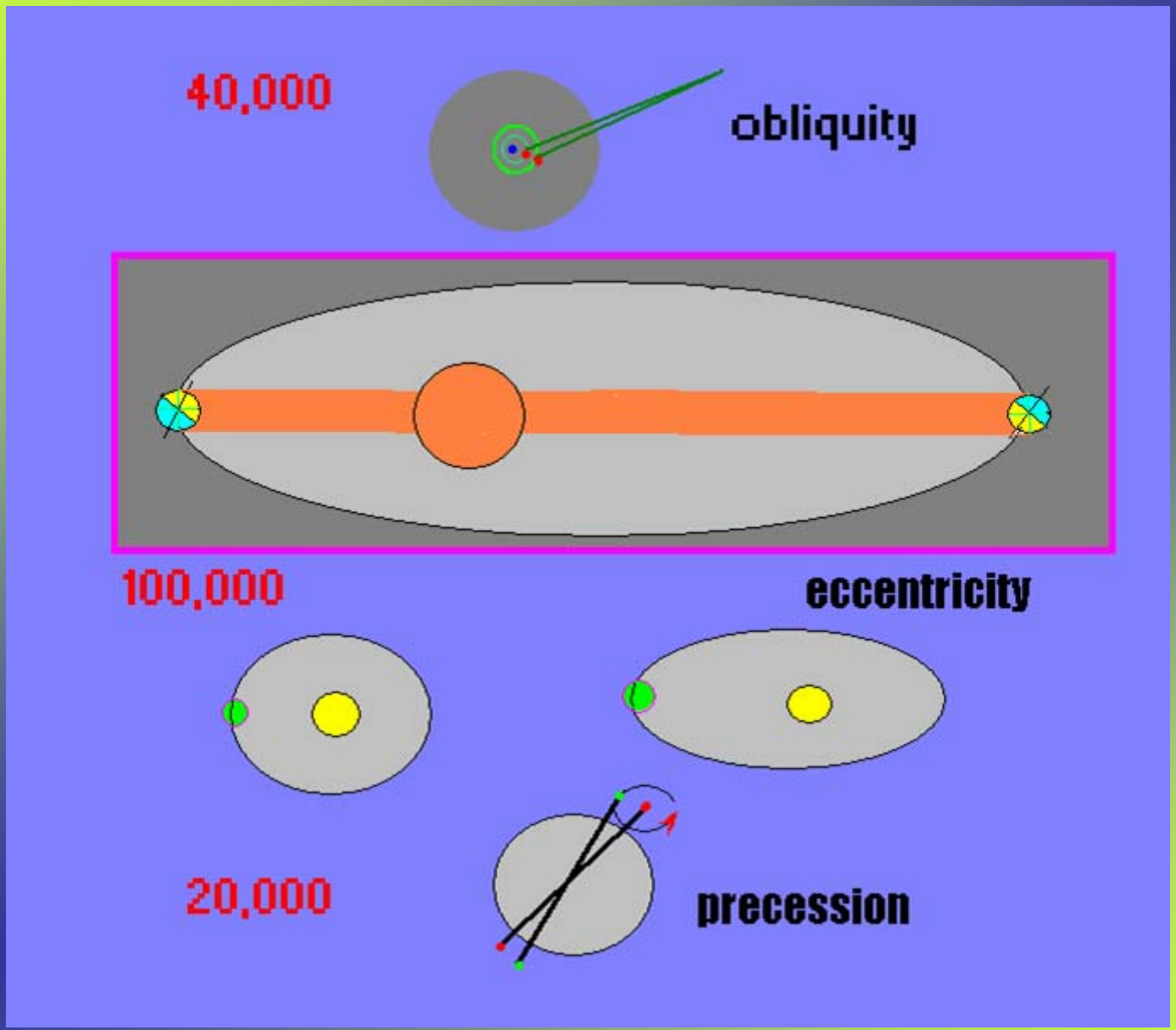


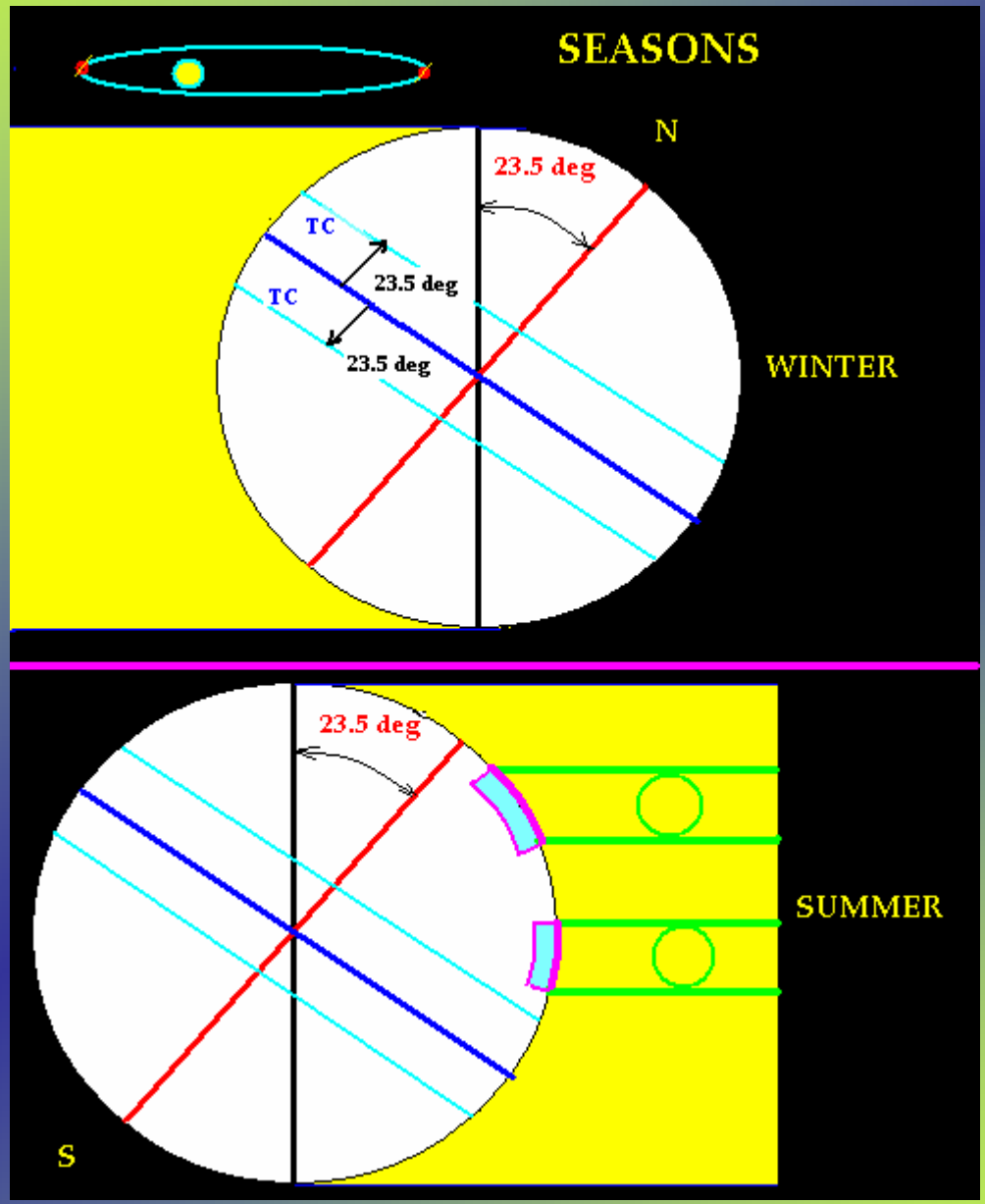



% Coiling Direction: N.pachyderma
% L/R Coiling
100.0
80.0
60.0
40.0
20.0
0.0
%R
%L
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
AGE in 10,000 yr increments,Down Core

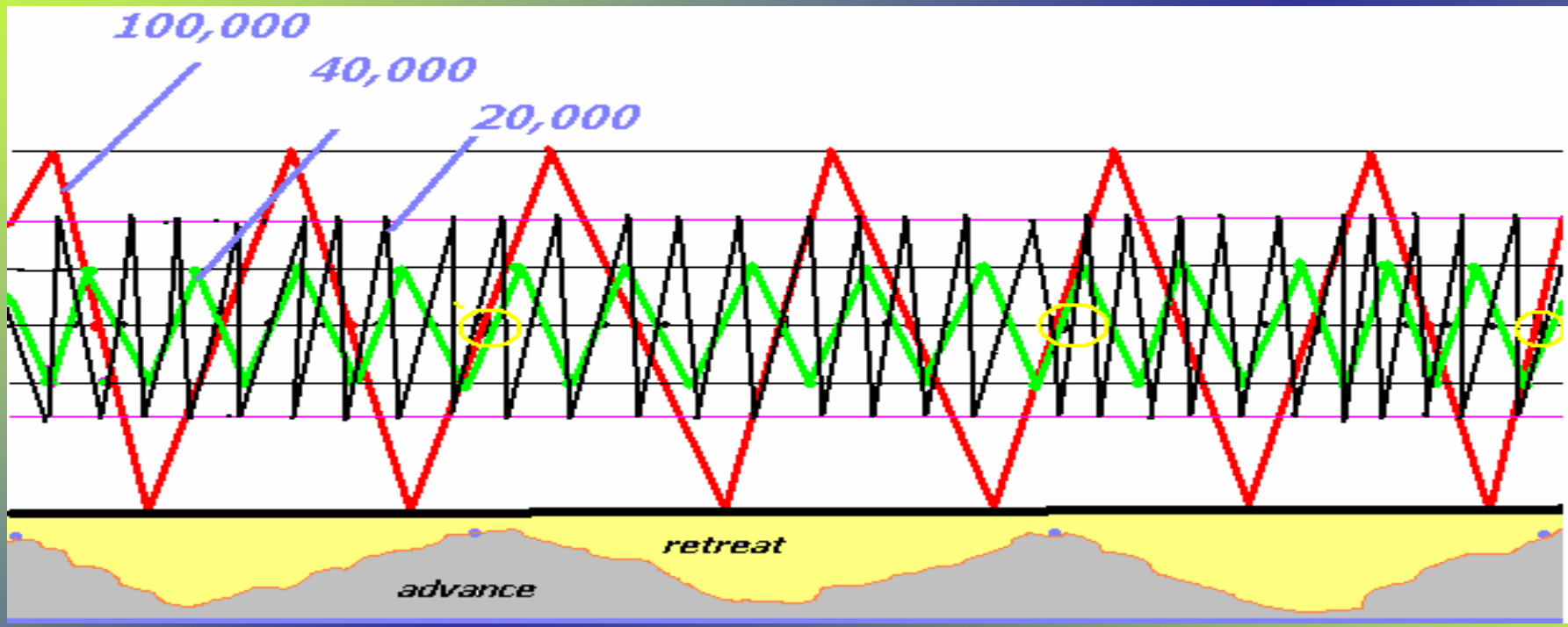


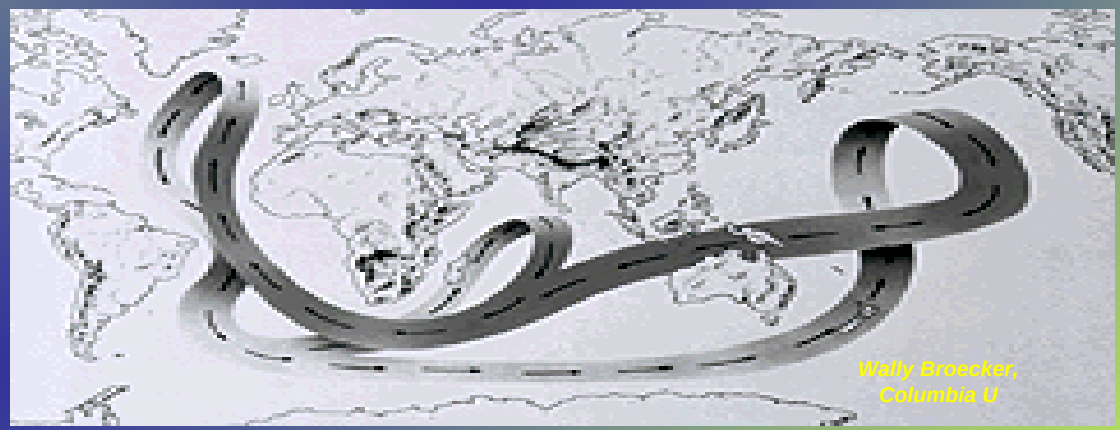
Interglacial | Glacial | Interglacial | Glacial

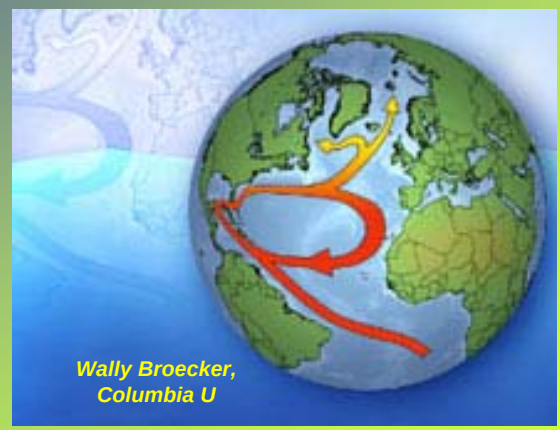

40,000
obliquity
100,000
eccentricity
20,000
precession


SEASONS
N
23.5 deg
TC
23.5 deg
TC
23.5 deg
WINTER
23.5 deg
SUMMER
S

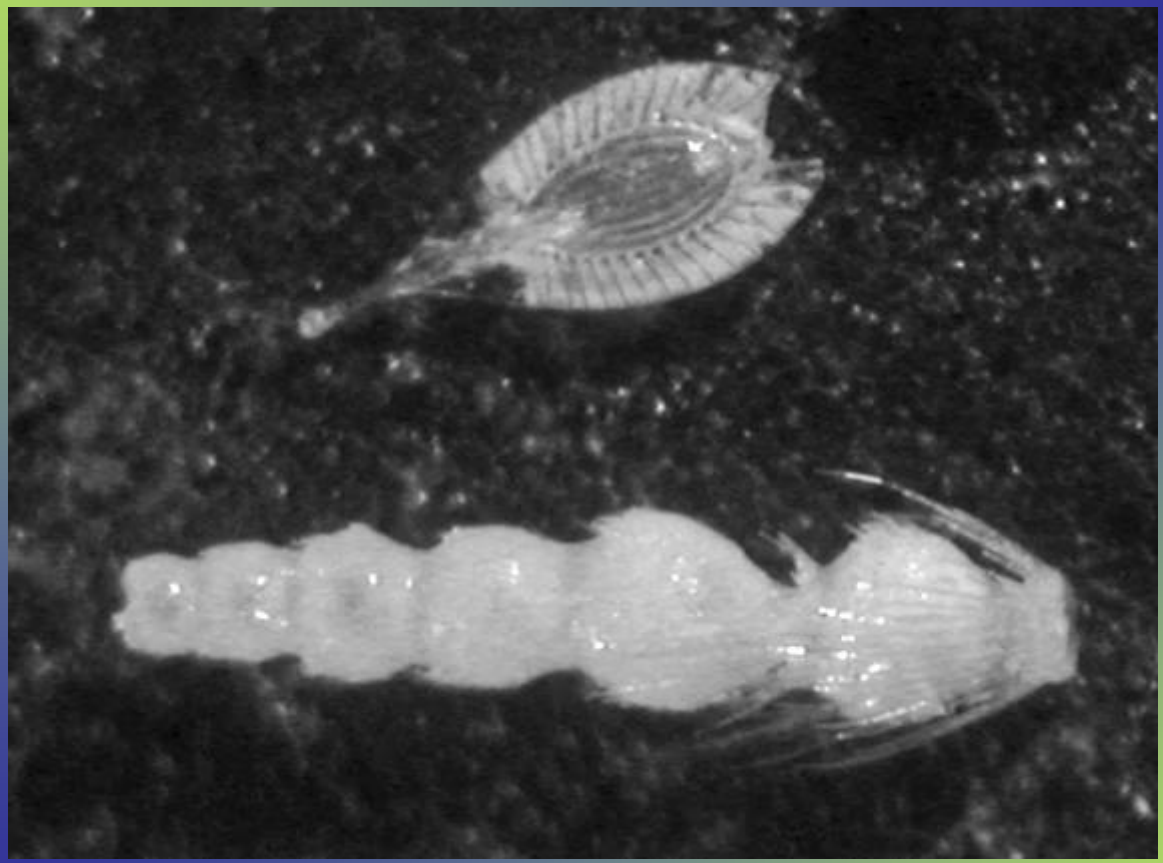
Milankovitch: Cyclical variations in Eccentricity, Axis Tilt and Wobble cause Glacial Advance & Retreat due to Ocean Currents being modified (Conveyor Belt)

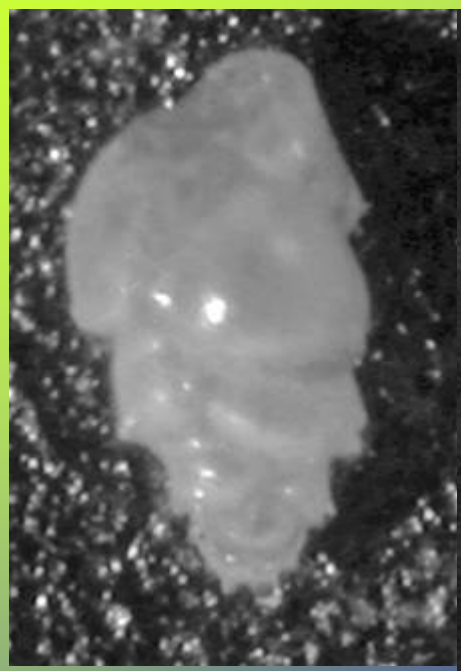
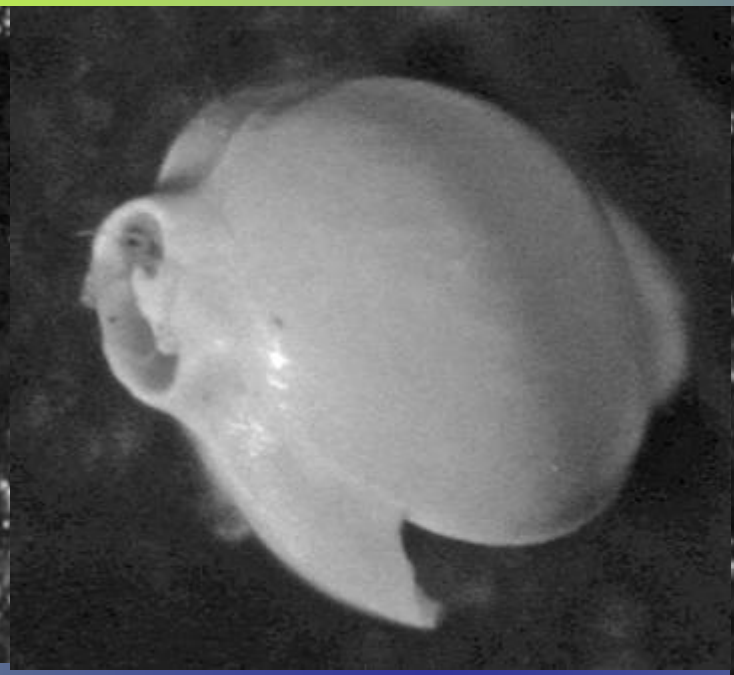
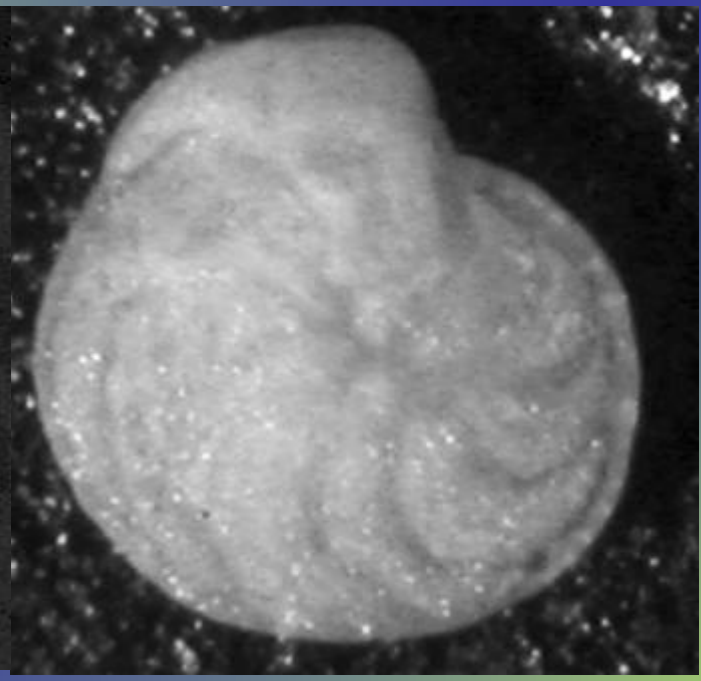
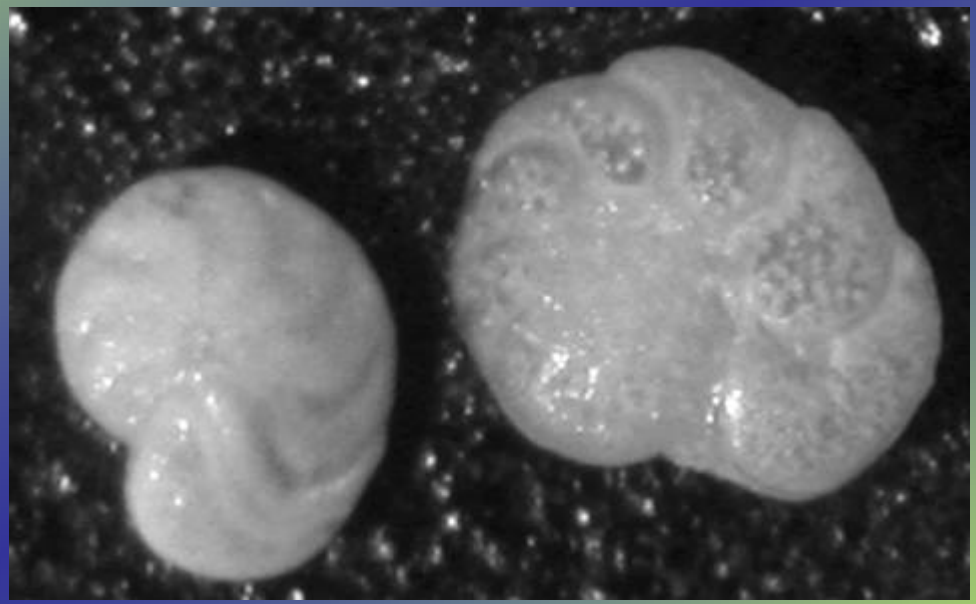
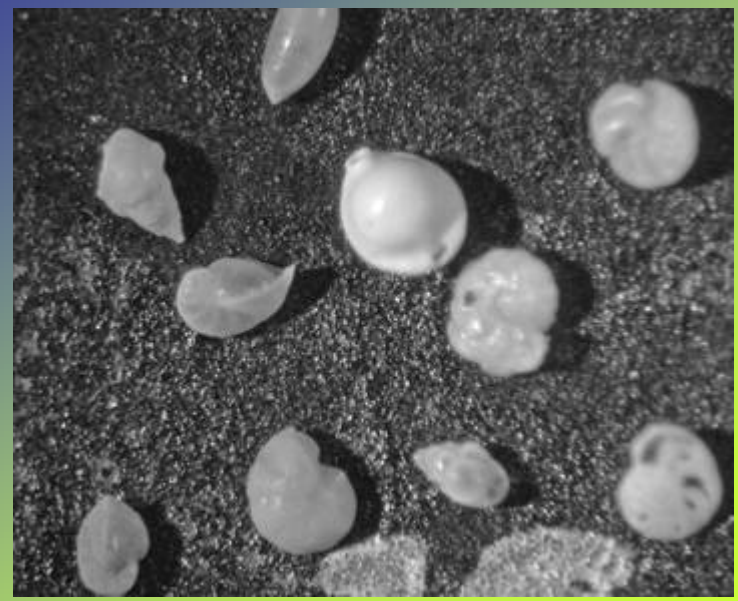


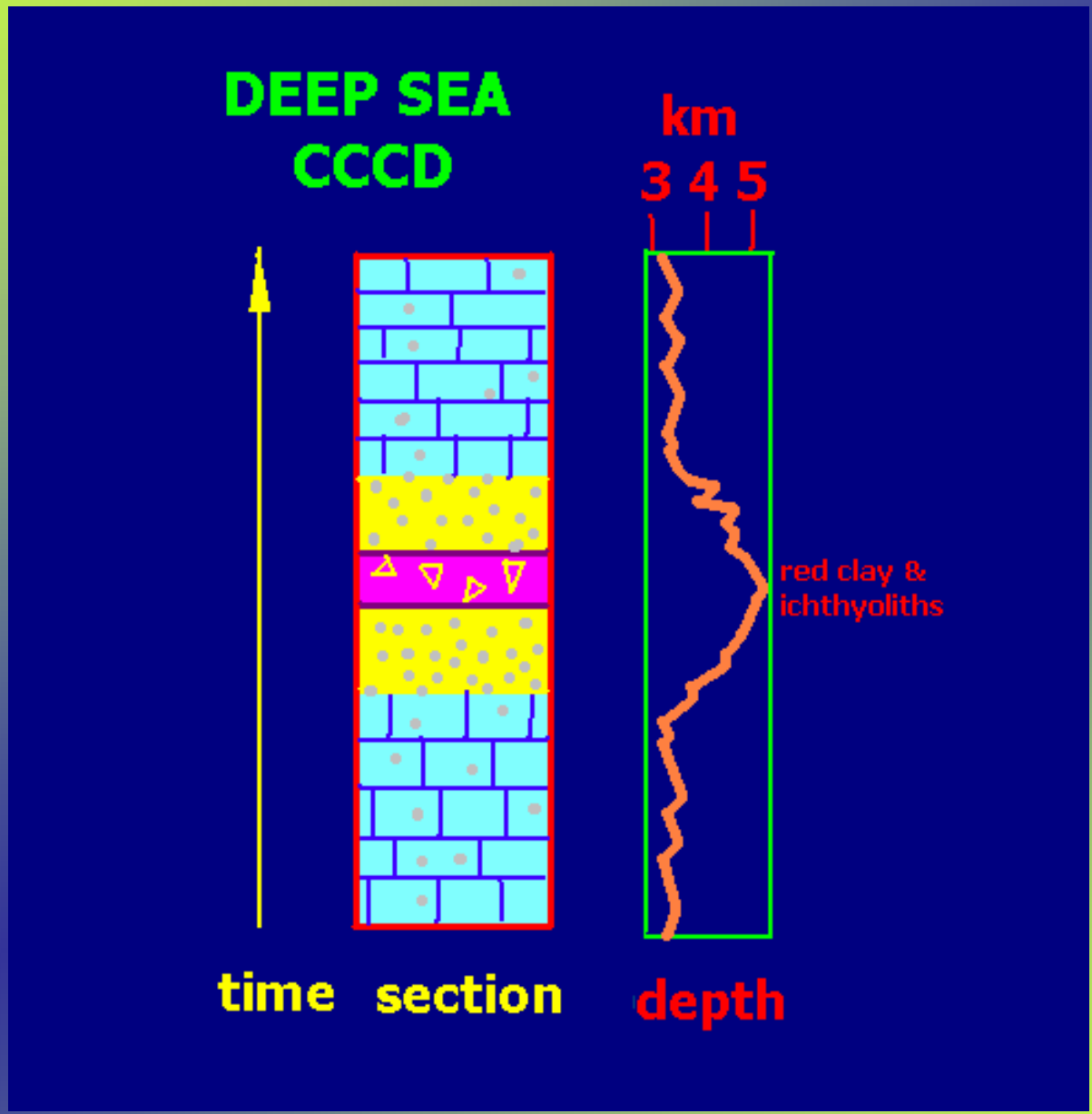




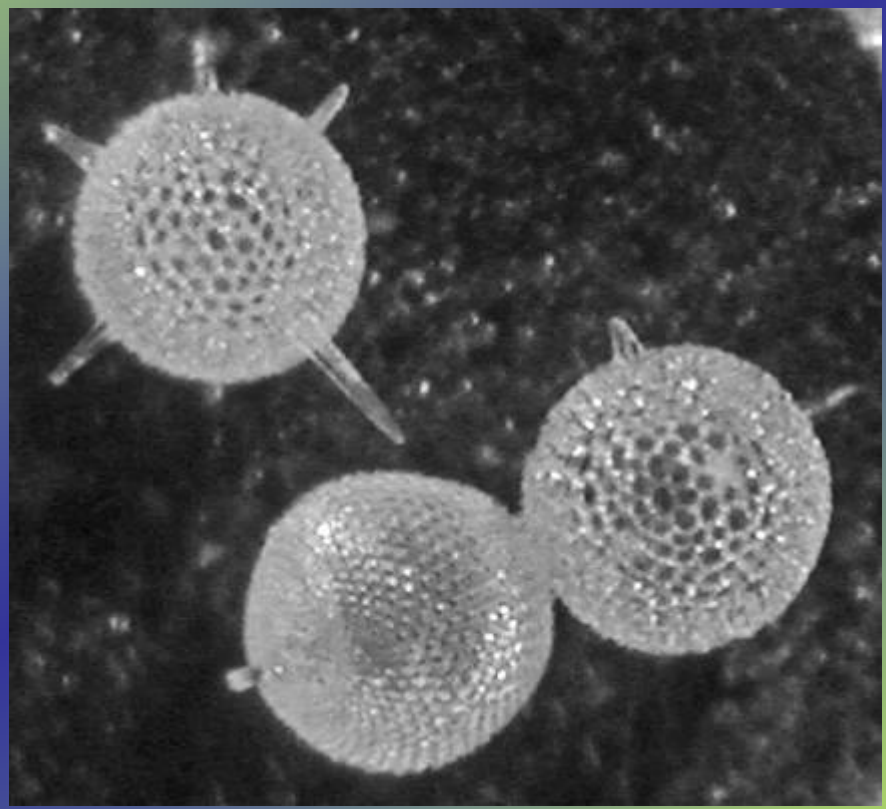
Benthic Foraminifera



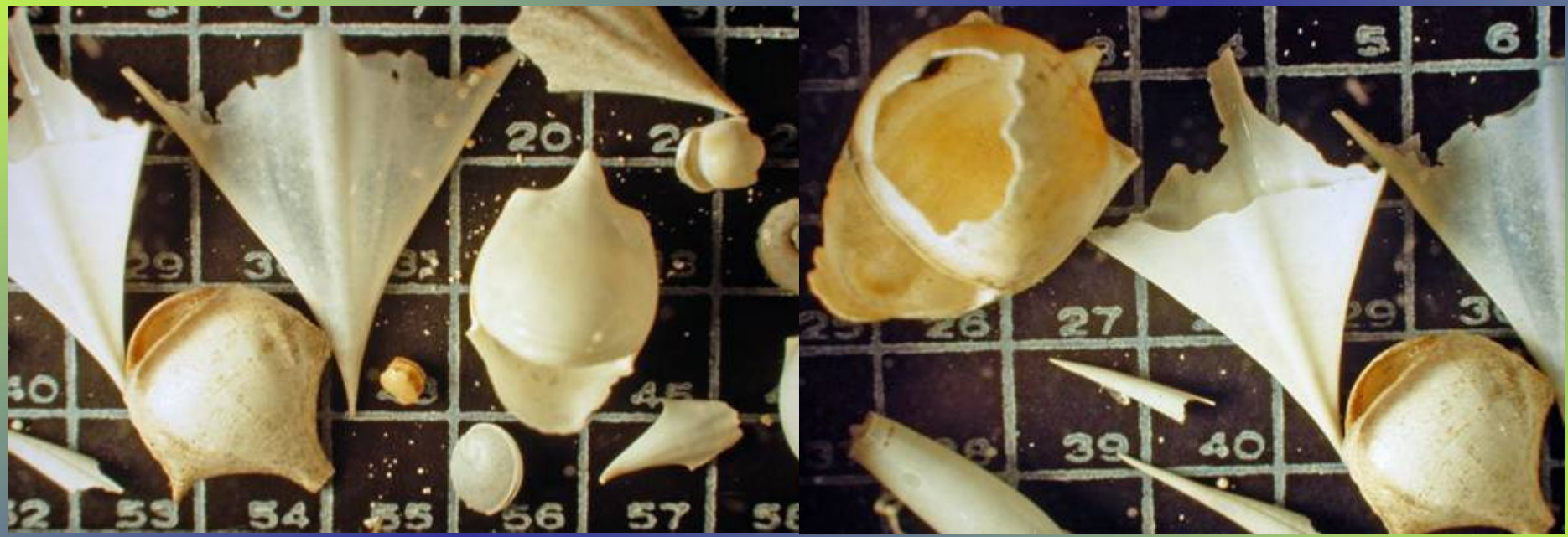






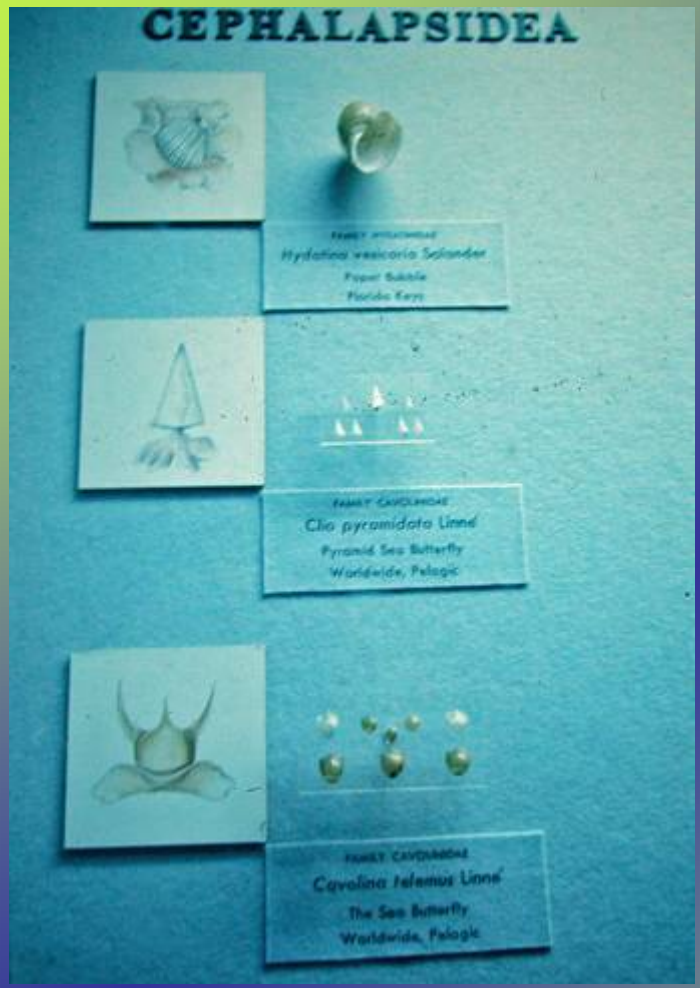

DEEP SEA
CCCD
km
3 4 5
red clay &
ichthyoliths
time
section
depth

Radiolaria



Pteropods



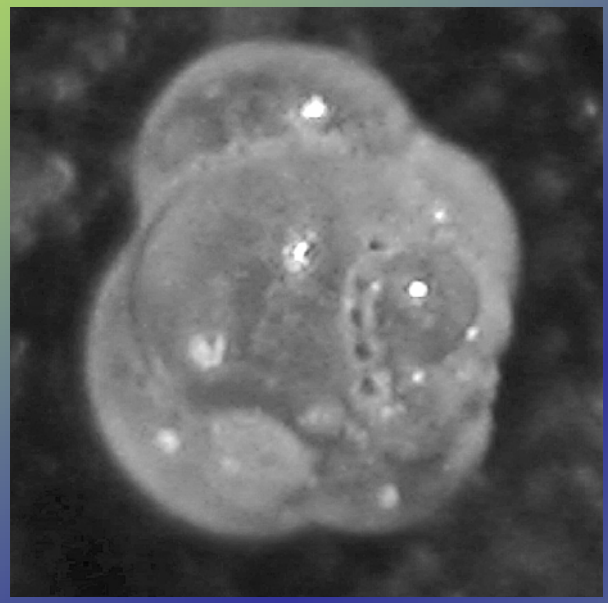

CEPHALAPSIDEA
Hydatina vesicaria Solander
Paper Bubble
Florida Keys
Clio pyramidata Linné
Pyramid Sea Butterfly
Worldwide, Pelagic
Cavolina telemus Linné
The Sea Butterfly
Worldwide, Pelagic


PTEROPODS

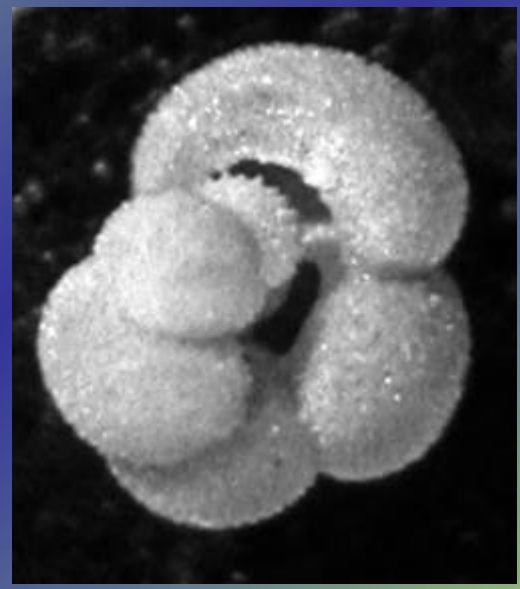
Planktonic Foraminifera

Beella digitata

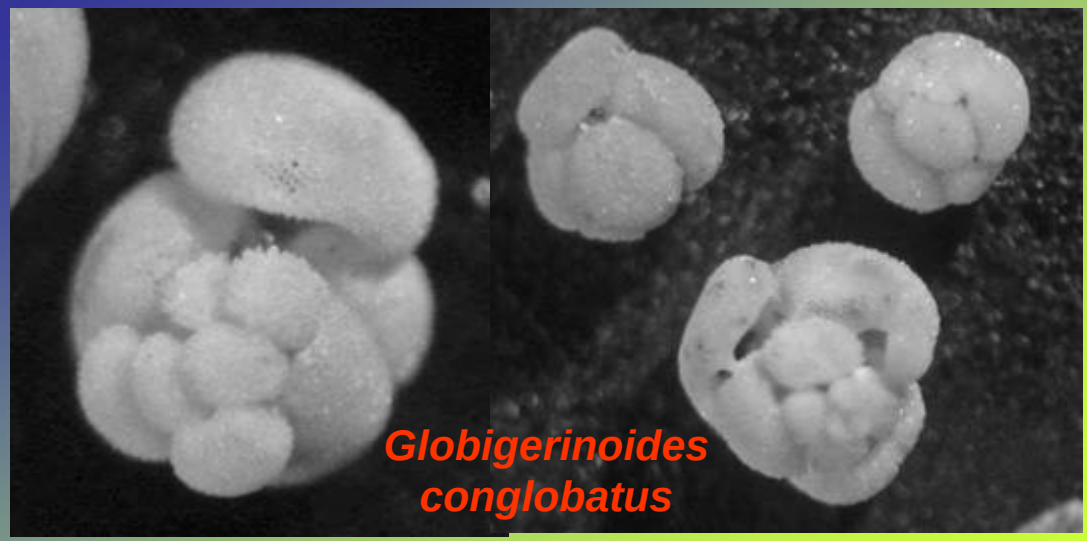
Candeina nitida



Globogerinoides aequilateralis

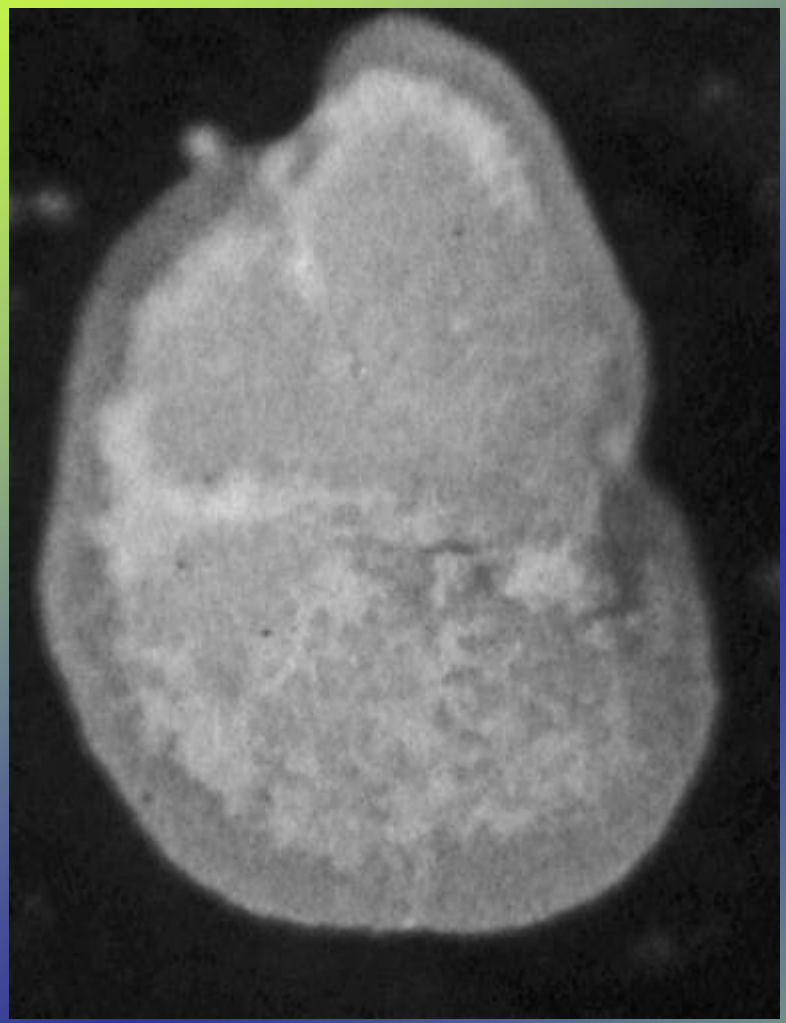


Globorotalia scitula



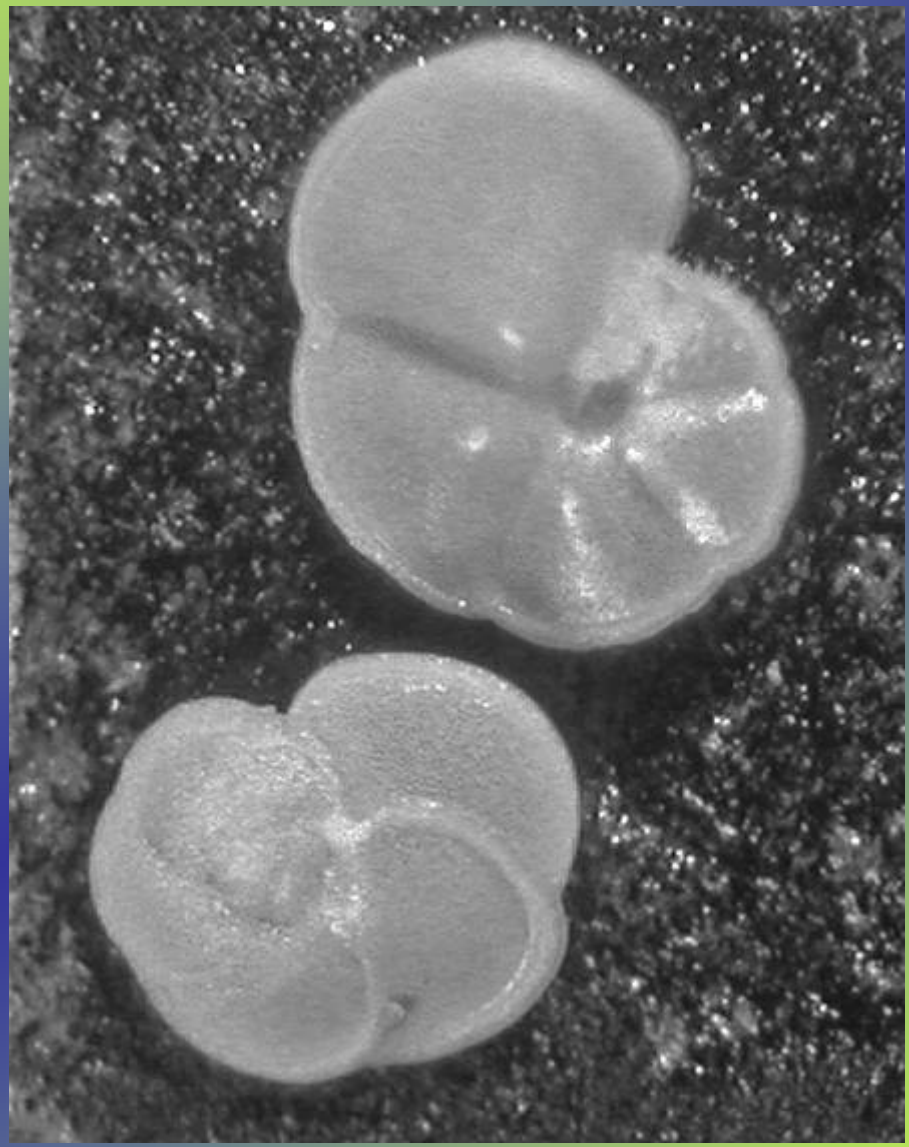
Globigerinoides conglobatus

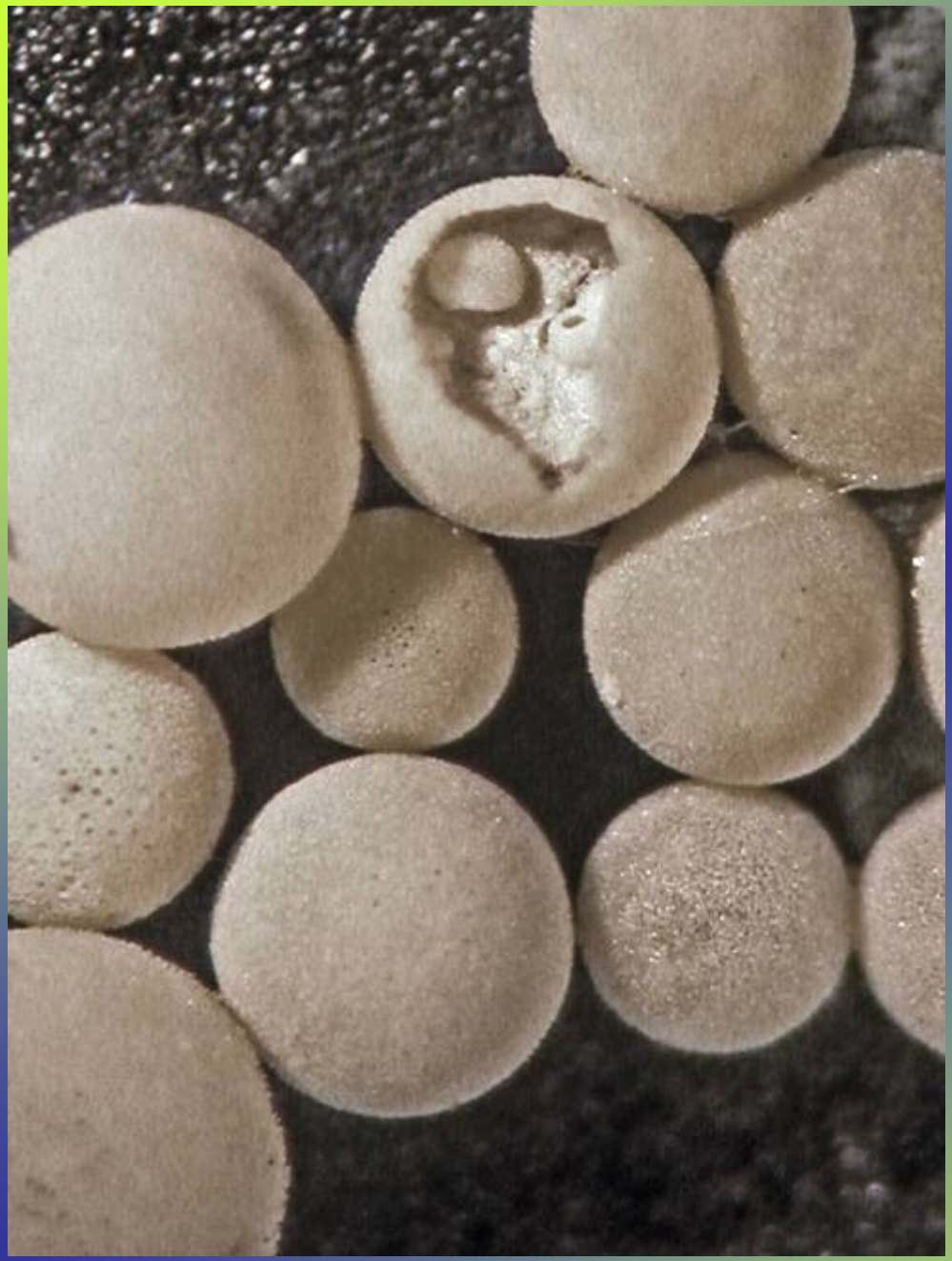
Globorotalia tumida



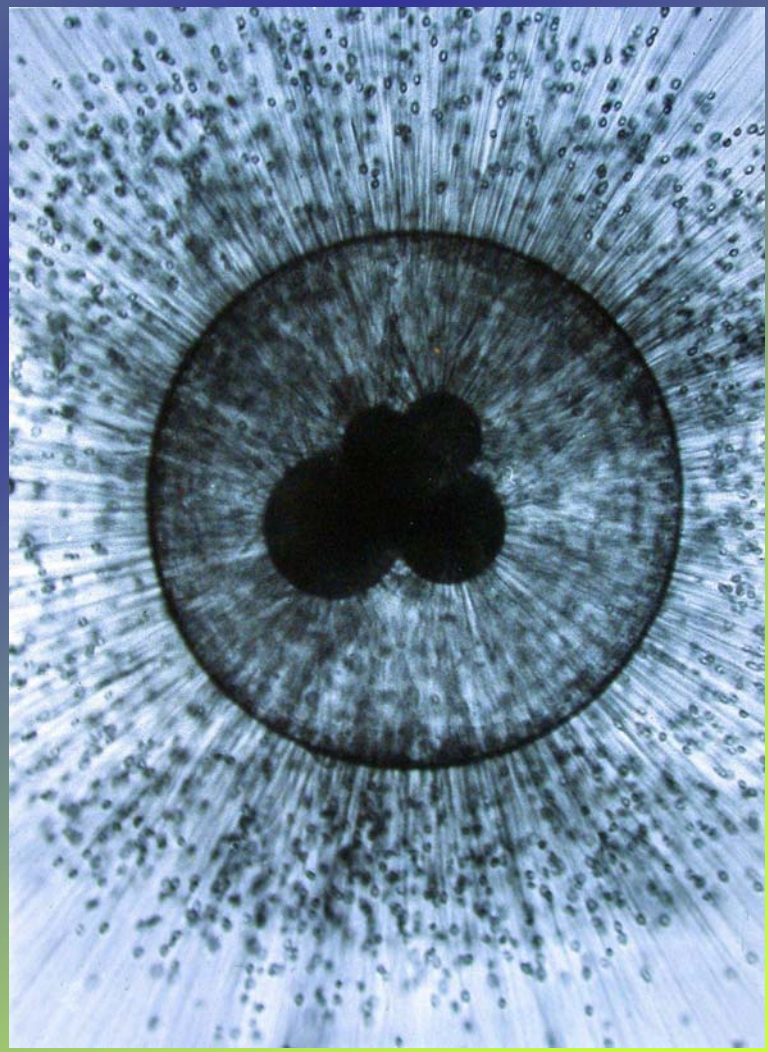
Globorotalia menardii

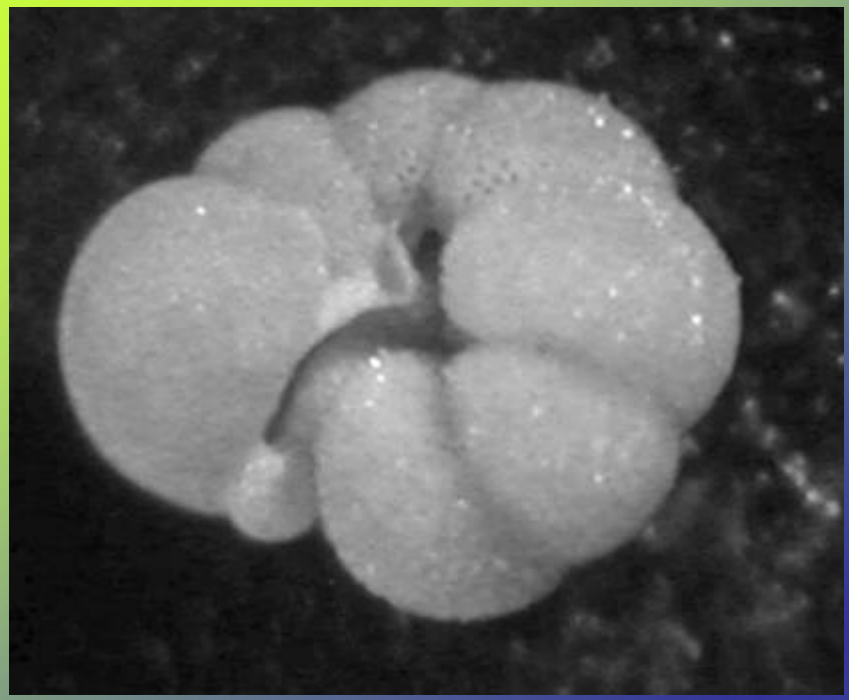
Globorotalia menardii





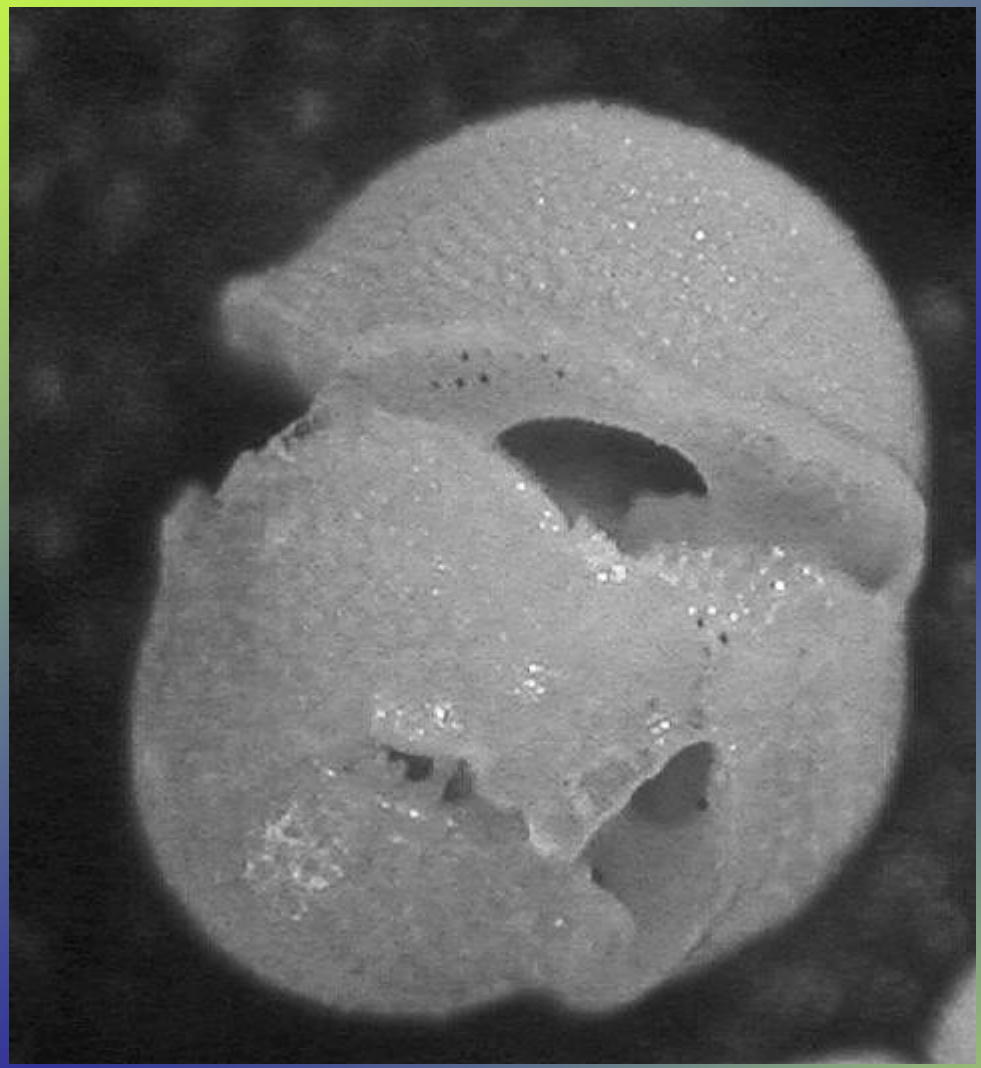
Orbulina universa





Neogloboquadrina dutertrei

Globigerinoides sacculifer

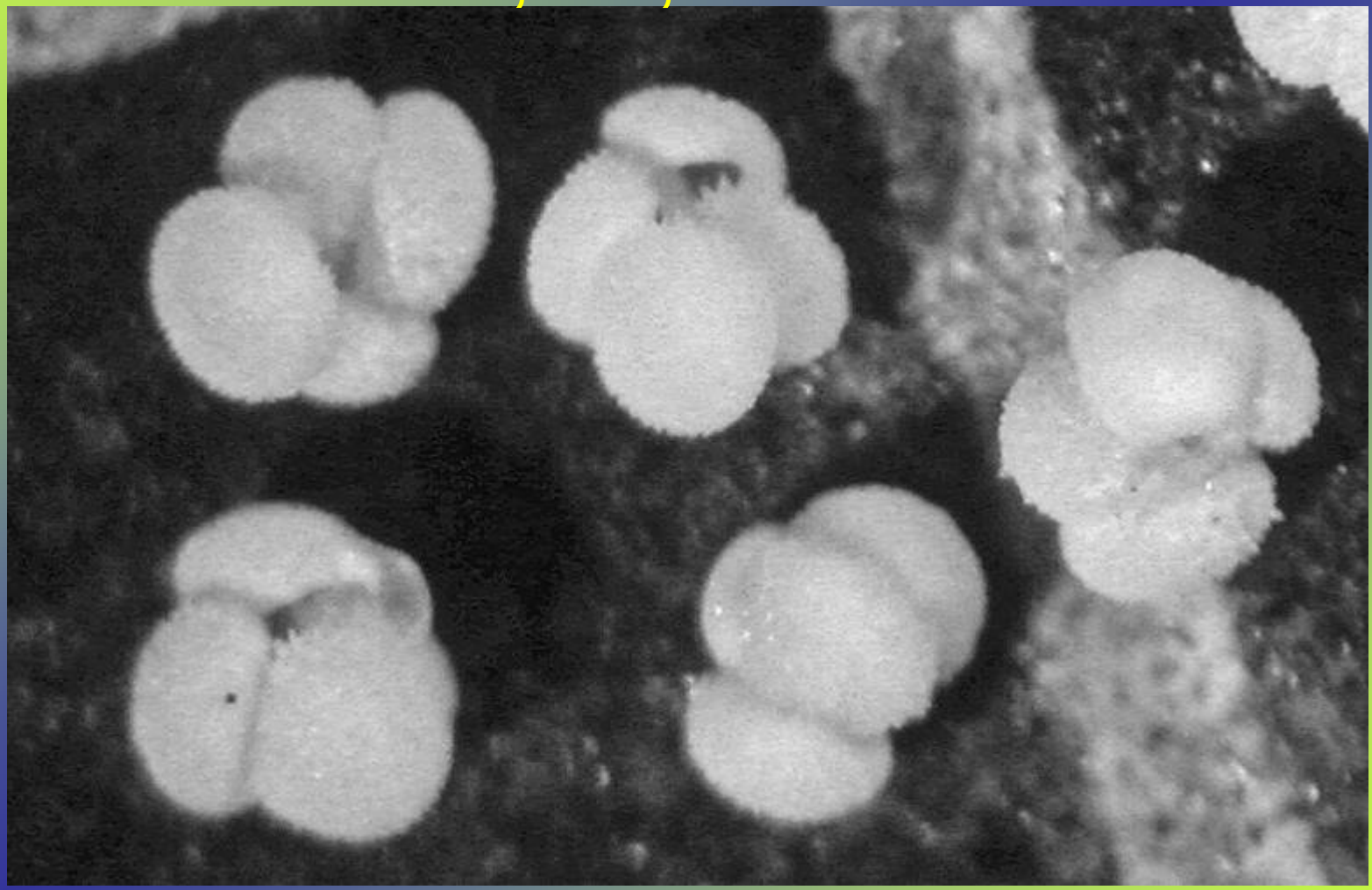


Sphaeroidinella dehiscens

Eocene Planktonic Forams

Acaranina soldadoensis VM-34-62

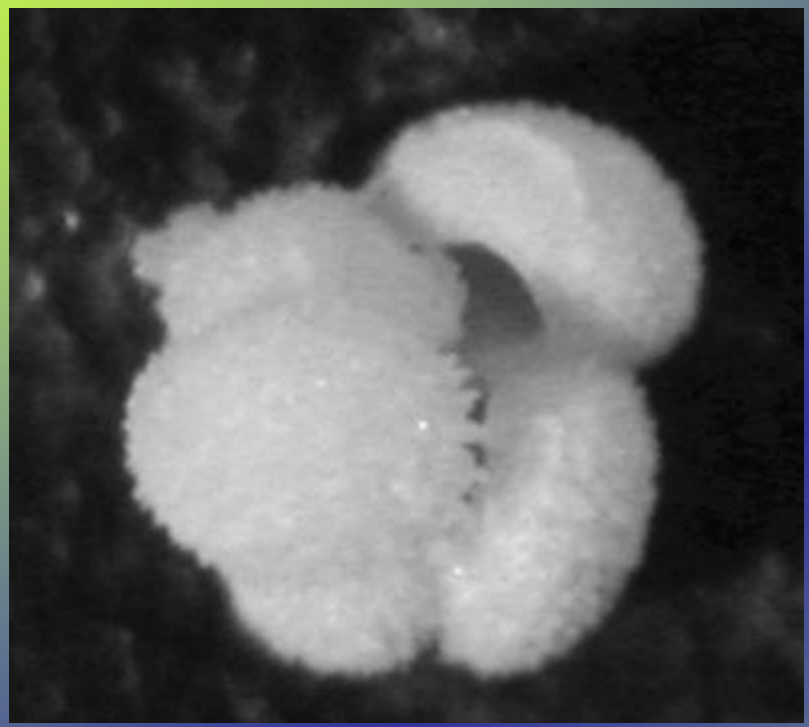
6 S, 88 E, 4710 M

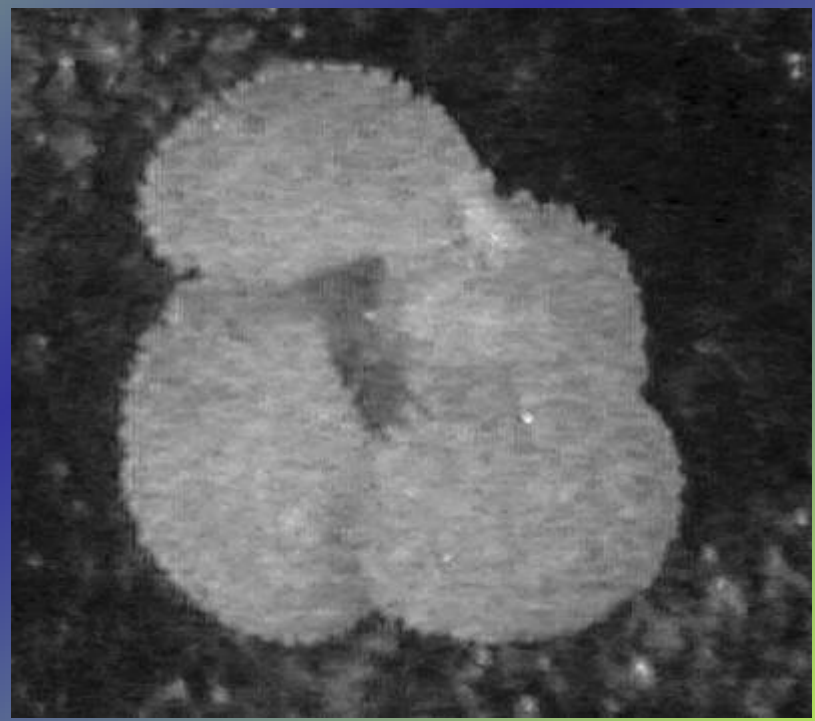


Early Eocene

Acaranina soldadoensis VM-34-62

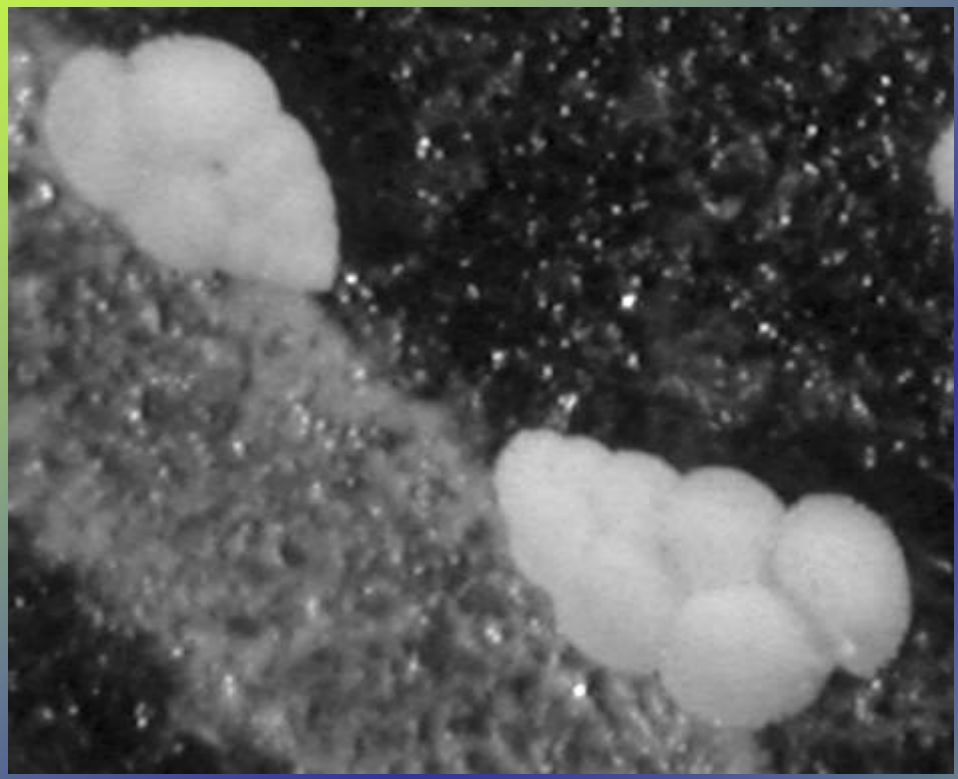
6 S, 88 E, 4710 M



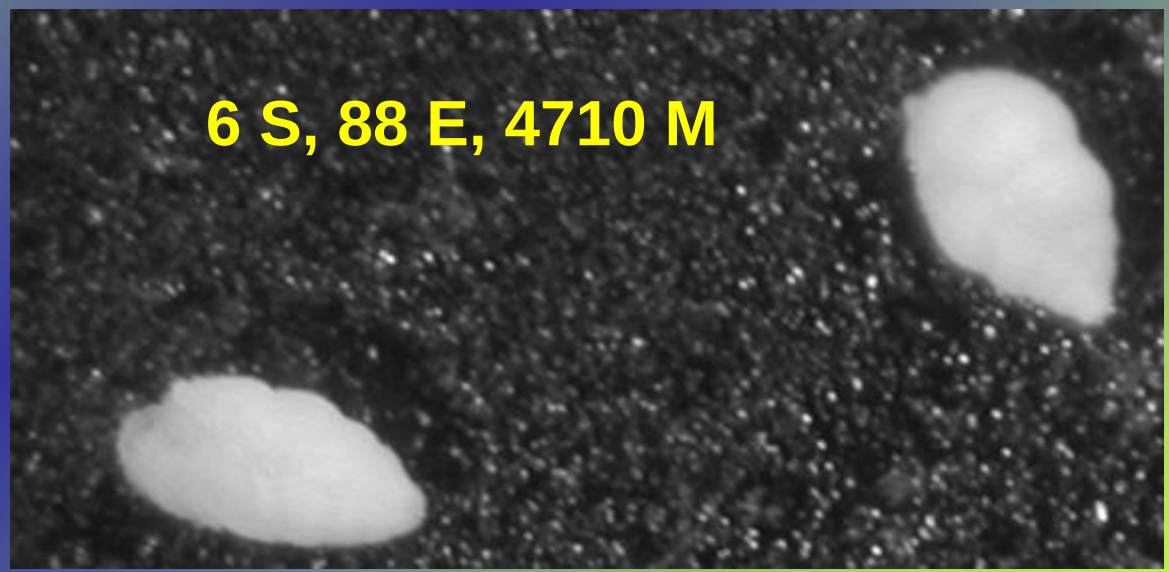


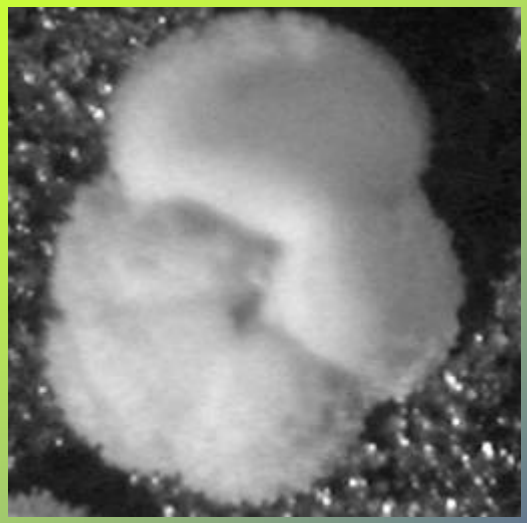
Early Eocene

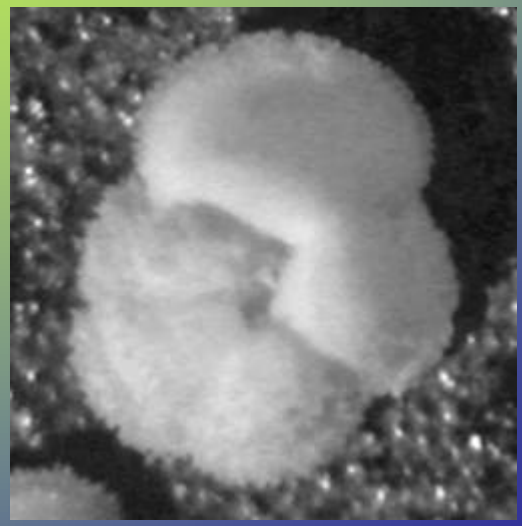
Early Eocene

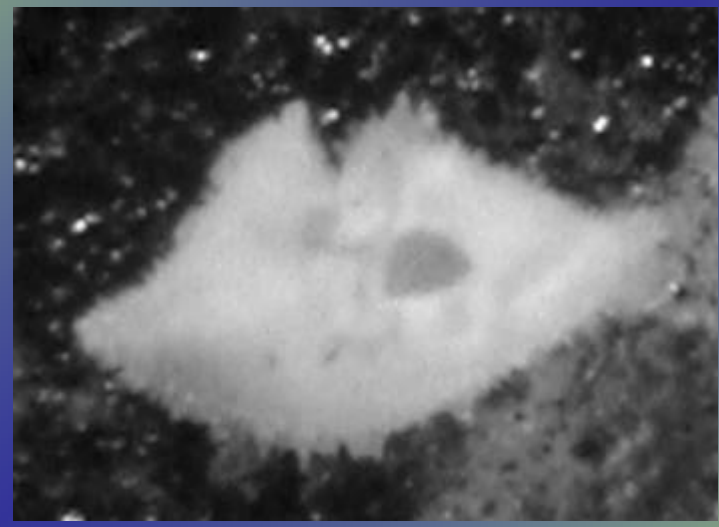


Chiloguembolina sp.







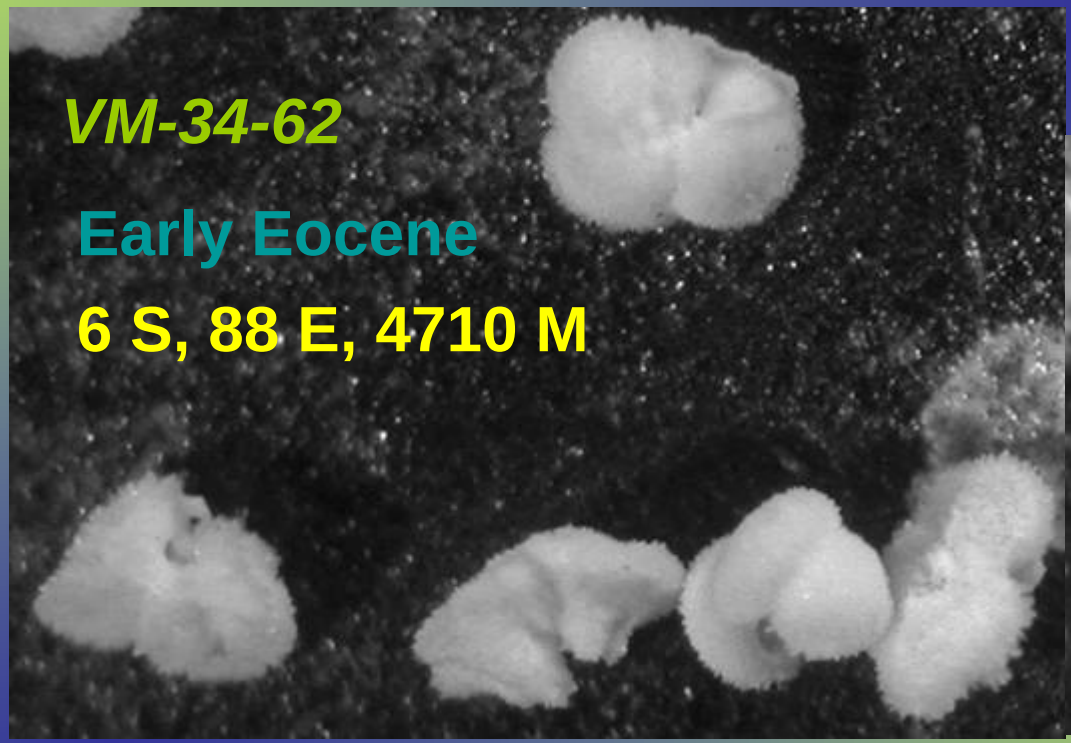


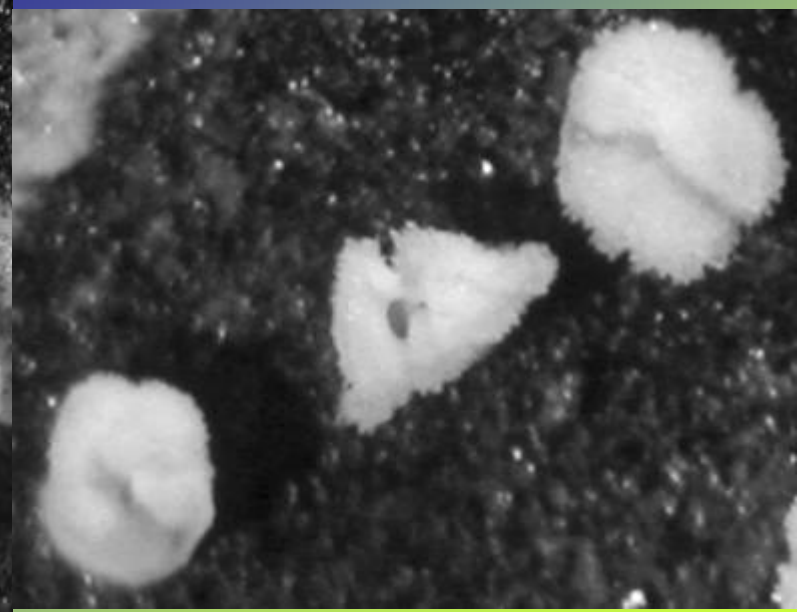
Morozovella subbotinae

VM-34-62

Early Eocene

6 S, 88 E, 4710 M

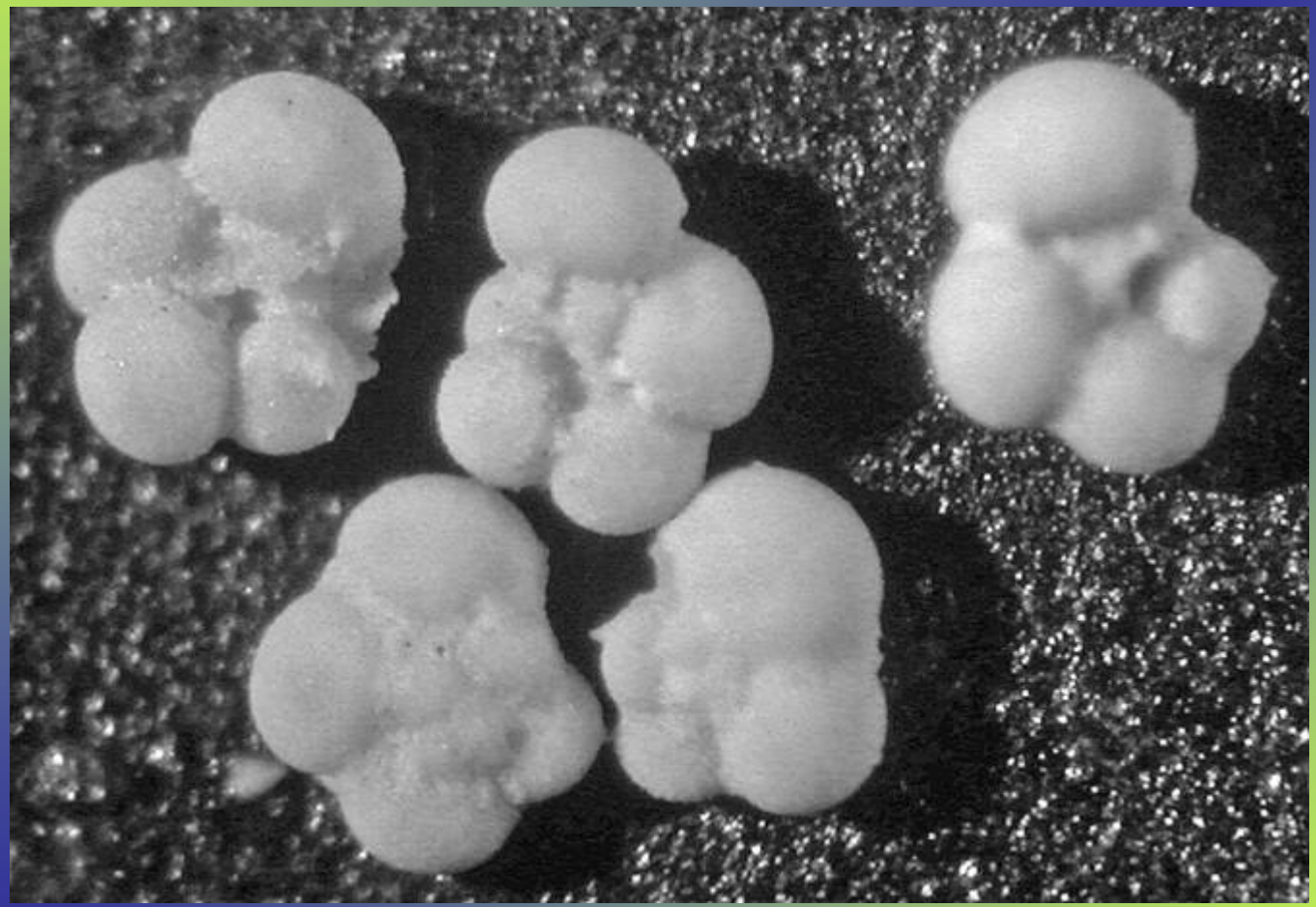




Paleocene Planktonic Forams

Subbotina triloculinoides

VM-29-124

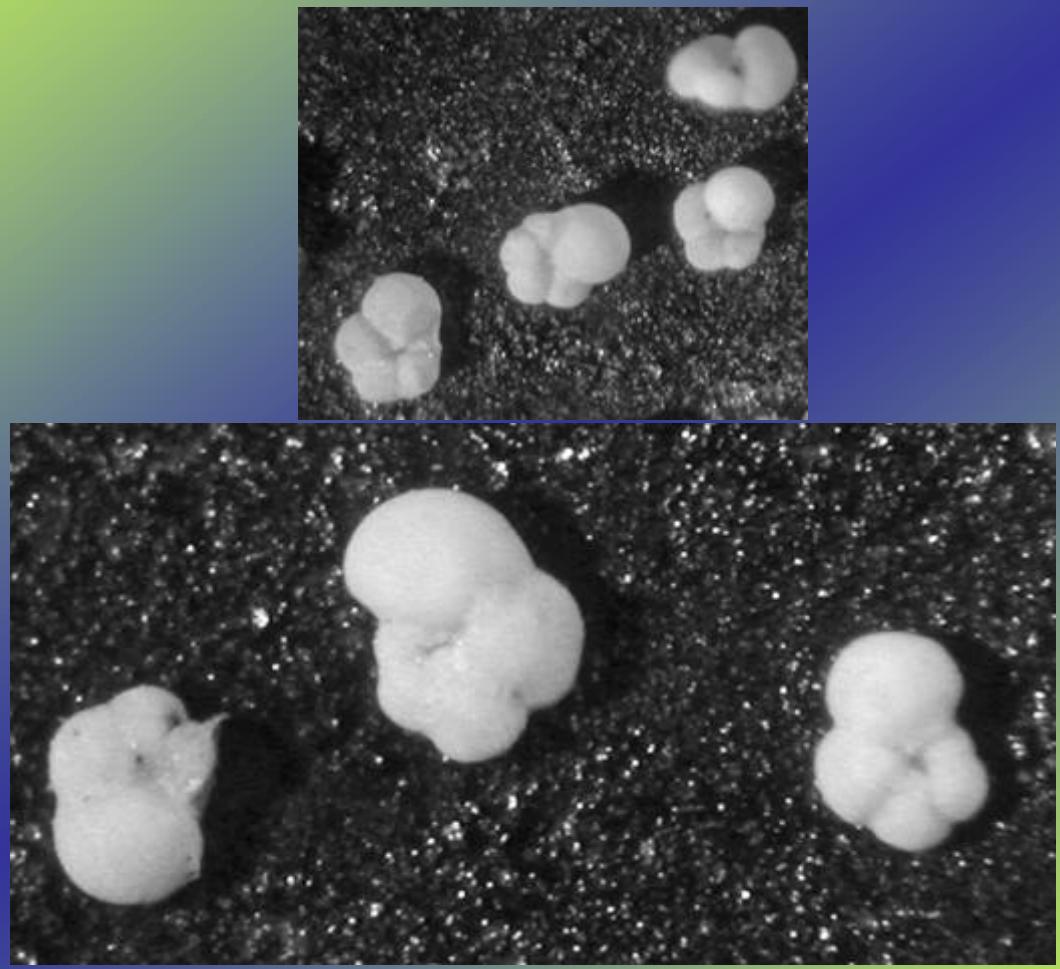


Paleocene

28 S, 3 E, 3063 M

Planomalina compressa

VM-29-124



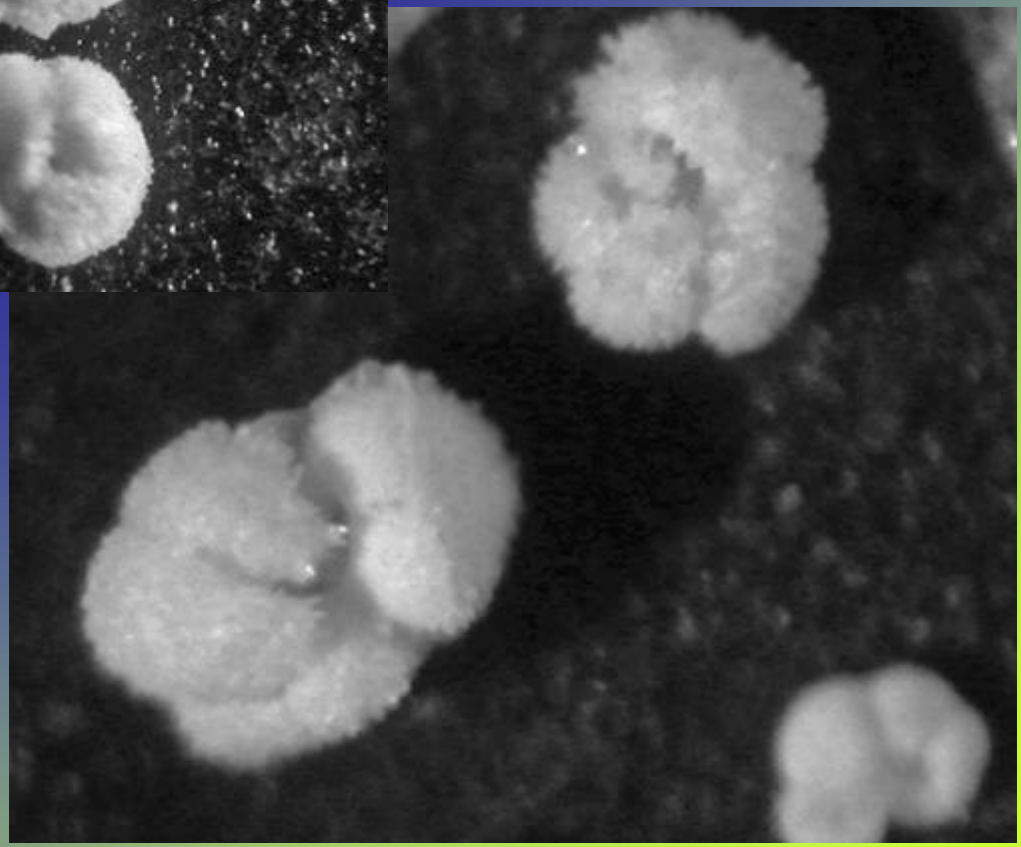
Paleocene

28 S, 3 E, 3063 M

Morozovella

Conicotruncata

@ Aacranina



VM-29-124

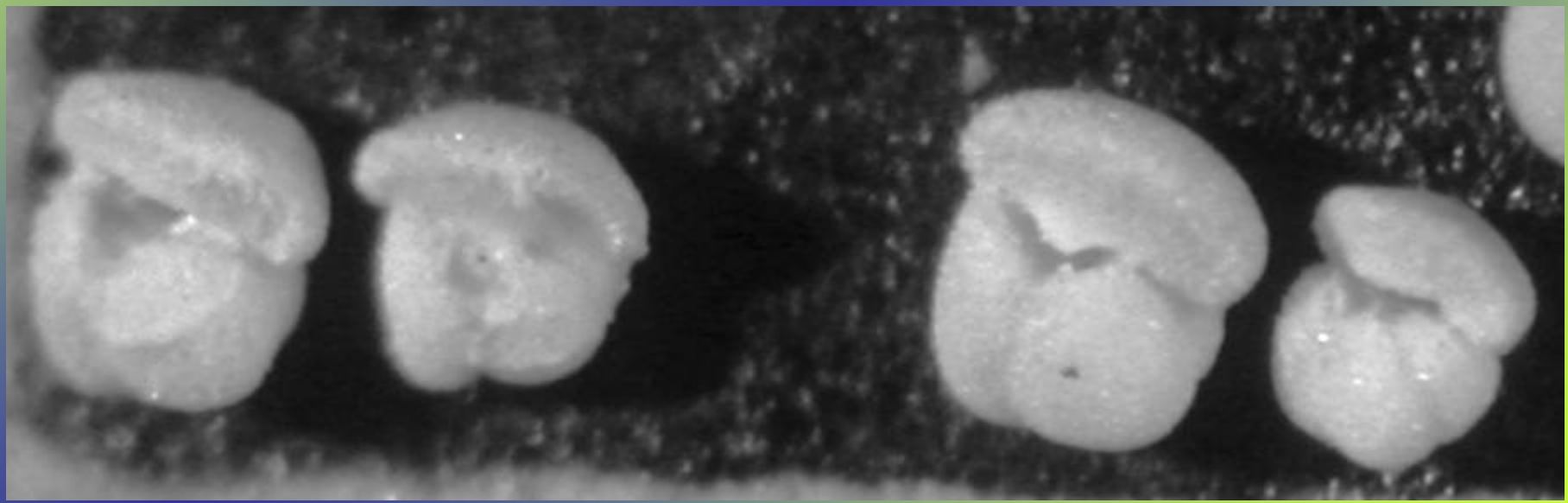
Paleocene

28 S, 3 E, 3063 M

Middle Miocene
Planktonic Foraminifera

Middle Miocene *Globoquadrina dehiscens*

RC-12-306, 26 S, 37 E, 2501 M



Middle Miocene

Dentoglobigerina altispira

RC-12-306, 26 S, 37 E, 2501 M