CLASSIFICAZIONE ROCCE CARBONATICHE

- *Folk (1959, 1962)*
- *Dunham (1962)*

Classificazione di Folk

1 – allochimici (granuli) → 1. Peloidi, 2. Ooidi, 3. Bioclasti, 4. Intraclasti

2 – matrice (micrite)

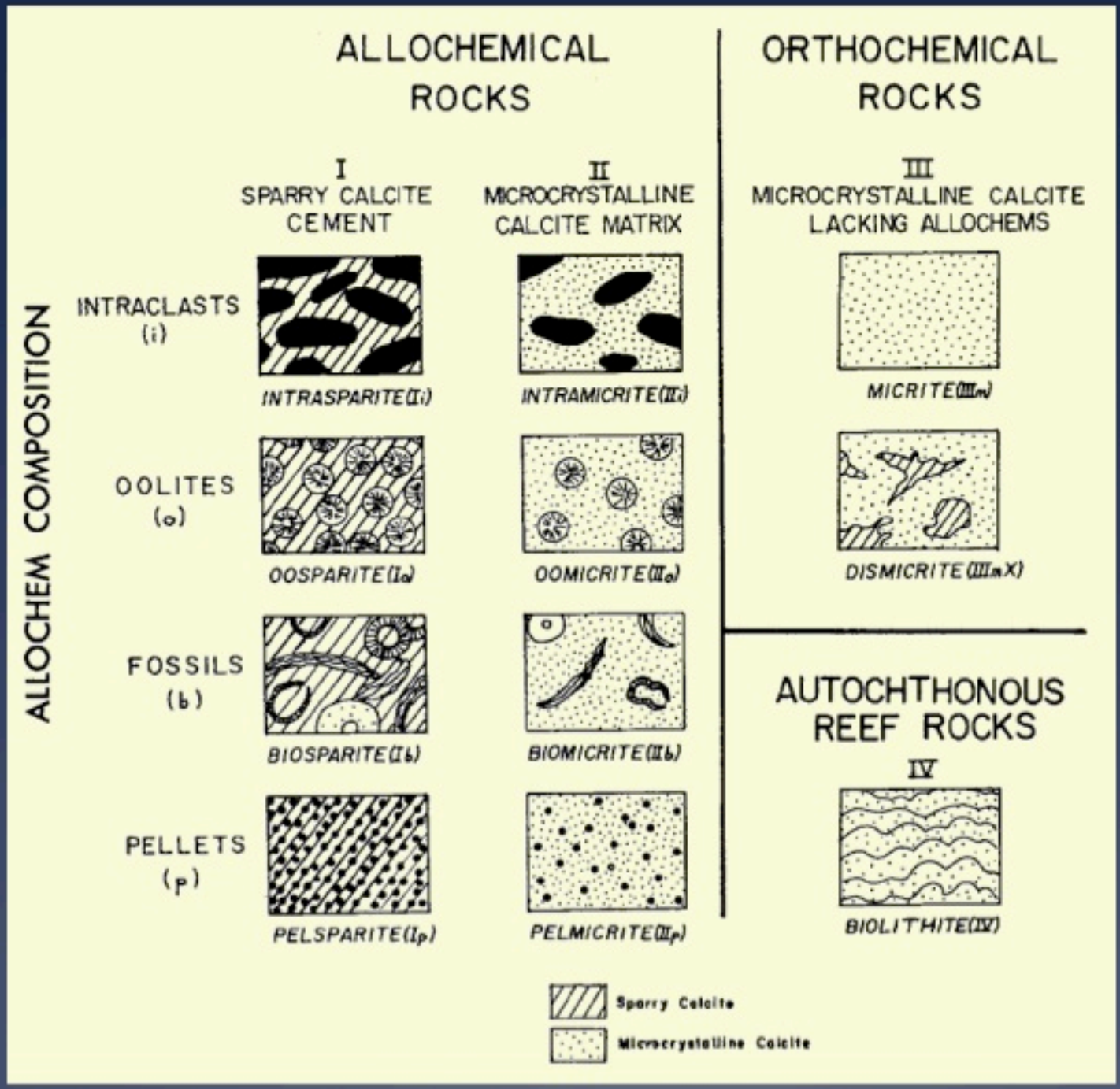
3 – cemento (sparite)

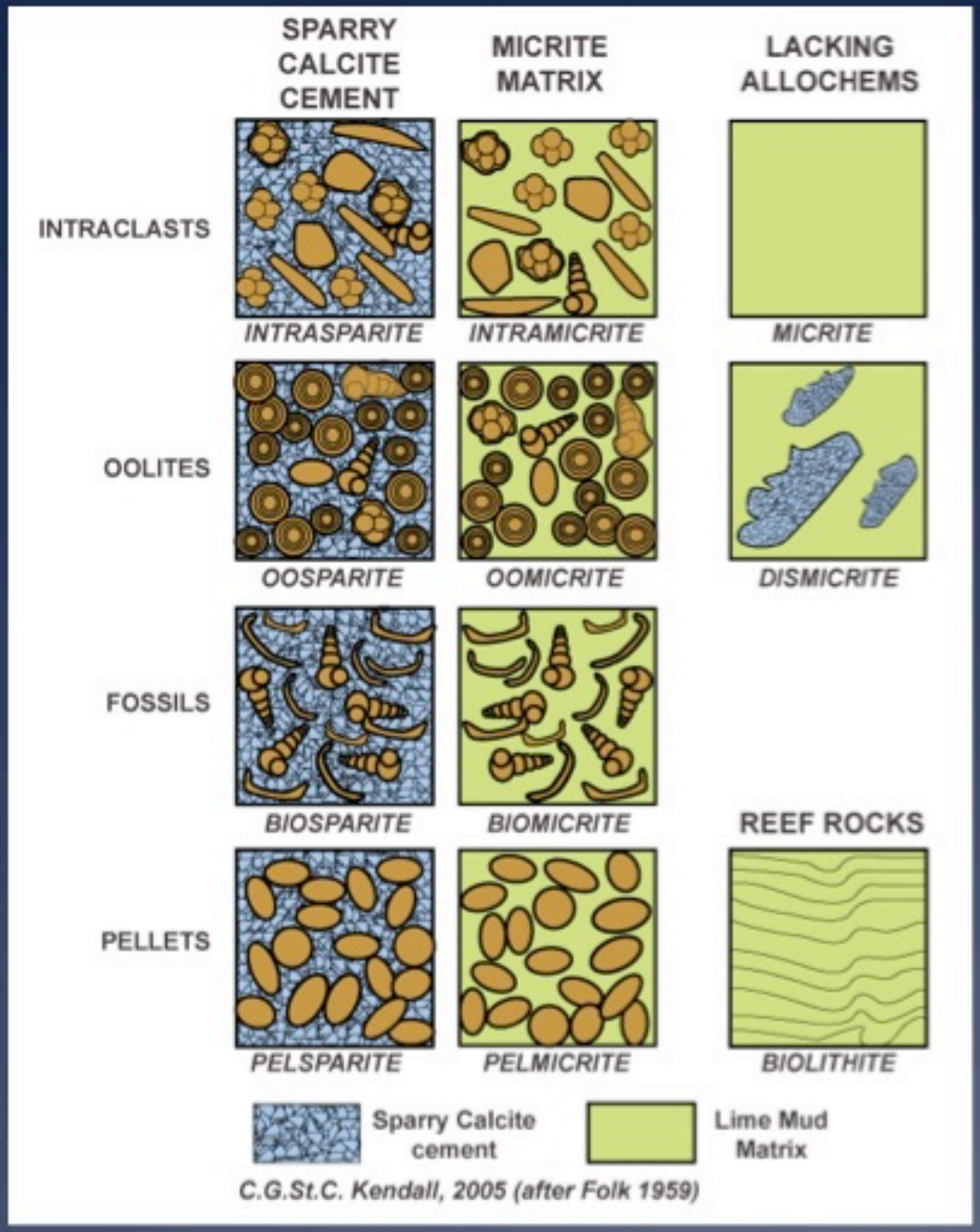
1.Calcari sparitici allochemici
2.Calcari micritici allochemici
3.Calcari microcristallini
4.Biolititi

Grain and Crystal Size Scales (Folk, 1962)

Scholle, 2002

	Transported Constituents	Authigenic Constituents	
64 mm	Very coarse calcirudite	Extremely coarsely crystalline	
16 mm	Coarse calcirudite		
4 mm	Medium calcirudite		4 mm
1 mm	Fine calcirudite	Very coarsely crystalline	1 mm
0.5 mm	Coarse calcarenite	Coarsely crystalline	
0.25 mm	Medium calcarenite		0.25 mm
0.125 mm	Fine calcarenite	Medium crystalline	
0.062 mm	Very fine calcarenite		0.062 mm
0.031 mm	Coarse calcilutite	Finely crystalline	
0.016 mm	Medium calcilutite		0.016 mm
0.008 mm	Fine calcilutite	Very finely crystalline	
	Very fine calcilutite		0.004 mm
		Aphanocrystalline	

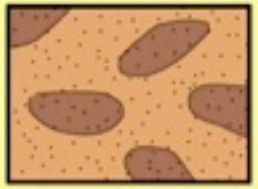
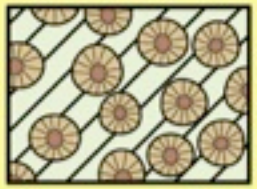
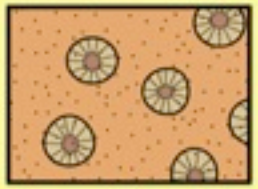
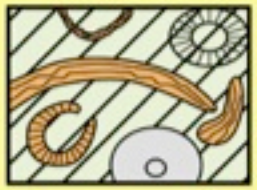
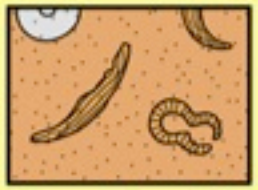
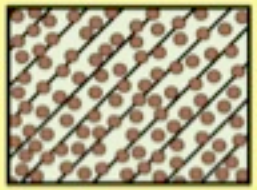
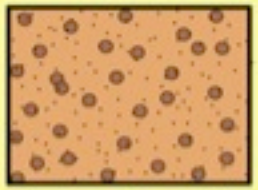




FOLK, 1959 classification

ALLOCHEMICAL ROCKS

ALLOCHEM TYPE

	Spar Cement	Micrite Matrix
INTRACLASTS	 Intrasparite	 Intramicrite
OOIDS	 Oosparite	 Oomicrite
FOSSILS	 Biosparite	 Biomicrite
PELLETS	 Pelsparite	 Pelmicrite

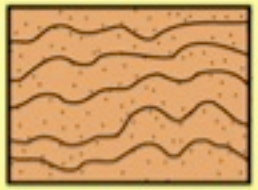
ORTHOCHEMICAL ROCKS

Micritic Matrix
Lacking Allochems

Micrite

Dismicrite

AUTOCHTHONOUS REEF ROCKS



Biolithite

Scholle, 2002

Textural Spectrum of Carbonate Rocks (Folk, 1962)

	> 2/3 LIME MUD MATRIX				SUBEQUAL SPAR and LIME MUD	> 2/3 LIME SPAR CEMENT		
Percent allochems	0-1%	1-10%	10-50%	> 50%		SORTING POOR	SORTING GOOD	ROUNDED and ABRADED
Textural name	MICRITE and DIS-MICRITE	FOSSILI-FEROUS MICRITE	SPARSE BIO-MICRITE	PACKED BIO-MICRITE	POORLY-WASHED BIO-SPARITE	UN-SORTED BIO-SPARITE	SORTED BIO-SPARITE	ROUNDED BIO-SPARITE
Typical fabric								
Terri-genous analogs	Claystone		Sandy clay-stone	Clayey or immature sandstone		Sub-mature sand-stone	Mature sand-stone	Super-mature sand-stone

Scholle, 2002

Classificazione di Dunham

Classificazione basata sulla tessitura della roccia o del sedimento

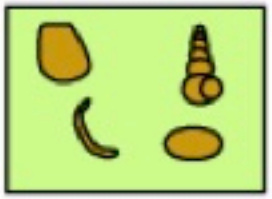
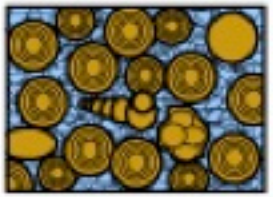
1 – calcari matrice-sostenuti

2 – calcari grano-sostenuti

3 – calcari biocostruiti

4 – Calcari cristallini

Classificazione CARBONATI

Original components not bound together at deposition				
Contains mud (particles of clay and fine silt size)			Lacks Mud	
Mud-supported		Grain-supported		
Less than 10% Grains	More than 10% Grains			
Mudstone	Wackestone	Packstone	Grainstone	
				

Original components bound together at deposition. Intergrown skeletal material, lamination contrary to gravity, or cavities floored by sediment, roofed over by organic material but too large to be interstices

Boundstone

Dunham, 1962

Classificazione CARBONATI

<table>
<tr><th colspan="4">DEPOSITIONAL TEXTURE RECOGNIZABLE</th><th rowspan="3">Original Components Bound Together During Deposition</th><th rowspan="3">DEPOSITIONAL TEXTURE NOT RECOGNIZABLE</th></tr>
<tr><th colspan="3">Original Components Not Bound Together During Deposition</th></tr>
<tr><th colspan="2">Contains mud</th><th rowspan="2">Grain-supported</th><th rowspan="2">Lacks mud and is grain-supported</th></tr>
<tr><th>Mud-supported</th><th></th></tr>
<tr><td>< 10% grains

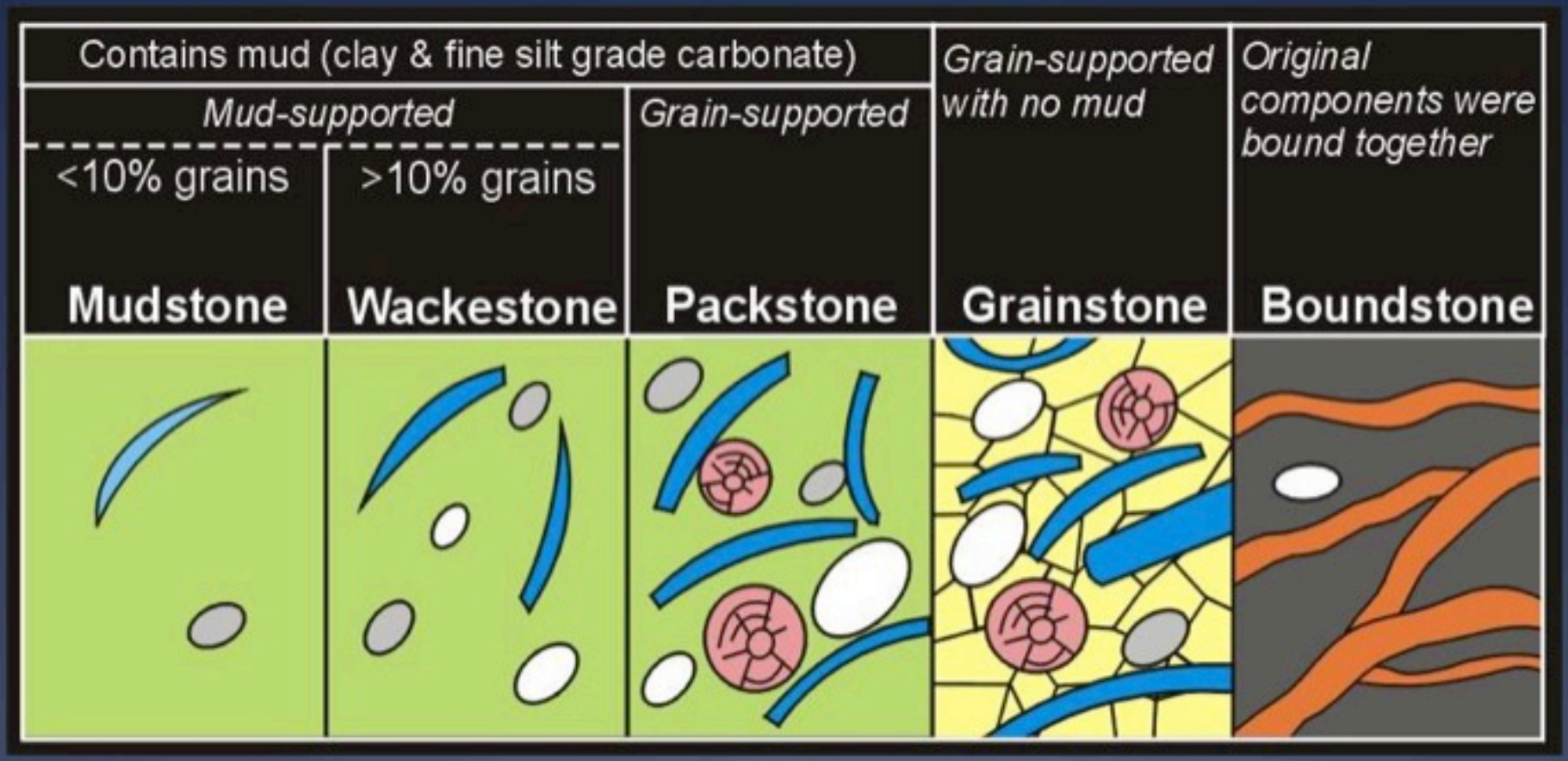
Mud-stone</td><td>> 10% grains

Wacke-stone</td><td>Packstone</td><td>Grain-stone</td><td>Boundstone</td><td>Crystalline carbonate

(Subdivisions based on texture or diagenesis)</td></tr>
</table>

Dunham, 1962

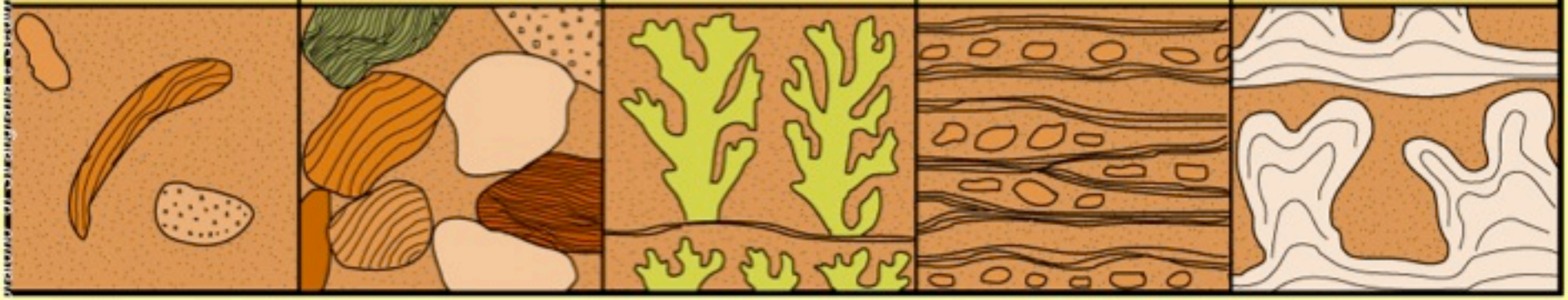
Classificazione CARBONATI



Dunham, 1962

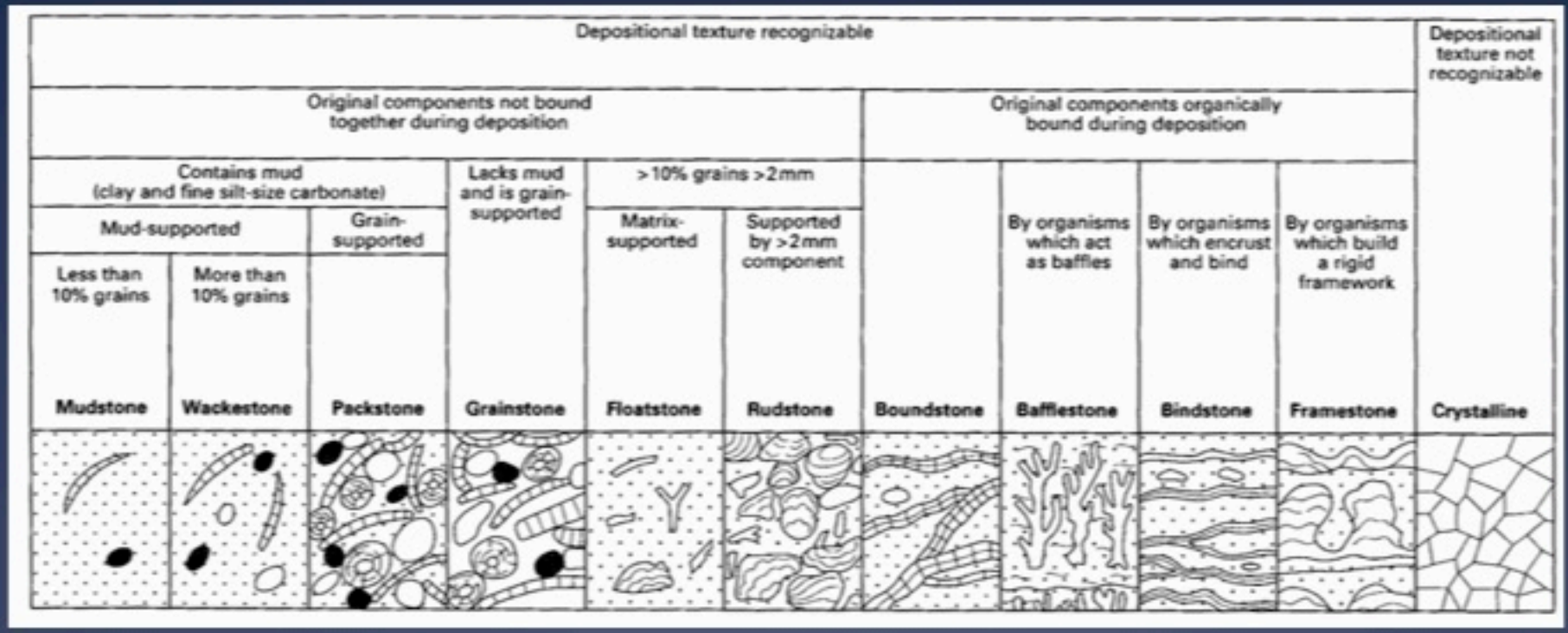
Classificazione CARBONATI

Original Components Not Organically Bound During Deposition		Original Components Organically Bound During Deposition		
> 10% grains >2 mm		Organisms acted as baffles	Organisms encrusted and bound	Organisms built a rigid framework
Matrix-supported	Supported by components larger than 2 mm			
Floatstone	**Rudstone**	**Bafflestone**	**Bindstone**	**Framestone**



Embry & Klovan, 1971

Classificazione CARBONATI

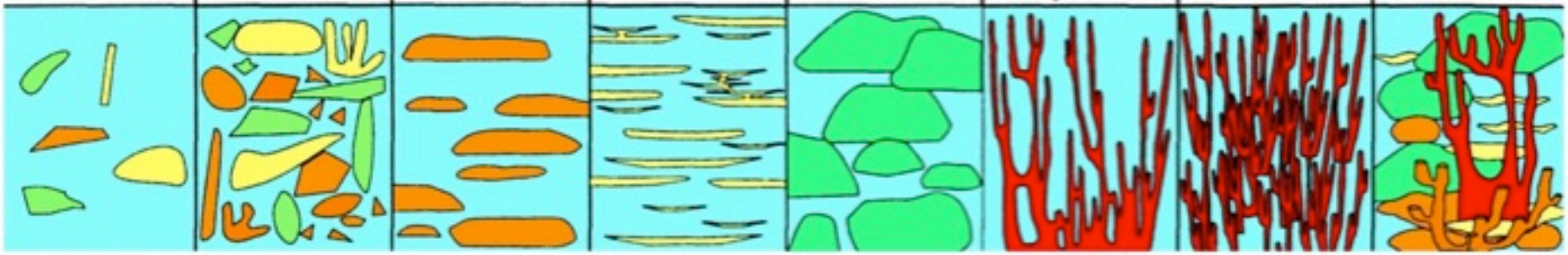


Dunham, 1962; Embry & Klovan, 1971

cementstone

Classificazione CARBONATI

ALLOCHTHONOUS		AUTOCHTHONOUS					
Depositional fabric dominated by bio- and lithoclastic reefal material. More than 10% of the fragments are greater than 1 cm in size.		Facies dominated by a growth fabric of *in situ* and *in growth position* skeletons of calcifying organisms.					
Matrix supported.	Supported by the greater than 1 cm component.	Growth fabric dominated by platy to tabular colonies where calcification in the horizontal plane dominates over that of the vertical plane (width to height ratio of dominant organisms: 30:1 - 5:1). These growth forms constitute more than 60% of the total CSV.	Growth fabric dominated by sheet-like & lamellar colonies where calcification in the horizontal plane greatly dominates over that of the vertical plane (width to height ratio: >30:1). These growth forms constitute more than 60% of the total CSV.	Growth fabric dominated by domal & irregular massive colonies which have the same calcification potential in all free directions. These growth forms constitute more than 60% of the total CSV.	Growth fabric dominated by organisms which have a dominant vertical component of growth and relatively restricted lateral growth (for example all types of branching colonie and rod and tubular solitary forms). These growth forms constitute more than 60% of the total CSV.		No one growth form dominates in terms of CSV.
					PILLARSTONE		
FLOATSTONE	RUDSTONE	PLATESTONE	SHEETSTONE	DOMESTONE	*Sparse*	*Dense*	MIXSTONE



Insalaco, 1998

Classificazione CARBONATI

ALLOCHTHONOUS		AUTOCHTHONOUS					
Depositional fabric dominated by bio- and lithoclastic reefal material. More than 10% of the fragments are greater than 1 cm in size.		Facies dominated by a growth fabric of *in situ* and *in growth position* skeletons of calcifying organisms.					
Matrix supported.	Supported by the greater than 1 cm component.	Growth fabric dominated by platy to tabular colonies where calcification in the horizontal plane dominates over that of the vertical plane (width to height ratio of dominant organisms: 30:1 - 5:1). These growth forms constitute more than 60% of the total CSV.	Growth fabric dominated by sheet-like & lamellar colonies where calcification in the horizontal plane greatly dominates over that of the vertical plane (width to height ratio: >30:1). These growth forms constitute more than 60% of the total CSV.	Growth fabric dominated by domal & irregular massive colonies which have the same calcification potential in all free directions. These growth forms constitute more than 60% of the total CSV.	Growth fabric dominated by organisms which have a dominant vertical component of growth and relatively restricted lateral growth (for example all types of branching colonie and rod and tubular solitary forms). These growth forms constitute more than 60% of the total CSV.		No one growth form dominates in terms of CSV.
					PILLARSTONE		
FLOATSTONE	RUDSTONE	PLATESTONE	SHEETSTONE	DOMESTONE	*Sparse*	*Dense*	MIXSTONE
							

Fig. 11. Modified descriptive classification for styles of scleractinian growth fabric. *CSV* = coral skeletal volume.

Insalaco, 1998

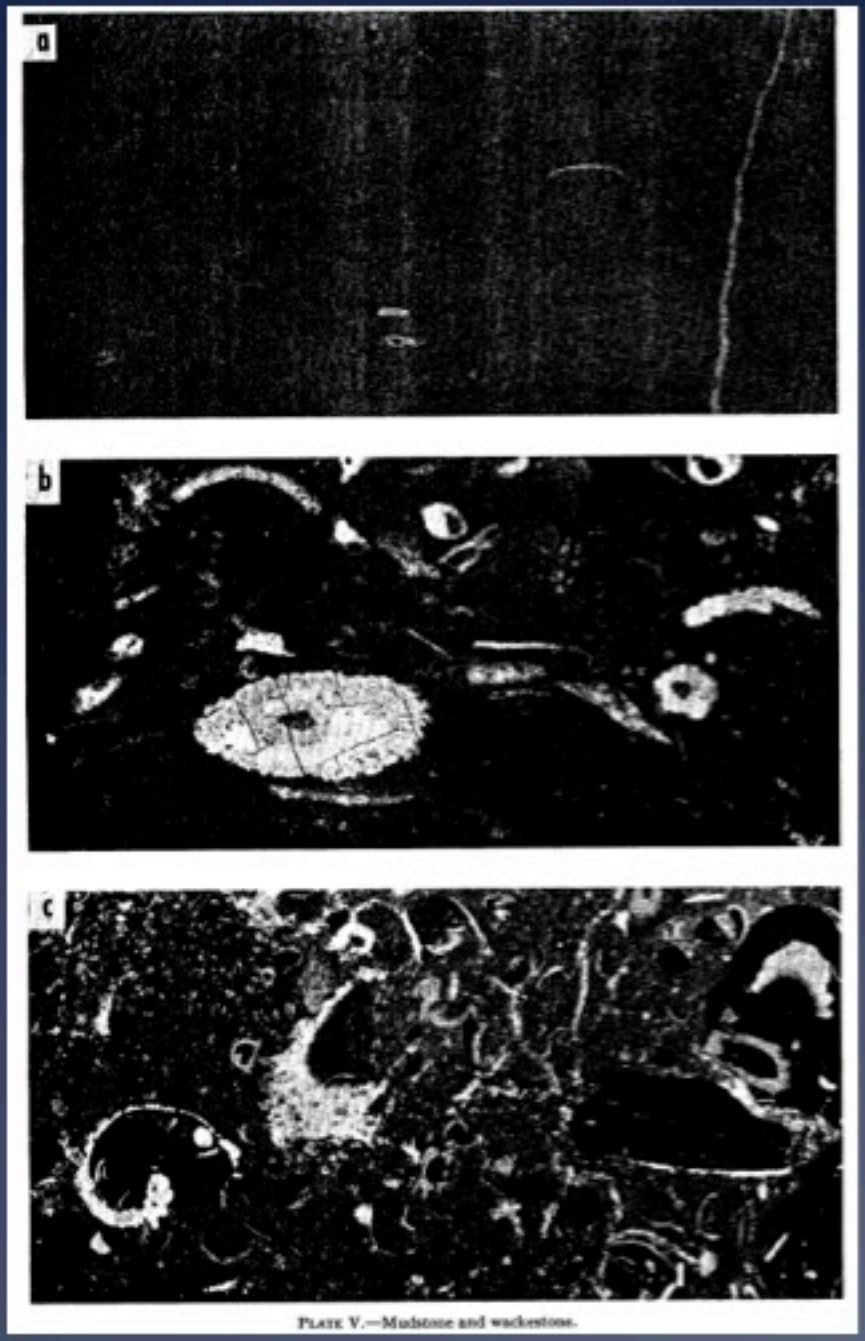
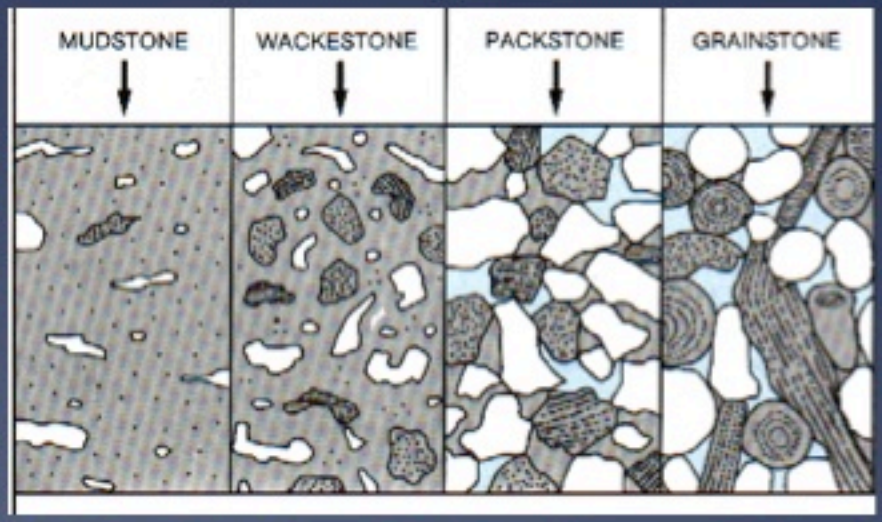


PLATE V.—Mudstone and wackestone.

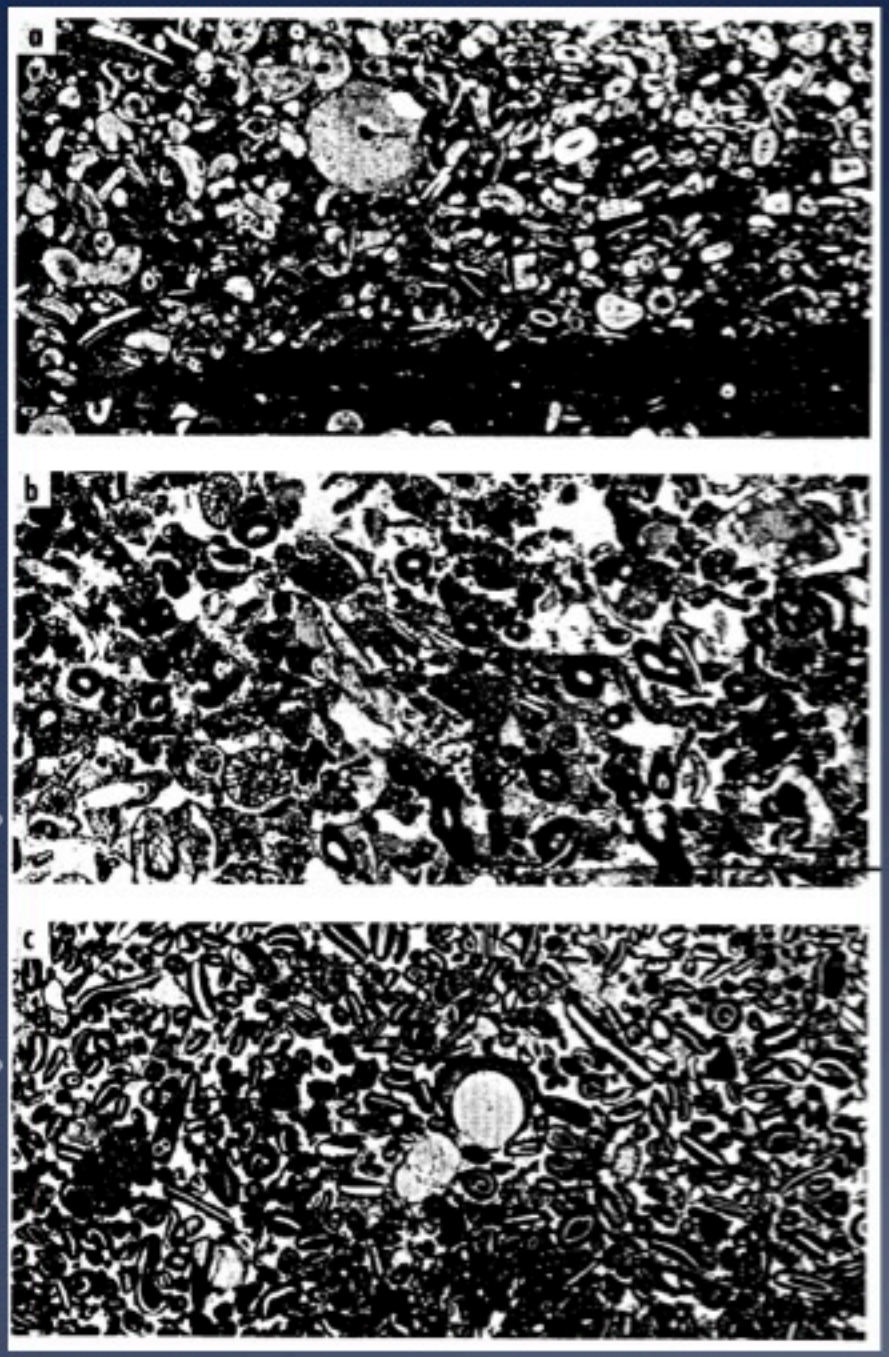
Mudstone-wackestone

Tessitura fango sostenuta

Sedimenti o rocce matrice-sostenuti



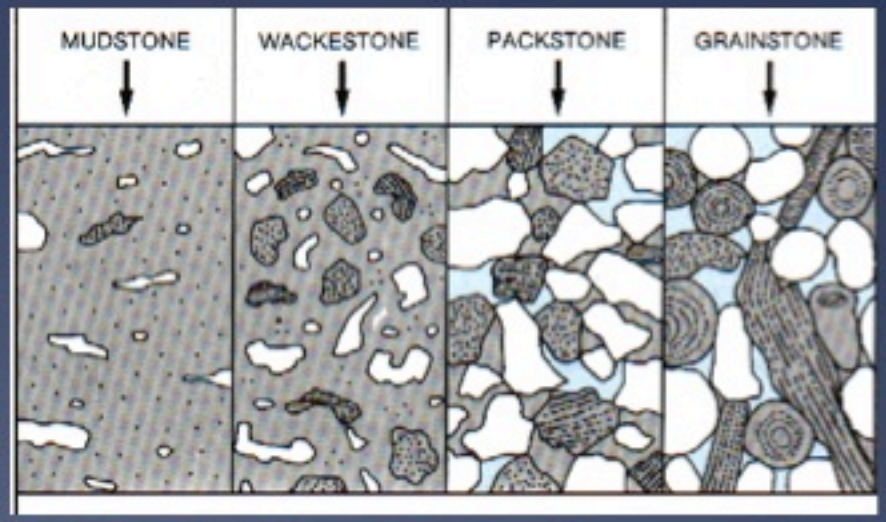
Da Dunham, 1962



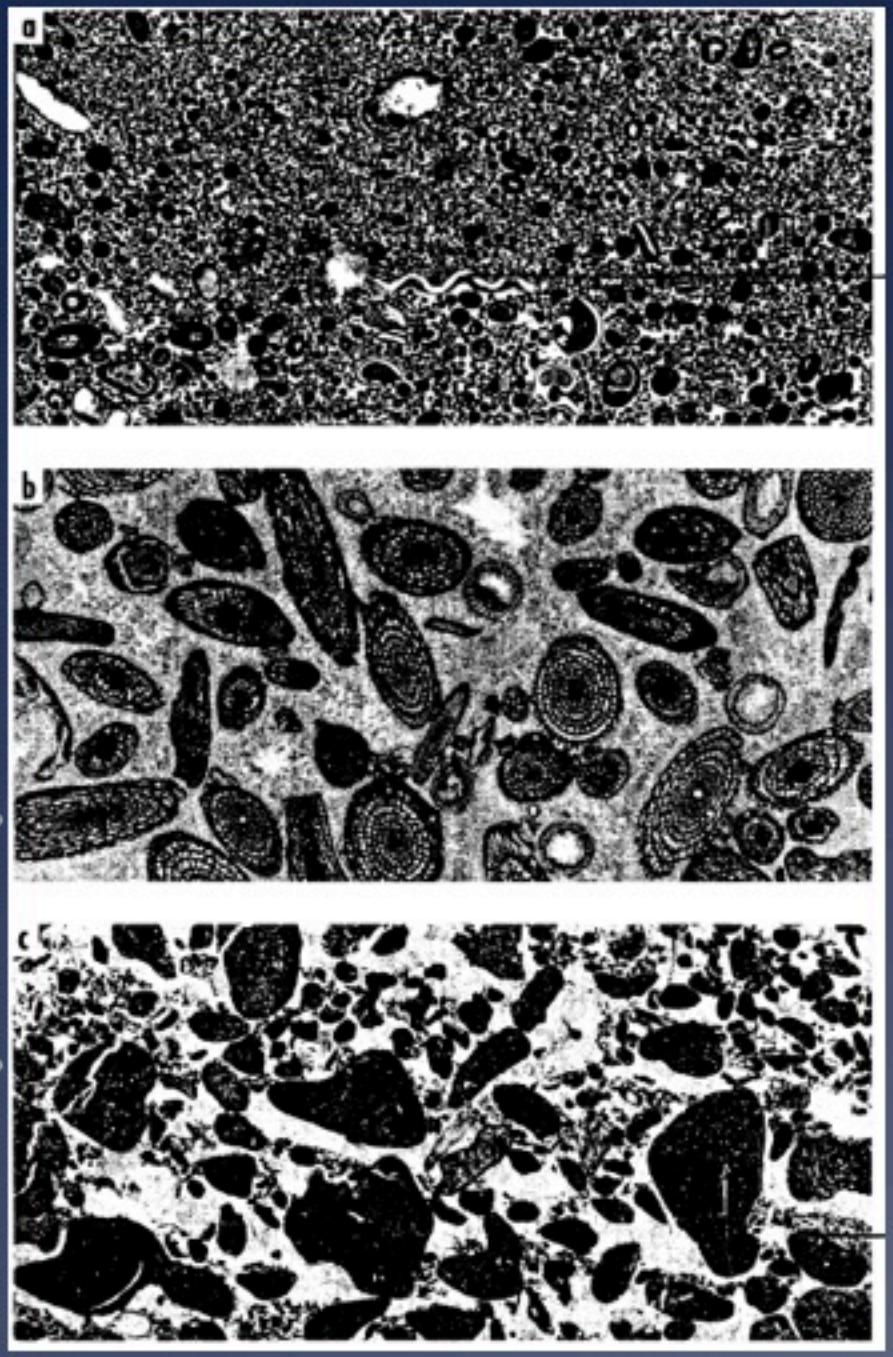
Packstone

Tessitura grano sostenuta

Sedimenti o rocce con matrice e cemento



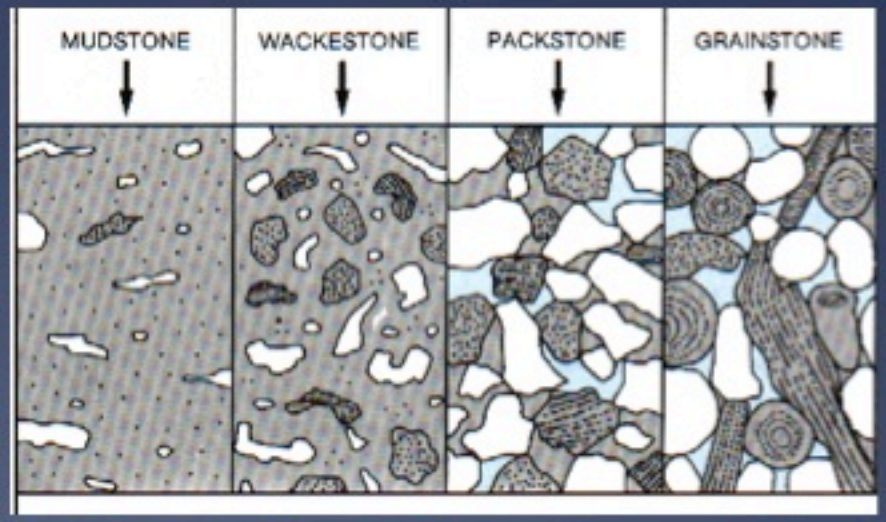
Da Dunham, 1962



Grainstone

Tessitura grano sostenuta

Sedimenti o rocce con cemento



Da Dunham, 1962

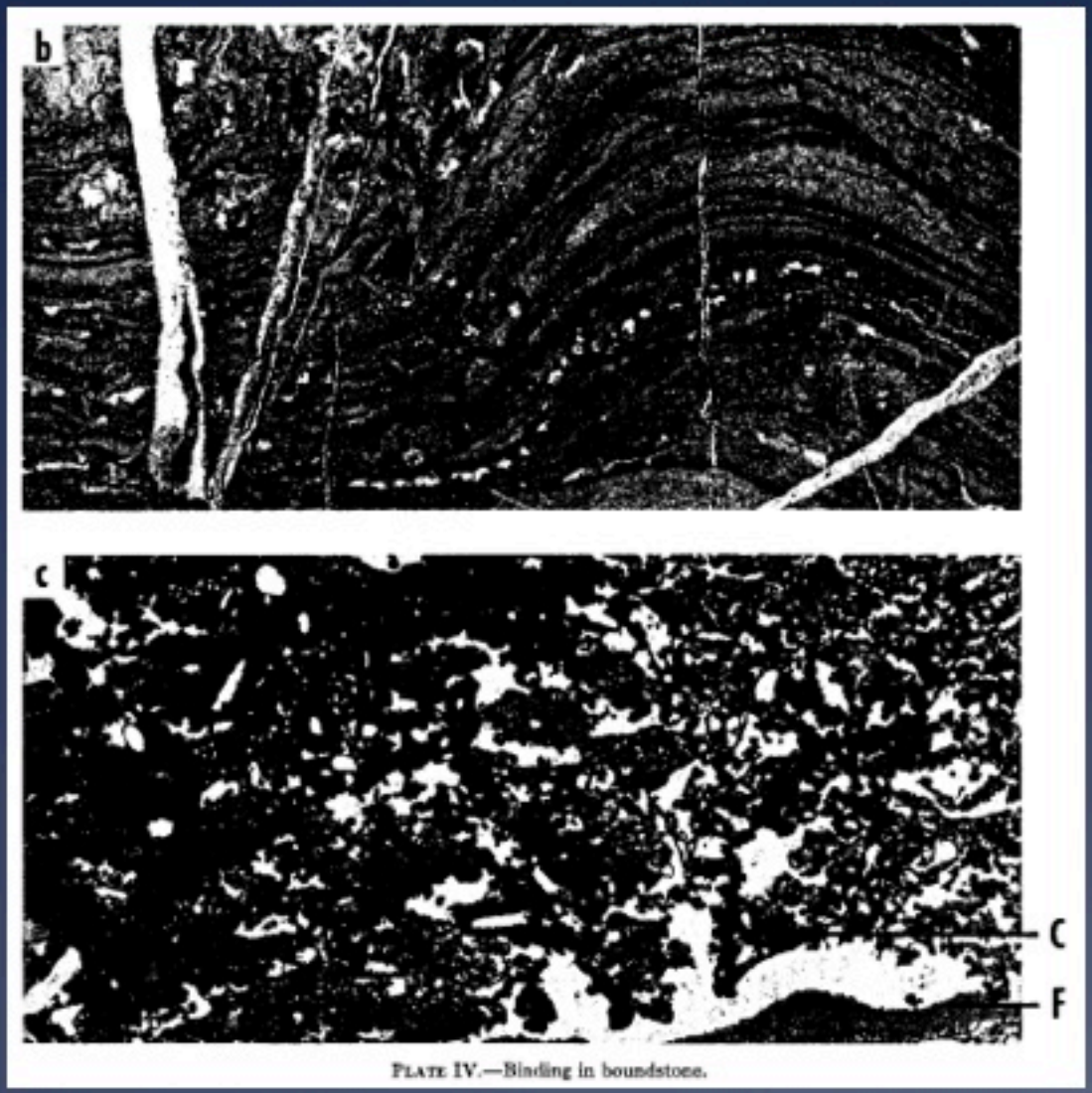


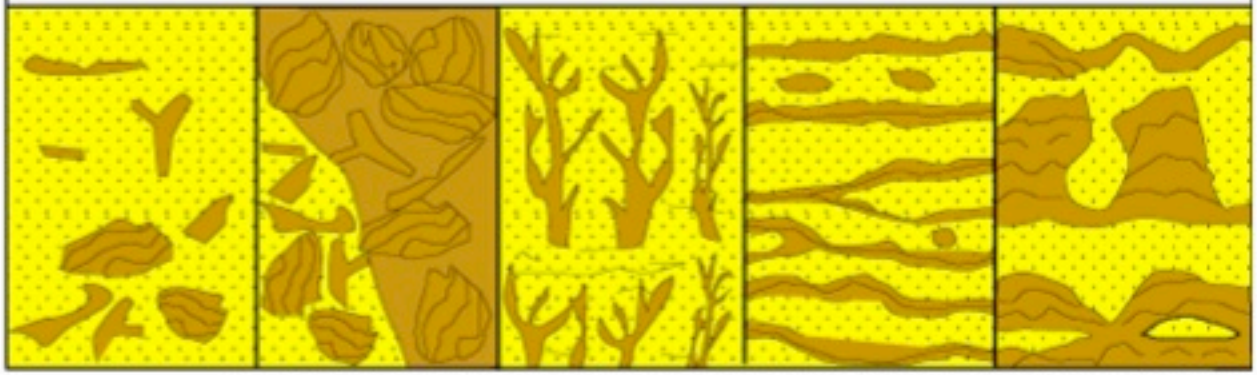
PLATE IV.—Binding in boundstone.

Boundstone

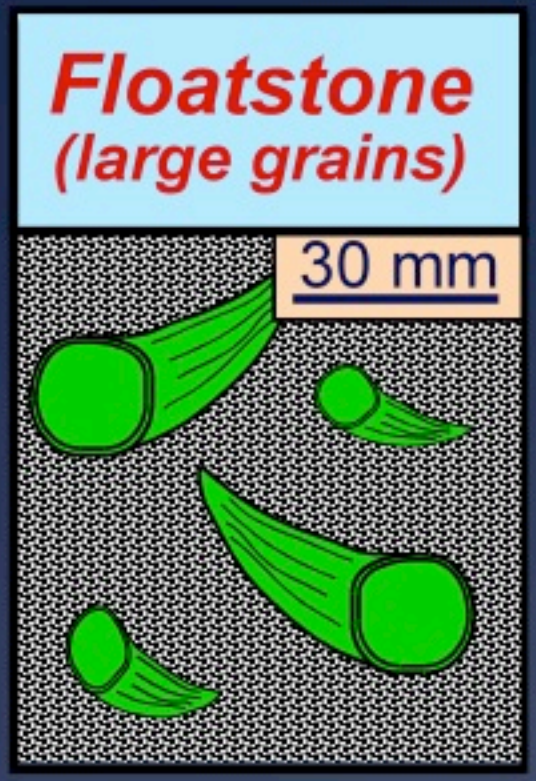
Componenti legati insieme al momento della loro deposizione

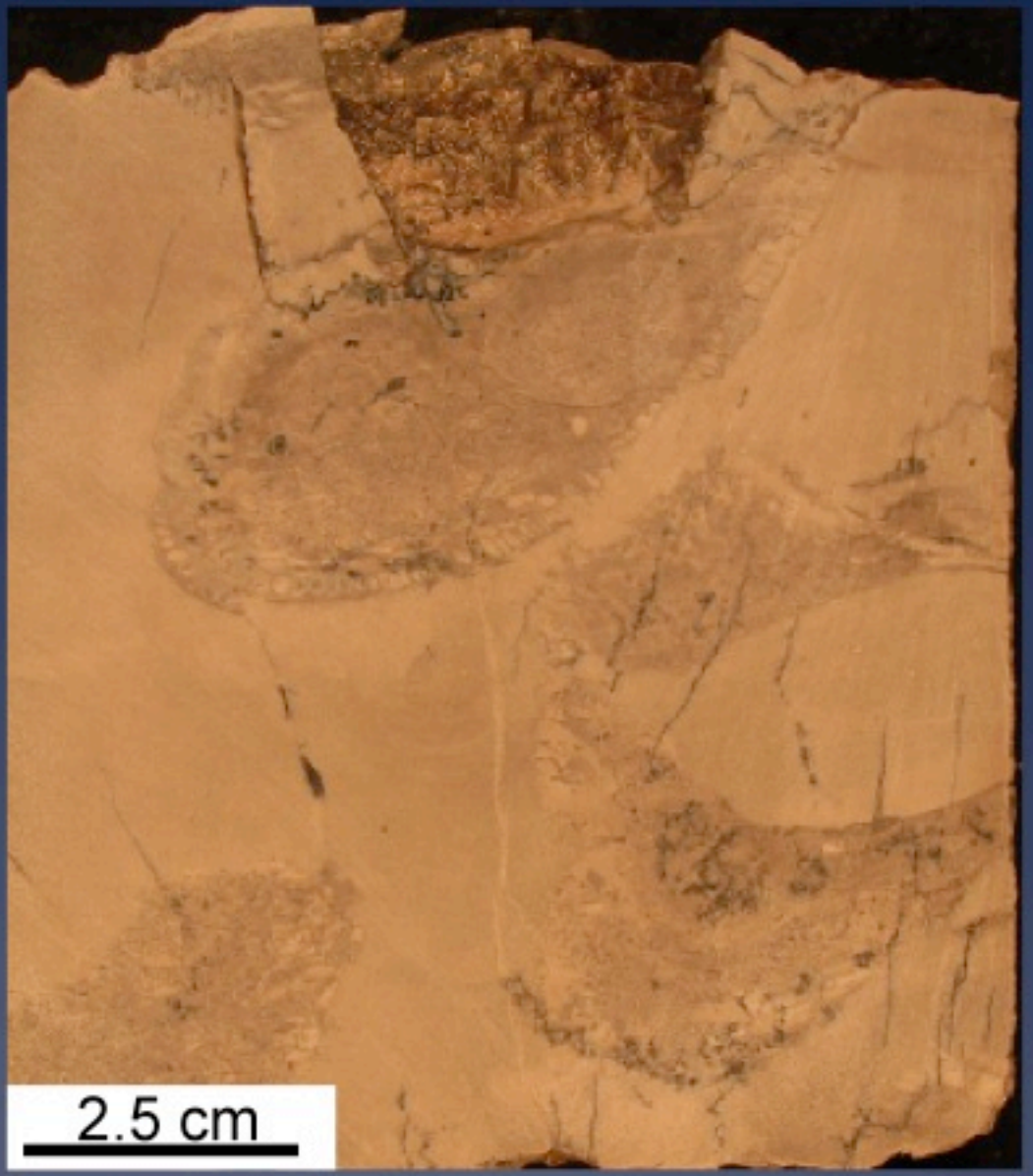
Da Dunham, 1962

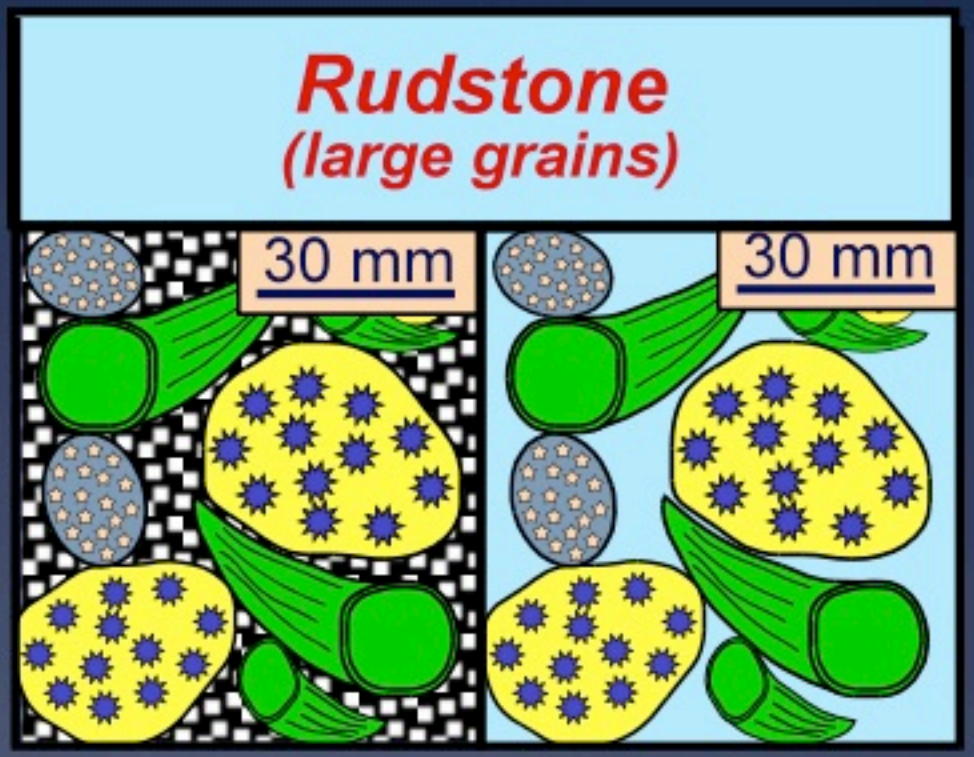
Allochthonous		Autochthonous		
Original components not bound organically at deposition		Original components bound organically at deposition		
>10% grains>2mm				
Matrix supported	Supported by >2mm component	By organisms that act as baffles	By organisms that encrust and bind	By organisms that build a rigid framework
Floatstone	Rudstone	Bafflestone	Bindstone	Framestone



Textural classification of reef limestones after Embry & Klovan (1971) and James (1984)







Boundstone

Framestone

Bindstone

Bafflestone

Framestone

Framestone

1m

Florida Keys – Morsilli, 2002


Framestone
1m
Florida Keys – Morsilli, 2002
Corso Laboratorio di Stratigrafia e Sedimentologia – Prof. Michele Morsilli – Università di Ferrara

Shark Bay, Australia

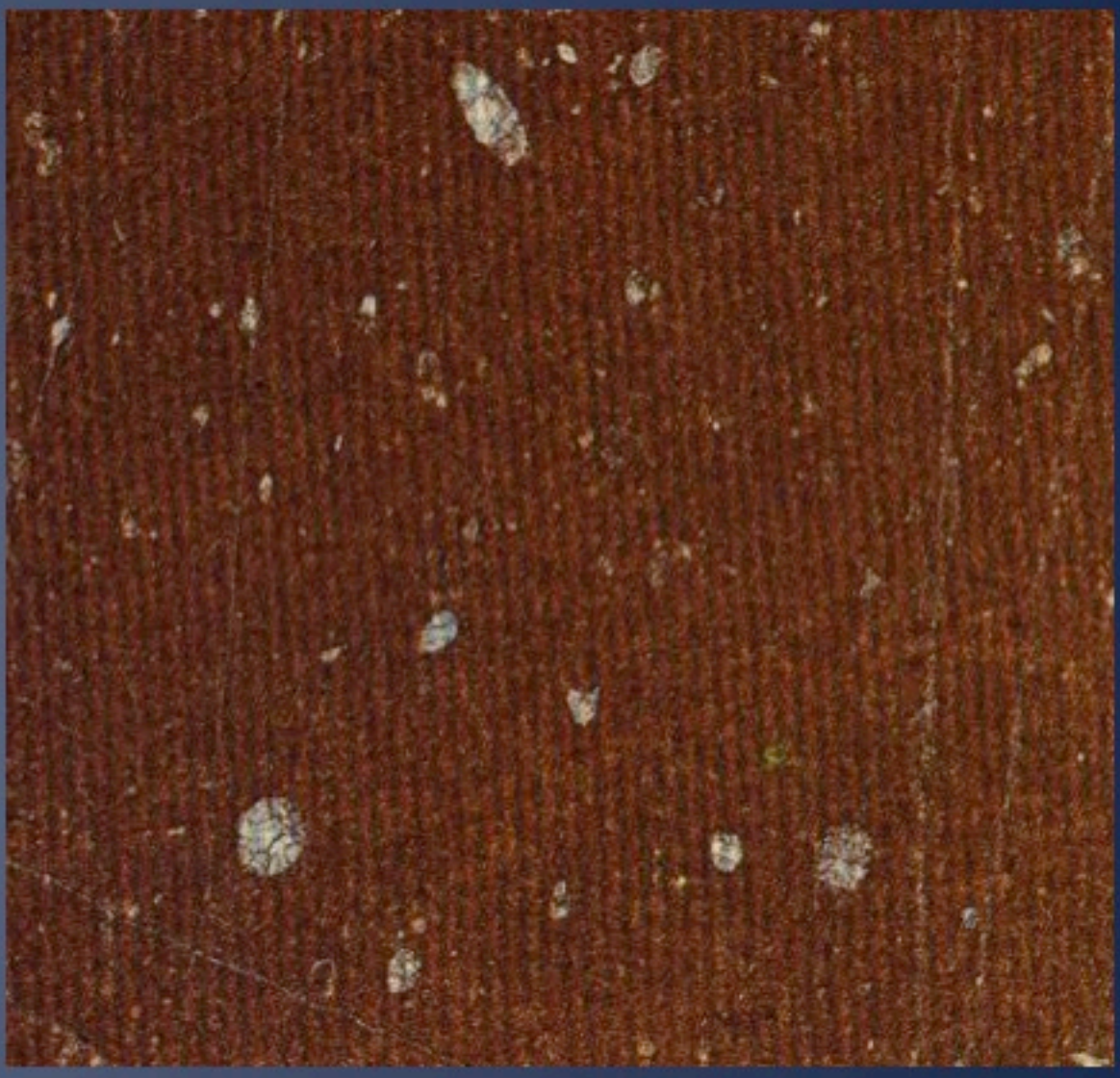
Bindstone

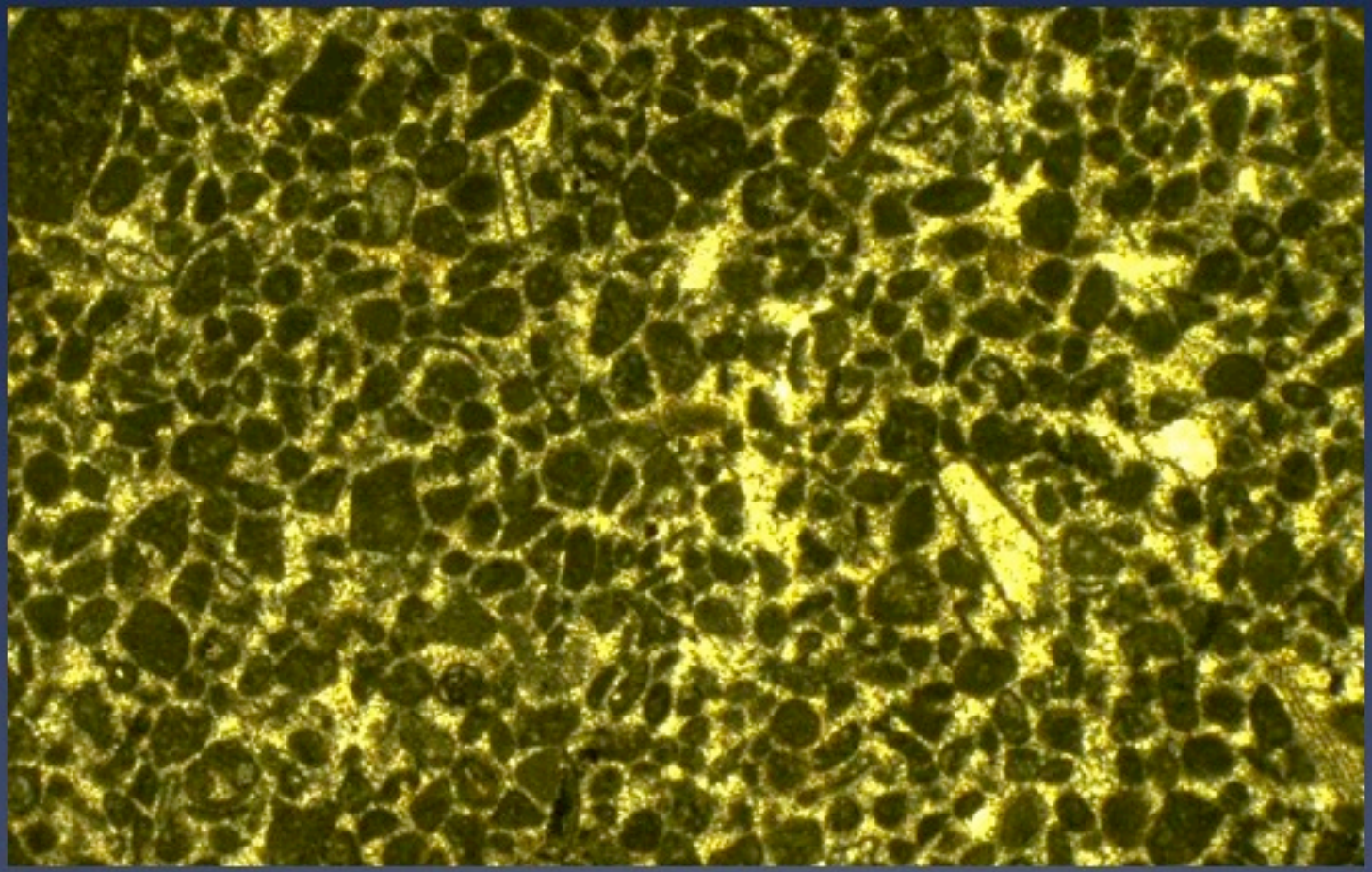
100 mm

Shark Bay, Australia

Gargano, Stromatoliti (Barremiano) – Morsilli, 2003

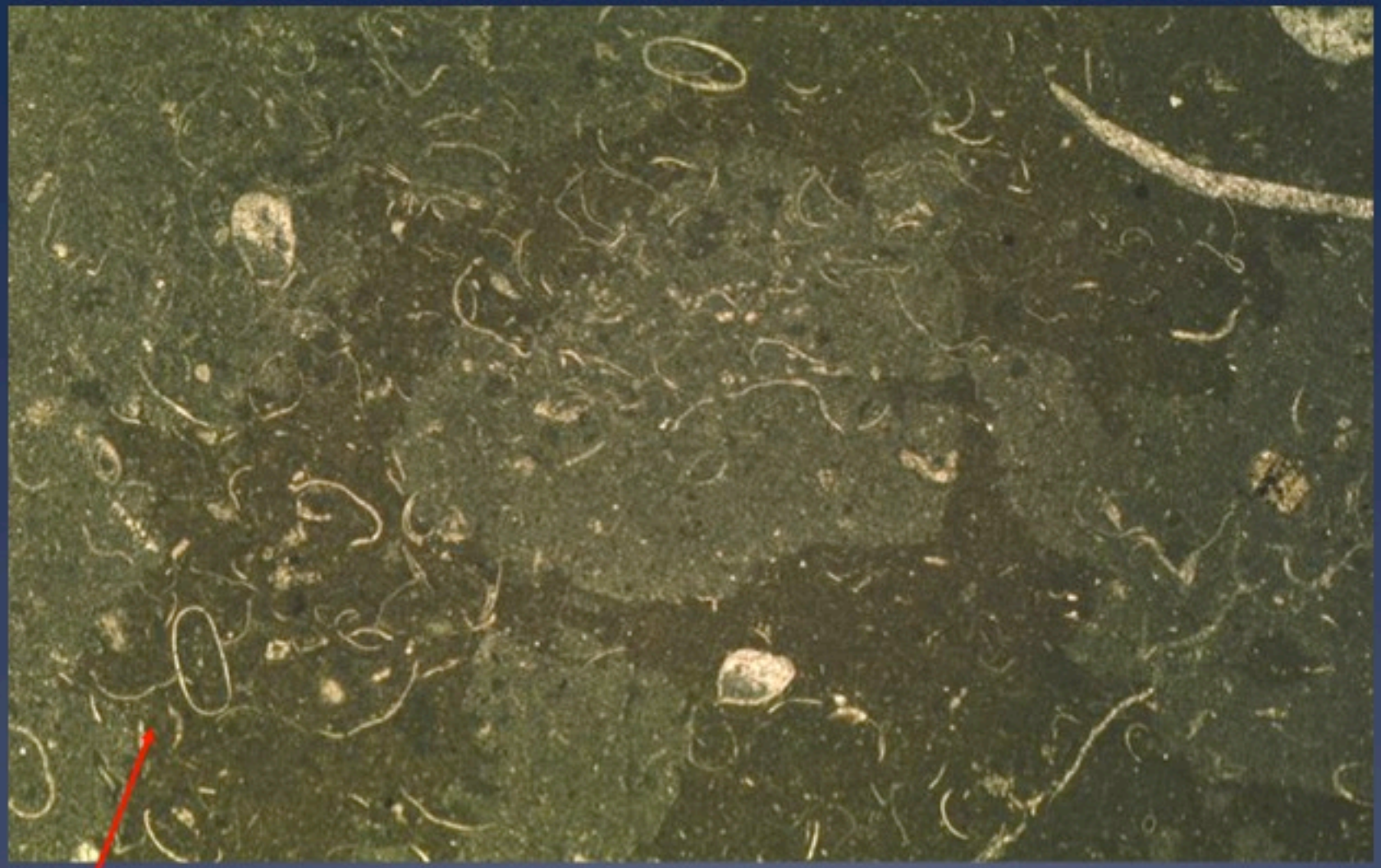
Baffle stone





Giurassico - Portogallo

10 mm



ostracodi

Giurassico - Francia