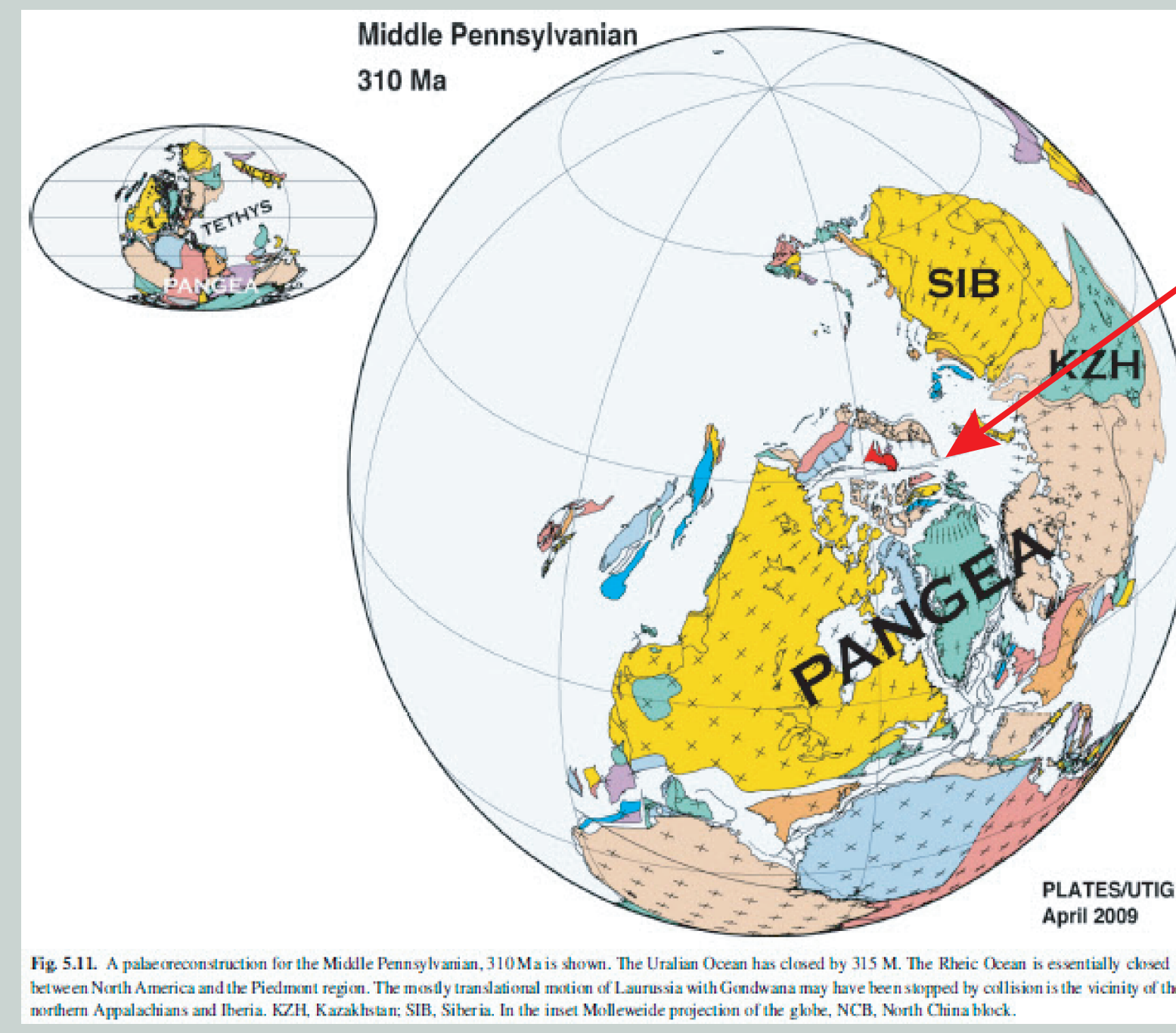
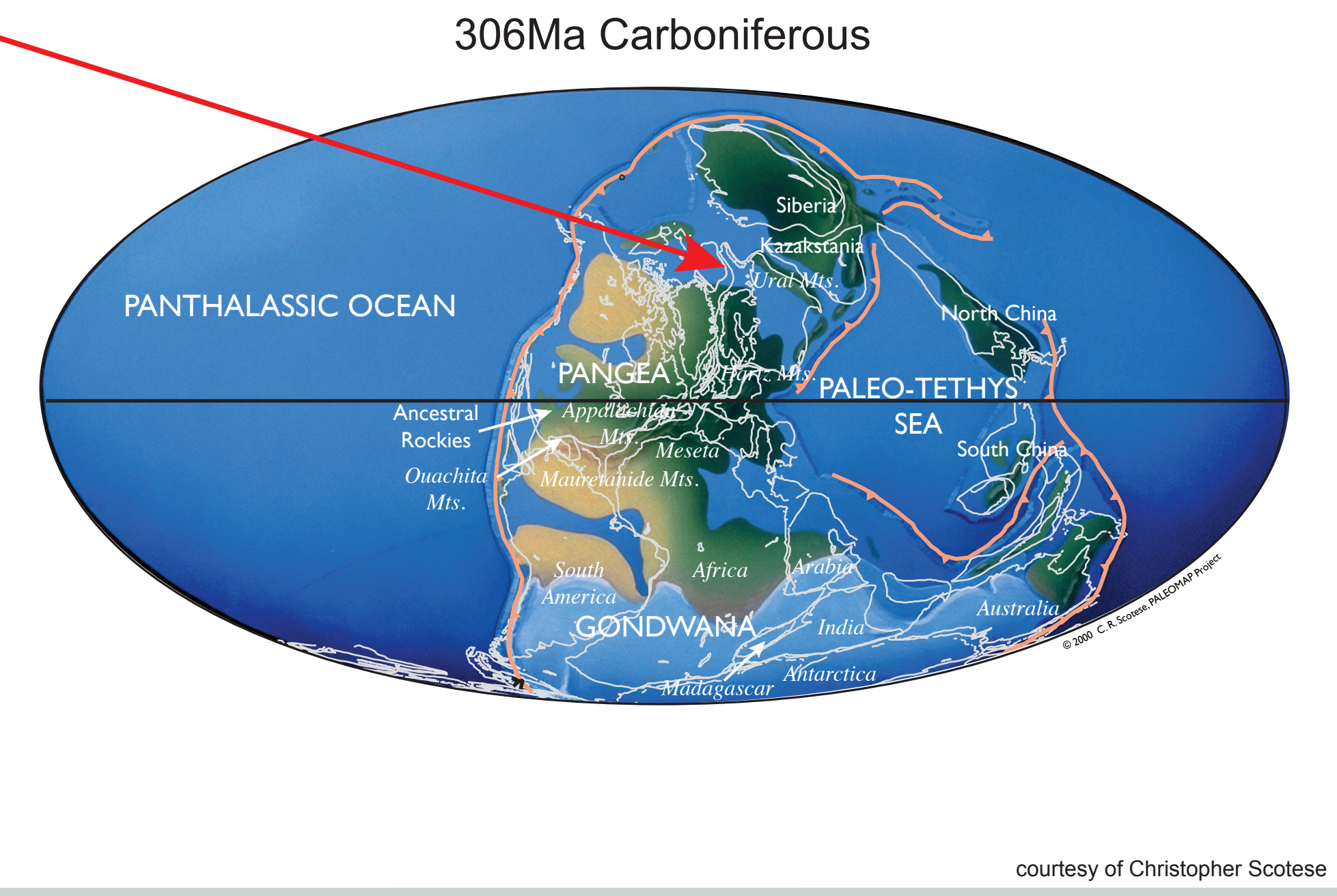


Stratigraphy and Paleo-Environment of Brucebye Beds, basal Tyrrellfjellet Member, Svalbard.

Felix Gradstein, University of Oslo, Norway, Vladimir Davydov, University of Boise, ID, USA, Carl Dons and Jon Halvor Pedersen, Lundin Norway AS, Judith Hannah, Colorado State U., Colorado, USA



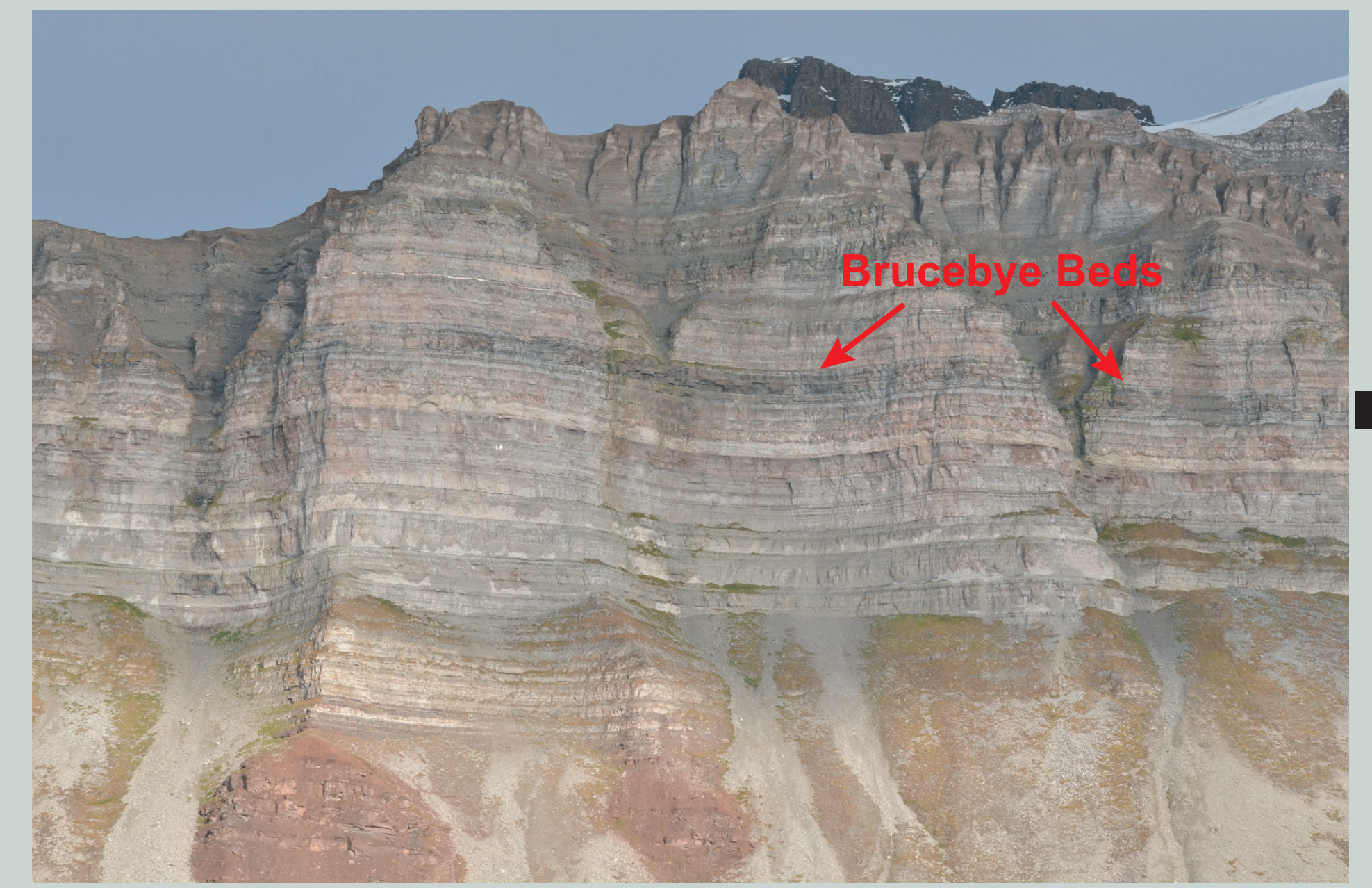
Svalbard



Brucebye Bed, Tyrrellfjellet



Jon Halvor below Brucebye Bed, Kolosseum



Brucebye Beds, Kapitol, Svalbard

Tyrellfjellet locality, Billefjorden:

Sample # 1 on 30 August in basal Brucebye bed; irregularly bedded black bituminous limestone underlying lighter colored crinoidal organoclastic limestone.

Sample # 2 of 30 August is a loose block, collected in alluvial fan slope under outcrop; more shaly than sample 1.

Age: Both samples belong to the *Schwagerina robusta-Ultradaixina bosbytaensis* fusulinid zone of latest Gzelian age, latest Carboniferous; 300- 298.9 Ma.

Organics and diagenesis: In both samples # 1 and #2 the fusulinid microfossils appear to be in place, and no indication of abraded or fragmented specimens due to re-sedimentation. At the same time, the microfossil specimens are severely compressed during early diagenesis, as many specimens have post mortality damage or are crushed and broken. It appears that this shallow-water limestone was very porous and permeable during sedimentation and early diagenesis, allowing organics to easily migrate in the sample space.

Kolosseum locality

Basal Tyrrellfjellet Mb with fusulinid limestone; bluish, dense limestone, from visual observation not rich in organics. Sample # 1 September 1 –taken by Jon Halvor Pedersen in situ at base of the steep cliff .Sample # 1 September 2 – two loose pieces of fusulinid 1st in loose scree just below the outcrop.

Age: both samples belong to lower Asselian *Sphaeroschwagerina robusta-Ultradaixina bosbytaensis* - *S. fusiformis* fusulinid zone of earliest Asselian Age, earliest Permian; 298.9 - 296 Ma

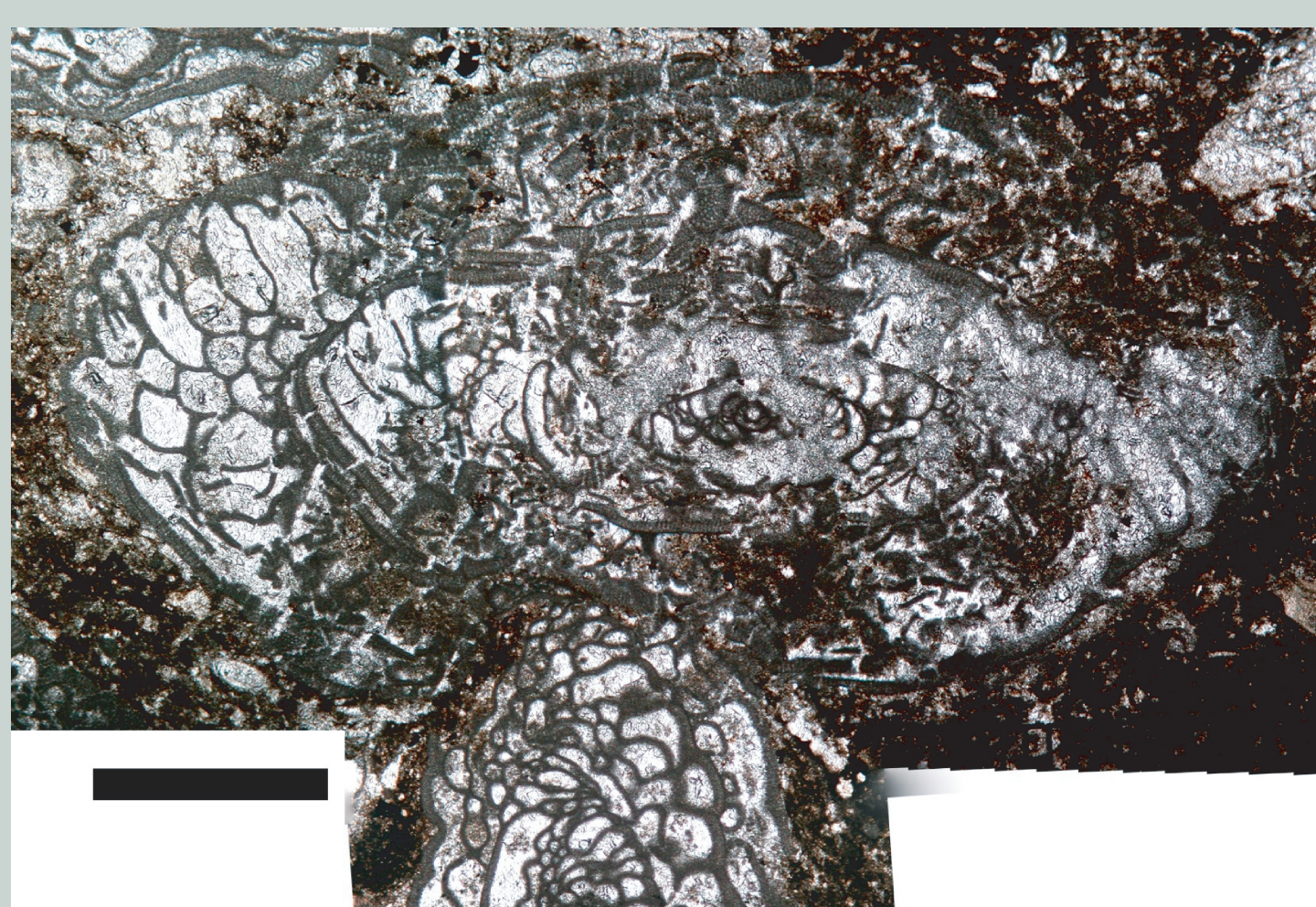
Cementation: Samples are coarse, poorly sorted grainstone; some shells are abraded and crushed before the diagenesis. The meteoritic cementation was very early. Hence, organics had less possibility to migrate in than in the August 30 and 31 samples

Biofacies: Deposition of all 6 samples (30 and 31 August and 1 September) was most likely initiated high in the photic zone in the warmest waters above storm-weather wave base and possibly above fair-weather wave base.

Kapitol locality:

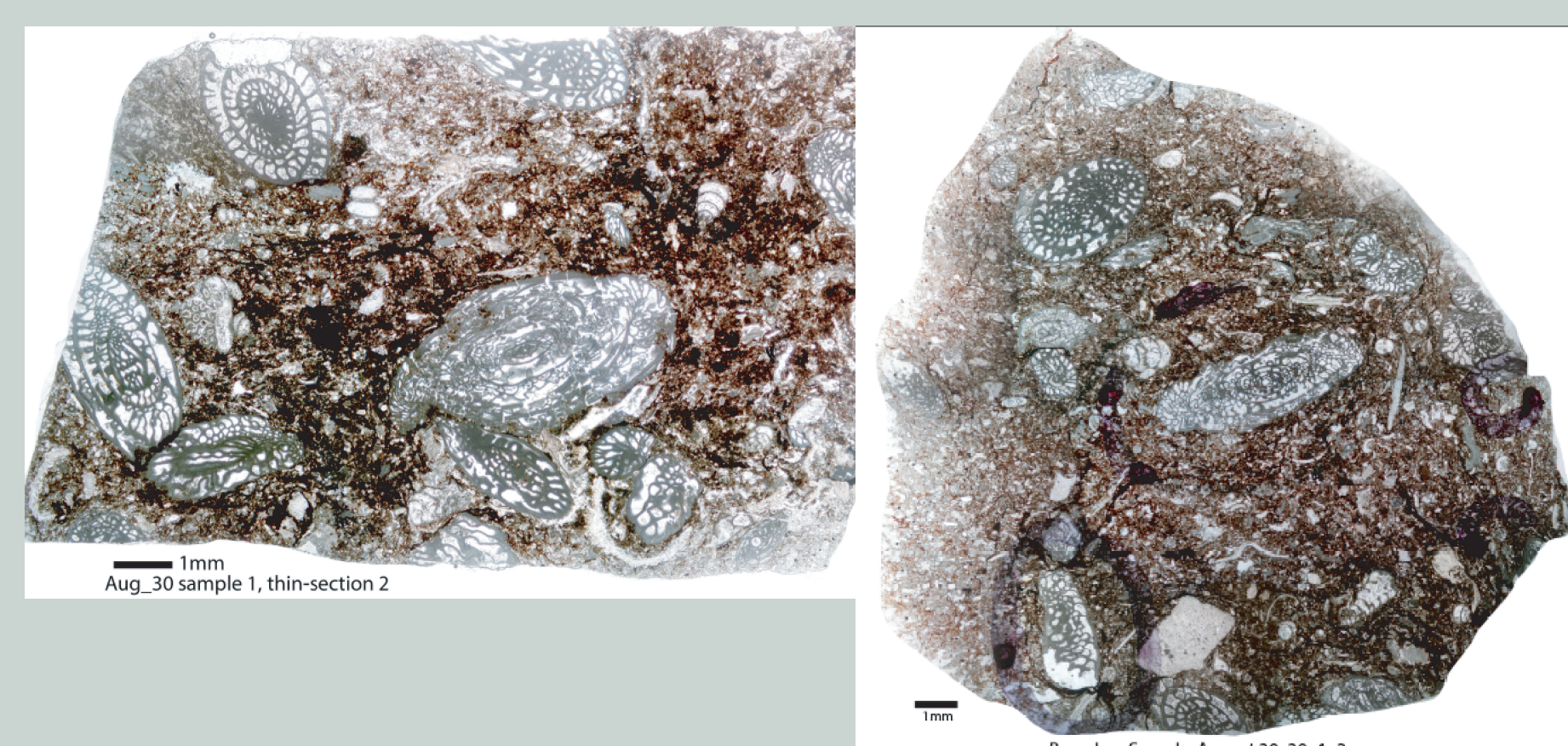
Samples # 31 August 1 and 2. Two Fusulina limestone samples in profile above glacier. Picked the sample in scree just below the outcrop Very bituminous. The actual level of the fusulinid 1st may be seen in the Kapitol profile above a karst level.

Age: Both samples belong to uppermost Gzhelian *Schwagerina robusta-Ultradaixina bosbytaensis* fusulinid zone of latest Gzelian age, latest Carboniferous and 300- 298.9 Ma



1mm Aug_30_1_4b

Fusulinids crushed during diagenesis, Brucebye Bed, Tyrrellfjellet



Fusulinids, Brucebye Bed, Tyrrellfjellet, Svalbard

AGE (Ma)	Period	Epoch/Age (Stage)	Russian Chron	Conodont Zonation	Ammonoid Zonation	Fusulinid & other benthic Foraminifer Zonation	T - R cycles
295	Permian	Sakmarian	Sakmarian	<i>Overtognathus meruli</i> - <i>Mesopodoceras uranense</i>	Sakmarites	<i>Sakmarella moelleri</i>	Sak1
296				<i>Streptognathodus postulus</i> - <i>Meso. pseudostriata</i> - <i>Meso. striata</i>		<i>Sphaeroschwagerina gigas</i>	
297	Asselian	Asselian	Asselian	<i>Streptognathodus fusa</i> - <i>Meso. simulata</i>	Svetlanoceras - Paragastropoceras	<i>Pseudoschwagerina robusta</i>	Ass1
298				<i>Streptognathodus constrictus</i> - <i>Mesopodoceras keibitoria</i>		<i>Schwagerina nux</i>	
299	Gzhelian	Gzhelian	Gzhelian	<i>Streptognathodus sigmoidata</i> - <i>Strept. ornifera</i>	Shumardites - Vidriceras	<i>Sphaeroschwagerina fusiformis</i>	Gzh1
300				<i>Streptognathodus websterensis</i> - <i>St. fluvius</i>		<i>Ultradaixina bosbytaensis</i>	
301	Gzhelian	Gzhelian	Gzhelian	<i>Streptognathodus simplex</i> - <i>Streptognathodus bellus</i>	Shumardites - Vidriceras	<i>Ultradaixina postobolensis</i>	Gzh2
302				<i>Streptognathodus virgatus</i>		<i>Davina sokensis</i>	
303	Gzhelian	Gzhelian	Gzhelian	<i>Streptognathodus vitali</i>	Shumardites - Vidriceras	<i>Jugulites jugulensis</i>	Gzh3
304				<i>Idognathodus simulatrix</i>		<i>Rausentes stuckenbergi</i>	
305	Kasimovian	Kasimovian	Kasimovian	<i>Streptognathodus firmus</i>	Dunbarites - Parashumardites	<i>Rausentes rossicus</i>	Kas1
306				<i>Idognathodus toretzianus</i>		<i>Rausentes quasiarcticus</i>	
				<i>Streptognathodus cancellatus</i>		<i>Montiparus subrossicus</i>	
				<i>Idognathodus sagittalis</i>		<i>Montiparus paramontiparus</i> - <i>Chondelites ovalis</i>	
				<i>Streptognathodus subvexellus</i> - <i>Sar. makhiniae</i>		<i>Protriticites pseudomontiparus</i>	

Brucebye Kolosseum
Brucebye - Tyrrellfjellet
and Kapitol

Ma	Period	Epoch	Age	Russian Platform, Urals	Formation	Spitsbergen	Brucebye Beds	Bjørnøya	N. Greenland	Number of fusulinid species
291	Permian	Cisuralian	Sakmarian	Sterlitamakian	Cipschuken	?		Boultonia sp.	Zigarella plicatissima	10
295				Tastubian						
296	Asselian	Asselian	Asselian	Sakmarian	Lyrrellfjellet	Sphaeroschwagerina linearis	Sphaeroschwagerina gigas	Sphaeroschwagerina gigas	Sakmarella aff. moelleri	50
297				Shikhanian						
298	Gzhelian	Gzhelian	Gzhelian	Uskalykian	Kapitol	Sphaeroschwagerina robusta	Sphaeroschwagerina robusta	Sphaeroschwagerina robusta	Schwagerina aff. robusta	100
299				Sjurianian						
300	Gzhelian	Gzhelian	Gzhelian	Melekhovian	Kapitol	Sphaeroschwagerina robusta	Sphaeroschwagerina robusta	Sphaeroschwagerina robusta	Schwagerina aff. robusta	100
301				Noginskian						
302	Gzhelian	Gzhelian	Gzhelian	Pavlovopodskian	Kapitol	Sphaeroschwagerina robusta	Sphaeroschwagerina robusta	Sphaeroschwagerina robusta	Schwagerina aff. robusta	100
303				Rusavkinian						
304	Kasimovian	Kasimovian	Kasimovian	Dorogomilovian	Kapitol	Sphaeroschwagerina robusta	Sphaeroschwagerina robusta	Sphaeroschwagerina robusta	Schwagerina aff. robusta	100
305				Khamovnikian						
306	Kasimovian	Kasimovian	Kasimovian	Krevyakinian	Kapitol	Sphaeroschwagerina robusta	Sphaeroschwagerina robusta	Sphaeroschwagerina robusta	Schwagerina aff. robusta	100
307				Peskovian						
310	Moscovian	Moscovian	Moscovian	Myachkovian	Kapitol	Fusulinella bocki	Fusulinella bocki	Fusulinella bocki	Fusulinella bocki	100
311				Podolskian						
315	Moscovian	Moscovian	Moscovian	Kashirian	Kapitol	Fusulinella bocki	Fusulinella bocki	Fusulinella bocki	Fusulinella bocki	100
316				Tsininian						
	Moscovian	Moscovian	Moscovian	Vereian	Kapitol	Fusulinella bocki	Fusulinella bocki	Fusulinella bocki	Fusulinella bocki	100

Stratigraphic Summary Brucebye Beds, Svalbard with abundance peak of fusulinids