

Appendix 7. Section Catalog Files for Cretaceous Chronostratigraphic Database:
Projects MIDK3, MIDK4, MIDK41, MIDK42, MIDK45, LOK, CRET1, and CRET2.

Global reference sections define the Cretaceous chronostratigraphic database by a progressive set of graphic correlation experiments. The CRET1CS.1 database was compiled in eight stages: I) MIDK3, II) MIDK4, III) MIDK41, IV) MIDK42, V) MIDK45, VI) LOK, VII) CRET1, and VIII) CRET2.

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SECTION FILE - SECTION NAME AGE-SCALE REFERENCE SECTION FILES

MIDK.2 - Harland Geologic Time Scale, 1990

*Harland et al., 1990 Time Scale, Cambridge Univ. Press. Standard Reference Section for MIDK3.cat

Data

Top Albian	/ma	-97.00	***
Top Aptian	/ma	-112.00	***
Top Barremian	/ma	-124.5	***
Top Berriasian	/ma	-140.5	***
Top Campanian	/ma	-74.0	***
Top Cenomanian	/ma	-90.50	***
Top Coniacian	/ma	-86.50	***
Top Hauterivian	/ma	-132.0	***
Top Maastricht	/ma	-65.0	***
Top Santonian	/ma	-83.00	***
Top Tithonian	/ma	-145.5	***
Top Turonian	/ma	-88.50	***
Top Valanginian	/ma	-135.0	***

*END

NEWKAGES.1 - 2004 Ages Modified

Standard Reference Section for MIDK41.cat; using midpoints.

Mega-annums revised by J.D. Obradovich, 1993, in Caldwell & Kauffman, eds., Geol. Assoc. Canada, Paper 39, p. 379-396, compared with modified ages by Hardenbol et al., 1998, chart 5 within +/- range, except for top Maastrichtian; Gradstein et al., 2004, Episodes, 27:83-100; Cambridge U. Press. Hicks et al., 1999, Cret. Res. 20:1-27, Table 2; PS = Pierre Shale. Revised by RWS 07-09.

Data

*Base Stage	Age	Ma	*1993 age vs. 2004 age
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Base Danian	/ma	65.5	*	*65.4 vs 65.0 vs 65.5+/-0.3
Base Maastricht	/ma	72.3	*	*72.3 vs 70.6+/-0.6
Base Campanian	/ma	83.5	*	*83.5 +/-0.7
Base Santonian	/ma	85.8	*	*86.3 vs 85.8+/-0.7
Base Coniacian	/ma	89.3	*	*88.7 vs 89.3+/-1
Base Turonian	/ma	93.5	*	*93.3 vs 93.5+/-0.8
*Base Cenomanian	/ma	100.5	98.7	
*use Obradovich age #27 = 97.17+/-0.69, Table 1, p. 383, Clay Spur Bentonite				
*Hardenbol et al., 1998, SEPM SP 60 = 98.9+/-0.6 = 99.5 98.3				
*Gradstein/Ogg 2004 @99.6=-0.9Ma				
Base Albian	/ma	112.0	*	*112.0 vs 112.2 vs 112.0+/-1
Base Aptian	/ma	125.0	*	*121 vs 125.0+/-1
Base Barremian	/ma	130.0	*	*127 vs 130.0+/-1.5
Base Hauterivian	/ma	136.4	*	*130 vs 132 vs 136.4+/-2
Base Valanginian	/ma	140.2	*	*135 vs 137 vs 140.2+/-3
Base Berriasian	/ma	145.5	*	*142 vs 144.2 vs 145.5+/-4

*Key fossils at stage boundaries (Hardenbol et al., 1998, chart 5)

K-T Iridium anomaly	/gc	65.50	*	
Pachydiscus neubergicus	/am	71.29	*	
Nostoceras hyatti	/am	72.71	*	
Placentoceras bidorsatum	/am	83.46	*	
Dica concavata	/fp	*	83.50	
Cladoceramus undulatoplicatus	/bi	85.79	*	
Forresteria sp.	/am	88.96	*	
*Romaniceras deverianum	/am	90.74	*	
*Rota globotruncanoides	/fp	99.15	*	
*Dipoloceras cristatum	/am	102.12	*	
Leymeriella tardefurcata	/am	112.2	*	
Magnetostratigraphy CMOR	/mb	125.0	*	

Numbered Bentonites (Obradovich 1993, Geol. Assoc. Canada, SP 39:379-396, Table I);

Revised by Hicks et al. (1999, Cret. Res., Table 2); PS = Pierre Shale.

Mid-points and age range of error bar.

Marker bed PS clinolobatus bentonite	/mb	69.42	*	
*(#4) Red Bird unit 112 69.42/-0.37 Ma=69.94 to 69.20				
Marker bed PS grandis bentonite	/mb	70.15	*	
*Red Bird unit 97 70.15+/-0.65 Ma=70.80 to 69.50				
Marker bed PS compressus	/mb	73.52	*	
*(#5) dated in MT at 73.52+/-0.39 Ma=73.91 to 73.13				
Marker bed PS jenneyi bentonite	/mb	74.31	*	
*(#6) dated in NW Colo. at 74.31+/-0.43 Ma=74.74 to 73.88; range of species				
Globotruncana calcarata	/fp	75.37	*	
*(#7) dated Arkansas Anonna Fm. 5m above FO at 75.37+/-0.39 Ma=75.76 to 74.98				
Marker bed PS scotti bentonite	/mb	76.07	*	
*dated in NM at 76.07+/-0.51 Ma=76.58 to 75.56; species range				
Marker bed PS obtusus bentonite	/mb	80.04	*	
*(#9) Red Bird unit 10 at 80.04+/-0.45 Ma=80.44 to 79.64; species range				
Marker bed PS Ardmore bentonite	/mb	80.04	*	
*(#9) Red Bird unit 10 dated at 80.04+/-0.45 Ma=80.44 to 79.64				
*Correlated with middle unit of Elkhorn Mountains Volcanics dated at 81-80 Ma				
Cladoceramus undulatoplicatus	/bi	*	84.88	
*(#13) Austin Chalk, top zone, Grayson Co., TX, 84.88+/-0.28 Ma=85.16 to 84.60				
Prionocyclus hyatti	/am	*	90.51	
*(#17) Ferron S., Utah, 90.51+/-0.45 Ma=90.96 to 90.06				
Pseudaspidoceras flexuosum	/am	*	93.25	
*(#19) Laholi Point, AZ, Mancos Sh. BM-15, 93.25+/-0.55 Ma=93.80 to 92.70				
Neocardioceras juddii	/am	*	93.56	
*(#20) Greenhorn Fm., NM, 93.78+/-0.49 & 93.59+/-0.58 Ma & Nebr.,				
*HL-3 Hattin bed, 93.30+/-0.40 Ma; Mean age = 93.56+/-0.58 Ma=94.14 to 92.98				
Euomphaloceras septemseriatum	/am	*	93.49	
*(#21) Lohali Point, AZ, Mancos Sh. BM-6, 93.49+/-0.89 Ma=94.38 to 92.60				
Acanthoceras amphibolum	/am	*	94.93	
*(#24) Soap Creek Bent., Frontier Fm., Natrona Co., WY,				
94.93+/-0.53 Ma=95.46 to 94.40				

Marker bed Thatcher Mbr. /mb * 95.78
 *(25) Thatcher Ls. Mbr., Graneros Fm., Pueblo Co. CO, in *Conlinoceras gilberti*
 Zone 95.78+/-0.61 Ma=96.39 to 95.17

Marker bed Clay Spur bentonite /mb * 97.17
 *(27) Top Mowry Fm., Casper, WY, 97.17+/-0.69 Ma=97.86 to 96.48

Marker bed Arrow Creek bentonite /mb * 98.52
 *(28) Arrow Creek Mbr., *Neogastropilites cornutus* Zone, Colorado Fm., MT,
 *98.52+/-0.41 Ma=98.93 to 98.11

*Dated bentonite beds in Pueblo section (Kennedy et al., 2000, *Acta Geologica Polonica*
 *Vol. 50:295-334, Fig. 7) in Ma projected into section from other sections.

Bentonite	/mb	*	93.30	*94.03 to 92.77
Bentonite 96	/mb	*	93.80	*93.25 to 92.70
Bentonite 88	/mb	*	94.05	*93.56 to 93.07
Bentonite 80	/mb	*	94.38	*93.49 to 92.60
Bentonite 69	/mb	*	94.62	*93.90 to 93.18
Bentonite 64	/mb	*		

*END

CRET.1 - Cretaceous Time Scale 2004

*CRET.1 Chronostratigraphic Time Scale Adjusted to ages in Ogg et al. (2004, Cambridge Univ. Press)

*Except age of Albian/Cenomanian boundary at 97.13 Ma; Ranges copied from MIDKCS45.2

Data

*TAXA	Morph	Base	Top Ma
Marker bed K-T Iridium anomaly	/MB	-65.5022	-65.4554
*Basal Maastrichtian criterion			
<i>Pachydiscus neubergicus</i>	/AM	-72.5783	-67.7370
<i>Hoploscaphites constrictus</i>	/AM	-72.2240	-66.5333
<i>Gansserina gansseri</i>	/FP	-72.9885	-65.5740
<i>Baculites jenseni</i>	/AM	-72.3813	-72.3813
Magnetostratigraphic C32n 2n	/MB	***	-71.8462
<i>Quadrum trifidum</i>	/NN	-76.1892	-68.2075
<i>Globotruncana calcarata</i>	/FP	-75.5683	-65.9207
*Basal Campanian criterion			
<i>Placentoceras bidorsatum</i>	/AM	-83.5675	-83.4440
<i>Marsupites testudinarius</i>	/CR	-83.9439	-83.5544
Magnetostratigraphic C34n	/MB	***	-83.3947
*Basal Santonian criterion			
<i>Cladoceras undulatoplicatus</i>	/BI	-85.9071	-85.4820
*Basal Coniacian criteria			
<i>Cremonoceras rotundatus</i>	/BI	-88.5221	-88.4714
<i>Inoceramus erectus</i>	/BI	-88.5071	-88.1200
<i>Forresteria</i> sp.	/AM	-88.5394	-88.2848
*Basal Turonian criterion			
<i>Watinoceras devonense</i>	/AM	-92.9500	-90.4642
Carbon peak OAE 2	/GC	-93.5200	-92.9973
*Basal Cenomanian criterion			
<i>Mantelliceras mantelli</i>	/AM	-97.0656	-95.2933
<i>Rotalipora brotzeni</i>	/FP	-97.0842	-93.4511
<i>Rotalipora globotruncanoides</i>	/FP	-97.1300	-90.7767
*Basal Albian criterion			
Marker bed Niveau Paquier	/MB	-112.7155	-111.7777
<i>Leymeriella tardefurcata</i>	/AM	-112.6567	-110.7531
<i>Hypacanthoplites jacobi</i>	/AM	-117.8332	-112.8857
<i>Farnhamia farnhamensis</i>	/AM	-113.1060	-112.8857
*Basal Aptian criterion			
<i>Deshayesites tuarkyricus</i>	/AM	-124.4418	-123.6075
<i>Deshayesites ogranlensis</i>	/AM	-124.5453	-123.9058
Magnetostratigraphic CMOR	/MB	-125.0000	-123.7773
*Basal Barremian criterion			
<i>Spitidiscus vandeckii</i>	/AM	-130.2337	***

*END

MIDK Section Data Files

MIDK.1 - Kalaat Senan, Turonian Reference section of Coniacian
 El Kef, Tunisia: Kalaat Senan outcrop section; U Cen-Coniacian. Robaszynski et al., 1990, BCREP Elf, 14:213-384. Assumed to record continuous & uniform sed accumulation at 0.04 cm/ka.
 Reference section for Turonian cycles interpreted by Hardenbol et al. 1998. Actual C-13 curve presented by Robaszynski et al., 1995 abst., p.103. Top Fahdene Fm. 114 m; top Bahloul Fm. 137 m; top Annaba Mbr. 287 m; top Bireno Mbr. 410 m; top Aleg Fm. 987 m.

Data

*Taxon name	morph	base	top meters	
Carbon peak OAE 2	/gc	113	124	
*Range of TOC spike inflection points; Fig. 32, p. 372. Coincides w/ condensed section.				
*Top Middle Cenomanian	/ma	*	108	
*Between T A. jukesbrownei/B Eucalycoceras sp.				
Top Cenomanian	/ma	*	137	
*Between T E. septemseriatum & B P. flexuosum				
Top Early Turonian	/ma	*	409	
*Between T M. nodosoides & B C. woollgari				
Top Middle Turonian	/ma	*	678	
*Below B R. deverianum				
Top Turonian	/ma	*	947.5	
*Between T Prionocyclas sp. & B Forresteria sp.				
Acanthoceras jukesbrownei	/am	95	95	
Choffaticeras luciae	/am	287	309	
Choffaticeras sp.	/am	149.5	314	
Coilopoceras requienianum	/am	491	819	* ID as sp. cf.
Collignonicerias woollgari	/am	409	409	
Eucalycoceras sp.	/am	109	129	
Euomphaloceras septemseriatum	/am	134	135	
*ID cf.; also as Kanabicerias				
Fagesia superstes	/am	287	346	
Forresteria sp.	/am	947.5	987	
Kamerunoceras turoniense	/am	287	384	
Lewesiceras sp.	/am	287	914	
Mammites nodosoides	/am	254	336	
Morrowites subdepressus	/am	287	287	
Neoptychites cephalotus	/am	181	361	
Paramammites polymorphus	/am	287	287	
Prionocyclus sp.	/am	674	947	
Prionocyclus novimexicanus	/am	919	924	
Pseudocalycoceras sp.	/am	111	130	
Pseudaspidoceras flexuosum	/am	137	137	
Reesidites minimus	/am	900	900	
Romaniceras deverianum	/am	678	753	
Romaniceras kallesi	/am	384	497	
Thomasites jordani	/am	297	317	
Thomasites rollandi	/am	279	309	
Thomasites sp.	/am	149.5	313	
Ahmueллерella octoradiata	/nn	400.5	913	
Axopodorhabdus albianus	/nn	88	108	
Axopodorhabdus dietzmannii	/nn	554	559	
Braarudosphaera bigelowii	/nn	148	885	
Chiastozygus litterarius	/nn	412	974	
Chiastozygus platyrhethus	/nn	549.5	974	
Chiastozygus tenuis	/nn	88	857	
*Corollithion achylosum	/nn	88	962	
*J.A. Bergen says this is too low 7/96				
Corollithion exiguum	/nn	400.5	974	*large + small forms

*Corollithion exiguum small	/nn	493	974
Corollithion signum	/nn	88	979
Cretarhabdus conicus	/nn	145	969.5
Eiffellithus eximius	/nn	559	979
Eprolithus moratus	/nn	384	933
*J.A. Bergen says too hi at 974			
Eprolithus octopetalus	/nn	190	469.5
*ID as Lithastrinus "octus"; J.A. Bergen says 813 is too hi 7/96			
Eprolithus septenarius	/nn	876	927.5
Flabellites biforaminis	/nn	293	974
Gartnerago obliquum	/nn	140	979
Gephyrorhabdus coronadventis	/nn	105	951
Helenea chiastia	/nn	88	108
Helicolithus trabeculatus	/nn	105	979
Lithastrinus floralis	/nn	88	974
Lithraphidites acutum	/nn	88	101
Lithraphidites pseudoquadratus	/nn	98	98
Lucianorhabdus quadrifidus	/nn	408.5	969.5
Marthasterites furcatus	/nn	801	979
Microrhabdulus decoratus	/nn	445	944
Microrhabdulus belgicus	/nn	400.5	400.5
Microrhabdulus helicoideus	/nn	148	979
Nannoconus truitti	/nn	88	962
Prediscosphaera cretacea	/nn	345	979
Prediscosphaera spinosa	/nn	88	974
Quadrum gartneri	/nn	317.5	962
*Reinhardtites anthophorus	/nn	196	979*J.A.Bergen says too low
Rhagodiscus splendens	/nn	404.5	979 *ID as Zygodiscus
Rotelapillus laffittei	/nn	391	391
Tetrapodorhabdus decorus	/nn	445	979
Tranolithus minimus	/nn	156.5	979
Zeugrhabdotus bicrescenticus	/nn	345	639*ID as Zygodiscus compactus
Rota cushmani	/fp	114.6	114.6
Rota greenhornensis	/fp	114.6	114.6
Dica hagni	/fp	145	368.8
Marginotruncana marianosi	/fp	467	537
*ID as sp. cf Sigalitruncana aff. marianosi			
Whit baltica	/fp	114.6	944
Whit paradubia	/fp	145	521
Whit archaeocretacea	/fp	114.6	976
Helv'ana praehelvetica	/fp	131	575
*base lower by Beaudoin & Caron, 1995 abst			
Helv'ana helvetica	/fp	231	575
*base lower by Beaudoin & Caron, 1995 abst			
Marginotruncana schneegansi	/fp	493	976
Dica imbricata	/fp	145	976
Dica canaliculata	/fp	537	541
Marginotruncana pseudolinneiana	/fp	537	976
Marginotruncana coronata	/fp	609	974
Dica primitiva	/fp	661	890
Sigalia sigali	/fp	433	976
Marginotruncana renzi	/fp	537	976
*Cont fornicata	/fp	890	974
*ID = ?Contusotruncata fornicata (Plummer); range known as Sant-Camp			

Sequence stratigraphic interpretation (Hardenbol in Robaszynski et al., 1990, p. 372-373) with numbering scheme from preprint of cycle chart Hardenbol et al., 1998, SEPM SP No. 60); cycle numbers modified by J. Hardenbol 14/7/96.

Marker bed Ce SB 5	/mb	109.3	109.3
*see Figs. 15 & 16			
Marker bed Ce TS 5	/mb	118	118
Marker bed Ce DL 5	/mb	200	200
Marker bed Tu SB 1	/mb	287	287

Marker bed Tu TS 1	/mb	382	382
Marker bed Tu DL 1	/mb	475	475
Marker bed Tu SB 2	/mb	550	550
Marker bed Tu DL 2	/mb	637	637
Marker bed Tu SB 3	/mb	684	684
Marker bed Tu DL 3	/mb	834.5	834.5
Marker bed Tu SB 4	/mb	882.5	882.5
Marker bed Tu TS 4	/mb	947.2	947.2
*END			

MIDK.3 - Santa Rosa Canyon Section, Mexico

Santa Rosa Canyon, Nuevo Leon, Mexico. Blausler & McNulty, 1980, Trans. Gulf Coast Assoc. Geol. Soc., 30:263-272; Ice & McNulty, 1980, idem, 30:403-425. Footage position of stage boundaries projected from experimental graphs. Top La Casita Fm at 24 ft; Top Taraises Fm at 470 ft; Top Lower Tamaulipas Fm at 2500 ft; Top Otates Fm at 2700 ft; Top Upper Tamaulipas Fm at 3195 ft overlain by 30cm blk sh; Top Cuesta del Cura Fm at 3745-3770 ft in covered interval; Top of section in Agua Nueva Fm at 4293 ft.

Data

*Taxon name	morph	base	top feet
Top Berriasian	/ma	400	400
Top Valanginian	/ma	1140	1140
Top Hauterivian	/ma	1700	1700
*Top Barremian	/ma	2210	2210
Top Early Aptian	/ma	2560	2560
Top Aptian	/ma	2710	2710
Top Early Albian	/ma	3000	3000
Top Middle Albian	/ma	3140	3140
Top Albian	/ma	3575	3575
*Top Middle Cenomanian	/ma	4020	4020
*Top Cenomanian	/ma	4150	4150
*Top Early Turonian	/ma	4230	4230
*Marker bed Al SB GR 1	/mb	2700	2700
*OCT-95 REMOVED because its age is projected too young; may be too high			
*Top Early Cenomanian	/ma	3775	3775
Marker bed Al SB WA 1	/mb	3195	3195
Marker bed Ap SB PR 1	/mb	2500	2500
Olcostephanus coahuilaensis	/am	429	429
Neocomites sp.	/am	429	429
*ID by K. Young in Blausler, 1981, p. 42, West Tx. Geol. Soc. Guidebook Publ. 81-74;			
Valanginian			
Calpionella alpina	/ca	20	49
Calpionella elliptica	/ca	20	197
Calpionella oblonga	/ca	49	436
Calpionella simplex	/ca	118	197
Calpionellites darderi	/ca	295	295
*ID as Calpionella darderi			
Remaniella cadischiana	/ca	39	49
Stenosemellopsis hispanica	/ca	295	295
Tintinopsella carpathica	/ca	20	463
Tintinopsella longa	/ca	49	410
Nannoconus steinmannii	/nn	39	2258
Nannoconus wassallii	/nn	2460	2558
Bonetocardiella conoidea	/ca	3395	4023
Colomiella mexicana	/ca	2676	2808
Colomiella recta	/ca	2676	3011
Microcalamoides diversus	/id	2676	3198
Pith ovalis	/ca	3395	3395
Pith sphaerica	/ca	3198	4023
Biti breggiensis	/fp	3211	3415
Glob'oides algerianus	/fp	2519	2538

Glob'oides bentonensis	/fp	3467	3742
Glob'oides cushmani	/fp	3461	4129
Hedbergella washitensis	/fp	2676	3447
Helv'ana helvetica	/fp	4211	4211
Marginotruncana schneegansi	/fp	4244	4244
Planomalina buxtorfi	/fp	3421	3493
Praeglobotruncana delrioensis	/fp	3447	3742
Praeglobotruncana stephani	/fp	3447	4096
Rota appenninica	/fp	3428	3742
Rota cushmani	/fp	4031	4129
Rota gandolfi	/fp	3900	3900
Rota greenhornensis	/fp	3949	3949
Tici roberti	/fp	3198	3480
Tici subticinensis	/fp	3224	3410
Tici ticinensis	/fp	3326	3493
*END			

MIDK.3B - Santa Rosa Canyon Section, Mexico

Santa Rosa Canyon, Nuevo Leon, Mexico. Blausler & McNulty, 1980, Trans. Gulf Coast Assoc. Geol. Soc., 30:263-272; Ice & McNulty, 1980, idem, 30:403-425. New Nanno data from Bralower et al., 1999, J. Foram Research, Fig. 3. Lithostratigraphy same as in MIDK.3.

Data

* Taxon name	morph code	base	top ft
Top Berriasian	/ma	400	400
Top Valanginian	/ma	1140	1140
Top Hauterivian	/ma	1700	1700
Top Barremian	/ma	2210	2210
*Top Early Aptian	/ma	2560	2560
Top Aptian	/ma	2710	2710
*Top Early Albian	/ma	3000	3000
*Top Middle Albian	/ma	3140	3140
*Top Albian	/ma	3575	3575
*Top Middle Cenomanian	/ma	4020	4020
*Top Cenomanian	/ma	4150	4150
*Top Early Turonian	/ma	4230	4230
Marker bed Al SB WA 1	/mb	3195	3195
Marker bed Ap SB PR 1	/mb	2500	2500
Olcostephanus coahuilaensis	/am	429	429
Neocomites sp.	/am	429	429

*ID by K. Young in Blausler, 1981, p. 42, West Tx. Geol. Soc. Guidebook Publ. 81-74;

Valanginian			
Calpionella alpina	/ca	20	49
Calpionella elliptica	/ca	20	197
Calpionella oblonga	/ca	49	436
Calpionella simplex	/ca	118	197
Calpionellites darderi	/ca	295	295
*ID as Calpionella darderi	/ca	295	295
Remaniella cadischiana	/ca	39	49
Stenosemellopsis hispanica	/ca	295	295
Tintinopsella carpathica	/ca	20	463
Tintinopsella longa	/ca	49	410
Nannoconus steinmannii	/nn	39	2258
Nannoconus wassallii	/nn	2460	2558
Bonetocardiella conoidea	/ca	3395	4023
Colomiella mexicana	/ca	2676	2808
Colomiella recta	/ca	2676	3011
Microcalamoides diversus	/id	2676	3193
Pith ovalis	/ca	3395	3395
Pith sphaerica	/ca	3198	4023
Biti breggiensis	/fp	3211	3415

Glob'oides algerianus	/fp	2519	2538
Glob'oides bentonensis	/fp	3467	3742
Glob'oides cushmani	/fp	3461	4129
Hedbergella washitensis	/fp	2676	3447
Helv'ana helvetica	/fp	4211	4211
Marginotruncana schneegansi	/fp	4244	4244
Planomalina buxtorfi	/fp	3421	3493
Praeglobotruncana delrioensis	/fp	3447	3742
Praeglobotruncana stephani	/fp	3447	4096
Rota appenninica	/fp	3428	3742
Rota cushmani	/fp	4031	4129
Rota gandolfi	/fp	*	3900
Rota greenhornensis	/fp	3949	3949
Tici roberti	/fp	3198	3480
Tici subticinensis	/fp	3224	3410
Tici ticinensis	/fp	3326	3493
	*Bralower et al., 1999, fig. 7		
Carbon peak OAE 1b	/gc	2791.9	2828.0
Carbon peak OAE 1a	/gc	2516.4	2565.6
	*base-top of inflection of del 13 C curve		
Marker bed Nannoconid crisis	/mb	2483.3	2540.0
	*"Nannoconid crisis" is top of abundance curve below Selli level, Erba '94		
	*Nanno events taken from Bralower et al., 1999, J. Foram Research, 29(4), Fig. 3;		
	*convert meter position to feet and add 2073.6'; base La Pena/Otates at 130 m (426.4')		
	= 2500'		
Assipetra infracretacea	/nn	2406.8	3091.4
Bidiscus rotatorius	/nn	2586.3	3101.2
Biscutum constans	/nn	2515.4	3111.1
Braarudosphaera regularis	/nn	2406.8	3130.7
Chiastozygus litterarius	/nn	2539.4	2539.4
Corollithion achylosum	/nn	2614.1	2813.6
Cretarhabdus conicus	/nn	2515.4	2825.7
Cretarhabdus surirellus	/nn	2482.9	3101.2
Cribrosphaerella ehrenbergii	/nn	2791.3	2791.3
Cyclagelosphaera margerelii	/nn	2442.9	3111.1
Diazomatolithus lehmanii	/nn	2511.5	3111.1
*Eiffellithus turriseiffelii	/nn	3071.7	3111.1
	*This report extends into M. Albian; lowest base at 2633.8' too low		
Eprolithus floralis	/nn	2540.7	3145.5
Flabellites oblonga	/nn	2527.9	3101.2
Hayesites albiensis	/nn	3101.2	3111.1
*Lithraphidites alatus	/nn	2614.1	2614.1
	*ID as subspecies magnus		
Helenea chiastia	/nn	2482.9	3101.2
Lithraphidites carniolensis	/nn	2442.9	3101.2
Manivitella pemmatoidea	/nn	2511.1	3101.2
Markalius circumradiatus	/nn	2538.4	3101.2
Micrantholithus hoschulzii	/nn	2448.2	2646.0
Micrantholithus obtusus	/nn	2527.9	2586.3
Nannoconus bermudezii	/nn	2425.2	2425.2
Nannoconus bucheri	/nn	2539.4	2543.6
Nannoconus globulus	/nn	2627.9	2627.9
Nannoconus kamptneri	/nn	2425.2	2623
Nannoconus steinmannii	/nn	2405.8	2482.9
Nannoconus truitti	/nn	2543.6	3111.1
*Nannoconus wassalii	/nn	2511.5	2614.1
Parhabdolithus achlyostaurion	/nn	2527.9	3111.1
Percivalia fenestrata	/nn	2611.2	3101.2
Prediscosphaera columnata	/nn	2786.3	2938.9
Rhagodiscus angustus	/nn	2627.9	2786.3
Rhagodiscus asper	/nn	2539.4	3111.1
Rhagodiscus splendens	/nn	2538.4	3101.2
Rotelapillus laffittei	/nn	2515.4	3101.2

Rucinolithus irregularis	/nn	2425.2	3130.7
Rucinolithus terebrodentarius	/nn	2477.7	3101.2
Tranolithus orionatus	/nn	2909.3	3130.7
Vagalapilla stradneri	/nn	2562.0	2562.0
Watznaueria barnesae	/nn	2409.5	3145.5
Watznaueria britannica	/nn	2539.4	2539.4
Watznaueria communis	/nn	2540.7	2791.3
Zeugrhabdotus embergeri	/nn	2440.6	3145.5
Zeugrhabdotus erectus	/nn	3101.2	3111.1
Zygodiscus diplogrammus	/nn	2482.9	3130.7
Zygodiscus elegans	/nn	2527.9	2938.9

*base at 2633.8' quite low

*END

MIDK.4 - DSDP 547, Offshore Morocco

DSDP Core Hole 547A+B, NW Offshore Morocco; 33° 46.84'N, 09° 20.98'W; DSDP Vol. LXXIX, (79):563-649. Stratigraphic span - Upper Albian-Cenomanian; base of section at 772.4 m and top of section at 422.0 m are major unconformities. Reported as a continuous & uniform accumulation at 3.1-3.2 cm/ka (p. 252, fig. 19). Petrizzo et al., 2008, Paleooceanography 23:PA1213, doi:10.1029/2007PA001517, Fig. 6

Data

*Taxon name	morph code	base (meters)	top
*Top Early Cenomanian	/ma	-489	-489
*Top Middle Cenomanian	/ma	-459.5	-450.4
*Top Albian	/ma	-634	-634
*Top Middle Albian	/ma	-772.4	-772.4
Carbon peak OAE 1d	/GC	-650	-625
*Petrizzo et al., 2008, Fig. 5, ~1.0 ppm increased del 13C shift			
*ID of planktic forams (fp) by R. Mark Leckie, U. Mass			
Biti breggiensis	/fp	-772.4	-659
Clav moremani	/fp	-772.4	-650
Clav simplex	/fp	-772.4	-431
Clav subcretacea	/fp	-772.0	-725.5
Glob'oides bentonensis	/fp	-772.4	-431
Hedb delrioensis	/fp	-772.4	-431
Hedb planispira	/fp	-772.4	-431
Hedb simplicissima	/fp	-772.4	-431
Heterohelix moremani	/fp	-772.4	-431
Planomalina buxtorfi	/fp	-687.5	-634
*One occurrence at -545.5 is treated as reworked			
Planomalina praebuxtorfi	/fp	-707	-687.5
*One occurrence at -545.5 is treated as reworked			
Praeglobotruncana delrioensis	/fp	-680.3	-431
Praeglobotruncana stephani	/fp	-640	-431
Rota appenninica	/fp	-716.5	-459.5
Rota cushmani	/fp	-450.4	-431
Rota gandolfi	/fp	-649.5	-431.3
Rota greenhornensis	/fp	-564.8	-431
Schackoina cenomana	/fp	-659	-431
Tici praeticinensis	/fp	-772.4	-738.5
Tici primula	/fp	-772.4	-650
Tici roberti	/fp	-772.4	-650 *ID as s.l.
Tici subticinensis	/fp	-772.4	-757.8
Tici ticinensis	/fp	-772.4	-634
Whit paradubia	/fp	-772	-431
*ID of nannos by George F. Wiegand, Florida State U.			
Ahmuellerella octoradiata	/nn	-422.2	*
Axopodorhabdus albianus	/nn	-772	-422
Axopodorhabdus dietzmannii	/nn	-772	-422
*Too low! Broinsonia parca	/nn	-422	-422 *
*Ceratulolithus aculeus	/nn	-422	*

*May be re-worked Ceratolithoides?? or Tertiary form			
Chiastozygus litterarius	/nn	-772	-422
Corollithion achylosum	/nn	-772	-422
Corollithion signum	/nn	-772	-422
Cretarhabdus conicus	/nn	-772	-422
Cretarhabdus loriei	/nn	-772	-432
Cribrosphaerella ehrenbergii	/nn	-772	-422
Eiffellithus turriseiffelii	/nn	-772	-422
Eprolithus floralis	/nn	-772	-422
Flabellites biforaminis	/nn	-772	-422
Gartnerago obliquum	/nn	-772	-422
Hayesites albiensis	/nn	-722	-650
Helenea chiastia	/nn	-768	-422
Helicolithus trabeculatus	/nn	-753.6	-422
Lithraphidites acutum	/nn	-490	-422
*ID as subsp. eccentricum			
Lithraphidites alatus	/nn	-642	-431.7
Lithraphidites carniolensis	/nn	-772	-422
Manivitella pemmatoidea	/nn	-772	-422
Microrhabdulus belgicus	/nn	-640.8	-450
Nannoconus truitti	/nn	-739	-472.5
Prediscosphaera cretacea	/nn	-772	-422
Tetrapodorhabdus decorus	/nn	-772	-422
Tranolithus gabalus	/nn	-772	-422
Tranolithus orionatus	/nn	-772	-422
Vagalapilla stradneri	/nn	-772	-422
Zygodiscus spiralis	/nn	-422	*
*ID of dinos by Raimond Below, U. Bonn, Fig. 4			
Achomosphaera ramulifera	/dn	-706.5	-499
Aptea eisenackii	/dn	-769.5	-480
Codoniella campanulata	/dn	-770.5	-489.5
Cometodinium whitei	/dn	-770.5	-637.1
Coronifera oceanica	/dn	-770.5	-489.5
Cribooperidinium orthoceras	/dn	-739	-739
Cribooperidinium tensiftense	/dn	-770.5	-689.3
Cyclonephelium compactum	/dn	-769.5	-765.5
Dapsilidinium warrenii	/dn	-770.5	-489.5
*ID as Poly.			
Dinopterygium tuberculatum	/dn	-735	-473.5
*ID as Oodn			
Downiesphaeridium multispinosum	/dn	-768.5	-768.5
Endoceratium ludbrookiae	/dn	-546.5	-646.5
Exochosphaeridium pseudhystrichodinium	/dn	-770.5	-499
Florentinia berran	/dn	-739	-739
Florentinia laciniata	/dn	-616	-518
Florentinia mantellii	/dn	-770.5	-470.5
Florentinia resex	/dn	-739	-739
Florentinia stellata	/dn	-770.5	-470.5
Hapsocysta dictyota	/dn	-770.5	-473.5
Hapsocysta peridictya	/dn	-768.5	-768.5
Hystrichodinium pulchrum	/dn	-765.5	-638.13
Hystrichosphaeridium albertense	/dn	-770.5	-518
*ID as Olig irregulare			
Hystrichosphaeridium atlasiense	/dn	-764	-764
Hystrichosphaeridium bowerbankii	/dn	-735	-575
Kiokansium corollum	/dn	-770.5	-470.5
Litosphaeridium arundum	/dn	-772	-739
*ID as Hyst.			
Litosphaeridium conispinum	/dn	-772	-651
*highest spl @ -546.5 raises top; use 3rd separated by 12 spls.			
Litosphaeridium siphoniphorum	/dn	-770.5	-473.5
Maghrebinia chleuh	/dn	-772	-518
Maghrebinia perforata	/dn	-770.5	-470.5

Odontochitina operculata	/dn	-772	-470.5
Oligosphaeridium complex	/dn	-735	-473.5
Oligosphaeridium pulcherrimum	/dn	-765.0	-489.5
Ovoidinium diversum	/dn	-736	-736
Ovoidinium scabrosum	/dn	-765.5	-564
Ovoidinium verrucosum	/dn	-706.5	-499
Pervosphaeridium pseudhystrichodinium	/DN	-770.5	-499
*ID as Exoc			
Prolixosphaeridium parvispinum	/dn	-767.0	-470.5
Spiniferites hyperacanthus	/dn	-718.8	-470.5
Spiniferites lenzi	/dn	-765.5	-494.4
Spiniferites ramosus ramosus	/dn	-736.0	-689.3
Subtilisphaera cheit	/dn	-727.5	-689.3
*??? -470.5			
Subtilisphaera senegalensis	/dn	-735	-629.4
Tehamadinium coummia		-769.5	-651.0
*ID as Occi			
Tehamadinium mazaganense	/dn	-770.5	-736
*ID as Occi			
Wrevittia cassidata	/dn	-564	-546.5
*ID as Gony.			
Xenascus ceratioides	/dn	-708	-473.5
Xiphophoridium alatum	/dn	-772	-473.5
*ID as Oodn.			
Fromea amphora	/ac	-768.5	-763.0
*END			

MIDK.5 - DSDP 545, Offshore Morocco

DSDP Core 545, NW Offshore Morocco; DSDP vol. LXXIX, 79, 1984, 33° 39.86'N; 09° 21.88'W.

Base of section at -530.7m and top at 255.5m are major unconformities; Leckie (1984, p. 594) suggests unconformities at -377, -371, -369.5, & -353+/-; may be faults. Leckie et al., 2002, Paleocyanography 17:13-1 to 13-26, fig. 2, shows unconformity at about 378 mbsf above OAE 1b "Paquier" bed; OAE 1d at about 310-320 m. Top Early Cenomanian -267 to -256; Top Albian -333 to -333; Top Aptian -454 to -440. Herrle et al., Earth Planet Sci Letters 218:149-161; OAE 1d at ~310-320 m, above OAE 1b "Paquier" bed.

Data

*Taxon name	morph code	base (m)	top
*Herrle et al., 2004, p. 154, Fig. 5; negative del 13C 1.2 ppm			
Carbon peak OAE 1b	/gc	-390.00	-389.80
*Bralower et al., 1993, Geophysical Monograph 77, fig. 9, TOC ~1.5% increase			
Carbon peak OAE 1d	/gc	-352	-342
*ID of plank forams by R. Mark Leckie, U. Mass.			
Biti breggiensis	/fp	-375.6	-360
Clav moremani	/fp	-375.6	-350.5
Clav subcretacea	/fp	-375.6	-369.5
Clav simplex	/fp	-437	-255.6
Glob'oides algerianus	/fp	-518	-490.5
*Top at 304 in Cen may be reworked?			
Glob'oides aptiense	/fp	-528	-382.6
Glob'oides bentonensis	/fp	-398.5	-255.6
*Top Middle Albian /ma -377 -377			
*Glob'oides ferreolensis	/fp	-525	-465
*Top at 303 in Cen may be reworked?			
Hedb simplicissima	/fp	-375.6	-255.6
Hedb delrioensis	/fp	-528	-255.6
Hedb gorbachikae	/fp	-528	-408
Hedb planispira	/fp	-528	-255.6
Hedb trocoidea	/fp	-515.6	-417
*Top at 313.7 in Cen may be reworked?			

Heterohelix moremani	/fp	-351.4	-255.6
Planomalina buxtorfi	/fp	-369.6	-333
Planomalina cheniourensis	/fp	-465	-454.5
Planomalina praebuxtorfi	/fp	-354.4	-354.4
Praeglobotruncana delrioensis	/fp	-369.6	-255.6
Praeglobotruncana stephani	/fp	-369.6	-284
*use 2nd top, not 1st @ -255.6			
Rota appenninica	/fp	-369.6	-284
*use 2nd top, not 1st @ -274.5			
Rota cushmani	/fp	-312.5	-255.6
* ID as aff.			
Rota gandolfi	/fp	-351.4	-255.6
Rota greenhornensis	/fp	-304	-255.6
Rota reicheli	/fp	-256	-256
Schackoina bicornis	/fp	-351.4	-265
Schackoina cenomana	/fp	-351.4	-255.6
*base at lowest consistent occurrence			
Tici primula	/fp	-408	-360
Tici praeticinensis	/fp	-408	-372.6
Tici roberti	/fp	-465	-360
Tici subticinensis	/fp	-375.6	-372.6
Tici ticinensis	/fp	-375.6	-354.4
Whit paradubia	/fp	-364	-255.6
*ID of nannos by George E. Wiegand, Florida State U.			
Axopodorhabdus albianus	/nn	-377	-255.6
Axopodorhabdus dietzmannii	/nn	-526.6	-255.6
Chiastozygus litterarius	/nn	-528.4	-255.6
Corollithion achylosum	/nn	-513	-255.6
Corollithion signum	/nn	-398.7	-255.6
Cretarhabdus conicus	/nn	-528.4	-255.6
Cretarhabdus loriei	/nn	-526.6	-265.2
Eiffellithus turriseiffelii	/nn	-377	-255.6
Eprolithus floralis	/nn	-528.4	-255.6
Flabellites biforaminis	/nn	-528.6	-255.6
Gartnerago obliquum	/nn	-362.5	-267
Hayesites albiensis	/nn	-422	-351.4
Helenea chiastia	/nn	-528.4	-255.6
Helicolithus trabeculatus	/nn	-369.6	-255.6
Lithraphidites acutum	/nn	-267	-255.6
Lithraphidites alatus	/nn	-351.4	-294
Lithraphidites carniolensis	/nn	-518	-255.6
Manivitella pennatoidea	/nn	-528.4	-255.6
Microrhabdulus belgicus	/nn	-315.8	-265.2
Nannoconus elongatus	/nn	-518	-477.5
Nannoconus truitti	/nn	-528.4	-285.8
Prediscosphaera cretacea	/nn	-439	-255.6
Rhagodiscus angustus	/nn	-439	-255.6
Rucinolithus irregularis	/nn	-528.4	-351.4
Tetrapodorhabdus decorus	/nn	-528.4	-255.6
Tranolithus gabalus	/nn	-526.6	-255.6
Tranolithus orionatus	/nn	-407.7	-255.6
Vagalapilla stradneri	/nn	-528.4	-255.6
*ID of dinos by Raimond Below, U. Bonn, Fig. 1, p. 622			
Achomosphaera ramulifera	/dn	-343	-323
Achomosphaera sagena	/dn	-304	-304
Achomosphaera verdieri	/dn	-520	-378.6
Aptea polymorpha	/dn	-520	-398
Apteodinium maculatum	/DN	-520	-294
Callaiosphaeridium trycherium	/dn	-497	-372
Canningia reticulata	/dn	-520	-361 *ID as cf.
Carpodinium granulatum	/dn	-461.5	-422
Cassiculosphaeridia reticulata	/dn	-486	-379.5
Codoniella campanulata	/dn	-438.5	-304

Codoniella psygma	/dn	-453	-448	
Cometodinium whitei	/dn	-520	-378.6	
Coronifera oceanica	/dn	-520	-285.3	
Cribroperidinium orthoceras	/dn	-525	-379.5	
Cribroperidinium tensiftense	/dn	-520	-315.9	
Cribroperidinium tenuiceras	/dn	-525	-461.5	
*ID as Occisucysta				
Circulodinium distinctum	/dn	-520	-285.3	
*ID as Cyclonephelium				
Cribroperidinium ehrenbergii	/dn	-381	-255.6	
Cyclonephelium brevispinatum	/dn	-525	-285.3	
Cyclonephelium maugaad	/dn	-525	-378.6	
Cyclonephelium paucimarginatum	/dn	-520	-520	
Danea chibanis	/dn	-507	-383	
Dapsilidinium warrenii	/dn	-520	-304	
*ID as Poly.				
Dingodinium albertii	/dn	-438.5	-438.5	
Dinopterygium tuberculatum	/dn	-365.5	-285.3	
*ID as Oodn.				
Downiesphaeridium flexuosum	/dn	-520	-378.6	
*ID as Poly.				
Ellipsodinium imperfectum	/dn	-444	-444	
Epelidosphaeridia spinosa	/dn	-285.3	-285.3	
Exochosphaeridium bifidum	/dn	-525	-361	
Exochosphaeridium phragmites	/dn	-512.6	-304	
Florentinia laciniata	/dn	-285.3	-285.3	
Florentinia mantellii	/dn	-520	-285.3	
Florentinia radiculata	/dn	-525	-298	
Florentinia resex	/dn	-351.6	-323	
Florentinia stellata	/dn	-323	-285.3	
Hapsocysta peridictya	/dn	-455	-378.6	
Heterosphaeridium heteracanthum	/dn	-525	-417.6	*second top
Hystrichodinium pulchrum	/dn	-471.3	-394	
*2nd base used rather than 523m separated by 9 spls without it				
Hystrichosphaeridium albertense	/dn	-525	-304	
*ID as Olig irregulare				
Hystrichosphaeridium bowerbankii	/dn	-285.3	-285.3	
Hystrichosphaeridia schindewolfii	/dn	-431.6	-431.6	
Kiokansium corollum	/dn	-365.5	-304	
Kiokansium hydra	/dn	-525	-378.6	
Kiokansium polypes	/dn	-497	-438.5	
Kleithriasphaeridium eoinodes	/dn	-520	-379.5	
Kleithriasphaeridium sarmentum	/dn	-410	-410	
Lithodinia stoveri	/dn	-520	-378.6	
*ID as Meiourogony.				
Litosphaeridium arundum	/dn	-372	-332	
*ID as Hystricho.				
Litosphaeridium conispinum	/dn	-372.2	-361	
*Base at first consistent occurrence				
Litosphaeridium siphoniphorum	/dn	-351.7	-294	
*Base at first consistent occurrence				
Maghrebinia chleuh	/dn	-351.6	-316	
Maghrebinia perforata	/dn	-365.5	-285.3	
Muderongia perforata	/dn	-525	-410	
Occisucysta hinzii	/dn	-461.5	-410	
Occisucysta tentorium	/dn	-455	-383	
Odontochitina operculata	/dn	-520	-285.3	
Oligosphaeridium asterigerum	/dn	-520	-417.6	
Oligosphaeridium complex	/dn	-529	-294	
Oligosphaeridium djenn	/dn	-520	-455.4	
Oligosphaeridium poculum	/dn	-520	-304	
Oligosphaeridium totum	/dn	-520	-438.5	*second top
Oligosphaeridium totum minus	/dn	-529	-431.6	

Oligosphaeridium verrucosum	/dn	-486	-444	
Operculodinium hirsutum	/dn	-507	-438.5	*second top
Ovoidinium scabrosum	/dn	-507	-444	
Ovoidinium verrucosum	/dn	-315.9	-285.3	
Palaeohystrichophora infusorioides	/dn	-361	-285.3	
Prolixosphaeridium parvispinum	/dn	-520	-343	
Protoellipsodinium seghire	/dn	-486	-378.6	
Protoellipsodinium touile	/dn	-497	-398	
Pseudoceratium almohadensis	/dn	-461.5	-438.5	*ID as Aptea
Pseudoceratium eisenackii	/dn	-525	-316	*ID as Aptea
Pterodinium aliferum	/dn	-497	-378.6	
Pterodinium cingulatum	/dn	-512.6	-285.3	
Pterodinium cornutum	/dn	-520	-316	
Raetiaedinium truncatum	/dn	-525	-285.3	
*ID as Pervosph.				
Rhynchodiniopsis aptiana	/dn	-520	-378.6	
Spiniferites ancoriferus	/dn	-520	-285.3	
Spiniferites hyperacanthus	/dn	-520	-409.8	
Spiniferites lenzi	/dn	-520	-285.3	
Spiniferites magnoserratus	/dn	-520	-401	
Spiniferites twistringiensis	/dn	-525	-520	
*ID as ramosus multibrevis				
Spiniferites ramosus ramosus	/dn	-529	-365.5	
Stanfordella cretacea	/dn	-520	-351.6	
*ID as Gonyaulacysta				
Subtilisphaera deformans	/dn	-461.5	-379.5	
Subtilisphaera senegalensis	/dn	-525	-401	
Systematophora cretacea	/dn	-438.5	-417.6	
Systematophora silybum	/dn	-512.6	-378.6	
Tanyosphaeridium regulare	/dn	-520	-298	
Tehamadinium mazaganense	/dn	-361	-361	
*ID as Occisucysta				
Tehamadinium sousense	/dn	-520	-378.6	
*ID as Occisucysta				
Tenua aucda	/dn	-512.6	-422	
*ID as Cerbia				
Tenua hystrix	/dn	-525	-401	
*ID as Cerbia tabulata				
*Tenua Cyclonephelium hystrix	/dn	-525	-379.5	*second top
Trichodinium castanea	/dn	-507	-285.3	
Valensiella tazadensis	/dn	-455	-410	
*ID as Cassiculo.				
Wrevittia cassidata	/dn	-343	-332	
*ID as Gonyaulacysta				
Wrevittia helicoidea	/dn	-525	-285.3	
*ID as Gonyaulacysta				
Xenascus ceratioides	/dn	-343	-294	
Xiphophoridium alatum	/dn	-332	-285.3	
*ID as Oodochitina				
Fromea amphora	/ac	-497	-383	
*END				

MIDK.6 - Type Cenomanian section, France

Type Cenomanian at Sarth E of Le Mans, France. From Pierre Juignet in BRGM No. 109, 1980, p. 130-138, figs. 5 & 6. Sets ammonite control for top Lower and Middle Cenomanian; note hiatuses at base with Albian, 30, 45, 50, 69, 87.5, 49, 98, & 100m. Top Cenomanian 104; Top Middle Cenomanian 87.5; Top Early Cenomanian 50; Top Albian -2 placed below unconformity at 0 m to account for missing section across boundary.

Data

*Taxon name	morph code	base (m)	top
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<i>Acanthoceras jukesbrowni</i>	/am	70	75
<i>Acanthoceras rhotomagense</i>	/am	50.15	71
*Based on unconf. at base of rhotomagense at 50.1.			
<i>Callihoplites variabilis</i>	/am	1	2
<i>Calycoceras cenomanense</i>	/am	72	89.5
<i>Calycoceras choffati</i>	/am	72	75
<i>Calycoceras guerangeri</i>	/am	90.5	97
<i>Calycoceras naviculare</i>	/am	88	101
*Based on B naviculare at 88.0 & unconf. at 87.5 & T cenomanense at 89.5 & unconformity at 90m.			
<i>Calycoceras newboldi</i>	/am	68	72
<i>Calycoceras sarthence</i>	/am	60	62
<i>Euhystrihoceras nicaisei</i>	/am	22	30
<i>Euomphaloceras cunningtoni</i>	/am	50.15	53
<i>Euomphaloceras septemseriatum</i>	/am	98.5	100.5
<i>Forbesiceras beaumontianum</i>	/am	21	25
<i>Forbesiceras largilliertianum</i>	/am	45.2	71
<i>Hypoturritelites mantelli</i>	/am	14	16.5
<i>Hypoturritelites tuberculatus</i>	/am	11	14.5
<i>Hypoturritelites gravesianus</i>	/am	21	25
<i>Hyphoplites falcatus</i>	/am	25	30
<i>Idiohamites ellipticus</i>	/am	11	21
<i>Mantelliceras cantianum</i>	/am	14	25
<i>Mantelliceras mantelli</i>	/am	14	30
<i>Mantelliceras saxbii</i>	/am	14	36
<i>Mariella dorsetensis</i>	/am	11	14.5
<i>Mariella lewesiensis</i>	/am	17	23
<i>Metengonoceras dumbli</i>	/am	50.15	99.5
<i>Metococeras geslinianum</i>	/am	98.5	100.5
<i>Neocardioceras juddii</i>	/am	103	104
<i>Neostlingoceras carcitanense</i>	/am	11.5	15
<i>Pseudocalyoceras dentonense</i>	/am	100	101
<i>Pseudocalyoceras haugi</i>	/am	93	97
<i>Scaphites obliquus</i>	/am	45.2	71
<i>Sciponoceras baculoidea</i>	/am	50.15	71
<i>Schloenbachia varians</i>	/am	10.5	50
<i>Sciponoceras gracile</i>	/am	98.5	101
<i>Stomohamites simplex</i>	/am	55	71
<i>Thomasites sornayi</i>	/am	93	98
<i>Turrilites acutus</i>	/am	50.15	71
<i>Turrilites costatus</i>	/am	45.2	71
<i>Turrilites scheuchzerianus</i>	/am	45.2	53
<i>Vascoceras dartianum</i>	/am	101.2	102.5
*SB @ 0, 30, 50.1, 69, 87.5, 98, & 100 m; MF/TS @ 71, 90, 98 m.			
Marker bed Ce SB 1.1	/mb	0.1	0.1
Marker bed Ce SB 1	/mb	30	30
*Marker bed Ce SB 2	/mb	45	45
Marker bed Ce SB 3	/mb	50.1	50.1
*Marker bed Ce TS 3	/mb	50.1	50.1
Marker bed Ce SB 4	/mb	69	69
Marker bed Ce TS 4	/mb	87.5	87.5
Marker bed Ce DL 4	/mb	90	90
Marker bed Ce SB 5	/mb	98	98
Marker bed Ce TS 5	/mb	99	99
*Marker bed Ce SB 6	/mb	100	100
*END			

MIDK.7 - Djebel Bireno, Tunisia,
Djebel Bireno, Tunisia, El Kef region, south of Thala and between Ain el Glaa and Khanguet el Garjouma.
Gargouri-Razgallah, S., 1983, Le Cenomanien du Tunisie centrale: Doc. et Trav. IGAL, Paris, no. 6, 215

p. Apparently a continuous record of sediment accumulation for Cenomanian; rate of sediment accumulation 5cm/ka; data from Tab. 13, 13b and p. 24.

Data

*Taxon name	morph code	base (m)	top	
Glob'oides delrioensis	/fp	153	160	
Glob'oides eaglefordensis	/fp	3	220	
Hedb planispira	/fp	3	220	
Hedb delrioensis	/fp	3	220	
Hedb amabilis	/fp	3	94	
Hedb brittonensis	/fp	3	220	
Praeglobotruncana inornata	/fp	35	206	
Praeglobotruncana stephani	/fp	3	94	
*Note a single occurrence at 172m.				
Rota appenninica	/fp	3	64	
Rota cushmani	/fp	132	220	
*May occur as low as 103 as indicated by dashed line.				
Rota greenhornensis	/fp	80	220	
Schackoina cenomana	/fp	0	10	*Listed on p. 24
Whit aprica	/fp	214	240	
Ammodiscus cretaceus	/FB	3		
Charentia cuvillieri	/fb	65	220	
Pith sphaerica	/ca	46	240	
Acanthoceras rhotomagense	/am	3	30	
Acanthoceras newboldi	/am	100	110	
Neolobites vibrayeanus	/am	100	110	
Turrilites costatus	/am	3	30	
Myti labiatus	/bi	230	240	
Biscutum constans	/nn	35	40	
Cretarhabdus loriei	/nn	0	30	*ID as cf.
Cribrosphaerella ehrenbergii	/nn	35	40	
Discorhabdus ignotus	/nn	35	40	
Lithastrinus floralis	/nn	0	20	
Lithraphidites carniolensis	/nn	150		
Prediscosphaera cretacea	/nn	0	30	
Rotelapillus laffittei	/nn	150	220	
Zeugrhabdotus erectus	/nn	0	20	
*END				

MIDK.8 - Djebel Mrhila, Tunisia,

Djebel Mrhila, Tunisia; El Kef region, 1 km west of Foum el Guelta and 15 km NE of Sbeitla and E of Bireno. Gargouri-Rasgallah, S., 1983, Le Cenomanien de Tunisie centrale: Doc. et Trav. IGAL, Paris, no. 6, 215 p.; p. 17-19, Tab. 6. Apparently continuous, uniform accumulation rate from uppermost Albian to Turonian; 5.34 cm/ka.

Data

*Taxon name	morph code	base (m)	top
Glob'oides eaglefordensis	/fp	15	250
Hedb planispira	/fp	25	250
Hedb delrioensis	/fp	15	260
Hedb amabilis	/fp	45	235
Hedb brittonensis	/fp	15	250
Hedbergella washitensis	/fp	15	50
Planomalina buxtorfi	/fp	0	10
Praeglobotruncana stephani	/fp	15	230
Rota montsalvensis	/fp	40	64
Rota appenninica	/fp	20	95
Rota cushmani	/fp	225	250
Rota greenhornensis	/fp	145	250
Whit aprica	/fp	261	265

Ammodiscus cretaceus	/FB	45	250
Charentia cuvillieri	/fb	15	250
Pseudocyclammina rugosa	/fb	235	250
Acanthoceras cenomanense	/am	130	140
Calycoceras newboldi	/am	190	220
Forbesiceras largilliertianum	/am	130	140
Mantelliceras saxbii	/am	60	90
*ID as Mantelliceras zone (p. 19)			
Neolobites vibrayeanus	/am	190	220
Turrilites costatus	/am	105	125
Turrilites scheuchzerianus	/am	105	125
Vascoceras dartianum	/am	270	280
*ID as sp. in unit f, Bahloul Fm. (p.18)			
*END			

MIDK.9 - Bounds, Core, Kansas

Amoco Bounds Core, Greeley Co., Kansas. Scott et al., 1994, in Dolson et al., eds., Rocky Mountain Association of Geologists, Unconformity-related hydrocarbons in sedimentary sequences, p. 89-98; Scott et al., 1996, SEPM Concepts in Sed. & Paleont., No. 6, p. 11-34.

Continuous core of lower Niobrara to top Morrison; sample depths core depths.

Thatcher Ls Mbr at 1083.6-1085.3 ft is associated with a date at Pueblo, Colo.; a bentonite 20 cm below is 95.78±0.61 Ma by Obradovich '93:390.

Data by Mike Evetts, Jeff Stein, Jim Bergen, & R. Scott.

08/01/05: Graphed all Niobrara events to the MIDK41 database.

Data

*Taxa	Morph code	base (ft)	top
*ID's by R. W. Scott with inoceramids checked by E. G. Kauffman.			
Carbon peak OAE 2	/gc	-981.0	-969.0
Adkinsites bravoensis	/am	-1412.9	-1412.9
Collignonicerias woollgari	/am	-790	-790
Prionocyclus hyatti	/am	-790	-761.8
*bentonites in P. hyatti zone constrain m-u Tur boundary to 90.4-90.3 Ma			
Inoc arvanus	/bi	-1085.2	-1071.3
Inoc comancheanus	/bi	-1406.5	-1406.5
Inoc cuvieri	/bi	-834.8	-834.8
Inoc pictus	/bi	-999.6	-999.6
Inoc prefragilis	/bi	-1034.4	-1008.5
Inoc rutherfordi	/bi	-1067.6	-1053.8
Myti costellatus	/bi	-761.8	-761.8*ID questioned
Myti hercynicus	/bi	-838.2	-838.2*ID questioned
Myti labiatus	/bi	-851.6	-851.6
Myti mytiloides	/bi	-950.5	-943.9
Myti opalensis	/bi	-973.4	-963.4
Myti subhercynicus	/bi	-943.5	-943.5
Ostrea beloiti	/bi	-1057.8	-1048
*Platyceramus platinus	/bi	-592	-551
Pseudoperma bentonensis	/bi	-838.2	-838.2
*Pseudoperma congesta	/bi	-592	-578.5
*ID by M. J. Evetts, 1994, modified Mar 1995;			
comments by S. Nederbragt 7 Ap 1995. Scott et al., 1998, Table 3, p. 25			
Archaeoglobigerina cretacea	/fp	-610	-600
Bifarina geneae	/fp	-670	-620
Clav moremani	/fp	-870	-870
Clav simplex	/fp	-1020	-600
Clav subcretacea	/fp	-960	-870
Dica concavata	/fp	-660	-640
Dica hagni	/fp	-950	-950
Dica imbricata	/fp	-610	-610
Dica primitiva	/fp	-670	-610

Glob'oides bentonensis	/fp	-1020	-1000
Glob'oides ultramicrus	/fp	-1030	-600
Globotruncana lapparenti	/fp	-660	-600 *ID as cf.
Globotruncana linneiana	/fp	-660	-600
*Evetts ID is sp. cf.; S. Nederbragt reports this in the range of pseudolinneiana			
Globotruncana renzi	/fp	-670	-650
Hasterigerinoides subdigitata	/fp	-600	-600
Hedb delrioensis	/fp	-1080	-630
Hedb loetterlei	/fp	-1000	-600
Hedb planispira	/fp	-1080	-600
Hedb simplicissima	/fp	-1020	-600
Helv'ana helvetica	/fp	-920	-910
*New genus is Helvetoglobotruncana			
Hete globulosa	/fp	-1080	-600
Heterohelix moremani	/fp	-1080	-620
Hete pulchra	/fp	-930	-600
*Placed in Laeviheterohelix by S. Nederbragt			
Marginotruncana coronata	/fp	-640	-600
Marginotruncana marginata	/fp	-670	-600
Marginotruncana renzi	/fp	-670	-650
Marginotruncana schneegansi	/fp	-930	-670
Praeglobotruncana delrioensis	/fp	-880	-880
*not on final list			
Praeglobotruncana stephani	/fp	-1000	-1000
Pseudotextularia browni	/fp	-670	-630
*A junior synonym of Pseudotext. nuttalli			
Rota cushmani	/fp	-1000	-990
Rota greenhornensis	/fp	-1020	-1000
Rota multiloculata	/fp	-990	-990
*Same as R. ticinensis or subticinensis fide S. Nederbragt.			
Schackoina cenomana	/fp	-990	-990
Ventilabrella austinana	/fp	-990	-640
*May be a morphotype of H. globulosa fide S. Nederbragt.			
Whit paradubia	/fp	-1020	-600
*Scott et al., 1998, p. 25, Table 3			
Anomalina nelsoni	/fb	-650	-610
Ammobaculites perimpexus	/fb	-760	-760
Bulimina fabilis	/fb	-980	-980
Eouvigerina aculeata	/fb	-620	-610
Frondicularia archiaciana	/fb	-640	-640
Frondicularia bidentata	/fb	-650	-650
Frondicularia undulosa	/fb	-670	-650
Gaudryina bentonensis	/fb	-730	-730
Gaudryina nebrascensis	/fb	-670	-650
Gaudryina pupoides	/fb	-640	-640
Gaudryina rugosa	/fb	-670	-640
Gaudryina spiritensis	/fb	-770	-730
Gavelinella kansasensis	/fb	-770	-640
Globorotalites subconicus	/fb	-660	-600
Globorotalites umbilicatus	/fb	-640	-620
Goesella rubulosa	/fb	-610	-610
Gyroidina nitidus	/fb	-670	-600
Haplophragmoides howardense	/fb	-760	-730
Haplophragmoides rota	/fb	-760	-760
Lenticulina isidis	/fb	-650	-650
Lenticulina kansasensis	/fb	-670	-660
Lenticulina muensteri	/fb	-610	-610
Lenticulina sublaevis	/fb	-670	-610
Marginulina austinana	/fb	-660	-660
*Miliammina ischnia	/fb	-760	-760
*too high fide MJ Evetts 5/02			
Neobulimina albertensis	/fb	-980	-980
Neobulimina canadensis	/fb	-640	-600

Neobulimina irregularis	/fb	-620	-610
Neoflabellina cushmani	/fb	-670	-670
Neoflabellina suturalis	/fb	-630	-620
Nodosaria affinis	/fb	-670	-650
Planularia dissona	/fb	-640	-640
Pleurostomella austiniana	/fb	-670	-620
Praebulimina kickapooensis	/fb	-660	-660
Praebulimina reussi	/fb	-660	-600
Pseudoclavulina hastata	/fb	-750	-730
Quadrimorphina minuta	/fb	-610	-600
Reophax pepperensis	/fb	-1050	-1050
Saccamina alexanderi	/fb	-760	-750
Spirillina acosta	/fb	-760	-760
Tappanina costifera	/fb	-670	-620
Trochamma wickendeni	/fb	-770	-770
*top at -730 too high fide M.J. Evetts May 15, 2002			
Trochamminoides apricarius	/fb	-1050	-1050
Valvulineria infrequens	/fb	-670	-670
Valvulineria loetterlei	/fb	-980	-770
Valvulineria plummerae	/fb	-670	-600
Verneuilinoides bearpawensis	/fb	-730	-710
Virgulina tegulata	/fb	-670	-610
Nannos by J. A. Bergen, as of Mar '95 with new generic assignments;			
*Scott et al., 1998, p. 25-26, Table 3			
Ahmuellerella octoradiata	/nn	-970	-600
Amphizygus brooksii	/nn	-1005.16	-600
Assipetra terebrodentarius	/nn	-1040	-610
*ID as Broinsonia			
Axopodorhabdus albianus	/nn	-1080	-983
Bidiscus rotatorius	/nn	-1074.83	-600
Biscutum ellipticum	/nn	-1080	-600
Braarudosphaera bigelowii	/nn	-1030	-640
Broinsonia dentata	/nn	-1074.83	-600
Broinsonia enormis	/nn	-1080	-890
Broinsonia parca	/nn	-1070	-600
Bukryolithus ambiguus	/nn	-1080	-600
Calculites obscurus	/nn	-930	-850
Chiastozygus fessus	/nn	-994	-600
Chiastozygus litterarius	/nn	-1084.75	-600
Chiastozygus platyrhethus	/nn	-1050	-920
Corollithion achylosum	/nn	-1010	-880
*ID as Stoverius			
Corollithion exiguum	/nn	-920	-790
Corollithion kennedyi	/nn	-1080	-980
Corollithion madagaskarensis	/nn	-1080	-800
Corollithion signum	/nn	-1080	-600
Cretarhabdus conicus	/nn	-1080	-600
Cretarhabdus loriei	/nn	-1080	-980
Cribrosphaerella ehrenbergii	/nn	-1070	-600
Cyclagelosphaera margerelii	/nn	-1080	-600
Cylindralithus asymmetricus	/nn	-660	-600
Cylindralithus biarcus	/nn	-960	-600
Cylindralithus coronatus	/nn	-660	-600
Cylindralithus nudus	/nn	-1065	-610
Darwinilithus pentarhethum	/nn	-1070	-994
Eiffellithus eximius	/nn	-670	-600
Eiffellithus turriseiffelii	/nn	-1084.75	-600
Ellipsagelosphaera ovata	/nn	-1080	-600
*Eprolithus eptapetalus	/nn	-978.16	-780
*Synonym of E. moratus			
Eprolithus floralis	/nn	-1084.75	-600
Eprolithus moratus	/nn	-670	-600
Eprolithus octopetalus	/nn	-978.16	-920

Eprolithus rarus	/nn	-910	-860
Flabellites oblonga	/nn	-1065	-600
Gartnerago nanum	/nn	-1084.75	-1025.75
Gartnerago obliquum	/nn	-1000	-600
Gartnerago theta	/nn	-1065	-1035
Grantarhabdus coronadventis	/nn	-1080	-600
Helenea chiastia	/nn	-1075	-980
Helicolithus anceps	/nn	-1005	-600
Helicolithus compactus	/nn	-1075	-600
Isocrystallithus compactus	/nn	-1070	-979
*ID as Lucianorhabdus			
Kamptnerius magnificus	/nn	-670	-620
Liliasterites angularis	/nn	-850	-800
Lithraphidites acutum	/nn	-1050	-980
Lithraphidites alatus	/nn	-1045	-985
Lithraphidites carniolensis	/nn	-1055	-610
Lordia xenotus	/nn	-1080	-1065
Lucianorhabdus cayeuxii	/nn	-640	-610
Lucianorhabdus maleformis	/nn	-920	-630
Manivitella pemmatoidea	/nn	-1084.75	-600
Markalius circumradiatus	/nn	-1030	-600
Marthasterites furcatus	/nn	-670	-600
Microrhabdulus decoratus	/nn	-610	-600
Microrhabdulus undosus	/nn	-860	-860
*ID as Radiolithus			
Micula decussata	/nn	-630	-600
Octocyclus magnus	/nn	-1025.75	-1025.75
Percivalia fenestrata	/nn	-1070	-920
Percivalia hauytonensis	/nn	-1070	-994
Prediscosphaera cretacea	/nn	-1084.75	-600
Prediscosphaera spinosa	/nn	-1080	-610
Quadrum gartneri	/nn	-977.08	-600
Radiolithus planus	/nn	-1074.83	-850
Rhagodiscus achlyostaurion	/nn	-1070	-840
Rhagodiscus asper	/nn	-1080	-979
Rhagodiscus angustus	/nn	-1074.83	-610
Rhagodiscus splendens	/nn	-1070	-610
Reinhardtites scitula	/nn	-1084.75	-600
Reinhardtites sisyphus	/nn	-670	-600
Retecapsa octofenestratus	/nn	-1080	-640
*ID as Cretarhabdus			
Retecapsa schizobrachiatus	/nn	-1045	-620
*ID as Cretarhabdus			
Rotelapillus crenulatus	/nn	-1080	-600
Scampanella cornuta	/nn	-1080	-670
Sollasites horticus	/nn	-1010	-600
Stradneria crenulata	/nn	-1084.75	-600
Tegumentum stradneri	/nn	-1080	-600
Tetrapodorhabdus coptensis	/nn	-1070	-976.5
Tetrapodorhabdus decorus	/nn	-1065	-610
Tranolithus exiguus	/nn	-1084.75	-610
Tranolithus gabalus	/nn	-1025.75	-600
Tranolithus minimus	/nn	-983	-600
Tranolithus orionatus	/nn	-1060	-610
Tubodiscus jurapelagicus	/nn	-1040	-1020
Vagalapilla dibrachiata	/nn	-1080	-600
Watznaueria barnesae	/nn	-1084.75	-600
Watznaueria biporta	/nn	-1055.16	-600
Watznaueria britannica	/nn	-1070	-1065
*ID as Ellipsagelosphaera			
Watznaueria fossacincta	/nn	-1084.75	-640
Zeugrhabdotus bicrescenticus	/nn	-1084.75	-600
*ID as Zygodiscus			

Zeugrhabdotus biperforatus	/nn	-660	-600
*ID as Reinhardtites			
Zeugrhabdotus elegans	/nn	-1080	-610
*ID as Glaukolithus			
Zeugrhabdotus embergeri	/nn	-1084.75	-600
Zeugrhabdotus trivectis	/nn	-1080	-1040
Zygodiscus diplogrammus	/nn	-1084.75	-600
*Palynomorphs by J. A. Stein, April, 1995 using minimum ranges on range chart			
*Scott et al., 1998, p. 26-27, Table 3; Note by RW Scott, Feb 10, 2003			
*occurrences at 670' may be reworked above basal Niobrara unconformity; delete			
Aldorfina deflandrei	/dn	-1090	* -670
Aptea polymorpha	/dn	-1380	-1360
Apteodinium grande	/dn	-1380	-1100
Atopodinium haromense	/dn	-1380	* -670
Batioladinium jaegeri	/dn	-1380	-1340
Chatangiella ditissima	/dn	-800	-680
Chatangiella granulifera	/dn	-808	-720
Chatangiella spectabilis	/dn	-960	* -670
Chatangiella verrucosa	/dn	-780	-702
Chichaouadinium vestitum	/dn	-1482	-1150
Cyclonephelium membraniphorum	/dn	-980	-740
Dapsilidinium laminaspinosum	/dn	-1400	-702
Dingodinium cerviculum	/dn	-1340	-1312.4
Dinogymnium albertii	/dn	-670	* -670
Dinogymnium cretaceum	/dn	-960	* -670
Dinogymnium euclaense	/dn	-1000	-860
Dinopterygium cladoides	/dn	-1482	-680
Dorocysta litotes	/dn	-960	-860
Ellipsodinium rugulosum	/dn	-980	* -670
Elytrocysta druggii	/dn	-800	-680
Endoscrinium campanula	/dn	-950	-740
Epelidosphaeridia spinosa	/dn	-1000	-970
Eurydinium glomeratum	/dn	-960	-740
Florentinia deanei	/dn	-1050	-680
Florentinia mantellii	/dn	-950	-680
Florentinia resex	/dn	-1482	-680
Florentinia verdieri	/dn	-1466	* -670
Ginginodinium evittii	/dn	-1150	-1119.5
Heterosphaeridium difficile	/dn	-920	* -670
*ID as Hyst.			
Isabelidinium amphiatum	/dn	-740	* -670
Isabelidinium magnum	/dn	-1000	-702
Kiokansium perprolatum	/dn	-1482	-1050
Litosphaeridium conspicuum	/dn	-1400	-1380
Litosphaeridium siphoniphorum	/dn	-1100	-980
Luxadinium primulum	/dn	-1150	-1100
Luxadinium propatulum	/dn	-1340	-1150
Maghrebinia perforata	/dn	-1380	-1360
Muderongia asymmetrica	/dn	-1400	-1119.5
Odontochitina rhakodes	/dn	-1482	-1312.4
Odontochitina singhii	/dn	-1380	-1380
Oligosphaeridium prolixispinosum	/dn	-980	-702
Oligosphaeridium totum minus	/dn	-1482	-1340
Ovoidinium verrucosum	/dn	-1168.9	-1119.5
Palaeohystrichophora infusorioides	/dn	-1445	*
*this LO is in basal Niobrara and may be reworked (RWS 06/02/03)-670			
Pervosphaeridium truncigerum	/dn	-670	* -670
Prolixosphaeridium conulum	/dn	-1050	-840
Protoellipsodinium spinosum	/dn	-1425	-1380
Psalignonyaulax deflandrei	/dn	-840	-760
Pseudoceratium anaphrisum	/dn	-1465	-1340
*ID as Aptea cf.			
Pseudoceratium expolitum	/dn	-1482	-1100

Rhiptocorys veligera	/dn	-960	-702
Senoniasphaera protrusa	/dn	-960	-670
Sepispinula huguoniotii	/dn	-1000	-970
*ID in Clei			
Stephodinium coronatum	/dn	-1400	-970
Subtilisphaera cheit	/dn	-1482	-680
Trithyrodinium vermiculatum	/dn	-840	-740
Trithyrodinium sp.	/dn	-1050	* -670
Xenascus ceratioides	/dn	-1090	* -670
Afropollis jardinus	/sp	-1212	-1128
Appendicisporites unicus	/sp	-1312.4	-1312.4
Cicatricosisporites crassiterminatus	/sp	-1212	-680
Classopollis echinatus	/sp	-1425	-1400
Complexiopollis funiculus	/sp	-970	-702
Foraminisporis asymmetricus	/sp	-1340	-1245
Ischyosporites crateris	/sp	-1292	-1179
Januasporites spiniferus	/sp	-1482	-1482
Neoraistrickia robusta	/sp	-1360	-1179
Ornamentifera distalgranulata	/sp	-1425	-1090
Pilosisporites trichopappilosus	/sp	-1482	-1119.5
Pilosisporites verus	/sp	-1292	-1212
Plicapollisserta	/sp	-680	-680
Rugubivesiculites rugosus	/sp	-1312.4	* -670
Scopusporis lautus	/sp	-1425	-1212
Stellatopollis barghoorni	/sp	-1202	-1150
Taurocusporites segmentatus	/sp	-1425	-1179
Tigrisporites reticulatus	/sp	-1465	-1212
Trilobosporites apiverrucatus	/sp	-1482	-1150

*Milankovitch-scale depositional cycles defined by marl-limestone interbedding.

*Marker beds in Greenhorn and Niobrara defined by Laferrier & Hattin, AAPG Bulletin 73:630-640.

*Base Niobrara Fm marker beds (Scott et al. 1998, Table 2, Fig. 13)

Marker bed Kn 9	/mb	-615.8	594.7
Marker bed Kn 8	/mb	-631.0	*
Marker bed Kn 7	/mb	-640.0	*
Marker bed Kn 6	/mb	-660.0	*
Marker bed Kn 5	/mb	-668.2	*
Marker bed Kn 4	/mb	-675.0	*

*Greenhorn Fm marker beds (Scott et al. 1998)

*(cycle base is base shale; core depths Table 2, Fig. 11)

Marker bed PF 3	/mb	-916.0	-908.3
Marker bed Gn Cycle 8	/mb	-908.3	*
*Marker bed Gn Cycle 7	/mb	-912.3	*
Marker bed PF 2	/mb	-921.8	*
Marker bed PF 1	/mb	-930.7	*
Marker bed JT 12	/mb	-942.7	*
Marker bed JT 11	/mb	-946.2	*
Marker bed JT 10	/mb	-948.8	*
*Marker bed Gn Cycle 6	/mb	-945.5	*
Marker bed JT 9	/mb	-955.0	*
*Marker bed Gn Cycle 5	/mb	-	*
*Marker bed Gn Cycle 4	/mb	-957.7	*
Marker bed JT 1	/mb	-962.7	*
Marker bed HL 5	/mb	-967.6	*
Marker bed HL 4	/mb	-972.5	*
*Marker bed Gn Cycle 3	/mb	-967.6	*
*Marker bed Gn Cycle 2	/mb	-972.5	*
Marker bed HL 3	/mb	-982.7	*
Marker bed HL 2	/mb	-985.5	*
Marker bed HL 1	/mb	-997.7	*
*Marker bed Gn Cycle 1	/mb	-997.7	*

Marker bed "X" bentonite /mb	-1046.4	-1046
Marker bed Al SB WA 1 /mb	-1495	-1495
Marker bed Thatcher Mbr. /mb	-1085.3	-1084
*END		

MIDK.9B - Bounds, Core, Kansas – Niobrara Fm. only
Same data as in MIDK.9 except nannofossil tops adjusted by Bralower & Bergen, 1998, p. 69, Table 5,
SEPM Concepts in Sedimentology & Paleontology No. 6. Section graphed to MIDK41.CAt

Data

Ahmuellerella octoradiata /nn	-970	-500
*LO in Bralower & Bergen, 1998, p. 69		
Amphizygus brooksii /nn	-1005.16	-500
*LO in Bralower & Bergen, 1998, p. 69		
*Aspidolithus enormis /nn	-1080	-890
Assipetra terebrodentarius /nn	-1040	-540
*ID as Broinsonia, LO in Bralower & Bergen, 1998, p. 69		
Axopodorhabdus albianus /nn	-1080	-983
Broinsonia parca /nn	-1070	-600
Bidiscus rotatorius /nn	-1074.83	-500
*LO in Bralower & Bergen, 1998, p. 69		
Biscutum ellipticum /nn	-1080	-600
Braarudosphaera bigelowii /nn	-1030	-500
*LO in Bralower & Bergen, 1998, p. 69		
Broinsonia dentata /nn	-1074.83	-500
*LO in Bralower & Bergen, 1998, p. 69		
Bukryolithus ambiguus /nn	-1080	-520
*LO in Bralower & Bergen, 1998, p. 69		
Calculites obscurus /nn	-930	-500
Chiastozygus fessus /nn	-994	-500
Chiastozygus litterarius /nn	-1084.75	-510
Chiastozygus platyrhethus /nn	-1050	-920
Corollithion achylosum /nn	-1010	-880
*ID as Stoverius		
Corollithion exiguum /nn	-920	-530
Corollithion kennedyi /nn	-1080	-980
Corollithion madagaskarensis /nn	-1080	-500
Corollithion signum /nn	-1080	-500
Cretarhabdus conicus /nn	-1080	-500
Cretarhabdus loriei /nn	-1080	-980
Cribrosphaerella ehrenbergii /nn	-1070	-510
Cyclagelosphaera margerelii /nn	-1080	-600
Cylindralithus asymmetricus /nn	-660	-600
Cylindralithus biarcus /nn	-960	-500
Cylindralithus coronatus /nn	-660	-500
Cylindralithus nudus /nn	-1065	-530
Darwinilithus pentarhethum /nn	-1070	-994
Eiffellithus eximius /nn	-670	-500
Eiffellithus turrisieffellii /nn	-1084.75	-500
Ellipsagelosphaera ovata /nn	-1080	-600
*Eprolithus eptapetalus /nn	-978.16	-820
*Synonym of E. moratus		
Eprolithus floralis /nn	-1084.75	-570
*LO in Bralower & Bergen, 1998, p. 69		
Eprolithus moratus /nn	-670	-600
*Eprolithus octopetalus /nn	-978.16	-920
*Eprolithus rarus /nn	-910	-860
Flabellites oblonga /nn	-1065	-580
*Gartnerago nanum /nn	-1084.75	-1025.75
Gartnerago obliquum /nn	-1000	-500
*Gartnerago theta /nn	-1065	-1035

Grantarhabdus coronadventis	/nn	-1080	-500
Helicolithus anceps	/nn	-1005	-500
Helicolithus compactus	/nn	-1075	-520
Isocrystallithus compactus	/nn	-1070	-979
*ID as Lucianorhabdus compactus			
Kamptnerius magnificus	/nn	-670	-500
*Liliasterites angularis	/nn	-850	-800
*Lithraphidites acutum	/nn	-1050	-980
*Lithraphidites alatus	/nn	-1045	-985
Lithraphidites carniolensis	/nn	-1055	-500
*Lordia xenotus	/nn	-1080	-1065
Lucianorhabdus cayeuxii	/nn	-640	-500
Lucianorhabdus maleformis	/nn	-920	-500
Manivitella pemmatoidea	/nn	-1084.75	-500
*Microstaurus chiastia	/nn	-1075	-980
Markalius circumradiatus	/nn	-1030	-530
Marthasterites furcatus	/nn	-670	-500
Microrhabdulus decoratus	/nn	-610	-510
Micula decussata	/nn	-630	-500
*Microrhabdulus undosus	/nn	-860	-860
*ID as Radiolithus undosus			
*Octocyclas magnus	/nn	-1025.75	-1025.75
*Percivalia fenestrata	/nn	-1070	-920
*Percivalia hauxtonensis	/nn	-1070	-994
Prediscosphaera cretacea	/nn	-1084.75	-500
Prediscosphaera spinosa	/nn	-1080	-510
Quadrum gartneri	/nn	-977.08	-520
*Radiolithus planus	/nn	-1074.83	-850
Reinhardtites scitula	/nn	-1084.75	-510
Reinhardtites sisyphus	/nn	-670	-500
Retecapsa octofenestratus	/nn	-1080	-510
*ID as Cretarhabdus			
Retecapsa schizobrachiatus	/nn	-1045	-520
*ID as Cretarhabdus			
*Rhagodiscus achlyostaurion	/nn	-1070	-840
*Rhagodiscus asper	/nn	-1080	-979
Rhagodiscus angustus	/nn	-1074.83	-500
Rhagodiscus splendens	/nn	-1070	-500
Rotelapillus crenulatus	/nn	-1080	-510
Scampanella cornuta	/nn	-1080	-540
Sollasites horticus	/nn	-1010	-580
Stradneria crenulata	/nn	-1084.75	-600
Tegumentum stradneri	/nn	-1080	-520
*Tetrapodorhabdus coptensis	/nn	-1070	-976.5
Tetrapodorhabdus decorus	/nn	-1065	-500
Tranolithus exiguus	/nn	-1084.75	-500
Tranolithus gabalus	/nn	-1025.75	-500
Tranolithus minimus	/nn	-983	-500
Tranolithus orionatus	/nn	-1060	-610
*Tubodiscus jurapelagicus	/nn	-1040	-1020
Vagalapilla dibrachiata	/nn	-1080	-540
Watznaueria barnesae	/nn	-1084.75	-500
Watznaueria biporta	/nn	-1055.16	-500
*Watznaueria britannica	/nn	-1070	-1065
*ID as Ellipsagelosphaera			
Watznaueria fossacincta	/nn	-1084.75	-640
Zeugrhabdotus bicrescenticus	/nn	-1084.75	-500
*ID as Zygodiscus			
Zeugrhabdotus biperforatus	/nn	-660	-500
*ID as Reinhardtites			
Zeugrhabdotus elegans	/nn	-1080	-610
*ID as Glaukolithus			
Zeugrhabdotus embergeri	/nn	-1084.75	-500

*Zeugrhabdotus trivectis	/nn	-1080	-1040
Zygodiscus diplogrammus	/nn	-1084.75	-600
*END			

MIDK.10 - Kalaat Senan, Tunisia Section

Cenomanian of Kalaat Senan, Tunisia, Robaszynski et al., 1993, Rev. Paleobiologie 12:351-505. Composited outcrop sections tied by means of lithologic marker beds. Cen/Tur boundary between 742-745m based on ammonites and 738m at base of Q. gartneri. Taxonomic editing by S. Nederbragt, 4 Ap 95. Alb/Cen boundary at 94 m by base of R. globotruncanoides w/ top Mortonicerias sp. Reference section for Cenomanian cycles interpreted by Hardenbol 14/7/96. Top Fahdene Formation at 722m; Top Bahloul Formation at 745m; Top of section at 1032m in Annaba Formation; SB @ 78, 207, 318, 406.5, 623, 717.5.

Data

*Taxa	Morph group	Base-m	Top-m
Carbon peak OAE 2	/gc	721	732
*Robaszynski et al., 1995 abst., p. 103			
Foram data by M. Caron, fig. 36			
Dica algeriana	/fp	552	768
Dica hagni	/fp	665	768
Hedbergella washitensis	/fp	55	479
*Reported as Favusella sp.			
Rota appenninica	/fp	55	511
*Rota balernaensis	/fp	55	422
*junior synonym of R. appenninica			
Rota cushmani	/fp	539	723
Rota deeckeii	/fp	511	550
Rota evoluta	/fp	55	305
Rota gandolfi	/fp	55	688
Rota globotruncanoides	/fp	96.5	723
*May be synonym of R. greenhornensis w/ base near base R. cushmani			
Rota greenhornensis	/fp	175	718
Rota montsalvensis	/fp	285	723
Rota reicheli	/fp	444	534
Praeglobotruncana delrioensis	/fp	55	723
Praeglobotruncana stephani	/fp	55	768
*Includes P. sp. aff. P. stephani fide S. Nederbragt.			
*Siga marianosi	/fp	577	768
*Fide S. Nederbragt this species spans Tur/Con not Cen/Tur; not well documented here.			
*Nanno data by S. Gartner, figs. 43, p. 439			
Axopodorhabdus dietzmannii	/nn	55	544
Axopodorhabdus albianus	/nn	55	726
Corollithion kennedyi	/nn	232	723
*J.A. Bergen says too low at 80			
Flabellites biforaminis	/nn	55	514
Gartnerago stenostauron	/nn	55	98
*ID as Broinsonia			
Gartnerago obliquum	/nn	738	795
Helenea chiastia	/nn	55	726
Lithraphidites acutum	/nn	200	723
*J.A. Bergen says too low at 150			
Lithraphidites alatus	/nn	55	160
Lithraphidites pseudoquadratus	/nn	92	504
Quadrum gartneri	/nn	738	795
Watznaueria britannica	/nn	55	102
*Ammonite data by F. Amedro, Fig. 26, p. 408-409, fig. 17			
Acanthoceras amphibolum	/am	623.5	623.5
Acanthoceras rhotomagense	/am	463	564
*ID as cf. rhotomagense			
Algericeras boghariense	/am	165.5	192

Algericeras proratum	/am	195	271
Euhystrichoceras nicaisei	/am	165.5	395
Euomphaloceras septemseriatum	/am	742	742
*ID as cf septemseriatum			
Forbesiceras beaumontianum	/am	99.4	96.5
Hypoturritelites gravesianus	/am	96.5	141.5
Hypoturritelites schneegansi	/am	99.4	178
Lechites gaudini	/am	77	90
Mantelliceras saxbii	/am	99.4	300
Mantelliceras mantelli	/am	128	305
*ID as cf. mantelli			
Mantelliceras dixonii	/am	334	334
Mariella bergeri	/am	77	94
Mariella cenomanensis	/am	99.4	99.4
Mortoniceras sp.	/am	77	94
Neolobites vibrayeanus	/am	723	726
Neostlingoceras carcitanense	/am	99.4	99.4
Pseudaspidoceras flexuosum	/am	745	745
Sciponoceras roto	/am	96.5	99.4
Sharpeiceras schlueteri	/am	99.4	165.5
Sharpeiceras laticlavicum	/am	240	332
Turrilites costatus	/am	382	519
Turrilites acutus	/am	519	641.5
Turrilites scheuchzerianus	/am	406.5	445

Sequence stratigraphy by J. Hardenbol,
figs. 5a, 8, 12, 13, 14, 15, composite thickness in fig. 5a

Marker bed Ce SB 1.1	/mb	78	78
*base of Azreg Mbr. fig. 10			
Marker bed Ce TS 1.1	/mb	95	95
Marker bed Ce DL 1.1	/mb	170	170
Marker bed Ce SB 1	/mb	207	207
*number 2 in fig. 11 in Touil Mbr. at 33.5 in section SMB			
Marker bed Ce TS 1	/mb	223	223
Marker bed Ce DL 1	/mb	260	260
Marker bed Ce SB 2	/mb	318	318
*number 3 in fig. 11 in Touil Mbr. at 144 in section SMB			
Marker bed Ce TS 2	/mb	339	339
Marker bed Ce DL 2	/mb	357	357
Marker bed Ce SB 3	/mb	406.5	406.5
*number 4 in fig. 13 in Touil Mbr. at 52.5 in section SMC			
Marker bed Ce TS 3	/mb	525	525
Marker bed Ce DL 3	/mb	557	557
Marker bed Ce SB 4	/mb	623	623
*number 5 in fig. 11 in Dellal Mbr. at 136.5 in section KD			
Marker bed Ce TS 4	/mb	641	641
Marker bed Ce DL 4	/mb	656	656
Marker bed Ce SB 5	/mb	717.5	717.5
*number 6 in fig. 14 in Dellal Mbr. at 109.3 in section SM			
Marker bed Ce TS 5	/mb	724.2	724.2
*END			

MIDK.11 - DSDP 386 Bermuda Plateau, Atlantic

DSDP Core Hole 386 Central Bermuda Rise Offshore U. S. East Coast, Leg 43.

31° 11.21'N, 64° 14.94'W, water depth 4782 m, TD 973.8 m; Albian-Cenomanian interval.

Vol. 63, 1979, p. 203, 492, & Table 5C; Forams by C. L. McNulty, p. 487-505; nannos by H. Okada & H. R. Thierstein, p. 522-523. Section from 636 to 638.5m is Maastrichtian; 698.5 is Upper Cretaceous; and from 724.3 to 956.1m is dark gray claystone Albian-Cenomanian. Rate of sediment accumulation continuous and uniform between 750 to 830m. Albian dark green-gray and black claystone with radiolarian sand layers overlies basalt dated at 153+/-18my to 110+/-20my by argon 40/39, best est. 125+/-25my(Houghton et al., p. 739-753).

Internal reference section of OAE 1b & 1c based on percent organic carbon; data from McCave, 1979, DSDP, vol. 43, fig. 1, p. 412 and Dean et al., 1990, p. 85.

Data

*Taxa	Morph Gp	Base in m	Top
Carbon peak OAE 1c	/gc	839	825
*top picked at unconf. to keep event in Albian			
Carbon peak OAE 1b	/gc	962	910
Biti breggiensis	/fp	887.2	839.5
Glob'oides cushmani	/fp	824.4	788.7
*ID as G. caseyi, but according to B. A. Masters this is G. cushmani.			
Hedb delrioensis	/fp	818.6	788.2
Hedb libyca	/fp	842.4	827.5
Hedb planispira	/fp	887.2	788.7
Hedb simplicissima	/fp	887.2	790.3
*ID as H. amabilis, but according to B.A. Masters this is H. simplicissima.			
Hedb trocoidea	/fp	887.2	861.0
Planomalina buxtorfi	/fp	853.9	827.5
*Reported as high as 788.2 but use top of consistent occurrence; see fig. 3, p. 492.			
Praeglobotruncana stephani	/fp	842.4	790.3
Rota appenninica	/fp	842.4	804.2
Schackoina cenomana	/fp	825.4	790.3
Tici primula	/fp	868.9	852.3
Tici praeticinensis	/fp	881.7	880.3
Tici roberti	/fp	887.2	861.0
Tici subticinensis	/fp	880.3	861.0
Tici ticinensis	/fp	863.0	839.5
*Nanno data from , 1979, Table 5C, p. 528-529			
Arkhangelskiella cymbiformis	/nn	638.5	636.8
Axopodorhabdus albianus	/nn	898.3	750.9
Axopodorhabdus dietzmannii	/nn	867.8	814.6
Biscutum constans	/nn	956.1	636.8
Broinsonia enormis	/nn	814.5	636.8
*Broinsonia parca	/nn	636.9	636.9
Broinsonia signata	/nn	822.3	750.9
Chiastozygus litterarius	/nn	956.1	636.8
Corollithion achylosum	/nn	956.1	750.9
Corollithion signum	/nn	888.3	750.9
Cretarhabdus angustiforatus	/nn	888.3	822.3
*Cretarhabdus conicus	/nn	638.5	636.8
Cretarhabdus loriei	/nn	841.4	806.6
Cretarhabdus surirellus	/nn	956.1	636.8
Cribrosphaerella ehrenbergii	/nn	832.1	636.8
Cyclagelosphaera margerelii	/nn	956.1	636.8
Discorhabdus rotatorius	/nn	956.1	636.9
Eiffellithus turriseiffelii	/nn	888.3	636.6
Flabellites biforaminis	/nn	956.1	788.7
*Gartnerago obliquum	/nn	637.7	636.9
Gephyrorhabdus coronadventis	/nn	956.1	806.6
Hayesites albiensis	/nn	904.9	841.4
Helenea chiastia	/nn	956.1	766.7
Helicolithus trabeculatus	/nn	956.1	636.9
Lithraphidites alatus	/nn	806.6	766.6
Lithastrinus floralis	/nn	898.3	750.9
Lithraphidites carniolensis	/nn	904.9	636.8
*Lucianorhabdus cayeuxii	/nn	638.5	638.5
Manivitella pemmatoidea	/nn	913.3	637.7
Markalius circumradiatus	/nn	913.3	841.4
*Microrhabdulus decoratus	/nn	638.5	636.8
*Micula staurophora	/nn	638.5	636.6
Parhabdolithus asper	/nn	956.1	638.5
Parhabdolithus angustus	/nn	956.1	766.6

Parhabdolithus embergeri	/nn	956.1	638.5	
Parhabdolithus splendens	/nn	814.6	636.8	
Prediscosphaera cretacea	/nn	956.1	636.6	
Prediscosphaera spinosa	/nn	841.4	636.9	
Rhagodiscus infinitus	/nn	841.4	841.4	
*ID as Parhabdolithus				
Reinhardtites fenestratus	/nn	898.3	857.8	
Rotelapillus laffittei	/nn	956.1	636.9	*ID as S.
Sollasites horticus	/nn	822.3	822.3	
Tegumentum stradneri	/nn	898.3	750.9	
*ID as Tranolithus				
Tetrapodorhabdus decorus	/nn	956.1	637.6	
*Tranolithus aculeus	/nn	638.5	636.6	
Tranolithus gabalus	/nn	956.1	750.9	
Tranolithus orionatus	/nn	888.3	638.5	
Vagalapilla matalosa	/nn	888.3	755.6	
Vagalapilla stradneri	/nn	956.1	636.9	
Watznaueria barnesae	/nn	956.1	636.6	
Watznaueria britannica	/nn	956.1	788.7	
Watznaueria communis	/nn	898.3	788.7	
Zygodiscus diplogrammus	/nn	956.1	636.8	
Zygodiscus elegans	/nn	956.1	750.9	
Zygodiscus spiralis	/nn	867.8	636.8	
*other taxa not recorded here that range into Maastrichtian or new to the dictionary				
*END				

MIDK.11B - DSDP 386 Upper & Lower Cretaceous

This section data adds benthic foraminifers identified by Kuhnt graphed to MIDK41.Cat.

Data

*Benthic foram data from Kuhnt et al. in Microfossils and Oceanic Environments, *p. 64-75, Table 2.

Ammodiscus cretaceus	/FB	648.53	633.74	
Ammodiscus glabratus	/FB	636.57	636.57	
Ammodiscus planus	/FB	700.52	636.9	
Caudammina crassa	/FB	719.74	719.74	
Caudammina ovulum	/FB	639.8	635.76	
Glomospira charoides	/FB	719.74	635.76	
Glomospirella gaultina	/FB	695.13	635.76	
Glomospira gordialis	/FB	710.94	636.9	
Glomospira irregularis	/FB	719.74	636.9	
Haplophragmoides bulloides	/FB	719.74	719.74	
Haplophragmoides concavus	/FB	719.74	634.54	*ID cf.
Haplophragmoides herbichi	/fb	639.18	636.9	
Haplophragmoides perexplicatus	/FB	639.8	639.18	*sensu lato
Kalamopsis grzybowskii	/FB	710.54	634.54	
Karrerriella conversa	/fb	703.25	700.52	
Praecystammina globigerinaeformis	/FB	719.74	719.74	
Pseudobolivina munda	/FB	719.74	642.6	
Rzehakina epigona	/fb	646.94	641.5	
Saccammina placenta	/FB	710.54	633.74	*ID cf
Trochammina globigeriniformis	/FB	646.21	646.21	
Trochammina gyroidinaeformis	/FB	639.8	636.9	
Uvigerinammina jankoi	/FB	706.19	701.13	
*END				

MIDK.12 - Boulonnaise Section, France

Boulonnais Section, Coast of France. Amedro et al., 1981, Bull. Inf. Geol. Bass. Paris 18:3-19; Amedro et al., 1978, Geol. Mediterranee 5:5-18; Amedro et al., 1978, Bull. Inf. Geol. Bassin Paris 15:3-20. Albian-Coniacian section; 0 m is base of Middle Albian unconformity; Lower Albian lag and Aptian sand underly it; top Middle Albian at unconformity at 4.1 m; top of section at 143 m is in uppermost Turonian;

poorly exposed Coniacian is above. Lithostratigraphic boundaries must match MIDK.6 Type Cenomanian section; top Ce TS3=37.5; top Ce SB5=76.8; top Albian at 11m; top Cenomanian at 79.5m.

Data

*TAXA	Morph	Base (m)	Top (m)
Carbon peak OAE 2	/gc	77	77.8
*Plenus Marl marker bed			
Actinocamax plenus	/am	77.2	77.2
Acanthoceras jukesbrownei	/am	56	63
Acanthoceras rhotomagense	/am	37	54
Anahoplites intermedius	/am	1	2
Calycoceras naviculare	/am	66	72
Collignonicerias woollgari	/am	98	99
Dipoloceras cristatum	/am	4.2	4.2
Euhoplites loricatus	/am	1.5	2.5
Euhoplites lautus	/am	2.5	4
Euomphaloceras cunningtoni	/am	38	41.5
Euomphaloceras septemseriatum	/am	77.8	77.8
Hoplites dentatus	/am	0.5	1
Hypoturrilites gravesianus	/am	11.5	23
Hypoturrilites mantelli	/am	13	23
Hypoturrilites tuberculatus	/am	12.5	26.2
Hysterocheras orbigny	/am	4.5	7.5
Lewesiceras sp.	/am	82	139
Mantelliceras cantianum	/am	12.5	23
Mantelliceras mantelli	/am	12.5	23
Mantelliceras saxbii	/am	26.2	29
Mammites nodosoides	/am	82	86
Mariella lewesiensis	/am	14.5	20.6
Metoicoceras geslinianum	/am	77.6	77.8
Neostlingoceras carcitanense	/am	11.5	11.5
Prohysterocheras goodhalli	/am	4.5	7.2
Scaphites obliquus	/am	23	23
Schloenbachia varians	/am	11.5	26.2
Sciponoceras baculoidea	/am	41.5	41.5
Sciponoceras gracile	/am	78	79
Sharpeiceras laticlavicum	/am	11.5	12.5
Turrilites costatus	/am	38	43
Turrilites scheuchzerianus	/am	41.5	41.5
Actinoceramus sulcatus	/bi	4.2	7
Inoc concentricus	/bi	0.5	7.5
Inoc crippsi	/bi	12	46
Inoc fiegei	/bi	129	132
Myti labiatus	/bi	94	94
Myti mytiloides	/bi	81	81
Inoc pictus	/bi	78	79
Dica algeriana	/fp	78	104
Dica hagni	/fp	74	81
Dica imbricata	/fp	77.6	121
Glob'oides bentonensis	/fp	9.5	11.5
Hedb delrioensis	/fp	1	144
Hedbergella washitensis	/fp	5.5	5.5
Helv'ana helvetica	/fp	86	111
Marginotruncana coronata	/fp	116	144
Marginotruncana marginata	/fp	92	120
Marginotruncana pseudolinneiana	/fp	104	144
Praeglobotruncana delrioensis	/fp	12	56
Rota appenninica	/fp	10	33.2
Rota cushmani	/fp	41.5	76.5
Rota greenhornensis	/fp	61.5	76.5
Tici primula	/fp	8	10.5
Globorotalites subconicus	/fb	106	144

Gyroidinoides nitidus	/fb	12	144
Tubulospina oblongata	/fb	20.6	64
Ahmuellerella octoradiata	/nn	66	144
Amphizygus brooksii	/nn	77.2	144
Axopodorhabdus albianus	/nn	77.2	77.8
Broinsonia signata	/nn	77.8	144
Chiastozygus litterarius	/nn	77.2	144
Corollithion achylosum	/nn	1	10.5
Corollithion exiguum	/nn	38	144
Corollithion signum	/nn	7	144
Cretarhabdus loriei	/nn	77.2	144
Eiffellithus eximius	/nn	120	144
Eiffellithus turriseiffelii	/nn	8	144
Gartnerago obliquum	/nn	66	144
Gartnerago theta	/nn	20.6	144
Hayesites albiensis	/nn	0.5	10
Helenea chiastia	/nn	0.5	42.5
Helicolithus trabeculatus	/nn	77.2	144
Kamptnerius magnificus	/nn	120	144
Lithraphidites acutum	/nn	20.6	86
Lithraphidites alatus	/nn	12	34
Lithraphidites carniolensis	/nn	77.2	144
Lithastrinus floralis	/nn	77.2	144
Lucianorhabdus maleformis	/nn	77.8	144
Manivitella pemmatoidea	/nn	77.2	144
Microrhabdulus belgicus	/nn	32.5	144
Microrhabdulus decoratus	/nn	38	144
Nannoconus elongatus	/nn	84	144
Prediscosphaera cretacea	/nn	77.2	144
Prediscosphaera spinosa	/nn	77.2	144
Quadrum gartneri	/nn	80	144
Stradneria crenulata	/nn	77.2	144
Vagalapilla stradneri	/nn	77.2	144
Tranolithus orionatus	/nn	77.2	144
*Tranolithus phacelosus	/nn	3	10.5
*same as orionatus			
Zygodiscus spiralis	/nn	77.2	144
Pith sphaerica	/ca	2	144
Achomosphaera crassipellis	/dn	14.5	77
Achomosphaera ramulifera	/dn	14.5	120
Achomosphaera sagena	/dn	14.5	79
Adnatosphaeridium tutlosa	/dn	14.5	20.6
Apteodinium deflandrei	/dn	37	120
*ID as Aldorfina			
Apteodinium grande	/dn	14.5	120
Apteodinium granulatum	/dn	64	67.5
Batiacasphaera euteiches	/dn	67.5	67.5
*ID as Chytroeispha			
Callaiosphaeridium asymmetricum	/dn	14.5	120
Canninginopsis colliveri	/dn	14.5	29
Carpodinium obliquicostatum	/dn	14.5	77.6
Cassiculosphaeridia reticulata	/dn	29	120
Chlamydophorella discreta	/dn	29	56
Circulodinium distinctum	/dn	14.5	143
Codoniella campanulata	/dn	56	77
Cometodinium whitei	/dn	14.5	89
Coronifera oceanica	/dn	20.6	120
Coronifera striolata	/dn	14.5	120
Cribroperidinium edwardsii	/dn	14.5	77
Cribroperidinium exilicristatum	/dn	52	72
Cribroperidinium intricatum	/dn	20.6	37
Cyclonephelium hughesii	/dn	14.5	114
Cyclonephelium membraniphorum	/dn	20.6	120

Dapsilidinium laminaspinosum	/dn	37	77.6
*ID as Poly.			
Dapsilidinium pumilum	/dn	20.6	77
*ID as Poly.			
Diacrocanthidium echinulatum	/dn	72	77.6
Dinopterygium cladoides	/dn	20.6	77
Downiesphaeridium armatum	/dn	14.5	120
*ID as Cleist			
Ellipsodinium rugulosum	/dn	14.5	77.6
Elytrocysta circulata	/dn	14.5	72
Endoscrinium campanula	/dn	14.5	120
*=Scriniodinium campanulum			
Epelidosphaeridia spinosa	/dn	14.5	56
Exochosphaeridium arnace	/dn	14.5	114
Exochosphaeridium bifidum	/dn	14.5	77
Exochosphaeridium phragmites	/dn	14.5	120
Exochosphaeridium palmatum	/dn	14.5	114
Exochosphaeridium pseudhystrichodinium	/dn	14.5	120
Exochosphaeridium truncatum	/dn	14.5	143
Florentinia buspina	/dn	104	114
*ID as Sili.			
Florentinia clavigera	/dn	20.6	79
Florentinia deanei	/dn	14.5	120
Florentinia ferox	/dn	64	114
*ID as Sili.			
Florentinia laciniata	/dn	20.6	120
Florentinia mantellii	/dn	20.6	77
Florentinia radiculata	/dn	14.5	79
Florentinia tridactylites	/dn	14.5	20.6
*ID as Sili.			
Florentinia torulosa	/dn	104	120
*ID as Sili.			
Heterosphaeridium heteracanthum	/dn	14.5	143
Heterosphaeridium multifurcatum	/dn	14.5	89
*ID as Clei			
Histiocysta palla	/dn	14.5	67.5
Heterosphaeridium difficile	/dn	89	120
*ID as Hyst.			
Kallosphaeridium helbyi	/dn	29	79
*ID as Cann minor			
Kiokansium polypes	/dn	42	89
*ID as Cleistosphaeridium polypes			
Kleithriasphaeridium loffrense	/dn	14.5	120
Kleithriasphaeridium readei	/dn	20.6	120
Leberidocysta chlamydata	/dn	14.5	120
Leberidocysta defloccata	/dn	14.5	79
Litosphaeridium siphoniphorum	/dn	14.5	77.6
Micrhystridium inconspicuum	/dn	72	72
Micrhystridium singulare	/dn	72	72
Microdinium crinitum	/dn	14.5	77.6
Microdinium setosum	/dn	14.5	77.6
Microdinium reticulatum	/dn	14.5	72
Microdinium variospinum	/dn	67.5	67.5
Odontochitina costata	/dn	14.5	143
Odontochitina operculata	/dn	14.5	120
Oligosphaeridium complex	/dn	14.5	120
Oligosphaeridium prolixispinosum	/dn	14.5	120
Oligosphaeridium pulcherrimum	/dn	56	120
Palaeohystrichophora infusorioides	/dn	14.5	143
Pervosphaeridium pseudhystrichodinium	/dn	14.5	120
*ID as Hyst. palmatum			
Prolixosphaeridium conulum	/dn	14.5	120
Psalignonyaulax deflandrei	/dn	14.5	77

Pterodinium cingulatum	/dn	14.5	79	
Pterodinium pterotus	/dn	14.5	114	
*ID as Spinif.				
Rhiptocorys veligera	/dn	14.5	77.6	
Sepispinula huguoniotii	/dn	14.5	79	*ID as Clei
Spiniferites membranaceus	/dn	14.5	114	
Spiniferites pseudofurcatus	/dn	14.5	77.6	
Spiniferites ramosus gracilis	/dn	14.5	120	
Spiniferites ramosus granosus	/dn	14.5	64	
Spiniferites ramosus ramosus	/dn	14.5	143	
Spiniferites ramosus reticulatus	/dn	14.5	77.6	
Spiniferites scabrosus	/dn	14.5	120	
Spiniferites twistringiensis	/dn	14.5	104	
Stephodinium coronatum	/dn	20.6	77.6	
Surculosphaeridium longifurcatum	/dn	14.5	89	
Tanyosphaeridium variecalamus	/dn	14.5	120	
Trichodinium castanea	/dn	14.5	79	
Veryhachium rhomboidium	/dn	72	79	
Wallogidium anglicum	/dn	14.5	72	
Xenascus ceratioides	/dn	56	120	
Xiphophoridium alatum	/dn	14.5	114	
Fromea amphora	/ac	120	120	
*Sequence Stratigraphy marker beds by J. Hardenbol (partial list)				
Marker bed Ce SB 1.1	/mb	10.8	10.8	
Marker bed Ce TS 1	/mb	20.2	20.2	
*Marker bed Ce DL 2	/mb	28.8	28.8	
*Marker bed Ce TS 3	/mb	37.5	37.5	
Marker bed Ce SB 5	/mb	76.8	76.8	
*Marker bed Ce SB 7	/mb	78	78	
*END				

MIDK.13 - Piobbico Core, Marche, Italy

Piobbico Core, Marche, Italy; Tornaghi, Premoli Silva, & Ripepe, 1989, *Rivista Italia Paleont. Strat.*, v. 95, p. 223-264. Grippo et al. 2004, *SEPM SP 81*: 57-81, define sedimentary cycles.

Oceanic Red Beds-ORB-defined by Hu et al. 2005, *Palaeo-3* 233:163-186, fig. 2.

Aptian/Albian section. Core length 77.7 m with 98.8% recovery thru the entire Scisti a Fucoidi and the top transition with the Scaglia Bianca and the basal transition with the Maiolica. Facies is the forereef basin limestone-mudstone.

Data

*Taxa	Morph	Base (m)	Top (m)
Carbon peak OAE 1a	/gc	-75	-74
Carbon peak OAE 1b	/gc	-39	-38
*these are black shales in Fig. 2, in Premoli Silva, 1989; Urbino bed of Grippo et al.			
Marker bed Nannoconid crisis	/mb	*	-77
*Erba, 1994, <i>Paleoceanography</i> , 9:483-501, Fig. 5			
Marker bed Selli Level	/mb	-75	-73
Biti breggiensis	/fp	-23.7	-3.24
Biti subbreggiensis	/fp	-24.03	-3.24
Clav simplex	/fp	-25.59	-3.24
Glob'oides algerianus	/fp	-68.95	-60.55
Glob'oides barri	/fp	-68.93	-58.1
Glob'oides bentonensis	/fp	-33.18	-3.24
Glob'oides blowi	/fp	-77.4	-68.95
*Includes G. gottisi, G. duboisi. G. maridalensis			
Glob'oides cushmani	/fp	-32.1	-3.24
*ID as Glob'oides caseyi			
Glob'oides ferreolensis	/fp	-72.38	*
*Top at -47.56 is in Albian			
Glob'oides saundersi	/fp	-72.91	-72.38
Gubkinella graysonensis	/fp	-77.04	-71.43

Hedb bollii	/fp	-77.04	-72.38
Hedb delrioensis	/fp	-72.74	-0.00
*Includes H. infracretacea			
Hedb gorbachikae	/fp	-70.32	-38.86
Hedb hispaniae	/fp	-70.45	-68.27
Hedb libyca	/fp	-6.38	-0.0
Hedb planispira	/fp	-77.4	-3.24
*Includes H. occulta + H. luterbacheri			
Hedb sigali	/fp	-77.4	-71.43
Hedb similis	/fp	-77.4	-47.56
Hedb trocoidea	/fp	-69.31	-41.27
Leupoldina cabri	/fp	-72.91	-71.43
Planomalina buxtorfi	/fp	-0.19	-0.0
Planomalina cheniourensis	/fp	-66.81	-47.56
Planomalina praebuxtorfi	/fp	-6.38	-0.0
*B.A. Masters includes w/ buxtorfi?			
Praeglobotruncana delrioensis	/fp	-7.25	-0.0
Praeglobotruncana stephani	/fp	-6.00	-0.0
Rota appenninica	/fp	-6.00	-0.0
*Includes R. balernaensis			
Tici primula	/fp	-41.27	-6.38
Tici praeticinensis	/fp	-24.5	-0.0
*Includes Rota. praebalernaensis			
Tici raynaudi	/fp	-24.03	-3.24
Tici roberti	/fp	-64.6	-47.56
*Includes T. bejaouaensis + T. bej.transitoria			
Tici subticinensis	/fp	-7.25	-3.24
Tici ticinensis	/fp	-6.4	-0.0
*from core log & Erba, 1988, Rivista Italiana Paleont. Strat., 94:249-284.			
Assipetra infracretacea	/nn	-68.98	-53.63
Axopodorhabdus albianus	/nn	-33.76	-11.21
Biscutum magnum	/nn	-30.75	-0.21
Braarudosphaera africana	/nn	-72.18	-2.73
*Cera litterarius	/nn	-75.83	-1.8
Chiastozygus litterarius	/nn	-77.4	-1.8
Corollithion achylosum	/nn	-49.74	-5.99
Cretarhabdus angustiforatus	/nn	-77.14	-1.8
Cretarhabdus conicus	/nn	-72.18	-4.9
Cribrosphera ehrenbergii	/nn	-41.07	-0.21
Cyclagelosphaera margerelii	/nn	-77.14	-4.9
Eiffelithus eximius	/nn	-4.9	-4.9
Eiffelithus turriseiffelii	/nn	-5.5	-0.21
Ellipsagelosphaera ovata	/nn	-71.61	-5.99
Flabellites oblonga	/nn	-71.46	-1.8
Hayesites albiensis	/nn	-12.07	-12.07
*ID as cf.			
Helenea chiastia	/nn	-71.61	-1.8
Lithastrinus floralis	/nn	-71.61	-0.21
Manivitella pemmatoidea	/nn	-65.57	-0.21
Nannoconus bucheri	/nn	-71.61	-52.9
Nannoconus kamptneri	/nn	-68.98	-41.07
Nannoconus regularis	/nn	-52.15	-9.16
Nannoconus truitti	/nn	-68.98	-13.39
Parhabdolithus achlyostaurion	/nn	-19.56	-0.21
Parhabdolithus angustus	/nn	-71.61	-0.21
Prediscosphaera columnata	/nn	-44.37	-1.8
Prediscosphaera cretacea	/nn	-24.65	-7.37
Radiolithus planus	/nn	-65.57	-16.02
Reinhardtites fenestratus	/nn	-69.63	-5.5
Rotelapillus laffittei	/nn	-62	-17.62
Rucinolithus irregularis	/nn	-77.14	-0.21
Tegumentum stradneri	/nn	-75.83	-1.8
*ID as Tranolithus			

Vagalapilla stradneri	/nn	-72.18	-4.9
Watznaueria biporta	/nn	-67.59	-37.17
Watznaueria britannica	/nn	-75.83	-4.9
Watznaueria communis	/nn	-77.14	-4.9

*Grippo et al. 2004, SEPM SP 81, figs. 14, 15

*Piobbico graphed to Petrano to correlate Piobbico cycles to Petrano cycle numbers.

*Petrano Cycle number from base up Base meters

Eccentricity Cycle 1	-45	*	
Eccentricity Cycle 2	-43.5	*	
Eccentricity Cycle 3	-42.4	*	
Eccentricity Cycle 4	-40.6	*	
Eccentricity Cycle 5	-39.0	*	
*Eccentricity Cycle 6	-	*	
Eccentricity Cycle 7	-34.5	*	
Eccentricity Cycle 8	-32.4	*	
Eccentricity Cycle 9	-30.0	*	
Eccentricity Cycle 10	-28.5	*	
Eccentricity Cycle 11	-26.4	*	
Eccentricity Cycle 12	-24.5	*	
Eccentricity Cycle 13	-22.6	*	
Eccentricity Cycle 14	-20.6	*	
Eccentricity Cycle 15	-19.0	*	
Eccentricity Cycle 16	-17.4	*	
Eccentricity Cycle 17	-15.6	*	
Eccentricity Cycle 18	-13.5	*	
Eccentricity Cycle 19	-11.6	*	
Eccentricity Cycle 20	-9.9	*	
Eccentricity Cycle 21	-7.6	*	
Eccentricity Cycle 22	-5.3	*	
Eccentricity Cycle 23	-4.5	*	
Eccentricity Cycle 24	-3.4	*	
Eccentricity Cycle 25	-1.5	*	
*Eccentricity Cycle 26	-	*	
*Eccentricity Cycle 27	-	*	
*Eccentricity Cycle 28	-	*	
*Eccentricity Cycle 29	-	*	
Marker bed ORB 7	/mb	-2.5	0
Marker bed ORB 6	/mb	-17.85	-15.5
Marker bed ORB 5	/mb	-23.1	-21.7
Marker bed ORB 4	/mb	-35.1	-34.0
Marker bed ORB 3	/mb	-43.36	-41.0
Marker bed ORB 2	/mb	-48.5	-45.3
Marker bed ORB 1	/mb	-71.0	-53.5

*END

MIDK.14 - DSDP 369A, Offshore Morocco

DSDP 369A, Offshore Morocco, 1977? Aptian-Albian section. TD @ 488.5m; unconformities at 430.5, 423.5, & 370m. Lithologic changes at 384, 403, 424.7 (=423.5 w/ depth corrections), & 450.5m. Forams by Pflaumann & Krasheninnikov, p. 539-550; nannos by Cepek, p. 667-681.

Data

*Taxa	morp gp	base (m)	Top
Biti breggiensis	/fp	-441	-433
Hedb delrioensis	/fp	-474	-441
Hedb globigerinelloides	/fp	-488	-431
Hedb gorbachikae	/fp	-484	-474
Hedb infracretacea	/fp	-488	-431
Hedb planispira	/fp	-484	-433
*Hedb sigali	/fp	-486	-471
Hedb similis	/fp	-486	-482
Hedb simplicissima	/fp	-446	-431

Hedb trocoidea	/fp	-488	-431
Clav moremani	/fp	-434	-434
Clav subdigitata	/fp	-488	-434
Glob'ooides bentonensis	/fp	-441	-441
*Glob'ooides blowi	/fp	-488	-488
Glob'ooides caseyi	/fp	-435	-435
*Glob'ooides ferreolensis	/fp	-475	-435
Glob'ooides ultramicrus	/fp	-488	-488
Glob'ooides gottisi	/fp	-475	-435
Praeglobotruncana delrioensis	/fp	-442	-433
Schackoina cenomana	/fp	-441	-425
*Tici bejaouaensis	/fp	-457	-452
*This depth is in Albian, too young			
Tici praeticinensis	/fp	-446	-441
Tici primula	/fp	-446	-433
Tici raynaudi	/fp	-445	-426
Tici roberti	/fp	-452	-431
Tici subtacinensis	/fp	-441	-434
Tici ticinensis	/fp	-442	-426
Chiastozygus litterarius	/nn	-488	-422
Cretarhabdus conicus	/nn	-482	-387
Corollithion achylosum	/nn	-488	-416
Corollithion signum	/nn	-482	-416
Cribrosphaerella ehrenbergii	/nn	-431	-372
Eiffellithus eximius	/nn	-433	-412
Eiffellithus turriseiffelii	/nn	-433	-372
Flabellites biforaminis	/nn	-482	-433
Hayesites albiensis	/nn	-482	-444
Lithraphidites carniolensis	/nn	-488	-372
Lithastrinus floralis	/nn	-488	-416
Manivitella pemmatoidea	/nn	-488	-406
Parhabdolithus angustus	/nn	-488	-424
Prediscosphaera cretacea	/nn	-488	-372
Rotelapillus laffittei	/nn	-482	-424
Stradneria crenulata	/nn	-482	-416
Vagalapilla stradneri	/nn	-488	-387
Tranolithus gabalus	/nn	-488	-433
Tranolithus orionatus	/nn	-452	-387
Watznaueria biporta	/nn	-488	-384
Zeugrhabdotus erectus	/nn	-488	-463
*END			

MIDK.15 - Pueblo, Colorado outcrop

Canon City-Pueblo, Colorado outcrop section; Kauffman & Pratt, 1985, SEPM Field Trip Guidebook No. 4, 1985 Midyear Mtg. Section described p. FRS-1 to FRS-26; data in various papers in book.

Composited outcrops across a distance of several miles beginning at Skyline Dr.; excellent exposure.

Stratigraphic contacts from measured sections:

Base Cretaceous Lytle Fm = 6.5m; top Lytle = 11.0m; top Planview ts = 14.0m;

ts in Glencairn Fm = 19.0m, 21.5m, 29.8m, 33.0m, & top = 36.5m SB overlain by Dakota;

ts in Dakota = 54.5m, ts & top Dakota/ base Graneros Shale = 62.0m; Thatcher Ls. Mbr. = 85.0-85.5m;

"X" Bentonite Marker Bed = 100.0-100.5m also is base Greenhorn Ls, Lincoln Mbr.; base Hartland Mbr. =

112.5m; base Bridge Creek Mbr. = 129.5m; top Greenhorn/Bridge Creek/base Carlile Sh/Fairport Chalk

Mbr. = 143.1m; base Blue Hill Sh. = 165.8m; base Codell Ss. Mbr. = 195.0m;

base Juana Lopez Fm. = SB at 204.5m; base Niobrara/Fort Hays SB = 205.0m; base Smoky Hill Mbr. = 217.1m. Top Cenomanian 133.9.

Sequence stratigraphy transgressive contacts of Gale et al. 2008, Geology 36:859-862.

Sequence 1 base Thatcher Ls. Bed is transgressive contact at 85m

Sequence 2 base limestone bed 1.7 m below Soap Creek Bentonite="X" at 98.3 m

Sequence 3 bed 11A in Lincoln Ls. Mbr. (Sageman & Johnson, 1985, SEPM Guide p. 100-109) in

I. pictus Zone

Sequence 4 base beds 28-35 in Hartland Sh. Mbr. (Sageman 1985, p. 110-121) in M. mosbyensis Zone

Sequence 5 basal bed 63 Bridge Creek Ls. Mbr. in geslinianum zone

Sequence 6 base bed 78 Bridge Creek in Judii Zone

Data

*TAXA	Morph Gp	Base (m)	Top (m)
Carbon peak OAE 2	/gc	129.5	134
*Pratt, 1985, p. 40, fig. 2.			

*Greenhorn Fm. marker beds from Hattin 1985, p. 29, fig. 2.

*For bed definition see Hattin, 1985, p. 29, fig. 2, SEPM Guidebook 4;

*measured on FRS-11, Kauffman & Pratt, 1985

Marker bed HL 1	/mb	129.2	*
Marker bed HL 2	/mb	131.2	*
Marker bed HL 3	/mb	132.1	*
Marker bed HL 4	/mb	134.1	*
Marker bed HL 5	/mb	135.2	*
Marker bed JT 1	/mb	135.2	*
Marker bed JT 6	/mb	137.0	*
Marker bed JT 10	/mb	138.4	*
Marker bed JT 12	/mb	139.2	*
Marker bed JT 13	/mb	140.8	*

Marker bed "X" bentonite	/mb	100.5	100.5
Marker bed Thatcher Mbr.	/mb	85.0	85.5

*Niobrara/Fort Hays marker beds identified by correlating with Canon City section

*in Laferriere & Hattin, '89, AAPG Bull. 73:632, fig. 3.

*measured on FRS-19, Kauffman & Pratt, 1985

Marker bed Kn 1	/mb	206.7	*
Marker bed Kn 2	/mb	209	*
Marker bed Kn 3	/mb	211.5	*
Marker bed Kn 4	/mb	213.2	*
Marker bed Kn 5	/mb	215.3	*
Marker bed Kn 6	/mb	217.5	*
Inoc comancheanus	/bi	22	23
Inoc bellvuensis	/bi	22	23
Inoc cripsii	/bi	109.5	111
Inoc deformis	/bi	213	223
Inoc erectus	/bi	210.5	211.8
Inoc eulesanus	/bi	85.3	*
Inoc pictus	/bi	116.2	133
Inoc prefragilis	/bi	109.5	111
Inoc rutherfordi	/bi	85	100.5
Myti mytiloides	/bi	135.3	140
Myti opalensis	/bi	133.9	135.3
Ostrea beloiti	/bi	98.4	111
Pseudoperla congesta	/bi	213	*

*Cobban & Scott, 1972, USGS PP 645, p.7-8

Borissiakoceras compressum	/am	85.3	*
Calycoceras gilberti	/am	85.3	86.9
Euomphaloceras cunningtoni	/am	85.3	* *ID as cf
Acanthoceras granerosense	/am	88.0	*
Acanthoceras muldoonense	/am	88.0	92.3
Metengonoceras dumbli	/am	89.0	*
Acanthoceras amphibolum	/am	95.2	98.4
Allocrioceras annulatum	/am	130	130
Baculites yokoyamai	/am	135.3	142.2
Collignonicerias woollgari	/am	139.5	143
Euomphaloceras septemseriatum	/am	130	130.7
Mammites nodosoides	/am	135.9	139.2

Metoicoceras geslinianum	/am	129.2	130
Neocardioceras juddii	/am	132	133
Prionocyclus hyatti	/am	186	191
Pseudaspidoceras flexuosum	/am	135.3	*
Sciponoceras gracile	/am	130	131.2
Stomohamites simplex	/am	85.7	128.5
Turrilites acutus	/am	97	99
Watinoceras devonense	/am	133.9	*
*Defines Base Lower Turonian			
Watinoceras coloradoense	/am	135.3	*
*Forams by Eicher & Diner, 1985, p. 60-71; Gustason & Kauffman, p. 79			
Ammobaculites euides	/fb	22	23
*Miliammina ischnia	/fb	22	23
*Troc apricarius	/fb	90	95
Trochammina rutherfordi	/fb	63	70
*Verneuilinoides perplexus = Vern kansasensis	/fb	22	23
*Eicher, 1965, J. Paleo. 39:875-909; top = base spl range; base = top spl range.			
Ammobaculites impexus	/fb	69	94.5
Ammobaculoides plummerae	/fb	69	91.5
Ammodiscus planus	/fb	64	82
Haplophragmoides gilberti	/fb	64	*
Lenticulina gaultina	/fb	88	*
Miliammina ischnia	/fb	22	66
Praebulimina wyomingensis	/fb	88	*
Pseudobolivina variana	/fb	72	82
Reophax pepperensis	/fb	72	79
Psamminopelta bowsheri	/fb	69	*
Textularia rioensis	/fb	69	76
Trochammina gatesensis	/fb	64	76
Trochammina mellariolum	/fb	64	70
Trochammina wickendeni	/fb	69	91.5
Trochamminoides apricarius	/fb	75	94.5
Verneuilina alameda	/fb	81	*
Verneuilinoides hectori	/fb	69	70
Verneuilinoides perplexus	/fb	22	82
*original base at 64', extended by V. perplexus=V. kansasensis			
Glob'oides bentonensis	/fp	88	
Hedb delrioensis	/fp	69	94.5
Hedb planispira	/fp	72	94.5
Praeglobotruncana stephani	/fp	78	
Rota evoluta	/fp	72	* *ID as cf.
Rota greenhornensis	/fp	72	
*Data from Leckie, 1985, p. 140.			
Dica hagni	/fp	134.0	*
Helv'ana helvetica	/fp	133.9	*
*Data from Beaudoin & Caron, 1995, abst. p. 167			
Glob'oides bentonensis	/fp	112.5	130.2
Praeglobotruncana stephani	/fp	112.5	130.7
Helv'ana praehelvetica	/fp	130	130.8
Rota cushmani	/fp	112	130.2
Rota greenhornensis	/fp	112	130.2
Whit aprica	/fp	129.5	133.9
Whit archaeocretacea	/fp	129	134
*Data on praehelvetica from Beaudoin & Caron, 1995, abst, p. 167			
*Nannos by D. Watkins, 1985			
Corollithion kennedyi	/nn	101	132.7
Eprolithus moratus	/nn	127.5	143
Gartnerago nanum	/nn	101	110.5
Gartnerago obliquum	/nn	134.5	143
Lithraphidites acutum	/nn	101	125
Rhagodiscus asper	/nn	101	138.3
Reinhardtites fenestratus	/nn	101	131
*Rudist: Cobban et al. 1991, USGS Bull. 1985-D; cluster of specimens			

*found in "...uppermost part of the Bridge Creek Member of the Greenhorn Ls...

*NE of La Junta, Otero Co. projected into section in upper 5 m.

Durania cornupastoris /bi 160 165

*END

MIDK.15B - Pueblo, Colorado, Turonian GSSP

Pueblo, Colorado outcrop section, U. Albian - Coniacian. Section Rock Canyon anticline, NW NE 31, 20S, 65W & SW NW NW, 30, 20S, 65W, Pueblo Co., Colorado; same section as in Cobban & Scott, 1972 & in Kauffman & Pratt, 1985, SEPM Field Trip Guidebook No. 4, 1985 Midyear Meeting (MIDK.15).

New data in Kennedy, Walaszczyk, & Cobban (2000, Acta Geologica Polonica Vol. 50:295-334).

Stratigraphic contacts from measured sections: base Bridge Creek Mbr. @ 0m = 129.5 m in MIDK.15; top Greenhorn/Bridge Creek/base Carlile Sh/Fairport Chalk Mbr. @ 17.55 m = 143.1m.

Proposed GSSP Base Turonian at base bed 86 = 4.42 m; base Middle Turonian at base beds 120 = 10.43 m. Radiometric dates (Fig. 8) from Obradovich, 1993, Table 1:

bed 96 @ 5.84-6.07 m = 93.4+-0.63 Ma; bed 88 @ 5.21-5.22 = 93.25+-0.55 Ma;

bed 80 @ 2.79-2.95 m = 93.56+-0.49 Ma; bed 69 @ 1.12-1.30 m = 93.49+-0.89;

bed 64 @ 0.46-0.53 m = 93.90+-0.72 Ma.

Data

*TAXA	Morph Gp	Base (m)	Top (M)
Top Cenomanian	/ma	4.42	4.42
Carbon peak OAE 2	/gc	0.0	5.4

Pratt, 1985, p. 40, fig. 2; Kennedy et al., 2000, Fig. 8.

Dated bentonite beds on Fig. 7 projected into section from elsewhere

Bentonite 96	/mb	5.84	6.07
Bentonite 88	/mb	5.21	5.22
Bentonite 80	/mb	2.79	2.95
Bentonite 69	/mb	1.12	1.30
Bentonite 64	/mb	0.46	0.53

Data from Figs. 5, 6, Table 1

Inoc pictus	/bi	0.8	3.6
*base on fig. 6 @ 2.7			
Mytiloides hattini	/bi	4.5	6.5
*base on Fig. 6 @ 3.8			
Mytiloides kossmati	/bi	5.5	7.7
Myti labiatus	/bi	6.1	7.7
Myti mytiloides	/bi	7.7	10.5
Mytiloides puebloensis	/bi	4.5	7.7
Myti subhercynicus	/bi	10.9	15.8

Data from Figs. 5, 7, Table 1

Allocrioceras annulatum	/am	0.8	0.8
Baculites yokoyamai	/am	5.5	14.4
Calycoceras naviculare	/am	0.4	0.4
Collignonicerias woollgari	/am	10.5	17.5
Euomphaloceras septemseriatum	/am	0.8	1.9
Fagesia catinus	/am	6.1	6.1
Mammites nodosoides	/am	6.8	10.1
Metoicoceras geslinianum	/am	0.4	0.8
Neocardioceras juddii	/am	2.7	3.7
Pseudocalycoceras angolaense	/am	0.4	0.8
Pseudaspidoceras flexuosum	/am	6.1	6.1
Quitmanicerias reaseri	/am	4.5	4.5
Sciponoceras gracile	/am	0.8	1.9

*Defines Base Lower Turonian

Watinoceras devonense	/am	4.5	6.8
Watinoceras coloradoense	/am	6.1	6.8
Watinoceras praecursor	/am	4.5	4.5
Quadrum gartneri	/nn	4.5	*
Rota cushmani	/fp	*	1.0

*END

MIDK.16 - Wadi Miaidin, Oman, Scott, '90

Wadi Miaidin Outcrop section, Jebel Akhdar, Oman. Scott, 1990, Geol. Soc. Spec. Publ. 49, p.94-96. Section extends from Aptian/Albian to uppermost Cenomanian carbonates. Top Wasia Group = 4836 ft = top Cenomanian at unconformity; Top B Member = 4750'; Top C Member = 4600'; Top D Member = 4370'; Top E Member = 4310'; Top F Member = 3930'; Top G Member = 3890'; Top Nahr Umr Fm. = 3835', base = 3240' in unconformable contact with Shuaiba Fm. Top Albian = 3800' based on graphic correlation in Scott '90; Top Lower Cenomanian = 4245'; Top Middle Cenomanian = 4685'.

Data

*Taxa	Morph	Base (ft)	Top
Biplanata peneropliformis	/fb	4150	4337
Chrysalidina gradata	/fb	4150	4408
Cuneolina pavonia	/fb	4110	4590
Dicyclina schlumbergeri	/fb	4280	4280
Hemicyclammina whitei	/fb	3303	3592
Hete globulosa	/fp	4650	4750
Merlingina cretacea	/fb	4150	4337
Nezzazata simplex	/fb	3247	4370
Orbitolina aperta	/fb	3617	3910
Orbitolina conica	/fb	4117	4312
Orbitolina concava	/fb	4130	4130
Orbitolina subconcava	/fb	3368	4049
Orbitolina texana	/fb	3247	3247
Orbitolinopsis depressa	/fb	4408	4495
Ovalveolina ovum	/fb	4189	4357
Praealveolina cretacea	/fb	4312	4750
Pseudocyclammina sp.	/fb	3362	4470
Pseudedomia drorimensis	/fb	4590	4590
Pseudolituonella reicheli	/fb	4782	4782
Pseudonummoloculina heimi	/fb	4197	4337
Taberina bingistani	/fb	4150	4408
Trocholina elongata	/fb	3944	3944
Permocalculus irenae	/al	4750	4750
Polystrata alba	/al	4322	4335
Pith sphaerica	/ca	3368	4382
Chondrodonta joannae	/bi	4770	4770
Praeradiolites sp.	/bi	3784	4337
Marker Bed B Nahr Umr SB	/mb	3240	3240
Marker Bed T Nahr Umr	/mb	3835	3835
Marker Bed T Natih E Mbr SB	/mb	4310	4310
Marker Bed T Natih A Mbr SB	/mb	4836	4836

*END

MIDK.16B - Wadi Miaidin, Oman, Scott, '90 & Immenhauser

Hargrounds in Immenhauser et al., 1999, Journal of Sedimentary Research, 69:434-446, Figs. 2, 9 beds renamed hardgrounds as Fig. 7. Nahr Umr 225 m thick in Fig. 2, so thicknesses reduced by 80.9% to match thickness of 182 m by Scott (MIDK.16).

Positions of HG contacts in Fig. 2 reduced by 80.9% and converted to feet.

Marker bed HG-8	/mb	3818	* SB8
Marker bed HG-6	/mb	3713	* SB6
Marker bed HG-4	/mb	3445	* SB4
Marker bed HG-3	/mb	3318	* SB3
Marker bed HG-2	/mb	3262	* SB2
Marker bed HG-1	/mb	3240	*

*SB1 = Base Nahr Umr/Top Shuaiba

*END

MIDK.17 - Wadi Miaidin, Oman, Simmons, '87

Wadi Miaidin Outcrop section, Jebel Akhdar, Oman. Simmons & Hart, 1987, *Micropalaeo. of Carbonate Environments*, p.176-207. Same section as MIDK.16 by different analysts.

Section extend from top Jurassic to uppermost Cenomanian carbonates. Top Wasia Group = 490 m = top Cenomanian at unconformity; Top B Member = 455 m; Top C Member = 375 m; Top D Member = 339 m; Top E Member = 320 m; Top F Member = 215 m; Top G Member = 197 m; Top Nahr Umr Fm. = 180 m; base = 0 m in unconformable contact with Shuaiba Fm. Top Albian = 197-208 m; Top Lower Cenomanian = 280-300 m.

Data

*Taxa	Morph	Base (m)	Top
Buccicrenata rugosa	/fb	196	197
Buccicrenata subgoodlandensis	/fb	25	137
Charentia cuvillieri	/fb	267	480
Chrysalidina gradata	/fb	200	348
Cisalveolina fraasi	/fb	305	318
Cuneolina pavonia	/fb	191	195
Dicyclina schlumbergeri	/fb	275	377
Hemicyclammina sigali	/fb	1	190
Merlingina cretacea	/fb	275	339
Nezzazata simplex	/fb	275	375
Pseudonummoloculina heimi	/fb	285	294
Orbitolinopsis depressa	/fb	351	377
Orbitolina aperta	/fb	120	137
Orbitolina conica	/fb	200	205
Orbitolina sefini	/fb	196	215
Orbitolina subconca	/fb	40	95
Orbitolina texana	/fb	1	8
Ovalveolina ovum	/fb	305	318
Praealveolina brevis	/fb	339	350
Praealveolina tenuis	/fb	351	400
Pseudedomia drorimensis	/fb	339	400
Trocholina altispira	/fb	200	270
Trocholina arabica	/fb	190	215
Trocholina lenticularis	/fb	196	215
Trochospira avnimelechi	/fb	176	339
Permocalculus irenae	/al	95	400
Salpingoporella hasi	/al	152	158
Marker Bed B Nahr Umr SB	/mb	0	0
Marker Bed T Nahr Umr	/mb	180	180
Marker Bed T Natih E Mbr SB	/mb	320	320
Marker Bed T Natih A Mbr SB	/mb	490	490

*END

MIDK.18 - Shell No. 1 Chapman Core, TX

Shell No. 1 Chapman Core, Waller Co., Texas; Aptian-Upper Albian carbonate platform forereef basin to shelf margin. Data in Scott, 1990, *SEPM Concepts*, v. 2, p. 82.

Data

*Taxa	Morph	Base (ft)	Top
Marker bed Al SB WA 1	/mb	-17140	*
*top Fredericksburg Gp.			
Marker bed Al SB GR 1	/mb	-20025	-20025
*base Tamaulipas Fm. above Pearsall Fm.			
Marker bed Ap SB PR 1	/mb	-20075	-20075
*base Pearsall Fm. on Sligo Fm.			
*TD at 20,800 ft			
Choffatella decipiens	/fb	-20718	-20415.5
Coskinolinella daguini	/fb	-18285	-18216

Coskinolinooides texanus	/fb	-18285	-17315
Cuneolina walteri	/fb	-17978.5	-17340
Dictyoconus walnutensis	/fb	-18253	-17189
Hedbergella washitensis	/fp	-19886	-18174.5
Pseudonummoloculina heimi	/fb	-17290	-17290
Lingulogavelinella albiensis	/fb	-19886	-18253
Orbitolina lenticularis	/fb	-20581	-20545.5
Colomiella mexicana	/ca	-19726	-19484
Colomiella recta	/ca	-19432	-18340.5
Colomiella tunesiana	/ca	-19886	-18588.5
Cadosina fusca	/ca	-19826	-18311
Pith sphaerica	/ca	-19886	-17406.5
Microcalamoides diversus	/id	-19673	-18174.5
Globochaeta alpina	/al	-20545.5	-17200
Micritosphaera ovalis	/al	-20435	-17189
Neomeris cretacea	/al	-20777	-20631
Pycnoporidium lobatum	/al	-20718	-17200
Nannoconus bucheri	/nn	-20000	-19886
Chondrodonta munsoni	/bi	-17864.5	-17200
Caprinuloidea multitubifera	/bi	-17380	-17373
Caprinuloidea perfecta	/bi	-17793	-17222
Eoradiolites davidsoni	/bi	-17894	-17189
Petalodontia calamitiformis	/bi	-17778	-17200
Texicaprina vivari	/bi	-17793	-17200
Toucasia texana	/bi	-17559	-17189

*END

MIDK.19 - Shell No. 1 Tomasek Core, TX

Shell No. 1 Tomasek, Bee Co., Texas. Data in Scott, 1900, SEPM Concepts, v. 2, p. 82.

Lower-Upper Albian carbonate platform foreereef basin to shelf margin. TD at 15,407 ft.

Top of Tamaulipas Fm. 14,550 ft; top of Fredericksburg Gp. at -13420'.

Data

*Taxa	Morph	Base (ft)	Top
Marker bed Al SB WA 1	/mb	-13420	*
Coskinolinooides texanus	/fb	-14732	-13509
Dictyoconus walnutensis	/fb	-14737	-13439
Glob'oides ultramicrus	/fp	-15382	-15382
Hedb delrioensis	/fp	-15387	-14677
Hedb planispira	/fp	-15382	-14737
Hedbergella washitensis	/fp	-15374	-14677
Nezzazata simplex	/fb	-14966	-14737
Pseudonummoloculina heimi	/fb	-14721	-13439
Colomiella mexicana	/ca	-15382	-15098
Colomiella recta	/ca	-15340	-14837
Colomiella tunesiana	/ca	-15374	-15109
Cadosina fusca	/ca	-14901	-14677
Pith ovalis	/ca	-14737	-14735
Pith sphaerica	/ca	-15387	-14584
Microcalamoides diversus	/id	-15247	-14721
Bacinella irregularis	/al	-14732	-13515
Globochaeta alpina	/al	-15374	-13467
Micritosphaera ovalis	/al	-14062	-13467
Neomeris cretacea	/al	-14230	-13515
Polystrata alba	/al	-13630	-13627
Nannoconus truitti	/nn	-15387	-14737
Chondrodonta munsoni	/bi	-13614	-13467
Eoradiolites davidsoni	/bi	-14525	-13467
Petalodontia calamitiformis	/bi	-14510	-13483
Texicaprina vivari	/bi	-14716	-13439
Toucasia texana	/bi	-13594	-13439

*END

MIDK.20 - Trinity River, Texas Section

Trinity River Valley Composite Section, North-central Texas, Weatherford and Tarrant Counties, 32.75°N, 97.5°W. Data from Perkins, 1961 and Scott et al., 1978. Sample positions related to formation boundaries. Nanno data from M.E. Hill, 1976, Lower Cretaceous calcareous nannofossils from Texas and Oklahoma, *Palaeontographica* Abt. B, 156:103-179; Foram data from Michael, 1972, *J. Foram. Res.*, 2:200-220; Tappan, 1940, *J. Paleo.*, 14:93-126 & 1943, *J. Paleo.* 17:476-517, selected taxa only; updated 4-98 with foram data.

Data

*TAXA	Morph	Base (ft)	Top	
Data by Hill, 1976, p. 113-114; Genera modified according to Perch-Nielsen, 1985				
<i>Amphizygus brooksii</i>	/nn	248	671	
* <i>Arkhangelskiella cymbiformis</i>	/nn	671	671	*Too low!
<i>Axopodorhabdus albianus</i>	/nn	375	671	
<i>Axopodorhabdus dietzmannii</i>	/nn	410	671	
<i>Biscutum constans</i>	/nn	243	671	
<i>Braarudosphaera africana</i>	/nn	230	615	
<i>Braarudosphaera quinquecostata</i>	/nn	460	575	
<i>Chiastozygus litterarius</i>	/nn	230	671	
<i>Chiastozygus platyrhethus</i>	/nn	375	671	
<i>Chiastozygus striatus</i>	/nn	378	580	
<i>Corollithion achylosum</i>	/nn	230	671	
<i>Corollithion signum</i>	/nn	378	671	
<i>Cretarhabdus conicus</i>	/nn	230	671	
<i>Cribrosphaerella ehrenbergii</i>	/nn	460	671	
<i>Cyclagelosphaera margerelii</i>	/nn	378	394	
* <i>Eiffellithus eximius</i>	/nn	420	620	*Too low!
<i>Eiffellithus turriseiffelii</i>	/nn	455	671	
<i>Flabellites biforamini</i>	/nn	248	590	
<i>Grantarhabdus unicornis</i>	/nn	389	671	
<i>Hayesites albiensis</i>	/nn	248	380	
<i>Helenea chiastia</i>	/nn	248	671	
<i>Helicolithus trabeculatus</i>	/nn	230	671	
<i>Lithraphidites carniolensis</i>	/nn	258	615	
<i>Lithastrinus floralis</i>	/nn	243	671	
<i>Manivitella gronosa</i>	/nn	248	671	
<i>Manivitella pemmatoidea</i>	/nn	248	671	
<i>Manivitella solida</i>	/nn	230	671	
<i>Nannoconus elongatus</i>	/nn	410	610	
<i>Nannoconus truitti</i>	/nn	248	671	
<i>Parhabdolithus achlyostaurion</i>	/nn	230	671	
<i>Parhabdolithus angustus</i>	/nn	230	671	
<i>Parhabdolithus asper</i>	/nn	230	671	
<i>Parhabdolithus embergeri</i>	/nn	230	671	
* <i>Prediscosphaera spinosa</i>	/nn	248	650	*Too low
<i>Rhombolithion rhombicum</i>	/nn	494	494	
*ID as <i>Corollithion</i>				
<i>Rotelapillus laffittei</i>	/nn	230	671	
<i>Rucinolithus irregularis</i>	/nn	460	671	
<i>Rucinolithus wisei</i>	/nn	230	440	
<i>Sollasites horticus</i>	/nn	378	671	
<i>Stradneria crenulata</i>	/nn	230	671	
<i>Tetrapodorhabdus decorus</i>	/nn	410	671	
*ID as <i>Gephyrorhabdus</i>				
<i>Tranolithus gabalus</i>	/nn	248	671	
<i>Tranolithus exiguus</i>	/nn	420	671	
<i>Tranolithus orionatus</i>	/nn	230	671	
<i>Vagalapilla matalosa</i>	/nn	230	671	
<i>Watznaueria barnesae</i>	/nn	230	671	

Ellipsagelosphaera ovata	/nn	230	671
Zygodiscus diplogrammus	/nn	230	671
Zygodiscus spiralis	/nn	375	671
Data by R.W. Scott or Stanton, 1947			
Ceratostreon texana	/bi	230	368
Inoc comancheanus	/bi	402	406
Inoc concentricus	/bi	368	391
Peilinia quadriplicata	/bi	460	605
*Perkins ID as <i>Lopha colubrina</i> from Ft. Worth to Pawpaw; pers. obser. in Main St.			
Lopha subovata	/bi	320	580
Mariella brazoensis	/AM	580	615
*Lowest occurrence in upper 10' of Weno fide Clark, 1965, GSA Mem.95, p. 46			
Mariella rhacioformis	/AM	600	650
Neithea occidentalis	/bi	300	350
Neithea texana	/bi	449	684
Texi mucronata	/bi	230	368
Texi pitcheri	/bi	368	410
Texi roemeri	/bi	515	670
Texi washitaensis	/bi	420	610
Stanton, 1947, p. 29; McGill, 1967, Perm Basin SEPM, p. 219 ff			
Adkinsites bravoensis	/am	368	394
Craginites serratescens	/am	402	406.5
Dipoloceras cristatum	/am	288	339
*range from Young's 1966 Tarrant Co. locales 16&23; Kennedy et al. 1999 p. 1111			
Drakeoceras lasswitzii	/am	459	462
Drakeoceras wintoni	/am	452	532
Eopachydiscus brazoense	/am	406.5	407
Manuaniceras carbonarium	/am	300	339
*range from Young's 1966 Tarrant Co. locales 3 & Marys Creek by R. Scott 1999			
Manuaniceras powelli	/am	300	339
*range from Young's 1966 Tarrant Co. locales 4 & 18			
Manuaniceras supani	/am	269	348
*range from Young's 1966 Parker Co. 3 & 5, and Tarrant Co. locales, p. 54			
Mortonoceras equidistans	/am	445	445
Oxytropidoceras stenzeli	/am	300	339
*range from Young's 1966 Tarrant Co. locale 3 & 29			
Venezoliceras acutocarinaratum	/am	238	348
*range from Young's 1966 Parker Co. locales 1 & 5, p. 51			
Clav subcretacea	/fp	600	672
Glob'oides bentonensis	/fp	624	684
Glob'oides caseyi	/fp	392	684
Hedb delrioensis	/fp	392	684
Gubkinella graysonensis	/fp	624	684
*in Gubkinella by Michael, 1972, J. Foram. Res.; known in Duck Creek Fm.			
*reported by Tappan, 1943; may be a benthic foram			
Hedb planispira	/fp	392	684
Hedbergella washitensis	/fp	392	684
Heterohelix moremani	/fp	392	684
Rota appenninica	/fp	648	684
Rota evoluta	/fp	648	684
Praeglobotruncana delrioensis	/fp	636	684
Tici primula	/fp	392	488
Data from Grayson Bluff locality; selected taxa only			
Ammobaculites goodlandensis	/fb	680	680
Ammodiscus kiowensis	/fb	660	660
*fide M.J. Evetts A. kiowensis = A. gaultinus			
*Ammodiscus gaultinus	/fb	660	660
Cribratina texana	/fb	664	680
Klukisporites pseudoreticulatus	/sp	658.6	658.6
Heslertonia cylindrata	/dn	662.6	662.6
Kiokansium unituberculatum	/dn	664.6	664.6
Maghrebinia perforata	/dn	664.6	664.6
*ID as <i>Atopodinium</i>			

Ovoidinium verrucosum	/dn	662.6	662.6	
Fromea amphora	/ac	662.6	662.6	*ID as sp.
Top Albian	/ma	*	612	
Marker bed Ce SB WB	/mb	702	702	
*base Woodbine Fm.				
Marker bed Ce TS WA 6	/mb	612	612	
*base Grayson Fm.				
Marker bed Al TS WA 5	/mb	543	543	
*top upper limestone bed at top Weno Fm.				
Marker bed Al TS WA 4	/mb	494	494	
*top lower limestone in Weno Fm.				
Marker bed Al TS WA 3	/mb	462	462	
*top Fort Worth Fm.				
Marker bed Al TS WA 2	/mb	410	410	
*top thick beds in lower Duck Creek Fm.				
Marker bed Al SB WA 1	/mb	359	359	
*base Kiamichi Fm. = base Washita Gp.				
Marker bed Al MF FR 1	/mb	265	275	
Marker bed Al SB FR 1	/mb	180	180	
*base Fredericksburg Fm.				
Marker bed Al SB GR 1	/mb	0	0	
*base Glen Rose Fm.				
Top Aptian	/ma	*	0	
*END				

MIDK.20B - Trinity River Compositated Section Revised
MIDK.20 MODIFIED 07-08-01 TO REVISED COMPOSITE SECTION IN METERS & PALY DATA.
Trinity River Valley Composite Section, North-central Texas, Weatherford and Tarrant Counties, 32.75 deg N, 97.5 deg W. Sample positions related to formation boundaries. Data from Perkins, 1961 and Scott et al., 1978; Reaser & Dawson, 95, GCAGS v. 95. Nanno data from M.E. Hill, 1976, Lower Cretaceous calcareous nannofossils from Texas and Oklahoma, Palaeontographica Abt. B, 156:103-179. Foram data from Michael, 1972, J. Foram. Res., 2:200-220; Tappan, 1940, J. Paleo., 14:93-126 & 1943, J. Paleo. 17:476-517, selected taxa only. Updated 4-98 with foram data; new paly data by D. Benson & F. Obokue, 2002.

Data

*TAXA	Morph	Base (meters)	Top	
ID by Hill, 1976, p. 113-114; genera modified according to Perch-Nielsen, 1985				
Amphizygus brooksii	/nn	75.6	204.6	
Arkhangelskiella cymbiformis	/nn	204.6	204.6	
Axopodorhabdus dietzmannii	/nn	125	204.6	
Axopodorhabdus albianus	/nn	153	246	*= Podo albianus
Axopodorhabdus albianus	/nn	153	246	
Biscutum constans	/nn	119	246	
Braarudosphaera africana	/nn	117	226	
Braarudosphaera quinquecostata	/nn	209	211	
Braarudosphaera stenorhetha	/nn	209	211	
Chiastozygus litterarius	/nn	117	246	
Chiastozygus platyrhethus	/nn	114.3	204.6	
Chiastozygus striatus	/nn	115.2	176.8	
Corollithion achylosum	/nn	70.1	204.6	
Corollithion rhombicum	/nn	150.6	150.6	
Corollithion signum	/nn	153	246	
Cretarhabdus conicus	/nn	117	246	
Cribrosphaerella ehrenbergii	/nn	183	246	
Cyclagelosphaera margerelii	/nn	153	160	
Eiffellithus monechiae	/nn	173	230	*too low
Eiffellithus eximius	/nn	173	230	
*= Eiffellithus monechiae fide R. Morin 08/08/01				
Eiffellithus turriseiffelii	/nn	180	250	

Flabellites biforaminis	/nn	75.6	179.9	
Gartnerago nanum	/nn	209	226	
Gartnerago obliquum	/NN	209	226	*ID as cf.
Tetrapodorhabdus decorus	/nn	125	179.9	
*ID as Gephyrorhabdus				
Gephyrorhabdus unicornis	/nn	118.6	204.6	
Hayesites albiensis	/nn	119	122	
Helenea chiastia	/nn	119	246	
Helicolithus trabeculatus	/nn	117	246	
Lithraphidites alatus	/nn	209	246	
Lithraphidites carniolensis	/nn	122	246	
Lithastrinus floralis	/nn	117	250	
Manivitella gronosa	/nn	75.6	204.6	
Manivitella pemmatoidea	/nn	122	246	
Manivitella solida	/nn	70.1	204.6	
Microrhabdulus decoratus	/nn	226	226	
Nannoconus elongatus	/nn	125	186	
Nannoconus fragilis	/nn	209	211	
Nannoconus truitti	/nn	75.6	204.6	
Parhabdolithus achlyostaurion	/nn	115	246	
Parhabdolithus angustus	/nn	115	246	
Parhabdolithus asper	/nn	115	246	
Parhabdolithus embergeri	/nn	70.1	204.6	
Prediscosphaera columnata	/nn	117	246	
Prediscosphaera cretacea	/nn	246	246	
Prediscosphaera spinosa	/nn	75.6	198.2	
Rucinolithus irregularis	/nn	140.2	204.6	
Rucinolithus wisei	/nn	117	156	
Sollasites horticus	/nn	115.2	204.6	
Rotelapillus laffittei	/nn	70.1	204.6	
Stradneria crenulata	/nn	117	246	
*ID as Cretarhabdus				
Tranolithus gabalus	/nn	75.6	204.6	
Tranolithus exiguus	/nn	173	246	
Tranolithus orionatus	/nn	117	246	
Vagalapilla matalosa	/nn	70.1	204.6	
Watznaueria barnesae	/nn	119	246	
Watznaueria ovata	/nn	70.1	204.6	
Zygodiscus diplogrammus	/nn	70.1	204.6	
Zygodiscus spiralis	/nn	114.3	204.6	
Data by R.W. Scott or Stanton, 1947				
Ceratostreon texana	/bi	109	153	
Exogyra clarki	/bi	*	250	
Exogyra whitneyi	/bi	*	250	
Inoc comancheanus	/bi	165	167	
Inoc concentricus	/bi	156	162	
Lopha quadriplicata	/bi	190	218	
*Perkins ID as L. colubrina from Ft. Worth to Pawpaw; pers. obser. in Main St.				
Lopha subovata	/bi	97.6	176.8	
Neithea occidentalis	/bi	91.5	106.7	
Neithea roemeri	/bi	*	250	
Neithea texana	/bi	171	237	
Protocardia multistriata	/bi	236	237	
Texi mucronata	/bi	109	153	
Texi pitcheri	/bi	164	182	
Texi roemeri	/bi	226	242	
Texi washitaensis	/bi	182	218	
Stanton, 1947, p. 29; McGill, 1967, Perm Basin SEPM, p. 219 ff				
Adkinsites bravoensis	/am	153	162	
Craginites serratescens	/am	165	165	
Budaiceras elegantior	/am	*	250	
Dipoloceras cristatum	/am	131.5	152	
*range from Young's 1966 Tarrant Co. locales 16&23; Kennedy et al. 1999 p. 1111				

Drakeoceras lasswitzii	/am	183	183.5
Drakeoceras wintoni	/am	183	206
Eopachydiscus brazoense	/am	165	167
Manuaniceras carbonarium	/am	137	152
*range from Young's 1966 Tarrant Co. locales 3 & Marys Creek by R. Scott 1999			
Manuaniceras powelli	/am	137	148
*range from Young's 1966 Tarrant Co. locales 4 & 18			
Manuaniceras supani	/am	137	152
*range from Young's 1966 Parker Co. 3 & 5, and Tarrant Co. locales, p. 54			
Mariella brazoensis	/AM	237	237
Mariella rhacioformis	/AM	236	237
Mortoniceras equidistans	/am	171	179
Oxytropidoceras stenzeli	/am	137	152
*range from Young's 1966 Tarrant Co. locale 3 & 29			
Venezoliceras acutocarinatum	/am	113	152
*range from Young's 1966 Parker Co. locales 1 & 5, p. 51			
Clavihedbergella subcretacea	/fp	182.9	204.9
Glob'oides bentonensis	/fp	213	250
Glob'oides caseyi	/fp	119.5	208.5
Gubkinella graysonensis	/fp	171	246
*in Gubkinella by Michael, 1972, J. Foram. Res.; known in Duck Creek Fm.			
*reported by Tappan, 1943; may be a benthic foram			
Hedb delrioensis	/fp	119.5	208.5
Hedb planispira	/fp	144	246
Hedbergella washitensis	/fp	111	246
Heterohelix moremani	/fp	119.5	208.5
Rota appenninica	/fp	197.6	208.5
Rota evoluta	/fp	226	246
Praeglobotruncana delrioensis	/fp	193.9	208.5
Tici primula	/fp	130	190
Data from Grayson Bluff locality; selected taxa only			
Ammobaculites goodlandensis	/fb	*	207.3
Ammodiscus gaultinus	/fb	*	201.2
Cribratina texana	/fb	206	219
Paly data from D.G. Benson 12/02 & F.E. Oboh-Ikuenobe 06/02			
Achomosphaera ramulifera	/dn	223	237
Apteodinium grande	/dn	115	235
*FO & LO U Alb Monteil 98			
Caligodinium aceras	/dn	115	144
Callaiosphaeridium asymmetricum	/dn	219	219
Canningia reticulata	/dn	219	219
Canninginopsis colliveri	/dn	223	227
Carpodinium granulatum	/dn	227	227
*LO U Alb Monteil 98; in basal Grayson w/ Graysonites			
Cassiculosphaeridia reticulata	/dn	217	217
Circulodinium distinctum	/dn	219	236
Coronifera albertii	/dn	125	237
Coronifera oceanica	/dn	115	237
Cribroperidinium cooksoniae	/dn	223	223
Cyclonephelium compactum	/dn	213	226
Cyclonephelium distinctum	/dn	211	223
Cyclonephelium paucispinum	/dn	130	237
Endoscrinium campanula	/dn	115	115
*placed in Scrinodinium			
Dapsilidinium laminaspinosum	/dn	226	227
Dinopterygium cladoides	/dn	211	236
Downiesphaeridium flexuosum	/dn	211	227
Downiesphaeridium multispinosum	/dn	211	226
Epelidosphaeridia spinosa	/dn	215	215
*FO U Alb, LO Lo Tur Monteil 98			
Exochosphaeridium phragmites	/dn	130	130
Florentinia cooksoniae	/dn	219	237
Florentinia laciniata	/dn	119	119

Florentinia mantellii	/dn	219	237
Florentinia radiculata	/dn	217	237
*ID of top as cf			
Florentinia resex	/dn	211	237
Fromea amphora	/ac	119	236
Fromea fragilis	/ac	211	227
Hystriosphæridium bowerbankii	/dn	115	144
Kiokansium unituberculatum	/dn	227	227
Kleithriasphaeridium loffrense	/dn	211	223
Kleithriasphaeridium sarmentum	/dn	211	227
Litosphaeridium arundum	/dn	115	237
Litosphaeridium conispinum	/dn	125	125
Litosphaeridium siphoniphorum	/dn	219	237
*FO U Alb, LO U Cen Monteil 98			
Micrhystridium singulare	/dn	211	227
Micrhystridium stellatum	/dn	115	130
Odontochitina operculata	/dn	115	236
Oligosphaeridium albertense	/dn	125	144
Oligosphaeridium complex	/dn	115	237
Oligosphaeridium irregulare	/dn	119	119
Palaeohystriochophora infusorioidesDB	/dn	115	237
*Species concept of D. Benson; FO U Alb Monteil 98			
Palaeoperidinium cretaceum	/dn	115	237
Pervosphaeridium truncatum	/dn	211	211
Prolixosphaeridium conulum	/dn	211	237
Prolixosphaeridium parvispinum	/dn	211	236
Protoellipsodinium touile	/dn	219	226
*placed in subsp. mugatae			
Pterodinium cingulatum	/dn	223	237
Pterodinium cornutum	/dn	226	227
Sepispinula huguoniotii	/dn	211	227
Spiniferites cingulatus	/dn	119	125
Spiniferites multibrevis	/dn	223	237
Spiniferites ramosus gracilis	/dn	211	227
Spiniferites ramosus ramosus	/dn	211	226
Stephodinium coronatum	/dn	223	223
Subtilisphaera deformans	/dn	115	211
Surculosphaeridium longifurcatum	/dn	219	227
Tanyosphaeridium regulare	/dn	226	226
Tenua hystrix	/dn	211	211
Tubulospina oblongata	/dn	211	211
Xenascus ceratioides	/dn	219	235
Xiphophoridium alatum	/dn	223	237
Wrevittia cassidata	/dn	223	223
Camarozonosporites insignis	/sp	115	237
Cicatricosporites hallei	/sp	217	217
Classopollis classoides	/sp	115	236
Classopollis echinatus	/sp	119	144
Classopollis simplex	/sp	127	130
Cyathidites australis	/sp	125	237
Cyathidites minor	/sp	115	227
Gleicheniidites circiniidites	/SP	111	237
Gleicheniidites senonicus	/SP	115	227
Taurocusporites segmentatus	/sp	125	125
Vitreisporites pallidus	/sp	130	130
New Dinoflagellate analyses by D. Benson Dec. 2002			
Callaiosphaeridium asymmetricum	/DN	235	237
Cassiculosphaeridia reticulata	/DN	237	237
Cerbia tabulata	/DN	235	235
Circulodinium brevispinosum	/DN	236	237
Exochosphaeridium bifidum	/DN	236	237
Hapsocysta dictyota	/DN	235	235
Hapsocysta peridictya	/DN	235	237

Hystrichosphaeridium pulchrum	/DN	236	235	
Kalyptea aceras	/DN	235	237	
Maghrebinia perforata	/DN	235	237	*ID as cf
Microdinium reticulatum	/DN	236	236	*ID as cf
Odontochitina costata	/DN	236	237	
Oligosphaeridium anthophorum	/DN	235	235	
Oligosphaeridium asterigerum	/DN	235	237	
Ovoidinium scabrosum	/DN	235	237	
Ovoidinium verrucosum	/DN	202	237	
Pervosphaeridium cenomaniense	/DN	235	235	
Pterodinium aliferum	/DN	235	235	
Pterospermella harti	/DN	235	235	
Tanyosphaeridium salpinx	/DN	235	237	
Trigonopyxidida ginella	/DN	235	236	
Wrevittia helicoidea	/DN	235	237	
*ID as Gonyaulacysta				
Appendicisporites erdtmanii	/SP	235	237	*ID as cf
Clavifera triplex	/SP	235	237	*ID as cf
Inaperturopollenites hiatus	/SP	235	237	
Rugubivesiculites rugosus	/SP	235	237	
Marker bed Ce SB WB	/mb	250.5	250.5	
*base Woodbine Fm.				
Marker bed Ce TS WA 6	/mb	223.1	223.1	
*base Grayson Fm.				
Marker bed Al TS WA 5	/mb	203.5	203.5	
*top upper limestone bed at top Weno Fm.				
Marker bed Al TS WA 4	/mb	192.6	192.6	
*top lower limestone in Weno Fm.				
Marker bed Al TS WA 3	/mb	183.5	183.5	
*top Fort Worth Fm.				
Marker bed Al TS WA 2	/mb	167.3	167.3	
*top thick beds in lower Duck Creek Fm.				
Marker bed Al SB WA 1	/mb	152.5	152.5	
*base Kiamichi Fm. = base Washita Gp.				
Marker bed Al MF FR 1	/mb	133	133	
Marker bed Al SB FR 1	/mb	91.5	91.5	
*base Fredericksburg Fm.				
Marker bed Al SB GR 1	/mb	46	46	
*base Glen Rose Fm.				
*END				

MIDK.21 - Austin, Texas Composite Section

Austin, Texas Composite section, Travis Co. Sections selected along TX 1431.

Data from Young, 1974, Geoscience & Man, 8:175-228; Perkins, *ibid*, 131-174.

Amsbury, 1988, GSA Centennial Field Guide-S-Central, 373-376;

Enhanced by personal observations by R. W. Scott & E. Mancini, 2003.

Upper Aptian - Lower Cenomanian mixed carbonate & clastics platform.

Data

*TAXA	Morph	Base	Top (ft)
Marker bed Ce SB WB	/mb	1302	1302
*base Pepper Shale above Buda Fm.			
Marker bed Ce TS WA 6	/mb	1265	1265
*base Del Rio Fm. = Grayson Fm.			
Marker bed Al TS WA 2	/mb	1196	1196
*base Washita Gp. on Edwards Fm. (top Fredericksburg Gp.)			
Marker bed Al SB FR 1	/mb	836	836
*base Walnut Fm.			
Marker bed Al SB GR 2	/mb	460	460
*6m below base "Corbula marker bed" in mid Glen Rose Fm.			
Marker bed Ap TS GR 1	/mb	200	*

*base lower Glen Rose mbr.
 Marker bed Ap SB PR 2 /mb 160 *
 *base Hensel Formation above Cow Creek Fm. = James Ls. downdip
 Marker bed Ap SB PR 1 /mb 0 *
 *base Sycamore Sandstone above Paleozoic rocks = base Pearsall Fm.

Chelonicerias cornuelianum	/am	110	110
Dipoloceras fredericksburgensis	/am	1186	1186
Drakeoceras drakei	/am	1255	1255
Drakeoceras lasswitzii	/am	1226	1235
Drakeoceras wintoni	/am	1230	1244
Dufrenoyia rebecca	/am	110	110
Dufrenoyia justinae	/am	120	160
Douvilleicerias mammillatum	/am	448	470
Eopachydiscus brazoense	/am	1198	1200
Hypacanthoplites comalensis	/am	540	565
Hypacanthoplites cragini	/am	260	395
Hypacanthoplites mayfieldensis	/am	450	460
Idiohamites fremonti	/am	1198	1200
Kazanskyella spathi	/am	200	210
Mariella brazoensis	/am	1255	1262
Mortoniceras equidistans	/am	1210	1225
Dictyoconus walnutensis	/fb	876	1186
Orbitolina texana	/fb	350	476
Caprina gracilis	/bi	1186	1196
*= Caprinuloidea perfecta in Scott 2002 J. Paleo.			
Ceratostreon texana	/bi	841	970
Chondrodonta munsoni	/bi	1186	1195
Eoradiolites davidsoni	/bi	1189	1189
Exogyra americana	/bi	1238	1240
Lopha carinata	/bi	1222	1245
Neithea texana	/bi	1186	1195
Texicaprina vivari	/bi	1186	1195
Texigryphaea graysonana	/bi	1263	1275
Texi hillii	/bi	830	840
Texi mucronata	/bi	866	970
Texi navia	/bi	1198	1198
Texi washitaensis	/bi	1198	1260
Toucasia texana	/bi	1186	1195
*END			

MIDK.21B - Colorado River Compositated Section Revised

Data

Austin, Texas Composite section, Travis Co.; revised 24 Nov 2003 in meters with foraminifera and palynomorph data. Sections selected along TX 1431 with additional data from Hamilton State Park; Data from Young, 1974, Geoscience & Man, 8:175-228; Perkins, *ibid*, 131-174. Amsbury, 1988, GSA Centennial Field Guide-S-Central, 373-376; Lozo & Stricklin, 1956, GCAGS, 6:67-78, figs. 5, 6, 7; Martin, 1967, Permian Basin SEPM 67-8:286-299, fig.2, #6; Moore, 1964, BEG Rpt. Invest. 52, fig. 6; Stricklin et al, 1971, BEG Rpt. Invest. 71, figs. 9, 10; Wilbert, 1967, Permian Basin SEPM 67-8:256-285, pl. 1, # 13, 14; Young, 1977, Guidebook to the geology of Travis County, U. Texas. Enhanced by personal observations of R. W. Scott. Upper Aptian - Lower Cenomanian mixed carbonate & clastics platform.

*TAXA	Morph	Base	Top (meters)
Marker bed Ce SB WB	/mb	381	*
*base Pepper Shale above Buda Fm.			
Marker bed Ce TS WA 6	/mb	348	*
*base Del Rio Fm. = Grayson Fm.			
Marker bed Al SB WA 2	/mb	326	*
Marker bed Al SB WA 1	/mb	326	*
*base Washita Gp. on Edwards Fm. (Fredericksburg Gp.)			
Marker bed Al MF FR 1	/mb	262	*

*Keys Valley-Comanche Peak transition
 Marker bed Al SB FR 1 /mb 216 *
 *base Walnut Fm.
 Marker bed Al SB GR 3 /mb 163 *
 Marker bed Al SB GR 2 /mb 102 *
 *5 m below base "Corbula marker bed" in mid Glen Rose Fm.
 Marker bed Ap TS GR 1 /mb 70 *
 *base Ss in lower Glen Rose Fm. in Amsbury 1988;
 Marker bed Ap SB PR 2 /mb 49 *
 *base Hensel Formation above Cow Creek Fm. = James Ls. downdip
 Marker bed Ap SB PR 1 /mb 0 *
 *base Sycamore Sandstone above Paleozoic rocks at 0 m, = top Sligo Fm. downdip

Budaiceras hyatti	/am	371	375
Drakeoceras drakei	/am	342.5	342.5
Eopachydiscus brazoense	/am	330	331
Graysonites adkinsi	/am	347.1	348.6
Mariella brazoensis	/am	343	347
Metengonoceras ambiguum	/am	221	230
Mortoniceras equidistans	/am	334	334
Dictyoconus walnutensis	/fb	234	235
Orbitolina texana	/fb	75	140
Favusella washitensis	/fp	326.5	326.5
Caprina gracilis	/bi	296	297
Ceratostreon texana	/bi	216.5	266
Ceratostreon walkeri	/bi	337	338
Chondrodonta munsoni	/bi	301	302
Corbula harveyi	/bi	106	107
Eoradiolites davidsoni	/bi	322	322
Exogyra americana	/bi	340	341
Exogyra weatherfordensis	/bi	185	191
Ilmatogyra arietina	/bi	347	347.5
Lopha carinata	/bi	336	343
Monopleura marcida	/bi	284	285
Neithea texana	/bi	322	325
Texicaprina vivari	/bi	284	285
Texi hilli	/bi	210	220
Texi mucronata	/bi	216.5	325
Texi roemeri	/bi	369	369
Texi washitaensis	/bi	326.5	339
Toucasia patagiata	/bi	284	285
Loriola texana	/ec	185	185

*Foram data from Del Rio outcrop in Austin between 29th & 31st St., M.J. Evetts, 2003

Clavihedbergella simplex	/fp	356	356	
Favusella washitensis	/fp	261.5	356	
Glob'oides bentonensis	/fp	356	356	
Gubkinella graysonensis	/fp	356	356	
Hedbergella delrioensis	/fp	356	356	
Hedbergella planispira	/fp	356	356	
Heterohelix moremani	/fp	356	356	
Citharina complanata	/fb	356	356	
Citharina complanata perstriata	/fb	356	356	
Citharina intumescens	/fb	231	231	*ID ?
Citharina kochii striolata	/fb	356	356	
Citharina recta	/fb	356	356	
Conorbina conica	/fb	231	263	
Dentalina communis	/fb	356	356	
Discorbis floscula	/fb	218.6	263	
Discorbis minima	/fb	218.6	356	*ID ?
Gavelinella plummerae	/fb	356	356	
Glandulopleurostomella ozawai	/fb	356	356	
Globulina lacrima subsphaerica	/fb	356	356	
Guttulina symploca	/fb	36	263	

Lagena apiculata	/fb	356	356	
Lenticulina cyprina	/fb	218.6	243.3	
Lenticulina gaultina	/fb	263	356	*ID of base is cf.
Lingulina furcillata	/fb	243.5	356	*ID of base is cf
Lingulina serrata	/fb	356	356	
Lingulogavelinella asterigerinoides	/fb	356	356	
Marginulina striatifera	/fb	231.1	263	*ID as aff.
Marginulina tenuissima	/fb	356	356	
Massilina planoconvexa	/fb	356	356	
Neobulimina minima	/fb	231.1	263	
Nodosaria obscura	/fb	356	356	
Patellina subcretacea	/fb	218.6	263	
Pseudoglandulina scotti	/fb	356	356	
Pseudopolymorphina plectis	/fb	218.6	231	*ID ?
Pyrulina cylindroides	/fb	356	356	
Quadritina subquadrata	/fb	356	356	*ID ?
Quinqueloculina minima	/fb	216.9	263	*ID of top ?
Quinqueloculina sabella	/fb	356	356	*ID ? as cf
Saracenaria cushmani	/fb	356	356	
Tristix excavata	/fb	356	356	
Valvulineria loetterlei	/fb	356	356	
Ammobaculites cuyleri	/fb	356	356	
Ammobaculites dentonensis	/fb	356	356	
Ammobaculites goodlandensis	/fb	231.1	356	
Ammobaculites subcretaceus	/fb	231	231	
Coskinolina texanus	/fb	231	243.3	
Flabellamina alexanderi	/fb	231	231	
Gaudryinella delrioensis	/fb	356	356	
Haplophragmoides globosus	/fb	216.9	263	*ID of base ?
Spiroplectammia alexanderi	/fb	231	263	
Spiroplectammia goodlandana	/fb	263	263	
Spiroplectammia longa	/fb	356	356	
Spiroplectammia nuda	/fb	356	356	
Textularia rioensis	/fb	231.1	356	
Textularia washitensis	/fb	356	356	
Trochamminoides coronus	/fb	231	263	
*Palynology by D. Benson 2003				
Callaiosphaeridium asymmetricum	/dn	356	356	
Cassiculosphaeridia reticulata	/dn	22	22	
Catastomocystis microreticulata	/dn	263	263	
Catastomocystis spinosa	/dn	263	263	
Chichaouadinium boydii	/dn	216	230	
Chichaouadinium vestitum	/dn	218	218	
Chlamydoaphorella nyei	/dn	230	263	*ID of base as cf.
Circulodinium brevispinosum	/dn	218	356	
Circulodinium paucispinum	/dn	36	356	
Cleistosphaeridium aciculare	/dn	263	356	
Coronifera albertii	/dn	36	356	
Coronifera oceanica	/dn	261.5	263	
Coronifera striolata	/dn	261.5	263	
Cribroperidinium muderongense	/dn	36	231	
Cribroperidinium orthoceras	/dn	230	230	
Cribroperidinium saetigerum	/dn	263	263	*ID as cf
Cribroperidinium sepimentum	/dn	230	230	
Cyclonephelium distinctum	/dn	218	356	
Dingodinium cerviculum	/dn	36	36	
Dinopterygium sp. 2	/dn	218	356	
Exochosphaeridium phragmites	/dn	218	230	*ID of base as cf.
Florentinia cooksoniae	/dn	218	261.5	*ID as cf.
Florentinia buspina	/dn	263	263	
Florentinia mantellii	/dn	36	356	
Florentinia resex	/dn	218	356	
Gardodinium trabeculosum	/dn	36	36	

Gingiodinium evittii	/dn	218	218	
Gingiodinium ornatum	/dn	263	263	
Gonyaulacysta cretacea Complex	/dn	230	356	
Kalyptea aceras	/dn	216	356	
Kalyptea monoceras	/dn	36	36	
Kiokansium unituberculatum	/dn	36	263	
Kiokansium williamsii	/dn	230	230	
Lecaniella foveata	/dn	356	356	
Litosphaeridium arundum	/dn	261.5	263	
Litosphaeridium siphoniphorum	/dn	263	263	
Maghrebinia sp. A (= Bensonia-1)	/dn	263	263	
Maghrebinia perforata	/dn	356	356	
Muderongia simplex	/dn	36	36	*ID as cf
Nexosispinum vetusculum	/dn	218	218	
Odontochitina costata	/dn	263	263	
Odontochitina operculata	/dn	36	356	
Odontochitina rhakodes	/dn	261.5	261.5	
Oligosphaeridium albertense	/dn	36	356	
Oligosphaeridium asterigerum	/dn	356	356	
Oligosphaeridium complex	/dn	36	356	
Oligosphaeridium pulcherrimum	/dn	36	356	
Oligosphaeridium perforatum	/dn	218	218	
Ovoidinium scabrosum	/dn	230	356	
Ovoidinium verrucosum	/dn	356	356	
Palaeostomocystis fragilis	/dn	263	263	
Palaeohystrichophora infusorioidesDB	/dn	36	356	
*Species concept of D. Benson. This FO in Sycamore Ss. is much older than reported.				
Palaeoperidinium cretaceum	/dn	36	263	
Pervosphaeridium cenomaniense	/dn	356	356	
Prolixosphaeridium conulum	/dn	263	263	
Prolixosphaeridium parvispinum	/dn	36	36	
Pseudoceratium polymorphum	/dn	36	36	
Pseudoceratium eisenackii	/dn	36	261.5	
Pterodinium cingulatum	/dn	230	356	
Pterospermella australiensis	/dn	36	231	
Pterospermella harti	/dn	230	230	
Senoniasphaera microreticulata	/dn	261.5	263	
Spiniferites aligerus	/dn	356	356	
Spiniferites dentatus	/dn	263	263	
Spiniferites multibrevis	/dn	36	356	
Subtilisphaera deformans	/dn	36	263	
Subtilisphaera rotundata	/dn	218	218	
Subtilisphaera perlucida	/dn	36	263	
Subtilisphaera senegalensis	/dn	230	230	
Subtilisphaera terrula	/dn	36	216.6	
Tetraguladinium conspicuum	/dn	230	356	
Trichodinium castanea	/dn	36	356	
Wallodinium lunum	/dn	356	356	
Calamospora mesozoica	/sp	231	231	
Callialasporites trilobatus	/sp	36	36	
Cerebropollenites mesozoicus	/sp	36	36	
Cicatricosisporites hallei	/sp	231	231	
Classopollis simplex	/sp	36	263	
Classopollis classoides	/sp	36	263	
Clavifera triplex	/sp	356	356	
Chomotriletes almagrensis	/sp	243	243	
Cyathidites minor	/sp	231	356	
Exesipollenites tumulus	/sp	36	231	
Inaperturopollenites hiatus	/sp	231	263	
Rugubivesiculites rugosus	/sp	356	356	
Tricolpites vulgaris	/sp	216.9	243.5	
Tricolpites sagax	/sp	218.3	218.6	
*END				

MIDK.22 - Nahr Ibrahim, Lebanon

Nahr Ibrahim Section, Lebanon (Saint-Marc, 1974, Notes et Mem. sur le Moyen-Orient, v. 13, Mus. Nat. d'Histoire Naturelle, p. 37-43, fig. 8). Albian-Cenomanian carbonate platform. Taxa assumed to range throughout the units.

Data

*Taxa	Morph	Base (m)	Top
Hedb delrioensis	/fp	692	709
Hedbergella washitensis	/fp	251	275
Biconcava bentori	/fb	197	594
Biplanata peneropliformis	/fb	499	594
Chrysalidina gradata	/fb	499	594
Cuneolina pavonia	/fb	19	594
Dicyclina schlumbergeri	/fb	499	594
Merlingina cretacea	/fb	499	594
Nezzazata simplex	/fb	44	365
Nummofallotia apula	/fb	499	594
Nummoloculina regularis	/fb	499	594
Orbitolina subconcava	/fb	12	19
*ID as Orbitolina sp.			
Orbitolina concava	/fb	251	275
Ovalveolina crassa	/fb	197	214
Praealveolina iberica	/fb	305	365
Pseudocyclammina rugosa	/fb	19	37
Pseudedomia drorimensis	/fb	499	642
Pseudedomia viallii	/fb	197	365
Pseudolituonella reicheli	/fb	499	594
Pseudonummoloculina heimi	/fb	499	594
Pseudorhapydionina laurinensis	/fb	499	594
Simplalveolina simplex	/fb	594	642
Taberina bingistani	/fb	499	594
Trochospira avnimelechi	/fb	499	594
Whit archaeocretacea	/fp	642	709
Lithophyllum shebae	/al	12	19
Permocalculus irenae	/al	12	19
Thaumatoporella parvovesiculifera	/al	44	594
Pith ovalis	/ca	251	275
Pith sphaerica	/ca	251	275
Exogyra flabellata	/bi	12	19
*ID as Exogyra sp.			
Chondrodonta joannae	/bi	76	251
Eoradiolites lyratus	/bi	76	119
Praeradiolites irregularis	/bi	594	642
*Lithostrat contacts representing transgression			
Marker bed Levant TS 1	/mb	119	*
Marker bed Levant TS 2	/mb	214	*
Marker bed Levant TS 3	/mb	251	*
Marker bed Levant TS 4	/mb	365	*
Marker bed Levant TS 5	/mb	454	*
Marker bed Levant TS 6	/mb	590	*
Marker bed Levant TS 7	/mb	642	*
New data from Saint-Marc, 1981 in Reymont & Bengston, Aspects of Mid-Cretaceous Regional Geology, Academic Press, p. 103-131			
Knemiceras dubertreti	/am	12	19
Knemiceras uhligi	/am	12	19

*END

MIDK.23 - Diebta-Chenin Aair, Lebanon

Dlebta-Chenan Air Section, Lebanon by St. Marc, 1974, Notes et Mem. sur le Moyen-Orient, v. 13, Mus. Nat. d'Histoire Naturelle, p. 26-32, fig. 5. Albian-Cenomanian carbonate platform. Taxon ranges assumed to be throughout the units.

Data

*Taxon	Morph	Base (m)	Top
Biplanata peneropliformis	/fb	454	585
Charentia cuvillieri	/fb	8	14
Chrysalidina gradata	/fb	394	585
Cuneolina laurentii	/fb	8	14
Cuneolina pavonia	/fb	454	585
Hemicyclammina sigali	/fb	8	14
Merlingina cretacea	/fb	394	585
Nezzazata simplex	/fb	394	585
Nummofallotia apula	/fb	454	585
Nummoloculina regularis	/fb	394	585
Pseudocyclammina rugosa	/fb	8	14
Pseudedomia drorimensis	/fb	505	585
Pseudonummoloculina heimi	/fb	394	585
Pseudorhapydionina lauricensis	/fb	454	585
Pseudolituonella reicheli	/fb	454	585
Simplorbitolina moulladei	/fb	8	14
Taberina bingistani	/fb	394	585
Trochospira avnimelechi	/fb	454	585
Valvulammina picardi	/fb	394	585
Glob'oides caseyi	/fp	125	139
Hedb delrioensis	/fp	125	139
Hedbergella washitensis	/fp	125	139
Planomalina buxtorfi	/fp	125	139
Praeglobotruncana stephani	/fp	323	383
Boueina pygmaea	/al	8	14
Neomeris pfenderae	/al	8	14
Thaumatoporella parvovesiculifera	/al	394	505
Pith ovalis	/ca	323	383
Pith sphaerica	/ca	139	383
Exogyra flabellata	/bi	190	585
Lithostrat contact representing transgression fig.5			
Marker bed Levant TS 1	/mb	124.5	*
Marker bed Levant TS 2	/mb	227	*
Marker bed Levant TS 3	/mb	258	*
Marker bed Levant TS 4	/mb	350	*
Marker bed Levant TS 5	/mb	450	*
Marker bed Levant TS 6	/mb	581	*

New data from Saint-Marc, 1981 in Reymont & Bengston,
Aspects of Mid-Cretaceous Regional Geology, Academic Press, p. 103-131

Knemiceras dubertreti	/am	8	14
Knemiceras uhligi	/am	8	14

*END

MIDK.24 - Mt. Risou, Rosans, SE France, Cenomanian GSSP

Mt. Risou, Rosans, SE France. Proposed stratotype by Gale et al., Cret. Research, 17:515-606, figs. 2, 3, 4, 1995. Measured downward and upward from marker limestone; I have added -100 m so as to appear to be a well, but is an outcrop. Top & base of data end of report; more section available.

Data

*Taxa	Morph	Base	Top m
Carbon 13 positive shifts (Fig. 2, 8, 9)			
Carbon peak Risou U Alb A	/gc	-239	-232
Carbon peak Risou U Alb B	/gc	-206	-180
Carbon peak Risou U Alb C	/gc	-170	-142

Carbon peak Risou L Cen D	/gc	-128	-118
Lithologic unit - thin bedded marl & laminated carbonaceous marl (Fig. 2, 8)			
Marker bed Breistroffer	/mb	-235	-224
Hedb libyca	/fp	-236	-212
*placed in Costellagerina by M. Caron			
Planomalina buxtorfi	/fp	-236	-216
Rota appenninica	/fp	-236	-115
Rota gandolfi	/fp	-140	-115
Rota globotruncanoides	/fp	-136	-115
questioned ID's at 148, 144, & 138 based on very few specimens w/ uncertain features fide M. Caron 11-09-95, oral comm. = R. brotzeni of others.			
Tici subticinensis	/fp	-236	-232
Tici ticinensis	/fp	-236	-140
Anisoceras perarmatum	/am	-260	-180
Arrhaphoceras briacensis	/am	-132	-132
Callihoplites cantabrigense	/am	-280	-230
Hyphoplites coelonotus	/am	-165	-165
Hyphoplites valbonnensis	/am	-180	-180
Lechites gaudini	/am	-280	-132
Mantelliceras mantelli	/am	-130	-38
Mariella bergeri	/am	-280	-150
Mortoniceras perinflatum	/am	-280	-226
Neostlingoceras carcitanense	/am	-130	-38
*ID as N. oberlini			
Schloenbachia varians	/am	-104	-38
Sciponoceras roto	/am	-130	-50
Stoliczkaia clavigera	/am	-280	-130
Stoliczkaia dispar	/am	-280	-280
Turrilitoides hugardianus	/am	-260	-260
Inoc crippsi	/bi	-97	-38
Inoc anglicus	/bi	-130	-96
Data from J. A. Burnett in Gale et al., 1996; many new taxa to dct not added here			
*Ahmuellerella octoradiata	/nn	-236	-104
*J.A. Bergen says this is too low 7-96			
Amphizygus brooksii	/nn	-236	-80
Axopodorhabdus albianus	/nn	-236	-80
Biscutum ellipticum	/nn	-236	-80
Biscutum gartneri	/nn	-180	-80
Braarudosphaera africana	/nn	-236	-80
Braarudosphaera bigelowii	/nn	-92	-92
Broinsonia enormis	/nn	-236	-80
Broinsonia matalosa	/nn	-224	-80
Broinsonia signata	/nn	-236	-80
Bukrylithus ambiguus	/nn	-236	-80
Calcicalathina alta	/nn	-236	-80
Calculites anfractus	/nn	-140	-84
Calculites supracretaceus	/nn	-236	-80
Chiastozygus bifarius	/nn	-236	-84
Chiastozygus litterarius	/nn	-236	-80
Chiastozygus platyrhethus	/nn	-236	-80
Corollithion kennedyi	/nn	-80	*
Corollithion madagaskarensis	/nn	-236	-80
Corollithion signum	/nn	-236	-80
Cretarhabdus conicus	/nn	-236	-80
Cretarhabdus striatus	/nn	-236	-80
Cribrosphaerella ehrenbergii	/nn	-236	-80
Crucicribrum anglicum	/nn	-224	-80
Cyclagelosphaera margerelii	/nn	-236	-80
Cylindralithus nudus	/nn	-220	-88
Discorhabdus ignotus	/nn	-236	-80
Eiffellithus turriseiffelii	/nn	-236	-80
Ellipsagelosphaera ovata	/nn	-216	-112
Eprolithus apertior	/nn	-236	-80

Eprolithus floralis	/nn	-236	-84	
Flabellites oblonga	/nn	-236	-80	
Gartnerago nanum	/nn	-236	-96	
Gartnerago praeobliquum	/nn	-84	*	
Gartnerago theta	/nn	-108	-80	
Hayesites albiensis	/nn	*	-232	
Helenea chiastia	/nn	-224	-84	*ID as Gartnerago
Helicolithus trabeculatus	/nn	-236	-80	
Lithraphidites carniolensis	/nn	-236	-80	
Lithraphidites pseudoquadratus	/nn	-236	*	
Manivitella pemmatoidea	/nn	-236	-80	
Markalius circumradiatus	/nn	-228	-80	
Microrhabdulus belgicus	/nn	-160	-108	
Nannoconus elongatus	/nn	-220	-80	
Nannoconus minutus	/nn	-224	-80	
Nannoconus regularis	/nn	-232	-80	
Nannoconus truitti	/nn	-220	-80	
Percivalia hauxtonensis	/nn	-144	-144	
Placozygus fibuliformis	/nn	-230	-80	
*ID as Tegumentum tesselatus				
Prediscosphaera columnata	/nn	-236	-80	
Prediscosphaera cretacea	/nn	-84	-80	
Prediscosphaera spinosa	/nn	-220	-80	
Radiolithus planus	/nn	-100	-80	
Reinhardtites fenestratus	/nn	-228	-88	
*placed in Percivalia by Bennett				
Rhagodiscus achlyostaurion	/nn	-236	-80	
Rhagodiscus angustus	/nn	-236	-80	
Rhagodiscus asper	/nn	-236	-80	
Rhagodiscus splendens	/nn	-228	-80	
Repagulum parvidentatum	/nn	-236	-80	
Rotelapillus crenulatus	/nn	-236	-80	
Rotelapillus laffittei	/nn	-224	-80	
Staurolithites glaber	/nn	-232	-112	
Stoverius achylosus	/nn	-172	-80	
Tegumentum stradneri	/nn	-230	-80	
Tetrapodorhabdus coptensis	/nn	-230	-80	
Tranolithus gabalus	/nn	-230	-80	
Tranolithus minimus	/nn	-220	-132	
Tranolithus orionatus	/nn	-230	-80	
Watznaueria barnesae	/nn	-230	-80	
Watznaueria biporta	/nn	-230	-80	
Watznaueria britannica	/nn	-230	-80	
Watznaueria fossacincta	/nn	-230	-80	
Watznaueria manivitiae	/nn	-230	-80	
Zeugrhabdotus embergeri	/nn	-230	-80	
Zeugrhabdotus bicrescenticus	/nn	-230	-80	*ID as Zygodiscus
Zeugrhabdotus erectus	/nn	-230	-80	
Top Albian	/ma	*	-136	
*END				

MIDK.25 - Cap Blanc-Nez Revised, France

*Cap Blanc-Nez, France Revised. New measurements, ammonites and sequence stratigraphy of Cen-Tur Robaszynski & Amedro, 1995, Guidebook for Second Int. Symp. on Cretaceous Stage Boundaries, IRScNB, Brussels, w/ seq strat by J. Hardenbol as modified by him on the field trip. This is same section as Cape Boulonnaise MIDK12 with new measurements & observations. Formation boundaries must match: top G'=32; top H'=42.8; top I=62; top J=75.

Data

*Taxa	Morph	Base (m)	Top
Acanthoceras jukesbrownei	/am	52	61

Acanthoceras rhotomagense	/am	32	54	
Actinocamax plenus	/am	76.2	76.3	
*collected by RWS 16-9-95				
Calycoceras guerangeri	/am	73	74.8	
Calycoceras naviculare	/am	66	75.7	
Cunningtoniceras inerme	/am	27	39	
Euomphaloceras septemseriatum	/am	76.4	76.4	
Fagesia catinus	/am	78	78	
*observed by RWS 16-9-95 in float, located in section by Amedro				
Forbesiceras largilliertianum	/am	13	18	
Hypoturritelites gravesianus	/am	0.2	29.5	
Hypoturritelites mantelli	/am	2.5	12	
Hypoturritelites tuberculatus	/am	0.2	17	
Mammites nodosoides	/am	78.3	*	
Mantelliceras cantianum	/am	0.2	15	
Mantelliceras dixoni	/am	*	20	*base questioned
Mantelliceras mantelli	/am	0.2	17.95	
Mantelliceras saxbii	/am	0.2	15	
Mariella lewesiensis	/am	2.5	9.5	
Metoicoceras geslinianum	/am	75.2	76.3	
Neostlingoceras carcitanense	/am	0.2	0.2	
Scaphites obliquus	/am	13	54	
Sciponoceras roto	/am	0.2	2	
Sciponoceras baculoidea	/am	36	39	
Sciponoceras gracile	/am	75.7	76.4	
Sharpeiceras laticlavicum	/am	1	2.5	
Turrilites acutus	/am	40	42	
Turrilites costatus	/am	29	39	
Turrilites scheuchzerianus	/am	19	57	
Inoc crippsi	/bi	2.7	3.5	
Myti mytiloides	/bi	78.3	*	
Inoc pictus	/bi	74	77.4	
Dica hagni	/fp	74	97	
Helv'ana helvetica	/fp	82	107	
Helv'ana praehelvetica	/fp	77.6	80	
Rota cushmani	/fp	38	76	
Rota greenhornensis	/fp	74	74.8	
Rota reicheli	/fp	26	39	
Whit archaeocretacea	/fp	73	87	
Globorotalites subconicus	/fb	107	114	

Sequence Stratigraphy by J. Hardenbol et. al. (SEPM SP, 1998) & modified 16-9-95
Positions of seq contacts 2,3, & 4 moved in consultation w/ J. Hardenbol 14/7/96;
cycle numbers changed by him then also.

Marker bed Ce SB 1.1	/mb	0.1	0.1	
Marker bed Ce DL 1.1	/mb	3.8	3.8	
Marker bed Ce SB 1	/mb	9.5	9.5	
Marker bed Ce DL 1	/mb	*	*	
Marker bed Ce SB 2	/mb	18	*	
Marker bed Ce TS 2	/mb	20.6	20.6	
Marker bed Ce DL 2	/mb	23	23	
Marker bed Ce SB 3	/mb	26	26	
Marker bed Ce TS 3	/mb	32	32	
Marker bed Ce DL 3	/mb	39.8	39.8	
Marker bed Ce SB 4	/mb	53.5	*	
Marker bed Ce TS 4	/mb	56.4	*	
Marker bed Ce DL 4	/mb	62	*	
Marker bed Ce SB 5	/mb	75	*	
Marker bed Ce TS 5	/mb	76.1	*	
*Marker bed Ce SB 7	/mb	76.5	*	
*Marker bed Ce TS 7	/mb	78.2	*	
*END				

MIDK.26 - Cismon Outcrop Section, Italy

Cismon Section, Italy, Lower Cretaceous. Continuous outcrop measured by B. Fouke et al., 1994-5, Vrije Universiteit, Amsterdam. Unconformity between 69.01-69.18 at 69.01m. Red Biancone Marker bed 0-6.26 m; Haut/Barrem at 4.9m; Scisti a Fucoidi 47.98-71.62m = 269.0. Channel et al., 1979, Earth & Planet. Sci. Letters 42:133-166; Bralower, 1987, Mar. Micropal. 11:293-310; Erba, 1994; Paleocyanography 9:483-501; Mayer, 1997, Geophysical J. Int. 131:387-400; Erba & Larson, 1998, Riv. Italiana Paleont. Strat. 104:181-192; Channell et al. 2000, GSA Bull. 112:1430-1443.

Data

*Taxa	Morph	Base	Top
Data from Channell et al. 2000, Table 3 less 35 m adjust to Fouke's measurements			
Magnetostrat CM0R	/mb	51	55
Magnetostrat CM1R	/mb	24.58	27.04
Magnetostrat CM3R	/mb	11.56	18.22
Magnetostrat CM6R	/mb	6.61	*
Magnetostrat CM7R	/mb	2.77	5.26
Magnetostrat CM8R	/mb	-16.08	0.75
Magnetostrat CM9R	/mb	*	-24.10
Carbon peak OAE 2	/gc	128.24	129.5
Carbon peak OAE 1a	/gc	59	63
*base-top of inflection of del 13 C curve			
Marker bed Bonarelli	/mb	128.24	128.61
Marker bed Selli Level	/mb	59	63
Marker bed Nannoconid crisis	/mb	*	57
*"Nannoconid crisis" is top of abundance curve below Selli level, Erba '94			
*Top Hauterivian	/ma	*	4.9
Nanno events taken from Channell et al., 1979, Earth & Planetary Sci. Letter, 42:153-166; depths converted to new measurements.			
Calccalathina oblongata	/nn	*	93.2
Eiffelithus turriseiffelii	/nn	70.22	*
Lithastrinus floralis	/nn	60.44	*
Prediscosphaera cretacea	/nn	69.20	*
Nannoconus colomii	/nn	*	50.3
Nannoconus steinmannii	/nn	*	54.5
Rucinolithus irregularis	/nn	51	*
Data from Bralower, 1987, Marine Micropaleo., 11:293-310, Fig. 6; convert depth taking 273m = 51m & 324m = 0m in Fouke's section			
Assipetra infracretacea	/nn	-73.6	62.5
Calccalathina oblongata	/nn	-129.5	62.5
Conusphaera mexicana	/nn	-125.9	60.8
*same as Conusphaera rothii			
Cretarhabdus angustiforatus	/nn	-125.9	60.8
Cretarhabdus conicus	/nn	-84.0	54.6
Cretarhabdus surirellus	/nn	-125.9	60.8
Cruciellipsis cuvillieri	/nn	-129.5	-9.5
Cyclagelosphaera margerelii	/nn	-125.9	60.8
Diazomatolithus lehmanii	/nn	-129.5	31.1
Flabellites oblonga	/nn	60.8	*
Hayesites radiatus	/nn	24.6	59.1
Helenea chiastia	/nn	-125.9	62.5
Lithraphidites bollii	/nn	-33.1	3.5
Lithraphidites carniolensis	/nn	-116.5	60.8
Manivitella pemmatoidea	/nn	-125.9	62.5
Markalius circumradiatus	/nn	-122.2	60.8
Nannoconus bermudezii	/nn	-113.8	60.8
Nannoconus broennimannii	/nn	54.6	55.8
Nannoconus bucheri	/nn	-4.0	60.8
Nannoconus globulus	/nn	-113.8	60.8
Nannoconus kamptneri	/nn	-36.0	62.5
Nannoconus steinmannii	/nn	-129.5	62.5
Nannoconus truitti	/nn	-122.2	60.8
Parhabdololithus asper	/nn	-125.9	62.5

Parhabdolithus embergeri	/nn	-129.5	62.5
Parhabdolithus splendens	/nn	-84.0	62.5
Reinhardtites fenestratus	/nn	-73.6	62.5
Rotelapillus laffittei	/nn	-129.5	60.8
Rucinolithus irregularis	/nn	53.0	62.5
Vagalapilla stradneri	/nn	-125.9	62.5
Watznaueria barnesae	/nn	-129.5	62.5
Watznaueria communis	/nn	51.1	59.1
Zygodiscus diplogrammus	/nn	51.1	*
Zygodiscus elegans	/nn	32.8	60.8
Data from Nederbragt 1994 unpublished at that time			
Biti breggiensis	/fp	77.5	100.66
Dica algeriana	/fp	125.77	130.56
Helv'ana helvetica	/fp	133.1	139.84
Helv'ana praehelvetica	/fp	131.44	133.1
Hedb trocoidea	/fp	69.20	107.03
Leupoldina cabri	/fp	60.44	69.00
Planomalina buxtorfi	/fp	81.01	101.73
Rota appenninica	/fp	103.83	120.06
Rota cushmani	/fp	120.24	128.24
Rota gandolfi	/fp	111.2	*
Rota globotruncanoides	/fp	*	125.27
Rota montsalvensis	/fp	117.11	128.0
Rota reicheli	/fp	119.86	119.86
Tici subticinensis	/fp	74.1	92.75
Tici ticinensis	/fp	76.64	101.73
Whit archaeocretacea	/fp	128.82	130.56
*ID as Whiteinella spp.			
*END			

MIDK.26B - Cismon Cored Section, Italy

Cismon Core, Italy. Middle Aptian to lower Hauterivian section drilled to 131.8 m TD. Aptian/Albian unconformity @ -7.8 m. Channell et al., 2000, Geol. Soc. Am. Bull. 112:1430-1443, figs. 4, 8. Erba & Larson, 1998, Riv. Italiana Paleont. Strat. 104:181-192; Erba et al., 1999, J. Foram. Res., 29:371-391

Data

*Taxa	Morph	Base (m)	Top
Reversed chrons; Erba et al., Fig. 5			
Magnetostratigraphic CM0R	/mb	-29.17	-25.75
Magnetostratigraphic CM1R	/mb	-56.55	-54.68
Magnetostratigraphic CM3R	/mb	-70.42	-61.7
Magnetostratigraphic CM6R	/mb	-76.1	*
Magnetostratigraphic CM7R	/mb	-78.76	-77.69
Magnetostratigraphic CM8R	/mb	-95.41	-81.14
Magnetostratigraphic CM9R	/mb	*	-105.27
Marker bed Selli Level	/mb	-23.68	-18.77
Marker bed Nannoconid crisis	/mb	-23.9	*
*"Nannoconid crisis" is top of abundance curve below Selli level, Erba '94			
*Top Barremian	/ma	*	-29.17
*Top Hauterivian	/ma	*	-70
Erba et al., p. 376			
Biscutum magnum	/nn	-7.66	*
Braarudosphaera africana	/nn	-14.28	*
Calcicalathina oblongata	/nn	*	-68.0
Corollithion achylosum	/nn	-15.27	*
Cruciellopsis cuvillieri	/nn	*	-79.19
Eprolithus floralis	/nn	-19.86	*
Flabellites oblonga	/nn	-33.48	*
Lithraphidites bollii	/nn	-116	-71.34
Nannoconus truitti	/nn	-30.36	*
Parhabdolithus achlyostaurion	/nn	-4.59	*

Rucinolithus irregularis	/nn	-32.45	*	
Rucinolithus terebrodentarius	/nn	-82.87	*	
	Erba et al., p.	378-379		
Biti breggiensis	/FP	-4.4	*	
Biti subbreggiensis	/FP	-7.04	*	
Glob'oides aptiense	/FP	-29.06	*	
Glob'oides blowi	/FP	-60.12	*	
Glob'oides ferreolensis	/FP	-29.06	*	
Glob'oides maridalensis	/FP	-24.33	*	
Glob'oides saundersi	/FP	-18.43	*	
*Hedb kutznetsovae	/FP	-64.36	*	
Hedb similis	/FP	-64.36	*	
Hedb trocoidea	/FP	-18.43	*	
Leupoldina cabri	/FP	-24.33	-9.72	
Tici praeticinensis	/FP	-7.66	*	
Tici primula	/FP	-7.78	*	
Tici raynaudi	/FP	-7.04	*	
Tici subtcinensis	/FP	-0.5	*	*in Rotalipora
	Erba et al., p.	380		
Bourkidinium granulatum	/DN	-115	-70	
Cassiculosphaeridia reticulata	/dn	*	-7.9	
Cymososphaeridium validum	/DN	-115	-83.5	
Damassadinium chibane	/DN	-7.7	*	
Hystrichosphaeridium atlasense	/DN	-7.7	*	
Hystrichodinium pulchrum	/dn	*	-7.9	
Kleithriasphaeridium fasciatum	/DN	-60.9	-59.5	*ID as cf.; acme range
Litosphaeridium arundum	/DN	-2.1	*	
Litosphaeridium conispinum	/DN	-2.1	*	
Odontochitina operculata	/DN	-53.7	*	
Oligosphaeridium totum	/DN	-115	-83.5	
Ovoidinium diversum	/DN	-7.7	*	
Palaeoperidinium cretaceum	/DN	*	-7.9	
Phoberocysta neocomica	/DN	*	-28.1	
*top of common occurrence				
Pinocchiodinium erbae	/DN	-25.5	-7.9	
Prolixosphaeridium conulum	/DN	-7.7	*	
Prolixosphaeridium parvispinum	/DN	-56.0	*	
Rhynchodiniopsis aptiana	/DN	*	-28.1	
*END				

MIDK.27 - Pie' del Dosso Section, Italy

Pie' del Dosso Section, Italy. Barremian-Aptian outcrop of transition between Maiolica and Scaglia Variegata formations. Erba & Quadrio, Riv. Italiana Paleont. Strat., 93:3-108, 1987. Defines approximate base Aptian @ base *Conusphaera mexicana* & base *Rucinolithus irregularis* between 8.5-16.5 m. Magnetostratigraphy from Channell & Erba, 1992, Earth & Planetary Sci. Let. 108:161-179.

Data

*Taxa	Morph	Base (m)	Top
Top Barremian	/ma	*	17.58
*placed at base CM0R			
Magnetostratigraphy CM0R	/mb	17.58	20.15
Magnetostratigraphy CM1R	/mb	2.23	6.45
<i>Chiastozygus litterarius</i>	/nn	4.5	55
<i>Conusphaera mexicana</i>	/nn	8.5	23
<i>Cretarhabdus angustiforatus</i>	/nn	0.5	62
<i>Cretarhabdus conicus</i>	/nn	29	55
<i>Cyclagelosphaera margerelii</i>	/nn	0.5	68.5
<i>Lithraphidites carniolensis</i>	/nn	45.5	64.5
<i>Lithastrinus floralis</i>	/nn	53.5	53.5
<i>Micrantholithus hoschulzii</i>	/nn	0.5	57.5
<i>Nannoconus bucheri</i>	/nn	0.5	68.5

Nannoconus colomii	/nn	0.5	44.5
Nannoconus steinmannii	/nn	0.5	56.5
Nannoconus wassallii	/nn	0.5	55
Parhabdolithus angustus	/nn	53.5	53.5
Parhabdolithus embergeri	/nn	0.5	68.5
Reinhardtites fenestratus	/nn	2.5	68.5
Rucinolithus irregularis	/nn	16.5	70.5
Watznaueria britannica	/nn	0.5	66.5
Watznaueria communis	/nn	0.5	70.5
Glob'oides blowi	/fp	55	62.5
Glob'oides duboisi	/fp	25	39
Glob'oides gottisi	/fp	25	55
Glob'oides maridalensis	/fp	50.5	62.5
Hedb sigali	/fp	25	55
Hedb similis	/fp	25	62.5
*END			

MIDK.28 - Estella Basin, NW Spain

Estella Basin, Navara, NW Spain. Lamolda, Lopez, & Martinez, 1989, Turonian integrated biostratigraphy in the Estella Basin (Navarra, Spain) in J. Wiedmann, Cret. of W. Tethys, p. 145-159, Text-fig. 2; Proc. 3rd Intl. Cret. Symp., Tübingen, 1987, E. Schweitserbart'sche Verr.

The Ganuza section is stacked below the Ollogoyen section about 2 km apart.

Data

*Taxa	Morph	Base (m)	Top
Collignonicerias woollgari	/am	48	170
*Fagesia sp.	/am	45	65
Lewesicerias sp.	/am	35	65
Mammites nodosoides	/am	35	35
Romanicerias kallesi	/am	110	110
Myti hercynicus	/bi	65	100
*Myti labiatus	/bi	65	95
*too high; graph raises top; may be wider taxon concept than others			
Myti mytiloides	/bi	48	65
Myti submytiloides	/bi	45	45
Dica algeriana	/fp	20	145
Dica hagni	/fp	20	145
Dica imbricata	/fp	145	235
Dica primitiva	/fp	235	250
Hedbergella flandrini	/fp	210	247
Helv'ana helvetica	/fp	90	200
Helv'ana praehelvetica	/fp	45	95
Marginotruncana coronata	/fp	195	245
Marginotruncana marianosi	/fp	45	190
Marginotruncana pseudolinneiana	/fp	185	247
Marginotruncana renzi	/fp	27	245
Marginotruncana schneegansi	/fp	230	247
Marginotruncana sigali	/fp	145	247
Marginotruncana sinuosa	/fp	230	247
Marginotruncana tarfayaensis	/fp	205	247
Praeglobotruncana stephani	/fp	7	30
Rota cushmani	/fp	5	25
Rota greenhornensis	/fp	5	20
Whit archaeocretacea	/fp	25	240
Whitinella baltica	/fp	25	135
*END			

MIDK.29 - Eastbourne, UK

Eastbourne Section, East Sussex, UK, base Cenomanian-Santonian.

Composited section along coastline based on data in Lake et al., 1987, Geology of the country around Lewes, British Geol. Survey, Memoir for 1:50,000 geological sheet 319. Wood & Mortimore, 1995, Berliner geowiss. Abh., E 16, p. 277-287, "An anomalous Black Band succession (Cenomanian-Turonian boundary interval) at Melton Ross, Lincolnshire, eastern England and its international significance." Base Plenus Marls = 70.1m, base Melbourn Rock = 78m, base Holywell Mbr. = 80m.

Data for Lower Chalk from Kennedy, 1969, Proc. Geol. Assoc., 80(4):459-560.

Lithostratigraphic tops/bases from Lake et al., 1987:

19.2m - base Glauconitic Marl overlying Upper Greensand, base Lower Chalk Fm.;

20.5m - top Glauconite Marl; 70m - Top Zig Zag Chalk Mbr., Lower Chalk Fm.; 78m - Top Plenus Marls, top Lower Chalk Fm., base Middle Chalk Fm.; 80m - Top Melbourn Rocks; 81.7m - Top Meads Marls; 117.5m - Top Holywell Beds; 165.5m - Top New Pit Chalk Mbr., Ranscombe Mbr., T Middle Chalk Fm., & Base Upper Chalk Fm.; 237m - Top Beachy Head Sponge Beds/Shoreham Marls, Lewes Nodular Chalk Mbr. Above; 280m - Seaford Chalk Mbr.

Data:

*Taxa	Morph	Base	Top meters	
Carbon peak OAE 2	/gc	73	85	
Acanthoceras jukesbrownei	/am	38.5	46	*ID as group
Acanthoceras rhotomagense	/am	32.7	35.5	*ID as cf. or group
Actinocamax plenus	/am	76	76	
Calycoceras naviculare	/am	67.2	74	
Collignoniceras woollgari	/am	119	152	
Euomphaloceras septemseriatum	/am	77.5	77.5	
Forbesiceras largilliertianum	/am	19.5	20.2	
Forresteria sp.	/am	206	206	
Hypoturritelites gravesianus	/am	19.5	20.2	
Hypoturritelites mantelli	/am	19.5	20.8	
Mammites nodosoides	/am	97	97	
Hypoturritelites tuberculatus	/am	19.5	20.2	
*Lewesiceras sp.	/am	170	207	
Mantelliceras cantianum	/am	19.5	28	
Mantelliceras mantelli	/am	19.5	20.2	
Mantelliceras saxbii	/am	20.8	28	
Mantelliceras tuberculatum	/am	19.5	28	
Mariella cenomanensis	/am	24	28	
Mariella lewesiensis	/am	19.5	20.8	
Metococeras geslinianum	/am	71	77.5	
Neostlingoceras carcitanense	/am	19.5	20.2	
Pseudocalyoceras dentonense	/am	76.6	76.7	
Romaniceras deverianum	/am	174	180	
Scaphites obliquus	/am	31.9	32.7	
Schloenbachia varians	/am	19.5	20.2	
Sciponoceras baculoidea	/am	31.2	32.7	
Sciponoceras gracile	/am	78.5	79.5	
Turrilites acutus	/am	33.9	33.9	
Turrilites costatus	/am	32.2	32.7	
Turrilites scheuchzerianus	/am	24	28	
Watinoceras coloradoense	/am	82.2	82.2	
*ID as Watinoceras in Pomerol & Mortimer, 1993, Fig. 3				
Cladoceramus undulatoplicatus	/bi	262	266	
Crem inconstans	/bi	211	211	
Crem schloenbachi	/bi	232	235	
Crem waltersdorfensis	/bi	211	211	
Inoc deformis	/bi	218	218	
Inoc erectus	/bi	218	218	
Inoc crippsi	/bi	19.5	32.7	
Inoc cuvieri	/bi	166	178	
Inoc fiegei	/bi	168	185	
Inoc pictus	/bi	38.5	80.2	
Myti mytiloides	/bi	82.2	102	
Volviceramus involutus	/bi	242	247	

Dica hagni	/fp	70	84
Dica imbricata	/fp	74	84
Hedb delrioensis	/fp	70.5	81.8
Helv'ana helvetica	/fp	82.2	83.6
Helv'ana praehelvetica	/fp	79.4	84
Praeglobotruncana delrioensis	/fp	70.5	84
Praeglobotruncana stephani	/fp	70.1	75.6
Rota cushmani	/fp	70.1	75.6
Rota greenhornensis	/fp	70.1	73.5
Whit aprica	/fp	69.7	84
Whit archaeocretacea	/fp	69.7	84
Whit baltica	/fp	69.7	84
Whit brittonensis	/fp	69.7	84
*Data of benthic forams in Fig. 91			
Ammobaculites agglutinans	/fb	70.5	79.6
Ammodiscus cretaceus	/fb	75	87.5
Arenobulimina conoides	/fb	70.1	70
Arenobulimina preslii	/fb	70.1	75.65
Dorothia oxycona	/fb	73.5	82.1
Dorothia trochus	/fb	69.7	84
Eggerellina brevis	/fb	77.7	78.5
Fronicularia angusta	/fb	75.65	83.6
Gavelinella ammonioidea	/fb	69.7	84
Gavelinella baltica	/fb	70.1	75.6
Gavelinella berthelini	/fb	69.7	84
Gavelinella cenomanica	/fb	70.1	74
Gavelinella intermedia	/fb	73.5	83.6
Gyroidinoides nitidus	/fb	75.6	75.65
Lenticulina rotulata	/fb	69.7	84
Lingulogavelinella globosa	/fb	69.7	84
Plectina cenomana	/fb	69.7	75.6
Plectina mariae	/fb	69.7	75.65
Praebulimina reussi	/fb	69.7	78.5
Ramulina aculeata	/fb	70.1	81.8
Textularia chapmani	/fb	69.7	78.5
Tritaxia pyramidata	/fb	69.7	84
Tritaxia tricarinata	/fb	69.7	76.7
Vaginulina mediocarinata	/fb	73.5	84
Eiffellithus eximius	/nn	165.5	*
*projected from Dover section			
Marthasterites furcatus	/nn	186	*
*projected from Dover section			
Micraster cortestudinarium	/ec	213	228
Micraster coranguinum	/ec	244	280
Micraster corbovis	/ec	167	177
Sternotaxis planus	/ec	167	200
Terebatulina lata	/br	118	182
*END			

MIDK.30 - Selbukhra Section, Crimea

Selbukhra composite section, Bakhchisaray Region, near Prokhladnoe Village, about 45° N, Crimea. Data from Alexandr S. Alekseev, alekseev@sbq.geol.msu.su, 25 Jan 96 13:28:36 +0300. "Main problem was insufficient accuracy of FAD and LAD. In my opinion Selbukhra data set is not very useful for Composite Standard development. But I will wait you opinion on the question. If data will be good enough, I will send you information about sources (published and unpublished)."

Total composited thickness 114 m of two sections.

Selbukhra North section; North slope of Selbukhra Mountain near Moscow State University Field Station. Several exposures and drill holes on the station territory. Interval 0-75.8 m. Selbukhra South section; southern slope of Selbukhra Mountain; about 2 km south of Field Station. Two exposures separated by a

distance of 200-250 m. Interval 75.8-114.0. Top of the section is not unit boundary, but level inside of Lower Turonian above that exposure covered by soil and vegetation.

Lithologic units:

0-34.0 Mangush Formation. Dark clays. Full thickness is up to 56 m (in bore-holes). Upper part (34 m) is constant in thickness, but lower part with a lot of pebbles varies in thickness in short distances. Lower Upper Albian.

34.0 - Hiatus

34.0-45.0- No name. Sandy limestones (grainstones) with glauconite. Middle Upper Albian.

Overlying the Mangush Fm. with gap and basal gravelite layer.

45.0 - Hiatus

45.0-46.5- No name. Glauconitic tuffaceous sandstones with a lot of andesitic material. Upper Upper Albian - Vraconian.

46.5 - Hiatus

46.5-49.0 - Member I. Calcareous glauconite sandstones and sandy limestones and marls. Lower Cenomanian.

49.0-57.0 – Member II. Limestones with minor silt material. Rhythmic sequence of more and less carbonate beds. Thin ash layer in upper part. Lower Cenomanian.

57.0-69.0 - Member III. Limestones. Rhythmic sequence as in member II but dominantly darker. Lower Cenomanian.

69.0-75.8 - Member IV. Marls with thin (0.1-0.4m) limestone beds (7 beds)

69.0-70.9 - Submember IV-1 - Lower Cenomanian.

70.9 - Hiatus

70.9-75.8 - Submember IV-2 - Middle Cenomanian interval.

75.8-89.8 - Member V. Rhythmic sequence with alternation of white limestones and dark more clayish limestones. Mid (?) Cenomanian.

89.8-100.4 - Member VIa. Unclear rhythmic alternation of limestones and silty limestones.

100.4-105.8 - Member VIb. White chalky limestones mudstones.

105.8 - Hiatus

105.8-109.1 - Member VIc. Silty limestones with dark spots (wackestones). Time-equivalent of Plenus Marls.

109.1 - Hiatus (?)

109.1-114.0 - Basal part of Member VII. Thin layered limestones. Lower Turonian

110.1 - Hiatus (?)

Data:

*Taxa	Morph	Base (m)	Top
Actinoceramus sulcatus	/bi	3.0	32.0
Inoc anglicus	/bi	8.0	33.0
Aucellina gryhaeoides	/bi	45.6	45.6
*Acanthoceras cf. confusum	/am	*	71.8
Anisoceras plicatile	/am	70.8	71.8
*Austeniceramus austeni (Sharpe)	/am	69.1	69.1
*Hypophylloceras seresitense	/am	69.1	69.1
*Hypoturritites tenouklensis	/am	69.1	69.1
Hysterocheras varicosum	/am	14.0	23.0
Mantelliceras tuberculatum	/am	69.1	69.1
Mantelliceras picteti	/am	69.1	69.1
Mortoniceras rostratum	/am	34.4	36.0
Puzosia planulata	/am	49.0	75.7
Scaphites obliquus	/am	69.1	71.8
Schloenbachia varians	/am	69.1	71.8
Sciponoceras baculoidea	/am	71.8	71.8
Stoliczkaia notha	/am	45.5	45.5
Turrilites costatus	/am	70.8	73.5
*Zelandites dozei (Fallot)	/am	69.1	69.1
Mesogaudryceras rarecostatum	/fb	71.8	77.0
Mesogaudryceras leptonema	/fb	76.0	77.0
Neohibolites menjalenkoi	/am	46.5	49.0

Neohibolites ultimus	/am	69.1	71.0	
*Calcareous nannoplankton sampled only from level 28.0 to 109.0				
Biscutum constans	/nn	28.0	93.0	
Biscutum dubium	/nn	28.0	37.0	
Broinsonia bevieri	/nn	91.5	109.0	
Broinsonia enormis	/nn	71.0	86.0	
Chiastozygus amphipons	/nn	46.6	95.0	
Chiastozygus litterarius	/nn	28.0	99.0	
Crepidolithus crassus	/nn	77.0	88.5	
Cretarhabdus conicus	/nn	74.0	105.0	
Cribrosphaerella ehrenbergii	/nn	76.0	109.0	
Cyclagelosphaera margerelii	/nn	34.5	109.0	
Diazomatolithus lehmanii	/nn	28.0	48.9	
Discorhabdus ignotus	/nn	28.0	105.0	
Eiffellithus turriseiffelii	/nn	28.0	105.0	
Eprolithus floralis	/nn	28.0	109.0	
Ethmorhabdus gallicus	/nn	28.0	34.0	
Gartnerago obliquum	/nn	49.0	109.0	
Gephyrorhabdus coronadventis	/nn	77.0	109.0	
Helenea chiastia	/nn	28.0	91.5	
Helicolithus anceps	/nn	74.0	109.0	
Helicolithus trabeculatus	/nn	74.0	104.0	
*Kamptnerius magnificus	/nn	90.2	109.0	
*Extends into Cenomanian out of range in mid Turonian				
Lithraphidites carniolensis	/nn	28.0	75.5	
Manivitella pemmatoidea	/nn	28.0	95.0	
Manivitella solida	/nn	28.0	109.0	
Markalius circumradiatus	/nn	28.0	63.0	
Microrhabdulus decoratus	/nn	90.2	109.0	
Nannoconus colomii	/nn	74.0	98.0	
Prediscosphaera cretacea	/nn	28.0	107.0	
*Prediscosphaera intercisa	/nn	74.0	109.0	synonym of P cretacea
Repagulum parvidentatum	/nn	49.0	109.0	
Rhagodiscus angustus	/nn	28.0	98.0	
Rhagodiscus asper	/nn	49.5	98.0	
Rhagodiscus splendens	/nn	71.0	109.0	
Rotelapillus laffittei	/nn	28.0	87.0	
Watznaueria barnesae	/nn	28.0	109.0	
Watznaueria biporta	/nn	76.0	109.0	
Watznaueria britannica	/nn	53.0	86.0	*ID as Ellipsagelosphaera
Zeugrhabdotus acanthus	/nn	35.5	109.0	
Zeugrhabdotus embergeri	/nn	28.0	109.0	
Dica biconvexiformis	/fp	107.5	114.0	
Dica hagni	/fp	107.5	114.0	
Dica imbricata	/fp	107.5	114.0	
Hedb infracretacea	/fp	0.0	45.0	
Hedb globigerinelloides	/fp	0.0	45.0	
Hedb planispira	/fp	0.0	107.5	
Hedb portsdownensis	/fp	101.4	108.6	
Helv'ana praehelvetica	/fp	109.2	114.0	
Helv'ana helvetica	/fp	109.2	114.0	
Praeglobotruncana turbinata	/fp	*	107.5	
Praeglobotruncana delrioensis	/fp	*	108.5	
Praeglobotruncana oraviensis	/fp	107.5	114.0	
Rota appenninica	/fp	46.0	69.5	
Rota greenhornensis	/fp	70.9	106.6	
Rota cushmani	/fp	71.4	105.9	
Rota deeckeri	/fp	73.6	*	
Tici ticinensis	/fp	39.0	43.0	
Whit brittonensis	/fp	103.2	114.0	
Whit archaeocretacea	/fp	108.0	108.8	
*END				

MIDK. 30B- Alternate Selbukhra Section, Crimea

Selbukhra C/T section, Crimea. Crimea, Bakhchisaray Region, near Prokhladnoe Village, about 45°N. Kopaevich & Kuzmicheva, 2002, in Wagerich, ed., Aspects of Cretaceous stratigraphy & palaeobiogeography. Osterreichische Akademie der Wissenschaftenm band 15, p. 129-147. Erosional contact @ 5.2 "overlain here by 1 m of sandy and silty chalks with intraclasts and chalk conglomerates, debris flows, glauconites and dark gray organic lenses...." (p. 134).

Data:

*Taxa	Morph	Base (m)	Top
Ammodiscus cretaceus	/fb	1.0	7.4
*Bolivinita eovigeriniformis	/fb	0.4	13.3
*Cibicidoides gorbenkoi	/fb	1.0	1.0
Eggerellina brevis	/fb	0	4.9
*Fronicularia hastata	/fb	8.3	8.3
*Gaudryina angustata	/fb	1.0	1.0
*Gaudryina serrata	/fb	1.0	7.2
Gavelinella baltica	/fb	0	7.0
*Gavelinella belorussica	/fb	2.7	13.3
*Gavelinella minutissima	/fb	0	7.8
*Gyroidinoides subconica	/fb	0	13.3
Lingulogavelinella globosa	/fb	2.7	13.3
*Spiroplectammina cuneata	/fb	1.0	4.9
Spiroplectammina praelonga	/fb	3.9	3.9
Textularia chapmani	/fb	1.0	2.7
Tritaxia pyramidata	/fb	2.7	3.1
Dica biconvexiformis	/fp	7.4	13.3
Dica hagni	/fp	6.2	13.3
Dica imbricata	/fp	0	13.3
Guembelitra cenomana	/fp	0	9.5
Hedbergella delrioensis	/fp	0	13.3
Hedb delrioensis	/fp	0	13.3
Hedb infracretacea	/fp	0	13.3
Hedb planispira	/fp	0	9.7
Heterohelix moremani	/fp	0	13.3
Heterohelix reussi	/fp	6.5	13.3
*Praeglobotruncana aumalensis	/fp	0	13.3
Praeglobotruncana gibbi	/fp	0	13.3
Praeglobotruncana oraviensis	/fp	6.5	13.3
Praeglobotruncana stephani	/fp	0	13.3
Rota cushmani	/fp	0	5.0
Rota deecke	/fp	0	5.0
Rota greenhornensis	/fp	3.1	5.0
Schackoia cenomana	/fp	2.7	13.3
Schackoia multispinata	/fp	6.5	7.4
Whit aprica	/fp	6.2	13.3
Whit baltica	/fp	1.0	13.3
Whit brittonensis	/fp	2.7	13.3
Whit archaeocretacea	/fp	3.9	9.7
*END			

MIDK.31 - Kef el Azreg, Tunisia

Kef el Azreg outcrop, El Kef area, Tunisia. Robaszynski et al., 1993, Fig.28. Proposed as a boundary reference section of Alb/Cen boundary by Robaszynski & Amedro, 1995, Brussels mtg. Boundary proposed between 18.5-19.1 above Stoliczkaia sp. at 17.4-18.5 m and below base of Mantelliceras spp. & Hypoturrilites spp. at 19.1 m.

Data:

*Taxa	Morph	base m	top m
Forbesiceras beaumontianum	/am	21.2	*

Hypoturrilites gravesianus	/am	19.1	21.1	
Hypoturrilites schneegansi	/am	21.1	*	
Mantelliceras saxbii	/am	19.5	21.1	Id as aff.
Neostlingoceras carcitanense	/am	21.1	*	
Sciponoceras roto	/am	19.1	21.1	
Sharpeiceras schlueteri	/am	19.5	21.1	
Stoliczkaia dispar	/am	17.4	18.5	ID Stoliczkaia sp.

*END

MIDK.32 - Sopeira Section, Pyrenees,
 Sopeira Section, Pyrenees, Spain. Caus et al., 1993, Cretaceous Research 14:531-551, Fig. 3;
 Foram id's by Caus; ammonites by Gomez-Garrido.
 Top Sopeira Marl @ 347 m; top Santa Fe Breccia @ 456 m; top section in Pardina Ls. @ 561 m;
 boundary of Santa Fe & Sant Gervais cycles @395 m. Glauconite sand at 171m.

Data:

*Taxa	Morph	Base (m)	Top (m)	
Carbon peak OAE 2	/gc	489	504	
Acanthoceras rhotomagense	/am	205	205	
*Calycoceras newboldi	/am	205	440	*id as group
Euomphaloceras cunningtoni	/am	205	205	
Hypoturrilites gravesianus	/am	170	170	
Mantelliceras cantianum	/am	170	170	
Mantelliceras picteti	/am	165	170	
Mantelliceras saxbii	/am	170	170	
Turrilites costatus	/am	*	170	
Turrilites scheuchzerianus	/am	205	205	
Dica hagni	/fp	508	538	
Hedbergella washitensis	/fp	1	225	
Helv'ana helvetica	/fp	505	532	
Helv'ana praehelvetica	/fp	505	532	
Hete delrioensis	/fp	*	272	*base @ 6 is too low
*Hete simplex	/fp	10	272	*ID?; range too low
Marginotruncana coronata	/fp	520	538	
Marginotruncana pseudolinneiana	/fp	520	538	
Marginotruncana schneegansi	/fp	518	538	
*Marg sigali	/fp	508	508	
Rota montsalvensis	/fp	340	460	
Praeglobotruncana delrioensis	/fp	30	460	
Praeglobotruncana stephani	/fp	30	305	
Rota appenninica	/fp	75	208	
*top occurrence too hi raising top in CS; use second top				
Rota globotruncanoides	/fp	30	25	
Rota cushmani	/fp	198	480	
Rota gandolfi	/fp	30	208	
Rota greenhornensis	/fp	205	225	
Rota reicheli	/fp	198	220	
Whit archaeocretacea	/fp	*	538	
*base @ 360 too low				
Whit paradubia	/fp	392	490	
Merlingina cretacea	/fb	13	13	
Nezzazata simplex	/fb	1	13	
Orbitolina conica	/fb	16	39	
*Praealveolina iberica	/fb	410	410	
*id in Fig. 11.1; too hi, reworked?				

*END

MIDK.33 - Flamicell Section, Pyrenees
 Flamicell section, Pyrenees, Spain. Caus et al., 1993, Cretaceous Research 14:531-551, Fig. 5;

Foram id's by Caus.

Top Santa Fe Limestone @ 24 m; base is unconformity with Jur-L. Cretaceous top of section in Pardina Ls. @ 31 m; boundary of Santa Fe & Sant Gervais cycles @ 11 m.

Data:

*Taxa	Base m	Top m	
Dica hagni	/fp	24.5	29
Hete delrioensis	/fp	24.5	24.5
Hete planispira	/fp	29	29
Helv'ana helvetica	/fp	24.5	25
Helv'ana praehelvetica	/fp	24.5	25
Marginotruncana marginata	/fp	30	30
Marginotruncana pseudolinneiana	/fp	30	30
Marginotruncana schneegansi	/fp	30	30
Marginotruncana sigali	/fp	30	30
Whit archaeocretacea	/fp	24.5	29
Biconcava bentori	/fb	12	12
Merlingina cretacea	/fb	12	12
Ovalveolina crassa	/fb	8	12.5
Ovalveolina ovum	/fb	8	19.5
Praealveolina cretacea	/fb	14	22.5
Praealveolina iberica	/fb	1	6.5
Praealveolina simplex	/fb	13	16

*END

MIDK.34 - Montsec Section, Pyrenees

Montsec section, Pyrenees, Spain. Caus et al., 1993, Cretaceous Research 14:531-551, Fig. 4; Foram id's by Caus.

Top Santa Fe Limestone @ 20 m; base unconformity with Jur/L. Cretaceous; top of section in Pardina Ls. @ 62 m; boundary of Santa Fe & Sant Gervais cycles @ 11 m.

Data:

*Taxa	Base m	Top m	
Carbon peak OAE 2	/gc	19.5	20
Dica hagni	/fp	22	25
Hete delrioensis	/fp	22	25
Helv'ana helvetica	/fp	22	22
Helv'ana praehelvetica	/fp	22	22
Marginotruncana marginata	/fp	46	46
Marginotruncana sigali	/fp	*	34
Whit archaeocretacea	/fp	22	22
Cuneolina pavonia	/fb	1	19
Charentia cuvillieri	/fb	1	10
Daxia cenomana	/fb	4	4
Orbitolina conica	/fb	1	2
Ovalveolina ovum	/fb	15	19
Praealveolina cretacea	/fb	4	19
Praealveolina simplex	/fb	15	19

*END

MIDK.35 - Peace River Composite, Canada

Peace River Composite, Canada. Albian data: C. Singh, 1971, Lower Cretaceous microfloras of the Peace River Area, northwestern Alberta: Research Council Alberta, Bull. 28, v. 1, 299 p.

Cenomanian data: 1983, Cenomanian microfloras...: Alberta Research Council Bull. 44.

1975, Stratigraphic significance or early angiosperm pollen...: Geol. Assoc. Canada, Spec. Paper No. 13, p. 365-389. Ranges changed to accomodate taxonomic changes from Singh 71 to 83, Appendix A

Top of section at 1755 ft = 348.5+186.5m;

Base Lower Kaskapau Fm. at 1478' = 264+186.5m

Base Dunvegan Fm. at 1005'= 119.5+186.5m
 Base Upper Shaftesbury Fm. at 612'= 0m in 1983 composited section
 Fish Scale Formation at 607-612'(185-186.5m); Alb/Cen boundary
 Base Lower Shaftesbury Fm. unconformity at 307'
 Base Paddy Mbr at 249'
 Base Cadotte Mbr at 182'
 Base Harmon Mbr at 156'
 Base Peace River Fm., Notikewin Mbr at 131'
 Base of section in Loon River Fm at 0'
 Range adjustments Aug, 2002 because some tops extended greatly.

Data:

*Taxa	Morph	Base	Top ft
Alterbidinium daveyi	/dn	1463	1471
Aptea polymorpha	/dn	1	682
Apteodinium reticulatum	/dn	316	678
Batioladinium jaegeri	/dn	162	682
*Broomea jaegeri, Singh 71 & Imbatodinium jaegeri, Singh 83; single top @ 1256			
Bourkidinium psilatatum	/dn	643	682
Canninginopsis colliveri	/dn	180	494
*Carpodinium granulatum	/dn	666	1236.6; 2 single specimen raise top
Chlamydothorella nyei	/dn	1	1270
*Clei polypes = Bacchidinium polypes in Singh 71 /dn 170 494			
Circulodinium distinctum	/dn	66	1466 *ID as Cycl.
Cometodinium whitei	/dn	46	1365
Coronifera oceanica	/dn	643	682
Crassosphaera bella	/dn	316	682
Crassosphaera papillata	/dn	613	666
Cribroperidinium edwardsii	/dn	316	678
Cribroperidinium exilicristatum	/dn	1245	1466
Cribroperidinium intricatum	/dn	643	1463
Cyclonephelium vannophorum	/dn	643	1471
Dingodinium cerviculum	/dn	175	666
*(highest top single occurrence at 1237')			
Downiesphaeridium multispinosum	/dn	1	1270
*=Clei multispinosum & Baltisphaeridium multispinosum			
Endoscrinium campanula	/dn	161	1270
*ID as Scri campanulum 161 322			
Exochosphaeridium phragmites	/dn	1364.5	*
Florentinia laciniata	/dn	308	1269
*= Hyst. ferox in Singh 71			
Florentinia cooksoniae	/dn	316	1256
*=Hyst. cooksoni Singh 71			
Florentinia resex	/dn	661	682
Florentinia verdieri	/dn	*	1466
Gardodinium trabeculosum	/dn	26	1288
*=Gardodinium eisenacki in Singh 71			
Ginginodinium evittii	/dn	643	682
Kleithriasphaeridium loffrense	/dn	76	1463
*=Hyst. stellatum in Singh 71			
Kiokansium perprolatum	/dn	*	1364.5
Kiokansium polypes	/dn	170	1463
*ID as Bacchidinium polypes			
Leberidocysta chlamydata	/dn	167	643
Leberidocysta defloccata	/dn	643	677
Lecaniella foveata	/dn	251	1471
Leiofusa jurassica	/dn	167	1471
Litosphaeridium arundum	/dn	170	170
*=Hyst. arundum in Singh 71; top at 1463 a single specimen			
Luxadinium propatulium	/dn	322	682
*=Scrinodinium eurypylum in Singh 71			

Micrhystridium inconspicuum	/dn	643	1463	
Micrhystridium stellatum	/dn	161	1270	
Muderongia asymmetrica	/dn	1228	1237	
Odontochitina costata	/dn	179	1463	
* = O. striatoperforata in Singh 71				
Odontochitina operculata	/dn	1	1465	
Odontochitina singhii	/dn	643	682	
* (highest occurrence a single specimen at 1269'; will raise top in CS)				
Oligosphaeridium complex	/dn	162	1462	
Oligosphaeridium prolixispinosum	/dn	167	484	
Oligosphaeridium pulcherrimum	/dn	1	1466	
Oligosphaeridium tenuiprocessum	/dn	608	666	
* = Hyst. recurvatum in Singh 71				
Oligosphaeridium totum	/dn	316	678	
* = Olig. diastema in Singh 71				
Ovoidinium verrucosum	/dn	571	682	
* = Ascodinium verrucosum in Singh 71				
Palaeohystrichophora infusorioides	/dn	1364.5	1466	
Palaeoperidinium cretaceum	/dn	66	1267	
Pareodinia ceratophora	/dn	162	682	*top at 1179 single specimen
Pervosphaeridium pseudhystrichodinium	/dn	1256		* *ID as Exoc.
Pseudoceratium expolitum	/dn	162	677	
* = Pseudoceratium regium in Singh 71				
Pterodinium cornutum	/dn	161	161	*single specimen at 1270'
Pterospermella aureolata	/dn	179	678	
* in 71 Singh used Pterspermopsis in place of Pterospermella				
Pterospermella australiensis	/dn	36	1271	
Pterospermella eurypteris	/dn	161	678	
Pterospermella harti	/dn	16	16	
*single specimen at 1463', use base				
Pterodinium cingulatum	/dn	1	1270	
* = Hyst. cingulata in Sing 71				
Spiniferites ramosus gracilis	/dn	170	1257	
Spiniferites twistringiensis	/dn	170	1206	
*ID as Spin ramosus multibrevis				
Spiniferites ramosus ramosus	/dn	16	1466	
Spiniferites scabrosus	/dn	46	1237	
* = Hyst. scabrosa in Singh 71				
Spiniferites vestitum	/dn	238	1466	
* = Deflandrea limpida in Singh 71				
Stephodinium coronatum	/dn	*	682	
Stiphrosphaeridium anthophorum	/dn	316	1465	*ID as Oligosphaeridium
*Subtilisphaera deformans		*	1256;	rare occurrence
Tanyosphaeridium salpinx	/dn	157	683	
* = Tanyosphaeridium sp. in Singh 71				
Trichodinium castanea	/dn	666	*	
Veryhachium collectum	/dn	180	678	
Veryhachium lairdi	/dn	162	1466	
Veryhachium reductum	/dn	26	1471	
Veryhachium rhomboidium	/dn	16	1270	
Wallodinium anglicum	/dn	643	1463	
Wrevittia cassidata	/dn	308	308	*ID as Gony.
Ascostomocystis gigantea	/ac	677	682	
Fromea amphora	/ac	1	1288	
Fromea fragilis	/ac	316	678	
* = Palaeostomocystis fragilis in Singh 71				
Fromea glabella	/ac	464	1245	
* = Palaeostomocystis glabella in Singh 71				
Appendicisporites unicus	/sp	1	464	
Artiopollis indivisus	/sp	1356	*	
Cicatricosisporites crassiterminatus	/sp	1205	1463	
Clavatipollenites hughesii	/sp	1174	1445	
Nyssapollenites albertensis	/sp	666	677	

Tricolpites micromunus /sp 1164 1445
 *added only key pollen either already in CS or used by Singh as important bases)
 *END

MIDK.36 - Anderson Husky Roros, Canada

Anderson Husky Roros well, 10-35-45-2W4, Alberta, Canada. Schroder-Adams et al., 1996, Cret. Research, 17:311-365.

Lithostrat contacts in core: Second White Specks Fm. top/base 411-422 m; Belle Fourche Fm. top/base 422-442.7 m; Fish Scales Fm. top/base 442.7-445 m; Westgate Fm. top 445 m.

Data:

*Taxa	Morph	Base	Top m
Alterbidinium daveyi	/dn	-478	-417
Apteodinium granulatum	/dn	-498	-428
Apteodinium reticulatum	/dn	-488	-433
Batioladinium jaegeri	/dn	-498	-453
Bourkidinium psilatum	/dn	-473	-473
Chatangiella ditissima	/dn	-408	*
Chatangiella granulifera	/dn	-412	-408
Chichaouadinium vestitum	/dn	-498	-453
Chlamydophorella nyei	/dn	-443	-410
Circulodinium distinctum	/dn	-498	-408
Cribroperidinium edwardsii	/dn	-498	-443
Cribroperidinium exilicristatum	/dn	-498	-408
Cribroperidinium intricatum	/dn	-498	-410
Cyclonephelium vannophorum	/dn	-498	-413
Dingodinium cerviculum	/dn	-468	-453
Dinopterygium cladoides	/dn	-417	-413
Dorocysta litotes	/dn	-413	*
Ellipsodinium imperfectum	/dn	-498	-488
Endoscrinium campanula	/dn	-458	-453
Eurydinium glomeratum	/dn	-417	-408
Florentinia cooksoniae	/dn	-488	-408
Florentinia verdieri	/dn	-417	*
Gardodinium trabeculosum	/dn	-498	-483
Ginginodinium evittii	/dn	-498	-443
Heterosphaeridium difficile	/dn	-417	-408
Hystrichodinium pulchrum	/dn	-473	*
Isabelidinium globosum	/dn	-413.5	-408
Isabelidinium magnum	/dn	-417	-408
Kallosphaeridium ringnesiorum	/dn	-463	-408
Leberidocysta defloccata	/dn	-473	-408
Leptodinium episomum	/dn	-498	-473
Luxadinium propatulum	/dn	-498	-453
Odontochitina costata	/dn	-417	-408
Odontochitina operculata	/dn	-498	-408
Odontochitina singhii	/dn	-488	-443
Oligosphaeridium complex	/dn	-498	-408
Oligosphaeridium pulcherrimum	/dn	-478	-428
Oligosphaeridium totum	/dn	-498	-453
Ovoidinium verrucosum	/dn	-458	-428
Palaeohystrichophora infusorioides	/dn	-453	-411
Palaeoperidinium cretaceum	/dn	-498	-453
Pseudoceratium eisenackii	/dn	-498	-443
Pseudoceratium expolitum	/dn	-498	-453
Stephodinium australicum	/dn	-488	-417
Surculosphaeridium longifurcatum	/dn	-417	-408
Tanyosphaeridium variecalamus	/dn	-493	-417
Trichodinium spinosum	/dn	-458	-443
Trithyrodinium dubium	/dn	-417	-408
Trithyrodinium suspectum	/dn	-414	-408

Trigonopyxidida ginella	/dn	-411	-410
Catastomocystis spinosa	/sp	-468	-453
Ascostomocystis gigantea	/ac	-463	-463
Ascostomocystis maxima	/ac	-473	-468
Fromea amphora	/ac	-488	-408
Fromea fragilis	/ac	-498	-408
Hedb amabilis	/fp	-417	-411.8
Hedb delrioensis	/fp	-417	-411
Hedb loetterlei	/fp	-417	-411.8
Hedb planispira	/fp	-414	-412.7
Hedb portsdownensis	/fp	-414	-412.7
Hete globulosa	/fp	-417	-411.8
Whit aprica	/fp	-414	-411.8
Ammobaculites petilus	/fb	-474.4	-474.4
Haplophragmoides gilberti	/fb	-496.4	-496.4
Haplophragmoides howardense	/fb	-476.4	-448.3
Haplophragmoides kirki	/fb	-456.4	-456.4
Miliammina ischnia	/fb	-460.4	-460.4
Miliammina manitobensis	/fb	-498.4	-448.3
Reophax minuta	/fb	-492.5	-456.4
Saccamina alexanderi	/fb	-498.4	-454.4
Trochammina depressa	/fb	-462.4	-462.4
Trochammina rutherfordi	/fb	-462.4	-460.4
Trochammina wetteri	/fb	-456.4	-456.4
Verneuillina canadensis	/fb	-498.4	-448.3

*many new taxa yet could be added

Ahmuellerella octoradiata	/nn	-417	-411
Arkhangelskiella cymbiformis	/nn	-417	-414
Biscutum constans	/nn	-417	-411
Braarudosphaera bigelowii	/nn	*	-411
Chiastozygus plicatus	/nn	-417	-411
Corollithion exiguum	/nn	-417	*
Corollithion signum	/nn	-417	-411
Cretarhabdus conicus	/nn	-417	-412
Cribrosphaerella ehrenbergii	/nn	-417	-412
Eiffellithus eximius	/nn	-417	-411
Eiffellithus turriseiffelii	/nn	-417	-411
Helicolithus trabeculatus	/nn	-417	-412
Lithastrinus floralis	/nn	-417	-411
Lithraphidites carniolensis	/nn	-417	-411
Markalius circumradiatus	/nn	-412	-411
Microrhabdulus decoratus	/nn	*	-413
Micula decussata	/nn	-417	-411
Parhabdolithus angustus	/nn	-417	-412
Prediscosphaera cretacea	/nn	-417	-411
Prediscosphaera spinosa	/nn	-417	-411
Rotelapillus laffittei	/nn	-417	-411
Stradneria crenulata	/nn	-417	-412
Watznaueria barnesae	/nn	-417	-411

*several additional taxa new to the data set could be added

*END

MIDK.37 - Type Shell Creek Fm., Wyoming

Type Shell Creek Fm., Sheep Mountain, Big Horn County, Wyoming.

Section measured by Eicher, 1960; reports *Neogastrolites haasi* 160 & 187 ft above base Shell Creek Fm. Palynology by J. Stein, 1995, unpubl., forams by M. J. Evitts; Radiometric dates by Obradovich, 1993, Geol. Assoc. Canada SP 39, p. 379-396.

Base Cody Fm. at 2205'; Base Frontier Fm. at 1520'; Base Mowry Fm. at 1270'; Base Shell Creek Fm. at 1010'; Base Muddy/Thermopolis Fm. at about 580'. Merewether et al., 1975, 27th Annual Field Conf., Wyoming Geological Assoc., p. 73-84 shows base of Cody near Turonian/Coniacian boundary.

Data:

*Taxa	Morph	Base	Top(ft)	
Marker bed Clay Spur bentonite	/mb	1520	*	
*dated at 97.17+-0.69 Ma by Obradovich (1993, p. 385, Geol. Assoc. Canada SP 39)				
Aptea polymorpha	/dn	1070	1590	*=Pseudoceratium
Apteodinium deflandrei	/dn	2425	3045	
Alisogymnium euclaense	/dn	3015	*	
Alterbidinium acutulum	/dn	2895	3045	
Alterbidinium montanaense	/dn	2395	3045	
Apteodinium grande	/dn	910	1841	
Apteodinium perforata	/dn	880	1590	
Batioladinium jaegeri	/dn	880	1550	
Chatangiella ditissima	/dn	2395	3045	
Chatangiella spectabilis	/dn	2395	3045	
Chatangiella verrucosa	/dn	2395	3045	
Chichaouadinium vestitum	/dn	860	1975	
Circulodinium brevispinosum	/dn	1420	3015	
Cribroperidinium edwardsii	/dn	900	2204.9	
Cribroperidinium exilicristatum	/dn	890	1570	
Dapsilidinium laminaspinosum	/dn	934	1550	
Dingodinium albertii	/dn	1410	2204.9	*id as Coronifera
Dingodinium cerviculum	/dn	1070	1240	
Dinogymnium acuminatum	/dn	2455	3045	
Elytrocysta druggii	/dn	2395	3045	
Elytrocysta circulata	/dn	2455	*	
Florentinia deanei	/dn	2205	3045	
Florentinia laciniata	/dn	1210	1590	
Florentinia mantellii	/dn	1420	*	*id as cf.
Gingodinium evittii	/dn	1130	1590	
Hystrichosphaeridium bowerbankii	/dn	1841	3045	
Heterosphaeridium difficile	/dn	2395	3045	*ID as Hyst.
Isabelidinium magnum	/dn	2205	2695	
Kiokansium unituberculatum	/dn	880	2004.9	
Kleithriasphaeridium loffrense	/dn	1240	3045	
Litosphaeridium conispinum	/dn	1130	1240	
Litosphaeridium siphoniphorum	/dn	1250	2204.9	
Luxadinium primulum	/dn	1300	1938	
Luxadinium propatulum	/dn	1020	1420	
Microdinium ornatum	/dn	2895	3045	
Muderongia asymmetrica	/dn	721	1590	
Odontochitina singhii	/dn	1210	1610	
Oligosphaeridium tenuiprocesum	/dn	1300	1440	
Oligosphaeridium totum	/dn	820	1841	
Oligosphaeridium totum minus	/dn	860	1500	
Oligosphaeridium verrucosum	/dn	1279	1841	
Oligosphaeridium albertense	/dn	1370	2204.9	
Palaeohystrichophora infusorioides	/dn	1279	3045	
Palaeotetradinium silicorum	/dn	2425	3045	
Pareodinia ceratophora	/dn	840	900	
Prolixosphaeridium conulum	/dn	880	2204.9	
Psalignonyaulax deflandrei	/dn	880	910	
Pseudoceratium anaphrisum	/dn	880	1500	*ID as cf.
Pseudoceratium expolitum	/dn	588.5	1590	
Senoniasphaera microreticulata	/dn	2955	3045	
Sepispinula huguoniotii	/dn	*	2204.9	*ID as Clei
Subtilisphaera cheit	/dn	1279	2450	
Subtilisphaera deformans	/dn	910	1300	
Trigonopyxidina ginella	/dn	2395	2955	
Trithyrodinium vermiculatum	/dn	2205	3045	
Fromea amphora	/ac	721	1030	*ID as sp.
Appendicisporites unicus	/sp	900	1841	*id as cf.
Appendicisporites tricornitatus	/sp	1110	*	
Appendicisporites undosus	/sp	1530	1841	

Acanthotriletes varispinosus	/sp	2695	3045	
Chomotriletes almagrensis	/sp	588.5	*	
Distaltriangulisporites perplexus	/sp	920	2204.9	
Januasporites spiniferus	/sp	588.5	860	
Klukisporites pseudoreticulatus	/sp	588.5	2004.9	
Lophozotriletes intraverrucatus	/sp	588.5	1985	
Lycopodiumsporites marginatus	/sp	920	*	
Perinopollenites elatoides	/sp	635	920	*ID as cf.
Pilosisorites trichopappilosus	/sp	588.5	1130	
Pilosisorites verus	/sp	588.5	1530	
Retitriletes annulatus	/sp	1985	*	
Rugubivesiculites rugosus	/sp	920	2455	
Sphagnum australe	/sp	1500	3045	
Taurocusporites segmentatus	/sp	624.5	2204.9	
Taurocusporites spackmani	/sp	920	1010	
Tigrisporites reticulatus	/sp	880	1590	
Trilobosporites apiverrucatus	/sp	624.5	1050	
Trilobosporites marylandensis	/sp	900	1040	
Ammobaculites euides	/fb	880	880	
Gaudryina bentonensis	/fb	2395	2395	
Gaudryina nebrascensis	/fb	2745	2745	
Gavelinella kansasensis	/fb	2450	2595	
Haplophragmoides rota	/fb	2205	2985	
Lenticulina kansasensis	/fb	2745	2985	
Miliammina ischnia	/fb	1033	1246	
Miliammina manitobensis	/fb	1033	1260	
Neobulimina albertensis	/fb	2450	2455	
Trochammina mellariolum	/fb	1965	1965	
Valvulineria plummerae	/fb	2745	2985	
Verneuilina canadensis	/fb	1033	1610	
Verneuilinoides hectori	/fb	1196	1260	
Archaeoglobigerina cretacea	/fp	2450	2495	
Hete globulosa	/fp	2450	2495	
Hete pulchra	/fp	2495	2495	
*more forams not now in CS were identified and could be added				
Marginotruncana marginata	/fp	2450	2595	
Myti costellatus	/bi	2870	*	
Pycnodonte aucella	/bi	2205.5	*	
Baculites codyensis	/am	2870	*	
Neogastrolites haasi	/am	1170	1187	
*reported by Eicher (1960, p. 27) @ 160-187' above base Shell Creek nearby				
*dated at 98.54+-0.70 Ma by Obradovich (1993, p. 383, 385, GACanada SP 39)				
Scaphites ventricosus	/am	2830	*	
*END				

MIDK.38 - Ida ou Tanane, Morocco

Ida ou Tanane Outcrop, SW Morocco. Composited sections north of Agadir, circa 30° 35'N, 9° 40'W. R. Below, 1981, *Palaontographica* Abt. B, Bd. 176, Lfg. 1-4, p. 1-145, Abb. 87, 88; and 1982, *Palaontographica* Abt. B, Bd. 182, Lfg. 1-3, p. 1-51, figs. 10, 11. Sample spacing in meters from composited measured sections EB + IAA + IAB + E + IAB(top) + KV;

Data:

*TAXA	Morph	Base	Top	Meters
Apteodinium granulatum	/dn	121	286	
Aptea polymorpha	/dn	129	144.5	
Callaiosphaeridium asymmetricum	/dn	130.5	144.5	
Canninginopsis colliveri	/dn	0.5	9	
Canningia reticulata	/dn	129.6	129.6	
Cassiculosphaeridia reticulata	/dn	14	14	
Chlamyphorella nyei	/dn	137	579	
Circulodinium attadalicum	/dn	9	137	*ID as Cycl.

Circulodinium distinctum	/dn	0.5	569	
Cribroperidinium cooksoniae	/dn	0.5	573	
Cribroperidinium edwardsii	/dn	0.5	256	
Cribroperidinium muderongense	/dn	0.5	51	*ID as Crib diaphanum
Cribroperidinium orthoceras	/dn	0.5	190	
Cribroperidinium tensiftense	/dn	207	385	
Cribroperidinium tenuiceras	/dn	129	140	*ID as Occicysta
Cyclonephelium brevispinatum	/dn	0.5	573	
Cyclonephelium chabaca	/dn	565	579	
Cyclonephelium maugaad	/dn	0.5	144.5	
Cyclonephelium paucimarginatum	/dn	190	573	
Cyclonephelium paucispinum	/dn	222	569	
Cyclonephelium vannophorum	/dn	222	573	
Danea chibanis	/dn	131	144.5	
Diconodinium pusillum	/dn	207	232	
Dingodinium albertii	/dn	0.5	129.6	
Dingodinium globulum	/dn	0.5	266	
Ellipsodinium imperfectum	/dn	190	266	
Elytrocysta circulata	/dn	244	286	
Endoscrinium campanula	/dn	0.5	579	
Lithodinia pertusa heta	/dn	0.5	24	
*ID of next 3 taxa as Meiorugony.				
Lithodinia pertusa pertusa	/dn	0.5	121	
Lithodinia stoveri	/dn	0.5	137	
Maghrebinia chleuh	/dn	565	579	
Maghrebinia perforata	/dn	557	579	
Muderongia perforata	/dn	207	379	
Muderongia staurota	/dn	0.5	51	
Occisucysta tentorium	/dn	9	131	
Odontochitina alata	/dn	557	579	*id as cf.
Odontochitina operculata	/dn	121	579	
Odontochitina tuberculata	/dn	133	579	
Palaeohystrichophora infusorioides	/dn	565	579	
Palaeoperidinium cretaceum	/dn	121	475	
Protoellipsodinium seghire	/dn	129.6	144.5	
Protoellipsodinium spinosum	/dn	131	134.8	
Protoellipsodinium touile	/dn	14	*	
*allocated to subspecies mugatais				
Pseudoceratium anaphrisum	/dn	0.5	*	*ID as Aptea
Pseudoceratium eisenackii	/dn	138	579	*ID as Aptea
Pseudoceratium pelliiferum	/dn	0.5	31	
Rhynchodiniopsis aptiana	/dn	0.5	121	
Stanfordella cretacea	/dn	14	137	*ID as Gony.
Stanfordella fastigata	/dn	14	*	*ID as Gony.
Subtilisphaera cheit	/dn	286	579	
Subtilisphaera senegalensis	/dn	0.5	579	
Subtilisphaera zawia	/dn	232	295	
Tehamadinium coummia	/dn	190	385	
Tehamadinium sousense	/dn	130	144.5	
Tenua aucda	/dn	70	121	*ID as Cerbia
Tenua hystrix	/dn	70	*	
*ID as Cerbia tabulata top at 138				
Tenua hystrix	/dn	*	379	
*ID as Cycl. = C. tabulata				
Trichodinium castanea	/dn	129.6	579	
Valensiella tazadensis	/dn	14	144.5	*ID as Cassic.
Wallodinium krutzschii	/dn	0.5	142	
Wrevittia cassidata	/dn	579	*	*ID as Gony.
Wrevittia helicoidea	/dn	121	146	*ID as Gony.
Xenascus plotei	/dn	190	573	
Fromea amphora	/ac	140	369	
*1982 data, figs. 10, 11				
Achomosphaera verdieri	/dn	0.5	385	

Cometodinium whitei	/dn	0.5	277		
Coronifera oceanica	/dn	266	572		
Coronifera tubulosa	/dn	222	379		
Florentinia resex	/dn	132	579		
Florentinia radiculata	/dn	222	519		
Florentinia stellata	/dn	131	379		
Heterosphaeridium heteracanthum	/dn	0.5	138		
Kiokansium hydra	/dn	0.5	144.5		
Kleithriasphaeridium eoinodes	/dn	207	573		
Litosphaeridium siphoniphorum	/dn	519	565		
Oligosphaeridium complex	/dn	0.5	579		
Oligosphaeridium djenn	/dn	207	486		
*Oligosphaeridium irregulare =O. albertense	/dn	0.5	573		
Oligosphaeridium poculum	/dn	286	557		
Oligosphaeridium pulcherrimum	/dn	0.5	569		
Oligosphaeridium totum minus	/dn	190	369		
Oligosphaeridium totum	/dn	286	*		
Oligosphaeridium albertense	/dn	0.5	573	*range = 232	295 m
Operculodinium hirsutum	/dn	190	579		
Stiphrosphaeridium anthophorum	/dn	286	*	*ID as Poly.	
Prolixosphaeridium parvispinum	/dn	190	277		
Spiniferites ancoriferus	/dn	190	519		
Spiniferites hyperacanthus	/dn	244	369		
Spiniferites lenzi	/dn	190	579		
Tanyosphaeridium regulare	/dn	244	579		

*Stage tops based on megafossil studies by Weidmann et al., 1978, Geol Rundschau, 67:454-508 and unpublished microfossil studies by Dr. Butt, Univeristy of Tuebingen.

*Top Albian	/ma	549	569		
*Top Aptian	/ma	*	195		
*Top Barremian	/ma	*	95		
*Top Hauterivian	/ma	40	50		

*BASED ON TEXT STATEMENT; CHART SHOWS IT BETWEEN 45-58 M.
*additional new taxa to be loaded if needed

*END

MIDK.39 - Chichaoua I, Morocco

Chichaoua I Section, NW Morocco. Borehole north of Agadir, circa 31° 30'N, 9° W. R. Below, 1981, Palaeontographica Abt. B, Bd. 176, Lfg. 1-4, p. 1-145; 1982, Palaontographic Abt. B, Bd. 182, Lfg. 1-3, p. 1-51. Samples in meters from depth of 300 m up to 100 m as if it were an outcrop; base of Cenomanian limestone at 198 m above base; marl/shale from 198 to 79 m; sandstone from 79 to 0 m.

Data:

*TAXA	Morph	Base	Top Meters	
				*1981 Data Abb. 89, p. 105
Apteodinium maculatum	/dn	27.5	176	
Canningia reticulata	/dn	90.5	176	
Chichaouadinium arabicum	/dn	154	154	
Chlamydophorella discreta	/dn	93	176	
Chlamydophorella nyei	/dn	90.5	191	
Circulodinium attadalicum	/dn	109	109	*ID as Cyclo.
Circulodinium distinctum	/dn	27.5	164	
Cribooperidinium edwardsii	/dn	118	137	
Cribooperidinium muderongense	/dn	27.5	27.5	*ID as diaphanum
Cribooperidinium tensiftense	/dn	93	191	
Cyclonephelium brevispinatum	/dn	27.5	140	
Cyclonephelium chabaca	/dn	154	154	
Cyclonephelium maugaad	/dn	90.5	191	
Cyclonephelium paucimarginatum	/dn	166	180.5	
Cyclonephelium paucispinum	/dn	112	191	
Cyclonephelium vannophorum	/dn	180.5	191	
Diconodinium pusillum	/dn	157	157	

Dingodinium albertii	/dn	110	110	
Dingodinium globulum	/dn	90.5	191	
Endoscrinium bessebae	/dn	90.5	27.5	
Hystrichodinium compactum	/dn	27.5	27.5	
Kallosphaeridium helbyi	/dn	90.5	150	
*ID as Cann minor				
Lithodinia pertusa heta	/dn	27.5	27.5	
*ID of next 3 taxa as Meiourgony.				
Lithodinia pertusa pertusa	/dn	93	93	
Lithodinia stoveri	/dn	90.5	109	
Muderongia perforata	/dn	115	191	
Muderongia staurota	/dn	27.5	27.5	
Odontochitina operculata	/dn	90.5	191	
Palaeoperidinium cretaceum	/dn	90.5	191	
Pseudoceratium eisenackii	/dn	129.5	129.5	*ID as Aptea
Pseudoceratium pelliiferum	/dn	27.5	27.5	
Pterodinium cornutum	/dn	90.5	137	
Pterodinium premmun	/dn	90.5	90.5	
Stanfordella cretacea	/dn	118	121	*ID as Gony.
Stanfordella fastigata	/dn	112	112	*ID as Gony.
Subtilisphaera cheit	/dn	191	191	
Subtilisphaera senegalensis	/dn	27.5	170.5	
Subtilisphaera zawia	/dn	154	154	
Tehamadinium coummia	/dn	140	191	
Tenua aucda	/dn	90.5	90.5	*ID as Cerbia
Tenua hystrix	/dn	90.5	*	*ID as Cerbia tabulata
Tenua hystrix	/dn	*	166	
*ID as Cycl. base at 93 = C. tabulata				
Trichodinium castanea	/dn	27.5	27.5	
Wallodinium krutzschii	/dn	109	109	
Wrevittia helicoides	/dn	137	180.5	*ID as Gony.
Xenascus plotei	/dn	115	180.5	
Fromea amphora	/ac	191	191	
*1982 data, Fig. 12, p. 40				
Achomosphaera verdieri	/dn	27.5	180.5	
Coronifera oceanica	/dn	90.5	191	
Coronifera tubulosa	/dn	145	145	
Downiesphaeridium flexuosum	/dn	90.5	90.5	*ID as Poly.
Florentinia radiculata	/dn	90.5	191	
Florentinia stellata	/dn	180.5	180.5	
Heterosphaeridium heteracanthum	/dn	27.5	27.5	
Kiokansium hydra	/dn	27.5	176	
Kleithriasphaeridium eoinodes	/dn	27.5	191	
Oligosphaeridium albertense	/dn	90.5	191	*single occurrence at 115m
Oligosphaeridium asterigerum	/dn	90.5	154	
Oligosphaeridium complex	/dn	27.5	191	
Oligosphaeridium dictyophorum	/dn	27.5	27.5	
Oligosphaeridium djenn	/dn	115	180.5	
*Oligosphaeridium irregulare=O. albertense	/dn	90.5	191	
Oligosphaeridium poculum	/dn	115	180.5	
Oligosphaeridium pulcherrimum	/dn	27.5	145	
Oligosphaeridium totum minus	/dn	154	154	
Operculodinium hirsutum	/dn	27.5	180.5	
Pervosphaeridium truncatum	/dn	27.5	154	
Prolixosphaeridium parvispinum	/dn	90.5	154	
Spiniferites ancoriferus	/dn	90.5	191	
Spiniferites hyperacanthus	/dn	154	154	
Spiniferites lenzi	/dn	90.5	191	
Stiphrosphaeridium anthophorum	/dn	27.5	27.5	*ID as Poly.
Systematophora silybum	/dn	27.5	27.5	
Tanyosphaeridium regulare	/dn	121	180.5	
*END				

MIDK.40 - Timinoun, Morocco

Timinoun Section, NW Morocco. Outcrop east of Agadir, circa 30° 40'N, 9° W.

R. Below, 1981, Palaeontographica Abt. B, Bd. 176, Lfg. 1-4, p. 1-145, 1982, Palaeontographica Abt. B, Bd. 182, Lfg. 1-3, p. 1-51. Top of limestone unit at 101 m; calcareous sandstone from 101 to 139 m; limestone to 160 m; calcareous sandstone from 160 to 240 m.

Data:

*TAXA	Morph	Base	Top Meters	
				*1981 Data Abb. 89, p. 105
Apteodinium maculatum	/dn	195	*	
Aptea polymorpha	/dn	143.5	202.5	
Canninginopsis colliveri	/dn	146	165	
Chlamydochorella nyei	/dn	146	202.5	
Circulodinium attadalicum	/dn	146	178	*ID as Cycl.
Circulodinium distinctum	/dn	150	214	
Cribroperidinium cooksoniae	/dn	149	162	
Cribroperidinium edwardsii	/dn	146	162	
Cribroperidinium orthoceras	/dn	146	162	
Cribroperidinium tensiftense	/dn	171	214	
Cribroperidinium tenuiceras	/dn	146	162	*ID as Occicysta
Cyclonephelium chabaca	/dn	146	178	
Cyclonephelium paucimarginatum	/dn	214	*	
Cyclonephelium brevispinatum	/dn	146	202.5	
Cyclonephelium maugaad	/dn	143.5	162	
Cyclonephelium vannophorum	/dn	149	202.5	
Dingodinium globulum	/dn	146	*	
Muderongia perforata	/dn	171	206	
Odontochitina operculata	/dn	143.5	214	
Palaeoperidinium cretaceum	/dn	199	206	
Protoellipsodinium seghire	/dn	146	162	
Protoellipsodinium touile	/dn	146	202.5	*allocated to subspecies mugatais
Pseudoceratium eisenackii	/dn	143.5	202.5	*ID as Aptea
Stanfordella cretacea	/dn	146	*	*ID as Gony.
Subtilisphaera cheit	/dn	199	206	
Subtilisphaera senegalensis	/dn	171	214	
Tehamadinium sousense	/dn	162	*	
*Tenua hystrix	/dn	143.5	171	*ID as Cerbia tabulata
Tenua hystrix	/dn	149	202.5	*ID as Cycl. = C. tabulata
Trichodinium castanea	/dn	162	214	
Valensiella tazadensis	/dn	162	185	*ID as Cassic.
Wrevittia helicoidea	/dn	162	202.5	*ID as Gony.
Xenascus plotei	/dn	185	*	
				*1982 data, Fig. 12, p. 40
Achomosphaera verdieri	/dn	154	214	
Coronifera oceanica	/dn	162	185	
Coronifera tubulosa	/dn	199	214	
Downiesphaeridium flexuosum	/dn	146	171	*ID as Poly.
Florentinia radiculata	/dn	150	185	
Kleithriasphaeridium eoinodes	/dn	171	202.5	
Kiokansium hydra	/dn	146	202.5	
Kiokansium polypes	/dn	162	*	
				*R. Below moved from Cleistosphaeridium to Kiokansium; ID as Bacchidium
Oligosphaeridium asterigerum	/dn	154	202.5	
Oligosphaeridium complex	/dn	143.5	214	
*Oligosphaeridium irregulare = O. albertense	/dn	146	206	
Oligosphaeridium poculum	/dn	150	*	
Oligosphaeridium pulcherrimum	/dn	150	206	
Oligosphaeridium totum minus	/dn	148	202.5	
Oligosphaeridium albertense	/dn	146	214	
Operculodinium hirsutum	/dn	143.5	202.5	
Pervosphaeridium truncatum	/dn	171	214	

<i>Prolixosphaeridium parvispinum</i>	/dn	143.5	185
<i>Spiniferites ancoriferus</i>	/dn	143.5	202.5
<i>Spiniferites hyperacanthus</i>	/dn	146	162
<i>Spiniferites lenzi</i>	/dn	146	202.5
<i>Tanyosphaeridium regulare</i>	/dn	146	214

*END

MIDK.400 - Wadi Bani Kharus, Oman

Wadi Bani Kharus, Oman. Immenhauser et al., 1999, J. Sed. Research, 69:434-446; Section measured 6-11-96. Published measurements begin at 0 m at Shuaiba/Nahr Umr contact; so 10 m added to begin section in Shuaiba Fm.

Data:

*TAXA		BASE	TOP	meters
*Marker bed hardgrounds at base of depositional sequences; Fig. 7				
Marker bed HG-1	/mb		10	19.9
*top of Shuaiba/base Nahr Umr = 10 m				
Marker bed HG-2	/mb		20	29.9
Marker bed HG-3	/mb		30	50.9
Marker bed Nahr Umr MF-3	/mb		43	*
Marker bed HG-4	/mb		51.0	75.9
Marker bed HG-5	/mb		76.0	88.4
Marker bed HG-6	/mb		88.5	90.4
Marker bed HG-7	/mb		90.5	99.9
Marker bed HG-8	/mb		100.0	101.9
Marker bed HG-9	/mb		102.0	104.4
Marker bed HG-10	/mb		114.5	*
Eoradiolites lyratus	/bi		88.5	88.5
*id in thin section so is questioned				
Hemicyclammina whitei	/fb		91.0	91.0
Orbitolina aperta	/fb		70.0	91.0
Orbitolina subconcava	/fb		31.7	121.5
Orbitolina texana	/fb		10.8	41.5
Permocalculus irenae	/al		15.0	121.5
Knemiceras dubertreti	/am		43	43
*projected in at FG in mfs of Seq 3				
Knemiceras uhligi	/am		79	82
Marker Bed B Nahr Umr SB	/mb		10.0	*
Marker Bed T Nahr Umr	/mb		*	114.5

*END

MIDK.403 - Gorbea section, Northern Spain

Gorbea section, Northern Spain. Section data from Ramirez del Pozo, 1971, Mem. Inst. Geol. y Minero de Espana, Bioestratigrafia y microfacies del Jurásico y Cretácico del Norte de Espana, Tomo 78, Pl. 8. Lithostrat units: Galdames Fm., 0-200m; Tellamendi Fm., 200-340m; Itxina Fm., lower ls., 340-700m; middle shale, 700-795m; upper ls., 795-1010m; Balmeseda Fm., 1010-3600m;

Data:

*TAXA	Morph	Base	Top	(meters)
<i>Choffatella decipiens</i>	/fb	110	110	
<i>Orbitolina lenticularis</i>	/fb	110	110	
<i>Orbitolina subconcava</i>	/fb	1955	1955	
*reported as top of <i>O. texana</i> but too high				
<i>Orbitolina texana</i>	/fb	*	925	
<i>Orbitolina concava</i>	/fb	3300	3300	
<i>Sabaudia minuta</i>	/fb	500	500	

Simplorbitolina manasi	/fb	500	500	
*Hedb amabilis	/fp	2310	2470	
Hedb delrioensis	/fp	3300	3300	
Hedbergella washitensis	/fp	3300	3300	
Tici ticinensis	/fp	3300	3300	
Bacinella irregularis	/al	110	500	
Microcalamoides diversus	/id	500	500	
Chelonicerias gracile	/am	235	235	
Deshayesites deshayesi	/am	110	110	
Douvilleicerias mammillatum	/am	700	700	*ID as sp.
*END				

MIDK.405 Vizcaya, Durango, Spain

Section data from Ramirez del Pozo, 1971, Mem. Inst. Geol. y Minero de Espana, Bioestratigrafia y microfacies del Jurasico y Cretacico del Norte de Espana, Tomo 78, Pl. 8.

Lithostrat units: 1-carb shelf, 0-435 m; 2-carb slope, 435-615m; 2-clastic slope, 615-650m; 3A-clastics, 650-790m; 3B-clastics,790-950m; 3C-clastics, 950-2020m; 3D-clastics, 2020-2150m; 4-shale-slope, 2150-2290m; Durango section. Ixtina Fm., 0-435m; Balmaseda Fm., 435-2290m.

Data:

*TAXA	Morph	Base	Top (meters)	
Coskinolinoides daguini	/fb	110	585	
Cuneolina walteri	/fb	100	335	
Pseudonummoloculina heimi	/fb	240	380	*ID as sp. only
Orbitolina subconcava	/fb	*	2110	
*reported as top of O. texana but too high				
Orbitolina texana	/fb	100	*	
Orbitolinopsis simplex	/fb	30	175	
Sabaudia minuta	/fb	30	380	
Simplorbitolina manasi	/fb	265	370	
Marsonella oxycona	/fb	2310	2470	
Hedb amabilis	/fp	2310	2470	
Hedb washitensis	/fp	2390	2470	
Tici roberti	/fp	2275	2470	
Bacinella irregularis	/al	0	750	
Microcalamoides diversus	/ca	225	500	
*END				

MIDK.406 - Wadi El Assyi, Oman

Wadi El Assyi. Al Hassanat Fm., Oman. Section measured 14-01-99 by A. Immenhauser et al., 2001, Sedimentology v. 48:1187-1207, Figs. 7, 16; measurements begin at 0 m in Al Hassanat Fm., top of section at 186 m.

Data:

*TAXA		BASE	TOP meters	
*Marker bed hardgrounds + base depositional sequences identified with those in Wadi Bani Kharus				
Marker bed HG-1	/mb	0	*	*ID base of section
Marker bed HG-2	/mb	26	*	
Marker bed HG-3	/mb	26	*	*ID as DS-2; 26
Marker bed HG-4	/mb	98	*	*ID as DS-3d; 98
Marker bed HG-5	/mb	124.5	*	
Marker bed HG-6	/mb	170	*	
Marker bed HG-8	/mb	186	*	
Eoradiolites lyratus	/bi	*	131	
*id in thin section so is tentative				
Charentia cuvillieri	/fb	19.5	135.5	
Cuneolina walteri	/fb	13.3	138.3	*ID is species indet.
Nezzazata simplex	/fb	142.3	144.5	

Orbitolina subconcava	/fb	63.5	108.5	
Orbitolina texana	/fb	3.5	93.5	*LO too young 119.5
Peneropolis parvus	/fb	103.5	133.5	
Vercorsella scarselai	/fb	105.5	143.7	* raises LO
		*see Kuss & Conrad, J. Paleo 65:878		
Bacinella irregularis	/al	3.5	143.7	
Cayeuxia piaie	/al	10.5	103.5	
Globochaeta alpina	/al	3.5	66.0	
Pseudolithothamnium album	/al	33.0	160.0	
*END				

MIDK.41 - ODP 641C, Offshore Portugal

ODP 641C North Central Atlantic, 42deg09.3'N, 12deg10.9'W. Bralower et al., 1994, Palaios 9:335-369, figs. 4a, 4b; sea floor @ 4650m; Lithostratigraphy by Boillot et al., 1988, ODP Initial Rpt.; Nannos by Applegate & Bergen, 1988, ODP Initial Rpt., v. 103, p. 293 ff. Nannos reported only by Bralower et al. marked by * & depths where different from ODP Rpt. marked by *. Magnetostratigraphy by Ogg, 1988 ODP Initial Rpt., v. 103, p.659 ff. Carbon by Clauser et al., 1988, ODP Initial Rpt., v. 103, p. 489 ff, Fig. 1. Tremolada et al. 2006, Cret. Res. 27:887-894; no new data added to file.

Data:

*Taxa	Morph	Base	Top (meters)
Magnetostratigraphy CM0R	/mb	-242.7	-239.8
Carbon peak OAE 1b	/gc	-182	-165
Carbon peak OAE 1a	/gc	-210	*
Amphizygus brooksii	/nn	-249.88	-150.9
Axopodorhabdus dietzmannii	/nn	-304.84	-152.11
Biscutum constans	/nn	-304.84	-151.43
Braarudosphaera africana	/nn	*	-151.43
Bukryolithus ambiguus	/nn	-263.86	-151.43
Chiastozygus litterarius	/nn	-264.80	-151.43
*base by Bralower at 253.4			
Chiastozygus platyrhethus	/nn	-260.93	-151.43
Chiastozygus tenuis	/nn	-297.75	-268.36
Conusphaera mexicana	/nn	-304.84	-224.12
Conusphaera rothii	/nn	-302.60	-224.6
*Palaios 94			
Corollithion achylosum	/nn	-249.88	-151.43
*base by Bralower at 237.8			
Corollithion acutum	/nn	-249.88	-232.88
*base by Bralower at 261.5			
Corollithion ellipticum	/nn	-239.66	-232.88
Cretarhabdus conicus	/nn	-304.84	-151.43
Cretarhabdus loriei	/nn	-260.93	-151.43
Cyclagelosphaera margerelii	/nn	-304.84	-209.86
Cylindralithus nudus	/nn	-177.20	-151.43
*ID as Cyclagelosphaera			
Diadorhombus rectus	/nn	-268.36	-232.39
Diazomatolithus lehmanii	/nn	-287.70	-263.86
Discorhabdus ignotus	/nn	-304.84	-151.43
Eprolithus floralis	/nn	-223.67	-151.43
*base by Bralower at 222.7			
Flabellites biforaminiis	/nn	-260.97	-151.43
Flabellites oblonga	/nn	-264.80	-260.93
*base by Bralower at 272.8			
Grantarhabdus coronadventis	/nn	-240.3	-209.13
Grantarhabdus meddii	/nn	-272.77	-152.11
Hayesites albiensis	/nn	-204.28	-151.43
Helenea chiastia	/nn	-304.84	-151.43
Lithraphidites carniolensis	/nn	-304.84	-151.43
Manivitella pemmatoidea	/nn	-304.84	-151.43
Markalius circumradiatus	/nn	-304.84	-172.88

Micrantholithus hoschulzii	/nn	-304.84	-222.31
Micrantholithus obtusus	/nn	-304.84	-222.31
Nannoconus bermudezii	/nn	-268.36	*
Nannoconus bucheri	/nn	-262.31	-223.67
Nannoconus elongatus	/nn	-268.36	-204.05
Nannoconus globulus	/nn	-304.84	-222.31
Nannoconus kamptneri	/nn	-301.01	-223.67
Nannoconus steinmannii	/nn	-304.84	-223.67
Nannoconus truitti	/nn	-204.41	-203.93
Parhabdolithus angustus	/nn	-250.1	-209.13
*in Palaios '94, fig. 4A			
Percivalia fenestrata	/nn	-304.84	-204.41
Pickelhaube furtiva	/nn	-268.36	-207.76
Prediscosphaera columnata	/nn	-204.05	-151.43
Prediscosphaera spinosa	/nn	-172.88	-151.43
Radiolithus planus	/nn	-219.00	-172.88
Rhagodiscus angustus	/nn	-204.28	-151.43
Rhagodiscus asper	/nn	-304.84	-151.43
Rotelapillus laffittei	/nn	-304.84	-152.11
Rucinolithus irregularis	/nn	-248.7	-209.13
*Palaios '94 fig. 4A			
Rucinolithus terebrodentarius	/nn	-304.84	-219.00
*use 2nd top, top @ 203.93 too hi, reworked?			
Tegumentum stradneri	/nn	-279.66	-151.43
Tetrapodorhabdus coptensis	/nn	-302.26	-207.76
*Axopodorhabdus=Tetrapod. decorus	/nn	-210.9	-209.13
Tetrapodorhabdus decorus	/nn	-287.70	-152.11
Tranolithus gabalus	/nn	-239.66	-232.88
Tubodiscus jurapelagicus	/nn	-301.01	-297.75
Vagalapilla matalosa	/nn	-263.86	-151.43
Watznaueria barnesae	/nn	-304.84	-151.43
Watznaueria biporta	/nn	-304.84	-151.43
Watznaueria britannica	/nn	-304.84	-151.43
Zeugrhabdotus embergeri	/nn	-304.84	-151.43
Zeugrhabdotus pseudoangustus	/nn	-279.66	*
Zygodiscus diplogrammus	/nn	-304.84	-151.43
*J. Taugourdeau-Lantz, 1988, Proc. ODP, Sci. Results, v. 103, p. 419 ff			
Klukisporites pseudoreticulatus	/sp	-281.00	-281.00
Lycopodiumsporites marginatus	/sp	-304.81	-304.81
*only 2 sps analyzed w/ other species new to comp. std.			
*W. Drugg & D. Habib, 1988, ODP Initial Rpt., v. 103, p. 429 ff			
Callaiosphaeridium asymmetricum	/dn	-304.00	-265.63
Cassiculosphaeridia reticulata	/dn	-249.40	-249.40
Chlamydothorella nyei	/dn	-304.00	-265.63
Codoniella psygma	/dn	-175.05	-155.70
Dapsilidinium warrenii	/dn	-304.00	-265.63
Druggidium deflandrei	/dn	-304.00	-222.25
Druggidium rhabdoreticulatum	/dn	-304.00	-265.63
Endoscrinium campanula	/dn	-304.00	-265.63
*Id as Scrinodinium campanulum			
Litosphaeridium arundum	/dn	-155.70	-155.70
Litosphaeridium siphoniphorum	/dn	-175.05	-155.70
Oligosphaeridium asterigerum	/dn	-304.00	-265.63
Oligosphaeridium complex	/dn	-304.00	-265.63
Subtilisphaera perlucida	/dn	-304.00	-265.63
Systematophora cretacea	/dn	-175.05	-155.70
*END			

MIDK.42 - Cassis, France C-T Reference

Cassis Section, France. P. Jolet, J. Philip, G. Thomel, G. Lopez, & G. Tronchetti, 1997, Nouvelles donnees biostratigraphiques sur la limite Cenomanien-Turonien. La coupe de Cassis (Sud-Est de la

France): proposition d'un hypostratotype europeen: C.R. Acad. Sci. Paris, Sciences de la terre et des planetes, 325, 703-709.

Data:

*TAXA	Morph	Base	Top meters	
Dica algeriana	/fp	0	116	
Dica hagni	/fp	18	242	
Dica imbricata	/fp	28	254	
Helv'ana helvetica	/fp	238	242	
*New genus is Helvetoglobotruncana				
Helv'ana praehelvetica	/fp	28	242	*ID as Whiteinella
Praeglobotruncana stephani	/fp	0	52	
Rota cushmani	/fp	0	15	
Rota greenhornensis	/fp	0	15	
Whit aprica	/fp	0	232	
Whit archaeocretacea	/fp	28	150	
Whit baltica	/fp	0	240	
Whit paradubia	/fp	0	152	
Eucalycoceras pentagonum	/am	0	6	
Eucalycoceras sp.	/am	0	20	
Euomphaloceras septemseriatum	/am	74	90	
Metengonoceras dumbli	/am	20	20	
Metoicoceras geslinianum	/am	52	90	
Neocardioceras juddii	/am	52	90	
*Use second base to avoid over extension in slumped beds at 20				
Neolobites vibrayeanus	/am	52	58	
Sciponoceras gracile	/am	52	250	
Stomohamites simplex	/am	150	156	
Vascoceras dartianum	/am	52	90	
Watinoceras coloradoense	/am	150	162	
Watinoceras devonense	/am	150	162	
Myti hercynicus	/bi	110	155	
Myti labiatus	/bi	110	115	
Myti mytiloides	/bi	110	118	
Myti opalensis	/bi	110	194	
*Mytiloides				
*END				

MIDK.43 - Gorgo a Cerbara Section, Italy, Potential Aptian GSSP

Gorgo a Cerbara Section, central Italy, 43° 36'01"N, 0° 06'08"E.

Cecca et al., 1994 & 895.3m Erba, 1996. Lowrie et al., 1980, Geophysical Jour. R. Astron. Soc, 60:263-281. Lowrie & Alvarez, 1984, Earth & Planetary Sci. Letters, 71:315-328; Coccioni et al., 1992, Cret. Res. 13:517-537; Bralower et al., 1994, Palaios, 9:335-369; Cecca et al., 1994, Cret. Res. 15:457-467; Erba, 1994, Paleooceanography 9:483-501; Erba, 1996, Bull., Inst. Royal Sci., Nat. Belgique, Sci. de la Terre, 66-Supp. 31-43.

Pelagic limestone and marl section spans Jurassic to Tertiary. Maiolica Fm., U. Tithonian-L. Aptian, white ls., top gradational @ 896m; Scisti a Fucoidi Fm., L. Apt-Albian, marl and limestone; proposed Aptian stratotype. Top Maiolica-base Scisti a Fucoidi Fm. @ 896.5m. ORB1 @ 388.5-423cm abv top Miaolica = 899.2-899.5m; ORB2 @ 425.8-429cm = 899.56-899.60m Hu, 2007 per. comm.

Data:

*Taxa	Morph	Base	Top meters
*Data from Erba, '96, p. 39, 40; Coccioni et al., '92, fig.3			
Carbon peak OAE 1a	/gc	898.2	901.3
*Geology 1996, 24:499-502; Marine Micro. 1997, 30:139-158.			
Magnetostratigraphic CM0R	/Mb	893.3	895.0
Magnetostratigraphic CM1R	/Mb	867.2	871.7
Marker bed Selli Level	/Mb	896.3	898.2
Marker bed Nannoconid crisis	/Mb	*	896.1

*"Nannoconid crisis" is top of abundance curve below Selli level, Erba '94

*Data from Cecca et al. '94, fig.2

Magnetostron CM3R	/Mb	830	856
Magnetostron CM5R	/Mb	811	817
Top Barremian	/ma	*	893.3
Top Early Barremian	/ma	849	851.5
Top Hauterivian	/ma	822	833

*Nanno data from Bralower et al., '95, '87; Coccioni et al '92

Assipetra infracretacea	/nn	723.5	900.5
Biscutum constans	/nn	893.1	903.0
Calcicalathina oblongata	/nn	719.6	834.0
Chiastozygus litterarius	/nn	893.1	* *base in Coccioni 29.9m (=887.9)
Conusphaera mexicana	/nn	894.3	898.0 *same as Conusphaera rothii
Cretarhabdus angustifloratus	/nn	726.0	900.5
Cretarhabdus conicus	/nn	813.3	903.0
Cretarhabdus surirellus	/nn	724.5	900.5
Cyclagelosphaera margerelii	/nn	895.6	903.0
Diazomatolithus lehmanii	/nn	722.5	893.1
Discorhabdus rotatorius	/nn	893.1	896.1
Eprolithus floralis	/nn	899.5	903.0
Flabellites oblonga	/nn	887.9	899.5
Grantarhabdus coronadventis	/nn	893.1	*
Grantarhabdus meddii	/nn	*	900.5
Hayesites radiatus	/nn	835.1	890.1
*Lith bolli	/nn	772.4	811.0
Helenea chiastia	/nn	729.5	903.0
Lithraphidites carniolensis	/nn	719.6	903.0
Lithastrinus floralis	/nn	899.5	*
Manivitella pemmatoidea	/nn	729.5	903.0
Markalius circumradiatus	/nn	720.5	903.0
Micrantholithus hoeschulzii	/nn	896.1	*
Parhabdololithus angustus	/nn	892	903.0
Parhabdololithus asper	/nn	755.2	903.0
Parhabdololithus embergeri	/nn	719.6	903.0
Parhabdololithus splendens	/nn	749.0	903.0
Percivalia fenestrata	/nn	894.3	895.6
Rhagodiscus infinitus	/nn	893.1	* *ID as Parhabdololithus
Reinhardtites fenestratus	/nn	783.0	895.6
Rotelapillus laffittei	/nn	890.1	899.5
Rucinolithus irregularis	/nn	891.95	903.0
*base in Cecca = 40.85m (=898.85) & in Lowrie = 891.95m			
Rucinolithus terebrodentarius	/nn	893.1	900.5
Tegumentum stradneri	/nn	887.1	897.6
Vagalapilla stradneri	/nn	772.4	899.5
Watznaueria barnesae	/nn	719.6	899.5
Watznaueria communis	/nn	757.5	896.1
*Zygodiscus diplogrammus	/nn	865.1	894.3
*Zygodiscus elegans	/nn	780.0	899.5
Nannoconus bucheri	/nn	783	895.5
Nannoconus colomii	/nn	858	895.5
Nannoconus kamptneri	/nn	858	895.5
Nannoconus steinmannii	/nn	719.6	884.0
Nannoconus truitti	/nn	811.0	900.4
Nannoconus wassallii	/nn	858	895.5

*Planktic foram data from Ciccioni et al. 1992 (add 858m to convert to Lowrie's #)

Glob'oides blowi	/fp	881.3	901
Glob'oides duboisi	/fp	866.4	901
Glob'oides ferreolensis	/fp	899.0	901
Glob'oides gottisi	/fp	866.4	901
Globuligerina hoterivica	/fp	863.5	901
Gubkinella graysonensis	/fp	863.5	901
Hedb sigali	/fp	863.5	901
Hedb delrioensis	/fp	867.0	901

Leupoldina cabri /fp 898.1 901
 *selected key ammonites from Cecca et al., '94; see also Rawson '96, Bull.
 IRSNB, Sci. de la Terre, 66- Supp.:25-30.

Barremites difficilis /am 851.5 870 *ID as group
 Coronites coronatoides /am 865 * *ID as cf.
 Coronites hoplitifformis /am 866 * *ID as aff.
 Crioceratites duvalii /am 817.5 *

*group duvalii or villiersianus indistinguishable

Costidiscus reticostatus /am 853 * *ID as cf.
 Dissimilites trinodosum /am 851.5 * *ID as cf.
 Heinzia provincialis /am 853 866
 Heinzia sartousi /am 876 *
 Holcodiscus caillaudi /am 847 * *ID as cf.
 Plesiospitidiscus sp. /am 817.5 *
 Pseudothurmannia angulicostata /am 822 * *sensu Lapeyre
 Pseudothurmannia catulloi /am 822 *
 Silesites seranonis /am 876 882

*the following id as sp., cf. or sp. aff or sp. gr.
 *U. Hauterivian-L. Barremian between 822-833m

Spitidiscus intermedius /am 839 * *ID as aff.
 Spitidiscus vandeckii /am 833 * *ID as cf.
 Subpulchellia compressissima /am 849 * *ID as cf.

*L.-U. Barremian between 849-851.5m

*END

MIDK.44 - Culver Cliff, SE England

Culver Cliff, Isle of Wight, SE England. Dinoflagellate data by Clarke and Verdier, 1967, Verhand.
 KNAWN 24, no.3.

Data:

*TAXA	Morph	Base	Top meters
Achomosphaera ramulifera	/dn	26	218
Achomosphaera sagena	/dn	26	230
Callaiosphaeridium asymmetricum	/dn	26	230
Canninginopsis colliveri	/dn	26	230
Carpodinium obliquicostatum	/dn	26	213
Chlamydothorella discreta	/dn	26	213
Circulodinium distinctum	/dn	26	230
Cometodinium whitei	/dn	26	160
Coronifera oceanica	/dn	53	213
Coronifera striolata	/dn	26	230
Cribopteridinium edwardsii	/dn	26	169
Cyclonephelium hughesii	/dn	26	230
Cyclonephelium membraniphorum	/dn	218	230
Dinopterygium cladoides	/dn	37	160
Downiesphaeridium armatum	/dn	26	230
Ellipsodinium rugulosum	/dn	26	218
Elytrocysta circulata	/dn	53	213
Endoscrinium campanula	/dn	37	230*=Scriniodinium campanulum
Epelidosphaeridia spinosa	/dn	26	153
Exochosphaeridium bifidum	/dn	26	230
Leberidocysta chlamydata	/dn	26	230
Litosphaeridium siphoniphorum	/dn	26	213
Maghrebinia perforata	/dn	26	104
Microdinium setosum	/dn	26	213
Odontochitina costata	/dn	37	230
Odontochitina operculata	/dn	26	230
Oligosphaeridium complex	/dn	26	230
Oligosphaeridium pulcherrimum	/dn	115	115
Palaeohystrichophora infusorioides	/dn	26	230
Rhiptocorys veligera	/dn	75	218

Stephodium coronatum	/dn	48	182	
Trichodium castanea	/dn	26	230	
Wrevittia cassidata	/dn	26	182	*ID as Gony.
Xenascus ceratioides	/dn	104	169	
Xiphophoridium alatum	/dn	26	218	
*END				

MIDK.45 - Mobil Core 16, Dallas, TX

Mobil Core 16, Field Research Lab, 32° 41'44"N 96° 54'16"W. Elevation 203m (666'), TD -180.2m (-591.2'); with data composited from outcrop. Powell, 1970, First Intramerican Micropaleo. Colloquium, outcrop of Eagle Ford Fm. on Mansfield Rd. about 10 mi SW.

Brown & Pierce, 1962, AAPG Bull. 46:2133-2147; Pessagno, 1969, GSA Mem. 111, p. 66-68;

Christopher, 1982, J. Paleo. 56:525-541; 1984, USGS PP 1315.

Top core section in Austin Chalk @ -5m; base Austin @ -27m; base Arcadia Park Fm. @ -64m; base Britton Fm. @ -167m; base Tarrant Fm. @ -173m; base core in Woodbine Fm.

Tarrant Mbr. has ammonites of middle Cenomanian *Acanthoceras* assemblage: *A. tarrantense*, *A. wintoni*, *Forbesiceras conlini*, *Turrilites dearingi*, & *Epengonoceras dumbli*.

Data:

*TAXA	Morph	Base	Top meters	
*Palynological data from Christopher, 1982				
Atlantopollis verrucosa	/sp	-133.7	-53.1	
Complexiopollis funiculus	/sp	-166.0	*	*ID as spp. 1
*Nannofossils from Valentine, 1984				
Ahmullerella octoradiata	/nn	-126.5	-15.2	
Axopodorhabdus albianus	/nn	-160.1	-103.7	
Corollithion achylosum	/nn	-144.8	-42.7	
Corollithion exiguum	/nn	-126.5	-61.0	
Cretarhabdus loriei	/nn	-160.1	-64.0	
Cylindralithus asymmetricus	/nn	-19.8	-15.2	
Eiffellithus eximius	/nn	-64.0	-15.2	
Helenea chiastia	/nn	-160.1	-67.1	
Kamptnerius magnificus	/nn	-15.2	-15.2	
Lithraphidites acutus	/nn	-144.8	-68.6	
Lithastrinus floralis	/nn	-163.1	-15.2	
Marthasterites furcatus	/nn	-25.9	-15.2	
Microrhabdulus belgicus	/nn	-129.6	-15.2	
Rhagodiscus asper	/nn	-154.0	-76.2	
Tranolithus gabalus	/nn	-154.0	-123.5	
*Megafossil data from J.D. Powell, 1970				
Metoicoceras whitei	/am	-84	-83	
Prionocyclus hyatti	/am	-52	-52	
Inoc pictus	/bi	-84	-83	
Myti labiatus	/bi	-64	-63	
*Micropaleo data from Powell, 1970, p. A29-A32; Ranges added to Pessagno's list				
*Clav simplex	/fp	-77	-32	
*Glob'oides bentonensis	/fp	-77	-32	
*Hedb amabilis	/fp	-77	-68	
*Hedb brittonensis	/fp	-77	-68	
*Hedb delrioensis	/fp	-77	-32	
Helv'ana helvetica	/fp	-41	-32	
*Hete moremani	/fp	-77	-68	
*Marginotruncana sigali	/fp	-41	-32	
*Rota greenhornensis	/fp	-77	-68	
*Whit archaeocretacea	/fp	-41	-32	
*Bulimina fabilis	/fb	-77	-32	
*Haplophragmoides howardense	/fb	-41	-32	
*Neobulimina canadensis	/fb	-77	-32	
*Nodosaria affinis	/fb	-77	-68	
*Data from Pessagno (1969, pl. 39b)				

Glob'oides caseyi	/fp	-135	-123	
Globotruncanella havanensis	/fp	-160	-65	
Hedb amabilis	/fp	-160	-37	
Hedb brittonensis	/fp	-160	-54	
Hedb delrioensis	/fp	-160	-37	
Hedb planispira	/fp	-160	-48.2	
Hedb simplex	/fp	-135	-61	
Heterohelix moremani	/fp	-160	-43	
Heterohelix reussi	/fp	-65	-27.4	
Marginotruncana sigali	/fp	-61	-61	
Praeglobotruncana stephani	/fp	-96	-96	
Rota cushmani	/fp	-135	-135	
Schackoia cenomana	/fp	-123	-123	
Whit archaeocretacea	/fp	-65	-65	
*Palynological marker horizons defined by Brown & Pierce (1962, AAPG Bull.)				
Punctabivesiculites sp.	/sp	*	-55.4	*ID as sp.
Rugubivesiculites rugosus	/sp	*	-55.4	
*assemblage zone of abundance of these 2 taxa, horizon 11				
Striamonoporites sp.	/sp	-73.2	*	
*acme zone 9				
Striatriletes sp.	/sp	*	-46.5	
*top defines horizon 12				
Verrutricolporites sp.	/sp	-97.0	-67.0	
*base defines horizon 8, top defines horizon 10				
Punctatriporites sp.	/sp	-155.0	*	
*base defines horizon 2				
Psilainaperturites sp.	/sp	-161.1	*	
Punctainaperturites sp.	/sp	-161.1	*	
*both species define basal acme zone 1 in Eagle Ford				
*END				

MIDK.45B – Eagle Ford Outcrop, Dallas, TX

Eagle Ford Fm. Outcrop on Mansfield Rd. about 10 mi SW Mobil Field Research Lab, Dallas County, Texas. New data from Kennedy, 1988, The Palaeont. Assoc. Spec. Papers in Palaeontology 39, text-figs 3, 4; Powell, 1970, First Intraamerican Micropaleo. Colloquium; Pessagno, 1969, GSA Mem. 111, p. 66-68. Base of section in Tarrant Formation, top at 10 m; Six Flags Ls. 12-15m; top of section in Austin Chalk @ 5m; base Austin @ 201.6 m; base Arcadia Park Fm. @ 160 m; base Britton Fm. @ 10 m; base Tarrant Fm. @ 0 m.

Data:

*TAXA	Morph	Base	Top	meters
*New Ammonite & bivalve data from Kennedy, 1988				
Acanthoceras amphibolum	/am	12	15	
Allocrioceras annulatum	/am	80	90	
Baculites yokoyamai	/am	162	162	
Collignonicerias woollgari	/am	163	164	
*ID as C. woollgari regulare				
Conlinoceras tarrantense	/am	5	6	
Euomphaloceras septemseriatum	/am	150	159	
Metengonoceras dumbli	/am	5	6	
Metoicoceras geslinianum	/am	80	159	
Prionocyclus hyatti	/am	175	199	
Prionocyclus macombi	/am	200.6	200.7	*ID as cf
Pseudaspidoceras flexuosum	/am	160.5	160.5	
*ID as zone by W. cf. reesidei & mytiliides columbianus				
Sciponoceras gracile	/am	80	159	
Watinoceras coloradoense	/am	162	162	
*in the zone of Vascoceras birchbyi				
Lopha bellaplicata	/bi	197	199	*Powell, 1970
Inoc pictus	/bi	182	182	
Myti labiatus	/bi	163	164	

*Micropaleo data from Powell, 1970, p. A29-A32

Clavhedbergella simplex	/fp	150	159	
Glob'oides bentonensis	/fp	150	159	
Guembelitria harrisi	/fp	150	196	
Hedb amabilis	/fp	150	159	
Hedb brittonensis	/fp	150	196	
Hedbergella delrioensis	/fp	150	196	
Helv'ana helvetica	/fp	187	196	
Heterohelix moremani	/fp	150	196	
Marginotruncana sigali	/fp	187	196	
Rota greenhornensis	/fp	150	159	
Whit archaeocretacea	/fp	187	196	
Ammobaculites fragmentarius	/fb	150	159	
Ammobaculites subcretaceus	/fb	187	196	
Bulimina fabiliis	/fb	150	196	
Dentalina communis	/fb	150	159	
Haplophragmoides howardense	/fb	187	196	*ID as cf
Neobulimina canadensis	/fb	150	196	
Neobulimina irregularis	/fb	187	196	
Nodosaria affinis	/fb	150	159	
Quinqueloculina moremani	/fb	150	159	
Reophax deckeri	/fb	187	196	*ID as cf
Reophax minuta	/fb	150	159	*ID as cf
Spiroplectammina longa	/fb	187	196	
Trochammina diagonalis	/fb	150	159	
Vaginulina kochii	/fb	150	159	
Vaginulina recta	/fb	150	159	

*END

MIDK.46 - North Colo Front Range

Northernmost Colorado Eicher section 11, Larimer County, 5 mi south of Wyoming; NW sec 16, NE 17, T11N R69W. Eicher, 1965, J. Paleo 39:875-909; New foram analyses by M.J. Evetts 06/02/02 found 3 taxa that make no range or age changes. Base of section is base of Mowry Shale, Mowry Fm 0-114', base not described; Clay Spur Bentonite Bed at 114-116.8', 2.8' thick; Base Graneros Shale 116.8-322', 215' thick; "X" Bentonite Bed 322'. Top Mowry in *Miliammina manitobensis* zone; marginal marine. Base of fossil range = top spl range, top = base spl range.

Data:

*TAXA	MORPH	Base	Top ft above base Mowry
Marker bed "X" bentonite	/mb	322.0	324.5
Marker bed Clay Spur bentonite	/mb	114.0	116.8
Ammobaculites impexus	/fb	114	216
Ammobaculites mosbyensis	/fb	315	315
Haplophragmoides gilberti	/fb	171	231
Miliammina ischnia	/fb	99	171
Miliammina manitobensis	/fb	99	105.8
Pseudobolivina variana	/fb	99	114
Reophax pepperensis	/fb	308	315
Saccamina alexanderi	/fb	186	315
Psammionopelta bowsheri	/fb	99	201
Trochamminoides apricarius	/fb	268	315
Trochammina gatesensis	/fb	156	315
Trochammina mellariolum	/fb	216	216
Trochammina rutherfordi	/fb	109	130
Verneuilinoides hectori	/fb	99	109
Verneuilinoides perplexus	/fb	156	231
Hedb delrioensis	/fp	99	315
Hedb planispira	/fp	99	315
Heterohelix moremani	/fp	99	315

*ID as *H. globulosa* which FO in Campanian

*Paly data by D.G. Benson 08/03/02, unpublished

Appendicisporites erdtmanii	/sp	105.8	106.5	
Camarozonosporites insignis	/sp	43.7	105.8	
Cicatricosporites hallei	/sp	79.6	80.2	
Classopollis simplex	/sp	59.9	128.8	
Cyathidites australis	/sp	43.7	105.8	
Cyathidites minor	/sp	59.9	105.8	
Gleicheniidites circiniidites	/sp	43.7	105.8	
Gleicheniidites senonicus	/sp	58.9	59.9	
Inaperturopollenites hiatus	/sp	43.7	128.8	
Laevigatosporites gracilis	/sp	105.8	106.5	
Rugubivesiculites rugosus	/sp	105.8	106.5	
Schizosporis parvus	/sp	128.8	129.4	
Apteodinium deflandrei	/dn	58.9	59.9	
Aptea polymorpha	/dn	58.9	59.9	
Apteodinium grande	/dn	58.9	59.9	
Batioladinium jaegeri	/dn	43.7	105.8	
Canningia microciliata	/dn	58.9	59.9	
Cassiculosphaeridia reticulata	/dn	105.8	106.5	
Chichaouadinium vestitum	/dn	105.8	106.5	
Circulodinium brevispinosum	/dn	58.9	59.9	
Circulodinium hystrix	/dn	58.9	59.9	
Cribooperidinium edwardsii	/dn	58.9	59.9	*ID as cf
Cribooperidinium muderongense	/dn	59.9	105.8	
Cribooperidinium sepimentum	/dn	58.9	59.9	
Dinopterygium reticulatum	/dn	105.8	106.5	
Florentinia abbreviata	/dn	58.9	59.9	
Florentinia resex	/dn	58.9	59.9	
Ginginodinium evittii	/dn	58.9	128.8	
Kalyptea aceras	/dn	43.7	105.8	
Luxadinium propatulum	/dn	43.5	43.7	
Muderongia asymmetrica	/dn	128.8	129.4	
Odontochitina operculata	/dn	59.9	105.8	
Odontochitina singhii	/dn	43.5	43.7	
Oligosphaeridium albertense	/dn	43.7	105.8	
Oligosphaeridium anthophorum	/dn	105.8	106.5	
Oligosphaeridium complex	/dn	43.7	105.8	
Oligosphaeridium pulcherrimum	/dn	59.9	105.8	
Oligosphaeridium tenuiprocessum	/dn	80.2	105.8	
Ovoidinium scabrosum	/dn	43.7	128.8	
Ovoidinium verrucosum	/dn	43.7	128.8	
Palaeohystrichophora infusorioides	/dn	43.7	128.8	
Palaeoperidinium cretaceum	/dn	43.7	105.8	
Pseudoceratium anaphrissum	/dn	79.6	80.2	
Pseudoceratium eisenackii	/dn	43.7	128.8	
Pseudoceratium expoliturum	/dn	58.9	59.9	*ID as cf
Pterodinium cingulatum	/dn	105.8	106.5	
Pterospermella australiensis	/dn	59.5	105.8	
Pterospermella harti	/dn	79.6	80.2	
Spinidinium echinoideum	/dn	105.8	106.5	
Spiniferites multibrevis	/dn	43.7	105.8	
Spiniferites pseudofurcatus	/dn	105.8	106.5	
Subtilisphaera deformans	/dn	128.8	129.4	
Tenua hystrix	/dn	58.9	59.9	*ID as Circulodinium
/dn				
Xiphophoridium alatum	/dn	105.8	106.5	
Fromea amphora	/ac	105.8	106.5	
END				

MIDK.47 - Wadi Mi'aidin, Oman, Philip

Wadi Mi'aidin section, Oman. Philip et al., 1995, Paleo-3 119:77-92; taxa recorded in Fig. 3, p. 79; species assignments based on reports by Simmons & Hart (1988) and Scott (1990). Base of section at 0

m = base Natih Fm., top Natih at 280 m w/ Muti Fm.; SB @ 0, 48, 78, 127, 136, 166, 178, 215?, 280 m (van Buchem et al., 1996, 1997).

Data:

*Taxa	Morph	Base	Top meters
Hete globulosa	/fp	222	229
Biconcava bentori	/fb	237	237
Chrysalidina gradata	/fb	100	270
Nezzazata simplex	/fb	253	253
Orbitolina conica	/fb	4	80
Orbitolinopsis depressa	/fb	237	245
Ovalveolina ovum	/fb	125	125
Praealveolina cretacea	/fb	114	264
Pseudocyclamina sp.	/fb	172	172
Pseudolituonella reicheli	/fb	268	268
Pseudonummoloculina heimi	/fb	253	253
Pseudorhapydionina laurinensis	/fb	118	118
Trocholina altispira	/fb	32	40
*Apricardia sp.	/bi	110	*
Chondrodonta joannae	/bi	268	280
Durania sp.	/bi	276	280
Eoradiolites lyratus	/bi	40	158
Praeradiolites sp.	/bi	268	*
Praeradiolites irregularis	/bi	268	*
Sauvagesia sp.	/bi	276	280
Sphaerulites sp.	/bi	40	127
Pith sphaerica	/ca	181	284

*END

MIDK.48 - Blanc-Nez Composite, France

Blanc-Nez+Lottinghen Composite, France. Amedro and Robazynski,
Aptian-Albian unconformity @ 12.1m; Lower-Middle Albian unconformity @ 13.8m; unconformity between
St.-Po & Lottinghen Fm. @ 23.9m; Alb-Cen @ 27.5m.

Data:

*TAXA	MORPH	BASE	TOP M	
Anahoplites intermedius	/am	14.5	15.4	
Dipoloceras cristatum	/am	17.8	17.8	
Douvilleiceras mammillatum	/am	12.8	13.7	
Euhoplites lautus	/am	16.2	17.6	
Euhoplites loricatus	/am	14.5	16.2	
Hoplites dentatus	/am	13.9	14.1	
Hysterocheras orbigny	/am	17.8	21.0	
Mortoniceras inflata	/am	21.0	24.5	
Mortoniceras pricei	/am	17.8	20.5	
Mantelliceras mantelli	/am	26.5	27.5	
Schloenbachia varians	/am	26.5	27.5	
Actinoceramus sulcatus	/bi	17.8	20.2	
Inoc anglicus	/bi	17.8	22.0	
Inoc concentricus	/bi	13.9	20.5	
Glob'oides bentonensis	/fp	24	27	
Hedb delrioensis	/fp	25.2	27	
Praeglobotruncana delrioensis	/fp	27	*	
Rota appenninica	/fp	27	27	
Tici primula	/fp	22.0	26.2	
Aptea polymorpha	/dn	10	10	
Carpodinium obliquicostatum	/dn	17.8	23.4	
Cribroperidinium intricatum	/dn	18	23.4	
Florentinia radiculata	/dn	12		
Litosphaeridium arundum	/dn	12.2	23.5	*ID as Hyst.

Psaligonyaulax deflandrei	/dn	17.6	23.4
Pterodinium aliferum	/dn	13.7	20
Surculosphaeridium longifurcatum	/dn	14.5	23.4

*END

MIDK.49 - Smedmore-Blackgang, Isle of Wight, UK

Smedmore-Blackgang, southwest coast of Isle of Wight, United Kingdom. Ammonite data from Casey, R., 1961, The stratigraphical palaeontology of the Lower Greensand: Palaeontology, v. 3, p. 487-621; palynological data by R.W. Aurisano, Amoco Corp., 1984.

This section documents Aptian ammonites in the transition from Tethyan to Boreal and integrates dinoflagellates. Top Upper Aptian placed within Sandrock series @ about 1530 m; top Lower Aptian placed at lithological marker above *bowerbanki* @ 1120m.

Data:

*TAXA	Morph	Base	Top feet	
Aetostreon latissimum	/bi	822	1250	
Inoc neocomiensis	/bi	1232	1232	
Chelonicerias cornuelianum	/am	1021	1100	
Chelonicerias debile	/am	1155	1155	
Chelonicerias gracile	/am	1232	1232	
Chelonicerias kiliani	/am	1021	1109	
Chelonicerias martinoides	/am	1155	1155	
Chelonicerias meyendorffi	/am	1100	1109	
Chelonicerias parinodum	/am	980	980	
Deshayesites callidiscus	/am	889	923	
Deshayesites deshayesi	/am	980	980	
Deshayesites grandis	/am	1021	1021	
Deshayesites fittoni	/am	846	846	
Deshayesites forbesi	/am	846	923	
Dufrenoyia furcata	/am	1065	1100	
Dufrenoyia transitoria	/am	1056	1056	
Prodeshayesites obsoletus	/am	822	822	
Tropaeum benstedii	/am	1155	1155	
Tropaeum bowerbanki	/am	1065	1100	
Aptea polymorpha	/dn	1109	1109	*ID as Pseudoceratium
Apteodinium maculatum	/dn	1309	1358	
Augustidinium acribes	/dn	109	1109	
Batioladinium micropodum	/dn	1021	1309	
Callaiosphaeridium asymmetricum	/dn	1021	1109	
Carpodinium granulatum	/dn	1309	1456	
Cassiculosphaeridia reticulata	/dn	889	1232	
Cerbia tabulata	/dn	822	1358	
Circulodinium distinctum	/dn	636	1456	*ID as Cycl.
Circulodinium hughesii	/dn	1021	1456	*ID as Cycl.
Cometodinium obscurum	/dn	1109	1358	
Coronifera albertii	/dn	846	1309	
Coronifera oceanica	/dn	1155	1407	
Coronifera striolata	/dn	1358	1456	
Cribroperidinium edwardsii	/dn	822	1456	
Cribroperidinium longicorne	/dn	1109	1109	
Ctenidodinium elegantulum	/dn	846	1021	
Dingodinium cerviculum	/dn	1021	1109	
Druggidium rhabdoreticulatum	/dn	1021	1021	
Florentinia stellata	/dn	1358	1358	*ID as Hyst.
Gardodinium trabeculosum	/dn	923	1358	*ID as Chla.
Hystrichosphaeropsis ovum	/dn	1456	1456	
Hystrichodinium pulchrum	/dn	1021	1358	
Hystrichosphaeridium salpingophorum	/dn	1232	1309	
Hystrichosphaeridium schindewolfii	/dn	822	1407	
Lithodinia stoveri	/dn	822	822	*ID as Mei.
Muderongia simplex	/dn	1021	1021	

Odontochitina operculata	/dn	846	1456	
Oligosphaeridium complex	/dn	846	1456	
Oligosphaeridium pulcherrimum	/dn	1407	1407	
Oligosphaeridium totum	/dn	1309	1358	
Palaeoperidinium cretaceum	/dn	846	1407	
Protoellipsodinium spinosum	/dn	1155	1456	
Pterodinium cingulatum	/dn	1109	1358	
Spiniferites ramosus granosus	/dn	923	1407	
Spiniferites ramosus ramosus	/dn	846	1456	
Spiniferites twistringiensis	/dn	1232	1407	
*ID as Spin ramosus multibrevis	/dn			
Stiphrosphaeridium anthophorum	/dn	1456	1456	*ID as Poly.
Subtilisphaera perlucida	/dn	822	889	
Systematophora complicata	/dn	1358	1358	
Systematophora penicillata	/dn	1155	1407	
Wrevittia helicoidea	/dn	1109	1456	*ID as Gony.
Appendicisporites tricornitatus	/sp	135	1407	
Distaltriangulisporites perplexus	/sp	846	1456	
Lycopodiumsporites marginatus	/sp	598	1309	
Trilobosporites marylandensis	/sp	331	923	

*END

MIDK.50 - Wadi Miadin Section, Oman

Wadi Miadin Section, Oman. Data from von Buchem et al., 1997.

Members measured from his cross sections and detailed section; not included in graphic database.

Data:

*Taxa	Morph	Base	Top meters
Top Natih A Member	/mb	*	321
Top Natih B Member	/mb	*	290
Top Natih C Member	/mb	*	260
Top Natih D Member	/mb	*	185
Top Natih E Member	/mb	*	165
Top Natih F Member	/mb	*	50

*END

MIDK.51 - Grayson Bluff, Denton Co., TX

Grayson Bluff Section, Denton Co., Texas.

Measured section in Winton & Adkins, 1919, UT Bull. 1931, 1925, 2544; Dodge et al., 1974, Tx. Academy Sci., U. Tx. Arlington Guidebook.

Base Grayson @ 0', top @ 79', Buda 3' thick, base Woodbine Fm. @ 82'; top Main Street @ 0', base @ -16'; complete Main Street Fm. section 19, 16.2 ft in Slocki, 1967, SEPM Permian Basin Section Publ. 67-8; nearest section 9 incomplete, 10.7 ft; Base Cenomanian by Young (1979) is base P. brazoensis; Mancini (1979) & Hancock et al. (1993, GAC SP 39, p. 460-462) place it in transition zone between Main Street & Grayson. Foram data from J. Salaj and B.A. Masters, unpubl.; paly data from J.A. Stein, unpublished. Ammonite data: Young, 1979, Tx. Mem. Museum Bull 26, p. 81; Clark, 1965, GSA Mem. 95; Mancini, 1979, J. Paleo, v.53:1013-1022. Bivalve data by R.W. Scott, unpubl. notes, 1973.

Data:

*TAXA	Morph	Base	Top (feet)
Budaiceras elegantior	/am	50	60
Budaiceras hyatti	/am	50	60
Faraudiella roemeri	/am	50	70
Graysonites adkinsi	/am	0	5
Mariella brazoensis	/am	0	2
Mariella graysonensis	/am	45	50
		*Clark, 1965, p. 50; Mancini, 1979, p. 1015	
Mariella rhacioformis	/am	50	60

*Clark, 1965, p. 56; Mancini, 1979, p. 1015

<i>Stoliczkaia crotaloides</i>	/am	50	70
<i>Ilmatogyra arietina</i>	/bi	34	37
<i>Texigryphaea graysonana</i>	/bi	34	37
<i>Acruliammina longa</i>	/fb	6.5	57.8
<i>Ammobaculites cuyleri</i>	/fb	6.5	61.0
<i>Ammobaculites dentonensis</i>	/fb	6.5	59.5
<i>Ammobaculites subgoodlandensis</i>	/fb	12.6	61.0
<i>Ammobaculites testacea</i>	/fb	6.5	61.0
<i>Ammodiscus kiowensis</i>	/fb	6.5	61.0

*fide M.J. Evetts = *A. gaultinus*

<i>Ammodiscus gaultinus</i>	/fb	6.5	61.0
<i>Bigenerina wintoni</i>	/fb	20.8	22.8
<i>Bolivina textilaroides</i>	/fb	30.8	38.8
<i>Bulimina nannina</i>	/fb	6.5	48.8
<i>Bullopora cervicornis</i>	/fb	6.5	61.0
<i>Bullopora levis</i>	/fb	6.5	57.8
<i>Citharina complanata</i>	/fb	6.5	61.0
<i>Citharina perstriata</i>	/fb	6.5	61.0
<i>Citharina tripleura</i>	/fb	6.5	48.8
<i>Cribratina texana</i>	/fb	38.8	54.6
<i>Dentalina communis</i>	/fb	6.5	61.0
<i>Dentalina cylindroides</i>	/fb	6.5	59.5
<i>Dentalina debilis</i>	/fb	6.5	61.0
<i>Dentalina hammensis</i>	/fb	6.5	26.8
<i>Discorbis minutissima</i>	/fb	6.5	54.6
<i>Flabellamina alexanderi</i>	/fb	36.8	48.8
<i>Fursenkoina minuta</i>	/fb	6.5	57.8
<i>Gaudryina cushmani</i>	/fb	6.5	50.3
<i>Gaudryinella delrioensis</i>	/fb	6.5	38.8
<i>Gavelinella plummerae</i>	/fb	6.5	61.0
<i>Glandulopleurostomella ozawai</i>	/fb	6.5	50.3
<i>Globulina lacrima subsphaerica</i>	/fb	6.5	61.0

*in McNeil & Caldwell, 1981, GA Canada SP 21, ranges from Albian in France

*to Camp-Maast in Gulf Coast & in West. Int. from Ft. Hays to Pierre (p. 212)

<i>Haplophragmoides concavus</i>	/fb	6.5	54.6
<i>Lagena apiculata neocomiana</i>	/fb	6.5	54.6
<i>Lagena hispida</i>	/fb	6.5	38.8
<i>Lagena leptata</i>	/fb	6.5	54.6
<i>Lagena striatifera</i>	/fb	6.5	61.0
<i>Lagena sulcata</i>	/fb	6.5	46.8
<i>Lagenamina pyriformis</i>	/fb	6.5	57.8
<i>Lenticulina cyprina</i>	/fb	6.5	52.5
<i>Lenticulina gaultina</i>	/fb	6.5	61.0
<i>Lingulina furcillata</i>	/fb	6.5	61.0
<i>Lingulina lamellata</i>	/fb	6.5	52.5
<i>Lingulina nodosaria</i>	/fb	6.5	57.8
<i>Lingulina serrata</i>	/fb	6.5	54.6
<i>Lingulogavelinella asterigerinoides</i>	/fb	6.5	61.0
<i>Marginulina linearis</i>	/fb	6.5	61.0
<i>Marginulina striatifera</i>	/fb	12.6	38.8
<i>Marginulina tenuissima</i>	/fb	6.5	52.5
<i>Massilina planoconvexa</i>	/fb	6.5	50.3
<i>Neobulimina minima</i>	/fb	6.5	61.0
<i>Nodosaria amphioxys</i>	/fb	6.5	52.5
<i>Nodosaria chapmani</i>	/fb	6.5	38.8
<i>Nodosaria graysonensis</i>	/fb	6.5	61.0
<i>Nodosaria lepida</i>	/fb	6.5	54.6
<i>Nodosaria obscura</i>	/fb	6.5	61.0
<i>Nodosaria oklahomensis</i>	/fb	6.5	54.6
<i>Nodosaria paupercula</i>	/fb	34.8	36.8
<i>Patellina subcretacea</i>	/fb	6.5	32.8
<i>Pseudoglandulina scotti</i>	/fb	6.5	48.8

Pseudopolymorphina roanokensis	/fb	8.5	61.0
Pyrulina cylindroides	/fb	6.5	54.6
*McNeill & Caldwell, 1981, Grayson-Navarro in Gulf Coast & Greenhorn-Pierre (p. 214)			
Pyrulina longa	/fb	6.5	52.5
Ramulina fusiformis	/fb	6.5	61.0
Ramulina globulifera	/fb	6.5	56.2
Reophax deckeri	/fb	6.5	52.5
Reophax minuta	/fb	6.5	44.8
Saracenaria bononiensis	/fb	6.5	61.0
Saracenaria cushmani	/fb	8.5	40.8
Spirillina minima	/fb	6.5	57.8
Spiroplectamina ammovitrea	/fb	6.5	54.6
Spiroplectamina longa	/fb	6.5	48.8
Spiroplectamina nuda	/fb	6.5	61.0
Textularia rioensis	/fb	6.5	61.0
Textularia washitensis	/fb	6.5	57.8
Tristix excavata	/fb	6.5	61.0
Tristix quadrata	/fb	6.5	50.3
Vaginulina geisendorferi	/fb	6.5	32.8
Vaginulina kochii	/fb	6.5	61.0
Vaginulina recta	/fb	6.5	59.5
Vaginulina striolata	/fb	6.5	50.3
Valvulineria loetterlei	/fb	6.5	61.0
Washitella typica	/fb	6.5	46.8
Bifarina tenulissa	/fp	6.5	52.5
Glob'oides cushmani	/fp	6.5	61.0
Gubkinella graysonensis	/fp	6.5	61.0
*Placed in Gubkinella by Michael, 1972, J. Foram. Res.;			
*reported by Tappan, 1943 as Hedbergella; may be a benthic foram			
Guembelitria cenomana	/fp	6.5	52.5
Hedb delrioensis	/fp	6.5	61.0
Hedb planispira	/fp	6.5	61.0
Hedbergella washitensis	/fp	6.5	54.6
Heterohelix moremani	/fp	6.5	61.0
Rota appenninica	/fp	8.5	61.0
Rota evoluta	/fp	8.5	61.0
Praeglobotruncana delrioensis	/fp	8.5	28.6
Whit paradubia	/fp	6.5	59.5
*END			

MIDK.511 Lake Waco Dam Spillway

McLennan Co., Texas. Measured section by Mancini, 1974, Texas A&M Ph.D. dissertation; Mancini, 1977, GCAGC Trans. 27:334-351, measured on fig. 3; Mancini, 1978, GCAGS Trans. 28:295-311; Cret. Res. 3:241-259. Base Del Rio Fm. @ 0', top @ 15.8m/52'; Pepper Fm. from 15.8m/52' to 17.5m/57.6'; base middle claystone 15.2'/4.6m, base upper claystone 8.7m/28.6'; base upper nodular wackestone @14.7m/48.3'.

Hancock et al., 1993, GAC SP 39, p. 460-462; Young, 1979, Tx. Mem. Museum Bull 26, p. 86, lists the following taxa from the Del Rio in McLennan Co.: *Adkinsia bosquensis*, *Engonoceras bravoense*, *Graysonites wacoense*, *Otoscaphtes subevolatus*, *Scaphites bosquensis*, *Sciponoceras cf. baculoides*, *Stoliczkaia crotaloides* *Tetragonites brazoensis*, *Turrillites bosquensis*; Clark, 1965, GSA Mem. 95; Mancini, 1979, J. Paleol., v.53:1013-1022.

Data:

*TAXA	Morph	Base	Top (feet)
*Mancini, 1974; Table B-6, 1977; Table 2; 1982, p. 243; Hancock et al, 1993;			
Engonoceras bravoense	/am	51.0	51.5
*ID as cf by Hancock et al.			
Engonoceras serpentinum	/am	2	26
Graysonites wooldridgei	/am	51	51
*ID by Hancock et al. = Mant. saxbii			

Mant cantianum	/am	17	26	
*ID as cf. by Mancini, 1982; Hancock et al. ID as Stoliczkaia juvenile				
Mant saxbii	/am	51	51	
*ID by Mancini, 1982, p. 243				
Mariella bosquensis	/am	0.5	51.5	
*ID as cf. by Hancock et al.				
Mariella camachoensis	/am	2	26	
Mariella rhacioformis	/am	21	51	
*Clark, 1965, p. 56; Mancini, 1979, p. 1015; Hancock et al.				
Sharpeiceras mexicanum	/am	51	51	
*ID by Mancini, 1982; ok by Hancock et al.				
Stoliczkaia crotaloides	/am	51	51	
Submantelliceras aumalense	/am	17	26	
*= M. brazoense of Mancini fide Hancock et al. 1993				
Submantelliceras wacoense	/am	17	26	
*ID by Hancock et al.; may be juvenile Graysonites fide Young, '58:173				
Exogyra drakei	/bi	51	51	
Ilmatogyra arietina	/bi	5	13	
Neithea texana	/bi	2	51.5	
Texigryphaea graysonana	/bi	5	15	
Texi roemeri	/bi	17	50.0	
*Mancini, 1974, Table B-3; Manicni, 1977, Table 3				
Ammobaculites testacea	/fb	11.5	11.5	
Bulimina nannina	/fb	2	51	
Citharina complanata	/fb	11	11	
Cribratina texana	/fb	40	51	
Dentalina communis	/fb	34	34	
Dentalina cylindroides	/fb	11.5	11.5	
Fursenkoina minuta	/fb	2	51.5	
Gaudryina cushmani	/fb	2	2	
Gaudryinella delrioensis	/fb	2	47	
Gavelinella plummerae	/fb	2	51.5	
Haplophragmoides concavus	/fb	34	51.5	
Lagena striatifera	/fb	15.5	15.5	
Lagenammia pyriformis	/fb	2	51.5	
Lenticulina gaultina	/fb	5	5	
Lingulina furcillata	/fb	34	34	
Lingulina serrata	/fb	30	30	
Lingulogavelinella asterigerinoides	/fb	15.5	15.5	
Marginulina tenuissima	/fb	7	7	
Massilinia planoconvexa	/fb	2	51	
Neobulimina minima	/fb	2	51.5	
Nodosaria lepida	/fb	11	11	
Praebulimina nannina	/fb	11.5	11.5	
*McNeill & Caldwell, 1981, Grayson-Navarro in GC & Greenhorn-Pierre (p. 214)				
Pyrulina longa	/fb	2	51.5	
Quinqueloculina moremani	/fb	2	51.5	
Spirillina minima	/fb	3	51.5	
Spiroplectammia longa	/fb	2	2	
Spiroplectammia nuda	/fb	2	2	
Textularia rioensis	/fb	7	7	
Textularia washitensis	/fb	7	7	
Vaginulina kochii	/fb	11	11	
Vaginulina recta	/fb	7	7	
Valvulineria loetterlei	/fb	2	51.5	
*Mancini, 1974, Table B-2, 1977, Table 3				
Clav subcretacea	/fp	4	25	
Glob'oides bentonensis	/fp	2	42	
Glob'oides cushmani	/fp	4	34	*ID as G. caseyi
Gubkinella graysonensis	/fp	2	51.5	
*Placed in Gubkinella by Michael, 1972, J. Foram. Res.; reported by Tappan, 1943 as Hedbergella; may be a benthic foram				
Guembelitra cenomana	/fp	2	51.5	

*= *G. harrisi* & *G. graysonensis*

Hedb delrioensis	/fp	2	51.5
Hedb planispira	/fp	2	51.5
Hedb washitensis	/fp	2	51.5
Hete moremani	/fp	2	51.5
Rota appenninica	/fp	19	19
Rota evoluta	/fp	19	19
Rota brotzeni	/fp	19	19
Rota globotruncanoides	/fp	19	19
Prae delrioensis	/fp	11.5	42

*END

MIDK.52 Aube, France

Amedro, 1992, Bull. Centres Rech. Explor.-Prod. elf-aquitaine, 16:187-233, Figs. 8a, 16.

Data:

*TAXA	Morph	Base	Top m
Anahoplites intermedius	/am	50.9	52
Chelonicerias floridum	/am	0	6
Douvilleicerias mammillatum	/am	0	16.5
*top at 45m extends into Middle Albian			
Euhoplites loricatus	/am	51.2	52
Hoplites benettianus	/am	30.3	44.9
Hoplites dentatus	/am	44.9	51.2
Hoplites spathi	/am	44.9	51.2
Hoplites steinmanni	/am	30.3	39.5
Lyelliceras lyelli	/am	41.6	44.9
Otohoplites bulliensis	/am	22	26
Otohoplites normanniae	/am	29	32.8
Otohoplites raulinianus	/am	23	25
Oxytropidoceras roissyanum	/am	39.5	44.9
Pseudosonneratia puzosianus	/am	6	16.5

*END

MIDK.53 Weald Anticline, England

Amedro, F., 1992, L'Albien du basin Anglo-Parisien: Ammonites, zonation phylétique, séquences: Bulletin Centres Recherches Exploration-Production Elf-Aquitaine, v. 16, p. 187-233; Figure 7, p. 197; Aptian-Albian boundary reference section.

Data:

*TAXA	Base	Top m		
Chelonicerias floridum	/am	20.9	20.9	
Douvilleicerias leightonense	/am	5.6	17.8	
Douvilleicerias mammillatum	/am	17.8	20.9	
Farnhamia farnhamensis	/am	0.5	3	
Hypacanthoplites anglicus	/AM	0.5	3	
Hypacanthoplites cragini	/am	0.5	3	
Hypacanthoplites jacobi	/am	0.5	3	*assumed to be = <i>H. jacobi</i>
Hypacanthoplites milletioides	/am	0.5	5.2	
Leymeriella tardefurcata	/am	5.6	10	
Sonneratia kitchini	/am	17.8	17.8	

*END

MIDK.54 Folkestone, England

Amedro, 1992, Bull. Centres Rech. Explor.-Prod. elf-aquitaine, 16:187-233, figures 10, 12, p. 206, 207, 210, 211; Middle-Upper Albian reference section.

Data:

*TAXA	Morph	Base	Top m
Anahoplites daviesi	/am	9.2	9.8
Anahoplites intermedius	/am	2	4.2
Beudanticeras beudanti	/am	9.8	14.5
Callihoplites auritus	/am	14.6	23.9
Dimorphoplites niobe	/am	4.3	6.1
Dipoloceras cristatum	/am	9.9	10.4
Euhoplites lautus	/am	6.5	9.8
Euhoplites loricatus	/am	2	6.1
Hoplites dentatus	/am	1	2
Hysterocheras orbigny	/am	10.5	15
*Hysterocheras varicosum	/am	10.5	15
Lyelliceras lyelli	/am	0.6	0.6
Mojsisovicsia subdelaruei	/am	6.1	6.1
Mortoniceras inflata	/am	14.5	23.9
Mortoniceras pricei	/am	10.5	15
Oxytropidoceras roissyanum	/am	1	1
Schloenbachia varians	/am	36	37

*END

MIDK.54B Folkestone, England

Amedro, 1992, Bull. Centres Rech. Explor.-Prod. elf-aquitaine, 16:187-233, figures 10, 12, p. 206, 207, 210, 211; Middle-Upper Albian

Data:

*TAXA	Morph	Base	Top m
Anahoplites daviesi	/am	9.2	9.8
Anahoplites intermedius	/am	2	4.2
Beudanticeras beudanti	/am	9.8	14.5
Callihoplites auritus	/am	14.6	23.9
Dimorphoplites niobe	/am	4.3	6.1
Dipoloceras cristatum	/am	9.9	10.4
Euhoplites lautus	/am	6.5	9.8
Euhoplites loricatus	/am	2	6.1
Hoplites dentatus	/am	1	2
Hysterocheras orbigny	/am	10.5	15
Hysterocheras varicosum	/am	10.5	15
Lyelliceras lyelli	/am	0.6	0.6
Mojsisovicsia subdelaruei	/am	6.1	6.1
Mortoniceras inflata	/am	14.5	23.9
Mortoniceras pricei	/am	10.5	15
Oxytropidoceras roissyanum	/am	1	1
Schloenbachia varians	/am	36	37
Stoliczkaia notha	/am	33.7	35.7

*Species in phylogenetic succession ala Amedro

Arraphoceras studeri	/am	24.0	35.7
Euhoplites nitidus	/am	6.5	9.8
Euhoplites serotinus	/am	9.8	12.8
Euhoplites subcrenatus	/am	10.4	20.0
Euhoplites vulgaris	/am	10.4	20.0
Callihoplites vraconensis	/am	24.0	35.7
Dimorphoplites biplicatus	/am	6.5	9.8
Dimorphoplites doris	/am	6.1	6.5
Dimorphoplites silenus	/am	9.8	9.8
Epihoplites deluci	/am	12.8	14.5
Hysterocheras cantabrigense	/am	24.0	26.0
Hysterocheras carinatum	/am	10.5	23.9
Lepthoplites falcooides	/am	24.0	35.7
Mantelliceras lymense	/am	36.0	37.0
Metaclavites trifidus	/am	9.8	12.8
Mortoniceras fallax	/am	24.0	29.5

Neophlycticeras brottianum	/am	9.9	13.0
Pleurohoplites renauxianus	/am	24.0	35.7
Stoliczkaia rhamnonota	/am	24.0	24.0
Stoliczkaia dorsetensis	/am	33.7	35.7
END			

MIDK.55 - Monte Petrano, Central Italy, Proposed Albian GSSP

Monte Petrano, Central Italy. Outcrop north of Gubbio section, circa 31° 30'N, 9° W.

Fiet, N., and Masure, E., 2001, Les dinoflagelles albiens du bassin de Marches-Ombrie (Italie): proposition d'une biozonation pur le domaine tethysien: *Cretaceous Research* 22:63-77; Fiet et al., 2001, *Cretaceous Research* 22:265-275.

Samples in meters from base of section in Aptian at -1.5 m, top at 47.0 m; Informal lithostrat units: I -1.5-24 m; II 24-47 m; Scaglia Bianca 47-60 m (figs. 2, 3). OAE 1b=Urbino bed 6.9-7.1;

Oceanic Red Beds-ORB-defined by Hu et al. 2005, *Palaeo-3* 233:163-186, fig. 4.

Data:

*TAXA	Morph	Base	Top Meters	
Carbon peak OAE 1b	/gc	6.9	7.1	
Rota globotruncanoides	/fp	66.2	* *ID as <i>R. brotzeni</i> fig.4 (2001)	
Achomospaera verdieri	/dn	-0.5	44.3	
Adnatosphaeridium tutlosa	/dn	11.0	46.3	
Batiacasphaera granulosa	/dn	0.2	46.3	
Batiacasphaera saidensis	/dn	30.0	43.6	
Callaiosphaeridium asymmetricum	/dn	7.4	16.2	
Carpodinium granulatum	/dn	0.2	29.0	
Circulodinium asperum	/dn	38.8	43.6	
Codoniella campanulata	/dn	3.5	46.3	
Codoniella psygma	/dn	-0.5	39.1	
Cometodinium obscurum	/dn	20.0	40.2	
Cometodinium whitei	/dn	-0.5	21.5	
Coronifera oceanica	/dn	0.2	46.3	
Coronifera tubulosa	/dn	12.4	39.5	
Cribroperidinium auctificum	/dn	30.0	30.0	
Cribroperidinium edwardsii	/dn	13.0	33.4	
Cribroperidinium intricatum	/dn	-0.5	37.0	
Cribroperidinium muderongense	/dn	3.5	6.3	
Cribroperidinium tensiftense	/dn	5.3	12.4	
Cyclonephelium compactum	/dn	-0.5	46.3	
Cyclonephelium crassimarginatum	/dn	18.2	18.2	
Cyclonephelium hughesii	/dn	23.2	30.9	
Damassadinium chibane	/dn	-0.5	46.3	
Dapsilidinium pumilum	/dn	25.0	46.3	
Dapsilidinium warrenii	/dn	-0.5	33.4	*ID as Poly
Dinopterygium cladoides	/dn	29.0	37.0	
Downiesphaeridium multispinosum	/dn	19.9	19.9	
Exochosphaera arnace	/dn	39.1	40.2	*ID as cf.
Pervosphaeridium pseudhystrichodinium	/DN	15.0	46.3	
Florentinia cooksoniae	/dn	4.8	40.2	
Florentinia mantellii	/dn	15.0	21.5	
Wrevittia cassidata	/dn	15.0	46.3	
Hapsocysta dictyota	/dn	43.6	43.6	
Hapsocysta peridictya	/dn	-0.5	41.3	
Hystrichodinium pulchrum	/dn	7.4	43.6	
Hystrichosphaeridium atlasense	/dn	0.2	46.3	
Kleithriasphaeridium tubulosum	/dn	33.4	43.6	
Laciniadinium articum	/dn	25.6	37.0	*ID as cf
Leberidocysta chlamydata	/dn	4.0	39.5	
Litosphaeridium arundum	/dn	15.0	46.3	
Litosphaeridium conispinum	/dn	21.0	46.3	
Litosphaeridium siphoniphorum	/dn	43.6	46.3	

Tehamadinium coummia	/dn	4.8	40.2
Occisucysta hinzii	/dn	0.2	0.2
Odontochitina operculata	/dn	-0.5	46.3
Odontochitina rhakodes	/dn	-0.5	46.3
Oligosphaeridium complex	/dn	-0.5	46.3
Oligosphaeridium albertense	/dn	0.2	0.2
Oligosphaeridium irregulare	/dn	4.0	46.3
Oligosphaeridium pulcherrimum	/dn	4.0	19.9
Ovoidinium diversum	/DN	20.0	20.0
Ovoidinium scabrosum	/DN	8.6	46.3
Pervosphaeridium cenomaniense	/dn	0.2	17.8
Prolixosphaeridium parvispinum	/dn	-0.5	40.2
Protoellipsodinium spinocristatum	/dn	33.4	46.3
Protoellipsodinium spinosum	/dn	14.0	21.0
Spiniferites hyperacanthus	/dn	18.2	21.0
Spiniferites lenzi	/dn	11.8	46.3
Spiniferites ramosus ramosus	/dn	-0.5	46.3
Subtilisphaera cheit	/dn	-0.5	36.5
Subtilisphaera senegalensis	/dn	4.0	7.9
Systematophora cretacea	/dn	1.6	13.7
Tehamadinium sousense	/dn	-0.5	37.0
Tehamadinium mazaganense	/dn	25.0	46.3
Wallodinium inflatum	/dn	19.3	43.6
Xenascus ceratioides	/dn	4.8	19.9
Xiphophoridium alatum	/dn	33.4	38.0
Fromea amphora	/ac	11.0	16.7

*Foram data from Hu, 2007, Cret. Res., fig. 4 assuming zone boundary is FO of species

Hedb planispira	/fp	0	4
Tici primula	/fp	4	*
Biti breggiensis	/fp	25	*
Tici subticinensis	/fp	43.5	*
Tici ticinensis	/fp	47.5	*
Rota appenninica	/fp	53.5	*
Planomalina buxtorfi	/fp	53.5	*

*Climatic eccentricity cycles of Fiet et al. 2001 fig. 4, Cret. Res. 22:265-274, longer eccentricity cycles c. 413 kyr

*Cycle number from base up	Base meters	
Eccentricity Cycle 1	-0.5	*
Eccentricity Cycle 2	1.0	*
Eccentricity Cycle 3	2.8	*
Eccentricity Cycle 4	4.6	*
Eccentricity Cycle 5	6.8	*
Eccentricity Cycle 6	9.2	*
Eccentricity Cycle 7	12.2	*
Eccentricity Cycle 8	14.7	*
Eccentricity Cycle 9	17.0	*
Eccentricity Cycle 10	19.1	*
Eccentricity Cycle 11	21.3	*
Eccentricity Cycle 12	23.6	*
Eccentricity Cycle 13	26.3	*
Eccentricity Cycle 14	29.2	*
Eccentricity Cycle 15	32.0	*
Eccentricity Cycle 16	34.1	*
Eccentricity Cycle 17	36.0	*
Eccentricity Cycle 18	38.3	*
Eccentricity Cycle 19	40.0	*
Eccentricity Cycle 20	42.0	*
Eccentricity Cycle 21	44.2	*
Eccentricity Cycle 22	46.7	*
Eccentricity Cycle 23	48.6	*
Eccentricity Cycle 24	50.4	*
Eccentricity Cycle 25	53.5	*
Eccentricity Cycle 26	56.8	*

Eccentricity Cycle 27		60.2	*
Eccentricity Cycle 28		63.6	*
Eccentricity Cycle 29		66.2	*
Marker bed ORB 7	/mb	50.9	56.8
Marker bed ORB 6	/mb	31.9	35.0
Marker bed ORB 5	/mb	26.5	27.9
Marker bed ORB 4	/mb	11.4	12.0
Marker bed ORB 3	/mb	0.1	4.7

*END

MIDK.56 San Jon, Quay Co., New Mexico

Road cut 9 mi south of San Jon on NM road 469, SE1/4, sec. 20, T9N, R34E.

Scott, 1970, AAPG Bull. 54:1225-1244; 1974, Lethaia 7:315-330; Brand & Mattox, 1972; New Mexico Geol. Soc. Guidebook 23:98-104; Jacka & Brand, 1973, Panhandle Geol. Soc., p. 44-48; Cobban, 1985, USGS Bull 1641-A:1-7 reported ammonites in Mesa Rica, Tucumcari; Kietzke, 1985, New Mexico Geol. Soc. Guidebook, 36, p. 247-260; Kues et al., 1985, New Mexico Geol. Soc. Guidebook 36:261-281; Lucas & Kisucky, 1988, New Mexico Geology 10:82-89; Lucas & Hunt, 2000, New Mexico Museum of Nat. History & Sci. Bull. 16:97-100; Kues & Lucas, 2001, New Mexico Geol. Soc. Guidebook 52:229-249. Base of Tucumcari Sh. in contact with Morrison Fm. at 0 ft; shale-sandstone contact=top Tucumcari fide Lucas & Kues = 43.5 ft; sequence boundary between marine sand & fluvial sand = 59.5 ft = top Tucumcari fide Scott, 1970.

Data:

*TAXA	Morph	Base	Top in feet
Ceratostreon texana	/BI	1	4
Inoc comancheanus	/BI	11	15
Lopha subovata	/BI	37.5	38
*in Nicaisolopha Vyalov fide Kues & Lucas (2001, p. 239)			
*types from Pyramid Mtn. estimated strat position = 8b at San Jon			
Neithea occidentalis	/BI	5	59
Neithea texana	/BI	5	50
Peilinia levicostata	/bi	5	50
Protocardia multistriata	/bi	5	30.5
Protocardia texana	/bi	50	58
Scabrotrigonia emoryi	/bi	16	16
Texi pitcheri	/bi	5	50
*=Texi tucumcari fide Kues (1989) in Kues & Lucas (2001)			
Turritella belviderei	/ga	2	21.5
Turritella seriaticumgranulata	/ga	21	50
*Eopachydiscus brazoense	/AM	45	45 = E. marcianus; reported in Mesa Rica by Cobban, 1985; but too high vs M. equid.
Mortonicerias equidistans	/AM	30	45
*base from Hill Ranch, Roosevelt Co.; top from Quay Co. (Lucas & Hunt, 2000)			
*Data from Kietzke, 1985, at Pyramid Mtn SE of Tucumcari in basal 1m of Tucumcari Sh = bed 8b in San Jon (Kues & Lucas, 2001, p. 231.			
Acruliammina longa	/FB	37.5	38
Ammobaculites goodlandensis	/FB	37.5	38
Ammobaculites subcretaceus	/FB	37.5	38
Dentalina communis	/FB	37.5	38
Dentalina cylindroides	/FB	37.5	38
Dentalina debilis	/FB	37.5	38
Dentalina hammensis	/FB	37.5	38
Fursenkoina minuta	/FB	37.5	38
Gavelinella plummerae	/FB	37.5	38
Cribratina texana	/FB	5	38.5
Lagena sulcata	/FB	37.5	38
Lenticulina cyprina	/FB	37.5	38
Lenticulina gaultina	/FB	37.5	38
Lingulogavelinella asterigerinoides	/FB	37.5	38
*spelled asterinoides; this occurrence lowers the base			

*TX Trinity River section Baker (1976) reports it in Duck Creek-Grayson

Marginulina tenuissima	/FB	37.5	38	
Nodosaria oklahomensis	/FB	37.5	38	*species id questioned
Patellina subcretacea	/FB	37.5	38	
Pseudoglandulina scotti	/FB	37.5	38	
Reophax deckeri	/FB	37.5	38	
Spirillina minima	/FB	37.5	38	
Textularia rioensis	/FB	37.5	38	*in Textulariopsis
Textularia washitensis	/FB	37.5	38	
Vaginulina kochii	/FB	37.5	38	
Vaginulina striolata	/FB	37.5	38	
*both placed in Citherina				
Hedb planispira	/FP	37.5	38	
*END				

MIDK.57 - Tartonne, France, Aptian-Albian

Tartonne, France Base Albian. Kennedy et al., 2000, Cret. Research, 21:591-720.

Base of section at 0 m; base of Niveau Paquier at 21.8, top at about 33m, Fig. 15. Ammonites from Fig. 15 by Kennedy; nannos appendix 2, p. 719-720 by P.R. Bown; dinos appendix 1, p. 710-712 by RJ Davey.

Data:

*Taxa	Morph	Base	top meters	
Marker bed Niveau Paquier	/mb	21.8	32.8	
Carbon peak OAE 1b	/GC	23	29	
*3 peaks in this interval, not certain if it correlates with 1b				
Actinoceras salomoni	/bi	22	22	
Beudanticeras convergens	/am	17	26	
Leymeriella germanica	/am	17	21.4	
Leymeriella tardefurcata	/am	22	26	
Hypacanthoplites anglicus	/am	17	19	
Hypacanthoplites trivialis	/am	17	26	
Puzosia quenstedti	/am	22	26	*sp. ex group
Assipetra terebrodentarius	/NN	8	20	
Axopodorhabdus dietzmannii	/NN	0.1	23.3	
Biscutum constans	/NN	2	31	
Braarudosphaera bigelowii	/NN	0.1	21.8	
*Broinsonia matalosa	/NN	12	30	
*ID as cf; lowers from 97.9 to 112.2				
Broinsonia viriosa	/nn	2	31	
Bukryolithus ambiguus	/NN	3	31	
Chiastozygus litterarius	/NN	0.1	30	
Chiastozygus platyrhethus	/NN	0.1	31	
Cretarhabdus conicus	/NN	2	31	
*Helenea = Cruciplacolithus chiastia				
			/nn	0.1 31
Cyclagelosphaera margerelii	/NN	22.6	29	
Cylindralithus nudus	/NN	2	29	*ID as Cyclagelosphaera
Discorhabdus ignotus	/NN	2	31	
Eprolithus floralis	/NN	2	31	
Flabellites oblonga	/NN	0.1	31	
Grantarhabdus coronadventis	/NN	2	31	*ID as Flabellites
Haqius circumradiatus	/NN	0.1	31	
Helenea chiastia	/nn	0.1	31	
Helicolithus compactus	/NN	0.1	22.6	
Helicolithus trabeculatus	/NN	0.1	31	
Laguncula dorotheae	/nn	0.1	29	
Lithraphidites carniolensis	/NN	0.1	31	
Manivitella pemmatoidea	/NN	0.1	31	
Micrantholithus hoschulzii	/NN	29	30	
Nannoconus truitti	/NN	16	29	
Percivalia fenestrata	/NN	2	31	

Prediscosphaera columnata	/NN	0.1	31	
Prediscosphaera spinosa	/NN	2	28	
*this occurrence lowers base to U. Apt but Perch-Nielson '85 has it in Cenoman.				
Radiolithus planus	/NN	0.1	30	
Repagulum parvidentatum	/NN	0.1	31	
Rhagodiscus achlyostaurion	/NN	0.1	31	
Rhagodiscus angustus	/NN	0.1	31	
Rhagodiscus asper	/NN	0.1	31	
Rhagodiscus splendens	/NN	0.1	31	
Rotelapillus laffittei	/NN	0.1	31	
Stauroolithites glabra	/NN	3	31	
Stoverius achylosus	/NN	0.1	30	
Tegumentum stradneri	/NN	0.1	31	
Tetrapodorhabdus coptensis	/NN	0.1	31	
Tranolithus gabalus	/NN	0.1	31	
Watznaueria barnesae	/NN	0.1	31	
Watznaueria biporta	/NN	0.1	28	
Watznaueria britannica	/NN	0.1	31	
Watznaueria fossacincta	/NN	0.1	31	
Watznaueria manivitiaie	/NN	12	31	
Zeugrhabdotus embergeri	/NN	0.1	31	
Apteodinium granulatum	/DN	12	31	
Atopodinium haromense	/DN	2	31	
Callaiosphaeridium asymmetricum	/DN	2	31	
Carpodinium granulatum	/DN	22	22	
Cerbia tabulata	/DN	2	22.6	
Circulodinium distinctum	/DN	3	31	*ID as subsp. longispinatum
Codoniella campanulata	/DN	30	30	
Coronifera albertii	/DN	3	31	
Coronifera oceanica	/DN	2	31	
Cribopteridinium edwardsii	/DN	2	31	
Cyclonephelium brevispinatum	/DN	2	31	
Cyclonephelium compactum	/DN	14	30	*ID as cf; new taxon
Endoscrinium campanula	/DN	2	31	
Exochosphaeridium phragmites	/DN	31	31	
Florentinia deanei	/DN	2	31	
*ID as cf.; lowrs base from 101.7 to 112.9-ok				
Florentinia radiculata	/DN	29	31	
Hapsocysta peridictya	/DN	2	24	
Hystrichodinium pulchrum	/DN	2	31	
Hystrichosphaerina schindewolfii	/DN	12	12	
Kiokansium unituberculatum	/DN	2	31	
Kleithriasphaeridium eoinodes	/DN	2	31	
Lithodinia stoveri	/DN	31	31	
Muderongia staurota	/DN	6	16	
Odontochitina operculata	/DN	2	31	
Odontochitina singhii	/DN	24	31	
Oligosphaeridium complex	/DN	2	31	
Oligosphaeridium pulcherrimum	/DN	24	24	
Ovoidinium scabrosum	/DN	2	23.3	
Palaeoperidinium cretaceum	/DN	2	31	
Pareodinia ceratophora	/DN	12	30	
Prolixosphaeridium parvispinum	/DN	2	31	
Protoellipsodinium spinosum	/DN	2	26	
Pterodinium cingulatum	/DN	2	31	
Sepispinula huguoniotii	/DN	2	12	*in Chlamydophorella
Spiniferites ramosus ramosus	/DN	2	31	*ID as group; in range
Stephodinium australicum	/DN	30	31	
*ID as S. coronatum = australicum fide Lentini & Williams 1989; lowers base				
Stiphrosphaeridium anthophorum	/DN	2	24	
Subtilisphaera perlucida	/DN	2	30	
Surculosphaeridium longifurcatum	/DN	3	30	
Subtilisphaera cretacea	/DN	2	31	

Systematophora silybum	/DN	2	22	*ID as cf; in range
Trichodinium castanea	/DN	2	23.3	
Wallodinium krutzschii	/DN	8	23.3	
Wrevittia cassidata	/DN	3	31	
Wrevittia helicoidea	/DN	6	23.3	*ID as Gonyaulacysta
Fromea amphora	/ac	2	30	
Fromea fragilis	/ac	26	26	

*END

MIDK.58 - Pre-Guitard, France, Aptian-Albian

Pre-Guitard, France Base Albian. Kennedy et al., 2000, Cret. Research, 21:591-720.

Marnes Bleues Formation 0-166 m, marine shale; ammonite data from Fig. 10, p. 607; TOC from Fig. 23, p. 627; planktic foram data from Fig. 21, p. 623; dinos from Appendix 3, p. 713-714; nannos from Appendix 5, p. 717-718.

Data:

*Taxa	Morph	Base	top meters	
Marker bed Niveau Jacob	/mb	2.5	4	
*Upper Aptian jacobii zone				
Marker bed Niveau Kilian	/mb	37.5	38.5	
Marker bed Niveau Paquier	/mb	66.5	68	
Marker bed Niveau Leenhardt	/mb	101.5	102	
*Carbon peak OAE 1b	/GC	68	68	
*3 peaks in this interval, not certain if it correlates with 1b				
Actinoceramus salomoni	/bi	101.5	102	*ID as sp.
Beudanticeras convergens	/am	66.5	66.9	
Douvilleiceras leightonense	/am	66.5	66.9	
Douvilleiceras mammillatum	/AM	101.5	102	
*ID as cf. subsp. aequinodatum				
Eugaudryceras plutisulcatus	/am	2.5	51	
Leymeriella tardefurcata	/am	66.5	66.9	
Hoplites steinmanni	/am	109.5	109.5	
Hypacanthoplites anglicus	/am	66.5	66.9	
Hypacanthoplites clavatus	/am	2.5	66.9	
Hypacanthoplites elegans	/am	2.5	51	
Hypacanthoplites milletioides	/am	66.5	66.9	
Hypacanthoplites trivialis	/am	66.5	66.9	
Kosmatella romana	/am	101.5	109.5	
Puzosia quenstedti	/am	66.5	66.9	*sp. ex group
Hedb delrioensis	/fp	1	166	
Hedb infracretacea	/fp	1	166	
Hedb planispira	/FP	1	166	
Hedb sigali	/FP	6	166	
Hedb similis	/FP	56	166	
Hedb simplex	/FP	56	166	
Hedb trocoidea	/FP	1	166	
Tici bejaouaensis	/FP	1	26	
Tici primula	/FP	74	166	
Tici raynaudi	/FP	74	141	
Tici roberti	/FP	1	26	
Assipetra terebrodentarius	/NN	26	151	
Axopodorhabdus albianus	/NN	166	166	
Axopodorhabdus dietzmannii	/NN	1	166	
Biscutum constans	/NN	1	166	
Braarudosphaera africana	/NN	161	161	
Broinsonia matalosa	/NN	36	166	*ID as cf.
Broinsonia viriosa	/nn	61	74	
Bukryolithus ambiguus	/NN	1	166	
Chiastozygus litterarius	/NN	1	166	
Chiastozygus platyrhethus	/NN	6	166	
Corollithion signum	/NN	46	96	

Cretarhabdus conicus	/NN	1	166	
Cretarhabdus striatus	/NN	16	166	
Crucicribrum anglicum	/NN	166	166	
*Helenia = Cruciplacolithus chiastia				
			/NN	1 166
Cyclagelosphaera margerelii	/NN	16	151	
Cylindralithus nudus	/NN	6	166	*ID as Cyclagelosphaera
Discorhabdus ignotus	/NN	1	166	
Eprolithus floralis	/NN	1	166	
Flabellites oblonga	/NN	1	166	
Grantarhabdus coronadventis	/NN	11	166	
Grantarhabdus meddii	/NN	16	116	
Haqius circumradiatus	/NN	1	166	
Hayesites albiensis	/NN	1	166	
Helenea chiastia	/nn	1	166	
Helicolithus compactus	/NN	16	156	
Helicolithus trabeculatus	/NN	31	166	
Laguncula dorotheae	/nn	64	166	
Lithraphidites carniolensis	/NN	1	166	
Manivitella pemmatoidea	/NN	1	166	
Micrantholithus hoschulzii	/NN	1	58	
Nannoconus truitti	/NN	68	166	
Nannoconus minutus	/NN	68	68	
Percivalia fenestrata	/NN	1	166	
Pickelhaube furtiva	/NN	21	126	
Prediscosphaera columnata	/NN	21	166	
Prediscosphaera spinosa	/NN	1	166	*previous known FO in Cenomanian
Radiolithus planus	/NN	1	166	
Repagulum parvidentatum	/NN	1	166	
Rhagodiscus achlyostaurion	/NN	1	166	
Rhagodiscus angustus	/NN	1	166	
Rhagodiscus asper	/NN	1	166	
Rhagodiscus splendens	/NN	1	166	
Seribiscutum primitivum	/nn	96	166	
Staurolithites glabra	/NN	51	166	
Staurolithites laffittei	/NN	1	166	*in Rotelapillus
Stoverius achylosus	/NN	6	166	
Tegumentum stradneri	/NN	1	166	
Tetrapodorhabdus coptensis	/NN	1	161	
Tranolithus gabalus	/NN	1	166	
Tranolithus orionatus	/NN	126	166	
Watznaueria barnesae	/NN	1	166	
Watznaueria biporta	/NN	36	166	
Watznaueria britannica	/NN	1	156	
Watznaueria fossacincta	/NN	1	166	
Watznaueria manivittiae	/NN	1	161	
Zeugrhabdotus embergeri	/NN	1	166	
Achomosphaera verdieri	/DN	16	26	
Atopodinium haromense	/DN	26	101	
Callaiosphaeridium asymmetricum	/DN	1	81	
Carpodinium granulatum	/DN	16	81	
Circulodinium distinctum	/DN	1	64	
*ID as subsp. longispinatum				
Codoniella campanulata	/DN	68	71	
Coronifera albertii	/DN	1	101	
Coronifera oceanica	/DN	16	101	
Cribooperidinium edwardsii	/DN	1	101	
Cribooperidinium tenuiceras	/DN	16	101	*ID as Occisucysta
Cyclonephelium brevispinatum	/DN	1	101	
Cyclonephelium hughesii	/DN	91	91	
Dapsilidinium laminaspinosum	/DN	74	74	
Dingodinium albertii	/DN	26	101	
Endoscrinium campanula	/DN	26	101	
Florentinia deanei	/DN	26	91	

Hapsocysta peridictya	/DN	16	66	
Hystrichodinium pulchrum	/DN	16	101	
Kiokansium unituberculatum	/DN	1	101	
Occisucysta tentorium	/DN	1	66	
Odontochitina operculata	/DN	1	101	
Oligosphaeridium asterigerum	/DN	16	101	
Oligosphaeridium complex	/DN	1	101	
Palaeoperidinium cretaceum	/DN	1	101	
Prolixosphaeridium parvispinum	/DN	1	101	
Protoellipsodinium spinosum	/DN	1	56	
Pterodinium cingulatum	/DN	1	101	
Sepispinula huguoniotii	/DN	68	68	
*ID in Chlamydothorea & Clei				
Spiniferites ramosus ramosus	/DN	1	101	
Stephodinium australicum	/DN	66	71	
*in S. coronatum = australicum fide Lentin & Williams 1989				
Stiphrosphaeridium anthophorum	/DN	1	66	*ID as Olig.
Subtilisphaera perlucida	/DN	1	16	
Surculosphaeridium longifurcatum	/DN	68	91	
Systematophora cretacea	/DN	16	101	*ID as cf.
Tenua hystrix	/DN	1	68	*ID as Cerbia tabulata
Tenua hystrix	/DN	16	101	*ID as Cycl
Wallodinium krutzschii	/DN	36	36	
Wrevittia cassidata	/DN	81	101	*ID as Gony.
Wrevittia helicoida	/DN	1	81	*ID as Gony.
Fromea amphora	/ac	1	101	
*END				

MIDK.58b Pre-Guittard, France

Data from Hart et al. (1996, Figure 3 p. 48) defines Base Albian. Marnes Bleues Formation 0-166 m, marine shale; ammonite data from Fig. 3; planktic foram data from Fig. 3; nannos from Appendix Fig. 3.

Data:

*Taxa	Morph	Base	top meters
Marker bed Niveau Jacob	/mb	3	3
*Upper Aptian jacobi zone			
Marker bed Niveau Kilian	/mb	42	43
Marker bed Niveau Paquier	/mb	67	68
Marker bed Niveau Leenhardt	/mb	111	112
Douvilleiceras leightonense	/am	68	68
Douvilleiceras mammillatum	/am	110	110
*ID as cf. subsp. aequinodatum			
Leymeriella regularis	/am	80	80
Leymeriella tardefurcata	/am	65	85
Hypacanthoplites elegans	/am	3	50
Hypacanthoplites jacobi	/am	3	46
Hypacanthoplites trivialis	/am	68	68
Puzosia quenstedti	/am	80	110
*sp. ex group; use mid part of range			
Tici bejaouaensis	/fp	0	32
Tici primula	/fp	137	*
*Tici roberti	/fp	137	*= within range
Prediscosphaera columnata	/nn	20	*
*END			

MIDK.59 Shell Stephens Core, Henderson Co., Texas

Lozo, 1951, Fondren Science Series, No. 4; data from p. 84, Fig. 6. Top core in Woodbine @3552'; top Maness Fm. @ 3600'; top Buda @ 3666'; bottom sample in Grayson Shale @ 3788-3814'.

Data:

*TAXA	Morph	Base	Top (feet)	
Acruliammina longa	/fb	-3635	-3618	
Ammobaculites goodlandensis	/fb	-3635	-3563	
Ammobaculites subcretaceus	/fb	-3635	-3563	
Citharina striolata	/fb	-3640	-3635	
Cribratina texana	/fb	-3665	-3635	
Lingulina lamellata	/fb	-3665	-3635	
Lingulina nodosaria	/fb	-3665	-3635	
Marginulina tenuissima	/fb	-3665	-3635	
Praebulimina nannina	/fb	-3731	-3665	
Saracenaria cushmani	/fb	-3665	-3635	
Spirillina minima	/fb	-3788	-3721	
Spiroplectamma longa	/fb	-3635	-3618	
Spiroplectamma nuda	/fb	-3788	-3635	
Textularia rioensis	/fb	-3788	-3563	
Textularia washitensis	/fb	-3635	-3618	
Vaginulina geisendorferi	/fb	-3665	-3635	*Citharina fide Mancini 1982
Vaginulina kochii	/fb	-3635	-3618	*Citharina fide Mancini 1982
Vaginulina striolata	/fb	-3640	-3635	
Hedb washitensis	/fp	-3788	-3618	
Hedb delrioensis	/fp	-3788	-3635	*in Globigerina cretacea
Praeglobotruncana delrioensis	/fp	-3788	-3618	*reported as Globorotalia
Hedb planispira	/fp	-3635	-3618	
	*new taxa in Midk dictionary			
Bigenerina clavellata	/fb	-3635	-3618	
Citharina complanata	/fb	-3635	-3635	
Citharina strigillata	/fb	-3635	-3618	
Dentalina porcatulata	/fb	-3665	-3635	
Dentalinopsis martensi	/fb	-3665	-3635	
Dentalinopsis tricarinarum	/fb	-3635	-3635	
Epistomina scaphiocola	/fb	-3635	-3618	
Gaudryina alexanderi	/fb	-3665	-3635	
Gaudryina bosquensis	/fb	-3635	-3618	
Gavelinella plummerae	/fb	-3788	-3618	
Gyroidinoides loetterlei	/fb	-3788	-3618	
Lenticulina washitensis	/fb	-3788	-3563	
Nodophthalmidium pyriformis	/fb	-3788	-3618	
Quinqueloculina lirellangula	/fb	-3731	-3618	
Siphotectularia subcretaceous	/fb	-3635	-3618	
Spiroplectamma scotti	/fb	-3635	-3592	
Textularia losangica	/fb	-3635	-3618	
Tristix acutangula	/fb	-3721	-3618	

*END

MIDK.60 - Estella-Lizarra section, N. Spain

Estella-Lizarra, Northern Spain. Alb-Cen reference section, Lopez-Horgue et al., 1999, Cret. Research, 20:369-402, figs. 7, 8. Zufia Fm. section measured upward from fault. "The main erosional surfaces (bases of levels 2a, 2b, 2c, and Aramendia limestone; Figs. 2,3) represent rapid changes in the sedimentary conditions of the basin" p. 396; positions @ 448, 883, 1100, 1347, & 1517 m. The Alb-Cen boundary is bracketed between 1315 & 1348 m.

Data:

*Taxa	Morph	Base	Top m
Biti breggiensis	/fp	850	920
Glob'oides ultramicrus	/fp	920	1390
Hedb delrioensis	/fp	920	1390
Hedb planispira	/fp	630	1390
Hedbergella washitensis	/fp	260	1390
Heterohelix moremani	/fp	920	920
Planomalina buxtorfi	/fp	1110	1110

<i>Praeglobotruncana delrioensis</i>	/fp	920	1390	
<i>Praeglobotruncana stephani</i>	/fp	1110	1390	
<i>Rota appenninica</i>	/fp	1110	1610	
<i>Rota gandolfi</i>	/fp	1110	1348	
<i>Rota globotruncanoides</i>	/fp	1348	1390	
<i>Rota montsalvensis</i>	/fp	1390	1390	
<i>Rota reicheli</i>	/fp	1610	1610	
<i>Tici primula</i>	/fp	850	920	
<i>Tici raynaudi</i>	/fp	830	962	
<i>Tici subticinensis</i>	/fp	630	850	*placed in <i>Rotalipora</i>
<i>Tici ticinensis</i>	/fp	728	962	*placed in <i>Rotalipora</i>
<i>Daxia cenomana</i>	/fb	1540	1540	
<i>Orbitolina aperta</i>	/fb	440	1540	
<i>Orbitolina conica</i>	/fb	1540	1540	
<i>Orbitolina corbarica</i>	/fb	1540	1540	
<i>Orbitolina cuvillieri</i>	/fb	1540	1540	
<i>Orbitolina duranddelgai</i>	/fb	1540	1540	
<i>Orbitolina sefini</i>	/fb	1540	1540	
*the two preceding species were grouped together				
<i>Orbitolina subconcava</i>	/fb	170	170	
<i>Mantelliceras cantianum</i>	/am	1435	1435	
<i>Mantelliceras mantelli</i>	/am	1390	1390	*both species id as cf.
<i>Mariella</i> sp.	/am	1100	1315	
<i>Mortoniceras</i> sp.	/am	1099	1315	*includes <i>Durnovarites</i>
<i>Stoliczkaia clavigera</i>	/am	1100	1315	
<i>Stoliczkaia dispar</i>	/am	1100	1100	*id as sp. aff.
*END				

MIDK.61 - Dukhan-B, Qatar

Dukhan-B well, Qatar, Arabian Gulf, 25.42117°N, 50.7835°E. Data from Ibrahim & Al-Hitmi, 2000, *GeoArabia*, 5:483-507, Tables 1, 2. Top Mishrif Fm. =1700', top Ahmadi =1820', top Mauddud =2408', top Nahr Umr =2589', top Shuaiba Fm. =3038'.

Data:

*Taxa	Morph	Base	Top (ft)
<i>Orbitolinopsis depressa</i>	/FB	-2480	-2080
*from Henson, 1948, in DK-B well, p. 92			
<i>Circulodinium brevispinosum</i>	/DN	-2865	-2054
<i>Coronifera oceanica</i>	/DN	-2770	-1880
<i>Cribroperidinium orthoceras</i>	/DN	-2865	-2605
<i>Cyclonephelium vannophorum</i>	/DN	-2865	-1880
<i>Dinopterygium cladoides</i>	/DN	-2770	-2080
<i>Dinopterygium tuberculatum</i>	/dn	-2770	-2080
<i>Florentinia berran</i>	/DN	-2408	-1880
<i>Florentinia clavigera</i>	/DN	-2360	-2080
<i>Florentinia deanei</i>	/DN	-2360	-2080
<i>Florentinia laciniata</i>	/DN	-2770	-1800
<i>Florentinia radiculata</i>	/DN	-2408	-1880
<i>Florentinia resex</i>	/DN	-2408	-1800
<i>Florentinia cooksoniae</i>	/DN	-2865	-1880
<i>Hystriosphæridina turonica</i>	/dn	-2388	-2360
<i>Microdinium setosum</i>	/DN	-2605	-2080
<i>Odontochitina ancala</i>	/DN	-2865	-2388
<i>Odontochitina cripropoda</i>	/dn	-2408	-1926
<i>Odontochitina costata</i>	/DN	-2408	-1926
<i>Odontochitina operculata</i>	/DN	-2865	-2054
<i>Oligosphaeridium complex</i>	/DN	-2865	-2255
<i>Oligosphaeridium pulcherrimum</i>	/DN	-2865	-2255
<i>Senegalinium aenigmaticum</i>	/dn	-2865	-2360
<i>Spiniferites lenzi</i>	/DN	-2865	-2054
<i>Spiniferites ramosus ramosus</i>	/DN	-2865	-1800

Subtilisphaera cheit	/DN	-2388	-2360
Subtilisphaera hyalina	/dn	-2388	-2255
Subtilisphaera senegalensis	/DN	-2388	-2080
Trichodinium castanea	/DN	-2865	-1880
Xenascus ceratioides	/DN	-2865	-1880
Afropollis jardinus	/SP	-2964	-2190
Stellatopollis barghoorni	/SP	-2964	-2913

*END

MIDK.62 Shell Maness Core, No. 1

Cherokee Co., Texas. Lozo, 1951, Fondren Science Series, No. 4; data from p. 85, Fig. 7. Top core in Woodbine @ 4575'; top Maness Fm. @ 4705'; top Buda @ 4765'; bottom sample in Buda @ 4788'.

Data:

*TAXA	Morph	Base	Top (feet)	
Acruliammina longa	/fb	-4736	-4722	
Ammobaculites goodlandensis	/fb	-4754	-4654	
Ammobaculites subcretaceus	/fb	-4754	-4654	
Lingulina lamellata	/fb	-4754	-4754	
Praebulimina nannina	/fb	-4770	-4722	
Spirillina minima	/fb	-4770	-4754	
Spiroplectammina nuda	/fb	-4770	-4770	
Textularia rioensis	/fb	-4736	-4722	
Textularia washitensis	/fb	-4754	-4669	
Vaginulina geisendorferi	/fb	-4754	-4754	*Citharina fide Mancini 1982
Vaginulina kochii	/fb	-4736	-4722	*Citharina fide Mancini 1982
Hedb washitensis	/fp	-4770	-4736	
Hedb delrioensis	/fp	-4754	-4736	*in Globigerina cretacea
Prae delrioensis	/fp	-4770	-4722	*reported as Globorotalia
Hedb planispira	/fp	-4736	-4682	
	*new taxa in Mikd dictionary			
Bigenerina clavellata	/fb	-4754	-4682	
Citharina complanata	/fb	-4736	-4722	
Citharina strigillata	/fb	-4770	-4754	
Dentalina porcatulata	/fb	-4754	-4736	
Dentalinopsis tricarinatum	/fb	-4754	-4736	
Epistomina scaphiolocula	/fb	-4770	-4654	
Gaudryina alexanderi	/fb	-4754	-4736	
Gavelinella plummerae	/fb	-4770	-4754	
Gyroidinoides loetterlei	/fb	-4770	-4707	
Lenticulina washitensis	/fb	-4770	-4654	
Nodophthalmidium pyriformis	/fb	-4770	-4736	
Quinqueloculina lirellangula	/fb	-4770	-4754	
Siphotectularia subcretaceous	/fb	-4754	-4736	
Spiroplectammina scotti	/fb	-4754	-4654	
Textularia losangica	/fb	-4770	-4736	
Tristix acutangula	/fb	-4736	-4722	

*END

MIDK.63 Amoco No. Elm Grove A Core, Robertson Co., TX

Data unpubl. by J.A. Stein, Amoco, Houston, 1986; Fig. 37: Core depth: -7630 to -7814. Stratigraphy: Top core in Buda @ -7630; top Grayson @ -7639; top Georgetown @ -7659 ft.

DATA:

*TAXA	Morph	Base	Top (feet below KB)
Apteodinium perforata	/dn	-7725	-7639
Coronifera albertii	/dn	-7787	-7634
Dapsilidinium laminaspinosum	/dn	-7787	-7665

Florentinia laciniata	/dn	-7813	-7639	in part
Gonyaulacysta cassidata	/dn	-7813	-7769	
Heslertonia cylindrata	/dn	-7810	-7634	
Kiokansium unituberculatum	/dn	-7660	-7645	
Kleithriasphaeridium loffrense	/dn	-7814	-7634	
Litosphaeridium conispinum	/DN	-7813	-7769	
Litosphaeridium siphoniphorum	/DN	-7724	-7635	
Maghrebina perforata	/DN	-7724	-7640	
Oligosphaeridium totum	/dn	-7813	-7640	
Ovoidinium scabrosum	/DN	-7695	-7637	
Ovoidinium verrucosum	/DN	-7696	-7647	
Prolixosphaeridium conulum	/dn	-7787	-7634	
Subtilisphaera cheit	/DN	-7680	-7634	
Trigonopyxidia ginella	/dn	-7787	-7746	
Appendicisporites tricornitatus	/sp	-7787	-7639	
Appendicisporites undosus	/sp	-7652	-7645	
Rugubivesiculites rugosus	/SP	-7762	-7646	
Taurocusporites segmentatus	/sp	-7672	-7671	
Trilobosporites marylandensis	/SP	-7661	-7660	
*END				

MIDK.64 Hudson Hope, Peace River, BC

Hudson Hope, Peace River, British Columbia, Canada. North side of Peace River at mouth of small creek, about 7 km west of Halfway River, 56°11'45"N, 121°32'15"W.

Koke & Stelck, Canadian Soc. Pet. Geol., Mem. 9:271-279. Basal 65 m of Hasler Shale above Cadotte Fm & below gigas Zone in lower Hasler Mbr. of Hasler Shale; measured above base.

Data:

*TAXA	Morph	Gp	Base	Top	in meters
Stelckiceras liardense	/am		24	25	
*Position in section estimated at midpoint.					
*"The foraminifera are associated in outcrop with the ammonites S. lairdense					
*and...?Manuaniceras sp. and" Inoceramus sp. ex gp. anglicus (p. 271).					
Ammobaculites fragmentarius	/fb		7.6	45.7	
Ammobaculites tyrrelli	/fb		6.1	45.7	
Ammobaculites wenonahae	/fb		6.1	45.7	
Ammodiscus kiowensis	/fb		33.5	45.7	
Haplophragmoides gilberti	/fb		12.2	45.7	*ID as cf
Miliammina awunensis	/fb		45.7	45.7	
Miliammina inflata	/fb		45.7	45.7	
Miliammina manitobensis	/fb		7.6	45.7	
Sacc alexanderi	/fb		15.2	45.7	
Saccamina lathrami	/fb		24.4	25.9	
Psamminopelta bowsheri	/fb		6.1	45.7	
Trochammina depressa	/fb		32.0	32.0	
*Trochammina gatesensis			12.2	45.7	base too low
Trochammina rainwateri	/fb		6.1	25.9	*ID as cf
*Trochammina wetteri	/FB		12.2	12.2	base too low
*ID as wetteri umiatensis					
*END					

MIDK.65 Hot Springs Area, South Dakota

Fall River Co., South Dakota. Composited outcrop by Mike Evitts, K.L. Van Zant, & J.A. Stein, 1987-88. Data by Mike Evitts, Jeff Stein, Jim Bergen, & R. Scott. Top Belle Fourche at 19 ft, top lower Greenhorn Fm at 300', at date at Pueblo, Colo.; top Bridge Creek Mbr. at 328', top Pool Creek Mbr Carlile Fm. at 458', top Turner Sandy Mbr. 621', top Sage Breaks Mbr. at 803', top outcrop 947'.

Data:

*Taxa Morph code base (ft) top

*ID's by R. W. Scott with inoceramids checked by E. G. Kauffman.

Bacu yokoyamai	/am	565	570
Coll woollgari	/am	381	381
Prio wyomingensis	/am	451	527
Scaphites whitefieldi	/am	464.4	527
Inoc dimidius	/bi	451	451
Inoc fiegei	/bi	565	610
Crem inconstans	/bi	565	570
Inoc perplexus	/bi	464.4	527
Inoc rutherfordi	/bi	135	135
Myti mytiloides	/bi	307	307
Myti opalensis	/bi	307	307
Pseu congesta	/bi	798	798

*ID by M. J. Evetts, 1994, modified Mar 1995

Clav simplex	/fp	129	335
Clav subcretacea	/fp	335	379
Clav moremani	/fp	289	286
Dica hagni	/fp	302	328
Glob'oides abberanta	/fp	766	766
Glob'oides asper	/fp	826	826
Glob'oides bentonensis	/fp	81	286
Glob'oides quadricamella	/fp	896	896
Glob'ana cretacea	/fp	616	616
Glob'ana havanensis	/fp	756	756
Guembelitria cenomana	/fp	289	289
Hast subdigitata	/fp	726	792
Hast watersi	/fp	726	766
Hedb loetterlei	/fp	271	789
Hedb simplicissima	/fp	81	349
Hete americana	/fp	792	792
Hete globulosa	/fp	44	44
Hete moremani	/fp	616	616
Hete pulchra	/fp	302	302

*New genus is Archeoglobigerina

*Placed in Laeviheterohelix by S. Nederbragt

Prae stephani	/fp	289	327
Rota cushmani	/fp	164	289
Rota greenhornensis	/fp	110	279
Rugo rugosa	/fp	806	806
Scha cenomana	/fp	306	306
Whit paradubia	/fp	110	792
Dentalina basiplanata	/fb	292	292
Dentalina gracilis	/fb	766	766
Dorthia smokyensis	/fb	606	606
Eouv aculeata	/fb	726	786
Fron inversa	/fb	616	616
Gave kansasensis	/fb	616	792
Gavelinella plummerae	/fb	143	286
Glob subconicus	/fb	792	792
Gyro nitidus	/fb	792	792
Hapl howardense	/fb	666	666
Hapl kirki	/fb	626	626
Haplophragmoides rota	/fb	616	616
Lent kansasensis	/fb	606	616
Lingulogavelinella asterigerinoides	/fb	129	299
Lunatriella spinifera	/fb	311	306
Neob albertensis	/fb	164	786
Neob canadensis	/fb	616	616
Palmula suturalis	/fb	792	792
Praebulimina muchisoniana	/fb	716	766
Pseudobolivina rollaensis	/fb	616	937
Sacc alexanderi	/fb	81	626
Saracenaria tirangularis	/fb	616	616
Spirillina minima	/fb	289	286

Trochammina diagonis	/fb	626	626
Trochammina gatesensis	/fb	29	44
Trochammina rainwateri	/fb	91	379
Trochammina ribstonensis	/fb	937	937
Verneuilinoides hectori	/fb	29	44
Virg tegulata	/fb	292	292

*END

MIDK.66 - Jebel Areif El Naqa, Sinai, Egypt

Gebel Areif El Naqa, Sinai, Egypt, Section AN, N30° 21'23", E34° 26'00". Bauer, Marzouk, Steuber, & Kuss, Cret. Res., 2001, 22:497-546; Bauer et al., 2004, Cour Forsch. Senck, 247:207-231.

Use thicknesses in fig. 6 (2004); Base section @ 0 m in Halal/Raha Fm., base lower Abu Qada Fm. @ 45 m; base middle @ 74 m; base upper @ 86 m; base Wata Fm. @ 103 m; top section @ 155 m.

Sampled interval N5 49-94 m (p. 516, 2001)(=45-102m in fig. 6, 2004). C/T unconformity at base Abu Qada Fm. Sequence stratigraphy from Bauer et al. (2004): CeSin 7-45 m; TuSin 1-84 m.

Data:

*TAXA	Morph	Base m	Top m	
				*Bauer et al., 2001, figs. 4, 12
Choffaticeras luciae	/am	45.5	46	
Kamerunoceras turoniense	/am	45.5	46	
Thomasites rollandi	/am	45.5	46	*p. 516, fig. 12,
				*Bauer 2004, fig. 6, p. 215
Biradiolites angulosus	/bi	105	116	
Bournonia fourtaui	/bi	105	116	
Bournonia judaica	/bi	150	150	
Distefanella lombricalis	/bi	105	116	*ID as cf
Durania gaensis	/bi	105	116	*ID as cf
Hippurites requieni	/bi	80	116	
Radiolites sauvagesi	/bi	105	116	
				*p. 519, 504, Fig. 4 w/ oyster; older rudists at 29-30 m on Fig. 4
				*oysters @ 68-69, 105-106, 111-112 m on Fig. 4.
Corollithion signum	/nn	68	102	
Eprolithus floralis	/nn	68	102	
Quadrum gartneri	/nn	63	102	
				*base Q. gartneri zone CC 11 to FO L. maleformis/E. eximius
Radiolithus planus	/nn	65	102	
Watznaueria barnesae	/nn	63	102	
				*Bauer et al. 2004, fig. 6
Chrysalidina gradata	/fb	1	3	
Nummoloculina regularis	/fb	3	78	*ID as sp.
Pseudolituonella reicheli	/fb	1	44	
Pseudorhapydionina laurinensis	/fb	1	4	*ID as sp.
Boueina pygmaea	/al	80	81	
Neomeris cretacea	/al	80	81	
Pseudolithothamnium album	/al	44	44	

*END

MIDK.67 - Gebel Abu Zurub, Sinai, Egypt

Gebel Abu Zurub, Sinai, Egypt; Section Z, N29° 22'31", E33° 21'07". Bauer, Marzouk, Steuber, & Kuss, Cret. Res., 2001, 22:497-546; Bauer et al., 2004, Courier Forschung. Senckenberg 247:207-231, fig. 8;

Use thicknesses on fig. 8 (2004): Base section @ 0 m in Raha Fm.; base lower Abu Qada Fm. @ 82/75 m; base middle @ 100/93 m, base upper @ 122/115 m; base Wata Fm. @ 181m; top section @ 200/158 m.

Sampled intervals N2 12-62 m (p. 515)(=19-70m fig. 8, 2004); N9 77-90 m (=82-95m on fig. 8, 2004), N8 136-144 m (p. 516)(=142-150m on fig. 8, 2004). C/T unconformity @ base Abu Qada at 82 m (75 m in fig. 4, 2001); Section measurements in fig. 8 (2004); Sequence stratigraphy: Bauer et al. (2004): CeSin6 @9m; CeSin7 @75m; TuSin1 @122m.

Data:

*TAXA	Morph	Base m	Top m	
Choffaticeras segne	/am	82.5	87	
Vascoceras durandi	/am	82.5	87	*p. 516, fig. 12, *Bauer 2004, fig. 8, p. 218
Eoradiolites lyratus	/bi	7	7	
Hippurites requieni	/bi	120	121	
Praeradiolites fleuriaui	/bi	7	7	*ID as cf *p. 505, fig. 4, older indet. rudists at 0-5 m on Fig. 4
Exogyra flabellata	/bi	5	32	*ID as Ceratostreon
Exogyra olisiponensis	/bi	5	32	
Ilmatogyra africana	/bi	5	32	
				*p. 503, p. 505, Fig. 4; younger indet. oysters at 145-150 m on Fig. 4
Broinsonia enormis	/nn	41	147	
Chiastozygus platyrhethus	/nn	93	95	
Corollithion signum	/nn	24	147	
Eiffellithus eximius	/nn	93	147	
				*base E. eximius zone CC 12
Eiffellithus turriseiffelii	/nn	93	147	
Eprolithus floralis	/nn	24	147	
Gartnerago obliquum	/nn	94	94	
Lithraphidites carniolensis	/nn	93	147	
Lucianorhabdus maleformis	/nn	93	147	
				*base L. maleformis/E. eximius zone CC 12 to FO M. furcatus
Manivitella pemmatoidea	/nn	93	95	
Microrhabdulus decoratus	/nn	93	95	
				*Quadrum gartneri /nn 24 147
				*base Q. gartneri zone CC 11 to FO L. maleformis; base in M. nodosoides L. Tur
Radiolithus planus	/nn	24	147	
Rhagodiscus angustus	/nn	24	66	
Stradneria crenulata	/nn	93	147	
Tranolithus orionatus	/nn	93	95	
Watznaueria barnesae	/nn	93	147	
Watznaueria biporta	/nn	93	95	
Zeugrhabdotus erectus	/nn	32	147	
Zygodiscus diplogrammus	/nn	93	95	
				*Bauer et al., 2004, Courier Forschung. Senckenberg 247:207-231, fig. 8;
Chrysalidina gradata	/fb	3	3	
Nummoloculina regularis	/fb	3	3	*ID as sp.
Praealveolina cretacea	/fb	3	3	*ID as sp.
Pseudedomia drorimensis	/fb	3	3	*ID as sp.
Pseudolituonella reicheli	/fb	3	3	
Pseudorhapydionina laurinensis	/fb	3	3	*ID as sp.
Boueina hochstetteri	/al	110	115	*ID as cf.
Boueina pygmaea	/al	110	121	
Neomeris cretacea	/al	119	121	
Marinella lugeoni	/al	110	121	
Pseudolithothamnium album	/al	120	120	

*END

MIDK.68 - Gebel Guna, Sinai, Egypt

Gebel Guna, Sinai, Egypt, Section G, N28° 56'09", E34° 05'48". Bauer, Marzouk, Steuber, & Kuss, Cret. Res., 2001, 22:497-546. Base section @ 0 m in Raha Fm.; base Abu Qada Fm. lower @ 66 m; base middle @ 85 m; base upper @ 92 m; base Wata Fm. covered @ 117 m; top section @ 137 m. Sampled intervals N3 28-49 m, N10 67-78 m (p. 515-516). C/T unconformity @ base Abu Qada Section Q stacked above at Wata/Matulla contact at 187 m assuming Wata is 70 m thick, so top of composited section is 226 m; data from Fig. 13, p. 517.

Data:

*TAXA	Morph	Base m	Top m
-------	-------	--------	-------

Choffaticeras segne	/am	67	71	
Kamerunoceras turoniense	/am	67	71	
Vascoceras durandi	/am	67	71	*p. 516, fig. 12,
Hippurites requieni	/bi	90	92	*p. 519
Exogyra flabellata	/bi	24	32	*ID as Ceratostreon
Exogyra olisiponensis	/bi	24	32	
Ilmatogyra africana	/bi	24	32	*p. 503
Broinsonia enormis	/NN	29.5	205.5	
Calcicalathina alta	/nn	29.5	46.5	
Chiastozygus platyrhethus	/nn	163	205.5	
Corollithion signum	/nn	29.5	205.5	
Eiffellithus eximius	/nn	163	205.5	
Eiffellithus turriseiffelii	/nn	29.5	205.5	
Eprolithus floralis	/nn	29.5	205.5	
Gartnerago obliquum	/nn	29.5	205.5	
Lithastrinus septenarius	/nn	201	205.5	
Lithraphidites carniolensis	/nn	29.5	205.5	
Lucianorhabdus maleformis	/nn	163	205.5	
Manivitella pemmatoidea	/nn	29.5	205.5	
Marthasterites furcatus	/nn	188	205.5	
*base M. furcatus zone CC 13 to FO M. decussata				
Microrhabdulus decoratus	/nn	29.5	205.5	
*base M. decoratus zone CC 10 to FO Q. gartneri				
Micula decussata	/nn	201	205.5	
*base M. decussata zone CC 14 to FO R. anthophorous				
Prediscosphaera spinosa	/nn	29.5	205.5	
Quadrum gartneri	/nn	163	205.5	
Radiolithus planus	/nn	29.5	186.5	
Rhagodiscus angustus	/nn	29.5	205.5	
Stradneria crenulata	/nn	29.5	205.5	
Tetrapodorhabdus decorus	/nn	29.5	205.5	
Tranolithus orionatus	/nn	29.5	205.5	
Watznaueria barnesae	/nn	29.5	205.5	
Watznaueria biporta	/nn	29.5	205.5	
Zeugrhabdotus embergeri	/nn	186.5	205.5	
Zeugrhabdotus erectus	/nn	29.5	205.5	
Zygodiscus diplogrammus	/nn	30	205.5	

*END

MIDK.69 - Coupe de la Gare de Cassis, SE France

Coupe de la Gare de Cassis, Southeast France. Moullade et al., 1998, *Geologie Mediterraneenne*, v. 25, no. 3/4, p. 187-225; Moullade et al., 1998, *Geologie Mediterraneenne*, v. 25, no. 3/4, p. 289-298.

Base of Upper Bedoulian @ 63 m @ base of *D. deshayesi*; base of Gargasian @ 121.5 m @ base *A. nisum*.

Data:

*Taxa	Morph	Base	Top meters	
*Data below from Moullade et al., Fig. 1, p. 189; Moullade et al., Fig. 1, p. 291.				
Carbon peak OAE 1a	/gc	74	94	
*redefined 09/05 to match light	cl3 shift at Cison	from 95	120	
*Top Barremian	/ma	*	13	
*at base of Roch Horizon & base Deshayesites tuarkyricus				
*Nanno data from Bergen in Moullade et al. p. 291; Bergen, 1998, p. 226				
Assipetra infracretacea	/nn	6.8	121.3	
Assipetra terebrodentarius	/nn	5.7	121.3	
Axopodorhabdus dietzmannii	/nn	64	121.3	
Bidiscus rotatorius	/nn	5.7	121.3	
Biscutum ellipticum	/nn	3.3	121.3	
Braarudosphaera africana	/nn	119.5	121.3	
Braarudosphaera bigelowii	/nn	21	121.3	
Broinsonia matalosa	/nn	25.3	119.5	*ID as Eiffellithus paragodus

Bukryolithus ambiguus	/nn	7.5	121.3	
Chiastozygus platyrhethus	/nn	120.5	120.5	
Chiastozygus tenuis	/nn	5.7	121.3	
Conusphaera mexicana	/nn	5.7	50.0	*same as Conusphaera rothii
Corollithion madagaskarensis	/nn	104	121.3	
Cretarhabdus angustiforatus	/nn	3.3	57	*ID as Retecapsa
Cretarhabdus conicus	/nn	3.3	121.3	*ID as aff.
Cretarhabdus loriei	/nn	76.7	121.3	
Cretarhabdus surirellus	/nn	21	121.3	
Cyclagelosphaera margerelii	/nn	3.3	121.3	
Diazomatolithus lehmanii	/nn	3.3	121.3	
Eprolithus floralis	/nn	116.5	121.3	
Flabellites oblonga	/nn	3.3	121.3	
Grantarhabdus coronadventis	/nn	119	119.5	
Helenea chiastia	/nn	3.3	121.3	*ID as Microstaurus
Lithraphidites carniolensis	/nn	3.3	121.3	
Manivitella pemmatoidea	/nn	5.7	121.3	
Markalius circumradiatus	/nn	6.8	121.3	
Micrantholithus hoschulzii	/nn	3.3	121.3	
Micrantholithus obtusus	/nn	39	121.3	
Parhabdololithus splendens	/nn	25.3	121.3	
*ID as Rhagodiscus gallagheri (not on p. 226)				
Percivalia fenestrata	/nn	7.5	121.3	
Pickelhaube furtiva	/nn	13	121.3	
Radiolithus planus	/nn	119.5	121.3	
Reinhardtites scitula	/nn	3.3	121.3	
Retecapsa octofenestratus	/nn	6	115	
Retecapsa schizobrachiatus	/nn	28	116.6	
Rhagodiscus achlyostaurion	/nn	3.3	121.3	
Rhagodiscus angustus	/nn	64	121.3	
Rhagodiscus asper	/nn	3.3	121.3	
Rhagodiscus infinitus	/nn	25.3	121.3	*ID as Parhabdololithus
Rhagodiscus splendens	/nn	64	119.5	
Rotelapillus crenulatus	/nn	6	121.3	
Rucinolithus irregularis	/nn	13.2	121.3	*now in Hayesites
Stoverius achylosus	/nn	62.7	115	
Tetrapodorhabdus coptensis	/nn	55.6	121.3	
Tranolithus gabalus	/nn	64	119.5	
Tubodiscus jurapelagicus	/nn	6	121.3	
Watznaueria barnesae	/nn	3.3	121.3	
Watznaueria biporta	/nn	13	121.3	
Watznaueria britannica	/nn	3.3	121.3	*ID as Ellipsagelosphaera
Watznaueria fossacincta	/nn	3.3	121.3	
Zeugrhabdotus embergeri	/nn	6.8	121.3	
Zeugrhabdotus bicrescenticus	/nn	3.3	121.3	*ID as G. bicrescenticus
Zygodiscus diplogrammus	/nn	5.7	121.3	
Nannoconus bucheri	/nn	3.3	121.3	
Nannoconus globulus	/nn	3.3	121.3	
Nannoconus kamptneri	/nn	6.8	121.3	
Nannoconus regularis	/nn	79	119	
Nannoconus steinmannii	/nn	3.3	108	
Nannoconus truitti	/nn	7.5	121.3	
Nannoconus wassallii	/nn	28	121.3	
*Planktic foram data from Moullade et al., Fig. 1, p. 189				
Glob'oides blowi	/fp	64.2	126.35	*now in Blowiella
Glob'oides ferreolensis	/fp	142	*	
Glob'oides gottisi	/fp	95.25	126.35	*ID as Blowiella sp. 1
Glob'oides saundersi	/fp	119.7	124.85	*In Blowiella
Hedb infracretacea	/fp	95.25	126.35	
Hedb sigali	/fp	1.65	123.25	*In Praehedbergella
Hedb similis	/fp	95.25	126.35	
Leupoldina cabri	/fp	86.2	126.35	
Praehedbergella biozonae	/fp	86.2	126.35	

<i>Praehedbergella kuznetsovae</i>	/fp	1.65	126.35	
<i>Ammobaculites reophacoides</i>	/fb	41.5	114.75	
<i>Ammodiscus cretaceus</i>	/fb	105.6	126.35	
<i>Ammodiscus gaultinus</i>	/fb	50	126.35	
<i>Astacolus crepidularis</i>	/fb	13.3	123.25	
<i>Choffatella decipiens</i>	/fb	0.75	1.65	
<i>Cuneolina hensoni</i>	/fb	1.65	*	
<i>Falsogaudryinella tealbyensis</i>	/fb	13.3	126.35	
<i>Falsogaudryinella moesiana</i>	/fb	13.3	126.35	
<i>Gavelinella barremiana</i>	/fb	13.3	60.8	*ID as cf
<i>Gavelinella flandrini</i>	/fb	13.3	126.35	
<i>Globorotalites aptiensis</i>	/fb	13.3	126.35	
<i>Globorotalites bartensteini</i>	/fb	41.5	122.6	
<i>Gyroidinoides infracretaceus</i>	/fb	117.85	126.35	
<i>Lenticulina cuvillieri</i>	/fb	4.9		
<i>Nautiloculina cretacea</i>	/fb	0.75	*	
<i>Neotrocholina aptiensis</i>	/fb	1.65	3.35	
<i>Neotrocholina infragranulata</i>	/fb	1.65	90.5	
<i>Paleodictyoconus actinostoma</i>	/fb	0.75	*	
<i>Paleodictyoconus barremianus</i>	/fb	1.65	*	
<i>Paracoskinolina elongatissima</i>	/fb	0.75	*	
<i>Paracoskinolina sunnilandensis</i>	/fb	0.75	1.65	
<i>Praedorothia praeoxycona</i>	/fb	41.5	121.15	
<i>Praedorothia trochus</i>	/fb	13.3	124.85	
<i>Orbitolinopsis cuvillieri</i>	/fb	0.75	*	
<i>Orbitolinopsis elongata</i>	/fb	0.75	*	
<i>Orbitolina lenticularis</i>	/fb	0.75	0.75	*in Palorbitolina
<i>Patellina subcretacea</i>	/fb	1.55	117.85	
<i>Sabaudia minuta</i>	/fb	0.75	1.65	
<i>Spirillina minima</i>	/fb	1.55	123.25	
<i>Sprioplectinata robusta</i>	/fb	41.5	60.8	
<i>Tritaxia pyramidata</i>	/fb	3.35	126.35	
*selected key ammonites from Moullade et al, Fig. 1, p. 189				
<i>Aconeceras nisum</i>	/am	122	*	
<i>Deshayesites deshayesi</i>	/am	64	*	
<i>Deshayesites grandis</i>	/am	107	*	
<i>Deshayesites tuarkyricus</i>	/am	13.4	*	
<i>Deshayesites weissi</i>	/am	46	*	
<i>Dufrenoyia furcata</i>	/am	117	*	
<i>Martelites sarasini</i>	/am	0	13	
<i>Tropeum bowerbanki</i>	/am	117	*	*ID as Tropeum sp.
*Dino data by Masure et al., 1998, p. 265				
<i>Achomosphaera verdieri</i>	/dn	18.5	123	
<i>Aptea polymorpha</i>	/dn	18.5	18.5	
<i>Atopodinium haromense</i>	/dn	18.5	123	
<i>Callaiosphaeridium asymmetricum</i>	/dn	18.5	123	
<i>Cerbia tabulata</i>	/dn	18.5	120.5	
<i>Chlamydophorella nyei</i>	/dn	18.5	123	
<i>Circulodinium distinctum</i>	/dn	19.5	123	
<i>Coronifera oceanica</i>	/dn	6.3	108.5	
<i>Criproperidinium orthoceras</i>	/dn	19.5	89	
<i>Ctenidodinium elegantulum</i>	/dn	19.5	78	
<i>Dapsilidinium warrenii</i>	/dn	18.5	123	
<i>Exochosphaeridium phragmites</i>	/dn	123	123	
<i>Florentinia abjuncta</i>	/dn	78	108.5	
<i>Florentinia cooksoniae</i>	/dn	19.5	89	
<i>Gardodinium trabeculosum</i>	/dn	18.5	123	
<i>Heslertonia heslertonensis</i>	/dn	18.5	18.5	
<i>Hystrichodinium pulchrum</i>	/dn	42	123	
<i>Hystrichodinium ramoides</i>	/dn	18.5	18.5	
<i>Hystrichosphaerina schindewolfii</i>	/dn	93.5	123	
<i>Kiokansium unituberculatum</i>	/dn	28	120.5	
<i>Kleithriasphaeridium eoinodes</i>	/dn	89	116.5	

Lithodinia stoveri	/dn	6.3	123
Occisucysta tentorium	/dn	18.5	89
Odontochitina operculata	/dn	18.5	123
Oligosphaeridium complex	/dn	6.3	123
Oligosphaeridium poculum	/dn	28	93.5
Oligosphaeridium prolixispinosum	/dn	123	123
Ovoidinium diversum	/dn	19.5	93.5
Prolixosphaeridium parvispinum	/dn	19.5	106
Protoellipsodinium seghire	/dn	123	123
Pseudoceratium securigerum	/dn	18.5	116.5
Pterodinium cingulatum	/dn	116.5	123
Pterodinium premnon	/dn	18.5	108.5
Rhynchodiniopsis aptiana	/dn	6.3	78
Spiniferites ancoriferus	/dn	18.5	123
Subtilisphaera perlucida	/dn	28	42
Tehamadinium sousense	/dn	78	123
Tehamadinium tenuiceras	/dn	120.5	123
Tenua hystrix	/dn	6.3	123
Wallodinium krutzschii	/dn	123	123
Wrevittia helicoidea	/dn	6.3	123
Fromea amphora	/ac	57.5	123
Protocythere bedoulensis	/os	*	122.6

*END

MIDK.69B - Cassis-La Bedoule, France, Lower Aptian

Cassis-La-Bedoule, Southeast France. Ropolo et al., 2006, Carnet de Geologie, Memoir 2006/01; Figures 7-9, p. 23-25. Compositated section of 8 roadcuts and quarries; Ropolo et al. 2008, Carnet de Geologie, Memoir 2008/03; same sections as in 2006, use figs. 2-5.

Base Aptian = FO *Oglanlensis* above *Pseudocrioceras waagenoides* Zone at top Barremian.

Data :

*TAXA	Morph	Base	Top meters
Deshayesites bedouliensis	/am	14	21
Deshayesites consobrinus	/AM	50	61.5
*ID as sp. aff. 14.5	24.5		
Deshayesites dechyi	/AM	6	76
Deshayesites deshayesi	/AM	64	94
*Base Deshayesi Zone			
Deshayesites euglyphus	/AM	48	56
Deshayesites forbesi	/AM	53	61
Deshayesites gracilis	/AM	106	106 *ID as cf.
Deshayesites grandis	/AM	108	113
*Paradeshayesites; base Grandis Subzone; extends FO			
Deshayesites luppovi	/AM	14	34
Deshayesites normani	/AM	47	61
*ID as sp. gr. spathi/normani			
Deshayesites oglanlensis	/AM	14.5	41
*Paradeshayesites; Base Oglanlensis Zone			
Deshayesites planus	/AM	52	52
Deshayesites weissi	/AM	46	56
*Paradeshayesites; base Weissi Zone			
Deshayesites weissiformis	/AM	16	45
Dufrenoyia dufrenoyi	/AM	119	122
Dufrenoyia furcata	/AM	118	122
Dufrenoyia fursovae	/AM	118	118
Dufrenoyia sinzowi	/AM	120	120
*Dufrenoyia transitoria	/AM	118	119
*ID as sp. gr.; extends FO			
Roloboceras hambrovi	/am	92	92
*Base Hambrovi Subzone			

*Ropolo et al. 2008, figs. 2-4

Chelonicerias cornuelianum	/am	109	122
Chelonicerias kiliani	/am	88	117.5
Chelonicerias meyendorffi	/am	121	122
Chelonicerias parinodum	/am	112	117.5
Chelonicerias seminodosum	/am	86	117
Prochelonicerias pachystephanum	/am	6	51
Roloboceras hambrovi	/am	92	115

*END

MIDK.69c Cassis-La-Bedoule,
Southeast France. Ropolo et al. 2008, Carnet de Geologie, Memoir 2008/03.
La Marcouline Quarry section cannot be stacked on other sections.

Data:

*TAXA	Morph	Base	Top meters
	*Ropolo et al. 2008, fig. 5		
Epicheloniceras buxtorfi	/am	28	29
Epicheloniceras debile	/am	2	14
Epicheloniceras gracile	/am	15.5	26
Epicheloniceras martini	/am	2	15
Epicheloniceras subnodosocostatum	/am	5.5	24
Epicheloniceras tschernyschewi	/am	30	42
Parahoplites flexisulcatus	/am	33	35.5

*END

MIDK.70 SWP Brendenbury well
11-36-22-1W2, Alberta, Canada. Schroder-Adams et al., 1996, Cret. Research, 17:311-365, Appen. 7,
14. Lithostrat contacts in core: Second White Specks Fm. top/base 855-940' (260m);
Belle Fourche Fm. top/base 940-956'(284m); Fish Scales Fm. top/base 956-978'(290m);
Westgate Fm. top 978'(296m), top Viking 1140'(342m) (estimated from fig. 7).

Data:

*Taxa	Morph	Base	Top m
Clav simplex	/fp	-283.2	-281.3
Clav subcretacea	/fp	-283.2	-279.4
Hedb amabilis	/fp	-283.2	-270.9
Hedb delrioensis	/fp	-283.2	-270.9
Hedb loetterlei	/fp	-283.2	-270.9
Hedb planispira	/fp	-283.2	-270.9
Hedb portsdownensis	/fp	-283.2	-270.9
Hete pulchra	/fp	-277.5	-277.5
Hete globulosa	/fp	-285.1	-262.3
Whit aprica	/fp	-283.2	-270.9
Ammobaculites tyrrelli	/fb	-332.6	-321.8
Haplophragmoides howardense	/fb	-336.3	-316.8
Haplophragmoides gilberti	/fb	-348.8	-348.8
Haplophragmoides linki	/fb	-348.8	-316.8
Haplophragmoides rota	/fb	-336.3	-321.8
Miliammina manitobensis	/fb	-332.6	-321.8
Saccamina alexanderi	/fb	-328.1	-328.1
Trochammina rainwateri	/fb	-287	-285.1
Trochammina wetteri	/fb	-321.8	-296.7
Verneuilina canadensis	/fb	-336.3	-296.7
Verneuilinoides perplexus	/fb	-285.1	-285.1
Verneuilinoides hectori	/fb	-348.8	-321.8
* = Gaudryina canadensis in McNeil & Caldwell, 1981			
*many new taxa yet could be added			
Ahmuellerella octoradiata	/nn	-288.9	-265.9

*Arkhangelskiella cymbiformis	/nn	-288.9	-268.9 to old?
Biscutum constans	/nn	-288.9	-265.9
Braarudosphaera bigelowii	/nn	-268.9	-268.9
Chiastozygus plicatus	/nn	-288.9	-265.9
Corollithion achylosum	/nn	-288.9	-288.9
Cretarhabdus conicus	/nn	-288.9	-265.9
Cretarhabdus crenulatus	/nn	-288.9	-279.4
Cribroperidinium ehrenbergii	/nn	-288.9	-265.9
*Cylindralithus asymmetricus	/nn	-288.9	-281.3 too old +Stoverius
Eiffellithus eximius	/nn	-283.2	-265.9
Eiffellithus trabeculatus	/nn	-283.2	-273.7
Eiffellithus turriseiffelii	/nn	-288.9	-265.9
Kamptnerius magnificus	/nn	-268.9	-268.9
Lithastrinus floralis	/nn	-288.9	-268.9
Lithraphidites carniolensis	/nn	-288.9	-265.9
*Lucianorhabdus cayeuxi	/nn	-279.4	-279.4 too old
Manivitella pemmatoidea	/nn	-288.9	-273.7
Markalius circumradiatus	/nn	-288.9	-272.7
Micula staurophora	/nn	-279.4	-265.9
Parhabdolithus angustus	/nn	-288.9	-268.9
Parhabdolithus embergeri	/nn	-279.4	-279.4
Prediscosphaera cretacea	/nn	-288.9	-265.9
Prediscosphaera spinosa	/nn	-288.9	-272.7
Sollasites horticus	/nn	-273.7	-273.7
Stephanolithion laffittei	/nn	-283.2	-265.9
Vagalapilla matalosa	/nn	-288.9	-265.9
Watzneria barnesae	/nn	-288.9	-265.9
Zygodiscus compactus	/nn	-265.9	-265.9

*several additional taxa new to the data set could be added

*END

MIDK.71 - Guerrero-Morelos Basin, S. Mexico

Guerrero-Morelos Basin, Southern Mexico. Aguilera-Franco et al., 1998, Revista de la Sociedad Mexicana de Paleont. 8:107-122; Aguilera-Franco et al., 2001, J. So. American Earth Science, 14:237-255; Aguilera-Franco, 2003, Revista Mexicana de Ciencias Geologicas, 20:202-222; Aguilera-Franco & Macleod, MS, data therein; Aguilera & Scott, 2005, Stratigraphy, 2:341-354. Units are relative CSU's from MS.

Data:

*TAXA	Morph	Base	Top in csu's	
*Acicularia sp.	/al	42	91	
Biconcava bentori	/FB	3.25	120.23	
Biplanata peneropliformis	/FB	28	107.28	
Bonetocardiella conoidea	/CA	107	284	
*Boueina hochstetteri	/al	109	182	*id as sp.
Boueina pygmaea	/AL	80	252.16	
*Buccicrenata rugosa=Pseudocyclammina rugosa	/FB		14.84	147.75
*Cayeuxia piaie	/al	90	156.77	*ID as sp.
Chrysalidina gradata	/FB	29	123.75	
Cuneolina pavonia	/FB	27	167	
Dica hagni	/FP	272	278	*ID as cf. range ok
Dicyclina schlumbergeri	/FB	27	167	
Hedb delrioensis	/FP	110	272	
Hedb planispira	/FP	147	185	
Helv'ana helvetica	/FP	272	310	
Heterohelix moremani	/FP	147	295	
Heterohelix reussi	/FP	153	153	
*Lith shebae	/AL	145	173	*id as sp.
*Marginotruncana marginata	/FP	256.16	256.16	
*id as cf. base low?; upper Turonian & not overlap w/ helvetica: Premoli Silva & Sliter, 2002				

Merlingina cretacea	/FB	27	146.1
Nezzazata simplex	/FB	41	120.23
Nummoloculina regularis	/FB	58	97.52
Permocalculus irenae	/AL	61	241.47
Pith ovalis	/CA	70	183
Pith sphaerica	/CA	28	295
Pseudocyclammina rugosa	/FB	14.84	147.75
Pseudolituonella reicheli	/FB	4.51	120.37
Pseudonummoloculina heimi	/fb	58	107.28
Pseudorhapydionina laurinesis	/FB	33	107.28
*id as dubia	ok as is		
Salpingoporella milovanovici	/al	24.05	120.37
Whit aprica	/FP	243.71	310
Whit archaeocretacea	/FP	256	256
Whit baltica	/FP	170.56	297
Whit brittonensis	/FP	152	297
Whit paradubia	/FP	259	297

*END

MIDK.72 - Oued Melleque, Tunisia

Oued Mellegue, Northwest Tunisia. Nederbragt & Fiorentino, 1999, Cret. Res. 20:47-62

Data:

*TAXA	Morph	Base	Top meters
Carbon peak OAE 2	/gc	278	310
*Dica spp.	/fp	278	600
Helv'ana helvetica	/fp	415	600
Helv'ana praehelvetica	/fp	385	600
*Marginotruncana spp.	/fp	445	600
Rota cushmani	/fp	21	282.5
Rota greenhornensis	/fp	21	277
Whit archaeocretacea	/fp	279	600
Ahmuellerella octoradiata	/nn	430	600
Axopodorhabdus albianus	/nn	0	283
Corollithion kennedyi	/nn	55	283.5
Eprolithus moratus	/nn	313.5	600
Helenea chiastia	/nn	0	286.5
Lithraphidites acutum	/nn	21	279
Lucianorhabdus maleformis	/nn	400	600
*Marthasterites spp.	/nn	415	600
Quadrum gartneri	/nn	306	600

*END

MIDK.73 - Cres Island, Croatia section

Cres Island, Croatia section, approx. 45° N, 14° 30' E. Section composited from Dragozetici, Petrovski & Baldarin sections. Data from Husinec et al., 2000, Cret. Res. 21:155-171. Composite section Fig. 2; segment 1:46-86m in Fig. 3a; segment 2:138-188 in Fig.3b; segment 3:321-368 in Fig. 3c; segment 4:593-618 in Fig. 9A; segment 5:843-880 in Fig. 9B. Estimated stage bases: Aptian @ 46 m; Albian @ 125 m; Cenomanian @ 500 m. Multiple emersion beds from 110-140 m may correspond to intra-Aptian emergence event (p. 157).

Data:

*Taxa	Morph	Base (ft)	Top
Archalveolina reicheli	/fb	170	183
Biplanata peneropliformis	/fb	853	880
Broeckina balanica	/fb	846	880
Charentia cuvillieri	/fb	188	188
Chrysalidina gradata	/fb	856	880
Cuneolina parva	/fb	188	880

Cuneolina pavonia	/fb	138	880
Debarina hahounerensis	/fb	64	*
*LO at 179m too young			
Hedb planispira	/fp	596	618
Hedbergella washitensis	/fp	596	843
Hemicyclammina sigali	/fb	188	188
Mayncina bulgarica	/fb	145	338.3
Merlingina cretacea	/fb	853	856
Neotrocholina aptiensis	/fb	64	*
Neotrocholina friburgensis	/fb	50	64
Nezzazata conica	/fb	846	880
Nezzazata gyra	/fb	846	880
Nezzazata simplex	/fb	846	880
Nezzazatinella picardi	/fb	856	880
Nummoloculina regularis	/fb	853	880
Orbitolina conica	/fb	596	862
*ID as corbarica-conica gp.			
Orbitolina concava	/fb	596	600
*ID as sefini-concava gp.			
Orbitolina lenticularis	/fb	46	72
Orbitolina lotzei	/fb	64	*
Orbitolina sefini	/fb	596	600
*ID as sefini-concava gp.			
Orbitolina subconcava	/fb	145	183
Orbitolina texana	/fb	145	183
Peneropolis turonicus	/fb	853	880
Praechrysalidina infracretacea	/fb	64	179
Praeorbitolina cormyi	/fb	64	*
Praeorbitolina wienandsi	/fb	64	*
Pseudorhapydionina dubia	/fb	853	866
Pseudolituonella reicheli	/fb	853	880
Pseudonummoloculina heimi	/fb	138	880
Sabaudia auruncensis	/fb	138	179
Sabaudia briacensis	/fb	64	*
Sabaudia capitata	/fb	156	*
Sabaudia minuta	/fb	64	179
Trochospira avnimelechi	/fb	853	862
Valdanchella dercourti	/fb	338	338.3
Vercorsella arenata	/fb	145	179
Vercorsella laurentii	/fb	64	179
Vercorsella scarselai	/fb	64	338.3
Voloshinoides murgensis	/fb	50	64
Bacinella irregularis	/al	46	72
*Salpingoporella sp.	/al	64	86
Salpingoporella dinarica	/al	64	86
Salpingoporella turgida	/al	338	338.3
Bonetocardiella conoidea	/ca	596	846
Pith ovalis	/ca	596	846
Pith sphaerica	/ca	596	846
Chondrodonta joannae	/bi	650	700
Orthopthychus striatus	/bi	650	860
Schiosia carinatoformis	/bi	650	860
Ichthyosarcolites bicarinatus	/bi	650	860
Ichthyosarcolites poljaki	/bi	650	860
Ichthyosarcolites tricarinatus	/bi	650	860
*ranges estimated from Fig. 2			
*END			

MIDK.74 - Antruiles, Trento Plateau, Italy
 Antruiles, Trento Plateau, Italy, Gorge of Rouibes de Inze River, 10 km NW of Cortina d'Ampezzo, NW of Belluno. Luciani & Cobianchi, 1999, Cret. Res. 20:135-167.

Data:

*TAXA	Morph	Base	Top meters
Carbon peak OAE 2	/gc	95.2	96.4
*Bonarelli Level, Fig. 3			
*Data Fig. 7, p. 144-145			
Axopodorhabdus albianus	/nn	3	94
Biscutum constans	/nn	1	134
Braarudosphaera africana	/nn	23	55
Broinsonia enormis	/nn	91	134
Chiastozygus litterarius	/nn	6	107.5
Chiastozygus striatus	/nn	1	3
Corollithion exiguum	/nn	78	128.5
Corollithion kennedyi	/nn	0	99
Cretarhabdus angustiforatus	/nn	1	42.1
Cretarhabdus conicus	/nn	1	102
Cretarhabdus surirellus	/nn	1	55.5
Cribrosphaerella ehrenbergii	/nn	1	126
*Microstaurus chiastia	/nn	1	99
Cyclagelosphaera margerelii	/nn	1	134
Discorhabdus ignotus	/nn	3	78
Eiffellithus eximius	/nn	128.5	134
Eiffellithus turriseiffelii	/nn	1	134
*Eprolithus eptapetalus	/nn	118	134
*synonym of E. moratus			
Eprolithus floralis	/nn	12	134
Eprolithus moratus	/nn	118	134
Eprolithus octopetalus	/nn	113	128.5
Flabellites oblonga	/nn	1	49.8
Helicolithus trabeculatus	/nn	6	82
Lithraphidites carniolensis	/nn	1	134
Lithraphidites acutum	/nn	42.1	55
Lithraphidites pseudoquadratus	/nn	6	36
Manivitella pennatoidea	/nn	1	119
Markalius circumradiatus	/nn	2	90
Microrhabdulus decoratus	/nn	106	134
Nannoconus elongatus	/nn	12	52.5
Nannoconus truitti	/nn	12	52.5
Prediscosphaera columnata	/nn	6	133
Prediscosphaera cretacea	/nn	2	134
Prediscosphaera spinosa	/nn	4.5	78
Quadrum gartneri	/nn	102	133
Rhagodiscus achlyostaurion	/nn	1	99
Rhagodiscus asper	/nn	1	91
Rhagodiscus angustus	/nn	1	109
Rhagodiscus splendens	/nn	1	93
Reinhardtites fenestratus	/nn	1	119
Stradneria crenulata	/nn	1	134
Tranolithus gabalus	/nn	41	91
Tranolithus orionatus	/nn	42	87
Watznaueria barnesae	/nn	1	134
Watznaueria biporta	/nn	44.5	111
Watznaueria britannica	/nn	2	4.5
Watznaueria communis	/nn	1	128.5
Ellipsagelosphaera ovata	/nn	2	42.1
Zeugrhabdotus embergeri	/nn	1	133
Zeugrhabdotus erectus	/nn	1	134
Zygodiscus diplogrammus	/nn	1	128.5
*Data Fig. 11, p. 150-151			
Dica algeriana	/fp	42	134
Dica canaliculata	/fp	87	134
Dica hagni	/fp	90	134
Dica imbricata	/fp	55.5	134

Glob'oides bentonensis	/fp	1	94
Glob'oides caseyi	/fp	1	134
Glob'oides ultramicrus	/fp	1	134
Guembelitria cenomana	/fp	6	120
Hedb delrioensis	/fp	1	134
Hedb libyca	/fp	1	48 *ID in Costalligerina
Hedb planispira	/fp	1	134
Hedb simplex	/fp	1	134
Helv'ana helvetica	/fp	102	134
Helv'ana praehelvetica	/fp	87	134
Heterohelix moremani	/fp	6	134
Heterohelix reussi	/fp	43.1	134
Marginotruncana pseudolinneiana	/fp	123.5	134
Marginotruncana renzi	/fp	104	134
Marginotruncana schneegansi	/fp	104	134
Marginotruncana sigali	/fp	104	134
Praeglobotruncana delrioensis	/fp	1	48
Praeglobotruncana stephani	/fp	1	134
Rota appenninica	/fp	1	48
Rota brotzeni	/fp	1	50
Rota cushmani	/fp	30	93
Rota deeckeii	/fp	52	93
Rota gandolfi	/fp	1	34
Rota greenhornensis	/fp	1	93
Rota montsalvensis	/fp	17	52
Rota reicheli	/fp	26	44.3
Schackoina cenomana	/fp	1	134
Whit aprica	/fp	63	134
Whit archaeocretacea	/fp	63	134
Whit baltica	/fp	42.2	134
Whit brittonensis	/fp	42.2	134
Whit paradubia	/fp	63	134

*END

MIDK.75 - North Huqf, Oman, section S 001

North Huqf, Oman, section S 001. Immenhauser et al., unpublished, June 2002.

Large-scale sequences @ 3.1 m, 36.9 m, 61.5 m @ top of section; medium-scale sequences @ 3.1 m, 8.2 m, 21.4 m, 30.5 m, 36.9 m, 43.8 m, 55.5 m. Taxa on hold by * because they would be extended too far.

Data:

*TAXA	Morph	Base	Top meters
Glossomyophorus sp.	/bi	54.6	61.1
*Charentia cuvillieri	/fb	13.8	26.1
Choffatella decipiens	/fb	4.5	39.0
*ID as C. cruciensis		16.2	35.6
Debarina hahounerensis	/fb	16.2	35.6
*Mayncina bulgarica	/fb	43.8	43.8
Nezzazata simplex	/FB	37.3	40.3
Orbitolina lenticularis	/fb	3.7	60.2
*top species ID at 13.0 m			
Palorbitolina involutina	/fb	6.3	6.3
Praechrysalidina infracretacea	/fb	0.1	61.1
*Valvulineria loetterlei	/fb	3.7	59.8
*Vercorsella arenata	/FB	3.7	38.2
Voloshinoides murgensis	/fb	13.8	55.0
Bacinella irregularis	/al	30.7	60.2
Carpathoporella fontis	/al	2.5	25.2
Cylindroporella ivanovici	/al	0.3	23.3
Hensonella cyclindrica	/al	0.1	53.4

*senior synonym is Salpingoporella dinarica Radoicic, 1959, in Bassoullet et al.

*1978, Geobios Mem. spec 2, p.237-239; Simmons et al., 1991, Palaeontology 34:955-961,
 *retained Hensonella as distinct from Salpingoporella; H. dinarica is proper name.

Permocalculus irenae	/al	7.6	43.8
Polystrata alba	/al	13.0	13.0
Salpingoporella dinarica	/AL	13.8	28.2
Salpingoporella muehlberghii	/al	0.3	0.3
Salpingoporella sp.	/AL	0.3	0.3

*END

MIDK.76 - North Huqf, Oman, section S 008

North Huqf, Oman, section S 008. Immenhauser et al., unpublished June, 2002.

Shuaiba Fm., partial cycle 0-12.5 m.

Data:

*TAXA	Morph	Base	Top meters
Glossomyophorus sp.	/bi	0.1	0.7
Offneria sp.	/bi	5.6	6.0
Debarina hahounerensis	/fb	12.8	12.8
Nezzazata gyra	/FB	12.8	12.8
Nezzazata simplex	/FB	7.6	7.6
Orbitolina lenticularis	/fb	9.8	9.8
*micritized orbits up to		12.8 m	
Praechrysalidina infracretacea	/fb	1.1	11.8
Pseudocyclammina hedbergi	/fb	11.8	11.8
*ID as Everticyclammina			
*Valvulineria loetterlei	/fb	7.6	7.6
Vercorsella laurentii	/FB	10.2	12.8
Bacinella irregularis	/al	10.3	12.6
Neomeris pfenderae	/AL	11.8	11.8

*END

MIDK.77 - North Huqf, Oman, section D 005

North Huqf, Oman, section D 005. Immenhauser et al, unpublished, June 2002. Shuaiba Fm., Large-scale cycles @ 0 m, 29.9m, 49.8 m; medium-scale cycles @ 0 m, 14.2 m, 25.2 m, 29.9 m, 36.6 m, 45.3 m.

Data:

*TAXA	Morph	Base	Top meters
Choffatella decipiens	/fb	0.5	19.2
Debarina hahounerensis	/fb	36.0	36.0
*Mayncina bulgarica	/fb	36.0	36.0
Neotrocholina aptiensis	/FB	48.0	48.0
Nezzazata gyra	/FB	13.8	13.8
Nezzazata simplex	/FB	13.8	13.8
Orbitolina lenticularis	/fb	0.5	49.7
Praechrysalidina infracretacea	/fb	18.3	49.7
Pseudocyclammina hedbergi	/fb	13.8	28.1
*Trocholina elongata	/fb	7.9	7.9
*Valvulineria loetterlei	/fb	0.5	19.6
Vercorsella laurentii	/FB	13.8	13.8
Vercorsella scarselai	/FB	26.5	26.5
Bacinella irregularis	/al	49.7	49.7
Cylindroporella ivanovici	/al	4.2	19.2
Hensonella cylindrica	/al	4.2	21.5
Micritosphaera ovalis	/al	22.7	22.7
*Permocalculus irenae	/al	4.2	32.0
Salpingoporella dinarica	/AL	4.2	21.5
Salpingoporella sp.	/AL	19.2	26.5

*END

MIDK.78 - Oued Bahloul, central Tunisia

Oued Bahloul, 12 km SE of Maktar, central Tunisia. Caron et al., 1999, Bull. Soc. geol. France vol. 170:145-160. Type section of the Bahloul Formation.

Data:

*TAXA	Morph	Base	Top meters
Marker bed Ce SB 5	/mb	3.0	3.0
Marker bed Ce TS 5	/mb	5.0	5.0
*Figs. 2, 10			
Eucalycoceras sp.	/am	0.5	0.5
Fagesia superstes	/am	33	41
Fagesia catinus	/am	33	* *both taxa ID as sp.
Metoicoceras geslinianum	/am	5.1	5.1
*observation in nearby section at Kef Azreg			
Pseudocalyoceras dentonense	/am	8	17
*ID as Pseudaspidoceras pseudonodosoides, see occurrences on Fig. 2			
Thomasites sp.	/am	33.6	33.6
Watinoceras devonense	/am	33	* *ID as sp.
Dica biconvexiformis	/fp	19	22
Hete globulosa	/fp	18	23
*all taxa ranges above taken from Fig. 3 and are incomplete			
Rota cushmani	/fp	*	5.1
Helv'ana praehelvetica	/fp	22.2	* *ID as Whiteinella
*Only analyzed narrow interval, Fig. 4			
Callaiosphaeridium asymmetricum	/dn	21	21
Coronifera oceanica	/dn	20.6	21.3 *ID as cf.
Kiokansium polypes	/dn	20.6	21.3
Litosphaeridium siphoniphorum	/dn	21.3	22.6
Odontochitina costata	/dn	21.2	21.2
Odontochitina operculata	/dn	20.6	21.3
Palaeohystrichophora infusorioides	/dn	20.6	22.6
Pervosphaeridium truncatum	/dn	20.6	21.3
Stephodinium coronatum	/dn	21	21
Subtilisphaera cheit	/dn	20.6	22.6
Tanyosphaeridium variecalamus	/dn	21.2	21.3
Trichodinium castanea	/dn	21.0	21.3
*END			

MIDK.79 - Kef Hahouner, Algeria

Kef Hahouner, Algeria. Fourcade & Raoult, 1973, Rev. Micropaleo. 15:227-246.

Data from sections 1 & 2, figs. 3, 5. Base of section in Jur-Cret dolomite; hardground at 400 m; intra-Aptian drowning contact at 1150 m. top of section condensed with Alb-Tur-Con up to 1300 m.

Data:

*TAXA	Morph	Base	Top meters
Acicularia intermedia	/al	820	1145
Agardhielliopsis cretacea	/al	1205	1220
Bacinella irregularis	/al	520	1070
Hensonella cyclindrica	/al	750	950
Marinella lugeoni	/al	820	1100
Salpingoporella muehlberghii	/al	450	600 *ID as cf
Colomiella recta	/ca	1155	1155
Choffatella decipiens	/fb	680	820
Cuneolina gr. camposauri	/fb	750	1145
Cuneolina scarsellai	/fb	450	1100
Debarina hahounerensis	/fb	900	930
Neotrocholina friburgensis	/fb	870	870
Orbitolina lenticularis	/fb	680	870

*Orbi texana	/fb	1020	1020	
*may be an older Aptian taxon. too low here				
Orbitolinopsis capuensis	/fb	450	450	
Ovalveolina reicheli	/fb	1060	1090	
Paracoskinolina sunnilandensis	/fb	1050	1145	
Pseudocyclammina hedbergi	/fb	680	1060	*id as group
Sabaudia minuta	/fb	450	1145	
*base ? id, second base at 800				
Hedbergella washitensis	/fp	1210	1240	
Pseudotextularia salvensis	/fp	290	300	
Nannoconus bermudezii	/nn	1175	1175	
Nannoconus elongatus	/nn	1175	1175	
Nannoconus wassallii	/NN	1175	1175	
*END				

MIDK.80 - Sierra del Carche Prebetic zone, Spain

Sierra del Carche, Prebetic zone, Murica, Spain. Masse et al., 1992, Band 9, Austrian Academy of Science, 201-221; Vilas, Masse, & Arias, 1993, AAPG Mem. 56, p. 243-253.

Stratigraphy measured on fig. 2 in Masse et al. 1992: Base of section is Barremian sandstone w/ Spitidiscus & 3 other ammonites; 0m base Bedoulian limestone, base Gargasian 310 m; base Albian 595 m; section capped by uppermost Albian limestone, dolomite and clastics w/ fossils; Depositional sequence I 0-248m at unconformity; base of Caroch Fm. Depositional sequence II 248-434m at unconformity; Depositional sequence III 334-550m at unconformity, top Caroch Fm. at 680m base upper Albian sandstone-limestone.

Data:

*TAXA	Morph	Base	Top meters	
Agriopleura darderi	/bi	640	740	
Caprina choffati	/bi	685	685	
Caprina douvillei	/bi	130	190	
Horiopleura baylei	/bi	195	390	*ID as cf
Horiopleura lamberti	/bi	425	585	
Offneria sp.	/bi	130	190	
Pachytraga paradoxa	/bi	130	190	
Polyconites verneuilli		425	585	*ID as cf
Pseudotoucasia santanderensis	/bi	455	510	*ID as cf
Choffatella decipiens	/fb	0	110	
Debarina hahounerensis	/fb	0	110	
Dictyoconus vercorii	/fb	0	110	
Iraqia simplex	/fb	130	245	
Neotrocholina aptiensis	/fb	0	110	*ID as cf
Neoiraqia convexa	/fb	710	740	
Neorbitolinopsis conulus	/fb	685	740	
Orbitolinopsis cuvillieri	/fb	0	110	
Orbitolina lenticularis	/fb	0	110	
Orbitolina texana	/fb	510	575	*LO in Lower Albian
Praeorbitolina wienandsi	/fb	250	310	
Simplorbitolina conulus	/fb	610	740	
Simplorbitolina manasi	/fb	575	670	
*END				

MIDK.81 - Dugi Otok, Croatia

Dugi Otok, Croatia . Davey et al. 1992, Nues Jb. Geol. Palaont. Abh., 186:283-299.

Base in Cenomanian; SB at 10 m; base of debris beds at 85 m; top debris bed at 145

Data:

*TAXA	Morph	Base	Top meters
Marker bed Tu SB 1	/MB	5.5	*

Marker bed Tu SB 2	/MB	82	*
Marker bed Tu SB 3	/MB	95	*
Marker bed Tu SB 4	/MB	135	*
Chondrodonta joannae	/bi	0	5
Prionocyclus varicostatus	/am	150	150
Prionocyclus sp.	/am	150	150
Broeckina balanica	/fb	0	5
Chrysalidina gradata	/fb	0	5
Moncharmontia apenninica	/fb	70	97
Pseudocyclammia sphaeroidea	/fb	70	107
Scandonea samnitica	/fb	70	107
Dica hagni	/fp	148	*
*ID as hagni-primitiva, top too high @ 250			
Dica primitiva	/fp	160	195
*Glob'oides blowi	/fp	148	153
*?Archaeoglobigerina blowi Pessagno senus Robaszynski et al. 1990			
Helv'ana helvetica	/FP	70	82
Marginotruncana coronata	/FP	186	230
Marginotruncana marginata	/FP	134	153
Marginotruncana pseudolinneiana	/FP	99	250
Marginotruncana sigali	/FP	17	42
Pith ovalis	/CA	17	153
Pith sphaerica	/CA	17	153
Thaumatoporella parvovesiculifera	/AL	70	82
*END			

MIDK.82 Hameau-Fredet Quarry Section

Hameau-Fredet Quarry Section, Fumichon France. Tocher & Jarvis, 1994, Revue de Micropaleontologie 37:223-232, fig. 3. Lower-Mid Cenomanian; 0 m is base of exposure; top of section at 14 m.

Data:

*TAXA	Morph	Base	Top (m)
Marker bed Bruneval Hdg 1	/mb	1.8	*
Marker bed Bruneval Hdg 2	/mb	2.8	*
Marker bed Bruneval Hdg 3	/mb	8.1	*
Marker bed Rouen Hdg 1	/mb	11.1	*
Marker bed Rouen Omission 2	/mb	12.0	*
Marker bed Rouen Omission 3	/mb	13.3	*
Turrilites costatus	/am	11.2	*
Turrilites scheuchzerianus	/am	11.2	*
*reported as fossils of the T. costatus zone p. 225			
Callaiosphaeridium asymmetricum	/dn	2.9	13.3
Circulodinium distinctum	/dn	1.0	13.3
Cleistosphaeridium clavulum	/dn	4.1	13.3
Coronifera oceanica	/dn	2.9	13.3
Cribroperidinium exilicristatum	/dn	4.1	6.1
Cyclonephelium clathromarginatum	/dn	6.9	13.3
Cyclonephelium membraniphorum	/dn	7.3	7.3
Dapsilidinium laminaspinosum	/dn	4.1	13.3
Downiesphaeridium armatum	/dn	6.9	7.3
Ellipsodinium rugulosum	/dn	4.1	13.3
Endoscrinium campanula	/dn	10.9	10.9
Epelidosphaeridia spinosa	/dn	4.1	13.3
Exochosphaeridium arnace	/dn	13.0	13.3
Exochosphaeridium phragmites	/dn	4.1	7.3
Florentinia deanei	/dn	7.3	13.0
Florentinia laciniata	/dn	13.3	13.3
Florentinia mantellii	/dn	1.0	13.0
Heterosphaeridium heteracanthum	/dn	5.8	13.0
Hystrichosphaeridium bowerbankii	/dn	1.0	13.3
Kiokansium unituberculatum	/dn	6.1	13.3

*ID as Cleist

Kleithriasphaeridium readei	/dn	6.1	6.1
Leberidocysta chlamydata	/dn	13.3	13.3
*occurrence at 10.9 may be too low below base mid Cen - infilled in burrows?			
Odontochitina costata	/dn	2.9	13.3
Odontochitina operculata	/dn	1.0	13.3
Oligosphaeridium complex	/dn	1.0	13.3
Oligosphaeridium prolixispinosum	/dn	4.1	13.3
Pervosphaeridium pseudhystrichodinium	/dn	13.0	13.3
Pervosphaeridium truncatum	/dn	6.9	8.2
Prolixosphaeridium conulum	/dn	1.0	13.3
Spiniferites ramosus ramosus	/dn	4.1	10.9
Spiniferites twistringiensis	/dn	6.9	13.3
Surculosphaeridium longifurcatum	/dn	6.9	13.3
Tanyosphaeridium salpinx	/dn	6.1	13.0
Xenascus ceratioides	/dn	2.9	13.3
*END			

MIDK.83 Canteloup Quarry Section

Canteloup Quarry Section, Fumichon France. Tocher & Jarvis, 1994, Revue de Micropaleontologie 37:223-232; Fig. 4. Lower-Mid Cenomanian; 0 m is base of exposure; top of section at 14 m.

Data:

*TAXA	Morph	Base	Top (m)	
Marker bed Rouen Hdg 1	/mb	1.3	*	
Marker bed Rouen Omission 2	/mb	2.2	*	
Marker bed Rouen Omission 3	/mb	4.7	*	
Callaiosphaeridium asymmetricum	/dn	1.5	10.2	
Canninginopsis colliveri	/dn	2.5	11.5	
Circulodinium distinctum	/dn	1.5	14.6	
Cleistosphaeridium clavulum	/dn	2.5	14.6	
Coronifera oceanica	/dn	2.5	14.6	
Cribroperidinium exilicristatum	/dn	5.0	14.6	
Cyclonephelium clathromarginatum	/dn	2.5	13.7	
Cyclonephelium compactum	/dn	12.5	14.6	
Cyclonephelium membraniphorum	/dn	10.0	14.6	
Dapsilidinium laminaspinosum	/dn	1.5	6.1	
Dapsilidinium pumilum	/dn	4.3	10.0	
Downiesphaeridium armatum	/dn	6.1	13.7	*ID as Cleist
Ellipsodinium rugulosum	/dn	2.1	13.7	
Epelidosphaeridia spinosa	/dn	1.5	7.7	
Exochosphaeridium arnace	/dn	1.5	1.5	
Exochosphaeridium bifidum	/dn	2.5	11.8	
Exochosphaeridium phragmites	/dn	1.5	2.5	
Florentinia deanei	/dn	2.5	2.5	
Florentinia laciniata	/dn	1.5	1.5	
Florentinia mantellii	/dn	1.5	14.6	
Florentinia radiculata	/dn	7.7	11.8	
Heterosphaeridium heteracanthum	/dn	1.0	14.6	
Hystrichosphaeridium bowerbankii	/dn	1.5	14.6	
Hystrichosphaeridium pulchrum	/dn	2.5	5.0	
Kallosphaeridium ringnesiorum	/dn	6.1	6.1	
Kiokansium unituberculatum	/dn	1.5	14.6	
Leberidocysta chlamydata	/dn	4.3	14.6	
Leberidocysta defloccata	/dn	2.5	2.5	
Odontochitina costata	/dn	1.5	14.6	
Odontochitina operculata	/dn	1.5	14.6	
Oligosphaeridium complex	/dn	1.0	14.6	
Oligosphaeridium prolixispinosum	/dn	4.3	12.8	
Palaeohystrichophora infusorioides	/dn	1.5	2.5	
Pervosphaeridium pseudhystrichodinium	/dn	6.1	6.1	
Prolixosphaeridium conulum	/dn	2.1	13.7	

Spiniferites ramosus ramosus	/dn	1.5	11.8
Spiniferites twistringiensis	/dn	1.5	2.5
Surculosphaeridium longifurcatum	/dn	4.3	14.6
Tanyosphaeridium salpinx	/dn	4.3	7.7
Xenascus ceratioides	/dn	1.0	14.6

*END

MIDK.84 - DSDP Core Hole 549, SW Offshore England

DSDP Core Hole 549, SW Offshore England; 49° 05.28N, 13° 05.88W. DSDP Vol. LXXX (80). Upper Albian-Cenomanian; Base of section at 1000.5 m and top of section at 422.0 m are major unconformities. Unconformities @ K/T @ 379 m; Camp/Sant @ 407.6 m; @ 437 m black shale w/ hi gamma kick in core 27-1; @ Alb/Cen @ 480 m; and @ Barrem/Alb @ 662 m; base Barremian @ 964.5. 08/05: changed ID of 2 magnetochrons to match FO M. murus at 388.9m.

Data:

*Taxon name	morph	base	top meters	
		*Townsend, 1985, ch. 7, p. 389-414; Table 3, p. 403		
C25n	/MA	*	-350.5	
C25r	/MA	*	-360.5	
C26n	/MA	*	-371.4	
C26r	/MA	*	-373.8	
C30n	/MA	*	-383.2	
C30r	/MA	*	-389.5	
*On fig. 13, p.406 of DSDP report, ID as below; but w/ FO M. murus must be younger				
*C32n 1n	/MA	*	-383.2	
*C32n 1r	/MA	*	-389.5	
*C32n 2n	/MA	*	*	
*C32r 1n	/MA	*	*	
*C32r 1r	/MA	*	*	
*C32r 2r	/MA	*	*	
C33n	/MA	*	-390.3	
C33r	/MA	*	-407.6	
C34n	/MA	*	-408.9	
*ID of fp by F. Magniez, 1985, ch. 18, p. 601-628, p. 601-628				
Bulimina nannina	/fb	-616.5	-589.5	
Discorbis minutissima	/fb	-620.3	-620.3	*ID as sp. cf.
Glomospira charoides	/fb	-620.3	-512.2	
Lingulina lamellata	/fb	-512.2	-512.2	*ID as sp. cf.
Praebulimina nannina	/fb	-616.5	-589.5	
Spirillina minima	/fb	-620.3	-620.3	*ID as sp. cf.
Valvulineria gracillima	/fb	-620.3	-582.1	
Valvulineria loetterlei	/fb	-620.3	-559.5	*ID as sp. aff.
*Glob'oides ferreolensis	/fp	-589.5	-522.5	*ID as sp. cf.
*Glob'oides gottisi	/fp	-589.5	-522.5	*ID as sp. cf.
Gubkinella graysonensis	/fp	-620.3	-493.1	
*Hedb gorbachikae	/fp	-582.1	-582.1	*ID as sp. cf.
*Hedb infracretacea	/fp	-589.5	-582.1	*ID as sp. cf.
Hedb planispira	/fp	-616.5	-493.1	
*Tici bejaouaensis	/fp	-512.2	-512.2	too hi?
*ID of nn by C. Mueller, Frankfurt, 1985, ch. 17, p. 573-599				
Arkhangelskiella cymbiformis	/nn	-407.5	-383.7	
Axopodorhabdus albianus	/nn	-455.1	-446.2	
Broinsonia parca parca	/nn	-407.5	-390.5	
Calcicalathina oblongata	/nn	-732.1	-676.7	
Ceratolithoides aculeus	/nn	-402.9	-394.8	*ID as Tetralithus
Calculites obscurus	/nn	-390.5	-390.5	*ID as Tetralithus
Chiastozygus litterarius	/nn	-654.5	-407.9	
Conusphaera mexicana	/nn	-725.8	-674.0	
Corollithion achylosum	/nn	-626.0	-522.5	
Corollithion signum	/nn	-455.0	-447.8	
Cretarhabdus angustiforatus	/nn	-732.1	-598.0	

Cribrosphaerella ehrenbergii	/nn	-417.3	-483.7	
Eiffellithus eximius	/nn	-417.3	-402.9	
Eiffellithus turriseiffelii	/nn	-474.0	-383.7	
Eprolithus floralis	/nn	-600.9	-417.0	
Gartnerago obliquum	/nn	-436.0	-392.3	
Hayesites albiensis	/nn	-637.8	-531.0	
Hayesites radiatus	/nn	-750.6	-683.1	
Kamptnerius magnificus	/nn	-426.7	-388.9	
Lithraphidites carniolensis	/nn	-732.1	-394.8	
Lithraphidites quadratus	/nn	-388.5	-383.7	
Lithastrinus grillii	/nn	-417.3	-417.3	
Lucianorhabdus cayeuxii	/nn	-417.3	-390.5	
Manivitella pemmatoidea	/nn	-750.6	-390.5	
Marthasterites furcatus	/nn	-426.5	-426.5	
Microrhabdulus decoratus	/nn	-401.3	-383.7	
Micrantholithus obtusus	/nn	-750.6	-674.0	
Micula decussata	/nn	-426.7	-383.7	
Micula murus	/nn	-388.9	-383.7	
Nannoconus bucheri	/nn	-750.6	-687.4	
Nannoconus colomii	/nn	-750.6	-676.4	
Nannoconus minutus	/nn	-654.5	-512.4	
Nephrolithus frequens	/nn	-388.9	-388.9	
Parhabdolithus angustus	/nn	-725.8	-502.5	
*1st top @ 447.8 reworked?				
Parhabdolithus splendens	/nn	-750.6	-483.5	
*1st top @ 447.8 reworked?				
Prediscosphaera cretacea	/nn	-654.5	-388.5	
Quadrum gothicum	/nn	-401.3	-390.5	*ID as Tetralithus
Quadrum trifidum	/nn	-398.4	-394.8	*ID as Tetralithus
Reinhardtites anthophorus	/nn	-407.5	-390.5	
Reinhardtites fenestratus	/nn	-750.6	-683.1	
Rotelapillus laffittei	/nn	-750.6	-417.3	
Vagalapilla decoratus	/nn	-409.1	-409.1	
Watznaueria barnesae	/nn	-750.6	-388.9	
Watznaueria biporta	/nn	-701.4	-440.0	
Watznaueria britannica	/nn	-725.8	-683.0	
Watznaueria communis	/nn	-725.8	-446.2	
Zygodiscus diplogrammus	/nn	-637.8	-409.1	
*ID of dn by D. Frauconnier, 1985, ch. 21, p. 653-662, Fig. 2.				
Callaiosphaeridium asymmetricum	/dn	-825.0	-740.0	
Cassiculosphaeridia reticulata	/dn	-737.0	-603.5	
Coronifera oceanica	/dn	-701.0	-493.0	
Cribooperidium edwardsii	/dn	-852.0	-493.0	
Cyclonephelium brevispinatum	/dn	-825.0	-701.0	
Cyclonephelium distinctum	/dn	-852.0	-502.5	
*top @ may be reworked -436.0				
Dingodinium albertii	/dn	-740.0	-701.0	
Druggidium deflandrei	/dn	-707.0	-707.0	
*Epelidosphaeridia spinosa	/dn	-436.0	-436.0	Reworked?
Exochosphaeridium phragmites	/dn	-825.0	-493.0	
Florentinia mantellii	/dn	-852.0	-522.5	
Gardodinium trabeculosum	/dn	-852.0	-852.0	
Gonyaulacysta helicoidea	/dn	-689.0	-689.0	
Hystrichodinium pulchrum	/dn	-591.0	-581.5	
Hystrichosphaerina schindewolfii	/dn	-722.0	-722.0	
Kiokansium polypes	/dn	-825.0	-578.5	
Meiourogonyaulax pertusa pertusa	/dn	-740.0	-740.0	
Muderongia simplex	/dn	-852.0	-811.0	
*as subsp. microperforata				
Odontochitina operculata	/dn	-722.0	-572.0	
Oligosphaeridium asterigerum	/dn	-825.0	-493.0	
Oligosphaeridium complex	/dn	-825.0	-493.0	
*top @ -436.0 may be reworked				

Palaeohystrichophora infusorioides	/dn	-436.0	-436.0
Palaeoperidinium cretaceum	/dn	-725.0	-725.0
Spiniferites ramosus ramosus	/dn	-852.0	-502.5
*top @ -436.0 may be reworked			
Systematophora cretacea	/dn	-493.0	-493.0
Tanyosphaeridium variecalamus	/dn	-811.0	-701.0
Trichodinium castanea	/dn	-701.0	-594.0
*END			

MIDK.85 - Blanco River, TX Compositied Section

Blanco-Guadalupe River Composite Section, Kendall, Comal, Hays counties, Texas.

Upper Aptian-Lower Cenomanian mixed carbonate & clastics platform; Section Segments:

Buda Ls. 50' thick, top @ 381 m, unconf. at 30', sections 1, 2 (Martin, 1967, Permian Basin SEPM 67-8, p. 289, fig. 2, #6); Intra-Buda unconformity @ 375 m; Buda ammonites (Young, 1979, p. 83-84); Del Rio Shale 60' thick, top @ 366 m; Wilbert, 1967, Permian Basin SEPM 67-8:256-285, pl. 1, #13, 14; Georgetown Fm. 45' thick, top @ 347.6 m (Barnes, 1974, Seguin Sheet, Tx Atlas); Edwards Ls. 275' thick, top @ 334 m, Bee Cave Marl 5' thick, top @ 250 m (Moore, 1964, BEG Rpt. Invest. 52, fig. 6); Bull Creek Ls. Mbr. 40' thick', top @ 248 m; Upper Glen Rose Mbr. 400' thick at Seven H Ranch, top @ 236 m; Lower Glen Rose Mbr. 255' thick at Blanco Creek, top @ 114 m (Stricklin et al., 1971, BEG Rpt. Invest. 71, figs. 9, 10; Lozo & Stricklin, 1956, GCAGS, 6:67-78, figs. 5, 6, 7; Narrows biostrome @50-60 m; Pipe Creek biostrome @ 77-93 m; Hensel Fm. 45' thick at Edge Ranch, top @ 36.6m (Amsbury et al., 1999 unpubl.); Cow Creek Ls. 35' thick, Edge Ranch, top @ 23m (Amsbury et al., 1999, unpub.); Hammett Shale not fully exposed, top @ 12 m; Ammonites in Young, 1974, Geoscience & Man, 8:175-228; Perkins, ibid, 131-174; enhanced by personal observations by R. W. Scott.

Data:

*TAXA	Morph	Base	Top	m
Marker bed Ce SB WB	/mb	381.1	*	
*base Pepper Shale above Buda Fm.				
Marker bed Ce TS WA 6	/mb	347.6	*	
*base Del Rio Fm. = Grayson Fm.				
Marker bed Al SB WA 1	/mb	333.8	*	
*base Washita Gp. on Edwards Fm. (Fredericksburg Gp.)				
Marker bed Al SB FR 1	/mb	236.3	*	
*base Walnut Fm. = *Marker bed Al SB GR 3 /mb *				
Marker bed Al SB GR 2	/mb	108.2	*	
*6m below base "Corbula marker bed" in mid Glen Rose Fm.				
Marker bed Ap TS GR 1	/mb	34.5	*	
*Base lower Glen Rose mbr. in contact with Hensel Fm.				
Marker bed Ap SB PR 2	/mb	22.9	*	
*base Hensel Formation above Cow Creek Fm. = James Ls. downdip				
Marker bed Ap SB PR 1	/mb	0	*	
*base Sycamore Sandstone above Paleozoic rocks at 0 m, = top Sligo Fm. downdip				
Budaiceras elegantior	/am	368	373	
Budaiceras hyatti	/am	368	373	
Burckhardtites palmensis	/am	11	11	
Chelonicerias cornuelianum	/am	11	11	
Colombicerias robustum	/am	18	18	
Drakeoceras lasswitzi	/am	340	340	
Dufrenoyia rebecca	/am	11	11	
Dufrenoyia justinae	/am	18	18	
Douvilleicerias mammillatum	/am	109	120	*ID by K. Young as cf.
Eodouvilleicerias sp.	/am	18	18	*ID by Luc Bulot
Faraudiella roemeri	/am	370	370	
Faraudiella texana	/am	370	378	
Hypacanthoplites comalensis	/am	137	144	
Hypacanthoplites cragini	/am	46	94	
Hypacanthoplites mayfieldensis	/am	110	113	
Hypacanthoplites rugosus	/am	18	18	
Kazanskyella spathi	/am	37	37	

*Kazanskyella sp.	/am	40	120	
Mariella brazoensis	/am	347	347	
Mortoniceras dellense	/am	347	347	*ID in field by RWS
*Sharpeiceras sp.	/am	370	370	
Stoliczkaia crotaloides	/am	370	370	
Caprina gracilis	/bi	295	296	
Ceratostreon texana	/bi	237	238	
Ceratostreon walkeri	/bi	334	334	
Chondrodonta munsoni	/bi	300	301	
Corbula harveyi	/bi	114	114.2	
Ilmatogyra arietina	/bi	344.1	344.5	
Monopleura marcida	/bi	295	296	
Texi mucronata	/bi	237	324	
Texi roemeri	/bi	368	368	
Texi washitaensis	/bi	334	338	
Toucasia patagiata	/bi	295	296	
Loriola texana	/ec	194	194	
Orbitolina texana	/fb	40	152	
*Foraminifera by M.J. Evetts 2003				
Citharina intumescens	/fb	112.0	112.3	
Dentalina cucumis	/fb	112.0	112.3	*ID ?
Discorbis floscula	/fb	112.0	112.3	
Fursenkoina cronesei	/fb	112.0	112.3	
Guttulina symploca	/fb	112.3	113.6	
Lingulina furcillata	/fb	113.6	113.8	*ID as cf
Marginulina striatifera	/fb	112.3	114.4	*ID as sp. aff.
Neobulimina minima	/fb	112.0	112.3	
Nodosaria rigentia	/fb	114.4	114.7	
Pseudoglandulina mutabilis	/fb	113.6	113.8	*ID as cf
Pseudoglandulina scotti	/fb	113.6	113.8	
Quinqueloculina aeschira	/fb	114.4	114.7	
Quinqueloculina lirellangula	/fb	113.6	113.8	
Quinqueloculina minima	/fb	113.8	114.4	
Spiroloculina ophionea	/fb	114.4	114.7	
Trochamminoides coronus	/fb	112.3	114.4	*ID of top ?
Turrispirillina subconica	/fb	112.0	112.3	
*Paly by D. Benson 2003				
			Morph	Base Top (m)
Achomosphaera neptuni	/dn	112.0	112.3	*ID as cf.
Apteodinium granulatum	/dn	114.4	114.7	
Callaiosphaeridium asymmetricum	/dn	112.3	114.4	
Chlamydophorella nyei	/dn	112.0	112.3	
Circulodinium attadalicum	/dn	112.3	114.4	
Circulodinium brevispinosum	/dn	112.3	114.4	
Circulodinium paucispinum	/dn	112.3	114.4	
Cleistosphaeridium aciculare	/dn	112.0	112.3	
Coronifera albertii	/dn	112.0	112.3	
Cribooperidinium edwardsii	/dn	112.0	112.3	
Cribooperidinium intricatum	/dn	113.6	113.8	
Cribooperidinium muderongense	/dn	112.0	112.3	
Cribooperidinium saetigerum	/dn	114.4	114.7	*ID as cf
Cribooperidinium sepimentum	/dn	112.0	112.3	
Dapsilidinium polyps	/dn	112.0	112.3	
Dinopterygium sp. 2	/dn	114.4	114.7	
Dissiliodinium globulum	/dn	113.6	113.8	*ID as cf
Endoceratium dettmaniae	/dn	113.6	113.8	
Exochosphaeridium phragmites	/dn	113.6	113.8	
Florentinia cooksoniae	/dn	114.4	114.7	
Florentinia mantellii	/dn	112.0	112.3	
Gingnodinium evittii	/dn	112.0	112.3	
Gonyaulacysta cretacea Complex	/dn	112.3	114.4	
Heslertonina heslertonensis	/dn	112.0	112.3	*ID as sp. A
Kalyptea aceras	/dn	112.3	113.6	
Kiokansium unituberculatum	/dn	113.8	114.4	

Kiokansium williamsii	/dn	112.0	112.3	
Kleithriasphaeridium eoinodes	/dn	112.0	112.3	
Luxadinium propatulum	/dn	114.4	114.7	
Odontochitina ancala	/dn	112.0	112.3	
Odontochitina operculata	/dn	112.3	114.4	
Oligosphaeridium complex	/dn	112.3	114.4	
Oligosphaeridium albertense	/dn	113.8	114.4	
Oligosphaeridium asterigerum	/dn	114.4	114.7	
Oligosphaeridium perforatum	/dn	114.4	114.7	
Oligosphaeridium poculum	/dn	112.3	113.6	
Oligosphaeridium pulcherrimum	/dn	112.3	114.4	
Oligosphaeridium totum	/dn	112.0	112.3	
Palaeohystrichophora infusorioides	/dn	112.3	113.6	
Palaeoperidinium cretaceum	/dn	112.3	113.6	
*This occurrence quite low; species concept may be too broad				
Pervosphaeridium cenomaniense	/dn	113.6	114.4	
Pseudoceratium polymorphum	/dn	113.8	114.4	
Pterodinium aliferum	/dn	112.0	112.3	
Pterodinium cingulatum	/dn	114.4	114.7	
Pterospermella australiensis	/dn	112.3	114.4	
Pterospermella harti	/dn	112.0	112.3	
Spiniferites tripus	/dn	112.0	112.3	*ID as cf.
Spiniferites aligerus	/dn	112.0	112.3	*ID as cf.
Spiniferites multibrevis	/dn	112.3	114.4	
Subtilisphaera deformans	/dn	112.3	114.4	*ID if top as cf
Subtilisphaera perlucida	/dn	112.3	114.4	
Subtilisphaera terrula	/dn	114.4	114.7	
Trichodinium castanea	/dn	112.3	113.6	
Cicatricosisporites hughesii	/sp	112.0	112.3	
Cicatricosisporites hallei	/sp	112.0	112.3	
Classopollis simplex	/sp	112.0	112.3	
Classopollis classoides	/sp	112.3	114.4	
Cyathidites minor	/sp	112.0	112.3	
Cyathidites australis	/sp	112.0	112.3	
Exesipollenites tumulus	/sp	112.3	114.4	
Inaperturopollenites hiatus	/sp	112.0	112.3	
Todisporites minor	/sp	112.0	112.3	
Tricolpites vulgaris	/sp	112.0	112.3	
Tricolpites sagax	/sp	112.0	112.3	
*END				

MIDK.86 - Leon River, Tx Compositated Section

Leon River Composite section, 1.2 mi E Aquilla Texas.

Examined & collected by E. Mancini & R. Scott 7/03; Measured sections from various sources; base of section in Glen Rose Fm., base Paluxy Ss. @ 61 m; intra-Paluxy unconformity @ 67 m; base Walnut/Bee Cave @ 73 m; base of Cedar Park @ 79 m; base of Keys Valley Marl @ 85 m; base of upper marl mbr. @ 97.6 m; base of Comanche Peak/Cold Spring @ 110 m; base Pancake Mbr. @ 116 m; condensed contact @ 122 m; base Edwards Ls. @ 137.2 m; base Georgetown/Duck Creek @ 161 m; base Ft. Worth @ 169.5 m; base Denton @ 177.4 m; base Weno @ 179.3 m; base Main St. @ 183 m; base Del Rio @ 190.5 m; base Pepper Sh. @ 209 m Stephenson, 1953, USGS PP 243-E:60-61; 11' above base Pepper Sh.

Data:

*TAXA	Morph	Base	Top m
Marker bed Ce SB WB	/mb	215	*
*base Pepper Sh			
Marker bed Ce TS WA 6	/mb	190.5	*
*base Del Rio Sh.			
Marker bed Al TS WA 5	/mb	*	*
*top upper limestone bed at top Weno Fm.			

Marker bed Al TS WA 4	/mb	*	*
*top lower limestone in Weno Fm.			
Marker bed Al TS WA 3	/mb	177.4	*
*top Fort Worth Fm.			
Marker bed Al TS WA 2	/mb	161	*
*top thick beds in lower Duck Creek Fm.			
Marker bed Al SB WA 1	/mb	161	*
*base Kiamichi Fm. = base Washita Gp.			
Marker bed Al MF FR 1	/mb	97.6	*
*base upper marl mbr.			
Marker bed Al SB FR 1	/mb	67	*
*intra-Paluxy unconformity ?= base Fredericksburg Seq.			
Marker bed Al SB GR 1	/mb	*	*
*base of section in Glen Rose Fm.			
		*Bivalves in Stephenson, 1953	
Exogyra aquillana	/bi	218.4	218.4
		*ammonites from Young 1966	
Manuaniceras carbonarium	/am	120	120
Manuaniceras uddeni	/am	90	95
Oxytropidoceras salasi	/am	90	105
Venezoliceras acutocarinatum	/am	90	120
Venezoliceras texanum	/am	90	120
		*From Clark, 1965	
Anisoceras salei	/am	165	165
Hamites intermedius	/am	120	120
Mariella bosquensis	/am	192	192
Mariella graysonensis	/am	192	192
Sciponoceras baculoidea	/am	192	192
*Kennedy & Juignet (Cret. Res. 4:22) are unsure of this ID			
Scaphites bosquensis	/am	192	192
Scaphites subevolutus	/am	192	192
		*Foraminifera by M.J. Evetts 2003	
Clavhedbergella simplex	/fp	193.2	206.6
Favusella washitensis	/fp	115.5	209.2
Glob'oides bentonensis	/fp	186.4	214.2
Gubkinella graysonensis	/fp	186.4	214.2
Guembelitra harrisi	/fp	206.7	214.2
Guembelitriella graysonensis	/fp	211.3	214.2
Hedbergella delrioensis	/fp	186.4	214.2
Hedbergella planispira	/fp	186.4	214.2
Heterohelix moremani	/fp	193.2	214.2
Citharina complanata	/fb	186.4	214.2
Citharina complanata perstriata	/fb	211.2	211.3
Citharina intumescens	/fb	112.3	114
Citharina kochii	/fb	186.4	214.3
Citharina recta	/fb	186.4	214.2
Citharina tripleura	/fb	209.3	211.2
Conorbina conica	/fb	113	115.5
Coskinolina texanus	/fb	114	121
Dentalina communis	/fb	186.4	214.2
Dentalina cylindroides	/fb	194.3	206.6
Dentalina hammensis	/fb	211.2	211.3
Dictyoconus walnutensis	/fb	155	155
Discorbis floscula	/fb	109	121
Fursenkoina minuta	/fb	109	115.5
Gavelinella plummerae	/fb	186.4	214.2
Glandulopleuromella ozawai	/fb	186.4	214.2
Globulina exserta	/fb	209.2	209.3
Globulina lacrima	/fb	186.4	214.2
Guttulina symploca	/fb	109	114
Hoeglundina lenticularia	/fb	209.3	214.2
Lagena apiculata	/fb	191.7	214.2
Lagena striatifera	/fb	186.4	214.2

*ID ?

Lenticulina gaultina	/fb	186.4	214.2
Lingulina furcillata	/fb	191.6	191.7
Lingulina serrata	/fb	201.3	214.2
Lingulogavelinella asterigerinoides	/fb	186.4	214.2
Marginulina planitesta	/fb	193.0	193.2
Marginulina tenuissima	/fb	211.2	211.3
Massilina planoconvexa	/fb	194.0	194.3
Neobulimina minima	/fb	109	209.2
Nodosaria amphioxys	/fb	211.2	211.3
Nodosaria lepida	/fb	211.3	214.2
Nodosaria obscura	/fb	193.2	214.2
Patellina subcretacea	/fb	115.5	115.5
Praebulimina nannina	/fb	193.2	211.2
Pseudoglandulina scotti	/fb	204.3	211.2
Pyrulina cylindroides	/fb	186.4	211.2
Pyrulina longa	/fb	191.6	191.7
Quinqueloculina minima	/fb	53.4	155
Reussella comalensis	/fb	155	155
Saracenaria bononiensis	/fb	186.4	214.2
Saracenaria cushmani	/fb	186.4	214.2
Spirillina minima	/fb	186.4	204.3
Tristix excavata	/fb	186.4	214.2
Trochamminoides coronus	/fb	109	109
Valvulineria loetterlei	/fb	186.4	214.2
Ammobaculites cuyleri	/fb	214.2	214.3
Ammobaculites goodlandensis	/fb	186.4	214.2
Ammodiscus gaultinus	/fb	186.4	209.2
Gaudryina bosquensis	/fb	191.7	204.3
Gaudryinella delrioensis	/fb	186.4	214.2
Haplophragmoides concavus	/fb	209.3	214.2
Haplophragmoides globosus	/fb	113	115.5
Reophax minuta	/fb	186.4	194.0
Spiroplectammina alexanderi	/fb	114	121
Spiroplectammina goodlandana	/fb	113	121
Spiroplectammina longa	/fb	186.4	214.2
Spiroplectammina nuda	/fb	186.4	214.2
Textularia rioensis	/fb	109	214.2
Textularia washitensis	/fb	186.4	214.2
Triplasia goodlandensis	/fb	114	121
Trochamminoides coronus	/fb	20	121

*Paly by D. Benson 2003

Achomosphaera neptuni	/dn	206	206	
Achomosphaera ramulifera	/dn	155	216.6	
Actinotheca aphroditae	/dn	209.3	214.2	*ID top as cf.
Apteodinium granulatatum	/dn	186	211	
Apteodinium grande	/dn	115.5	186.1	
Ascodinium parvum	/dn	194	194.3	
Avellodinium falcificum	/dn	206.6	206.7	*ID cf.
Callaiosphaeridium asymmetricum	/dn	193	217	
Canningia colliverii	/dn	53.4	216	
Cassiculosphaeridia reticulata	/dn	209.3	214.2	
Catastomocystis spinosa	/dn	194	194.3	
Cerbia tabulata	/dn	209.3	211.2	*ID?
Chichaouadinium vestitum	/dn	155	155	
Chlamydophorella nyei	/dn	113	113	
Circulodinium attadalicum	/dn	204	214	
Circulodinium brevispinosum	/dn	38	217	
Circulodinium paucispinum	/dn	109	217.5	
Cleistosphaeridium aciculare	/dn	115	214	
Cleistosphaeridium armatum	/dn	109	109	
*Cometodinium sp. A	/dn	186.4	214.2	
Coronifera albertii	/dn	113	217.5	
Coronifera oceanica	/dn	113	217.5	

Coronifera striolata	/dn	38	214	
Cyclonephelium distinctum	/dn	113	113	
Cyclonephelium vannophorum	/dn	216.7	217.5	*ID of base as cf.
Dapsilidinium laminaspinosum	/dn	191.7	206.6	
Dingodinium cerviculum	/dn	206	206	
*Dinopterygium sp. 2	/dn	113	214	*ID of base & top as cf.
Epelidosphaeridia spinosa	/dn	109	121	
Exochosphaeridium phragmites	/dn	186	209	
Florentinia berran	/dn	109	217.5	
Florentinia buspina	/dn	115.5	186.1	
Florentinia clavigera	/dn	115.5	206.6	
Florentinia cooksoniae	/dn	155	214	*ID of top as cf.
Florentinia ferox	/dn	186.4	194	
Florentinia laciniata	/dn	206.7	211.2	
*Florentinia cf. laciniata/tenera	/dn	193.2	206.6	
Florentinia mantellii	/dn	20	214.2	
Florentinia radiculata	/dn	216.7	217.5	*ID as cf.
Florentinia resex	/dn	113	214	
Fromea amphora	/ac	113	209.2	
*Ginginodinium sp. A	/dn	53.4	53.4	
Gonyaulacysta cassidata	/dn	186.4	211.2	
Gonyaulacysta cretacea Complex	/dn	113	217	
Gonyaulacysta helicoidea	/dn	186.4	209.2	
Halophoridia xena	/dn	186.4	209.2	
Heslertonia heslertonensis	/dn	186.4	214.2	
Hystrichodinium pulchrum	/dn	186.4	214.2	
Hystrichosphaeridium bowerbankii	/dn	109	109	
Hystrichosphaerina schindewolfii	/dn	217.5	217.6	
Hystrichostrogylon membraniphorum	/dn	191.6	191.7	
Kalyptea aceras	/dn	38	214	
Kalyptea monoceras	/dn	211	211	
Kiokansium unituberculatum	/dn	53.4	53.4	
Kiokansium williamsii	/dn	38	194	*ID of top as cf.
Kleithriasphaeridium eoinodes	/dn	204	211	
Kleithriasphaeridium fasciatum	/dn	204.2	204.3	*ID as cf
Lecaniella foveata	/dn	155	155	
Leptodinium modicum	/dn	217.5	217.6	
Litosphaeridium arundum	/dn	113	214.2	
Litosphaeridium siphoniphorum	/dn	186.4	211.2	
Maghrebina sp. A (= Bensonia-1)	/dn	186.4	211.2	
Maghrebina perforata	/dn	191.7	214.2	
Maghrebina mirabilis	/dn	113	206.6	
Membranilarnacia polycladiata	/dn	193.2	194	
Membranilarnacia leptoderma	/dn	193.0	193.2	
Microdinium distinctum	/dn	109	109	
Nexosispinum vetusculum	/dn	155	155	*ID ?
Nummus monoculatus	/dn	113	115.5	
Odontochitina ancala	/dn	113	186	
Odontochitina costata	/dn	109	206.6	
Odontochitina operculata	/dn	113	214.2	
Odontochitina rhakodes	/dn	217.5	217.5	
Oligosphaeridium albertense	/dn	38	217.5	
Oligosphaeridium anthophorum	/dn	204.3	217.5	
Oligosphaeridium asterigerum	/dn	113	214	
Oligosphaeridium complex	/dn	53.4	214.2	
Oligosphaeridium fenestratum	/dn	209.2	209.3	
Oligosphaeridium perforatum	/dn	53.4	217	
Oligosphaeridium poculum	/dn	38	38	*ID as cf.
Oligosphaeridium prolixispinosum	/dn	204.3	216.6	
Oligosphaeridium pulcherrimum	/dn	53.4	216.6	
Oligosphaeridium totum	/dn	38	38	
Oligosphaeridium trabeculosum	/dn	209	209	
Ovoidinium scabrosum	/dn	191.7	214.2	

Ovoidinium verrucosum	/dn	191.7	214.2	
*Del Rio Sh. to Pepper Sh.; is top reworked?				
Palaeohystrichophora infusorioides	/dn	20	217.5	
*Base quite low, species concept may be too broad?				
Palaeostomocystis fragilis	/dn	109	214.2	
Palaeoperidinium cretaceum	/dn	53.4	216.6	
Palaeotetradinium silicorum	/dn	186.4	209.2	
*Pervosphaeridium sp. A	/dn	186.1	186.4	
Pervosphaeridium cenomaniense	/dn	186	194	
Pervosphaeridium truncigerum	/dn	206.7	206.7	*ID ?
Prolixosphaeridium conulum	/dn	113	211.2	
Prolixosphaeridium parvispinum	/dn	186	211	
Pseudoceratium anaphrisum	/dn	194	194.3	
Pterodinium aliferum	/dn	38	194	
Pterodinium cingulatum	/dn	100	214	
Pterodinium magnoserratum	/dn	115.5	209.2	
Pterospermella australiensis	/dn	20	155	
Senoniasphaera microreticulata	/dn	115.5	194	*ID cf or ?
Spiniferites aligerus	/dn	115	214	*ID of base & top as cf.
Spiniferites cornutus	/dn	113	186.1	
Spiniferites dentatus	/dn	204.3	211.2	
Spiniferites membranaceus	/dn	193.2	216.6	
Spiniferites multibrevis	/dn	53.4	214.2	
Spiniferites tripus	/dn	115	214	*ID if top as cf.
Subtilisphaera perlucida	/dn	109	217.5	
Subtilisphaera deformans	/dn	53.4	114	
Subtilisphaera rotundata	/dn	53.4	53.4	
Subtilisphaera senegalensis	/dn	38	217	
Subtilisphaera terrula	/dn	20	20	
Surculosphaeridium longifurcatum	/dn	209.2	209.3	*ID as cf.
Trichodinium castanea	/dn	38	214.2	
Tanyosphaeridium isocalamus	/dn	113	214.2	
Tanyosphaeridium salpinx	/dn	186.4	211.2	
Tetraporina horologia	/dn	217.5	217.6	
Thalassiphora microcysta	/dn	186.4	209.2	
Thalassiphora munda	/dn	186.4	191.6	
Trigonopyxidina ginella	/dn	109	194	*ID base ?
Veryhachium trispinosum	/dn	204.3	214.2	
Vesperopsis nebulosa	/dn	216.6	216.7	
Wallodinium lunum	/dn	109	214.2	
Xenascus ceratioides	/dn	186.4	217.5	
Xenascus plotei	/dn	206.7	217.5	
Xiphophoridium alatum	/dn	186.4	214.2	
Appendicisporites jansonii	/sp	211.2	211.3	
Appendicisporites potomacensis	/sp	109	216.6	
Appendicisporites problematicus	/sp	204.3	217.5	
Camerozonosporites insignis	/sp	109	217.5	
Cerebropollenites mesozoicus	/sp	217.5	217.6	
Cicatricosisporites brevilaesuratus	/sp	209.3	217.5	
Cicatricosisporites hallei	/sp	38	217.5	
Cicatricosisporites hughesii	/sp	194.0	194.3	
Cicatricosisporites venustus	/sp	53	53	
Cingulatisporites distaverrucosus	/sp	53	53	
Classopollis spinosus	/sp	53	155	
Classopollis simplex	/sp	53	155	
Classopollis classoides	/sp	38	217.5	
Coronatispora valdensis	/sp	217.5	217.6	
Costatoperforosp. foveolatus	/sp	217.5	217.6	
Cyathidites australis	/sp	53	217.5	
Cyathidites minor	/sp	53	217.5	
Dictyophyllidites harrisii	/sp	109	109	
Distaltriangulisporites perplexus	/sp	214.2	214.3	
Exesipollenites tumulus	/sp	38	186.1	

Gleicheniidites circiniidites	/sp	113	217.5	
Gleicheniidites confossus	/sp	194.0	194.3	
Gleicheniidites senonicus	/sp	113	217.5	
Inaperturopollenites hiatus	/sp	20	217.5	
Lycopodiacidites intraverrucatus	/sp	53	53	
Lycopodiumsporites marginatus	/sp	113	113	
Rugubivesiculites rugosus	/sp	186.4	217.5	
Taurocusporites segmentatus	/sp	53	53	
Todisporites minor	/sp	109	114	
Trilobosporites marylandensis	/sp	53	53	
Tricolpites sagax	/sp	20	204.2	*ID of base cf.
Tricolpites vulgaris	/sp	20	204.2	

*END

No MIDK.87 Section

MIDK.88 - Chimana Grande, Venezuela

Chimana Grande Island, Venezuela. Crespo de Cabrera et al., 1999, J. Foram. Res. 29:487-499, figs.2, 3, 4, 6. Base of Querecual Fm. at 6 m to 450 m; spans U. Albian-Santonian; covered gaps of 40 m at 260-270 m, 4 m at 340-350 m.

Data:

*TAXA	Morph	Base	Top meters	
Carbon peak OAE 2	/gc	275	300	*based on del C13 in fig. 7
Archaeoglobigerina blowi	/fp	431	442	
Archaeoglobigerina cretacea	/fp	428	448	
Clav simplex	/fp	162	415	
Dicarinella asymetrica	/fp	448	448	
Dica concavata	/fp	406	448	*ID of base = cf.
Dica primitiva	/fp	376	437	
Eohastigerina watersi	/fp	431	431	
Glob'oides bentonensis	/fp	9	276	
Glob'oides bollii	/fp	428	448	
Glob'oides cushmani	/fp	184	250	*ID as Glob'oides caseyi
Glob'oides ultramicrus	/fp	197	305	
Hedb delrioensis	/fp	35	90	
Hedbergella flandrini	/fp	376	448	
Hedb libyca	/fp	184	184	*ID as Costellagerina
Hedb planispira	/fp	35	448	
Hete globulosa	/fp	440	448	
Heterohelix moremani	/fp	35	442	
Heterohelix reussi	/fp	205	448	
Marginotruncana marginata	/fp	442	448	
Marginotruncana pseudolinneiana	/fp	428	428	*ID as cf
Marginotruncana renzi	/fp	376	448	
Marginotruncana sigali	/fp	428	448	
Rota montsalvensis	/fp	184	184	
Rota appenninica	/fp	155	197	*Includes R. balernaesis
Rota gandolfi	/fp	155	180	*ID as cf
Rota greenhornensis	/fp	208	208	*Top ID as cf
Schackoia cenomana	/fp	180	180	
Ticinella madecassiana	/fp	9	184	
Tici primula	/fp	9	184	
Tici raynaudi	/fp	35	180	
Tici roberti	/fp	40	184	
Tici ticinensis	/fp	40	180	*ID as Rotalipora
Whit aprica	/fp	205	425	
Whit baltica	/fp	205	442	
Whit brittonensis	/fp	260	260	

*END

MIDK.89 - Stanolind #1 Schmidt, Guadalupe Co., Texas

Stanolind No. 1 Schmidt, Guadalupe Co., Texas, cored 1072-1910', 2200-2610', TD at 2640 ft.
Aptian-Upper Albian carbonate platform to shelf margin. Microfossil thin section unpublished data by Scott, 1982. Palynomorph unpublished data by R.W. Hedlund, 1982.

Data:

*Taxa	Morph	Base	Top (ft)
Marker bed Ce SB WB	/mb	-280	*
*base Woodbine Ss. over buda Ls.			
Marker bed Ce SB 1.1	/mb	-340	*
Marker bed Al SB WA 6	/mb	-340	*
*base Del Rio Shale			
Marker bed Al SB WA 1	/mb	-490	*
*top Fredericksburg Gp.			
Marker bed Ap TS GR 1	/mb	-1802	*
*base Glen Rose Fm. above Pearsall Fm.			
Marker bed Ap SB PR 1	/mb	-1980	*
*base Pearsall Fm. on Sligo Fm.			
*Coskinolina texanus	/fb	-1515	-1279 too lo
Cuneolina walteri	/fb	-1276	-1137
Nezzazata simplex	/fb	-1279	-1278
Pseudonummoloculina heimi	/fb	-1382	-1381
Orbitolina texana	/fb	-1728	-1195
Paracoskinolina sunnilandensis	/fb	-1515	-1515
Pseudocyclammina hedbergi	/fb	-1515	-1515
Colomiella mexicana	/ca	-1606	-1557
Colomiella recta	/ca	-1628	-1557
Cadosina fusca	/ca	-1382	-1381
Pith sphaerica	/ca	-1557	-1556
Acicularia sp.	/al	-2156	-1137
Neomeris cretacea	/al	-2281	-2281
Permocalculus irenae	/al	-2281	-2281
Nannoconus bucheri	/nn	-1962	-1961
Nannoconus minutus	/nn	-1557	-1556
Nannoconus truitti	/nn	-1557	-1556
Nannoconus wassallii	/nn	-1962	-1961
Coalcomana ramosa	/bi	-1514	-1475 *ID as sp.
*Chon munsoni	/bi	-1474	-1279 too lo
Chondrodonta glabra	/bi	-1474	-1279
Monopleura marcida	/bi	-1474	-1137
*Toucasia texana	/bi	-1514	-1475 too lo
Alterbidinium minus	/dn	-1582	-1126
*Florentinia laciniata	/dn	-1838	-1625 too lo
*Heterosphaeridium difficile	/dn	-1813	-1809 too lo
Oligosphaeridium totum	/dn	-1518	-1514
*Palaeohystrichophora infusorioides	/dn	-1899	-1356 too lo
*Prolixosphaeridium conulum	/dn	-1870	-1625 too lo
Klukisporites pseudoreticulatus	/sp	-1582	-1368

*END

MIDK.90 - Lower Mondego River, Northern Portugal

Lower Mondego River, northern Portugal. Berthou, 1984, Bull. Geol. Sur. Denmark, 33:41-55, fig. 5. "Ammonite facies". Karst surface at 30 m, inferred position of Cen/Tur boundary; Contact @ 45 m between sandy carbonates below and fine grained sandstone above.

Data:

*TAXA	Morph	Base	Top meters
Calycoceras naviculare	/am	2	5

Eucalycoceras pentagonum	/am	2	5	
Euomphaloceras cunningtoni	/am	8	12	*ID as cf
Fagesia superstes	/am	33	37	
Neolobites vibrayeanus	/am	0	5	
Pseudocalycoceras sp.	/am	11	14	
Inoc pictus	/bi	33	36	*In subspecies sackenis
Myti hercynicus	/bi	36	37	
Myti subhercynicus	/bi	36	37	
Myti submytiloides	/bi	33	36	
Hemicyclammina sigali	/fb	0	14	
Praealveolina simplex	/fb	0	10	
Praealveolina tenuis	/fb	1	3	

*END

MIDK.91 - Composite Carbonate Section, Southern Portugal

Composite Carbonate Shelf Section, Southern Portugal. Berthou, 1984, Bull. Geol. Sur. Denmark, 33:41-55, fig. 8. Compositated data from Leira & Lisbon areas plotted to thickness of the Runa section; Considered to be the "Rudist Facies"; top @ 50 m is unconformity with Tertiary lava.

Data:

*TAXA	Morph	Base	Top meters
Eucalycoceras pentagonum	/am	6	8
Neolobites vibrayeanus	/am	2	10
Apricardia carentonensis	/bi	38	42
Apricardia laevigata	/bi	38	42
Caprinula boissyi	/bi	12	38
Caprinula brevis	/bi	12	38
Caprinula d'orbigny	/bi	12	38
Caprinula doublieri	/bi	12	38
Durania arnaudi	/bi	12	48
Radiolites lusitanicus	/bi	33	49
Radiolites peroni	/bi	49	49
Sauvagesia sharpei	/bi	12	42
Nerinea requieni	/ga	42	42
Biconcava bentori	/fb	0	42
Cisalveolina fraasi	/fb	5	12
Chrysalidina gradata	/fb	29	47
Hemicyclammina sigali	/fb	0	42
Praealveolina simplex	/fb	0	13
Praealveolina tenuis	/fb	3	8
Pseudocyclammina rugosa	/fb	0	42

*END

MIDK.92 - Composite Section, Portugal

Composite Section, Portugal. Berthou, 1984, Bull. Geol. Sur. Denmark, 33:41-55, fig. 2; Major unconformity @ 15 m between carbonate below and conglomerate above.

Data:

*TAXA	Morph	Base	Top meters
Knemiceras uhligi	/am	130	200
Neolobites vibrayeanus	/am	480	480
Turrilites costatus	/am	470	470
Apricardia carentonensis	/bi	310	500
Apricardia laevigata	/bi	310	500
Caprina choffati	/bi	250	255
Biconcava bentori	/fb	330	480
Biplanata peneropliformis	/fb	330	500
Choffatella decipiens	/fb	10	14

Chrysalidina gradata	/fb	495	500
Neiraqia convexa	/fb	250	320
Orbitolina lenticularis	/fb	10	14
Orbitolina texana	/fb	50	62
Ovalveolina crassa	/fb	300	320
Ovalveolina ovum	/fb	370	480
Praealveolina brevis	/fb	370	375
Praealveolina iberica	/fb	355	480
Praealveolina simplex	/fb	355	480
Praealveolina tenuis	/fb	475	480
Praeorbitolina cormyi	/fb	10	14
Praeorbitolina wienandsi	/fb	10	14
Pseudedomia drorimensis	/fb	370	480
Pseudedomia viallii	/fb	295	330
Simplorbitolina conulus	/fb	108	110
Simplorbitolina manasi	/fb	108	110
Cribooperidinium intricatum	/dn	112	290
Dinopterygium cladoides	/dn	50	400
Exochosphaeridium bifidum	/dn	230	300
Exochosphaeridium truncatum	/dn	50	310
Microdinium ornatum	/dn	230	300
Palaeohystrichophora infusorioides	/dn	220	450 *ID as cf.
Xiphophoridium alatum	/dn	50	480

*END

MIDK.93 - Gulf McAlpin Well, Louisiana

Gulf McAlpin Well, Vernon Parish, Louisiana, 15-T1N-R11W; TD 19350'. depth range is sample range; studied from 12,000' to 17,100'. Nanofossils identified by Gary A. Taylor (unpubl. 1978, 1980) based on cuttings; R.W. Scott studied from 17,558'-17,654' & 17,947'-18,015'. Tied to seismic by Tyrrell & Scott, 1989, AAPG Studies in Geol. #27.

Data:

*TAXA	Morph	Base	Top feet	
Marker bed Al SB WA 1	/mb	-12600	-12600	
Marker bed Ap SB PR 2	/mb	-15250	-15250	
*top James Ls				
Marker bed Ap SB PR 1	/mb	-15600	-15600	
*Top Sligo, Base Pearsall				
Marker bed Ap SB SL 1	/mb	-15600	-15600	
Favusella washitensis	/fp	-14300	-14300	
Hedbergella washitensis	/fp	-14300	-14300	
Colomiella mexicana	/CA	*	-15300	*Base may be caved?
Colomiella recta	/CA	-14800	-14700	
Nannoconus wassallii	/nn	-15700	-15650	*Top may be caved?
Microcalamoides diversus	/ID	-14600	-14600	
*Unpubl. thin section analyses by R.W. Scott, 1980				
Cadosina fusca	/ca	-17975	-17606	
Pith sphaerica	/ca	-17980	-17975	
Nannoconus globulus	/nn	-18000	-17566.5	
Nannoconus steinmannii	/nn	-17975	-17566.5	
Globochaeta alpina	/AL	-17630	-17628	
Hedb planispira	/fp	-17947	-17606	
*New core samples 15 July 2004, E.A. Mancini & R.W. Scott				
*Palynology by D.G. Benson, 08/04				
Cassiculosphaeridia reticulata	/dn	-17621	-17618	*ID as cf.
Circulodinium attadalicum	/dn	-17621	-17618	
Circulodinium distinctum	/dn	-18015	-18013	
Cribooperidinium muderongense	/dn	-17589	-17586	*ID as cf.
Cribooperidinium orthoceras	/dn	-17979	-17589	
Cyclonephelium brevispinatum	/dn	-17621	-17618	
Cyclonephelium paucispinum	/dn	-17621	-17618	

Dingodinium cerviculum	/dn	-17618	-17589	
Gardodinium trabeculosum	/dn	-17621	-17618	
Gonyaulacysta cretacea Complex	/dn	-17621	-17618	
Gonyaulacysta ordocava	/dn	-17621	-17618	
Kiokansium unituberculatum	/dn	-18015	-18013	
Pseudoceratium pelliiferum	/dn	-17621	-17618	
Pseudoceratium retusum	/dn	-17621	-17618	
Sentusidinium aptiense	/dn	-18013	-17621	
Subtilisphaera perlucida	/dn	-17618	-17589	
Fromea amphora	/ac	-17982	-17979	
Aequitriradites spinulosus	/sp	-18015	-18013	*ID as ?
Cicatricosisporites hughesii	/sp	-19410	-17589	
Cicatricosisporites mohhrioides	/sp	-17621	-17618	*ID as cf.
Cicatricosisporites venustus	/sp	-18013	-17621	
Cingulatisporites distaverrucosus	/sp	-17979	-17621	
Classopollis classoides	/sp	-19410	-17949	
Contignisporites dorsostriatus	/sp	-17982	-17979	
Cyathidites australis	/sp	-17621	-17618	*ID as cf.
Distaltriangulisporites irregularis	/sp	-17949	-17946	*ID as cf.
Exesipollenites tumulus	/sp	-19349	-17589	
Hoegisporis uniforma	/sp	-18015	-18013	*ID as ?
Inaperturopollenites hiatus	/sp	-17621	-17618	
Lycopodiacidites intraverrucatus	/sp	-18013	-17621	
Pilosisporites verus	/sp	-17982	-17979	
Taleisphaeridia hydra	/sp	-19353	-19349	*ID as ?
Taurocusporites reduncus	/sp	-17979	-17949	
Triporoletes reticulatus	/sp	-18015	-18013	
*Benthic forams by M.J. Evetts, Sept 2004				
Hedb sigali	/fp	-17949	-17946	
Globuligerina hoterivica	/fp	-18013	-17589	
Bolivina textilaroides	/fb	-17979	-17621	
Conorbina conica	/fb	-17618	-17589	
Conorotalites bartensteini intercedens	/fb	-17589	-17586	
Epistomina caracolla	/fb	-17979	-17949	
Gavelinella baremiana	/fb	-17589	-17586	
Globulina lacrima	/fb	-17621	-17618	
Discorbis floscula	/fb	-17979	-17621	
Globulina cylindroides	/fb	-17618	-17589	
Lenticulina bronni	/fb	-17618	-17589	
*Subgenus (Saracenaria) ID as cf. and ?				
Lenticulina crepidularis	/fb	-17589	-17586	*Subgenus
(Astacolus)				
Lenticulina franki	/fb	-17979	-17589	*Subgenus
(Saracenaria)				
Lenticulina nodosa	/fb	-17589	-17586	*ID ?
Lenticulina praegaultina	/fb	-19410	-17589	
Lenticulina tricarinella	/fb	-17949	-17946	
*Subgenus (Astacolus)				
*"Nodosarella" rohri	/fb	-17982	-17979	
*Nodosarella is Maast to Holocene; do not use				
Patellina subcretacea	/fb	-17979	-17621	
Pyrulina longa	/fb	-17589	-17586	
Quinqueloculina triangulata	/fb	-18013	-17589	*ID as cf.
Quinqueloculina sabella	/fb	-19410	-17589	*ID as cf.
Trocholina infragranulata	/fb	-17979	-17589	
Vaginulina debilis	/fb	-17979	-17949	
Vaginulina procerca	/fb	-17949	-17946	
Valvulineria loetterlei	/fb	-17618	-17589	*ID as cf.
Ammodiscus gaultinus	/fb	-17982	-17979	*ID as cf.
Choffatella decipiens	/fb	-17589	-17586	
Gaudryina glenrosensis	/fb	-17618	-17589	*ID as cf.
Glomospirella gaultina	/fb	-17589	-17586	
Haplophragmoides globosus	/fb	-17618	-17589	

Massilina planoconvexa	/fb	-17589	-17586	*ID as cf.
Marssonella kummi	/fb	-18013	-17589	
Spiroloculina ophionea	/fb	-17946	-17589	*ID as cf.
Trochaminoides coronus	/fb	-17949	-17946	*ID as ?

*END

MIDK.94 Oyubari Area, Hokkaido, Japan

F. Kawabe, R. Takashima, R. Wani, H. Nishi, & K. Moriya, 2003. Acta Geologica Polonica 53:81-91. Measured Section Tengu-sawa #3 with megafossils; microfossil samples projected from other section (Fig. 3) by means of key marker beds. Upper Albian to Lower Cenomanian biostratigraphy...North Pacific. Ranges from Fig. 4. Section not included in MIDK database model.

Data:

*TAXA	Morph	Base	Top meters from base of section
Inoc concentricus	/bi	440	440 *ID as Actinoceramus
Mantelliceras saxbii	/am	1260	1260
Mariella bergeri	/am	675	675
Mortoniceras rostratum	/am	475	475
Turrilites scheuchzerianus	/am	790	790
Biti breggiensis	/fp	250	370
Glob'oides ultramicra	/fp	1650	1925
Hedb delrioensis	/fp	250	1925
Hedb gorbachikae	/fp	240	240
Hedb planispira	/fp	250	1925
Hedb simplex	/fp	250	1925
Hedb washitensis	/fp	250	1850
Favusella washitensis	/fp	250	1850
Prae delrioensis	/fp	1060	1925
Praeglobotruncana stephani	/fp	1060	1925
Rota appenninica	/fp	1060	1925
Rota cushmani	/fp	1850	1850
Rota gandolfi	/fp	1060	1925
Rota globotruncanoides	/fp	1210	1925
Tici primula	/fp	250	575
Tici raynaudi	/fp	250	1050
Tici roberti	/fp	250	575
Tici subticinensis	/fp	400	400
Whit baltica	/fp	1850	1925

*END

MIDK.95 - Shell 4898 # 1, Chandeleur Sound, Louisiana

State Lease 4898 #1, Chandeleur Sound, Louisiana.

Core thin sections examined June 2004 by R.W. Scott in intervals: 14698-14748', 15953-15999', 16615-16790', 18291-18340', & 19930-19991', TD 20123'. Scott, 1993, AAPG Mem 56, p. 97-109, fig. 5: Top Comanchean SB 12340', top Fredericksburg 12900, Pearsall 19305-1890', TD 20130'.

Tied to seismic by M Badali, U. Alabama Ph.D.

Data:

*TAXA	Morph	Base	Top feet
Marker bed Ce TS WA 6	/mb	-12340	*
*base Grayson Fm., here is Washita/Tuscaloosa contact			
Marker bed Al SB WA 1	/mb	-12900	*
*Marker bed Ap SB PR 2			
	/mb		*top James Ls
Marker bed Ap SB PR 1	/mb	-19305	*
*Top Sligo, Base Pearsall			
Favusella washitensis	/fp	-18281	-13668
Hedbergella washitensis	/fp	-18281	-13668
Barkerina barkerensis	/fb	-14712	-14702
Choffatella decipiens	/fb	-19931	-19310

Cuneolina walteri	/fb	-14702	-14702	
Dictyoconus walnutensis	/fb	*	-13050	
*base at 16050 should not overlap with top O. texana				
Hemicyclammina whitei	/fb	-19931	-19931	*ID ?
Paracoskinolina sunnilandensis	/fb	-16620	-16620	
Praechrysalidina infracretacea	/fb	-16620	-16620	
Pseudonummoloculina heimi	/fb	-16691	-16691	
Pseudocyclammina hedbergi	/fb	-19931	-15992	
Orbitolina lenticularis	/fb	-19983.5	-19943.5	
*questionable occurrences as high as -19931				
Orbitolina texana	/fb	-16700	-15992	
Acicularia sp.	/al	-14712	-14702	
Bacinella irregularis	/al	-19951	-15992	
Boueina hochstetteri	/al	-14702	-14702	
Cayeuxia kurdistanensis	/al	-16730	-16437	
Marinella lugeoni	/al	-19951	-19931	
Permocalculus irenae	/al	-14702	-14702	
Pycnoporidium lobatum	/al	-16730	-16437	
Chondrodonta glabra	/bi	-19931	-15953	*ID questioned
*END				

MIDK.96 - Shell 4898 # 2, Chandeleur Sound, Louisiana
 State Lease 4898 #2, Chandeleur Sound, Louisiana.
 Four core segments examined 15 July 2004 by E.A. Mancini, R.W. Scott & J.C. Llinas: 12810-12851.5',
 13543-13565', 13624-13708', & 14199-14245'. Tied to seismic by M. Badali, U. Alabama Ph.D.

Data:

*TAXA	Morph	Base	Top feet	
*Unpubl. thin section analyses by R.W. Scott, 1980				
Caprinuloidea perfecta	/bi	-13552	-13552	
Kimbleia albrittoni	/bi	-12830	-12810.5	
Mexicaprina alata	/bi	-12827	-12815.5	
Mexicaprina quadrata	/bi	-12831	-12810.5	
Favusella washitensis	/fp	-13668	-13668	
*Palynology by D.G. Benson, 08/04				
Aequitriradites spinulosus	/sp	-12837	-12835	*ID as ?
Appendicisporites potomacensis	/sp	-12837	-12835	
Camarozonosporites insignis	/sp	-12837	-12835	
Cerebropollenites mesozoicus	/sp	-12837	-12835	
*Cicatricosisporites pseudotripartitus	/sp	-12837	-12835	
Cicatricosisporites venustus	/sp	-12837	-12835	
Cingulatisporites distaverrucosus	/sp	-12837	-12835	
Cyathidites australis	/sp	-12837	-12835	
Cyathidites minor	/sp	-12837	-12835	
*Exesipollenites tumulus	/sp	-12837	-12835	
Gleicheniidites senonicus	/sp	-12837	-12835	
Inaperturopollenites hiatus	/sp	-12837	-12835	
*Lycopodiacidites intraverrucatus	/sp	-12837	-12835	
*Matonisporites excavatus	/sp	-12837	-12835	
*Taurocusporites reduncus	/sp	-12837	-12835	
Taurocusporites segmentatus	/sp	-12837	-12835	
*Versperopsis mayi	/sp	-12837	-12835	
Hapsocysta peridictya	/dn	-12837	-12835	
*Kiokansium hesperum	/dn	-12837	-12835	*in Nexosispinum
Kiokansium unituberculatum	/dn	-12837	-12835	
Oligosphaeridium albertense	/dn	-12837	-12835	
Oligosphaeridium anthophorum	/dn	-12837	-12835	
Oligosphaeridium pulcherrimum	/dn	-12837	-12835	
Subtilisphaera deformans	/dn	-12837	-12835	
Subtilisphaera perlucida	/dn	-12837	-12835	
Trichodinium castanea	/dn	-12837	-12835	

*Ammodiscus gaultinus
 *Choffatella decipiens
 *END

/fb
 /fb

*ID as cf.

MIDK.97 - Ballard Carey-Carolla No. 1, Texas

Ballard Carey & Carolla No. 1, Grimes Co., Texas.

Data by Scott, 1987, unpublished; well logs, cores & cutting samples; Aptian-Upper Albian carbonate platform foreereef basin. Top Cretaceous 15870'; top Comanchean 17475'; top Fredericksburg facies 17955'; Pearsall Formation Marker bed Ap SB PR 1 19868-19833'; top Sligo 19868'. TD at 20,631 ft.

Data:

*Taxa	Morph	Base	Top (ft below kb)
Marker bed Ce TS WA 6	/mb	-17475	*
Marker bed Ce TS 1.1	/mb	-17475	*
*top Washita Gp.			
Marker bed Al SB WA 1	/mb	-17955	*
*top Fredericksburg facies			
Marker bed Ap SB PR 1	/mb	-19868	*
*base Pearsall Fm. on Sligo Fm.			
Coskinolina texanus	/fb	-18234	-18234
Dictyoconus walnutensis	/fb	-18234	-18234
Lingulogavelinella albiensis	/fb	-18214.2	-18193.7
Hedb delrioensis	/fp	-18400	-17620
Hedb planispira	/fp	-18780	-17620
Hedbergella washitensis	/fp	-19800	-17620
*Rotalipora spp	/fp	-18100	-17830
Bonetocardiella betica	/ca	-17710	-17530
Bonetocardiella conoidea	/ca	-17530	-17500
Colomiella mexicana	/ca	-19810	-19800
Colomiella recta	/ca	-19800	-19210
Colomiella tunesiana	/ca	-19800	-19110
Cadosina fusca	/ca	-18870	-17620
Pith ovalis	/ca	-18250	-17530
Pith sphaerica	/ca	-18580	-17530
Pithonella trejoi	/ca	-17530	-17500
Bacinella irregularis	/al	-20600	-20310
Microcalamoides diversus	/id	-19180	-18186.5
Globochaeta alpina	/al	-19800	-18234
Polystrata alba	/al	-20600	-18228.3
Pycnoporidium lobatum	/al	-20400	-20310
Nannoconus bucheri	/nn	-20000	-19880
Nannoconus minutus		-19860	-17530
Nannoconus truitti	/nn	-19900	-17740
Nannoconus wassallii	/nn	-19868	-19860

*Data on cuttings by Linda F. Lichty, Amoco 1987

Braarudosphaera bigelowii	/nn	-17440	-16810
Bukryolithus ambiguus	/nn	-17440	-16810
Calculites obscurus	/nn	-17440	-16810
Corollithion signum	/nn	-17440	-16810
Eiffellithus eximius	/nn	-17440	-16810
Eiffellithus turriseiffelii	/nn	-17440	-16810
Kamptnerius magnificus	/nn	-17440	-16810
Lithraphidites carniolensis	/nn	-16810	-16780
Lithastrinus floralis	/nn	-19868	-19860
Lucianorhabdus cayeuxii	/nn	-17440	-16810
Markalius circumradiatus	/nn	-16930	-16900
Marthasterites furcatus	/nn	-17080	-16930
Micrantholithus hoschulzii	/nn	-19868	-19850
Microrhabdulus decoratus	/nn	-17440	-16810
Micula staurophora	/nn	-17440	-16810
Reinhardtites sisypus	/nn	-17080	-17020

Rotelapillus crenulatus	/nn	-17440	-16810
Tranolithus gabalus	/nn	-17440	-17110
Tranolithus orionatus	/nn	-17470	-17440
Watznaueria barnesae	/nn	-19860	-16810
Watznaueria biporta	/nn	-19868	-19860
Zeugrhabdotus embergeri	/nn	-19868	-19860
Zygodiscus bicrescenticus	/nn	-17440	-17110
Zygodiscus diplogrammus	/nn	-17440	-16810

*END

MIDK.98 - Roter Sattel, Switzerland

Roter Sattel, Romandes Prealps, Switzerland; x° N, y° E, 586.000/159.270.

Cret. Res. 22:173-199, fig. 3. Guillaume, 1986, Fribourg thesis, p. 65, fig. 28; p. 115, fig. 48a;

Base of section at 0 m, top of section at 68 m; Calcaires-Plaquettes Fm.; Intyamon Fm., Couches-Rouges Fm.

Data:

*Taxon name	morph	base	top meters
Carbon peak OAE 1a	/GC	3.5	6.0
Carbon peak OAE 1b	/GC	34.9	35.5
Carbon peak OAE 1c	/GC	37.8	38.7
Carbon peak OAE 2	/GC	62	64
Marker bed Selli Level	/mb	4.5	6
Marker bed Bonarelli	/mb	62	64
	*ID of fp by M. Caron		
Biti breggiensis	/fp	37	40.9
Dica algeriana	/fp	55.2	68
Dica hagni	/fp	61.4	68
Glob'oides algerianus	/fp	27.5	31.8
Glob'oides blowi	/fp	0.2	17.5
Glob'oides ferreolensis	/fp	24.55	32.3 *top at 32.3 reworked
Hedb infracretacea	/fp	0	54.5
Hedb planispira	/fp	20.4	54.5
Hedb sigali	/fp	0	20.2
Helv'ana helvetica	/fp	67.1	68
Helv'ana praehelvetica	/fp	61.5	68 *ID as Whiteinella
Leupoldina cabri	/fp	7.4	17.1
Marginotruncana marianosi	/fp	67.5	68
Marginotruncana schneegansi	/fp	65.3	68
Planomalina buxtorfi	/fp	41.1	46.6
Planomalina cheniourensis	/fp	31.1	31.8
Planomalina praebuxtorfi	/fp	40.6	41.3
Rota appenninica	/fp	41.1	54.5
Rota cushmani	/fp	56.3	61.9 *hardground at 61.95
Rota globotruncanoides	/fp	47.7	54.9
	*Top at hardground at 61.95m too hi, use second LO		
Rota greenhornensis	/fp	50.8	60.6
Rota montsalvensis	/fp	49.2	60.1
Rota reicheli	/fp	50.8	58.4
Tici bejaouaensis	/fp	32.15	32.4
Tici primula	/fp	36.25	40.2
Tici subticinensis	/fp	39.6	40.4
Tici ticinensis	/fp	39.6	46.6
Whit archaeocretacea	/fp	57.7	68

*END

MIDK.99 - Zasan Section, Poland

Zasan Section, Poland. Bak, 2006, Palaeo-3, 237:335-358. Section is in Outer Carpathians in Subsilesian Nappe, 30 km south of Krakov. Radiolarian identified by M. Bak; forams by K. Bak.

Base of section in black shale is fault; top of section at 6.7 m; Barnasiowka Radiolarian Shale Formation spans Cen/Tur contact;

Data:

*TAXA	Morph	Base	Top meters
Carbon peak OAE 2	/GC	0	1.4
Marker bed Bonarelli	/mb	0	1.4
Hedb delrioensis	/fp	4.8	6.5
Hedb simplex	/fp	4.8	6.5
*Base of Hedbergella sp. at 4.8; species base only in top sample			
Helv'ana helvetica	/fp	4.4	4.4
*ID as questionable; Bak saw in thin section			
Marginotruncana schneegansi	/fp	5.15	5.15
*ID as species; Bak says it is the oldest form			
Ammodiscus cretaceus	/fb	0.8	5.15
*ID at base is Ammodiscus sp; base of cretaceous is at 4.8			
Caudammina ovulum	/fb	5.15	5.15
Glomospira charoides	/fb	1.45	1.45 *ID in Repmanina
Haplophragmoides nonioninoides	/fb	1.9	1.9
Kalamopsis grzybowskii	/fb	4.1	5.15 *ID in Saccammina
Rothina silesica	/fb	0.8	0.8
Saccammina placenta	/fb	2.0	4.1 *ID in Placentammina
Thalmannammina meandertornata	/fb	1.25	1.45 *Top is top Cenomanian
Alievium superbum	/ra	4.8	6.5
Crucella cachiensis	/ra	4.4	6.5
Crucella messinae	/ra	0.6	0.6
Patellula ecliptica	/ra	0.6	6.5
Patellula andrusovi	/ra	0.6	6.5
Patulibrachium californiense	/ra	0.6	4.8 *ID as Paronaella
*END			

MIDK.100 - Cassis, France Cenomanian-Turonian

Cassis, France Cenomanian-Turonian. J. Philip, 1998, SEPM SP 60:387-395; Fig. 2, p. 389.

A reference section for carbonate slope sequence stratigraphy in SE France.

Data:

*TAXA	Morph	Base	Top meters
Acanthoceras jukesbrownei	/am	9	9
Acanthoceras rhotomagense	/am	7	7
Calycoceras newboldi	/am	7	9
Eucalycoceras pentagonum	/am	15	16
Mantelliceras mantelli	/am	5	5
Turrilites scheuchzerianus	/am	7	7
Dica algeriana	/fp	9	91
Dica hagni	/fp	9	104
Hedb simplex	/fp	9	80
Helv'ana helvetica	/fp	90	104
Helv'ana praehelvetica	/fp	90	104
Heterohelix reussi	/fp	68	104
Praeglobotruncana stephani	/fp	9	104
Rota cushmani	/fp	9	80
Rota greenhornensis	/fp	9	80
Whit archaeocretacea	/fp	82	96
Whit baltica	/fp	95	102
Whit brittonensis	/fp	68	104
*Local Sequence Stratigraphy			
*Marker bed Ce Cassis TST5	/mb	*	104
*Marker bed Ce Cassis LST4	/mb	*	94
*Marker bed Tu Cassis SB5	/mb	90	*

*Marker bed Ce Cassis SB4	/mb	81	*
*Marker bed Ce Cassis LST3	/mb	*	43
*Marker bed Ce Cassis SB3	/mb	40	*
*Marker bed Ce Cassis TST2	/mb	*	26
*Marker bed Ce Cassis LST2	/mb	*	19
*Marker bed Ce Cassis SB2	/mb	8	*
*Marker bed Ce Cassis SB1	/mb	4	*

*Underlain by Upper Aptian strata
*END

MIDK.101 - Font-Blanc, France Cenomanian-Turonian
Font-Blanc, France Cenomanian-Turonian. J. Philip, 1998, SEPM SP 60:387-395; Fig. 3, p. 390.
Reference section for sequence stratigraphy on a platform in SE France.

Data:

*TAXA	Morph	Base	Top meters	
Choffaticeras sp.	/am	64	64	
Eucalycoceras pentagonum	/am	26	26	
Fagesia catinus	/am	64	64	
Mammites nodosoides	/am	64	64	
Heterohelix reussi	/fp	43	64	*ID as cf
Rota cushmani	/fp	39	39	*ID as cf
Chrysalidina gradata	/fb	4	41	
Praealveolina cretacea	/fb	4	33	*ID as sp.
Pseudolituonella reicheli	/fb	4	33	
Apricardia laevigata	/bi	36	41	*ID as sp
Caprina adversa	/bi	6	30	
Caprinula d'orbigny	/bi	22	26	*ID as sp
Durania arnaudi	/bi	29	54	
Hippurites requieni	/bi	68	78	
Ichthyosarcolites triangularis	/bi	6	30	*ID as cf.
Sauvagesia sharpei	/bi	29	39	
Vaccinites fontalbensis	/bi	60	62	
*Local Sequence Stratigraphy				
*Marker bed Ce Cassis HST5	/mb	*	78	
*Marker bed Ce Cassis TST5	/mb	*	73	
*Marker bed Tu Cassis SB5	/mb	63	*	
*Marker bed Tu Cassis DLS4	/mb	45	*	
*Marker bed Ce Cassis SB4	/mb	42	*	
*Marker bed Ce Cassis DLS3	/mb	*	28	
*Marker bed Ce Cassis SB3	/mb	10	*	
*Marker bed Ce Cassis SB2	/mb	3	*	
*Marker bed Ce Cassis SB1	/mb	3	*	

*Underlain by Upper Aptian strata
*END

MIDK.102 La Russille, Switzerland
About 15 km SW of Lake Neuchatel. Arnaud-Vanneau & Masse, 1989, Mem. Soc. Neuchateloise Sci. Naturelles, 11:257-276.
Base of section is top of Pierre Jaune Inferieure; 1.5-3.5 m Marne d'Uttings; 3.5-77 m Pierre Juane Superieure; 77-78 m Marnes de la Russille; 78-8 m Urgonien Superieur; Hauterivian/Barremian c. 78 m.

Data:

*TAXA	Morph	Base	Top meters
Citaeella favrei	/fb	0	5
Eclusia decastroi	/fb	36	70
Melathrokerion valserinensis	/fb	36	70
Nezzazatinella macovei	/fb	16	70
Paleodictyoconus sp. 1	/fb	36	70

Paleodictyoconus sp. 2	/fb	67	70
Paracoskinolina sunnilandensis	/fb	28	70
Pfenderina globosa	/fb	67	70

*END

MIDK.103 Vaulion, Switzerland

About 15 km SW of Lake Neuchatel. Arnaud-Vanneau & Masse, 1989, Mem. Soc. Neuchateloise Sci. Naturelles, 11:257-276.

Base of section is top of Pierre Jaune Inferieure; 1.5-3.5 m Marne d'Uttins; 3.5-77 m Pierre Juane Superieure; 77-78 m Marnes de la Russille; 78-8 m Urgonien Superieur; Hauterivian/Barremian c. 78 m.

Data:

*TAXA	Morph	Base	Top meters
Citaella favrei	/fb	30	37
Eclusia decastroi	/fb	94	110
Paleodictyoconus sp. 1	/fb	94	110
Paleodictyoconus sp. 2	/fb	100	110
Paracoskinolina sunnilandensis	/fb	65	110
Pfenderina globosa	/fb	94	110

*END

MIDK.104 La Sarraz Eclepens, Switzerland

About 15 km SW of Lake Neuchatel. Arnaud-Vanneau & Masse, 1989, Mem. Soc. Neuchateloise Sci. Naturelles, 11:257-276.

Base of section is top of Pierre Jaune Inferieure; 1.5-3.5 m Marne d'Uttins; 3.5-77 m Pierre Juane Superieure; 77-78 m Marnes de la Russille; 78-8 m Urgonien Superieur; Hauterivian/Barremian c. 78 m.

Data:

*TAXA	Morph	Base	Top meters
Citaella favrei	/fb	15	30
Dictyorbitolina ichnusae	/fb	65	80 *ID as aff.
Eclusia decastroi	/fb	58	80
Melathrokerion valserinensis	/fb	68	80
Paleodictyoconus sp. 1	/fb	65	80
Paleodictyoconus sp. 2	/fb	65	80
Paracoskinolina sunnilandensis	/fb	65	80
Pfenderina globosa	/fb	68	80

*END

MIDK.105 Gorges de l'Orbe, Switzerland

About 15 km SW of Lake Neuchatel; Arnaud-Vanneau & Masse, 1989, Mem. Soc. Neuchateloise Sci. Naturelles, 11:257-276.

Base of section is top of Pierre Jaune Inferieure; 1.5-3.5 m Marne d'Uttins; 3.5-77 m Pierre Juane Superieure; 77-78 m Marnes de la Russille; 78-8 m Urgonien Superieur; Hauterivian/Barremian c. 78 m.

Data:

*TAXA	Morph	Base	Top meters
Arenobulimina corniculum	/fb	78	85
Bolivinopsis bernardi	/fb	24	36
Charentia cuvillieri	/fb	28	85
Choffatella decipiens	/fb	32	78
Citaella favrei	/fb	20	36
Cribellopsis elongata	/fb	62	65 *ID as aff.
Cuneolina laurentii	/fb	63	65
Dictyorbitolina ichnusae	/fb	60	85 *ID as aff.
Dobrogelina anastasui	/fb	28	85 *ID as cf.
Eclusia decastroi	/fb	60	85

<i>Ecougella campiloides</i>	/fb	62	85	
<i>Gaudryina tuchaensis</i>	/fb	24	36	
<i>Melathrokerion valserinensis</i>	/fb	78	85	
<i>Nautiloculina bronnimanni</i>	/fb	78	85	
<i>Nautiloculina cretacea</i>	/fb	22	85	
<i>Neotrocholina friburgensis</i>	/fb	52	85	*ID as aff.
<i>Neotrocholina infragranulata</i>	/fb	3.5	85	
<i>Nezzazatinella macovei</i>	/fb	60	85	
<i>Paleodictyoconus</i> sp. 1	/fb	63	85	
<i>Paracoskinolina sunnilandensis</i>	/fb	60	85	
<i>Pfenderina globosa</i>	/fb	63	85	
<i>Reophax giganteus</i>	/fb	3.5	73	
<i>Sabaudia minuta</i>	/fb	60	85	
<i>Trocholina odukpaniensis</i>	/fb	3.5	85	
<i>Urgonina alpillensis</i>	/fb	62	65	
<i>Verneuilina polonica</i>	/fb	78	85	*ID as cf.

*END

MIDK.106 Gellin-Rochejean, Switzerland

Masse et al., 1989, Mem Soc. Neuchateloise Sci. Nat., v. 11:73-80. Type section of Calcaire a Pachytraga, lower Urgonian, Hauterivian. Hardgrounds at 9.1m, 11m, 15m, 21m.

Data:

*TAXA	Morph	Base	Top meters	
<i>Pachytraga tubiconcha</i>	/bi	13	20	
<i>Charentia cuvillieri</i>	/FB	10	20	
<i>Choffatella decipiens</i>	/FB	0	9	
<i>Derventina filipescui</i>	/fb	10	20	
<i>Dictyorbitolina ichnusae</i>	/FB	10	20	
<i>Neotrocholina infragranulata</i>	/FB	0	9	
<i>Orbitolinopsis flandrini</i>	/fb	10	20	
<i>Pseudolituonella gavonensis</i>	/fb	10	20	
<i>Trocholina odukpaniensis</i>	/FB	0	9	*ID as Trocholina sp. 1 and 2
<i>Urgonina alpillensis</i>	/FB	10	20	
<i>Dissocladella hauteriviana</i>	/al	0	9	
<i>Likanella danilovae</i>	/al	0	9	
<i>Montiella elitzae</i>	/al	0	9	
<i>Pseudoactinoporella fragilis</i>	/al	0	9	
<i>Salpingoporella genevensis</i>	/al	10	20	
<i>Salpingoporella melitae</i>	/al	10	20	
<i>Salpingoporella muehlberghii</i>	/AL	10	20	

*END

MIDK.107 - Blue Point, Arizona

Blue Point, Arizona, SW Black Mesa. Elder section A1, 1991, GSA SP 260, p.113-137, megafossils, Fig. 20; Li & Habib, 1996, Palaios, v. 11, p. 15-30, dinos.

Data:

*TAXA	Morph	Base	Top meters
Carbon peak OAE 2	/gc	6.2	10.7
<i>Allocrioceras annulatum</i>	/am	1.0	4.7
<i>Euomphaloceras septemseriatum</i>	/am	2.6	4.3
<i>Metoicoceras geslinianum</i>	/am	1.0	5.0
<i>Neocardioceras juddii</i>	/am	5.2	8.7
<i>Pseudocalyoceras angolaense</i>	/am	2.9	3.5
<i>Sciponoceras gracile</i>	/am	1.0	7.9
<i>Inoc pictus</i>	/bi	2.2	10.7
<i>Myti opalensis</i>	/bi	13.7	13.7
<i>Fromea amphora</i>	/ac	1.8	2.4
<i>Achomosphaera ramulifera</i>	/dn	1.8	13.7

Batiacasphaera euteiches	/dn	1.8	13.7
Cleistosphaeridium aciculare	/dn	3.8	8.7
Coronifera oceanica	/dn	3.2	8.7
Coronifera striolata	/dn	2.4	13.1
Cyclonephelium compactum	/dn	7.3	11.0
Cyclonephelium distinctum	/dn	1.8	12.5
Cyclonephelium membraniphorum	/dn	3.2	10.5
Cyclonephelium paucispinum	/dn	3.2	8.7
Cyclonephelium vannophorum	/dn	1.8	13.7
Exochosphaeridium phragmites	/dn	2.4	13.7
Epelidosphaeridia spinosa	/dn	3.2	11.0
Exochosphaeridium bifidum	/dn	3.2	12.5
Florentinia cooksoniae	/dn	3.2	3.2
Florentinia deanei	/dn	1.8	9.5
Florentinia mantellii	/dn	1.8	9.5
Florentinia radiculata	/dn	2.4	2.4
Gonyaulacysta cassidata	/dn	14.8	13.1
Gonyaulacysta helicoidea	/dn	6.3	13.1
Hystrichodinium pulchrum	/dn	2.4	11.8
Hystrichosphaeridium tubiferum	/dn	2.4	11.8
Isabelidinium magnum	/dn	3.8	3.8
Kiokansium polypes	/dn	2.4	13.7
Kiokansium williamsii	/dn	3.2	8.7
Litosphaeridium siphoniphorum	/dn	3.8	3.8
Micrhystridium inconspicuum	/dn	3.2	3.2
Micrhystridium stellatum	/dn	3.2	3.2
Muderongia perforata	/dn	11.0	11.8
Odontochitina costata	/dn	1.8	12.5
Odontochitina operculata	/dn	1.8	13.7
Oligosphaeridium complex	/dn	1.8	13.7
Ovoidinium verrucosum	/dn	2.4	12.5
Palaeohystrichophora infusorioides	/dn	1.8	13.7
Pervosphaeridium pseudhystrichodini	/dn	3.2	13.7
Pseudoceratium eisenackii	/dn	3.2	11.0
Pterodinium cingulatum	/dn	3.2	10.5
Spiniferites ancoriferus	/dn	1.8	11.8
Spiniferites cornutus	/dn	2.4	2.4
*ID as S. cornutus laevimunis			
Spiniferites ramosus gracilis	/dn	3.2	3.2
Spiniferites multibrevis	/dn	1.8	13.1
Spiniferites ramosus ramosus	/dn	1.8	13.1
Subtilisphaera deformans	/dn	2.4	13.7
*misspelled as S. deformance?			
Subtilisphaera senegalensis	/dn	13.1	13.7
Systematophora cretacea	/dn	1.8	11.0
Tanyosphaeridium salpinx	/dn	3.2	12.5
Trithyrodinium suspectum	/dn	2.4	2.4
Xenascus ceratioides	/dn	3.2	12.5
Xiphophoridium alatum	/dn	6.3	13.1
*END			

MIDK.108 - Shahneshin Mountain Section, Iran

Shahneshin Mountain section, Iran. About 60 km west of Shiraz in SW Iran; approx. 29°15'N, 51° 30'E; Ghasemi-Nejad et al., 2006, Cret. Res. 27:828-835, fig. 3; James & Wynd, 1965, AAPG Bull. 49:2182-2245. Base is unconformity over Cenomanian Sarvak Fm.; KT unconformity 302.4 m; 0-55m upper Santonian-lower Campanian, 55-145m mid-upper Campanian, 145-245m lower Maastrichtian, 245-302m upper Maastrichtian.

Data:

*TAXA Morph Base Top meters
*Figs. 2, 5 in Ghasemi-Nejad

Dicarinella asymetrica	/fp	7.5	7.5	
Dica concavata	/fp	7.5	7.5	
Morozovella subbotinae	/fp	303	303	
Subbotina triloculinoides	/fp	302.5	302.5	
*James & Wynd, 1965, AAPG Bull. 49:2182-2245; some estimated positions too low				
Marginotruncana sigali	/fp	7.5	7.5	*In Globotruncana
Globotruncana elevata	/fp	51	51	
*Globotruncana calcarata	/fp	66.5	66.5	
*Gansserina gansseri	/fp	154	154	
Globotruncana stuarti	/fp	119	119	
*Globotruncana contusa	/fp	119	119	
Cannosphaeropsis utinensis	/dn	235	301	
Cerodinium speciosa	/dn	265.5	284.0	
Cerodinium striata	/dn	284.0	284.0	
Chatangiella ditissima	/dn	*	284.0	*ID as cf.
Coronifera oceanica	/dn	*	284	
Coronifera striolata	/dn	*	284	
Cribroperidinium exilicristatum	/dn	*	284	
Cribroperidinium muderongense	/dn	22.5	154	
Dapsilidinium pumilum	/dn	22.5	185	
Dinogymnium acuminatum	/dn	*	171.5	
Dinogymnium euclaense	/dn	*	301	
Endoscrinium campanula	/dn	*	7.5	
Exochosphaeridium bifidum	/dn	*	89	
Exochosphaeridium phragmites	/dn	*	28	
Florentinia ferox	/dn	*	284	
Hystrichodinium pulchrum	/dn	*	119	
Hystrichokolpoma bulbosum	/dn	250.5	250.5	
Impagidinium cristatum	/dn	28	225	
Laciniadinium biconicolum	/dn	185	284	
Odontochitina costata	/dn	*	22.5	
Odontochitina cripropoda	/dn	*	136.5	
Palaeocystodinium australinum	/dn	301	301	*ID as cf
Palaeocystodinium golzowense	/dn	301	301	
Palaeoperidinium pyrophorum	/dn	163	163	
Pterodinium cingulatum	/dn	163	284	
Senegalinium biclavatum	/dn	171.5	284	*ID as cf
Spinidinium echinoideum	/dn	*	7.5	
Spiniferites cingulatus	/dn	*	195	
Spiniferites cornutus	/dn	*	301	
Spiniferites porosus	/dn	119	119	
Spiniferites ramosus ramosus	/dn	66.5	284	
Surculosphaeridium longifurcatum	/dn	*	163	
Trithyrodinium vermiculatum	/dn	*	163	
Fromea amphora	/ac	*	15	

*END

MIDK.109 - Gabal El Minsherah, North Sinai

Gabal El Minsherah, North Sinai. Saber et al. 2009 GeoArabia 14:113-134, figs. 5, 9. Felieh, 2007, manuscript, figs. 2, 4. Halal Formation 0-218 m; Wata Formation 218-290 m; boundary is C/T. Estimated positions of sequence boundaries of Bauer et al. 2004, Cour. Forsch 287: figs. 4, 5: CeSin 6-122 m; CeSin 7-206 m; TuSin 1-246.5 m; TuSin 2-274 m.

Data:

*TAXA	Morph	Base	Top meters
Choffaticeras segne	/am	220	220
Mammites nodosoides	/am	220	220
Neolobites vibrayeanus	/am	100	100
Pseudaspidoceras flexuosum	/am	220	220
*Vascoceras cauvini	/am	215	215
Chondrodonta joannae	/bi	125	195

Durania sp.	/bi	255	280	
Eoradiolites lyratus	/bi	30	125	
Exogyra flabellata	/bi	5	185	
*Placed in Ceratostreon				
Exogyra olisiponensis	/bi	210	210	*Placed in Costagyra
*Gyostrea delettrei	/bi	5	100	
Ichthyosarcolithes triangularis	/bi	150	155	
Ilmatogyra africana	/bi	120	210	
Pholadomya pedernalis	/bi	250	250	
*Praeradiolites sp.	/bi	195	195	
Praeradiolites biskraensis	/bi	40	40	
Protocardia hillana	/bi	5	5	
Pterocera incerta	/bi	75	95	
Pterotrigonia limbata	/bi	5	5	
Rhynchostreon mermeti	/bi	15	185	
Nerinea gemmifera	/ga	*	185	
Nerinea requieniana	/ga	290	290	
Tylostoma gadensis	/ga	250	250	
*New foram data 4/30/07 by email from Felieh				
Biconcava bentori	/fb	210	210	
Discorbis turonicus	/fb	220	270	
Haplophragmoides globosus	/fb	210	210	
Haplophragmoides rugosa	/fb	210	210	
Nezzazata gyra	/fb	210	210	
Nezzazata simplex	/FB	15	15	
Nezzazatinella aegyptiaca	/fb	220	270	
*Orbitolina concava	/fb	85	85	85 extends LO too hi
Praealveolina cretacea	/fb	120	120	
Praealveolina tenuis	/fb	120	120	
Hedb delrioensis	/fp	220	220	
Hedbergella delrioensis	/fp	220	220	
Heterohelix reussi	/fp	270	270	
Hemiaster grabielis	/ec	95	95	
Hemiaster cubicus	/ec	120	120	
Hemiaster heberti turonensis	/ec	250	250	
Phymosoma baylei	/ec	250	250	
Phymosoma abbatei	/ec	250	250	
*Polytremacis chalmasi	/st	195	195	
*Maghrebellia forgemoli	/?	120	120	
*END				

MIDK.110 - Gabal Yelleg, North Sinai

Gabal Yelleg, North Sinai. Felieh, 2007, manuscript, figs. 2, 4.

Halal Formation 0-450 m; Wata Formation 450-575 m; boundary is C/T.

Hardgrounds at 306m, 415m, 520m.

Data:

*TAXA	Morph	Base	Top	meters	
Calycoceras choffati	/am	432	432		
Choffaticeras segne	/am	451	455		
Coilopoceras requienianum	/am	555	555		
Neolobites vibrayeanus	/am	305	305		
Thomasites rollandi	/am	451	455		
Exogyra flabellata	/bi	20	170		*Placed in Ceratostreon
Chondrodonta joannae	/bi	180	360		
Durania arnaudi	/bi	512	550		
Eoradiolites lyratus	/bi	65	310		
Exogyra olisiponensis	/bi	420	430		*Placed in Costagyra
Ilmatogyra africana	/bi	350	350		
Orbitolina conica	/fb	5	5		
Praealveolina cretacea	/fb	210	310		

Praealveolina tenuis /fb 210 310
 *END

MIDK.111 - Molino River, Colombia

Molino River, Colombia. Ignacio Martinez R., 1989, Micropaleo.35:97-113.

Colon Formation 4-188 m continuous and uniform deposition; Maastrichtian.

Data:

*TAXA	Morph	Base	Top meters	
*Text-fig. 3.				
Abathomphalus mayaroensis	/fp	140	140	
Archaeoglobigerina blowi	/fp	4	188	*ID as cf
Archaeoglobigerina cretacea	/fp	4	8	
Gansserina gansseri	/fp	73	108	
Globigerinelloides multispinata	/fp	60	188	
Globigerinelloides subcarinatus	/fp	8	188	
Globigerinelloides volutus	/fp	188	188	
Globotruncana aegyptiaca	/fp	4	188	
Globotruncana arca	/fp	8	188	
Globotruncana conica	/fp	108	188	*ID as Globotruncanita
Globotruncana contusa	/fp	160	160	*ID as cf
Globotruncana fornicata	/fp	4	8	*ID as Rosita
Globotruncana insignis	/fp	4	60	
Globotruncana linneiana	/fp	4	4	
Globotruncana mariei	/fp	8	188	
Globotruncana patelliformis	/fp	4	4	*ID as Rosita cf.
Globotruncana rosetta	/fp	8	188	
Globotruncana stuarti	/fp	108	108	*ID as Globotruncanita
Globotruncana stuartiformis	/fp	4	188	*ID as Globotruncanita
Globotruncana ventricosa	/fp	4	8	
Globotruncanella petaloidea	/fp	4	188	
Guembelitra cretacea	/fp	4	155	
Hedbergella holmdelensis	/fp	8	8	*ID as cf
Heterohelix glabrans	/fp	8	188	
Heterohelix globulosa	/fp	4	24	*ID as cf
Hete navarroensis	/fp	170	188	*ID as cf
Heterohelix striata	/fp	4	188	
Planoglobulina brazoensis	/fp	24	170	
Planoglobulina carseyae	/fp	24	170	*ID as cf
Pseudoguembelina palpebra	/fp	8	188	
Pseudotextularia deformis	/fp	24	170	
Pseudotextularia elegans	/fp	4	8	
Rugoglobigerina rotundata	/fp	108	188	*ID as cf
Rugoglobigerina rugosa	/fp	8	188	
Rugoglobigerina scotti	/fp	24	188	
*Text-fig. 6				
Allomorphina trochoides	/fb	4	4	
Bolivinoidea draco	/fb	73	108	
Epistomina caracolla	/fb	188	188	*ID as cf
Gavelinella eriksdalensis	/fb	4	4	
Gavelinella nacatochensis	/fb	4	60	*ID as cf
Gavelinella stephensoni	/fb	8	73	
Gavelinella velascoensis	/fb	4	24	
Globorotalites conicus	/fb	8	73	*ID as cf
Gyroidinoides beisseli	/fb	60	73	*ID as cf
Gyroidinoides depressus	/fb	4	188	
Gyroidinoides globosus	/fb	4	108	
Osangularia cordieriana	/fb	73	188	
Praebulimina kickapooensis	/fb	4	188	
Praebulimina reussi	/fb	4	188	
Pseudouvigerina plummerae	/fb	73	73	

Pullenia cretacea	/fb	4	73	
Siphogenerinoides bramlettei	/fb	108	108	
Siphogenerinoides cretacea	/fb	60	60	
		*Text-fig. 7		
Dentalina basiplanata	/fb	4	4	*ID as cf
Dentalina gracilis	/fb	4	170	
Fissurina orbignyana	/fb	4	4	
Lenticulina muensteri	/fb	4	188	
Nodosaria paupercula	/fb	108	188	*ID as cf
Saracenaria triangularis	/fb	188	188	
		*Text-fig. 8		
Dorothia bulletta	/fb	4	137	
Gaudryina bentonensis	/fb	4	188	
Gaudryina laevigata	/fb	8	188	
Gaudryina rudita	/fb	24	60	
Haplophragmoides excavatus	/fb	155	170	*ID as cf
Haplophragmoides flageri	/fb	24	60	*ID as cf
Pseudobolivina munda	/fb	73	108	*ID as cf
Reophax constrictus	/fb	108	108	
Rzehakina epigona	/fb	24	73	
Trochammina texana	/fb	73	73	*ID as cf
*END				

MIDK.112 - Coppa della Nuvola, Southern Italy

Coppa della Nuvola, Southern Italy. Luciani et al., 2004, Eclogae geol. Helv. 97:77-92.

Outcrop on Gargano Promontory near Peschi. Marne Fucoidi 0-78 m, Scaglia Fm. 78-106 m with white mudstone & reddish chert.

Data:

*TAXA	Morph	Base	Top meters	
		*Data from Fig. 6		
Carbon peak Amadeus Event	/gc	72	73	
Carbon peak OAE 1c	/gc	72	73	
Carbon peak Urbino Event	/gc	21	23	
Carbon peak OAE 1b	/gc	21	23	
		*Data from Fig. 3		
Biti breggiensis	/fp	29.2	87	
Glob'oides caseyi	/fp	26	*	
Hedb gorbachikae	/fp	3	80	
Hedb similis	/fp	*	8	
Hedb simplex	/fp	12	*	
Hedb trocoidea	/fp	*	10	
Heterohelix moremani	/fp	87.5	*	
Planomalina buxtorfi	/fp	85	89	
Planomalina praebuxtorfi	/fp	82.5	*	
Praeglobotruncana delrioensis	/fp	26.5	*	
Praeglobotruncana stephani	/fp	68.5	*	
Rota appenninica	/fp	85.7	*	
Rota cushmani	/fp	105.5	*	
Rota gandolfi	/fp	90	*	
Rota globotruncanoides	/fp	89.5	*	
Rota greenhornensis	/fp	102	*	
Rota montsalvensis	/fp	99	*	
Rota reicheli	/fp	104.6	*	
Tici bejaouaensis	/fp	*	15	
Tici praeticinensis	/fp	25.5	88	
Tici primula	/fp	11	89	
Tici subticinensis	/fp	71	84	*ID as Rotalipora
Tici ticinensis	/fp	76	88	*ID as Rotalipora
Assipetra infracretacea	/nn	*	0	
Axopodorhabdus albianus	/nn	25	*	

Biscutum magnum	/nn	28.5	*
Corollithion kennedyi	/nn	101.7	*
Cribrosphaerella ehrenbergii	/nn	7	*
Eiffellithus turriseiffelii	/nn	75.5	*
Prediscosphaera columnata	/nn	6	*
Rhagodiscus achlyostaurion	/nn	32	*
Rucinolithus irregularis	/nn	*	105.2
Rucinolithus terebrodentarius	/nn	*	93.25
Watznaueria britannica	/nn	*	103

*END

MIDK.113 - Galilee Composite, Israel

Galilee-Golan Heights, Israel. Bachman & Hirsch, 2006, Cret. Res. 27:487-512, Figs. 6, 7.
 Data measured in composite section at Har Ramim & Ein Netofa. Top of section 430 m in Middle Albian with orbitolinids not identified; Barremian/Aptian boundary @ Aptian/Albian boundary @ 270 m.
 Second-order sequences: base SB ApE15 @ 145m; base SB ApE18 @ 245m.

Data:

*Taxa	Morph	Base	Top meters
Hensonella cyclindrica	/al	55	75 *from Fig.7
Choffatella decipiens	/fb	5	100
Orbitolina lenticularis	/fb	0	90
Orbitolina lotzei	/fb	90	100
Orbitolina texana	/fb	225	240
Praechrysalidina infracretacea	/fb	50	95 *from Fig. 7

*END

MIDK.114 - ODP 1183A, Ontong Java Plateau, Pacific

ODP 1183A, Ontong Java Plateau, Pacific, Leg 192.
 Sikora & Bergen, 2004, in Geol. Soc. London Spec. Publ. 229, 83-132; Fig. 3, Tables 2, 3.
 Unconformities at 1130.57 m top basalt dated at 118.6 Ma; 1128.7; 1121.0; 1109 mbsf; core recovery gap about 1101-1107 mbsf.

Data:

*TAXA	Morph	Base	Top meters
Marker bed Niveau Jacob	/mb	*	-1117.4
Marker bed Niveau Paquier	/mb	*	-1111.9
Carbon peak OAE 1a	/gc	*	-1130.2
Assipetra infracretacea	/nn	-1130.80	-1090.48
Axopodorhabdus albianus	/nn	-1107.51	-1090.55
Calcicalathina erbae	/nn	-1127.99	-1110.05
*top at -1108.40 too young, may be reworked			
Cretarhabdus loriei	/nn	-1108.40	-1091.78
Cribroperidinium ehrenbergii	/nn	-1107.51	-1098.63
Cylindralithus nudus	/nn	-1118.77	-1090.48
Eiffellithus monechiae	/nn	-1107.74	-1107.74
Eiffellithus turriseiffelii	/nn	-1107.51	-1090.55
Eprolithus floralis	/nn	-1130.99	-1090.48
Hayesites irregularis	/nn	-1130.99	-1107.51
Helenea chiastia	/nn	-1130.99	-1090.48*ID as Microstarus
Micrantholithus hoschulzii	/nn	-1130.99	-1130.99
Nannoconus globulus	/nn	-1128.64	-1128.64
Prediscosphaera columnata	/nn	-1113.38	-1091.78
Quadrum enebrachium	/nn	-1121.12	-1090.48
Rhagodiscus achlyostaurion	/nn	-1129.18	-1107.74
Rhagodiscus angustus	/nn	-1129.18	-1098.18
Rhagodiscus gallagheri	/nn	-1130.99	-1110.05
Rhagodiscus hamptonii	/nn	-1129.18	-1111.57
*Top at -1108.29 too young, may be reworked			

Tranolithus orionatus	/nn	-1107.74	-1090.75
Glob'oides algerianus	/fp	-1128.58	-1128.58
Glob'oides aptiense	/fp	-1121.40	-1121.29
Glob'oides barri	/fp	-1128.84	-1121.12
Glob'oides ferreolensis	/fp	-1130.33	-1120.58
Gubkinella graysonensis	/fp	-1130.13	-1122.30
Hedb delrioensis	/fp	-1120.58	-1091.73
Hedbergella delrioensis	/fp	-1120.58	-1091.73
Hedb gorbachikae	/fp	-1119.48	-1119.48*ID as Blefuscuiana
Hedb hispaniae	/fp	-1130.33	-1121.29*ID as Blefuscuiana
Hedb infracretacea	/fp	-1122.30	-1110.05*ID as Blefuscuiana
Hedb planispira	/fp	-1108.89	-1091.73
Hedb sigali	/fp	-1136.56	-1129.76*ID as Praehedbergella
Hedb trocoidea	/fp	-1120.58	-1113.38
Leupoldina cabri	/fp	-1130.13	-1129.76
*LO at 118.2 Ma Erba et al. 1999			
*Schakoina biozonae	/fp	-1121.40	-1121.40
Praehedbergella kuznetsovae	/fp	-1130.33	-1130.33
Rota appenninica	/fp	-1091.73	-1091.73
Tici bejaouaensis	/fp	-1120.14	-1113.38
*END			

MIDK.115 - Vaucluse, SE France

Vaucluse, SE France. Moullade et al., 2008, Carnet de Geologie/Notebooks on Geology, Art. 2008/01. Composite of 4 well exposed outcrop sections of marl and limestone in the area of the **historical stratotype** of the Bedoulian Substage; these section span the Bedoulian/Gargasian boundary with continuous deposition. Base Lower Gargasian at FO *P. luterbacheri* @ 22.06 m = 122.01 Ma.

Data:

*TAXA	Morph	Base	Top meters	
Ammobaculites subcretaceus	/fb	0	104.55	
*ID as sp. gr. parvispira-subcretaceous				
Ammodiscus cretaceus	/fb	1	104.55	
Astacolus crepidularis tricarinella	/fb	5	23.55	*zone species
Dorothia filiformis	/fb	72.05	98.55	
Falsogaudryinella tealbyensis	/fb	0	104.55	
Gavelinella flandrini	/fb	0	104.55	*ID as sp. gp.
Globorotalites bartensteini	/fb	22.55	24.06	*zone species
Glomospirella gaultina	/fb	4	88.05	
Lenticulina nodosa	/fb	0	22.56	
*ID as cf.; zone species				
Oolina apiculata	/fb	72.55	104.55	
Patellina subcretacea	/fb	31.55	34.50	
Ramulina aculeata	/fb	13.55	94.05	
*ID as sp. gp. aculeata				
Reophax minuta	/fb	1	104.55	
*ID as sp. gp. minuta-guttifer				
Tritaxia pyramidata	/fb	0	104.55	
Verneuilinoides neocomiensis	/fb	2	90.05	
*These next 2 species placed in Praehedbergella				
Hedb infracretacea	/fp	0	104.55	
Hedb sigali	/fp	0	104.55	
Glob'oides aptiense	/fp	6	98.55	
*ID as sp.gp. aptiensis-solida				
Glob'oides barri	/fp	104.55	104.55	
Glob'oides blowi	/fp	0	104.55	
Glob'oides duboisi	/fp	0	104.55	
Glob'oides ferreolensis	/fp	72.55	104.55	
Glob'oides saundersi	/fp	14.55	94.05*ID as Pseudoschackoina	
Leupoldina cabri	/fp	0	76.05	
Praehedbergella luterbacheri	/fp	22.06	104.55	

Schackoina pustulans	/fp	1	78.05
Protocythere bedouleensis	/os	0	104.55

*END

MIDK.116 - Pioneer Hermes Gas Unit No. 1, Texas
Pioneer Hermes Gas Unit, Lavaca County, Texas. Thin section analysis by R. Scott.
Top core 14,000; Top Stuart City Fm. 14,089.5 ft; base core 14,800.

Data:

*TAXA	Morph	Base	Top feet	
Acicularia americana		/al	-14666.5	-14116.3
Lithocodium aggregatum		/al	-14684.9	-14091.2
Pycnoporidium lobatum		/al	-14686.5	-14091.2
Bonetocardiella conoidea		/ca	-14086.2	-14086.2
Pith ovalis		/ca	-14087.5	-14086.2
Barkerina barkerensis		/fb	-14557.5	-14102.5
Coskinolinoides texanus		/fb	-14676.5	-14095.4
Cuneolina walteri		/fb	-14574.2	-14119.6
Dictyoconus walnutensis		/fb	-14687.55	-14094.4
Nautiloculina cretacea		/fb	-14466.35	-14115.5
Chondrodonta munsoni		/bi	-14687.55	-14091.2

*END

MIDK.117 - Pioneer No. 1 Schroeder
Pioneer No. 1 Schroeder, Bee County, Texas.
Lowell Waite et al. 2007, GCAGC Proceedings; paleo thin section data by R.W. Scott.
Top core 13,798 ft; Top Stuart City Fm. 13,798 ft; base core 14,749.

Data:

*TAXA	Morph	Base	Top feet	
Acicularia americana		/al	-14662.5	-13810.0
Cayeuxia piaie		/al	-14729.55	-13815.5
Globochaeta alpina		/al	-14738.55	-14591.5
Lithocodium aggregatum		/al	-14717.4	-13816.25
Micritosphaera ovalis		/al	-14610.4	-14060.5
Neomeris cretacea		/al	-14658.5	-14025.7
Pycnoporidium lobatum		/al	-14687.5	-13812.4
Barkerina barkerensis		/fb	-14515.5	-14005.55
Coskinolinoides texanus		/fb	-14281.3	-14100.0
Cuneolina walteri		/fb	-14670.5	-13841.5
Dictyoconus walnutensis		/fb	-14715.6	-13812.4
Orbitolina subconcava		/fb	-14549.4	-14249.5
Pseudocyclamina hedbergi		/fb	-14445.5	-14009.5
Pseudonummoloculina heimi		/fb	-14604.5	-13807.0
Chondrodonta munsoni		/bi	-14598.5	-13799.75
Caprinuloidea multitubifera		/bi	-14276.0	-14162.5
Caprinuloidea perfecta		/bi	-14681.2	-13848.5
*Coalcomana ramosa		/bi	-14620.0	-14620.0
Petalodontia calamitiformis		/bi	-14294.2	-14060.5
Texicaprina vivari		/bi	-14163	-14012

*END

MIDK.118 - ODP 1186, Ontong Java Plateau, Pacific
ODP 1186, Ontong Java Plateau, Pacific, Leg 192. Sikora & Bergen, 2004, in Geol. Soc. London Spec. Publ. 229, 83-132, Fig. 4, Tables 5, 6. Unconformities at 966.85 mbsf top basalt; 957.0; 950.6; 938.5; 931.0; core recovery gap at 966.42-959.88 mbsf; 947.2 to 9938.9.

Data:

*TAXA	Morph	Base	Top meters	
Marker bed Niveau Paquier	/mb	-950.81	-949.84	
Assipetra infracretacea	/nn	-966.83	-931.33	
Axopodorhabdus albianus	/nn	-934.36	-931.42	
Calcicalathina erbae	/nn	-966.73	-947.72	
Cretarhabdus loriei	/nn	-948.88	-948.88	
Cribroperidinium ehrenbergii	/nn	-938.88	-934.36	
Cylindralithus nudus	/nn	-950.81	-931.33	
Eiffellithus turriseiffelii	/nn	-934.36	-931.33	
Eprolithus floralis	/nn	-966.83	-931.33	
Hayesites irregularis	/nn	-966.83	-938.88	
Nannoconus globulus	/nn	-950.81	-950.81	
Prediscosphaera columnata	/nn	-950.81	-931.33	
Quadrum enebrachium	/nn	-957.54	-931.33	
Rhagodiscus achlyostaurion	/nn	-966.73	-938.88	
Rhagodiscus angustus	/nn	-938.88	-938.88	
Rhagodiscus gallagheri	/nn	-966.83	-950.81	
Rhagodiscus hamptonii	/nn	-966.83	-950.42	
Tranolithus orionatus	/nn	-938.88	-931.54	
Glob'oides algerianus	/fp	-959.88	-959.88	
Glob'oides aptiense	/fp	-966.68	-966.51	
Glob'oides barri	/fp	-959.88	-957.48	
Glob'oides blowi	/fp	-966.83	-966.51	
Glob'oides ferreolensis	/fp	-966.51	-957.48	
Glob'oides maridalensis	/fp	-966.51	-966.51	
Hedb delrioensis	/fp	-959.88	-938.26	
Hedbergella delrioensis	/fp	-959.88	-938.26	
Hedb gorbachikae	/fp	-959.88	-959.88	*ID as Blefuscuiana
Hedb hispaniae	/fp	-966.68	-957.48	*ID as Blefuscuiana
Hedb infracretacea	/fp	-966.83	-950.81	*ID as Blefuscuiana
Hedb planispira	/fp	-949.14	-938.26	
Hedb sigali	/fp	-981.55	-979.96	*ID as Praehedbergella
Hedb trocoidea	/fp	-957.48	-950.81	
Leupoldina cabri	/fp	-966.83	-966.81	
Rota appenninica	/fp	-938.26	-938.26	
Schackoina cenomana	/fp	-966.83	-966.51	
Tici bejaouaensis	/fp	-956.90	-950.81	
*END				

MIDK.119 - DSDP 263, Indian Ocean NW Australia

DSDP 263, Indian Ocean West of Australia; 23° 19.43'S, 110° 58.81'E.

Shipboard Scientific Party, 1974, Site 263, Initial Rept. Deep Sea Drilling Project 27:279-335.

Water depth 5048 m, cored 746 mbsf; 60% core recovery.

Lithology: unit 1 0-100m: Cenozoic green-gy ooze; unit 2 100-195m: dk gn-gy to black clay; unit 3 195-470m: gn-black claystone w/ carb nodules; unit 4 470-746m: olive-black silty claystone bioturbated; base of core overlies magnetochron M10 (Holbourne & Kaminski, 1995, fig. 2).

Nannofossils by Proto Decima, 1974, Table 8; Benthic forams by Scheibnerova, 1974, Table 6;

Benthic forams by Holbrun & Kaminski, 1995, Mar. Micro. 26:425-460, Tables 1, 2;

Dinos by Oosting et al., 2006, Cret. Res. 27:792-813, Table 3.

Data:

*TAXA	Morph	Base	Top Meters bsf
Adnatosphaeridium tutlosa	/dn	-357.26	-357.26
Apteodinium granulatum	/dn	-414.21	-129.67
Apteodinium maculatum	/dn	-281.67	-262.80
Batioladinium jaegeri	/dn	-205.69	-177.33
Batioladinium micropodum	/dn	-414.21	-148.70
Canningia reticulata	/dn	-300.53	-300.53
Carpodinium granulatum	/dn	-357.26	-129.67

Cassiculosphaeridia magna	/dn	-338.70	-300.53	
Cerbia tabulata	/dn	-146.70	-129.67	
Coronifera oceanica	/dn	-357.26	-129.67	
Cribroperidinium tenuiceras	/dn	-281.67	-148.70	
Dingodinium cerviculum	/dn	-414.21	-129.67	
Druggidium deflandrei	/dn	-262.80	-177.33	
Druggidium rhabdoreticulatum	/dn	-262.80	-177.33	
Endoscrinium bessebae	/dn	-281.67	-129.67	
Endoscrinium campanula	/dn	-414.21	-148.70	*ID in Scrinodinium?
Florentinia resex	/dn	-177.33	-177.33	
Heterosphaeridium heteracanthum	/dn	-243.69	-148.70	
Hystrichodinium pulchrum	/dn	-414.21	-129.67	
Kiokansium unituberculatum	/dn	-414.21	-129.67	
Kleithriasphaeridium eoinodes	/dn	-414.21	-129.67	
Kleithriasphaeridium fasciatum	/dn	-600	-600	
*Oosting et al. report on p. 800 in core 263-23				
Muderongia staurota	/dn	-414.21	-319.70	
Odontochitina operculata	/dn	-262.80	-129.67	
Pareodinia ceratophora	/dn	-319.70	-148.70	
Pervosphaeridium truncatum	/dn	-414.21	-129.67	
Phoberocysta neocomica	/dn	-460	-460	
*Oosting et al. report on p. 801 in core 263-19, not in Table 2				
Prolixosphaeridium parvispinum	/dn	-386.74	-129.67	
Protoellipsodinium spinosum	/dn	-414.21	-129.67	
Pseudoceratium securigerum	/dn	-300.53	-300.53	
Stiphrosphaeridium anthophorum	/dn	-386.74	-148.70	
Tehamadinium sousense	/dn	-300.53	-300.53	
Trichodinium castanea	/dn	-357.26	-148.70	
Wallodinium lunum	/dn	-281.67	-281.67	
Axopodorhabdus dietzmannii	/nn	-600.6	-113.2	*ID as Podorhabdus
Biscutum constans	/nn	-746	-114.9	
Braarudosphaera africana	/nn	-111.9	-111.9	
Broinsonia signata	/nn	-729.4	-418.6	
Corollithion achylosum	/nn	-717.5	-705.8	
Cretarhabdus conicus	/nn	-423.0	-111.9	
Cretarhabdus crenulatus	/nn	-302.0	-114.9	
Cretarhabdus surirellus	/nn	-717.5	-100.0	
Cruciplacolithus tenuis	/nn	-114.6	-114.6	*ID cf.
Cyclagelosphaera margerelii	/nn	-729.4	-100.0	
Discorhabdus rotatorius	/nn	-702.7	-702.7	
Eiffellithus turriseiffelii	/nn	-717.5	-565.5	
Ellipsolithus macellus	/nn	-114.6	-114.6	*ID as cf.
Gephyrorhabdus coronadventis	/nn	-114.9	-109.7	*ID as Cretarhabdus
Lithraphidites carniolensis	/nn	-114.9	-109.7	
Manivitella pemmatoidea	/nn	-565.5	-100.0	
Markalius circumradiatus	/nn	-717.5	-114.6	
Markalius inversus	/nn	-114.6	-114.6	
Micula infracretacea	/nn	-129.5	-113.2	
Micrantholithus hoschulzii	/nn	-702.7	-702.7	
Micrantholithus obtusus	/nn	-702.7	-702.7	
Nannoconus bucheri	/nn	-114.9	-114.9	
Parhabdolithus angustus	/nn	-705.8	-116.5	
Parhabdolithus asper	/nn	-460.0	-100.0	
Parhabdolithus embergeri	/nn	-705.8	-100.0	
Parhabdolithus splendens	/nn	-423.0	-114.6	
Podorhabdus decorus	/nn	-114.9	-109.7	
Prediscosphaera cretacea	/nn	-113.2	-113.2	
Reinhardtites fenestratus	/nn	-717.5	-129.5	
Stephanolithion laffittei	/nn	-111.9	-111.9	
Tegumentum stradneri	/nn	-639.7	-114.9	
Tranolithus exiguus	/nn	-600.6	-460.0	
Vagalapilla matalosa	/nn	-729.4	-302.0	
Vagalapilla stradneri	/nn	-746	-100.0	

Watznaueria barnesae	/nn	-746	-100.0	
Watznaueria biporta	/nn	-729.4	-116.5	
Watznaueria britannica	/nn	-460.0	-114.9	
Watznaueria communis	/nn	-746	-100.0	
Zygodiscus diplogrammus	/nn	-717.5	-100.0	
Zygodiscus elegans	/nn	-717.5	-114.6	
*Holbourn & Kaminski, Table 1				
Aaptotoichus challengerii	/fb	-671.9	-355.4	
Ammobaculites crespinae	/fb	-743.9	-599.2	
Ammodiscus cretaceus	/fb	-738.8	-114.6	
Ammodiscus infimus	/fb	-743.2	-244.8	
Ammodiscus tenuissimus	/fb	-731.0	-129.8	
Bathysiphon brosgiei	/fb	-738.8	-177.6	
Bimonilina variana	/fb	-560.2	-179.9	*ID as cf.
Bulbobaculites humei	/fb	-743.9	-558.4	
Bulbobaculites inconstans	/fb	-568.4	-341.2	*ID as cf.
Caudamina crassa	/fb	-675.5	-177.6	
Cribrostomoides nonioninoides	/fb	-743.2	-558.4	
Gaudryina cuvierensis	/fb	-731.0	-420.5	
Gaudryinopsis pseudobettenstaedti	/fb	-700.6	-596.9	
Glomospira charoides	/fb	-671.9	-114.6	
Glomospira gordialis	/fb	-675.5	-117.5	
Haplophragmoides concavus	/fb	-738.8	-263.9	
Haplophragmoides hagni	/fb	-418.9	-177.7	
Hippocrepina gracilis	/fb	-568.4	-179.9	
Kalamopsis grzybowskii	/fb	-560.2	-116.1	
Textulariopsis elegans	/fb	-743.2	-386.2	
Trochamina depressa	/fb	-705.8	-633.8	
Verneuilina howchini	/fb	-355.4	-152.7	
Verneuilinoides crespinae	/fb	-675.5	-177.6	*ID as aff.
Verneuilinoides neocomiensis	/fb	-743.2	-265.6	
*Holbourn & Kaminski, Table 2				
Citharina harpa	/fb	-420.5	-420.5	
Dentalina communis	/fb	-420.5	-420.5	
Dentalina debilis	/fb	-114.6	-114.6	
Gyroidina infracretacea	/fb	-129.8	-117.0	
Lenticulina heiermanni	/fb	-420.5	-420.5	
Vaginulina recta	/fb	-420.5	-420.5	
*END				

MIDK.120 - Angles section, Vocontian Basin, France

Angles section, Vocontian Basin, France. Oosting et al., 2006, Cret. Res. 27:792-813, Fig. 3.
Reference section for Barremian/Aptian boundary. Alternating limestone/marl continuous deposition.

Data:

*Taxa	Morph	Gp	Base	Top	m
*Dinoflagellates by Oosting et al., 2006, Cret. Research 27:792-813, Table 2					
Batioladinium micropodum	/dn		79.0	83.9	
Callaiosphaeridium asymmetricum	/dn		70.3	83.9	
Cassiculosphaeridia magna	/dn		70.3	74.0	
Cassiculosphaeridia reticulata	/dn		70.3	83.9	
Cerbia tabulata	/dn		70.3	83.9	
Cometodinium comatum	/dn		70.3	83.9	
Cometodinium habibii	/dn		70.3	83.9	
Coronifera albertii	/dn		72.9	72.9	
Coronifera oceanica	/dn		70.3	83.9	
Cribroperidinium tenuiceras	/dn		81.5	83.9	
Ctenidodinium elegantulum	/dn		70.3	83.9	
Cyclonephelium intonusum	/dn		74.0	83.9	
Cymososphaeridium validum	/dn		73.5	81.5	
Dingodinium cerviculum	/dn		71.0	83.9	

Dingodinium europaeum	/dn	71.0	71.0
Discorsia nanna	/dn	71.0	72.9
Dissiliodinium globulum	/dn	70.3	83.9
Druggidium apicopaucicum	/dn	70.3	75.5
Druggidium deflandrei	/dn	71.0	83.9
Elytrocysta circulata	/dn	74.0	83.9
Exochosphaeridium phragmites	/dn	70.3	83.9
Florentinia cooksoniae	/dn	72.0	79.0
Florentinia interrupta	/dn	72.9	83.9
Florentinia mantellii	/dn	71.0	82.0
Gardodinium trabeculosum	/dn	71.0	83.9
Heslertonia heslertonensis	/dn	70.3	83.9
Heterosphaeridium heteracanthum	/dn	70.3	83.9
Hystrichodinium pulchrum	/dn	70.3	83.9
Hystrichosphaeridium recurvatum	/dn	72.0	83.9
Hystiocysta outananensis	/dn	70.3	83.9
Kleithriasphaeridium eoinodes	/dn	70.3	83.9
Kleithriasphaeridium fasciatum	/dn	*	47.5 *Based on Fig. 5
Meiourogonyaulax stoveri	/dn	70.3	83.9
Muderongia simplex	/dn	70.3	74.0
Muderongia staurota	/dn	70.3	70.3
Occisucysta tentorium	/dn	75.5	83.9
Odontochitina operculata	/dn	44.5	83.9
Oligosphaeridium complex	/dn	70.3	83.9
Ovoidinium diversum	/dn	72.0	83.9
Palaeoperidinium cretaceum	/dn	70.3	83.9
Pareodinia ceratophora	/dn	70.3	79.6
Phoberocysta neocomica	/dn	70.3	83.9
Phoberocysta tabulata	/dn	72.9	83.9
Prolixosphaeridium parvispinum	/dn	46.0	83.1
Protoellipsodinium touile	/dn	72.9	72.9
Pseudoceratium pelliferum	/dn	70.3	75.5
Pseudoceratium retusum	/dn	72.9	83.9
Pseudoceratium retusum var. securigerum	/dn	79.0	83.9
Rhynchodiniopsis fimbriata	/dn	70.3	83.9
Scriniodinium? campanula	/dn	71.0	83.9
Tehamadinium coummia	/dn	81.5	81.5
Tehamadinium sousense	/dn	72.9	83.9
Trichodinium castanea	/dn	70.3	83.9
Wallodinium krutzschii	/dn	70.3	82.0
Wrevittia cassidata	/dn	71.0	83.9
Wrevittia helicoidea	/dn	70.3	83.9
*Ammonites based on Oosting et al., p. 795, Fig. 3 from Busnardo 1965			
Colchidites sp.	/am	69	74
Deshayesites tuarkyricus	/am	80	84
Deshayesites weissi	/am	85	*
Martelites sarasini	/am	69	74

*END

MIDK.121 - LAC Section, Alpes-de-Haute Provence

LAC Section, Saint-Andre-les-Alpes, Alpes-de-Haute Provence, France. Bert, Delanoy & Bersac, 2008, Carnets de Geologie/Notebooks on Geology-Article 2008/03 (CG2008_A03), p. 1-14.

Revised zones of Upper Barremian, SE France.

Data:

*TAXA	Morph	Base	Top meters
Acantholytoceras tenuicostatum	/am	7.3	15.0 *ID as aff.
Ancylezeiceras breistrofferi	/am	9.0	9.5 *Base Breistrofferi Subzone
Auduliceras audali	/am	17.7	18.2
Barrancycloceras barremense	/am	3.5	4.2 *Base Barremense Zone
Camereiceras davoui	/am	10.5	10.7

Camereiceras limentinus	/am	10.75	11.9	*Base Limentinus Zone/Subzone
Camereiceras marchandi	/am	9.8	10.2	*Base Marchandi Subzone
Gassendiceras enayi	/am	18.3	18.45	
Gassendiceras quelquejeui	/am	9.0	9.75	
Gerhardtia galeatoides	/am	9.0	10.0	
Heinzia provincialis	/am	12.9	15.7	
*in Gerhardtia; base Provincialis Zone/Subzone				
Gerhardtia sartousiana	/am	12.0	12.8	
Heinzia sartousi	/am	12.0	12.8	*these may be synonyms:
Hemihoplites casanovi	/am	15.8	16.9	
*=H. intermdius; base Casanovi Subzone				
Hemihoplites cornagoae	/am	13.5	13.9	
Hemihoplites feraudianus	/am	17.6	18.2	*Base Feraudianus Zone/Subzone
Hersia sayni	/am	3.5	4.2	*May be a synonym of:
Neocosmoceras sayni	/am	3.5	4.2	
Heteroceras baylei	/am	20.8	22.0	
Heteroceras coulleti	/am	20.8	22.0	
Holcodiscus uhligi	/am	9.8	10.2	*ID as cf.
Jaberites collignoni	/am	14.2	21.6	*ID as aff.
Kotetishvilia brevicostata	/am	6.5	7.3	
Kostishulia fischeri	/am	3.5	4.2	
Pachyhemihoplites gerthi	/am	13.1	13.9	
Peirescites gygii	/am	10.7	11.2	
Pseudoshasticrioceras autrani	/am	20.8	22.0	*Base Autrani Subzone
Pseudoshasticrioceras magnini	/am	18.5	19.2	*Base Magnini Subzone
Pseudoshasticrioceras quereilhaci/am		17.7	18.2	
Rugacrioceras monpujajae	/am	9.8	12.8	*ID as aff.
Spinocrioceras polyspinosum	/am	17.7	18.2	
Toxancyloceras vandenheckei	/am	2.4	3.2	*ID as aff.; near base Sayni Zone
*END				

MIDK.122 - MEO Section, Alpes-de-Haute Provence

MEO Section, Saint-Andre-les-Alpes, Alpes-de-Haute Provence, France. Bert, Delanoy & Bersac, 2008, Carnets de Geologie/Notebooks on Geology-Article 2008/03 (CG2008_A03), p. 1-14.
Revised zones of Upper Barremian, SE France.

Data:

*TAXA	Morph	Base	Top meters	
Acantholytoceras tenuicostatum	/am	5.2	6.6	*ID as aff.
Anglesites puzosianum	/am	11.5	12.0	
*Base Sarasini Zone/Puzosianum Subzone				
Colchidites giraudi	/am	6.7	6.9	*In subgenus Imerites
Deshayesites ogranlensis	/am	19.5	19.9	*Base Aptian
Deshayesites weissiformis	/am	20.0	21.0	
Gassendiceras enayi	/am	3.6	3.6	
Gassendiceras quelquejeui	/am	2.8	3.5	
Heinzia provincialis	/am	0.0	1.0	*in Gerhardtia
Hemihoplites casanovi	/am	1.2	2.3	
*=H. intermdius; base Casanovi Subzone				
Hemihoplites feraudianus	/am	2.8	3.5	*Base Feraudianus Zone
Heteroceras baylei	/am	5.2	17.2	
Heteroceras coulleti	/am	5.2	7.1	
Heteroceras emerici	/am	7.2	8.2	
Jaberites collignoni	/am	7.8	8.2	*ID as aff.
Martelites sarasini	/am	11.5	12.0	*Base Sarasini Zone
Pseudoshasticrioceras autrani	/am	5.2	6.6	*Base Autrani Subzone
Pseudoshasticrioceras magnini	/am	3.6	4.4	*Base Magnini Subzone
Pseudoshasticrioceras quereilhaci/am		2.8	3.5	
*END				

Sections MIDK.123 & 124 Not Included in Database

MIDK.125 - Hannover-Lahe Core

Hannover-Lahe core hole, Hannover Germany. Lehmann et al. 2007, Cret. Res. 28:719-742.
Ammonite & inoceramid data. TD -99 @ m; concretionary condensed interval between 51 & 40.35 m,
place disconformity at 45.5 m.

Data:

*TAXA	Morph	Base	Top meters	
				*Data from Fig. 5
Actinocerasmus sulcatus	/bi	-54	-37	
Inoc anglicus	/bi	-46	-27.6	
Inoc concentricus	/bi	-92	-64	
				*Data from Fig. 4 and text
Anahoplites daviesi	/am	-76.25	-67.59	
				*ID as Anahoplites sp. may be this species?
Callihoplites auritus	/am	-38.88	-38.88	
Euhoplites lautus	/am	-95.34	-71.55	
Hysterocheras orbigny	/am	-39.53	-38.60	
Hysterocheras varicosum	/am	-42.37	-42.37	
				*Taxa new to MIDK dictionary
Callihoplites patella	/am	-43.78	-37.11	
Euhoplites armatus	/am	-91.74	-56.10	
Euhoplites nitidus	/am	-96.50	-72.54	
Euhoplites ochetonotus	/am	-42.40	-42.40	*ID as cf.
Euhoplites opalinus	/am	-51.00	-51.00	*ID as cf.
Euhoplites truncatus	/am	-76.60	-66.92	
Hysterocheras binum	/am	-38.88	-38.88	
Hysterocheras subbinum	/am	-43.92	-43.92	*ID as cf.
Mortonicerias bipunctatum	/am	-39.38	-39.38	

*END

MIDK.126 - Kirchrode II Core, Saxony

Kirchrode II core hole, Hannover Germany. Owen, 2007, Cret. Res. 28:921-938. Ammonite and inoceramid data; Gault Formation; TD @ 279.35 m; top Schicheldt Ton Mbr. @ 254.5 m; top Minimus Ton Mbr. @ 127.9 m; Kirchrode Mergel Mbr. @ 127.9-0 m.

Data:

*TAXA	Morph	Base	Top meters	
				*Data from Fig. 3
Actinocerasmus sulcatus	/bi	-175.00	-140.37	
Inoc concentricus	/bi	-230.00	-190.00	
Callihoplites auritus	/am	-134.63	-134.63	
Euhoplites loricatus	/am	-209.75	-191.00	
Hoplites dentatus	/am	-225.85	-225.70	
Hoplites spathi	/am	-229.00	-229.00	
Hysterocheras orbigny	/am	-144.00	-140.47	
Leymeriella tardefurcata	/am	-272.40	-270.09	
				*Taxa new to MIDK dictionary
Anahoplites planus	/am	-151.57	-150.75	*ID as cf./group
Euhoplites ochetonotus	/am	-143.00	-143.00	*ID as cf.
Euhoplites opalinus	/am	-175.28	-163.53	*ID as cf.
Hysterocheras subbinum	/am	-143.00	-143.00	*ID as cf.
Leymeriella regularis	/am	-273.46	-267.12	*Base ID as cf.
Pseudosonneratia steinmanni	/am	-244.82	-241.25	*ID as cf.

*END

MIDK.127 – Aptian-Albian Composite Section, France

Aptian-Albian Composite SE France. Herrle & Mutterlose, 2003, Cret. Res. 24:1-22. Data from Fig. 5.

Data:

*TAXA	Morph	Base	Top meters
*Arkhangelskiella stenostauron	/nn	241	*
Braarudosphaera africana	/nn	17.5	*
Corollithion acutum	/nn	22	*
Cribroperidinium ehrenbergii	/nn	223	*
Eprolithus apertior	/nn	14	*
Eprolithus floralis	/nn	4	*
Hayesites albiensis	/nn	245	*
Helicolithus trabeculatus	/nn	238	*
Micrantholithus obtusus	/nn	0	45
Prediscosphaera columnata	/nn	215	*
Prediscosphaera spinosa	/nn	195	*
Radiolithus planus	/nn	7	*
Seribiscutum primitivum	/nn	238	*
Marker bed Nannoconid crisis	/mb	33	*
Marker bed Niveau Jacob	/mb	200	201
Marker bed Niveau Kilian	/mb	241	242
Marker bed Niveau Leenhardt	/mb	315	316
Marker bed Niveau Paquier	/mb	290	291
*Following Ammonite & foram zones derived from chart not actual occurrences			
Chelonicerias martinoides	/am	33	* In Epicheloniceras
Deshayesites deshayesi	/am	0	*
Douvilleicerias mammillatum	/am	315	*
Hypacanthoplites jacobi	/am	185	*
Leymeriella tardefurcata	/am	290	*
Tropaeum bowerbanki	/am	20	*
Glob'oides algerianus	/fp	85	*
Glob'oides ferreolensis	/fp	33	*
Hedb planispira	/fp	235	*
Hedbergella planispira	/fp	235	*
Hedb trocoidea	/fp	120	*
Leupoldina cabri	/fp	0	*
Tici bejaouaensis	/fp	133	*
*END			

MIDK.128 – Campillo de Arenas section

Jaen Province, S. Spain, 3.5 km NE of Campillo de Arenas, 37° 34'43"N, 3° 36'28"W, Betic Cordillera, Subbetic domain, External Zones. Aguado, Company, O'Dogherty, Sandoval & Tavera, 1992, Cret. Res. 12:445-452.

Stratigraphy: lower interval 97 m of alternating marl & marly limestone with some slumps in lower part; upper interval 103 m of dark gray marl with rare limestone interbeds; contact between these intervals is "a stratigraphic break surface with small biogenic perforations and a thin discontinuous ferruginous crust." Base of section no older than lower Barremian Hugii Zone (p. 451). Note that Aptian forams [*blowi*, *pentagonalis*, *maridaelnsis*, *ferrolensis*, *trochoidea*, & *bejaouaensis*] overlap with Albian forams [*roberti*]. Infer unconformity between LO of *chenioureensis* @ 170m & FO of *primula* @ 182m; then upper ranges of Aptian species are reworked and lower range of *roberti* is contaminated; place unconformity @ 171m.

Data:

*TAXA	Morph	Base	Top meters
*Ammonites from lower interval Fig. 1 p. 448			
Barremites difficilis	/am	5	62
Barremites strettostoma	/am	78	92
Heinzia provincialis	/am	62	68
Holcodiscus caillaudi	/am	50	52 *ID as caillaudianus
Holcodiscus perezianus	/am	50	50
Nicklesia pulchella	/am	49	53
Silesites seranonis	/am	80	87

Spitidiscus vandeckii	/am	1	25	*ID as gr. hughii-vandeckii
Subpulchellia compressissima	/am	52	58	
Subpulchellia nicklesi	/am	47	52	
*Feraudi Zone ID by Hemihoplites sp. & Subpulchellia sp. @ 80m				
*Asteri Zone ID by Heteroceras sp. @ 88m				
*Planktic forams Fig. 1, p. 449; unconformity @ 171m				
Glob'oides algerianus	/fp	128	150	
Glob'oides blowi	/fp	62	170	*LO @ 188 may be reworked
Glob'oides ferreolensis	/fp	120	170	*LO @ 188 may be reworked
Glob'oides maridalensis	/fp	112	165	*LO @ 188 may be reworked
Globuligerina hoterivica	/fp	1	1	*ID as Caucasella p. 446
Hedbergella delrioensis	/fp	40	188	
Hedb delrioensis	/fp	40	188	
Hedbergella praetrochoidea	/fp	99	140	
Hedb sigali	/fp	1	173	
Hedb trocoidea	/fp	128	188	
Leupoldina cabri	/fp	102	125	
Planomalina cheniourensis	/fp	142	170	
Tici bejaouaensis	/fp	158	170	*LO @ 188 may be reworked
Tici primula	/fp	182	188	
Tici roberti	/fp	173	188	*FO @158 may be contaminate
*Nannofossils Fig.1 p. 449				
Assipetra infracretacea	/nn	1	128	
Calcicalathina oblongata	/nn	1	72	*LO upper Barremian
Chiastozygus litterarius	/nn	99	188	
Conusphaera rothii	/nn	1	101	*LO lower Aptian
Corollithion achylosum	/nn	102	170	
Diazomatolithus lehmanii	/nn	1	102	
Eprolithus floralis	/nn	102	188	*FO in mid Aptian
Hayesites irregularis	/nn	99	188	*FO at base Aptian
Micrantholithus hoschulzii	/nn	1	188	
Micrantholithus obtusus	/nn	1	180	
Rhagodiscus angustus	/nn	167	188	*FO in Upper Aptian
Vagalapilla matalosa	/nn	100	188	
*Radiolaria not entered				
*END				

MIDK.129 - Wissant Section, Cap Blanc-Nez

Wissant Section at Cap Boulonnais, France. Robaszynski et al., Rev. de Micropaleontologie 22:195-321, fig. 10. Base section in Aptian Verlinchtun Fm.; 11.6 m = base Wissant Fm.; 12.75 m = base G. Fm.; 13.85 m = base St. Po Fm.; 24 m = base Lotting Fm. Major Unconformities at 11.6, 12.8, 13.75, 17.75, & 24 m at phosphate beds. Compare with data in MIDK.12 Cape Boulonnais.

Data:

*Taxa	Morph	Base	Top meters
Anahoplites intermedius	/am	14.8	15.8
Chelonicerias floridum	/am	12.8	12.8
Dimorphoplites niobe	/am	15.8	16.2
Dipoloceras cristatum	/am	17.8	17.8
Douvilleicerias mammillatum	/am	12.9	13.7
Euhoplites lautus	/am	16.2	17.5
Euhoplites loricatus	/am	16.2	17.5
Hoplites dentatus	/am	14.0	14.0
Hypacanthoplites jacobi	/am	11.8	12.5
Hypacanthoplites milletioides	/am	12.5	12.5
Hysterocheras orbignyi	/am	17.8	21.2
Leymeriella regularis	/am	12.9	12.9
Mojsovicsia subdelaruei	/am	16.2	16.2
Mortoniceras inflata	/am	23.5	23.5
Mortoniceras pricei	/am	17.8	21.2
Otohoplites auritifformis	/am	13.8	13.8

Otohoplites raulinianus	/am	13.8	13.8	
Oxytropidoceras roissyanum	/am	14.0	14.0	*ID as cf.
Tici primula	/fp	22.0	23.5	
Aptea polymorpha	/dn	*	11.0	
Carpodinium obliquicostatum	/dn	17.5	23.5	
Cribroperidinium intricatum	/dn	17.8	23.5	
Cribroperidinium sepimentum	/dn	11.8	12.5	
Florentinia radiculata	/dn	12.5	23.5	
Litosphaeridium arundum	/dn	12.8	23.5	*ID as Hystrichosphaeridium?
Protoellipsodinium spinocristatum	/dn	17.5	23.5	
Psaligonyaulax deflandrei	/dn	17.5	23.5	
Pterodinium aliferum	/dn	13.8	18.8	
Surculosphaeridium longifurcatum	/dn	14.5	23.5	
Thalassiphora munda	/dn	23.5	*	

*END

MIDK.130 - Mesa Verde Mancos Shale Section, Colorado

Mesa Verde Mancos Shale Section, Colorado. Leckie, Kirkland & Elder, 1997, New Mexico Geol. Society Guidebook, Figs. 10, 15, 19, 48th Field Conference, 163-216. Sections 10-21 & 28-33, T36N, R14W & sec. 4-6, T35N, R14W. Upper Cenomanian-Santonian interval.

Base @ 0 m is transgressive contact between Dakota Sandstone and Mancos Shale; Base Graneros Mbr. @ 0m; base Bridge Creek Ls. Mbr. @ 24.1 m; base Fairport Mbr. @ 37.9m; base Blue Hill Mbr. @ 66.1m; base Juana Lopez Mbr. @ 141.6m; base Montezuma Valley Mbr. @ 184.2m; unconformable base Smoky Hill Mbr. @ 200.4m; gradational base Cortez Mbr. @ 289.0m; gradational base Point Lookout Fm. (Sandstone) @ 682m; top of section @ 700m.

Data:

*Taxa	Morph	Base	Top	meters
Marker bed HL 1	/MB	16.00	*	
Marker bed HL 2	/MB	20.70	*	
Marker bed HL 3	/MB	23.10	*	
Marker bed HL 4	/MB	24.30	*	
Marker bed HL 5	/MB	25.20	*	
Marker bed JT 1	/MB	25.30	*	
Marker bed JT 10	/MB	27.82	*	*ID tentative; OK
*Marker bed JT 6	/MB	27.55	*	*ID tentative; plots too old
Marker bed JT 9	/MB	27.55	*	*ID tentative; OK
Allocrioceras annulatum	/am	18	22.2	
Baculites codyensis	/am	223	266	
Baculites haresi	/am	588.1	629.1	
Baculites undulatus	/am	171.2	171.2	
Baculites yokoyamai	/am	27.4	194	
Calycoceras canitaurinum	/am	-1	-1	
*Specimen in concretions in upper Twowells Tongue of Dakota at Cortez				
Collignonicerias woollgari	/am	39.5	72	
Desmoscaphites bassleri	/am	335.5	454	
Euomphaloceras irregulare	/am	22.5	22.5	
Euomphaloceras septemseriatum	/am	18	22.2	
Haresiceras montanaense	/am	405	405	
Kamerunoceras puebloensis	/am	27.4	27.4	
Mammites nodosoides	/am	25.3	27.8	
Metoicoceras geslinianum	/am	18	22.2	
Phlycticrioceras trinodosus	/am	220	230	
Prionocyclus hyatti	/am	121.4	121.4	
Prionocyclus macombi	/am	142.2	164	
Prionocyclus novimexicanus	/am	181.5	188	
Prionocyclus wyomingensis	/am	171.2	179	
Protexanites bourgeoisi	/am	235	244	
Reesidites minimus	/am	181.5	181.5	
Scaphites leei	/am	405	511	

Scaphites depressus	/am	223	238	
Scaphites hippocrepis	/am	588.4	629.1	
Scaphites warreni	/am	171.2	179	
Scaphites whitfieldi	/am	181.5	184	
Sciponoceras gracile	/am	18	22.2	
Watinoceras praecursor	/am	24.9	24.9	*ID as cf.
Cordiceramus muelleri	/bi	300	325	
Inoceramus balticus	/bi	310	660	*Subgenus Endocostea
Inoc costellatus	/bi	121.4	121.4	
Inoc cuvieri	/bi	33.4	39.5	
Inoceramus dimidius	/bi	142.2	171.2	
Inoceramus perplexus	/bi	170.0	181.5	
Inoc pictus	/bi	18	22.2	
Inoceramus subquadratus	/bi	223	266	*Subgenus Magadiceramus
Lopha lugubris	/bi	142.2	171.2	
Mytiloides columbianus	/bi	25.4	27.4	
Mytiloides hattini	/bi	24.9	24.9	
Mytiloides hercynicus	/bi	36.0	39	
Mytiloides kossmati	/bi	24.9	24.9	
Mytiloides labiatus	/bi	27.7	35	
Mytiloides latus	/bi	62	66	
Mytiloides mytiloides	/bi	26.4	28.2	
Mytiloides subhercynicus	/bi	27.7	36	
Platyceramus cycloides	/bi	350	350	
Platyceramus platinus	/bi	266.5	340	
Platyceramus stantoni	/bi	205	220	
Pseudoperna bentonensis	/bi	24.9	66	
Pseudoperna congesta	/bi	266.5	289	
Pycnodonte newberryi	/bi	17	25.3	
Volviceramus grandis	/bi	235	266	
Volviceramus involutus	/bi	219.4	225	
Uintacrinus socialis	/cr	481	491	*ID as sp.
* add forams				
*END				

MIDK.131 - Escalante Core, Utah

USGS No. 1 Escalante Core, Escalante, Garfield Co., Utah, 111.50° W, 37.6° N. Dean & Arthur, 1998, SEPM Concepts in Sedimentology & Paleo No. 6, p. 1-10, gamma log on p. 2, Fig. 3. Bralower & Bergen, 1998, SEPM Concepts in Sedimentology & Paleo No. 6, p. 59-77. West et al., 1998, SEPM Concepts in Sedimentology & Paleo No. 6, p. 79-88; Pancost et al., 1998, SEPM Concepts in Sedimentology & Paleo No. 6, p. 173-188; Leithold & Dean, 1998, SEPM Concepts in Sedimentology & Paleo No. 6, p. 189-200; Pagani & Arthur, 1998, SEPM Concepts in Sedimentology & Paleo No. 6, p. 201-225. TD at -275m in Dakota Formation, -255m base Tropic Shale, -73m base Tibbet Canyon Member, Straight Cliffs Formation.

Data:

*TAXA	Morph	Base	Top meters
*Carbon 13 Data from Leithold & Dean 1998, p. 196, Fig. 13			
Carbon peak OAE 2	/gc	-250	-235

*Bentonite marker beds in West et al., 1998, p. 82, Table 1

TT9 Marker bed	/mb	-83.2	*
TT8 Marker bed	/mb	-94.2	*
TT7 Marker bed	/mb	-100.3	*
TT6 Marker bed	/mb	-103.4	*
TT5 Marker bed	/mb	-200.3	*
TT4 Marker bed	/mb	-228.4	*
TT3 Marker bed	/mb	-235.1	*
TT2 Marker bed	/mb	-245.3	*
TT1 Marker bed	/mb	-251.4	*

*Nannos by J. A. Bergen in Bralower & Bergen, 1998, p. 64, Table 1

Ahmuellerella octoradiata	/nn	-249.69	-90.30
Amphizygus infracretacea	/nn	-210.02	-210.02
Bidiscus rotatorius	/nn	-213.07	-133.93
Biscutum constans	/nn	-252.94	-90.30
Braarudosphaera bigelowii	/nn	-216.11	-90.30
Braloweria judithae	/nn	-237.31	-164.57
Broinsonia enormis	/nn	-251.72	-106.53
Broinsonia signata	/nn	-252.94	-88.27
Bukryolithus ambiguus	/nn	-118.56	-118.56
Chiastozygus litterarius	/nn	-252.94	-92.12
Corollithion achylosum	/nn	-252.94	-149.16
Corollithion ellipticum	/nn	-216.11	-152.39
Corollithion exiguum	/nn	-124.81	-124.81
Corollithion signum	/nn	-247.66	-106.53
Cretarhabdus conicus	/nn	-252.94	-88.27
Cretarhabdus loriei	/nn	-252.94	-251.72
Cretarhabdus surirellus	/nn	-252.94	-90.30
Cribrosphaerella ehrenbergii	/nn	-252.94	-90.30
Eiffellithus eximius	/nn	-246.75	-85.84
Eiffellithus turriseiffelii	/nn	-252.94	-90.30
Eprolithus eptapetalus	/nn	-207.18	-95.78
*Synonym of E. moratus			
Eprolithus floralis	/nn	-252.94	-90.30
Eprolithus octopetalus	/nn	-234.47	-170.45
Eprolithus rarus	/nn	-207.18	-106.53
Flabellites oblonga	/nn	-251.31	-124.81
Gartnerago segmentatum	/nn	-252.94	-22.52
Grantarhabdus coronadventis	/nn	-252.43	-100.45
Helenea chiastia	/nn	-252.94	-248.47
Helicolithus anceps	/nn	-252.94	-100.45
Lithraphidites acutum	/nn	-252.74	-252.74
Lithraphidites carniolensis	/nn	-246.75	-144.28
Manivitella pemmatoidea	/nn	-252.94	-140.01
Markalius circumradiatus	/nn	-252.74	-237.31
Microrhabdulus decoratus	/nn	-237.31	-161.52
*Microstaurus chiastius	/nn	-252.94	-248.47
Prediscosphaera cretacea	/nn	-252.94	-88.27
Prediscosphaera spinosa	/nn	-252.94	-103.29
Quadrum gartneri	/nn	-179.61	-112.82
Radiolithus planus	/nn	-251.72	-112.82
Rhagodiscus achlyostaurion	/nn	-252.94	-90.30
Rhagodiscus asper	/nn	-249.69	-248.47
Rhagodiscus angustus	/nn	-252.94	-90.30
Rhagodiscus splendens	/nn	-251.31	-252.24
Rotelapillus laffittei	/nn	-237.31	-170.45
Scapholithus fossilis	/nn	-234.47	-234.47
Sollasites horticus	/nn	-161.52	-161.52
Tegumentum stradneri	/nn	-252.94	-144.28
Tetrapodorhabdus decorus	/nn	-252.94	-179.61
Tranolithus gabalus	/nn	-252.94	-90.30
Vagalapilla stradneri	/nn	-252.74	-90.30
Watznaueria barnesae	/nn	-252.94	-88.27
Watznaueria biporta	/nn	-246.75	-95.78
Watznaueria ovata	/nn	-244.42	-100.45
Zeugrhabdotus embergeri	/nn	-243.40	-146.63
Zygodiscus diplogrammus	/nn	-252.94	-90.30
Zygodiscus elegans	/nn	-252.94	-85.84
Zeugrhabdotus erectus	/nn	-252.94	-90.30

*ID as Zygodiscus

*Megafossils in Pagani & Arthur, 1998, Data Appendix 1, p.216-219,

IDs by Cobban & Kauffman

Inoc cuvieri	/bi	-147.4	-98.8
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Inoc pictus	/bi	-248.0	-244.1
Mytiloides columbianus	/bi	-224.7	-203.8
Mytiloides hattini	/bi	-233.3	-227.3
Mytiloides hercynicus	/bi	-192.1	-171.1
Mytiloides mytiloides	/bi	-198.4	-196.4
Mytiloides opalensis	/bi	-234.4	-216.5
Mytiloides subhercynicus	/bi	-203.3	-165.2
Pseudoperna bentonensis	/bi	-231.9	-206.6
Anisoceras coloradoense	/am	-248.2	-248.2
Baculites yokoyamai	/am	-173.1	-152.7
Collignonicerias woollgari	/am	-188.1	-77.9
Sciponoceras gracile	/am	-249.3	-249.3

*END

Midk.132 Portland Core Colorado

Sec. 20, T19S, R68W, 38° 22.6'N, 105° 01.3'W. Dean & Arthur, 1998, SEPM Concepts in Sedimentology & Paleontology No. 6, 1-10; Brawlower & Bergen, 1998, *ibid*, p. 59-77, Table 3 - nannofossils; Sageman et al., 2006, *Geology*, 34:125-128.

Stratigraphy in Dean & Arthur, fig. 5, p. 3: top of core @ -19.5', base Middle Shale @ -105.8'; base Middle Chalk @ -161.5'; base Lower Shale @ -181.5'; base Lower Shale & Limestone=base Smoky Hill Chalk @ -221.1'; base Fort Hays Ls. @ -258'; base Juana Lopez @ -261'; base Codell Ss. @ -339.2'; base Blue Hill Shale @ -378'; base Fairport Chalky Shale @ -447'; base Bridge Creek Ls. @ -487.5'; base Hartland Sh. @ -529.5'; base Lincoln Sh @ -568' = top "X" Bentonite; Thatcher Ls @ -611.5-613.5'; base Graneros Sh @ -673'; TD @ -700.27' in Dakota Group. Elder's marker bentonites (Sageman et al., 1998, p. 155): D @ -465', C @ -467.9 to -468, B @ -477.1 to -477.3, A @ -483.1 to -483.6.

Data:

*TAXA	Morph	Base	Top Feet
Carbon peak OAE 2	/gc	-488	-468
Marker bed "X" bentonite	/mb	-569	-568
Marker bed Thatcher Mbr.	/mb	-613.5	-611.5
Ahmuellerella octoradiata	/NN	-440	-20
Assipetra infracretacea	/NN	-483	-466.17
Axopodorhabdus albianus	/NN	-550	-488.08
Bidiscus rotatorius	/NN	-559	-110
Biscutum constans	/NN	-559	-20
Braarudosphaera regularis	/NN	-440	-20
Broinsonia enormis	/NN	-550	-25
Broinsonia signata	/NN	-550	-20
Calculites obscurus	/NN	-447	-25
Chiastozygus litterarius	/NN	-550	-55
Corollithion achylosum	/NN	-550	-393
Corollithion ellipticum	/NN	-390	-380
Corollithion exiguum	/NN	-393	-393
Corollithion kennedyi	/NN	-559	-488.04
Corollithion signum	/NN	-423	-25
Cretarhabdus conicus	/NN	-550	-215
Cretarhabdus loriei	/NN	-559	-477.17
Cretarhabdus surirellus	/NN	-559	-20
Cribrosphaerella ehrenbergii	/NN	-550	-20
Cyclagelosphaera margerelii	/NN	-20	-20
Eiffellithus eximius	/NN	-483	-20
Eiffellithus turriseiffelii	/NN	-559	-20
Eprolithus floralis	/NN	-559	-170
Eprolithus rarus	/NN	-140	-100
Eprolithus octopetalus	/NN	-210	-210
Flabellites oblonga	/NN	-461	-461
Gartnerago segmentatum	/NN	-489	-25
Grantarhabdus coronadventis	/NN	-559	-235
Helicolithus anceps	/NN	-559	-435

Helenea chiastia	/NN	-550	-473.17	*ID in Microstaurus
Kamptnerius magnificus	/NN	-258	-155	
Lithastrinus grillii	/NN	-110	-110	
Lithraphidites carniolensis	/NN	-530	-25	
Lucianorhabdus maleformis	/NN	-258	-70	
Manivitella pemmatoidea	/NN	-559	-20	
Markalius circumradiatus	/NN	-550	-461	
Marthasterites furcatus	/NN	-258	-20	
Micula staurophora	/NN	-195	-20	
Prediscosphaera cretacea	/NN	-559	-20	
Prediscosphaera spinosa	/NN	-550	-20	
Quadrum gartneri	/NN	-258	-70	
Radiolithus planus	/NN	-559	-146	
Reinhardtites anthophorus	/NN	-258	-30	
Rhagodiscus achlyostaurion	/NN	-559	-377	
Rhagodiscus angustus	/NN	-559	-50	
Rhagodiscus asper	/NN	-559	-470	
Rhagodiscus splendens	/NN	-559	-225	
Tetrapodorhabdus decorus	/NN	-482.08	-258	
Tranolithus gabalus	/NN	-483	-25	
Tranolithus orionatus	/NN	-559	-20	
Vagalapilla stradneri	/NN	-550	-70	
Watznaueria barnesae	/NN	-559	-20	
Watznaueria ovata	/NN	-484.92	-40	
Zeugrhabdotus embergeri	/NN	-559	-25	
Zygodiscus diplogrammus	/NN	-559	-20	
Zygodiscus elegans	/NN	-550	-25	

*END

MIDK.133 Bunker Hill Section, Kansas

Roadcuts CWL, sec. 18, T13S, R12W, 3 mi north of Bunker Hill village, Russell Co. Kansas.

Composited section of Graneros Fm. at section 2, Text-fig. 2, Hattin, 1968, J. Paleo. v. 42:1084-1090;

with Greenhorn Key section 2, locality 3 in Hattin, 1975, Kansas Geol. Survey Bull. 209, p. 116-119;

Composited with Fairport Chalk Member of Carlile Shale at Stop 6, SW SW sec. 28, T11S, R16W, Ellis Co. Ks; Fig. 17, 212 in Kauffman, ed., Cretaceous facies, faunas, and paleoenvironments....", RMAG 1977, v. 14.

Base of section in Graneros Shale at 0 ft (Hattin 1968), base Greenhorn Fm. @ 20', base Hartland Shale Mbr. @ 41.3', base Jetmore Chalk Mbr. @ 69.9, base Pfeifer Mbr. @ 90.7', base Carlile Sh. @ 111.1, top section in Fairport Chlk Mbr. @ 157'.

Data:

*TAXA	Morph	Base(ft)	Top(ft)
*Hattin 1975, Kans. Geol. Sur. Bull 209, Pl. 1, key section 2, loc. 3.			
Marker bed HL 1	/MB	47.5	*
Marker bed HL 3	/MB	55.8	*
Marker bed HL 4	/MB	65	*
Marker bed JT 10	/MB	83.2	*
Marker bed JT 6	/MB	76.7	*
Marker bed PF 1	/MB	97.7	*
Marker bed PF 2	/MB	104.6	*
*Pratt & Threlkeld, Canadian Soc. Petroleum Geol. Mem. 9:305-312, fig. 4			
Carbon peak OAE 2	/gc	42	68
*Hattin, 1968, J. Paleo, 42:1086, Text-fig. 2 & Hattin, 1977, Fig. 18, p. 214			
Marker bed "X" bentonite	/mb	17.4	18.0
*Callistina lamarensis	/bi	0.0	0.6
Ostrea beloiti	/bi	0.6	21.0
*Foram data: Eicher & Worstell, 1970, Micropaleontology 16:269-324, Text-Fig. 10, Fig. 4.			
Clav moremani	/FP	105	135
Clavihedbergella simplex	/FP	30.5	160

Clav subdigitata	/FP	72	115	
Glob'oides bentonensis	/FP	41.5	47	
Glob'oides caseyi	/FP	42.5	112	
Guembelitra harrisi	/FP	25	25	
Hedb amabilis	/FP	18.5	205	
Hedbergella delrioensis	/FP	16	210	
Hedbergella planispira	/FP	16	205	
Hedb portsdwnensis	/FP	18.5	195	
Heterohelix globulosa	/FP	16	210	
Heterohelix pulchra	/FP	58	150	
Praeglobotruncana stephani	/FP	42.5	110	
Rota cushmani	/FP	35	47	
Rota greenhornensis	/FP	35	50	
Rota multiloculata	/FP	42.5	47	
Schackoina cenomana	/FP	42.5	105	
Schackoina multispinata	/FP	42.5	105	
Whit aprica	/FP	55	145	
Bulimina fabilis	/FB	42.5	72	
Citharina complanata	/FB	50	50	
Citharina kochii	/FB	47	58	
Dentalina communis	/FB	58	58	
Gavelinella plummerae	/FB	47	52	
Globulina lacrima	/FB	47	47	
Lingulogavelinella asterigerinoides	/FB	42.5	72	
Lenticulina gaultina	/FB	42.5	50	
Neobulimina albertensis	/FB	42.5	85	*Use 2nd LO
Ramulina aculeata	/FB	47	47	
Valvulineria loetterlei	/FB	42.5	75	

Megafossil data: Hattin, 1978, Guidebook series 3, AAPG/SEPM Annual Mtg., p. 75, section from "upper cretaceous stratigraphy ... GUIDEBOOK" and Hattin, 1977 Mountain Geologist v. 14, Fourth and Fifth days, Upper Cretaceous stratigraphy, paleontology and paleoecology of Western Kansas, p. 175-218; data p. 214, fig. 18.

Inoc cuvieri	/BI	103	157	
Inoceramus ginterensis	/BI	23	23	
Inoc prefragilis	/BI	21	59	
Inoc rutherfordi	/BI	4	17	
Inoceramus hercynicus	/BI	128	128	
Myti latus	/BI	118	123	
Mytiloides latus	/BI	118	123	
Mytiloides subhercynicus	/BI	110	116	
Mytiloides mytiloides	/BI	82	111	
Mytiloides opalensis	/BI	70	86	
Allocrioceras annulatum	/AM	50	50	
Baculites yokoyamai	/AM	70	90	
Calycoceras canitaurinum	/AM	21	21	
Collignonicerias woollgari	/AM	98	128	
Euomphaloceras septemseriatum	/AM	50	50	
Mammites nodosoides	/AM	77	90	*ID as subsp. wingi
Metoicoceras whitei	/AM	50	50	
Sciponoceras gracile	/AM	50	50	
Stomohamites simplex	/AM	21	21	
Worthoceras vermiculus	/AM	50	53	

*END

MIDK.133B Bunker Hill Section, Kansas

Roadcuts sec. 18, T13S, R12W, 3 mi north of Bunker Hill village, Russell Co. Kansas; Eicher & Worstell, 1970, Micropaleontology 16:269-324, Text-Fig. 10, Fig. 4; Fairport Fm. exposed at SW1/4, T11S, R16W & E1/2, sec. 11 T21S R17W, Ellis Co. Kansas.

Megafossil data in Mountain Geologist v. 16, Hattin, Fourth and Fifth days, Upper Cretaceous stratigraphy, paleontology and paleoecology of Western Kansas, p. 175-218, data p. 214, fig. 18.

Data:

*TAXA	Morph	Base (ft)	Top (ft)
Marker bed "X" bentonite	/MB	6	6
Heterohelix globulosa	/FP	0	206
Hedbergella delrioensis	/FP	0	206
Hedbergella planispira	/FP	0	198
Hedb amabilis	/FP	6	198
Hedb portsdownensis	/FP	6	190
Guembelitria harrisi	/FP	12	12
Clavihedbergella simplex	/FP	18	156
Rota cushmani	/FP	22	35
Rota greenhornensis	/FP	22	38
Glob'oides bentonensis	/FP	29	35
Schackoina cenomana	/FP	30	98
Schackoina multispinata	/FP	30	98
Praeglobotruncana stephani	/FP	30	104
Rota multiloculata	/FP	30	36
Glob'oides caseyi	/FP	35	110
Whit aprica	/FP	40	134
Heterohelix pulchra	/FP	47	150
Clav subdigitata	/FP	56	116
Clav moremani	/FP	92	123
Valvulineria loetterlei	/FB	30	70.5
Bulimina fabilis	/FB	30	64
Neobulimina albertensis	/FB	30	190
Lingulogavelinella asterigerinoides	/FB	30	64
Lenticulina gaultina	/FB	30	38.5
Gavelinella plummerae	/FB	32	40
Citharina kochii	/FB	32	48
Globulina lacrima	/FB	32	32
Ramulina aculeata	/FB	32	32
Citharina complanata	/FB	35	35
Dentalina communis	/FB	47	47
*END			

MIDK.134 Gold Hill

Jeff Davis County, Texas. Hook, 1983, New Mexico Bureau Mines & Mineral Resources Circular 185, p. 48-54. Boquillas Formation overlies Buda Formation disconformably at 0 m; Shale & limestone member: 16.76m-49.18m; Flaggy limestone member: 0-16.76m; Unconformities inferred and estimated at 5m, 45.95m & 48.0m to separate overlapping species.

Data:

*TAXA	Morph	Base	Top meters	
Calycocheras canitaurinum	/am	6.0	6.0	*ID as cf.
Collignonicerias woollgari	/am	45.8	45.9	
*Desmoceras elgini	/am	0.5	0.5	
*Fagesia	/am	24.0	34.7	
*ID as sp. may be catinus-no too high				
Forbesiceras brundrettei	/am	0.5	0.5	
*Hamites simplex	/am	3.0	3.0	
*Hypoturrites youngi	/am	0.5	0.5	
Kamerunoceras turoniense	/am	38.0	38.0	
Lewesiceras sp.	/am	28.0	28.0	*ID as L. sharpei
Mammites nodosoides	/am	24.0	38.0	
Morrowites depressus	/am	34.7	46.0	
Neoptychites cephalotus	/am	46.0	46.0	*ID as cf
Nigericeras scotti	/am	14.0	14.0	
*Ostlingoceras brandi	/am	0.5	0.5	
*Ostlingoceras davisense	/am	0.5	0.5	
Prionocyclus hyatti	/am	46.0	47.1	

<i>Spathites rioensis</i>	/am	45.8	45.8
<i>Inoc arvanus</i>	/bi	0.5	3.0
<i>Inoc howelli</i>	/bi	46.0	46.0
<i>Inoc prefragilis</i>	/bi	6.0	6.0
<i>Inoc rutherfordi</i>	/bi	3.0	3.0
<i>Lopha lugubris</i>	/bi	49.1	49.1
* <i>Mytiloides duplicostatus</i>	/bi	17.0	27.1
<i>Mytiloides mytiloides</i>	/bi	28.6	34.7
<i>Mytiloides subhercynicus</i>	/bi	38.0	38.0
<i>Pycnodonte kansasense</i>	/bi	46.0	49.1
<i>Ostrea beloiti</i>	/bi	0.5	3.0

*END

MIDK.135 Cerro Cristo Rey Section

Dona Ana County, New Mexico. Böse, 1910, Instituto Geologico de Mexico, Bull. 25; Lovejoy, 1976, New Mexico Bureau Mines & Mineral Resources, Mem. 31; Strain, 1976, New Mexico Bureau Mines & Mineral Resources, Mem. 31, p. 77-82; Kennedy et alii, 1988, New Mex. Bur. Mines & Mineral Resources Bull. 114, p. 35-44; Lucas et alii, 2010, New Mexico Geology Technology Quarterly; Cornell, 1997, Review Palaeobotany & Palynology 98:153-157; Bullock, J.S., 1985, "Biostratigraphic study of Foraminifera from the Smelertown Formation (Lower Cretaceous, Albian) of southeastern New Mexico", Unpubl. MSc. thesis, Univ. Texas El Paso, 155 p., Appendix 1, 99-146; Mauldin, R.A., 1985, "Foraminiferal biostratigraphy, paleoecology, and correlation of the Del Rio Clay (Cenomanian), from the Big Bend National Park, Brewster County, Texas, to the Cerro de Muleros area, Dona Ana County, New Mexico", Unpubl. MSc. thesis, Univ. Texas El Paso, 89 p., App. A, 77-78; Del Rio interval from 280 m to 308.5 m. Thicknesses from Lucas et al. 2010 except thickness of Mesilla Valley: Mancos(= Boquillas-Ojinaga-Chispa Summit) @ 314.5-333.1m (Bose unit 11), Base Buda @ 299m (Bose unit 9), Del Rio @ 266m (Bose unit 8, midpoint 286m), Mojado(=Anapra) @ 208 (Bose unit 7, midpoint 240m), Mesilla Valley @ 157 (Bose unit 6, midpoint 190m) (51 m thickness measured by Rush & Scott Dec 2010), Muleros @ 124m, Smelertown @ 65m, Del Norte @ 41m, Finlay Fm. @ 0 m.

Data:

*Taxa		Morph	Base	Top meters
*Rush, 2012, MSc. data, University of Tulsa				
Carbon peak OAE 1c		/gc	177	197 *0.5% TOC increase
*Bose 1910, use midpoints of formation thickness				
<i>Adkinsites bravoensis</i>	/am	53	53	* in unit 2
<i>Adkinsites diazi</i>	/am	53	53	*in unit 2
<i>Mortoniceras equidistans</i>	/am	95	95	
*As <i>Schloenbachia whitei</i> (part) & <i>S. trinodosa</i> ; unit 4				
<i>Ceratostreon texana</i>	/bi	20	53	*in units 1-3
* <i>Exogyra whitneyi</i>	/bi	286	286	*as <i>Gyrostrea</i> ; in unit 8
<i>Lopha carinata</i>	/bi	95	130	*now <i>Rastellum</i> ; in units 4-5
<i>Lopha subovata</i>	/bi	286	286	*now <i>Nicaiolopha</i> ; in unit 8
<i>Neithea occidentalis</i>	/bi	20	20	*in unit 1
<i>Neithea texana</i>	/bi	20	190	*in units 1-6
<i>Pholadomya sanctae-sabae</i>	/bi	53	53	*in unit 2
<i>Protocardia texana</i>	/bi	53	190	*in units 2-6
<i>Scabrotrigonia emoryi</i>	/bi	130	190	*in units 5-6
<i>Texigryphaea navia</i>	/bi	53	53	*in units 2-3
<i>Turritella seriatimgranulata</i>	/ga	20	20	*in unit 1
*Lucas et alii, 2010, positions estimated				
<i>Dictyoconus walnutensis</i>	/fb	5	30	
<i>Pseudonummoloculina heimi</i>	/fb	5	30	
<i>Acicularia americana</i>	/al	5	30	
<i>Permolcalculus irenae</i>	/al	5	30	
<i>Mortoniceras equidistans</i>	/am	91	96	
<i>Texigryphaea washitaensis</i>	/bi	132	182	Bose units 5-6
<i>Cribratina texana</i>	/fb	139	223	
<i>Peilinia quadriplicata</i>	/bi	171	182	
<i>Exogyra whitneyi</i>	/bi	264	286	ID as <i>Gyrostrea</i>

Ilmatogyra arietina	/bi	271	286
		*Kennedy et alii, 1988,	
Acanthoceras amphibolum	/am	314.6	315.0
Turrilites acutus	/am	314.6	315.0
Inoc arvanus	/bi	314.6	315.0
Ostrea beloiti	/bi	314.6	315.0
		*Cornell, 1997, Dinoflagellate cysts	
Cyclonephelium distinctum	/dn	305	307 *ID as cf.
Hystrichosphaeridium tubiferum	/dn	300	300 *ID as cf.
		*Bullock, J.S., 1985, Smelertown foraminifers	
Ammobaculites goodlandensis	/fb	67	291
Ammobaculites subcretaceus	/fb	71	267
Ammodiscus gaultinus	/fb	69	69
Bolivina textilaroides	/fb	70	284
Citharina tripleura	/fb	69	100
Dentalina communis	/fb	67	96
Dentalina cylindroides	/fb	68	291
Haplophragmoides concavus	/fb	67	69
Lagena leptata	/fb	72	72
Lagena striatifera	/fb	68	291
Lagena sulcata	/fb	66	291
Lenticulina cyprina	/fb	68	70
Lenticulina gaultina	/fb	66	291
Lingulina furcillata	/fb	69	289
Lingulina nodosaria	/fb	66	279
Marginulina planitesta	/fb	72	113
Nodosaria oklahomensis	/fb	71	74
Quinqueloculina minima	/fb	70	96
Quinqueloculina sabella	/fb	69	96
Saracenaria bononiensis	/fb	69	92
Spirillina minima	/fb	69	86
Spiroplectammina longa	/fb	71	291
Spiroplectammina nuda	/fb	68	283
Textularia rioensis	/fb	66	291
Textularia washitensis	/fb	69	291
Favusella washitensis	/fp	69	71
Glob'oides cushmani	/fp	66	75
Globulina exserta	/fp	67	291
Guembelitria harrisi	/fp	69	98
Hedbergella delrioensis	/fp	68	283
Hedbergella planispira	/fp	66	283
Hedbergella washitensis	/fp	69	91
		*Mauldin, 1985, Del Rio Foraminiferal biostratigraphy	
Ammobaculites cuyleri	/fb	269	291
Ammobaculites testacea	/fb	269	276
Bulimina nannina	/fb	270	291
Citharina complanata	/fb	275	289
Citharina recta	/fb	289	289
Cribratina texana	/fb	273	273
Dentalina hammensis	/fb	269	291
Discorbis minima	/fb	276	290
Discorbis minutissima	/fb	267	289
Gaudryina cushmani	/fb	267	272
Lagena hispida	/fb	270	291
Lingulina lamellata	/fb	279	279
Massilina planoconvexa	/fb	281	281
Neobulimina minima	/fb	273	283
Nodosaria chapmani	/fb	273	276
Nodosaria obscura	/fb	284	284
Patellina subcretacea	/fb	269	270
Pyrulina cylindroides	/fb	269	290
Quinqueloculina aeschira	/fb	283	283
Valvulineria loetterlei	/fb	267	291

Washitella typica	/fb	283	283
Heterohelix moremani	/fp	275	286
*Palynological analysis by Franca Oboh-Ikuenobe, U. Missouri Rolla, *01-29-2012, unpublished			
Aptea polymorpha	/dn	169	175
Batiacasphaera granulosa	/dn	166	194
Batiacasphaera saidensis	/dn	166	191
Canningia reticulata	/dn	169	169
Cassiculosphaeridia reticulata	/dn	160	194
Coronifera oceanica	/dn	181	197
Cribopteridinium muderongense	/dn	160	187
Cyclonephelium brevispinatum	/dn	169	169
Cyclonephelium compactum	/dn	172	200
Cyclonephelium distinctum	/dn	166	197
Dissiliodinium globulum	/dn	169	194
Florentinia resex	/dn	181	181
Hapsocysta dictyota	/dn	169	187
Hapsocysta peridictya	/dn	184	184
Litosphaeridium arundum	/dn	160	169
Litosphaeridium conispinum	/dn	191	191
Luxadinium propatum	/dn	178	200
Odontochitina operculata	/dn	172	172
Oligosphaeridium complex	/dn	197	197
Oligosphaeridium poculum	/dn	184	197
Ovoidinium scabrosum	/dn	166	205.6
Ovoidinium verrucosum	/dn	175	200
Palaeohystrichophora infusorioides	/dn	157.5	200
Palaeoperidinium cretaceum	/dn	166	200
Pervosphaeridium pseudhystrichodini	/dn	184	184
Prolixosphaeridium parvispinum	/dn	172	175
Protoellipsodinium touile	/dn	181	184
Pterodinium cingulatum	/dn	169	200
Pterodinium? cornutum	/dn	160	178
Stephodinium coronatum	/dn	184	194
Subtilisphaera perlucida	/dn	169	200
Appendicisporites tricornitatus	/sp	191	200
Cyathidites minor	/sp	166	197
Gleicheniidites circiniidites	/sp	166	197
Gleicheniidites senonicus	/sp	157.5	200
Taurocusporites reduncus	/sp	172	172
Todisporites minor	/sp	194	194
*END			

MIDK.136 Big Sioux River Valley Composite Section

South Dakota. Ludvigson et al., 1994, Geol. Soc. Spec. Paper 287, p. 145-173, Fig. 2.

Top Dakota outcrop at 39 m, top Graneros Fm. at 50 m, top Greenhorn Fm. at 58 m, top Fairport Mbr. at 85 m, top of section in Blue Hill Mbr. at 121 m overlain by Niobrara Fm. unconformably. Ludvigson, G.A., Witze, B.J., González, L.A., Hammond, R.H., Plocher, O.W., 1994. Sedimentology and carbonate geochemistry of concretions from the Greenhorn marine cycle (Cenomanian-Turonian), eastern margin of the Western Interior Seaway. In: G.W. Shurr, G.A. Ludvigson, R.H. Hammond (Editors). Perspectives on the Eastern Margin of the Cretaceous Western Interior Basin. Geological Soc. Spec. Pap. 287:145-173.

Data:

*TAXA	Morph	Base	Top meters
Clavhedbergella simplex	/fp	37	37
Heterohelix pulchra	/fp	37	37
Whit aprica	/fp	37	37
Collignonicerias woollgari	/am	68	68
Dunveganoceras pondi	/am	40	40
Metengonoceras dumbli	/am	40	40
Prionocyclus hyatti	/am	104	104

*Scaphites carlilensis	/am	104	104
Scaphites patulus	/am	95	95
Inoc apicalis	/bi	95	95
Inoc cuvieri	/bi	68	68
*Inoceramus fragilis	/bi	73	104
Inoceramus ginterensis	/bi	48	48
Inoc prefragilis	/bi	40	40
Mytiloides mytiloides	/bi	55	55
*Trochamina rainwateri	/fb	32	32
*Palynology from Ravn & Witske, 1994, p. 111-128, Fig. 3; taxa new to CRET.dct w/ *			
Artiopollis indivisus	/sp	*	30
Cicatricosisporites crassiterminatu	/sp	15	30
*Cicatricosisporites mesozoicus	/sp	*	30
*Crybelosporites pannuceus	/sp	*	30
*Equisetosporites ambiguus	/sp	*	30
*Foveogleicheniidites confossus	/sp	15	30
*Microfoveolatosporis pseudoreticulatus	/sp	*	30
*Plicatella fucosa	/sp	20	30
*Plicatella unica	/sp	*	30
*Polypodiisporites cenomanianus	/sp	*	30
*Rousea wilsonii	/sp	20	30
*Stellatopollis largissimus	/sp	*	30
*Stephanocolpites tectorius	/sp	*	30
*END			

MIDK.137 Not Included in Database

MIDK.138-Miravete de la Sierra, Spain

East limb of Camarillas Syncline, Maestrat Basin, eastern Spain, 0deg43'W, 40deg35'N. Skelton, Gili, Bover-Arnal, Salas, & Moreno-Bedmar, 2010, map Fig. 3, Turkish Journal of Earth Sciences 19:557-5xx; Fig.4.

Data:

*TAXA	Morph	Base	Top meters
Carbon peak OAE 1a	/gc	4	25
Barremites spp.	/am	25	25
Chelonicerias cornuelianum	/am	28	103
Deshayesites deshayesi	/am	29	78
Dufrenoyia dufrenoyi	/am	85	143
Dufrenoyia furcata	/am	79	139
Pseudosaynella undulata	/am	30	30
Roloboceras hambrovi	/am	0	4
Roloboceras hispanicum	/am	-22	1
Toxoceratoides royerianus	/am	27	27 *ID as sp.
Caprina douvillei	/bi	6	6
Caprina parvula	/bi	156	156
Horiopleura dumortierii	/bi	6	6
Offneria sp.	/bi	158	158
Polyconites hadriani	/bi	155	158
Toucasia carinata	/bi	128	167
*END			

MIDK.139-DSDP 511, Falkland Plateau, So. Am.

*Falkland Plateau, South America, 51deg00.28'S, 46deg58.30'W; Initial Reports DSDP, 71, 1983; TC 632.0 mbsf. Calcareous nannofossils, Wise, 1983, 481-550, Table 1C; Planktic Forams by Krasheninnikov & Basov, 1983, 789-820, Fig. 2.

Lithology: Unit 5 (413.5-508.5) - reddish-brown, mottled claystone & nanno chalk, laminae of bivalve debris; Unit 6: (498-632) - 508.5-556.0m: dark gray laminated mudstone & nanno claystone, bivalve calcarenite, organic-rich: Albian/Cenomanian unconformity 430.02 m; Apt/Alb 506.11.
Forams Re-examined by Brian Huber

Data:

*TAXA Morph Base Top meters below sea floor
Carbon peak OAE 1b /gc -505 -500
*Defined by Bralower et al. 1993 Geophysical Monograph 77, Fig. 11, p. 21

*TAXA	Morph	Base	Top meters below sea floor
Carbon peak OAE 1b	/gc	-505	-500
*Defined by Bralower et al. 1993 Geophysical Monograph 77, Fig. 11, p. 21			
Glob'oides ferreolensis	/fp	-543.3	-537.55
Hedb amabilis	/fp	-480.34	-434.4
Hedb delrioensis	/fp	-512.6	-430.2
Hedb globigerinelloides	/fp	-550.84	-430.2
Hedb gorbachikae	/fp	-518.0	-518.0
Hedb infracretacea	/FP	-556.0	-430.2
Hedb planispira	/fp	-500.94	-430.2
Hedb sigali	/fp	-518.0	-518.0
Hedb similis	/fp	-518.0	-518.0
Hedb trocoidea	/fp	-500.94	-432.4
Tici raynaudi	/fp	-430.2	-430.2
Tici roberti	/fp	-504.2	-485.84
Axopodorhabdus albianus	/nn	-447	-447
Axopodorhabdus dietzmannii	/nn	-519	-463
Biscutum constans	/nn	-511	-429
Biscutum dissimilis	/nn	-462	-429
Braarudosphaera africana	/nn	-451	-446
Braarudosphaera bigelowii	/nn	-485	-430
Chiastozygus angustus	/nn	-500	-485
Corollithion achylosum	/nn	-504	-478
Corollithion geometricum	/nn	-528	-475
Corollithion rhombicum	/nn	-491	-485
Corollithion signum	/nn	-539	-539
Cretarhabdus conicus	/nn	-543	-429
Cretarhabdus loriei	/nn	-500	-460
Crucibiscutum salebrosum	/nn	-533	-528 *ID inSeribisculum
Cyclagelosphaera margerelii	/nn	-524	-428
Eiffellithus trabeculatus	/nn	-486	-486
Eiffellithus turriseiffelii	/nn	-434	-428
Flabellites oblonga	/nn	-494	-480
Grantarhabdus coronadventis	/nn	-511	-435
Hayesites albiensis	/nn	-451	-447
Lithastrinus floralis	/nn	-511	-428
Lithraphidites carniolensis	/nn	-511	-447
Manivitella pemmatoidea	/nn	-511	-436
Micrantholithus hoschulzii	/nn	-533	-514 *fragments
Nannoconus elongatus	/nn	-508	-474
Nannoconus multicaudus	/nn	-508	-474
Nannoconus truitti	/nn	-508	-435
Parhabdolithus embergeri	/nn	-541	-436
Parhabdolithus infinitus	/nn	-488	-488
Prediscosphaera cretacea	/nn	-519	-431
Prediscosphaera spinosa	/nn	-491	-451
Repagulum parvidentatum	/nn	-511	-446
Retecapsa angustiforata	/nn	-519	-507
Rhagodiscus angustus	/nn	-495	-444
Rhagodiscus asper	/nn	-507	-446
Seribiscutum primitivum	/nn	-483	-428
Sollasites horticus	/nn	-519	-511
Stephanolithion laffittei	/nn	-519	-446
Tetrapodorhabdus decorus	/nn	-528	-446
Tranolithus gabalus	/nn	-447	-429

Tranolithus orionatus	/nn	-451	-429
Watznaueria barnesae	/nn	-554	-428
Watznaueria biporta	/nn	-524	-524
Watznaueria britannica	/nn	-554	-543
Watznaueria ovata	/nn	-533	-430
Watznaueria supraretacea	/nn	-480	-451
Zygodiscus erectus	/nn	-554	-548
Zygodiscus diplogrammus	/nn	-555	-429

*END

MIDK.140-Gulf No. 20 Dix Core, Texas

Gulf No. 20 Dix, Guadalupe Co., Texas, cored 3000' - 5200 ft, 5 mi SE of Kingsbury, Texas.
 Microfossil thin section Data by Scott, 1982, unpublished data. Palynomorph data by R.W. Hedlund,
 1982, unpubl. TD at -5490 ft. Top Hosston Fm. -4965 ft.

Data:

*Taxa		Morph	Base	Top (ft)
Marker bed Ce SB WB	/mb	-2430	*	/base Woodbine Ss. over Buda Ls.
Marker bed Ce SB 1.1	/mb	-2475	*	
Marker bed Al SB WA 6	/mb	-2475	*	/base Del Rio Shale
Marker bed Al SB WA 1	/mb	-2690	*	/top Fredericksburg Gp.
*Top Glen Rose Fm. -3010 ft				
Marker bed Ap TS GR 1	/mb	-4227	*	/base Glen Rose Fm. above Pearsall Fm.
Marker bed Ap SB PR 1	/mb	-4405	*	/base Pearsall Fm. on top Sligo Fm.
Choffatella decipiens	/fb	-4415		-4415
Pseudonummoloculina heimi	/fb	-3670		-3280
Orbitolina texana	/fb	-3820		-3320
Patellina subcretacea	/fb	-4300		-4300
Pseudocyclammina hedbergi	/fb	-4600		-4600
Favusella washitensis	/fp	-4150		-3940
Hedb planispira	/fp	-4390		-4225
Hedbergella washitensis	/fp	-4150		-3940
Hedb delrioensis	/fp	-4390		-3940
Hedbergella delrioensis	/fp	-4390		-3940
Colomiella mexicana	/ca	-3940		-3940
Colomiella recta	/ca	-4135		-3940
Colomiella tunesiana	/ca	-4135		-4135
Pith sphaerica	/ca	-3940		-3940
Nannoconus bucheri	/nn	-4375		-4375
Nannoconus minutus	/nn	-4135		-4135
Nannoconus truitti	/nn	-4360		-3940
Nannoconus wassallii	/nn	-4375		-4375
Globochaeta alpina	/al	-3820		-3820
Florentinia deanei	/dn	-4180		-4150
Oligosphaeridium totum minus	/dn	-4300		-4300
Chomotriletes almagrensis	/sp	-5185		-4150
Klukisporites pseudoreticulatus	/sp	-4135		-3745
Lophozotriletes intraverrucatus	/sp	-4315		-4105

*END

MIDK.141-Humble No. 46 Pruitt, Texas

MIDK.141 Humble No. 46 Pruitt, Atascosa Co., Texas, cored 9650' to 10750 ft. Microfossil thin section
 Unpublished Data by Scott & B.A. Masters, 1984. Top Hosston Fm. -10780 ft; TD at -11,000 ft.

Data:

*Taxa		Morph	Base	Top (ft)
*Marker bed Al SB WA 1		/mb	-7535	*
*top Fredericksburg Gp.				
*Top Glen Rose Fm. -7850 ft				

Marker bed Ap TS GR 1	/mb	-9080	*
*base Glen Rose Fm. above Pearsall Fm.			
Marker bed Ap SB PR 1	/mb	-9740	*
*base Pearsall Fm. on top Sligo Fm.			
Chondrodonta glabra	/bi	-10292	-9802
Toucasia carinata	/bi	-10161	-9851
Choffatella decipiens	/fb	-10360	-9851
Nautiloculina cretacea	/fb	-10301	-9787
Pseudocyclammina hedbergi	/fb	-10748	-9851
Hedbergella delrioensis	/fp	-9658	-9657
Acicularia intermedia	/al	-10146	-9851
Cadosina fusca	/al	-9695	-9658
Cylindroporella ivanovici	/al	-10518	-9787
Neomeris cretacea	/al	-9787	-9787
Permocalculus irenae	/al	-10568	-9756
Nannoconus minutus	/nn	-9658	-9657
Nannoconus truitti	/nn	-9802	-9658
*END			

MIDK.142 Col de Palluel, Risou, France

Composite section merged with base Cenomanian GSSP at Mont Risou; Gale et al., 2011, Cretaceous Research 32:59-130, figs. 3-5; Measured like a well from base at -370m to 0m, Marnes Blues Formation Firmground disconformity at -259.5m (Fig. 3).

DATA

*TAXA	Morph	Base m	Top m
	*ID by W.J. Kennedy, marker bioevents list p. 70		
Anisoceras armatum	/am	-250.8	-80.0
Anisoceras perarmatum	/am	-248.6	-80.0
Dipoloceras bouchardianum	/am	-321.3	-271.9
Dipoloceras cristatum	/am	-314.7	-294.4
Dipoloceras pseudoon	/am	-293.5	-293.1
Elobiceras newtoni	/am	-271.9	-267.8
Lechites gaudini	/am	-250.8	-32.0
Hysterocheras bimum	/am	-278.4	-278.4
Hysterocheras orbigny	/am	-314.7	-254.3
Mariella bergeri	/am	-92.5	-50.0
Mortoniceras fallax	/am	-240.9	-212.3
Mortoniceras inflata	/am	-253.1	-245.9
Mortoniceras perinflatum	/am	-181.0	-102.8
Mortoniceras pricei	/am	-278.4	-257.7
Mortoniceras rostratum	/am	-186.0	-182.2
Ostlingoceras puzosianum	/am	-102.8	-91.0
Oxytropidoceras roissyanum	/am	-334.5	-334.5
Stoliczkaia clavigera	/am	-194.0	-32.0
Stoliczkaia dispar	/am	-198.9	-119.0
	*ID by J.S. Carmpton and A.S. Gale, p. 99		
Actinoceramus concentricus	/bi	-334.5	-213.3
Inoc concentricus	/bi	-334.5	-213.3
Actinoceramus concentricus parabolicus	/bi	-318.5	-314.9
*Base of Lineage Abundance Zone 50% acme;			
*specimens at top range are A. concentricus gryphaeoides			
Actinoceramus sulcatus	/bi	-314.9	-267.1
*Lineage Zone			
Actinoceramus sulcatus munsoni	/bi	-267.31	-266.9
*A. sulcatus forma munsoni Lineage Abundance Zone with 30% munsoni			
Actinoceramus sulcatus biometricus	/bi	-266.2	-265.4
*A. sulcatus biometricus Lineage Abundance Zone with 66% biometricus			
Inoc anglicus	/bi	-318.5	-298

*Planktic Foraminifera by M. Caron and M.R. Petrizzo p. 101, Fig. 42

Biti breggiensis	/fp	-297.9	-187.0
Biti subbreggiensis	/fp	-334.0	-292.3
Glob'oides bentonensis	/fp	-362.4	-129.5
Glob'oides ultramicrus	/fp	-251.9	-129.5
Hedbergella delrioensis	/fp	-370	-129.5
Hedb delrioensis	/fp	-370	-129.5
Hedb libyca	/fp	-161.1	-161.1
*As Paracostellagerina			
Hedbergella planispira	/fp	-367.1	-129.5
Hedb planispira	/fp	-367.1	-129.5
Hedb simplex	/fp	-306.1	-129.5
Planomalina buxtorfi	/fp	-173.4	-129.5
Planomalina praebuxtorfi	/fp	-193.2	-144.4
Praeglobotruncana delrioensis	/fp	-165.0	-129.5
Praeglobotruncana stephani	/fp	-161.1	-129.5
Rota appenninica	/fp	-196.6	-129.5
*As Thalmanninella			
Tici praeticinensis	/fp	-263.8	-236.7
Tici primula	/fp	-370.0	-150.0
Tici raynaudi	/fp	-370.0	-165.0
*As subspecies aperta			
Tici roberti	/fp	-324.2	-257.7
Tici subtacinensis	/fp	-259.4	-187.0
*As Pseudothalmanninella			
Tici ticinensis	/fp	-256.0	-129.5
*As Pseudothalmanninella			
Ticinella madecassiana	/fp	-339.1	-144.4
*Calcaeous nannofossils by P. Bown, p. 109, Fig. 48; Selected zone species			
Axopodorhabdus albianus	/nn	-370.0	-129.5
Crucicribrum anglicum	/nn	-360.0	-263.8
Eiffellithus turriseiffelii	/nn	-234.5	-129.5
Eiffellithus monechiae	/nn	-257.7	-182.6
Hayesites albiensis	/nn	-370.0	-257.7
*END			

Midk.143 Col de Palluel, Hautes-Alpes, France

Gale et al., 2011, Cret. Research 32:59-130; 2 km east of Rosans; Marnes Bleues Formation -370 to -30.4; Calcaires Marneaux de Risou; upper Middle Albian to lowermost Lower Cenomanian; rhythmically bedded marl & clay; measured at Ravin de Jassines from top at 129m to base of section at 370m; interval from -131 to 0m measured near La Chafau SW of Mont Risou; tied at base of Breistroffer bed 2; treat as a well. Unconformity at top of 'petite verole' bed at 259.5m; Niveau Briestroffer beds 1-6 from -135 to -102.5m. Bralower et al. (1993, Geophysical Monograph 77, Fig. 6, p. 16) show 1-1.5% TOC increase 10.2-11.2m @ base NC8B zone.

DATA:

*TAXA	Morph	Base	Top meters below top of section
*Gale et al. Figs. 4, 5, 6 thin beds from -135 to -102.5			
Marker bed Breistroffer	/mb	-135	-102.5
*Ammonites by W.J. Kennedy, p. 70			
*Anisoceras armatum	/am	-250.8	-80
Anisoceras perarmatum	/am	-248.6	-80
Arrhaphoceras briacensis	/am	-102.5	-32
*Dipoloceras bouchardianum	/am	-321.3	-271.9
Dipoloceras cristatum	/am	-314.7	-294.4
*Dipoloceras pseudoaon	/am	-293.5	-293.1
*Elobiceras newtoni	/am	-271.9	-267.8
Hysterocheras binum	/am	-278.4	-278.4
Hysterocheras orbigny	/am	-314.7	-254.3
Lechites gaudini	/am	-250.8	-32
Mantelliceras mantelli	/am	-30	*
*at La Chaud section			

Mariella bergeri	/am	-92.5	-50
Mortoniceras fallax	/am	-240.9	-212.3
Mortoniceras inflata	/am	-253.1	-245.9
Mortoniceras perinflatum	/am	-181	-102.8
Mortoniceras pricei	/am	-278.4	-257.7
Mortoniceras rostratum	/am	-186	-182.2
Ostlingoceras puzosianum	/am	-102.8	-91
Oxytropidoceras roissyanum	/am	-334.5	-334.5
Stoliczkaia clavigera	/am	-194	-32
Stoliczkaia dispar	/am	-198.9	-119
*Inoceramids p. 101			
Actinoceramus sulcatus	/bi	-314.9	-261.7
*Actinoceramus sulcatus forma munsoni	/bi	-267.1	-266.9
*Lineage Abundance Zone with >33% munsoni			
*Actinoceramus sulcatus biometricus	/bi	-266.2	-265.4
*Lineage Abundance Zone with >66%			
Inoc concentricus	/bi	-318.5	-314.9
*Actinoceramus concentricus parabolicus Lineage Abundance Zone >50%			
*Planktic Foraminifera by M. Caron & M.R. Petrizzo, p. 101-102, Fig. 42			
Biti breggiensis	/fp	-297.9	-187
Biti subbreggiensis	/fp	-334	-292.3
Glob'oides bentonensis	/fp	-362.4	-129.5
Glob'oides ultramicrus	/fp	-251.9	-129.5
Hedbergella delrioensis	/fp	-370	-129.5
Hedb libyca	/fp	-161.1	-161.1
*In Paracostellagerina			
Hedb planispira	/fp	-367.1	-129.5
Hedbergella planispira	/fp	-367.1	-129.5
Hedb simplex	/fp	-306.1	-129.5
Planomalina buxtorfi	/fp	-173.4	-129.5
Planomalina praebuxtorfi	/fp	-193.2	-144.4
Praeglobotruncana delrioensis	/fp	-165	-129.5
Praeglobotruncana stephani	/fp	-161.1	-129.5
Rota globotruncanoides	/fp	-36	*
*In Thalmanninella, data in Fig. 5 & p. 125			
Tici praeticinensis	/fp	-263.8	-236.7
Tici primula	/fp	-370	-150
Tici raynaudi	/fp	-370	-165
Tici roberti	/fp	-324.2	-257.7
*The following species in Thalmanninella			
Rota appenninica	/fp	-196.6	-129.5
*The following species in Pseudothalmanninella			
Tici subticinensis	/fp	-259.4	-187
Tici ticinensis	/fp	-256	-129.5
*Nannofossils p., Fig. 48.			
Assipetra terebrodentarius	/nn	-273.5	-273.5
Axopodorhabdus albianus	/nn	-370	-129.5
Axopodorhabdus dietzmannii	/nn	-334	-146.5
Biscutum constans	/nn	-370	-129.5
Braarudosphaera africana	/nn	-364.2	-161.1
Braarudosphaera stenorhetha	/nn	-324.2	-129.5
Broinsonia matalosa	/nn	-151.4	-151.4
Broinsonia signata	/nn	-146.5	-146.5
Bukrylithus ambiguus	/nn	-370	-161.1
Calcicalathina alta	/nn	-364.2	-134.4
Calculites percensis	/nn	-254	-140
Chiastozygus litterarius	/nn	-370	-129.5
Chiastozygus platyrhethus	/nn	-339.1	-161.1
Corollithion signum	/nn	-277.9	-140
Cretarhabdus conicus	/nn	-370	-129.5
Cribrorperidinium ehrenbergii	/nn	-364.2	-129.5
Crucicribrum anglicum	/nn	-364.2	-263.8
Cyclagelosphaera margerelii	/nn	-246.5	-246.5

Cylindralithus nudus	/nn	-370	-136.2
Diazomatolithus lehmanii	/nn	-261.8	-261.8
Discorhabdus ignotus	/nn	-370	-129.5
Eiffellithus monechiae	/nn	-257.7	-182.6
Eiffellithus turriseiffelii	/nn	-234.5	-129.5
Eprolithus floralis	/nn	-364.2	-129.5
Flabellites oblonga	/nn	-370	-129.5
Gaarderella granulifera	/nn	-294.1	-129.5
Gartnerago praeobliquum	/nn	-165.4	-165.4
Grantarhabdus coronadventis	/nn	-364.2	-129.5
Haqius circumradiatus	/nn	-364.2	-129.5
Hayesites albiensis	/nn	-370	-257.7
Hayesites irregularis	/nn	-370	-370
Helenea chiastia	/nn	-370	-129.5
Helicolithus trabeculatus	/nn	-324.2	-129.5
Laguncula dorotheae	/nn	-334	-136.2
Lithraphidites carniolensis	/nn	-370	-129.5
Manivitella pemmatoidea	/nn	-370	-129.5
Nannoconus elongatus	/nn	-146.5	-146.5
Nannoconus truitti	/nn	-364.2	-129.5
Octopodorhabdus reinhardtii	/nn	-364.2	-156
Percivalia fenestrata	/nn	-346.6	-129.5
Pickelhaube furtiva	/nn	-334	-334
Prediscosphaera columnata	/nn	-364.2	-129.5
Prediscosphaera spinosa	/nn	-364.2	-129.5
Repagulum parvidentatum	/nn	-370	-129.5
Rhagodiscus achlyostaurion	/nn	-370	-129.5
Rhagodiscus angustus	/nn	-370	-129.5
Rhagodiscus asper	/nn	-364.2	-129.5
Rhagodiscus gallagheri	/nn	-370	-129.5
Rhagodiscus hamptonii	/nn	-370	-140
Rhagodiscus infinitus	/nn	-370	-146.5
Rotelapillus laffittei	/nn	-370	-129.5
Seribiscutum primitivum	/nn	-364.2	-151.4
Sollasites horticus	/nn	-257.7	-257.7
Staurolithites crux	/nn	-370	-129.5
Staurolithites glaber	/nn	-370	-156
Stoverius achylosus	/nn	-364.2	-161.1
Tegumentum stradneri	/nn	-370	-129.5
Tetrapodorhabdus coptensis	/nn	-360	-129.5
Tranolithus gabalus	/nn	-370	-129.5
Tranolithus orionatus	/nn	-370	-129.5
Watznaueria barnesae	/nn	-370	-129.5
Watznaueria biporta	/nn	-364.2	-187
Watznaueria britannica	/nn	-370	-129.5
Watznaueria fossacincta	/nn	-370	-136.2
Watznaueria manivitiiae	/nn	-334	-334
Zeugrhabdotus embergeri	/nn	-370	-129.5

*END

MIDK.144 DSDP 400A Bay of Biscay, Offshore Spain
 47deg22.9'N, 9deg11.9'W; Sea floor at 4399 m, TD 777.5 m. Stratigraphic unit 4 (654-777.5m) upper
 Albian to upper Aptian; Overlain unconformably by Campanian unit 3. Carbonaceous mudstone of
 terrestrial type III organic matter interbedded with marly nannofossil chalk turbidites.
 *Biostratigraphic data from Bralower et al. 1993, Geophysical Monograph 77:5-37, fig. 16.

DATA:

*TAXA	Morph	Base	Top meters below sea floor
	*Bralower et al. 1993, fig. 16		
	*TOC ~1.8-2.64 ppm, type III kerogen, Deroo et al. chapter 42, table 1;		
Carbon peak OAE 1c	/gc	-676	-665

*Foram & nanno data in Bralower et al., 1993, fig. 16

Biti breggiensis	/fp	-670	-655
Hedb planispira	/fp	-673	-655
Hedbergella planispira	/fp	-673	-655
Hedb trocoidea	/fp	-777	-712
Planomalina buxtorfi	/fp	-655	-655
Tici subticinensis	/fp	-670	-664
Tici ticinensis	/fp	-664	-655
Tici bejaouaensis	/fp	-710	-692
Axopodorhabdus albianus	/nn	-675	-655
Eiffellithus eximius	/nn	-673	-655
Eiffellithus turriseiffelii	/nn	-664	-655
Eprolithus floralis	/nn	-777	-655
Hayesites albiensis	/nn	-695	-674
Parhabdolithus achlyostaurion	/nn	-710	-655
Parhabdolithus angustus	/nn	-777	-655
Parhabdolithus infinitus	/nn	-710	-664
Prediscosphaera columnata	/nn	-710	-655
Prediscosphaera spinosa	/nn	-710	-655
Tranolithus orionatus	/nn	-773	-655

*Dinoflagellate data p.56-57

Apteodinium grande	/dn	-665.8	-665.8
Cerbia tabulata	/dn	-712.7	-712.7

*ID as Cyclonephelium

*Chlamydophorella huguoniotii	/dn	-745.9	-745.9
Leberidocysta chlamydata	/dn	-665.8	-665.8
*Lithodinia stoveri	/dn	-745.9	-745.9

*ID as Meiourogonyaulax

Litosphaeridium arundum	/dn	-658.1	-658.1
Litosphaeridium conispinum	/dn	-665.8	-655.9
Litosphaeridium siphoniphorum	/dn	-655.9	-655.9
Muderongia staurota	/dn	-712.7	-712.7

*ID as cf.

*Oligosphaeridium anthophorum	/dn	-712.7	-712.7
*ID as Polystephanophorum			
*Subtilisphaera perlucida	/dn	-712.7	-712.7
Systematophora cretacea	/dn	-695.6	-676.5

*Davey, chapter 23, p. 547, fig. 1

Callaiosphaeridium asymmetricum	/dn	-733.0	-655.9
Cassiculosphaeridia reticulata	/dn	-740.6	-659.6
Chlamydophorella huguoniotii	/dn	-749.4	-655.9
Codoniella psygma	/dn	-733.0	-676.5
Coronifera oceanica	/dn	-749.4	-655.9
Cribroperidinium edwardsii	/dn	-777.0	-665.8
Cyclonephelium brevispinatum	/dn	-733.0	-684.2
Cyclonephelium hystrix	/dn	-749.4	-655.9
Dapsilidinium laminaspinosum	/dn	-749.4	-659.6
Exochosphaeridium phragmites	/dn	-777.0	-655.9
Florentinia mantellii	/dn	-749.4	-676.5
Fromea amphora	/ac	-733.0	-721.3
Gonyaulacysta helicoidea	/dn	-777.0	-655.9
Hystriodinium pulchrum	/dn	-777.0	-655.9
Kiokansium polypes	/dn	-777.0	-684.2

*ID as Bacchidinium

Kleithriasphaeridium sarmentum	/dn	-733.0	-684.2
Kleithriasphaeridium simplicispinum	/dn	-749.4	-701.5
Lithodinia stoveri	/dn	-777.0	-733.0
Odontochitina operculata	/dn	-777.0	-655.9
Oligosphaeridium anthophorum	/dn	-777.0	-712.7
Oligosphaeridium complex	/dn	-749.4	-655.9
Ovoidinium diversum	/dn	-740.6	-676.5
Palaeoperidinium cretaceum	/dn	-740.6	-659.6
Prolixosphaeridium parvispinum	/dn	-777.0	-712.7

Protoellipsodinium spinocristatum	/dn	-777.0	-665.8
Pterodinium aliferum	/dn	-777.0	-655.9
Pareodinia ceratophora	/dn	-749.4	-655.9
Spiniferites cingulatus	/dn	-777.0	-655.9
Spin ramosus multibrevis	/dn	-777.0	-701.5
Spiniferites ramosus ramosus	/dn	-777.0	-655.9
Spiniferites ramosus reticulatus	/dn	-777.0	-655.9
Subtilisphaera perlucida	/dn	-740.6	-712.7
Subtilisphaera terrula	/dn	-777.0	-695.6
Trichodinium castanea	/dn	-777.0	-655.9

*END

MIDKPAL.35 ODP 1050C, Blake Plateau, Western Atlantic

30° 05.9953'N, 76° 14.0997'W. Norris, R.D., D. Kroon, & A. Klaus, et al., 1998, Proc. ODP Init. Rept. v. 171B. water depth to seafloor 2308 m; TD 2902.5m, penetration 606.0m, 69.4% recovery; core recovery began at 327.1m; K/T boundary at 405.93 mbsf; Con/Camp at 491.39m; Cen/Tur at 501.7m.

DATA:

*TAXA	MORPH	BASE	TOP mbsf
*Magnetochrons from Fig. 34 p. 137			
*Planktic forams; Data from Table 10, p. 127-128			
Heterohelix reussi	/fp	-500.2	-500.2
Biti breggiensis	/fp	-605.4	-567.6
Dica algeriana	/fp	-500.2	-500.2
Dica imbricata	/fp	-500.2	-497.0
Helv'ana helvetica	/fp	-500.2	-497.0
Helv'ana praehelvetica	/fp	-500.2	-500.2
Hedb delrioensis	/fp	-605.4	-510.1
Hedb simplex	/fp	-605.4	-532.1
Heterohelix moremani	/fp	-510.1	-500.2
Marginotruncana marianosi	/fp	-497.0	-497.0
Praeglobotruncana delrioensis	/fp	-577.4	-501.3
Praeglobotruncana stephani	/fp	-555.6	-497.0
Rota appenninica	/fp	-567.6	-509.8
Rota brotzeni	/fp	-555.6	* top reworked -501.3
Rota cushmani	/fp	-510.3	* top reworked -501.3
Rota deeckeii	/fp	-510.3	* top reworked -501.3
Rota gandolfi	/fp	-555.6	-529.3
Rota greenhornensis	/fp	-555.6	* top reworked -501.3
Schackoina bicornis	/fp	-500.2	* top reworked -500.2
Schackoina cenomana	/fp	-605.4	-577.4
Tici praeticinensis	/fp	-605.4	-577.4
Tici raynaudi	/fp	-567.6	-567.6
Tici roberti	/fp	-605.4	-567.6
Tici subticinensis	/fp	-605.4	-577.4
Tici ticinensis	/fp	-605.4	-567.6
Whit baltica	/fp	-510.3	-500.2
Whit parabubia	/fp	-500.2	-496.0
*Cretaceous Nannos taxonomy Bralower & Siesser, 1992, ODP 762C			
Broinsonia parca constricta	/nn	-491.4	-491.4
Broinsonia parca parca	/nn	-491.4	-491.4
Ceratolithoides aculeus	/nn	-491.3	-491.4
Corollithion kennedyi	/nn	-529.1	-500.5
Eiffellithus eximius	/nn	-493.1	-482.3
Eprolithus septenarius	/nn	-493.4	-493.1
Quadrum gartneri	/nn	-500.5	-500.5
Rucinolithus irregularis	/nn	-586.8	-586.8

*END

CENOMANIAN & CONIACIAN SECTIONS FILES (CEN/CONIAC)

CEN.1 - Hot Springs, Texas

Frush & Eicher 1969 Canadian Geol. Assoc. S.P. Text-figure 2; Base Boquillas Fm. at 0m in contact with Buda Fm.; 'Allocrioceras hazzardi' ledge at 308-310 ft above base Boquillas marks base Coniacian (Frush & Eicher 1969, p. 280; Maxwell et al. 1967; Cobban et al. 2008).

Data:

*TAXA	Morph	Base	Top Feet
Allocrioceras hazzardi	/am	308	310
Clav moremani	/FP	151.0	267.0
Clav simplex	/FP	131.0	267.0
Clav subcretacea	/FP	127.0	127.0
Glob'oides bentonensis	/FP	22.0	295.0
Glob'oides caseyi	/FP	131.0	267.0
Hedb amabilis	/FP	22.0	305.0
Hedb delrioensis	/FP	22.0	305.0
Hedb planispira	/FP	22.0	305.0
Hedb portsdownensis	/FP	66.0	105.0
Helv'ana helvetica	/FP	131.0	195.0
Helv'ana praehelvetica	/FP	131.0	267.0
Heterohelix globulosa	/FP	22.0	305.0
Heterohelix pulchra	/FP	131.0	305.0
Marginotruncana coronata	/FP	275.0	295.0
Marginotruncana marginata	/FP	174.0	305.0
Marginotruncana pseudolinneiana	/FP	210.0	267.0
Marginotruncana renzi	/FP	141.0	305.0
Marginotruncana sigali	/FP	131.0	305.0
Praeglobotruncana stephani	/FP	44.0	267.0
Rota cushmani	/FP	44.0	105.0
Rota greenhornensis	/FP	22.0	105.0
Schackoina cenomana	/FP	86.0	131.0
Schackoina multispinata	/FP	81.0	81.0
Whit aprica	/FP	66.0	305.0
Whit archaeocretacea	/FP	105.0	295.0
Whit inornata	/FP	105.0	235.0

*END

CEN.2 Davis Mountains Texas

Frush & Eicher 1969 Canadian Geol. Assoc. Spec. Publ.. Text-figure 3. Boquillas Fm. in contact with Buda Fm at 65 ft; section is composite of upper two outcrops.

DATA:

*TAXA	Morph	Base	Top Feet
Bifarina ballerina	/FP	155.0	155.0
Clav moremani	/FP	159.0	207.0
Clav simplex	/FP	77.0	217.0
Clav subcretacea	/FP	159.0	159.0
Glob'oides bentonensis	/FP	77.0	77.0
Guembelitria harrisi	/FP	163.0	163.0
Hedb amabilis	/FP	77.0	217.0
Hedb delrioensis	/FP	71.0	217.0
Hedb planispira	/FP	71.0	207.0
Hedb portsdownensis	/FP	151.0	151.0
Helv'ana praehelvetica	/FP	159.0	159.0
Heterohelix globulosa	/FP	71.0	217.0

Heterohelix pulchra	/FP	151.0	217.0
Lunatriella spinifera	/FP	151.0	159.0
Marginotruncana coronata	/FP	177.0	217.0
Marginotruncana marginata	/FP	159.0	217.0
Marginotruncana renzi	/FP	159.0	217.0
Marginotruncana sigali	/FP	197.0	217.0
Praeglobotruncana stephani	/FP	77.0	217.0
Rota greenhornensis	/FP	71.0	77.0
Schackoia cenomana	/FP	150.0	150.0
Schackoia multispinata	/FP	155.0	155.0
Whit aprica	/FP	71.0	217.0
Whit archaeocretacea	/FP	159.0	207.0
Whit inornata	/FP	166.0	217.0
*END			

CEN.3 - Chispa Summit section, Texas

CEN.3 Chispa Summit Texas

Frush & Eicher 1969 Canadian Geol Assoc. S.P. Text-figure 4

Base @ 0 ft is unconformity/sequence boundary of Chispa Summit Fm. above Buda Fm., top at 373'=113.7m;

Cobban et al. 2008, New Mexico Geology 30(3):75-103, ammonites on p. 87.

Top of bed @ 129 ft (39.3 m) w/ *N. judii* is corroded hiatal surface-unconformity.

Data:

*TAXA	Morph	Base	Top Feet
Acanthoceras bellense	/am	15	15
Calycoceras canitaurinum	/am	59	59
Euomphaloceras septemseriatum	/am	120	125
Metoicoceras geslinianum	/am	120	125
Neocardioceras juddii	/am	129	129
Neoptychites cephalotus	/am	155	155 ID as cf.
Pseudocalyoceras angolaense	/am	128	128
Pseudaspidoceras flexuosum	/am	155	155
Sciponoceras gracile	/am	120	125
Bifarina ballerina	/FP	155.0	155.0
Clav moremani	/FP	127.0	345.0
Clav simplex	/FP	5.0	373.0
Clav subcretacea	/FP	85.0	85.0
Glob'oides bentonensis	/FP	5.0	127.0
Glob'oides caseyi	/FP	115.0	127.0
Guembelitria harrisi	/FP	70.0	85.0
Hedb amabilis	/FP	5.0	373.0
Hedb delrioensis	/FP	5.0	373.0
Hedb planispira	/FP	5.0	315.0
Hedb portsdownensis	/FP	55.0	115.0
Helv'ana helvetica	/FP	253.0	253.0
Helv'ana praehelvetica	/FP	85.0	315.0
Heterohelix globulosa	/FP	5.0	373.0
Heterohelix pulchra	/FP	55.0	373.0
Lunatriella spinifera	/FP	220.0	220.0
Marginotruncana coronata	/FP	345.0	373.0
Marginotruncana marginata	/FP	315.0	345.0
Marginotruncana renzi	/FP	115.0	373.0
Marginotruncana sigali	/FP	190.0	220.0
Praeglobotruncana stephani	/FP	5.0	190.0
Rota cushmani	/FP	20.0	55.0

Rota greenhornensis	/FP	20.0	55.0
Schackoina multispinata	/FP	85.0	85.0
Whit aprica	/FP	5.0	345.0
Whit archaeocretacea	/FP	115.0	373.0
Whit inornata	/FP	85.0	373.0

*END

CEN.4 - Ojinaga section, Mexico

Frush & Eicher, 1969, Canadian Geol. Assoc. SP 13, Text-figure 5; Ojinaga Fm. over Buda Fm. at unconformity 0 ft. Cobban et al. 2008, New Mexico Geology 30(3):75-103, ammonites on p. 88.

Data:

*TAXA	Morph	Base	Top Feet
Bifarina ballerina	/FP	560.0	560.0
Clav moremani	/FP	415.0	890.0
Clav simplex	/FP	48.0	890.0
Clav subcretacea	/FP	348.0	890.0
Glob'oides bentonensis	/FP	30.0	168.0
Glob'oides caseyi	/FP	30.0	415.0
Guembelitria harrisi	/FP	280.0	280.0
Hedb amabilis	/FP	30.0	890.0
Hedb delrioensis	/FP	30.0	890.0
Hedb planispira	/FP	30.0	640.0
Helv'ana helvetica	/FP	640.0	685.0
Helv'ana praehelvetica	/FP	348.0	822.0
Heterohelix globulosa	/FP	30.0	890.0
Heterohelix pulchra	/FP	348.0	890.0
Lunatriella spinifera	/FP	560.0	560.0
Marginotruncana coronata	/FP	822.0	890.0
Marginotruncana marginata	/FP	890.0	890.0
Marginotruncana renzi	/FP	822.0	890.0
Marginotruncana sigali	/FP	348.0	890.0
Praeglobotruncana stephani	/FP	115.0	890.0
Rota cushmani	/FP	168.0	168.0
Rota greenhornensis	/FP	30.0	168.0
Schackoina cenomana	/FP	30.0	560.0
Schackoina multispinata	/FP	168.0	348.0
Whit aprica	/FP	48.0	890.0
Whit archaeocretacea	/FP	72.0	890.0
Whit inornata	/FP	560.0	890.0

*END

NO CEN.5 to 7 Sections

CEN.8 - Lozier Canyon, Texas

Masters, Kidson, Lewy and Scott 1983 Amoco Production Company, Research Depart. Report M83-G-2, Figs. 5, 18. Buda Fm. 0-14ft(4.3m); Boquillas Fm. 14-194ft(=59.1m); Atco Mbr. of Austin Fm. 194-256ft(=78m). Cobban et al. 2008, New Mexico Geology 30(3):75-103, ammonites on p. 89. Boquillas/Austin contact conformable (Freeman, 1961, fig. 1, AAPG Bull. 45:105-107).

Data:

*TAXA	Morph	Base	Top Feet
Calycoceras canitaurinum	/am	14	14 ID questioned
Clav moremani	/FP	152.5	197.8
Clav simplex	/FP	130.0	240.5
Clav subcretacea	/FP	152.5	153.5

Glob'oides ultramicrus	/FP	137.8	137.8
Globotruncana havanensis	/FP	152.5	240.5
Globotruncana lapparenti	/FP	230.0	230.0
Globotruncana marginata	/FP	152.5	153.5
Globotruncana renzi	/FP	151.7	256.0
Globotruncana schneegansi	/FP	153.5	197.8
Globotruncana sigali	/FP	152.5	210.5
Hedb loetterlei	/FP	69.5	197.8
Hedb paradubia	/FP	110.5	142.5
Hedb planispira	/FP	39.0	256.0
Hedb simplicissima	/FP	138.0	196.5
Hedbergella washitensis	/FP	10.2	39.0
Heterohelix globulosa	/FP	10.2	256.0
Heterohelix pulchra	/FP	152.5	153.5
Heterohelix moremani	/FP	39.0	152.5
Pith ovalis	/CA	14.0	256.0
Pith sphaerica	/CA	14.0	256.0
Praeglobotruncana stephani	/FP	97.3	110.5
Rota cushmani	/FP	97.3	109.8
Rota greenhornensis	/FP	97.3	97.3
Rota multiloculata	/FP	137.8	153.5
Baculites mariasensis	/AM	210.5	210.5
Coilopceras colleti	/AM	160.0	160.0
Coilopceras inflatum	/AM	160.0	166.0
Collignonicerias woollgari	/AM	152.5	152.5
Desmoceras elgini	/AM	14.0	14.0
Euhystrihoceras adkinsi	/AM	14.0	14.0
Mammites nodosoides	/AM	138.0	145.8
Masiaposites carinatus	/AM	160.0	187.5
Metoicoceras geslinianum	/AM	113.5	113.5
Prionocyclus hyatti	/AM	152.5	152.5
Prionocyclus wyomingensis	/AM	160.0	180.0
Pseudacompsoceras bifurcatum	/AM	14.0	14.0
Pseudocalycoceras dentonense	/AM	114.0	114.0
Sciponoceras gracile	/AM	113.5	113.5
Watinoceras coloradoense	/AM	115.0	115.0
Crem inconstans	/BI	210.5	220.7
Inoc fiegei	/BI	210.5	220.7
Inoc prefragilis	/BI	56.8	69.5
Lopha lugubris	/bi	160.0	180.0
Hemiaster bosei	/ec	160.0	180.0
Apteodinium deflandrei	/dn	10	10
Dapsilidinium laminaspinosum	/dn	10	10
Dinopterigium cladoides	/dn	10	10
Dorocysta litotes	/dn	10	10
Florentinia deanei	/dn	10	10
Horologinella incurvata	/dn	10	10
Isabelidinium acuminatum	/dn	147.6	165
Oligosphaeridium albertense	/dn	163.7	163.7
Senoniasphaera protrusa	/dn	145	145

*END

CEN.9 La Boca Canyon, Mexico

Masters, Kidson, Lewy and Scott ,1983, Amoco Production Company, Research Dept.. Report M83-G-2
Figs. 12, 20. Cuesta Del Cura fm. 0-200 ft; Agua Nueva Fm. 200-800 ft.

Data:

*TAXA	Morph	Base	Top	Feet
Clav subcretacea	/FP	450	450	
Glob'oides bentonensis	/FP	22	450	
Glob'oides cushmani	/FP	390	430	

Glob'oides ultramicrus	/FP	430	450
Globotruncana havanensis	/FP	510	510
Globotruncana renzi	/FP	680	800
Globotruncana sigali	/FP	480	736
Hedb loetterlei	/FP	390	680
Hedb planispira	/FP	22	680
Hedb simplicissima	/FP	50	680
Hedbergella washitensis	/FP	0	180
Heterohelix globulosa	/FP	305	800
Pith sphaerica	/CA	305	305
Planomalina buxtorfi	/FP	130	150
Praeglobotruncana delrioensis	/FP	130	450
Praeglobotruncana stephani	/FP	390	390
Rota appenninica	/FP	130	180
Rota cushmani	/FP	341	341
Rota deeckeii	/FP	325	430
Rota greenhornensis	/FP	390	430
*END			

CEN.10 Black Mesa Composite section, AZ

Kirkland 1991, GSA SP 260:85-913; Kirkland, 1996, New Mexico Museum Natural History & Science, Bull 9,131 p., 50 plates; Elder, 1987, Palaios 2:24-40. All measurements based on Lohali Point section Figs. 6, 11; 0-0.5 Uppermost Dakota Formation; Lower Shale Member is 0.5-55.0m; Middle Shale member 55.0-97.0m; Hopi Sandy Member 97.0-119.0m; Upper Shale Member 119.0-201.0m; base Toreva Formation is regional unconformity.

Data:

*TAXA	Morph	Base	Top Meters
Allocrioceras annulatum	/AM	6.3	10.5
Anisoceras coloradoense	/AM	13.9	14.1
Baculites yokoyamai	/AM	46.5	62.1
Calycoceras naviculare	/AM	6.0	6.0
Calycoceras obrieni	/AM	0.0	0.5
Collignonicerias woollgari	/AM	46.5	62.1
Cunningtonicerias novimexicanum	/AM	0.0	0.5
Eucalycoceras pentagonum	/AM	6.0	6.0
Euomphaloceras costatum	/AM	13.9	14.1
Euomphaloceras septemseriatum	/AM	6.3	10.5
Fagesia catinus	/AM	17.1	21.8
Kamerunoceras turoniense	/AM	26.4	46.5
Mammites nodosoides	/AM	26.4	46.5
Metaptychoceras reesidei	/AM	6.3	26.4
Metoicoceras geslinianum	/AM	6.0	10.5
Metoicoceras mosbyense	/AM	0.0	0.5
Moremanoceras scotti	/AM	6.0	6.0
Nanometoicoceras acceleratum	/AM	6.3	10.5
Neocardioceras juddii	/AM	13.9	14.1
Neocardioceras minutum	/AM	6.0	6.0
Prionocyclus hyatti	/AM	182.0	182.0
Pseudaspidoceras pseudonodosoides	/AM	13.9	14.1
Pseudocalycoceras angolaense	/AM	6.3	10.5
Puebloites sp.	/AM	26.4	46.5
Quitmanicerias reaseri	/AM	17.1	21.8
Scaphites larvaeformis	/AM	46.5	62.1
Scaphites patulus	/AM	46.5	62.1
Sciponoceras gracile	/AM	6.3	10.5
Sumitomoceras conlini	/AM	6.3	10.5
Vascoceras dartianum	/AM	6.0	6.0
Watinoceras coloradoense	/AM	17.1	26.4 ID as Watinoceras sp. cf.
praecursor @ 17.1 21.8			
Watinoceras devonense	/AM	21.8	26.4

Watinoceras hattini		/AM	26.4	46.5
Worthoceras vermiculus		/AM	6.3	10.5
Yezoites delicatulus		/AM	6.3	10.5
Inoc cuvieri		/BI	46.5	62.1
Inoceramus dimidius		/BI	202.0	202.0
Inoceramus flaccidus		/BI	202.0	202.0
Inoceramus flavus		/BI	6.3	10.5
Inoc howelli		/BI	202.0	202.0
Inoceramus nodai		/BI	6.3	10.5
Inoc pictus		/BI	6.0	14.1
Lopha bellaplicata		/BI	202.0	202.0
Mytiloides columbianus		/BI	17.1	46.5
Mytiloides hercynicus		/BI	46.5	62.1
Mytiloides labiatus		/BI	26.4	46.5
Mytiloides latus		/BI	46.5	62.1
Mytiloides mytiloides		/BI	26.4	46.5
Mytiloides mytiloides arcuata		/BI	26.4	46.5
Mytiloides opalensis		/BI	21.8	26.4
Mytiloides subhercynicus		/BI	26.4	46.5
Myti submytiloides		/BI	6.3	10.5
Pycnodonte newberryi		/BI	6.0	6.0
*Radiometric Date BM4	93.90+/-0.72	/MB	6.0	6.3
*Radiometric Date BM6	93.49+/-0.89	/MB	7.0	7.4
*Radiometric Date BM15	93.25+/-0.55	/MB	16.3	16.5
*Radiometric Date BM17	93.40+/-0.63	/MB	25.9	26.0
*END				

Coniac.1 Chalk Hill Road, Dallas, TX

Hancock and Walaszczyk, Cret Res 25 (2004) pp. 459-471. Arcadia Park Shales 0-18.8 m: Austin Chalk 18.8-22 m: Unconformity at 18.8 m.

DATA:

*Taxa	Morph Code	Base	Top (meters)	
Coilopoceras springeri	/am	1.0	1.0	
Prionocyclus hyatti	/am	1.0	16.0	
Prionocyclus macombi	/am	17.7	17.7	*id as cf.
Scaphites carlilensis	/am	1.0	1.0	
Lopha bellaplicata novamexicana	/bi	1.0	1.0	*id as cf.
Lopha bellaplicata	/bi	15.2	15.2	
*END				

Coniac.2 Bluff View, Dallas, TX

Hancock and Walaszczyk, Cret Res 25 (2004) pp. 459-471. Arcadia Park Shales 0-6.4 m: Austin Chalk 6.4-21 m: Disconformity at 6.4 m.

DATA:

*Taxa	Morph Code	Base	Top (Meters)
Prionocyclus macombi	/am	1.0	2.0
* id as cf.			
Prionocyclus wyomingensis	/am	4.0	4.0
Scaphites whitfieldi	/am	4.0	4.0
Cremnoceras deformis dobrogensis	/bi	8.0	8.0
Crem waltersdorfensis	/bi	6.8	6.8
Inoceramus erectus	/bi	6.9	6.9
Lopha bellaplicata	/bi	3.5	3.5
Mytiloides incertus	/bi	5.0	6.0
Mytiloides scupini	/bi	6.5	6.5
*END			

Coniac.3 Ten Mile Creek, Dallas, Tx
Hancock and Walaszczyk, Cret Res 25 (2004) pp. 459-471. Middle Coniacian 0-2.1 m: Upper Coniacian
2.1-3.7 m; unconformable contact. Proposed GSSP for base Santonian.

DATA:

*Taxa		Morph Base	Top meters	
Mytiloides stantoni	/bi	3.25	3.25	
Phrygia aucella	/bi	2.2	2.2	*Sp. ID inferred
Platyceramus mantelli	/bi	0.2	1.8	*id as ex gr.
Volvicceramus involutus	/bi	2.0	2.0	*Sp. ID inferred
*Nannos from Blair & Watkins, 2009, Cret. Res. 30:367-384, Fig. 3, p. 371, *stack so 2.1m in Hancock's section = 1.25m in Blair's section				
Amphyzygus megalops	/nn	3.45	3.45	
Orastrum campanensis	/nn	5.3	5.3	
Prediscosphaera desidero grandis	/nn	3.35	3.35	
Tortolithus dodkachelyon	/nn	3.6	3.6	
Watznaueria quadriradiata	/nn	5.1	5.1	*Acme zone
Cladoceramus undulatoplicatus	/bi	5.55	5.55	
*END				

COMPOSITED SECTION DATA FILES

BAPTCS.1 - Base Aptian Ammonite Composite Section

List of sections:

- BAPT.1 Tekedzhik section, Turkmenistan; serves as SRS, composited data in metric scale
- BAPT.4 Caniers section, France
- BAPT.5 Camerlots section, France
- BAPT.6 Highway A52 section, France
- BAPT.7 Le Brigadan section, France
- BAPT.8 Fourniers section, France

Composite Data:

Aetostreon latissimum	/BI	32.5395	121.5000
Ammonitoceras wassiliewskyi	/AM	121.5000	121.5000
Ancycloceras brevis	/AM	-14.3000	16.8800
Ancycloceras urbani	/AM	-5.8522	19.9500
Barremites spp.	/AM	2.5956	16.3232
Barremites strettostoma	/AM	2.5956	16.3232
Chelonicerias cornuelianum	/AM	61.2000	82.2105
Colchidites sp.	/AM	-1.3421	8.2400
Deshayesites antiquus	/AM	18.2300	26.8829
Deshayesites babaschensis	/AM	52.6053	73.8000
Deshayesites callidiscus	/AM	60.5000	79.9079
Deshayesites consobrinoides	/AM	59.8421	79.9079
Deshayesites consobrinus	/AM	37.0000	59.8421
Deshayesites dechy	/AM	49.2000	80.5658
Deshayesites deshayesi	/AM	59.8421	73.8000
Deshayesites euglyphus	/AM	37.0000	73.8000
Deshayesites gracilis	/AM	54.5789	54.5789
Deshayesites inflatus	/AM	59.8421	66.6842
Deshayesites kiliani	/AM	60.5000	61.2000
Deshayesites kudrjavzei	/AM	60.5000	79.9079
Deshayesites latilobatus	/AM	61.2000	61.2000
Deshayesites levigatus	/AM	59.8421	79.9079
Deshayesites luppovi	/AM	18.5000	60.5000
Deshayesites normani	/AM	49.2000	79.9079

Deshayesites ogranlensis	/AM	18.3947	26.3549
Deshayesites pappi	/AM	59.8421	61.2000
Deshayesites planus	/AM	49.2000	66.6842
Deshayesites primitivus	/AM	22.9540	22.9540
Deshayesites similis	/AM	49.2000	61.2000
Deshayesites topleyi	/AM	49.2000	73.8000
Deshayesites tuarkyricus	/AM	18.5000	52.6053
Deshayesites weissi	/AM	49.2000	66.6842
Deshayesites weissiformis	/AM	23.7150	33.2188
Dufrenoyia dufrenoyi	/AM	80.7000	82.2105
Dufrenoyia furcata	/AM	80.7000	80.7000
Dufrenoyia fursovae	/AM	80.7000	82.2105
Dufrenoyia sinzowi	/AM	80.7000	82.2105
Epiaster fourtaei	/EC	82.2105	82.2105
Epiaster toxasteroides	/EC	7.5395	66.4211
Epicheloniceras subnodosocostatum	/AM	112.2105	121.5000
Epicheloniceras tschernyschewi	/AM	112.2105	115.5000
Hemihoplites ex gp. ukensis	/AM	8.0000	8.0000
Hemihoplites ridzewskyi	/AM	8.0000	17.0789
Hemihoplites turkmenicus	/AM	8.0000	8.0000
Neithea neocomiensis	/BI	32.5395	80.2368
Pseudocrioceras coquandi	/AM	6.2915	17.3792
Pseudocrioceras duvalianum	/AM	5.7635	16.3232
Pseudocrioceras fasciculare	/AM	2.5956	17.4380
Pseudocrioceras provinciale	/AM	6.3200	17.3792
Pseudocrioceras waageni	/AM	-7.9642	15.2500
Pseudohaploceras liptoviense	/AM	18.3050	19.7150
Pseudohaploceras ramosum	/AM	18.5000	73.8000
Pseudosaynella fimbriata	/AM	61.2000	61.2000
Toxoceratoides royerianus	/AM	80.5658	80.7000
Turkmeniceras geokderense	/AM	8.0000	17.0789
Turkmeniceras multicosatum	/AM	8.0000	8.0000
Turkmeniceras rarecostatum	/AM	8.0000	8.2000
Turkmeniceras tumidum	/AM	8.0000	18.2300
Turkmeniceras turkmenicum	/AM	8.0000	8.0000

*END

BEERCS.1 - Beer, Devon UK Compositated Turonian Sections

List of sections:

BEER.1 Beer.1 Beer Roads Section, Turonian; used as SRS, metric scale.

BEER.2 Beer.2 Beer Quarries Section, Turonian

BEER.3 Beer.3 Hooken Cliffs Section, Turonian

Composite Data:

Achomosphaera ramulifera	2.9476	30.5000
Achomosphaera sagera	8.6064	9.8000
Aldorfina deflandrei	4.0000	28.6708
Batiacasphaera euteiches	7.4651	13.6000
Beer bed Branscombe Hardground	7.8000	***
Beer bed Common Hill Marl Hardground	18.8629	19.3293
Beer bed Hall Flint	11.8365	***
Beer bed Haven Cliff Hardground	2.0000	***
Beer bed Humble Point Hardground	1.0000	***
Beer bed Smugglers Cave Marl	28.6000	29.0000
Beer bed West Ebb Marl	3.4130	***
Callaiosphaeridium asymmetricum	8.6064	30.5000
Canningia reticulata	8.6539	10.5085
Canninginopsis colliveri	3.4130	19.2000

Cassiculosphaeridia reticulata	11.1267	17.8165
Cleistosphaeridium armatum	9.4000	30.5000
Cleistosphaeridium clavulum	5.4679	30.5000
Coronifera oceanica	12.4000	30.5000
Coronifera striolata	2.8000	30.5000
Cyclonephelium compactum	7.4651	7.4651
Cyclonephelium distinctum	2.8000	32.8462
Cyclonephelium membraniphorum	2.8000	30.5000
Dapsilidium pumilum	13.6000	16.9000
Endoscrinium campanula	9.4000	26.9000
Exochosphaeridium arnace	12.4000	12.4000
Exochosphaeridium bifidum	6.0000	30.5000
Exochosphaeridium phragmites	10.7463	30.5000
Florentinia buspina	4.6119	30.5000
Florentinia deanei	3.4130	16.9000
Florentinia ferax	4.0000	16.9000
Florentinia laciniata	9.4000	30.5000
Florentinia resex	11.8400	14.7000
Florentinia torulosa	9.1000	11.8400
Florentinia tridactylites	7.5000	7.5000
Heterosphaeridium difficile	7.4651	7.5000
Heterosphaeridium heteracanthum	2.8000	11.1267
Hystrichodinium pulchrum	4.0000	30.5000
Hystrichosphaeridium palmatum	2.8000	32.3000
Hystrichosphaeridium tubiferum	4.0000	32.8462
Hystrichostrogylon membraniphorum	2.8000	30.5000
Kallosphaeridium ringnesiorum	4.0000	7.5000
Kiokansium polypes	9.4000	15.4000
Kleithriasphaeridium readei	9.4000	30.5000
Leberidocysta defloccata	8.6064	30.5000
Mammmites nodosoides	6.2287	6.2287
Microdinium crinitum	9.4000	9.4000
Microdinium ornatum	2.8000	32.3000
Microdinium reticulatum	26.9000	26.9000
Mytiloides opalensis	6.2287	6.2287
Odontochitina costata	2.8000	32.8462
Odontochitina operculata	4.0000	32.8462
Oligosphaeridium complex	2.8000	32.8462
Oligosphaeridium prolixispinosum	9.4000	16.9000
Palaeohystrichophora infusorioides	2.8000	30.5000
Palaeostomocystis reticulata	9.4000	30.5000
Pervosphaeridium truncatum	11.8400	26.9000
Prolixosphaeridium conulum	7.5000	12.9996
Pterodinium cingulatum	3.4130	26.9000
Rhiptocorys veligera	14.7000	26.9000
Senoniasphaera microreticulata	12.4000	32.3000
Senoniasphaera rotundata	3.4130	32.8462
Spiniferites multibrevis	2.8000	26.9000
Spiniferites ramosus gracilis	7.5000	30.5000
Spiniferites ramosus ramosus	3.4130	32.3000
Spiniferites ramosus reticulatus	9.4000	9.4000
Surculosphaeridium longifurcatum	16.9000	16.9000
Tanyosphaeridium variecalamus	2.8000	30.5000
Trichodinium castanea	2.8000	30.5000
Watinoceras coloradoense	3.8511	3.8511
Xenascus ceratioides	4.0000	16.9000

Xiphophoridium alatum 4.0000 26.9000
 *END

MURAL.1 - Lampazos, Sonora Section

Mural 1 Lampazos Area Composite Section; Scott & Gonzalez-Leon, 1991, GSA Spec. Paper 254, p.52-67. Sections 2 and 4 are stacked on base of Espinazo Del Diablo Fm. at 1090 m in #2. New taxa to midk4.dct not included.

Composite Data:

*TAXA	Morph	Base	Top meters above base of #2
*Arabicodium texana	/al	1090	1140
Boueina hochstetteri	/al	930	1385
Barkerina barkerensis	/fb	1130	1450
Coskinolinoides texanus	/fb	1100	1385 *top ID ?
Cuneolina walteri	/fb	1385	1450
Dictyoconus walnutensis	/fb	1090	1140
Orbitolina lenticularis	/fb	75	75
Orbitolina subconcava	/fb	1100	1325 base ID ?
Orbitolina texana	/fb	750	800
Pseudocyclamma hedbergi	/fb	1090	1140
Pseudonummoloculina heimi	/fb	1090	1385
Caprinuloidea perfecta	/bi	1090	1450
Ceratostreon texana	/bi	1050	1070
Chondrodonta munsoni	/bi	1090	1140
Texicaprina vivari	/bi	1090	1450
Engonoceras belviderense	/am	1610	1610
Dufrenoyia justinae	/am	265	265
*Cladophyllia furcifera	/co	1090	1140
*Columnocoenia ksiazkiewiczzi	/co	1100	1140
Marker bed Al SB WA 1	/mb	1451	*
Marker bed Ap SB PR 1	/mb	153	*

*END

MURALCS.1 - Mural Composite of Sonora Sections

List of sections:

MURAL.8 Rancho Bufalo Section, Sonora; serves as SRS scale in meters
 MURAL.2 Santa Ana Section, Sonora
 MURAL.3 Cerro Pimas Section, Sonora
 MURAL.4 El Ocuca Section, Sonora
 MURAL.5 Grassy Hill, Arizona
 MURAL.6 Paul Spur East Face, Arizona
 MURAL.7 Tuape Section, Sonora

Composite Data:

*TAXA	Morph	Base	Top csu
Acicularia americana	/al	546.0145	546.0145
Aetostreon latissimum	/bi	276.0000	705.3333
Amphidonte obliquata	/bi	40.0000	560.5278
Arabicodium texana	/al	46.0000	659.3478
Bacinella irregularis	/al	474.8442	478.9609
Buchotrigonia reesidei	/bi	442.5362	508.5303
Ceratostreon tuberculiferum	/bi	560.5278	560.5278
Chondrodonta glabra	/bi	512.1206	571.5390
Coalcomana ramosa	/bi	471.4556	659.3478
Colomiella recta	/ca	466.3000	466.3000
Colomiella tunesiana	/ca	466.3000	632.0000

Cucullaea gratiota	/bi	442.5362	523.0833
Cuneolina walteri	/fb	531.3688	601.4493
Douvilleiceras mammillatum	/am	468.8121	468.8121
Eodouvilleiceras adkinsi	/am	262.2011	262.2011
Favusella washitensis	/fp	616.0000	632.0000
Gervillaria alaeformis	/bi	442.5362	442.5362
Globochaeta alpina	/al	466.3000	531.3688
Hedbergella delrioensis	/fp	615.0000	615.0000
Immunitoceras immunitum	/am	291.4889	307.6449
Lingulogavelinella albiensis	/fb	467.0767	551.0355
Lithocodium aggregatum	/al	491.8116	654.4203
Orbitolina texana	/fb	466.0667	659.3478
Ostrea riograndensis	/bi	328.9500	705.3333
Paracoskinolina sunnilandensis	/fb	498.4000	654.4203
Parahoplites fasciculatus	/am	366.4111	366.4111
Pisotrigonia amsburyi	/bi	20.0000	27.0000
Pith sphaerica	/ca	466.3000	540.7837
Polystrata alba	/al	470.9605	523.6277
Pseudonummolocolina heimi	/fb	531.3688	697.6986
Pseudocyclammina hedbergi	/fb	444.7518	697.6986
Pseudolithothamnium album	/al	524.4565	524.4565
Pycnoporidium lobatum	/al	498.4000	498.4000
Quadratrigonia guildi	/bi	442.5362	508.5303
Rutitrigonia weaveri	/bi	442.5362	442.5362
Scabrotigonia stolleyi	/bi	293.4783	523.0833
Texicaprina vivari	/bi	***	***

*END

PECOSCS.1 - Pecos River Comp. Std. Section, TX

List of sections :

- PECOS.5 Harkell Canyon Section, SRS (Kerans section 5 in 1999 SEPM Guidebook, # 5)
- 1 Ft. Stockton Composite (Scott & Kidson, 1977, BEG, U Tx, Rpt. Invest. 89, p.173)
- 2 Hwy 90 Section (Scott, 1990, SEPM Concepts Series v. 2, p.67; composited lower section from core ID-1 in Kerans 1999 correlation chart)
- 3 US Highway 90 Bridge (Kerans section CK.3 in 1999 SEPM Guidebook, p. 93)
- 4 Ladder Section (Kerans section 4 in 1999 SEPM Guidebook, p. 93)
- 6 Painted Canyon Section (Kerans section in 1999 SEPM Guidebook, p. 16, fig. 7)
- 7 Lewis Canyon Section (Kerans section in 1999 SEPM Guidebook, p. 81, fig. L8)
- 8 Section 2-16-1 (Kerans section 8 in 1999 SEPM Guidebook, p. 85)
- 9 Deadman Canyon Section (Kerans section 9 in 1999 SEPM Guidebook, p. 89)
- 10 Hoodoo Canyon Section (Kerans section in 1999 SEPM Guidebook, pl. 10)
- 11 Railroad Bridge (Kerans section WFLZ in 1999 SEPM Guidebook, p. PC90-8)

Composite Data:

*TAXA	Morph	Base	Top csu
AL SEQ 18	/mb	***	0.0000
AL SEQ 19	/mb	0.0000	113.5246
AL SEQ 20	/mb	113.0000	145.0000
AL SEQ 21	/mb	145.0000	200.0000
AL-CEN SEQ 1	/mb	200.0000	258.0000
AL-CEN SEQ 2	/mb	258.0000	290.0000
Acicularia sp.	/al	212.1728	213.0204
Adkinsites bravoensis	/am	-9.8223	-9.8223
Adkinsites diazi	/am	-9.8223	-9.8223
Adkinsites imlayi	/am	1.0809	1.0809
Barkerina barkerensis	/fb	223.8696	251.2172
Boueina hochstetteri	/al	115.7013	184.0991
Budaiceras hyatti	/am	290.2294	300.1169
Ceratostreon texana	/bi	-124.3060	1.0809
Ceratostreon walkeri	/bi	193.4448	193.4448

Chondrodonta glabra	/bi	30.1333	121.3934
Chondrodonta munsoni	/bi	30.1333	121.3934
Coenholectypus planatus	/ec	-112.6240	1.0809
Coskinolinooides texanus	/fb	-124.3060	246.5432
Craginites serratascens	/am	13.5385	31.4542
Cribratina texana	/fb	291.8444	***
Cucullaea recedens	/bi	-22.2831	-22.2831
Cuneolina walteri	/fb	-124.3060	251.2172
Cyprimeria texana	/bi	-9.8223	***
DEL RIO SEQ	/mb	290.1800	293.6634
Dicyclina schlumbergeri	/fb	218.6667	218.6667
Drakeoceras lasswitzi	/am	82.8550	82.8550
Drakeoceras wintoni	/am	82.8550	94.5370
Engonoceras belviderense	/am	-9.8223	***
Eopachydiscus brazoense	/am	37.6846	54.7219
Eoradiolites davidsoni	/bi	83.5503	246.8489
Hedb delrioensis	/fp	133.1558	293.8548
Hedbergella washitensis	/fp	135.9778	293.8548
Hete globulosa	/fp	128.2343	301.4352
Heteraster mexicanus	/ec	-22.2831	-9.8223
Homomya budaensis	/bi	53.2606	68.0578
Homomya tarrantensis	/bi	-22.2831	***
Idiohamites fremonti	/am	31.4542	31.4542
Idiohamites varians	/am	31.4542	***
Ilmatogyra arietina	/bi	290.1965	291.8448
Kimbleia albrittoni	/bi	114.7049	246.8489
Kimbleia capacis	/bi	112.3443	228.4908
Lopha quadriplicata	/bi	137.3711	140.5070
Lopha subovata	/bi	-9.8223	116.3435
Ludbrookia arivechensis	/bi	-112.6240	-22.2831
Lunatia pedernalis	/ga	-22.2831	-22.2831
Manuaniceras carbonarium	/am	-27.6450	-27.6450
Manuaniceras powelli	/am	-27.6450	-27.6450
Manuaniceras supani	/am	-26.9559	***
Marker bed AI SB WA 1	/mb	***	0.0000
Marker bed AI TS WA 3	/mb	***	113.0000
Marker bed AI TS WA 4	/mb	***	145.0000
Marker bed AI TS WA 5	/mb	***	200.0000
Marker bed Ce TS WA 6	/mb	***	290.0000
Mexicaprina cornuta	/bi	148.4375	177.0833
Mexicaprina minuta	/bi	199.0701	246.6214
Micritosphaera ovalis	/al	25.0000	213.6049
Mortoniceras equidistans	/am	68.0578	68.0578
Mortoniceras nodosa	/am	13.5418	13.5418
Neithea occidentalis	/bi	-112.6240	-9.8223
Neithea texana	/bi	30.1333	197.3388
Neomeris cretacea	/al	149.0531	149.0531
Nezzazata simplex	/fb	212.1728	212.1728
Ostrea perversa	/bi	177.0899	177.0899
Paracoskinolina coogani	/fb	27.7170	272.0000
Peilinia quadriplicata	/bi	140.5070	140.5070
Permocalculus irenae	/al	-124.3060	272.0000
Pervinqueria smedalae	/am	82.8550	82.8550
Pholadomya sanctae-sabae	/bi	-112.6240	184.0991
Pith ovalis	/ca	134.2275	301.4352
Pith sphaerica	/ca	56.7811	301.4352
Polystrata alba	/al	251.0352	***
Praeglobotruncana delrioensis	/fp	293.1133	***
Prohysterocheras burckhardites	/am	53.2606	116.3435
Protocardia filosa	/bi	-9.8223	-9.8223
Protocardia multistriata	/bi	-112.6240	106.9979
Pseudocyclammina hedbergi	/fb	-100.9420	172.2523

Pseudonummoloculina heimi	/fb	-100.9420	251.2208
Pycnoporidium lobatum	/al	149.0531	149.0531
Salpingoporella sp.	/al	115.7013	115.7013
Streptalveolina mexicana	/fb	115.7013	251.2208
Tapes whitei	/bi	-9.8223	94.5370
Texi mucronata	/bi	-112.6240	***
Texi pitcheri	/bi	1.0809	31.4542
Texi washitaensis	/bi	31.4542	197.3944
Texicaprina vivari	/bi	111.1639	***
Turritella leonensis	/ga	82.8550	***
Tylostoma elevatum	/ga	-112.6240	197.3388
Venezoliceras acutocarinatum	/am	-26.9559	***

*END

WOODCS.1 - Tur-Con Comp. Std. Section, N. Germany

List of sections:

WOOD.1 Salzgitter-Salder Quarry (SRS); Wood et al., 1984, Bull. Geol. Soc. Denmark, 33:225-238.
Proposed reference section for base of Coniacian (Kauffman et al. 1996, Bull. Inst. Roayl Sci. Nat. Belgique, Sci. de la Terre Aardwet. v. 66-Supp. 81-94); Base Coniacian=base Crem rotundatus @ 207m;
WOOD.2 Floteberg section; WOOD.3 Staffhorst section; WOOD.4 Sohlde Dammann section.

Composite Data:

*TAXA	Morph	Base	Top csu in meters
Crem hannoverensis	/bi	204.0000	236.6643
Crem inconstans	/bi	236.0000	237.8214
Crem rotundatus	/bi	207.0000	221.6214
Crem waltersdorfensis	/bi	206.5000	231.0000
Didymotis I	/bi	199.0000	205.3200
Didymotis II	/bi	206.0000	209.3443
Echinocorys gravesi	/ec	90.7738	90.7738
Eprolithus septenarius	/nn	202.0000	202.0000
Hyphantoceras reussianum	/am	126.0000	120.8111
Inoc apicalis	/bi	50.0000	54.0000
Inoc costellatus	/bi	56.0000	126.0000
Inoc cuvieri	/bi	50.0000	54.0000
Inoc deformis	/bi	241.8714	246.5000
Inoc erectus	/bi	215.0000	231.0000
Inoc lamarcki	/bi	50.0000	54.0000
Marker bed Tu Marl Bed D2	/mb	94.4000	94.4000
Marker bed Tu Marl Bed E	/mb	103.0000	103.3000
Marker bed Tu Marl Bed G	/mb	147.1454	147.1454
Marker bed Tu Tuff Bed C	/mb	51.0000	51.0000
Marker bed Tu Tuff Bed D1	/mb	72.0000	73.1879
Marker bed Tu Tuff Bed D2	/mb	93.0000	90.6212
Marker bed Tu Tuff Bed E	/mb	100.0000	100.1303
Marker bed Tu Tuff Bed F	/mb	145.0000	148.9807
Marker bed Tu Tuff Bed G	/mb	148.0000	153.0050
Marthasterites furcatus	/nn	103.0000	103.3000
Micraster bucailli	/ec	149.0000	154.3464
Micraster cortestudinarium	/ec	224.5000	226.0000
Mytiloides fiegei	/bi	128.0000	128.0000
Mytiloides frechi	/bi	199.0000	206.0000
Mytiloides lusatiae	/bi	199.0000	206.0000
Scaphites geinitzii	/am	126.0000	120.8111
Sternotaxis planus	/ec	56.0000	70.0182

*END

TATRACS.1

List of sections:

Tatra.1 Posrednie III Section, 19deg48.10'E, 49deg15.30'N; Kryta Valley, Western Tatra Mountains, Poland; Grabowski & Pszczolkowski, 2006, Cret. Res. 27:398-417, Fig. 4. Jasenina Fm. 0-14m; Osnica Fm. 14-45m; Koscieliska Marl 45-50m top section. Tithonian-Berriasian boundary at LO *C. brevis* & *C. intermedia* at 12.5m. Tatra.2 Posrednie II Section, 19deg48.15'E, 49deg15.30'N; Kryta Valley, Western Tatra Mountains, Poland; Fig. 5. Osnica Fm. 0-29m top section. Tatra.3 Rowienka Section, 19deg51'E, 49deg16.45'N; Lejowa Valley, Western Tatra Mountains, Poland; Fig. 6. Osnica Fm. 0-9.5m; Koscieliska Marl Fm. 9.5-38m top section.

Composite Data:

*TAXA	Base	Top csu in meters
Borzaiella atava	42.2000	45.7500
Calpionella alpina	7.5000	50.6250
Calpionella elliptica	29.1429	44.8000
Calpionellites coronata	46.3203	49.0053
Calpionellites darderi	45.7500	49.9083
Calpionellites major	46.3440	50.6250
Calpionellopsis oblonga	45.7500	50.6250
Calpionellopsis simplex	43.6875	49.0312
Chitinoidea boneti	6.3467	8.1600
Chitinoidea dobeni	5.5533	6.3467
Chitinoidea slovenica	5.5533	6.3467
Crassicollaria brevis	7.5000	18.1333
Crassicollaria colomi	11.3333	18.1333
Crassicollaria intermedia	7.5000	18.1333
Crassicollaria massutiniana	7.5000	18.1333
Crassicollaria parvula	7.5000	43.7813
Dobeniella bermudezi	6.3467	8.1600
Dobeniella cubensis	6.3467	8.1600
Lorenziella hungarica	46.3875	49.0312
Lorenziella plicata	17.0886	49.0312
Magnetochron M16n	***	50.0000
Magnetochron M16r	***	44.0000
Magnetochron M17n	***	42.0000
Magnetochron M17r	***	36.0000
Magnetochron M18n	***	24.0000
Magnetochron M18r	***	21.0714
Magnetochron M19n	***	18.0000
Magnetochron M19r	***	9.0000
Magnetochron M20n	***	7.0000
Magnetochron M20r	***	2.0000
Praetintinnopsella andrusovi	5.4000	9.0667
Remaniella borzai	34.0000	44.3767
Remaniella cadischiana	34.0000	49.6875
Remaniella catalanoi	21.5040	41.7090
Remaniella colomi	25.2857	43.9189
Remaniella dadayi	45.7500	50.4844
Remaniella duranddelgai	25.2857	34.0000
Remaniella ferasini	21.5333	42.6070
Remaniella filipescui	45.7500	48.3750
Remaniella murgeanui	45.7500	49.1250
Sturiella oblonga	45.5211	45.5211
Tintinnopsella carpathica	9.0000	50.6250
Tintinnopsella longa	43.9189	50.2500
Tintinnopsella remanei	3.0720	9.2160

*END

LOWER CRETACEOUS DATA FILES (LOK)

LOK.1 DSDP 534

Blake Plateau, Offshore Florida, 28deg20.6'N, 75deg22.9'W;
 Sheridan, R. E., et al., 1983, Initial Reports DSDP 76, Washington, U.S. Govt. Printing Office. Depth seafloor 4976 m, penetration 1666.5 m, cored section 1130.2 m; 56% recovery; Basalt basement @ 1635 m; Blake Ridge Fm.-Pleist-Mio; 696 m top Bermuda Rise Fm., Eoc; 723.5 m top Plantagenet Fm., Eoc; 764.5 m top Hatteras Fm.; 950 m top Blake-Bahama Fm., Berrias.-Barrem.; 1342 m top Cat Gap Fm., Jurassic; 1635 mbsf basalt.

Taxa	Morph	Base	Top mbsf
Chronozones from Ogg, 1983, DSDP 76 Init. Repts., p. 685-697.			
Magnetostratigraphy M16n	/ma	*	-1264.2
Magnetostratigraphy M16r	/ma	*	-1269.8
Magnetostratigraphy M17n	/ma	*	-1277.0
Magnetostratigraphy M17r	/ma	*	-1283.9
Magnetostratigraphy M18n	/ma	*	-1314.3
Magnetostratigraphy M18r	/ma	*	-1323.9
Magnetostratigraphy M19n	/ma	*	-1329.2
Magnetostratigraphy M19r	/ma	*	-1357.0
Magnetostratigraphy M20n	/ma	*	-1365.6
Magnetostratigraphy M20r	/ma	*	-1374.0
Remane, 1983, DSDP 76, p. 561-566; zone boundaries not definable			
Calpionella alpina	/ca	-1350.3	-1307.0
Crassicollaria intermedia	/ca	-1350.3	-1350.1
Crassicollaria massutiniana	/ca	-1348.0	-1348.0
Crassicollaria parvula	/ca	-1352.9	-1326.7
Tintinnopsella carpathica	/ca	-1350.3	-1323.9
Roth, 1982, Init. Repts. DSDP, 76, p. 587ff.			
Bergen '94, J. Nannoplankton Res., 16:59-69; selected data only			
Acaenolithus vimineus	/nn	-981.5	-963.0
Amphizygus brooksii	/nn	-1075.0	-979.0
Axopodorhabdus dietzmannii	/nn	-1202.0	-950.7
Biscutum constans	/nn	-1305.5	-950.0
Braarudosphaera regularis	/nn	-1047.6	-1047.6
Bukryolithus ambiguus	/nn	-1211.5	-950.7
Calcicalathina oblongata	/nn	-1239.5	-975.5
*Bergen '94; FO = base Val/ LO = mid Barr, Mutterlose, '92			
Chiastozygus bilamellus	/nn	-1233.5	-1137.4
Chiastozygus striatus	/nn	-1075.0	-972.5
Chiastozygus tenuis	/nn	-1224.5	-1143.6
Conusphaera mexicana	/nn	-1340.0	-950.0
Corollithion geometricum	/nn	-1139.5	-974.5
Cretarhabdus conicus	/nn	-1287.5	-950.0
Cruciellopsis cuvillieri	/nn	-1268.0	-1020.5*Bergen '94 top pick
Cruciplacolithus furtivus	/nn	-1075.0	-1011.8
Cruciplacolithus salebrosus	/nn	-1264.0	-1196.4
Cyclagelosphaera deflandrei	/nn	-1340.0	-1220.0
*Bergen '94 picked top; Roth picked top at 1130.0			
Cyclagelosphaera margerelii	/nn	-1340.0	-950.0
Diadorhombus rectus	/nn	-1222.5	-1026.8
Diazomatolithus lehmanii	/nn	-1325.6	-950.0
Diloma placinum	/nn	-1110.6	-1107.5
Discorhabdus ignotus	/nn	-1287.2	-950.0
Ethmorhabdus hauterivianus	/nn	-975.5	-975.5*Bergen '94
Gaarderella granulifera	/nn	-965.7	-950.7
Grantarhabdus meddii	/nn	-1170.8	-1056.8
Haqius circumradiatus	/nn	-1289.0	-950.0
*Bergen '94; Roth picked base at 1176.2			
Hayesites radiatus	/nn	-1064.3	-953.1
Helenea chiastius	/nn	-1280.0	-950.0

Hexalithus noelae	/nn	-1340.0	-1331.2
Lithastrinus septentrionalis	/nn	-1075.0	-950.0
Lithraphidites bollii	/nn	-1119.5	-993.5
*Bergen '94; FO = mid Haut, Mutterlose, '92			
Lithraphidites carniolensis	/nn	-1334.1	-950.0
Manivitella pemmatoidea	/nn	-1277.0	-950.0
Micrantholithus obtusus	/nn	-1139.0	-972.7
Nannoconus bermudezii	/nn	-1206.8	-950.0
Nannoconus boletus	/nn	-1067.8	-1067.8
Nannoconus bonetii	/nn	-1107.8	-1107.8
Nannoconus broennimannii	/nn	-1331.2	-1269.0
Nannoconus bucheri	/nn	-1137.6	-950.0
Nannoconus colomii	/nn	-1340.0	-950.0
Nannoconus cornutus	/nn	-1093.8	-1093.8
Nannoconus globulus	/nn	-1334.1	-950.0
Nannoconus steinmannii	/nn	-1332.5	-1332.5*Bergen '94
Octopodorhabdus decussatus	/nn	-1232.2	-1196.4
Octopodorhabdus polytretus	/nn	-1058.7	-1008.5
Octopodorhabdus reinhardtii	/nn	-1135.5	-1101.7
Parhabdolithus achlyostaurion	/nn	-1261.3	-1233.5
Parhabdolithus infinitus	/nn	-1189.2	-950.0
Parhabdolithus swinnertonii	/nn	-1233.5	-1076.8
Polycostella senaria	/nn	-1305.6	-1305.6
Polypodorhabdus madingleyensis	/nn	-1337.4	-1058.8
Reinhardtites fenestratus	/nn	-1268.8	-950.0
Retecapsa angustiforata	/nn	-1331.0	-950.0
*Bergen '94; Roth picked base at 1276.9			
Retecapsa levis	/nn	-966.2	-960.9
Retecapsa neocomiana	/nn	-1292.0	-1089.8
Rhabdolekiskus parallelus	/nn	-1075.0	-966.2
Rhagodiscus asper	/nn	-1340.0	-950.0
Rhagodiscus eboracensis	/nn	-1148.8	-1148.8
Rhagodiscus splendens	/nn	-1289.9	-950.0
Rotelapillus laffittei	/nn	-1289.6	-950.0
Rotelapillus radians	/nn	-1301.1	-1301.1
Rucinolithus irregularis	/nn	-981.5	-958.7
*FO = Barr/Apt, Mutterlose, '92			
Rucinolithus terebrodentarius	/nn	-981.5	-981.5
*Bergen '94			
Rucinolithus wisei	/nn	-1260.5	-1203.5
*Bergen '94			
Sollasites horticus	/nn	-1268.8	-1196.4
Sollasites lowei	/nn	-972.5	-972.5
Speetonia colligata	/nn	-1271.8	-1008.5
*Bergen '94 picked top at 1001.0; LO = top Haut, Mutterlose, '92			
Stradneria crenulata	/nn	-1296.8	-950.0
Tegumentum stradneri	/nn	-1058.7	-959.4
Tetrapodorhabdus coptensis	/nn	-1099.2	-959.4
Tranolithus gabalus	/nn	-951.7	-950.6
Tubodiscus verenae	/nn	-1229.5	-1107.5
Vagalapilla stradneri	/nn	-1287.5	-950.0
Vekshinella angusta	/nn	-1113.9	-992.5
Watznaueria barnesae	/nn	-1340.0	-950.0
Watznaueria biporta	/nn	-1170.0	-950.7
Watznaueria britannica	/nn	-1340.0	-950.0
Watznaueria communis	/nn	-1340.0	-950.0
Watznaueria oblonga	/nn	-1155.8	-954.5
Watznaueria supraretacea	/nn	-1107.7	-951.7
Zeugrhabdotus embergeri	/nn	-1340.0	-950.0
Zygodiscus diplogrammus	/nn	-1221.0	-950.0
Zygodiscus elegans	/nn	-1268.0	-950.0
Zygodiscus erectus	/nn	-1340.0	-1001.0*Bergen '94 top pick
*Habib & Drugg, 1983, DSDP 76:623-635, Fig. 2			

Achomosphaera neptuni	/dn	-1235.3	-1113.9
Aldorfia dictyotum	/dn	-1176.3	-1176.3
Amphorula metaelliptica	/dn	-1283.5	-1243.1
Biorbifera johnewingii	/dn	-1287.5	-1205.1
Callaiosphaeridium asymmetricum	/dn	-1080.9	-950.0
Chlamydophorella membranoidea	/dn	-1113.	-1113.9
Chlamydophorella nyei	/dn	-975.0	-950.0
Circulodinium distinctum	/dn	-1277.0	-950.0
Cometodinium? whitei	/dn	-954.5	-954.5
Coronifera oceanica	/dn	-1066.3	-950.0
Crassiculosphaeridia reticulata	/dn	-975.0	-950.0
Cribroperidinium sepimentum	/dn	-1080.9	-950.0
Dapsilidinium warrenii	/dn	-1252.0	-966.8*=Polysphaeridium
Dicanthum hollisteri	/dn	-1287.5	-950.0
Dingodinium cerviculum	/dn	-1252.0	-950.0
Druggidium apicopaucicum	/dn	-1243.1	-1080.9
Druggidium deflandrei	/dn	-1193.4	-950.0
Druggidium rhabdoreticulatum	/dn	-1099.2	-950.0
Endoscrinium campanula	/dn	-1277.0	-950.0*=Scrinodinium
Escharisphaeridia pocockii	/dn	-1287.5	-1287.5
Gonyaulacysta helicoidea	/dn	-1340	-950.0
Hystriodinium voigtii	/dn	-1277.0	-966.8
Kiokansium polypes	/dn	-1243.1	-950.0*=Bacchidinium
Muderongia simplex	/dn	-1283.4	-1243.1
Muderongia staurota	/dn	-1091.4	-966.8
Odontochitina operculata	/dn	-1080.9	-950.0
Oligosphaeridium complex	/dn	-1176.2	-950.0
Oligosphaeridium pulcherrimum	/dn	-1205.1	-1066.3
Pareodinia ceratophora	/dn	-1322.2	-1322.2
Phoberocysta neocomica	/dn	-1340	-966.8
Polygonifera evittii	/dn	-1322.2	-1322.2
Pseudoceratium pelliferum	/dn	-1283.5	-1113.9
Scriniodinium attadalense	/dn	-1176.2	-950.0
Spiniferites dentatus	/dn	-1066.3	-950.0
Spiniferites ramosus	/dn	-1192.0	-950.0
Subtilisphaera perlucida	/dn	-1073.2	-950.0
Subtilisphaera tuerrula	/dn	-1080.9	-950.0
Systematophora fasciculigera	/dn	-1218.5	-1218.5
Tanyosphaeridium salpinx	/dn	-1302.5	-950.0
Tanyosphaeridium variecalamus	/dn	-1073.2	-950.0
Walloodinium cylindrica	/dn	-1243.1	-950.0 =Prismatocystis
Walloodinium krutzschii	/dn	-1277.0	-950.0

*END

LOK.2 DSDP 535

Eastern Gulf of Mexico, 23 deg 42.48'N, 84 deg 30.97'W; Buffler, R. T., et al., 1984, Initial Reports DSDP 77, Washington (U.S. Govt. Printing Office). Depth seafloor 3450 mbsf, penetration 714 m, cored section 714 m; 71% recovery; Top unit I @ 0 m, Holocene-Pleistocene; top Unit II 154.3 mbsf, Cen?-U. Alb?; top Unit III @ 387.5 mbsf, Alb?-upper Haut.; top Unit IV @ 466.55 mbsf, Haut-lower Valangin.; top Unit V @ 613.2 mbsf, Valangin.-upper Berrias. Berr/Val boundary between 692.93-692.89 at base of *R. dadayi* & *R. cadischiana*.

Taxa	Morph	Base	Top mbsf
*Ammonites by K. Young, 1984, p. 695-700; data not added to composite.			
*Acompsoceras sp.	/am	-297.3	-278.9
*Scaphites simplex	/am	-419.0	-419.0 Id as n. sp., aff.
*Stomohamites virgulatus	/am	-419.0	-319.0 Id as sp. cf.
*Karakaschiceras biasalense	/am	-667.5	-667.5 Id as sp. cf.
*Bochianites oosteri	/am	-667.5	-667.5 Id as sp. cf. too low
Cherchi & Schroeder, 1984, p. 585-587 - transported, reworked??			
Dictyoconus walnutensis	/fb	-202.2	-200.6

Paracoskinolina sunnilandensis	/fb	-202.0	-202.0*Id as cf.
Orbitolina texana	/fb	-202.2	-200.6
	Premoli Silva & McNulty, 1984, p. 547-584		
Calpionella alpina	/ca	-706.8	-684.0
Calpionellites darderi	/ca	-683.7	-641.0
Calpionellopsis oblonga	/ca	-706.8	-641.0
Calpionellopsis simplex	/ca	-714.0	-706.8
Lorenziella hungarica	/ca	-706.8	-684.0
Remaniella cadischiana	/ca	-692.8	-692.8
Remaniella dadayi	/ca	-692.8	-692.8
Tintinnopsella carpathica	/ca	-706.8	-641.0
Tintinnopsella longa	/ca	-706.8	-641.0
	Premoli Silva & McNulty, 1984, p. 547-584		
Globuligerina hoterivica	/fp	-570.6	-429.9
Gubkinella graysonensis	/fp	-524.9	-524.9
	Watkins & Bowdler, 1984, p. 649-674		
Axopodorhabdus dietzmannii	/nn	-674.9	-443.6
Discorhabdus ignotus	/nn	-674.9	-437.0
Biscutum ellipticum	/nn	-437.0	-437.0
Braarudosphaera regularis	/nn	-474.7	-474.7
Calcicalathina oblongata	/nn	-648.2	-437.0
Chiastozygus striatus	/nn	-520.6	-443.6
Corollithion ellipticum	/nn	-537.8	-537.8
Corollithion signum	/nn	-537.8	-537.8
Cretarhabdus conicus	/nn	-674.9	-437.0
Cretarhabdus loriei	/nn	-543.9	-437.0
Cribrosphaerella ehrenbergii	/nn	-537.8	-537.8
Cruciellopsis cuvillieri	/nn	-707.6	-443.6
Cyclagelosphaera deflandrei	/nn	-707.6	-437.0
Cyclagelosphaera margerelii	/nn	-707.6	-437.0
Diadorhombus rectus	/nn	-613.2	-575.5
Diazomatolithus lehmannii	/nn	-707.6	-437.0
Discorhabdus biradiatus	/nn	-458.8	-451.7
Ethmorhabdus gallicus	/nn	-707.6	-466.7
Grantarhabdus meddii	/nn	-530.6	-530.6
Hagius circumradiatus	/nn	-611.3	-437.0
Hayesites atlanticus	/nn	-520.6	-451.7
Hayesites radiatus	/nn	-466.7	-437.0
Helenea chiastius	/nn	-674.9	-437.0
Lithraphidites bollii	/nn	-466.7	-437.0
Lithraphidites carniolensis	/nn	-707.6	-437.0
Manivitella pennatoidea	/nn	-648.2	-437.0
Micrantholithus hoschulzii	/nn	-674.9	-437.0
Micrantholithus obtusus	/nn	-707.6	-437.0
Nannoconus bermudezii	/nn	-565.5	-437.0
Nannoconus broennimannii	/nn	-707.6	-437.0
Nannoconus colomii	/nn	-707.6	-437.0
Nannoconus cornutus	/nn	-693.7	-437.0
Nannoconus kamptneri	/nn	-512.3	-437.0
Nannoconus steinmannii	/nn	-707.6	-437.0
Parhabdolithus infinitus	/nn	-613.2	-458.8
Reinhardites elegans	/nn	-520.6	-443.6
Reinhardites fenestratus	/nn	-674.9	-437.0
Retecapsa angustiforata	/nn	-707.6	-437.0
Rhagodiscus angustus	/nn	-466.7	-466.7
Rhagodiscus asper	/nn	-707.6	-437.0
Rhagodiscus reightonensis	/nn	-530.6	-443.6
Rotelapillus laffittei	/nn	-707.6	-437.0
Rucinolithus wisei	/nn	-707.6	-512.3
Speetonia colligata	/nn	-707.6	-466.7
Stradneria crenulata	/nn	-674.9	-437.0
Tranolithus salillium	/nn	-707.6	-474.7
Tubodiscus verenae	/nn	-658.0	-537.8

Vekshinella stradneri	/nn	-707.6	-437.0
Watznaueria barnesae	/nn	-707.6	-437.0
Watznaueria biporta	/nn	-693.7	-437.0
Watznaueria britannica	/nn	-707.6	-443.6
Watznaueria communis	/nn	-707.6	-443.6
Zeugrhabdotus embergeri	/nn	-707.6	-437.0
Zygodiscus erectus	/nn	-707.6	-437.0
Riley & Fenton, 1984, p. 675-690			
Achomosphaera neptuni	/dn	-693.4	-437.4
Alvellodinium falsificum	/dn	-611.3	-592.5
Apteodinium maculatum	/dn	-581.4	-465.0
Batioladinium gochtii	/dn	-611.3	-511.7
Batioladinium varigranosa	/dn	-527.6	-527.6*=Aprobolocysta
Caddasphaera halosa	/dn	-667.2	-509.5
Callaiosphaeridium asymmetricum	/dn	-465.0	-465.0
Chlamydophorella huguoniotii	/dn	-552.5	-459.6
Cometodinium? whitei	/dn	-696.4	-608.9
Ctenidodinium scissum	/dn	-558.7	-558.7
Cymatiosphaera delicatula	/dn	-482.6	-447.2
Dapsilidinium warrenii	/dn	-705.5	-437.4 *=Polysphaeridium
Dicanthum hollisteri	/dn	-696.4	-552.5
Dingodinium albertii	/dn	-635.1	-437.4
Discorsia nanna	/dn	-459.6	-459.6
Druggidium apicopaucicum	/dn	-683.7	-683.7
Druggidium deflandrei	/dn	-516.5	-516.5
Druggidium rhabdoreticulatum	/dn	-611.6	-487.4
Endoscrinium glabra	/dn	-593.2	-592.5*=Athigmatocysta
Endoscrinium campanula	/dn	-598.8	-458.3*=Scrinodinium
Fromea amphora	/dn	-520.8	-520.8
Gonyaulacysta helicoidea	/dn	-696.4	-429.2
Gonyaulacysta kostromiensis	/dn	-592.5	-429.2
Hystrichodinium furcatum	/dn	-611.6	-429.2
Hystrichodinium pulchrum	/dn	-705.5	-429.2
Hystrichodinium voigtii	/dn	-641.5	-516.5
Kleithriasphaeridium corrugatum	/dn	-635.1	-635.1
Kleithriasphaeridium eoinodes	/dn	-458.3	-458.3
Kleithriasphaeridium fasciatum	/dn	-632.9	-534.7
Kleithriasphaeridium simplicispinum	/dn	-627.8	-593.2
Muderongia extensiva	/dn	-571.8	-568.3
Muderongia perforata	/dn	-527.6	-479.9
Muderongia simplex	/dn	-696.4	-479.9
Occisucysta tentorium	/dn	-693.4	-552.5
Oligosphaeridium complex	/dn	-641.5	-429.2
Oligosphaeridium pulcherrimum	/dn	-552.5	-437.7
Pareodinia ceratophora	/dn	-677.7	-527.6
Phoberocysta neocomica	/dn	-705.5	-437.4
Phoberocysta tabulata	/dn	-656.4	-656.4
Pseudoceratium pelliiferum	/dn	-683.7	-458.3
Pterospermella aureolata	/dn	-673.7	-429.2
Pterospermella australiensis	/dn	-651.8	-641.5
Sirmiodinium grossii	/dn	-504.3	-504.3
Spiniferites ramosus	/dn	-641.5	-429.2
Tanyosphaeridium boletus	/dn	-705.5	-428.7
Trichodinium castanea	/dn	-598.8	-457.3
Wallodinium cylindrica	/dn	-705.5	-527.6*=Prismatocystis
Wallodinium krutzschii	/dn	-705.5	-447.2
Wallodinium lunua	/dn	-476.1	-428.7

*END

LOK.3 Rio Argos section, Caravaca, Spain.

Hoedemaeker & Leereveld, 1995, Cret. Res., 16:195-230; Coccioni & Premoli-Silva, 1994, Cret. Research, 15:645-687. This is a composited section with gaps between the segments of indeterminate thickness: 89-100m, 444-450m, 575-580m, 866-870m, & 956-975m.

The top of segment A overlaps with base of segment V1, but thicknesses are different because of slumped bedding in V1; 820m in A = 820 in V1, 833 in A = 869m in V1, so the LOC may change slope in this interval. Proposed Valanginian boundary stratotype at 233m; base Hauterivian c. 462m; base Barremian c. 776-789m; base Aptian c. 1105m.

Data:

*TAXA	Morph	Base	Top m
Base Barremian	/mb	789	* base S. oosteri
Base Hauterivian	/mb	472	* base B. oosteri = radiatus zone
Base Late Valanginian	/mb	*	*
Base Valanginian	/mb	264	*= base T. pertransiens
Base Berriasian	/mb	10	*= base B. jacobi
Clavihedbergella eocretacea	/fp	828	1132
Clavihedbergella semielongata	/fp	828	1132
Glob'oides aptiense	/fp	1030	1060
Glob'oides blowi	/fp	980	1132
Glob'oides gottisi	/fp	416	1132
Glob'oides maridalensis	/fp	1132	1332
Globuligerina hoterivica	/FP	311	1128 ID as Favusella
Gubkinella graysonensis	/fp	828	1128 very rare at 458m
Hedb aptiana	/fp	828	1132
Hedb aptica	/fp	311	1132
Hedb delrioensis	/fp	434	1132
Hedb excelsa	/fp	1128	1128
Hedb kuznetsovae	/fp	828	1128
Hedb sigali	/fp	311	1128
Hedb similis	/fp	813	1132
Leupoldina cabri	/fp	1132	1132
Leupoldina pustulans	/fp	828	1132
Calpionellites darderi	/ca	307	307
Calpionellopsis oblonga	/ca	200	200
Calpionellopsis simplex	/ca	155	155
Crassicollaria parvula	/ca	81	81
Lorenziella hungarica	/ca	225	225
Remaniella cadischiana	/ca	28	28
Remaniella murgeanui	/ca	300	300
Ammonites from Hoedemaeker & Leereveld, 1995, Cret. Res., 16:195-230			
Ancyloceras vandenheckii	/am	900	900
Avramidiscus kiliani	/am	794	813
Balearites balearis	/am	747	755
Barremites spp.	/am	778	1114
Berriasella bebrovensis	/am	128	228
Berriasella callisto	/am	173	260
Berriasella chomeracensis	/am	10	70
Berriasella jacobi	/am	10	40
Berriasella malbosi	/am	45	45
Berriasella paramacillenta	/am	32	68
Berriasella picteti	/am	129	241
Berriasella privasensis	/am	78	152
Berriasella subcallisto	/am	41	86
Bochianites neocomiensis	/am	330	440
Bochianites oosteri	/am	472	474
*Busnardoites campylotoxum	/am	333	374
Chelonicerases spp.	/am	1128	1128
Colchidites spp.	/am	1030	1104
*Crioceratites duvali	/am	658	691 base too low
Crioceratites loryi	/am	506	506
Cruasiceras cruasense	/am	681	681
Dalmasicerases dalmasi	/am	127	127

Dalmasiceras punctatum	/am	145	162
Deshayesites weissi	/am	1104	1113
Eleniceras tchecchitevi	/am	438	438
Erdenella paquieri	/am	202	295
Erdenella zianidia	/am	166	196
Fauriella boissieri	/am	172	264
Fauriella gallica	/am	127	202
Fauriella kiliani	/am	235	320
Fauriella rarefurcata	/am	190	241
Heinzia provincialis	/am	900	900
Heinzia sartousi	/AM	1014	1021
*=H. sartousiana			
Himantoceras trinodosum	/am	424	438
Holcodiscus caillaudianus	/am	840	869
Kilianella busnardoii	/am	158	166
Kilianella retrocostata	/am	235	342
Kilianella roubaudi	/am	281	336
Mazenoticerias paramimounum	/am	145	202
Neocomites neocomiensis	/am	260	339
Neocomites subquadratus	/am	300	320
Neocosmoceras sayni	/am	80	81
Olcostephanus tenuituberculatus	/am	589	589
Olcostephanus balestrai	/am	420	428
Olcostephanus hispanicus	/am	474	474
Olcostephanus jeannoti	/am	504	575
Olcostephanus densicostatus	/am	474	474
Oosterella garciae	/am	418	440
Plesiospitidiscus subdifficilis	/am	759	773
Pseudosaynella termieri	/am	1128	1128
Pseudosubplanites euxinus	/am	32	42
Pseudosubplanites lorioli	/am	30	70
Pseudosubplanites ponticus	/am	18	54
Pseudothurmannia catulloi	/am	775	790
Pseudothurmannia ohmi	/am	764	792
Sarasinella eucyrta	/am	280	290
Sarasinella trezanensis	/am	292	311
Spitidiscus fasciger	/am	587	657
Spitidiscus hugii	/am	792	810
*Spitidiscus rawsoni	/am	473	475 base too low
Subpulchellia nicklesi	/am	809	833
Subsaynella sayni	/am	680	691
"Subthurmannia" clareti	/am	120	120
"Subthurmannia" floquinensis	/am	67	83
"Subthurmannia" occitanica	/am	155	185
"Subthurmannia" patruliusi	/am	122	153
"Subthurmannia" subalpina	/am	75	88
Taveridiscus oosteri	/am	789	800
Teschenites flucticulus	/am	473	474
Teschenites neocomiensiformis	/am	418	474
"Thurmanniceras" otopeta	/am	266	310
Tirnovella alpillensis	/am	227	271
Tirnovella pertransiens	/am	264	336
Valanginites bachelardi	/am	360	360
Dinoflagellates from Hoedemaeker & Leereveld, 1995, Cret. Res., 16:195-230			
Amphorula delicata	/dn	236	288
Aprobolocysta eilema	/dn	695	754
Biorbifera johnewingii	/dn	149	384
Cymosphaeridium validum	/dn	401	775
Dicanthum hollisteri	/dn	149	432
Dingodinium europaeum	/dn	908	1026
Druggidium apicopaucicum	/dn	319	695
Druggidium deflandrei	/dn	432	1033
Druggidium rhabdoreticulatum	/dn	705	911

Foucheria modesta	/dn	236	385
Meiourogonyaulax pertusa pertusa	/dn	483	695
Meiourogonyaulax stoveri	/dn	623	1038
Muderongia staurota	/dn	483	937
Odontochitina operculata	/dn	917	1038
Pseudoceratium anaphrissum	/dn	917	1028
Pseudoceratium pelliiferum	/dn	222	1026
Subtilisphaera perlucida	/dn	754	1038
Subtilisphaera senegalensis	/dn	809	1038
Systematophora palmula	/dn	149	433
Tanyosphaeridium magneticum	/dn	236	1026

*END

LOK.4 Chronostratigraphic Section.

Mega-annum ages of key markers from Hardenbol et al., 1998, Chart 5. Mega-annums revised by J.D. Obradovich, 1993, in Caldwell & Kauffman, eds., Geol. Assoc. Canada, Sp. Paper 39, p. 379-396, compared with modified ages by Hardenbol et al., 1998, chart 5 within +/- range, except for top Maastrichtian.

Data:

*Base Stage Age of Ma range of +/- uncertainty			
Base Aptian	/mb	121.	119.6
Base Barremian	/mb	127	125.4
Base Hauterivian	/mb	132	130.1
Base Late Valanginian	/mb	135.67	*
Base Valanginian	/mb	137	134.8 135 vs 137
Base Berriasian	/mb	144.2	141.6 142 vs 144.2
Acanthodiscus radiatus	/am	132.0	*
Berriasella jacobi	/am	144.2	*
Mazenoticerias paramimounum	/am	140.05	*
Berriasella picteti	/am	138.61	*
Berriasella privasensis	/am	141.04	*
Breistrofferella castellanensis	/am	132.03	*
Busnardoites campylotoxum	/am	136.00	*
Crioceratites loryi	/am	131.32	*
Criosarasinella furcillata	/am	133.52	*
Cruasiceras cruasense	/am	129.89	*
Dalmasiceras dalmasi	/am	140.55	*
Himantoceras trinodosum	/am	134.01	*
Karakaschiceras pronecostatum	/am	135.01	*
Neocomites callidiscus	/am	133.02	*
Neocomites peregrinus	/am	134.51	*
Olcostephanus jeannoti	/am	130.96	*
Olcostephanus nicklesi	/am	134.01	*
Olcostephanus variegatus	/am	130.6	*
Pseudothurmannia catulloi	/am	*	127.39
Saynoceras verrucosum	/am	135.50	*
"Subthurmannia" subalpina	/am	142.03	*
"Thurmanniceras" pertransiens	/am	136.49	*
Tirnovella alpillensis	/am	137.90	
Crucielipsis cuvillieri	/nn	*	129.5
Calpionellites darderi	/ca	136.5	*

*END

LOK.5 = MIDK.3 Santa Rosa Canyon, Nuevo Leon, Mexico.

Blauser & McNulty, 1980, Trans. Gulf Coast Assoc. Geol. Soc., 30:263-272; Ice & McNulty, 1980, idem, 30:403-425. Stage boundaries taken from graph of Amoco's CS (1990, unpublished).

*Taxon name	morph	base	top(ft)
*Top Berriasian	/mb	400	*

*But FO C. darderi at 295 at base Valanginian			
*Base Valanginian	/mb	400	*
*Base Hauterivian	/mb	1140	*
*Base Barremian	/mb	1700	*
*Base Early Aptian	/mb	2210	*
Base Aptian	/mb	2560	*
*Base Early Albian	/mb	2710	*
*Base Middle Albian	/mb	3000	*
Base Albian	/mb	3140	*
*Base-Top Middle Cenomanian	/mb	3575	4020
*Top Cenomanian	/mb	4150	4150
*Top Early Turonian	/mb	4230	4230
*Top La Casita Fm at 24 ft			
*Top Taraises Fm at 470 ft			
*Top Lower Tamaulipas Fm at 2500 ft			
*Marker bed Al SB GR 1	/mb	2700	2700
*OCT-95 REMOVED because its age is projected too young; may be too high			
*Top Otates Fm at 2700 ft			
*Top Cuesta del Cura Fm at 3745-3770 ft in covered interval			
*Top Early Cenomanian	/ma	3775	3775
*Top Upper Tamaulipas Fm at 3195 ft; 30cm blk sh			
*Top of section in Agua Nueva Fm at 4293 ft			
Marker bed Al SB WA 1	/mb	3195	3195
Marker bed Ap SB SL 1	/mb	2500	2500
Calpionella alpina	/ca	20	49
Calpionella elliptica	/ca	20	197 *FO at base Berriasian
Calpionellites darderi	/ca	295	295
*ID as Calpionella darderi in Valanginian	/ca	295	295
Calpionellopsis oblonga	/ca	49	436
Calpionellopsis simplex	/ca	118	197
Remaniella cadischiana	/ca	39	49
Stenosemellopsis hispanica	/ca	295	295
Tintinnopsella carpathica	/ca	20	463
Tintinnopsella longa	/ca	49	410 *FO in lower Berriasian
Colomiella mexicana	/ca	2676	2808
Colomiella recta	/ca	2676	3011
Pith ovalis	/ca	3395	3395
Pith sphaerica	/ca	3198	4023
Nannoconus steinmannii	/nn	39	2258
Nannoconus wassallii	/nn	2460	2558
Microcalamoides diversus	/id	2676	3198
Biti breggiensis	/fp	3211	3415
Glob'oides algeriana	/fp	2519	2538
Glob'oides bentonensis	/fp	3467	3742
Glob'oides cushmani	/fp	3461	4129
Hedbergella washitensis	/fp	2676	3447
Helv'ana helvetica	/fp	4211	4211
Marg schneegansi	/fp	4244	4244
Planomalina buxtorfi	/fp	3421	3493
Praeglobotruncana delrioensis	/fp	3447	3742
Praeglobotruncana stephani	/fp	3447	4096
Rota appenninica	/fp	3428	3742
Rota cushmani	/fp	4031	4129
Rota gandolfi	/fp	3900	3900
Rota greenhornensis	/fp	3949	3949
Tici roberti	/fp	3198	3480
Tici subticinensis	/fp	3224	3410
Tici ticinensis	/fp	3326	3493
*END			

LOK.6 Berrias Section, France
Galbrun et al., 1986, Bull. Soc. geol. France, 8.

Data:

*Taxa	Morph Gp	Base	Top m
Berriasella callisto	/am 24	25.5	
Berriasella malbosii	/am 16	22	
Berriasella paramacillenta	/am 1	7	
Berriasella picteti	/am 22	22.5	
Berriasella privasensis	/am 8	10	
Berriasella subcallisto	/am 7	7	
Dalmasiceras dalmasi	/am 11	11	
Dalmasiceras punctatum	/am 11	11	
Erdenella paquieri	/am 22	22	
Fauriella boissieri	/am 22	22	
Holcophylloceras calypso	/am 1	22.5	
Mazenoticeras paramimounum	/am 13.5	15	
Ptychophylloceras semisulcatum	/am 7	10	
"Subthurmannia" occitanica	/am 10	10	
"Subthurmannia" subalpina	/am 7	8	
Conusphaera mexicana	/nn 0	3	
Cretarhabdus crenulatus	/nn 14	18	
Crucellipsis cuvillieri	/nn 14	18	
Cyclagelosphaera margerelii	/nn 0	3	
Diazomatolithus lehmanii	/nn 0	22	
Lithraphidites carniolensis	/nn 5	5	
Micrantholithus obtusus	/nn 18	22	
Micula infracretacea	/nn 18	22	
Nannoconus broennimannii	/nn 14	16	
Nannoconus colomii	/nn 5	22	
Nannoconus globulus	/nn 14	16	
Parhabdolithus embergeri	/nn 5	22	
Watznaueria barnesae	/nn 0.5	13	
Watznaueria britannica	/nn 5	22	
Watznaueria communis	/nn 0	22.5	

*END

LOK.7 ODP 638B & C, Galicia Bank, Offshore Spain

42 deg 9.2' N, 12 deg 11.8' W, sea floor @ 4661 m, TD @ 547.2 mbsf; 49 to 28% recovery; Valanginian-Aptian. Applegate & Bergen, 1988, Proc. ODP, Sci. Results, v. 103, p. 293 ff. Unconformities @ 183.6, 212.6.

Data:

*Taxa	Morph Gp	Base	Top m
Applegate & Bergen, 1988, Table 2, p. 302-305			
Assipetra infracretacea	/NN -463.3	-184.3	
Axopodorhabdus dietzmannii	/nn -499.2	-184.3	
Biscutum constans	/nn -499.2	-184.3	
Bukryolithus ambiguus	/nn -499.2	-191.1	
Calcicalathina oblongata	/nn -473.2	-212.5	
Chiastozygus litterarius	/nn -219.8	-191.1	
*1st consistent base, lowest base @ 306.3			
Chiastozygus platyrhethus	/nn -217.3	-192.1	
Conusphaera mexicana	/nn -499.2	-184.3	
Corollithion acutum	/NN -384.1	-197.0	
Corollithion ellipticum	/NN -499.2	-184.3	
Cretarhabdus conicus	/nn -499.2	-184.3	
Cretarhabdus loriei	/nn -326.4	-192.1	ID as cf.

Cretarhabdus surirellus	/nn	-499.2	-184.3	
Cruciellipsis cuvillieri	/nn	-499.2	-193.7	
Cyclagelosphaera margerelii	/nn	-499.2	-184.3	
Diadorhombus rectus	/nn	-499.2	-192.1	
Diazomatolithus lehmanii	/nn	-499.2	-184.3	
Discorhabdus ignotus	/nn	-499.2	-184.3	
Flabellites oblonga	/nn	-221.9	-200.1	
Grantarhabdus meddii	/nn	-499.2	-184.3	
Haqius circumradiatus	/nn	-499.2	-184.3	
Lithraphidites carniolensis	/nn	-499.2	-184.3	
Manivitella pemmatoidea	/nn	-499.2	-184.3	
Micrantholithus hoschulzii	/nn	-499.2	-184.3	
Micrantholithus obtusus	/nn	-499.2	-184.3	
Nannoconus bermudezii	/NN	-499.2	-192.1	
Nannoconus bucheri	/NN	-329.7	-191.1	
Nannoconus elongatus	/NN	-329.7	-216.2	
Nannoconus globulus	/NN	-499.2	-191.1	
Nannoconus kamptneri	/NN	-329.7	-200.1	
Nannoconus steinmannii	/NN	-499.2	-184.3	
Nannoconus truitti	/nn	-329.7	-184.3	
Nannoconus wassallii	/NN	-211.9	-192.1	
*lowest base @ 306.3 followed by long gap				
Parhabdolithus judithae	/nn	-490.1	-415.0	
Percivalia fenestrata	/nn	-499.2	-184.3	
Pickelhaube furtiva	/nn	-499.2	-248.4	2nd top, 1st @ 211.9
Rhagodiscus asper	/NN	-499.2	-184.3	
Rhagodiscus splendens	/NN	-499.2	-184.3	
Rucinolithus terebrodentarius	/nn	-200.1	-191.1	
Rucinolithus wisei	/nn	-424.8	-384.4	
Sollasites horticus	/nn	-499.2	-184.3	
Speetonia colligata	/nn	-499.2	-213.4	
Stephanolithion laffittei	/nn	-499.2	-184.3	
Tegumentum stradneri	/nn	-344.7	-184.3	
Tetrapodorhabdus coptensis	/NN	-499.2	-184.3	
Tetrapodorhabdus decorus	/NN	-499.2	-306.3	
Tranolithus gabalus	/nn	-499.2	-184.3	
Tubodiscus jurapelagicus	/nn	-499.2	-184.3	
Tubodiscus verenae	/nn	-499.2	-220.9	
Watznaueria barnesae	/nn	-499.2	-184.3	
Watznaueria biporta	/nn	-499.2	-184.3	
Watznaueria britannica	/nn	-499.2	-229.3	
Zeugrhabdotus embergeri	/NN	-499.2	-184.3	
Zeugrhabdotus pseudoangustus	/NN	-499.2	-192.1	
Masure, 1988, Figs. 2, 3, p. 435 & 437				
Achomosphaera neptuni	/dn	-538.8	-528.1	top @ 307.7
Batioladinium varigranosa	/dn	-434.6	*	=Aprobolocysta
Biorbifera johnewingii	/dn	-471.8	-317.8	top U. Valanginian
Bourkidinium granulatum	/dn	-214.2	*	base U. Hauterivian
Canninginopsis colliveri	/DN	-245.0	-211.1	
Cassiculosphaeridia reticulata	/dn	-252.0	-191.3	ID as cf.
Cerbia tabulata	/dn	-211.1	-191.3	base in Barremian
Chlamydochorella nyei	/DN	-307.7	-270.3	
Cometodinium? whitei	/dn	-344.7	-211.1	
Ctenidodinium elegantulum	/dn	-317.8	-278.1	base U. Valanginian
Cyclonephelium distinctum	/DN	-266.1	-211.1	
Cyclonephelium hystrix	/DN	-538.8	-225.5	
Dapsilidinium warrenii	/dn	-528.1	-192.8	

Dingodinium cerviculum	/DN	-471.8	-192.8	
Druggidium apicopaucicum	/dn	-471.8	-214.2	
*base ties 638B & C; base in Valanginian				
Druggidium deflandrei	/dn	-252.0	-191.3	top in U. Aptian
Druggidium rhabdoreticulatum	/dn	-252.0	-191.3	
*u. lower to u. Hauterivian to mid Albian				
Exiguisphaera phragma	/dn	-434.6	-307.7	
Heterosphaeridium? galliciae	/dn	-344.7	-211.1	
Hystrichodinium furcatum	/dn	-307.7	*	
Hystrichodinium pulchrum	/dn	-191.3	-191.3	
Hystrichodinium voigtii	/dn	-462.4	*	
Kiokansium polypes	/dn	-434.6	-211.1	
Kleithriasphaeridium eoinodes	/dn	-211.1	-192.8	base in Barremian
Kleithriasphaeridium fasciatum	/dn	-307.7	-192.8	
Meiourogonyaulax pertusa pertusa	/dn	-402.5	*	
Meiourogonyaulax stoveri	/dn	-214.2	-192.8	
Muderongia perforata	/dn	-307.7	-245.0	
Muderongia simplex	/dn	-538.8	-501.3	
Muderongia simplex microperforata	/dn	-434.6	*	
Oligosphaeridium complex	/dn	-245.0	-225.5	
Oligosphaeridium dividuum	/dn	-278.1	-214.2	base U. Valanginian
Oligosphaeridium pulcherrimum	/dn	-225.5	-214.2	
Oligosphaeridium verrucosum	/dn	-192.8	*	base U. Aptian
Phoberocysta neocomica	/dn	-538.8	-211.1	
Protoellipsodinium seghire	/dn	-245.0	-225.5	as subsp. medaaure
Protoellipsodinium touile	/dn	-270.3	-214.2	
*subsp. mugatae; base in Hauterivian				
Pseudoceratium pelliiferum	/dn	-538.8	-325.7	
Rhynchodiniopsis aptiana	/dn	-225.5	-192.8	
Rhynchodiniopsis fimbriata	/dn	-434.6	*	
Spin ramosus multibrevis	/DN	-462.4	-214.2	
Spiniferites ramosus	/dn	-402.5	-214.2	base in Valanginian
Systematophora areolata	/dn	-538.8	-431.8	
Systematophora silybum	/dn	-402.5	-214.2	
Tanyosphaeridium magneticum	/dn	-480.3	-431.8	
Wallodinium krutzschii	/dn	-266.1	-192.8	base in Hauterivian
*END				

LOK.8 Bosso Valley Section, Italy

Housa et al., Cret. Res. 25:771-785; Jur/Cret boundary section. J/K @ Crassicollaria Zone/Calpionella Zone boundary @ 12.5m base, bed 78 in M19n; Base Maiolica Fm. @ 1.5 m in section @ base bed 30 in M20n; base section unconformity @ -9.5 m in Calcari a Saccocoma ed Aptici Fm.; top section @ 30m.

Data:

*TAXA	Morph	Base	Top meters
Calpionella alpina	/ca	6	29.6
Calpionella grandalpina	/ca	6	14
Chitinoidella slovenica	/ca	-5.8	3.6
Chitinoidella boneti	/ca	4.6	4.6
Crassicollaria brevis	/ca	6.8	12.5
Crassicollaria intermedia	/CA	7	12.4
Crassicollaria massutiniana	/CA	6.2	13.2
Crassicollaria parvula	/CA	6	15.6
Praetintinnopsella andrusovi	/ca	3.8	4.6
Tintinnopsella carpathica	/ca	5.2	29.6
*Magnetochron M17r	/MA	*	30 Top of section @ 30m

Magnetostron M18n	/MA	*	28.5
Magnetostron M18r	/ma	*	23.5
Magnetostron M19n	/MA	*	21.1
Magnetostron M19n.1r	/ma	*	19.6
Magnetostron M19r	/ma	*	8.0
Magnetostron M20n	/MA	*	6.2
Magnetostron M20n.1r	/ma	*	-0.4
*Lowest sample @ -9 m, may not be accurate base M20n			
*END			

No Section LOK.9

LOK.10 Barret-le-Bas, Vocontian Basin, France

Busnardo et al. 1979, p. 44, fig. 13; p. 90, fig. 28; p. 105, fig. 30; Bulot, 1995, Ph.D., figs. 3,6, 7.
Data:

*Taxa	Morph	Gp	Base	Top m
Baronnites hirsutus	/am		62	72
Berriasella callisto	/am		0	1
Bochianites neocomiensis	/am		57	105
Busnardoites campylotoxum	/am		98	110
Busnardoites desori	/am		81	110 ID as cf.
Busnardoites subcampylotoxum	/am		75	81
Clavithurmannia foraticostata	/am		0	5.5
Erdenella paquieri	/AM		0	3
Fauriella boissieri	/am		0	4.5
Fauriella donzei	/am		0	3
Fauriella kiliani	/am		2	26
Holcophylloceras calypso	/am		36	71
Kilianella lucensis	/am		29	96
Kilianella pexiptycha	/am		1.5	9.5
Kilianella retrocostata	/am		5.5	57
Kilianella roubaudi	/am		62	96
Luppovella superba	/am		66	75
Lytoceras juileti	/am		68	92
Neolissoceras grasianum	/am		57	96
Neocomites neocomiensis	/am		103	119
Neocomites premolicus	/am		26	57
Neocomites subtenuis	/am		113	119
Neocomites teschenensis	/am		71	84
Neolisoceras salinarium	/am		54	102
Olcostephanus drumensis	/am		26	65
Olcostephanus guebhardi	/am		98	102
Olcostephanus josephinus	/am		62	72
Olcostephanus stephanophorous	/am		62	108
Olcostephanus tenuituberculatus	/am		68	110
Phylloceras tethys	/am		60	72
Platylenticeras cardioceroides	/am		62	65
Platylenticeras occidentale	/am		46	68
Protancyloceras punicum	/am		0	2
Protetragonites quadrisulcatus	/am		26	92
Ptychophylloceras semisulcatum	/am		31	96
Saynoceras verrucosum	/am		119	119
"Thurmanniceras" otopeta	/am		1	9
"Thurmanniceras" pertransiens	/am		26	52
Tirnovella alpillensis	/am		0	9.5

Valanginites bachelardi	/am	119	119
Biscutum constans	/nn	0	125
Braarudosphaera bigelowii	/nn	0	125
Calcicalathina oblongata	/nn	46	125
Conusphaera mexicana	/nn	0	125
Cretarhabdus conicus	/nn	0	125
Cretarhabdus crenulatus	/nn	0	125
Cretarhabdus surirellus	/nn	1	125
Cruciellipsis chiasta	/nn	0	125
Cruciellipsis cuvillieri	/nn	0	125
Cyclagelosphaera margerelii	/nn	0	125
Diadorhombus rectus	/nn	67	125
Diazomatolithus lehmanii	/nn	0	125
Discorhabdus rotatorius	/nn	0	125
Lithraphidites carniolensis	/nn	0	125
Manivitella pemmatoidea	/nn	0	125
Markalius circumradiatus	/nn	0	125
Micrantholithus hoschulzii	/nn	0	125
Micrantholithus obtusus	/nn	1	125
Micula infracretacea	/nn	50	125
Nannoconus broennimannii	/nn	4	97
Nannoconus colomii	/nn	0	125
Nannoconus globulus	/nn	26	120
Parhabdolithus asper	/nn	0	125
Parhabdolithus embergeri	/nn	0	125
Parhabdolithus splendens	/nn	46	125
Podorhabdus dietzmanni	/nn	46	97
Reinhardtites fenestratus	/nn	41	125
Rhabdolithus rectus	/nn	7	125
Rucinolithus wisei	/nn	10	50
Speetonia colligata	/nn	41	125
Stephanolithion laffittei	/nn	0	125
Tubodiscus verenae	/nn	2	78
Vagalapilla compacta	/nn	0	92
Vagalapilla stradneri	/nn	0	125
Watznaueria barnesae	/nn	0	125
Watznaueria biporta	/nn	0	92
Watznaueria britannica	/nn	0	125
Watznaueria communis	/nn	0	125
Zygodiscus elegans	/nn	1	125
Zygodiscus diplogrammus	/nn	97	125
Calpionella alpina	/ca	0	12
Calpionellites coronata	/ca	71	87
Calpionellites darderi	/ca	28	87
Calpionellopsis oblonga	/ca	0	36
Lorenziella hungarica	/ca	0	70
Remaniella cadischiana	/ca	1	35
Remaniella murgeanui	/ca	28	32
Tintinnopsella carpathica	/ca	0	87
Tintinnopsella longa	/ca	3	87
*END			

LOK.11 Angles section, Vocontian Basin, France
 Busnardo et al. 1979; Les stratotypes Francais, v. 6, Hypostratotype Mesogeen de l'etage Valanginien:
 CNRS.

Data:

*Taxa	Morph	Gp	Base	Top	m
Marker bed 305	/mb		111	*	
Marker bed 321	/mb		125	*	
Acanthodiscus radiatus	/am		226	227	
Acanthodiscus rebouli	/am		226	227	
Bochianites neocomiensis	/am		54	227	
Bochianites oosteri	/am		226	230	
Breistrofferella castellanensis	/am		239	243	
Breistrofferella varappensis	/am		227	241	
Busnardoites campylotoxum	/am		67	88	
Clavithurmannia foraticostata	/am		6	9	
Criosarasinella furcillata	/am		195	200	
Eleniceras nikolovi	/am		222	239	
Eleniceras tchecchitevi	/am		195	227	
Dichotomites vergunorum	/am		185	191	
Fauriella boissieri	/am		2	9	
Fauriella kiliani	/am		18	20	
Himantoceras trinodosum	/am		179	188	
Hypophylloceras courchonense	/am		178	191	
Hypophylloceras perlobatum	/am		97	119	
Kilianella lucensis	/am		43	45	
Lytoceras juileti	/am		97	133	
Neocomites neocomiensis	/am		97	185	
Neocomites subquadratus	/am		99	110	
Neocomites subtenuis	/am		111	133	
Neocomites teschenensis	/am		111	123	
Neohoploceras provinciale	/am		111	133	ID as gr.
Neohoploceras submartini	/am		111	128	
Neolissoceras aberrans	/am		110	110	
Neolissoceras grasianum	/am		54	245	
Olcostephanus densicostatus	/am		187	238	
Olcostephanus drumensis	/am		99	109	
Olcostephanus nicklesi	/am		185	191	
Olcostephanus stephanophorous	/am		99	109	
Olcostephanus tenuituberculatus	/am		67	127	
Oosterella cultrataeformis	/am		235	241	
Protetragonites quadrisulcatus	/am		91	191	
Phylloceras tethys	/am		91	210	
Phyllopachyceras winckleri	/am		225	226	
Ptychophylloceras diphyllum	/am		111	191	
Ptychophylloceras semisulcatum	/am		54	188	
Sarasinella biformis	/am		111	125	
Sarasinella eucyrta	/am		106	109	
Sarasinella trezanensis	/am		100	109	
Saynoceras verrucosum	/am		111	123	
Substreblites zonarius	/am		111	123	
Teschenites callidiscus	/am		211	215	
Teschenites flucticulus	/am		222	234	
Teschenites pachydicranus	/am		185	245	
"Thurmanniceras" otopeta	/am		8	11	
"Thurmanniceras" perisphinctoides	/am		11	15	ID as aff.
"Thurmanniceras" salientum	/am		10	11	ID as cf.
Valanginites bachelardi	/am		75	133	ID as cf.
Valanginites nucleus	/am		111	123	
Biscutum constans	/nn		7	243	
Braarudosphaera bigelowii	/nn		7	243	
Calcicalathina oblongata	/nn		65	243	
Conusphaera mexicana	/nn		5	243	
Cretarhabdus conicus	/nn		7	227	
Cretarhabdus crenulatus	/nn		5	243	
Cretarhabdus surirellus	/nn		5	243	
Cruciellipsis chiasta	/nn		7	233	

Cruciellipsis cuvillieri	/nn	5	243
Cyclagelosphaera margerelii	/nn	5	243
Diadorhombus rectus	/nn	120	150
Diazomatolithus lehmanii	/nn	5	243
Discorhabdus rotatorius	/nn	5	243
Lithraphidites carniolensis	/nn	5	243
Manivitella pemmatoidea	/nn	7	243
Markalius circumradiatus	/nn	7	243
Micrantholithus hoschulzii	/nn	5	243
Micrantholithus obtusus	/nn	5	243
Micula infracretacea	/nn	130	243
Nannoconus colomii	/nn	5	243
Nannoconus globulus	/nn	21	196
Parhabdolithus asper	/nn	7	243
Parhabdolithus embergeri	/nn	5	243
Parhabdolithus splendens	/nn	130	243
Podorhabdus dietzmanni	/nn	95	227
Reinhardtites fenestratus	/nn	21	240
Rhabdolithus rectus	/nn	56	168
Rucinolithus wisei	/nn	28	56
Speetonia colligata	/nn	60	243
Stephanolithion laffittei	/nn	5	243
Tubodiscus verenae	/nn	7	212
Vagalapilla compacta	/nn	7	206
Vagalapilla stradneri	/nn	5	243
Watznaueria barnesae	/nn	5	243
Watznaueria biporta	/nn	7	219
Zygodiscus elegans	/nn	7	240
Zygodiscus diplogrammus	/nn	95	240
Calpionella alpina	/ca	0	36 ID as aff.
Calpionellites caravacaensis	/ca	47	64
Calpionellites coronata	/ca	36	64
Calpionellites darderi	/ca	30	68
Calpionellopsis oblonga	/ca	0	33
Calpionellopsis simplex	/ca	0	11
Lorenziella hungarica	/ca	0	44
Lorenziella plicata	/ca	9	11
Remaniella cadischiana	/ca	5	21
Remaniella murgeanui	/ca	15	73
Tintinnopsella carpathica	/ca	0	64
Tintinnopsella longa	/ca	0	60

*Marker bed (/mb) sets of more resistant limestone-marl bed sets;

*Bulot et al., 1992, 1995 Ph.D. Not included in composite data set.

Cycle F2 beds 233-243; Cycle F1 beds 224-base 232; Cycle N beds 218-219;

Cycle V beds 206-base 213; Cycle P beds 204-206 base.

*END

LOK.12 Angles section, Vocontian Basin, France

Bulot et al. 1992, 1995, spans campylotoxus - radiatus zones.

Data:

*Taxa	Morph	Gp	Base	Top m
Marker bed 305	/mb		6	*
Marker bed 321	/mb		23	*
Base Upper Valanginian	/mb		6	*
*proposed GSSP @ base of Saynoceras verrucosum				
Acanthodiscus radiatus	/am		96	107
*Breistrofferella aff. castellanensis	/am		106	115
Breistrofferella castellanensis	/am		96	105
Criosarasinella furcillata	/am		76	84

Criosarasinella mandovi	/am	81	87
Eleniceras nikolovi	/am	96.5	96.5
Himantoceras trinodosum	/am	56	85
Jeanthieuoyites quinquestriatus	/am	67	73
Karakaschiceras pronecostatum	/am	19	25
Neocomites neocomiensis	/am	0	20.5
Neocomites peregrinus	/am	27	47 ID as Varlheideites
Neocomites platycostatus	/am	6	7
Neocomites subquadratus	/am	0	5
Neocomites subtenuis	/am	6	26
Neocomites teschenensis	/am	6	12
Neohoploceras depereti	/am	19.5	26
Neohoploceras provinciale	/am	1.5	10
Neohoploceras submartini	/am	6	12
Olcostephanus balestrai	/am	37	68
Olcostephanus nicklesi	/am	56	63
Olcostephanus stephanophorous	/am	0	4
Olcostephanus tenuituberculatus	/am	0	10
Olcostephanus thieuoyi	/am	70	75
Oosterella cultrata	/am	90.5	90.5
Oosterella fascigera	/am	32	51
Sarasinella biformis	/am	6	10
Saynoceras verrucosum	/am	6	10
Sarasinella hirticula	/am	56	56
Teschenites callidiscus	/am	87	93
Teschenites flucticulus	/am	95.5	115
Teschenites pachydicranus	/am	73	115
Teschenites subflucticulus	/am	84	95.5
Valanginites bachelardi	/am	6	26
Valanginites nucleus	/am	6	10

*Marker bed (/mb) sets of more resistant limestone-marl bed sets;

*Bulot et al., 1992, 1995 Ph.D. Not included in composite dataset.

Cycle F2 beds 233-243; Cycle F1 beds 224-base 232; Cycle N beds 218-219;

Cycle V beds 206-base 213; Cycle P beds 204-206 base.

*END

LOK.13 La Charce, Vocontian Basin, France

Serre de l'Ane near La Charce village in Vocontian basin 75 km NE of Avignon, SE France.

Section spans Valanginian/Hauterivian boundary to upper Hauterivian Stage. Bulot et al. 1992, *Geologie Alpine* 68, 13-56, Tables VI, p. 27, VII, p. 30, VIII, p. 35, XII, p. 44, XIV, p. 49. Bulot, 1995 dissertation; this is proposed GSSP reference section for base lower & middle Hauterivian zones. Metric sample positions revised by Bulot 2009. Hauterivian Stage divided into lower and upper substages at base Sayni Zone (Ogg et al. 2004, p. 358, fig. 19.1). Age base Hauterivian 136.4+/-2.0 Ma, base Upper Hauterivian ~134 Ma (Ogg et al. 2004); younger than 136+/-3 Ma in Tibet section (Wan et al. 2011, Lethaia). Ogg et al. (2008) calibrate age of base Hauterivian at 133.9 Ma.

Data:

*Taxa	Morph	Base	Top m
*Data in fig. 5.7 and table in Bulot's dissertation 1995.			
Carbon peak IntraVal OAEb	/gc	-2.0	***
Carbon peak IntraVal OAEc	/gc	-25	***
Carbon peak IntraVal OAEd	/gc	-118	-120
Base Hauterivian	/mb	-93.5	***
At base A. radiatus/base Radiatus Zone; but see LOK.13b at base A. rebouli.			
Acanthodiscus radiatus	/am	-93.5	-107
Acanthodiscus rebouli	/am	-91	-108
*Position revised by Bulot			

Breistrofferella castellanensis	/am	-96	-102	
*Base Castellanensis Subzone of Radiatus Zone				
Crioceratites duvalii	/am	-191	-193	
Crioceratites gr. quenstedti	/am	-149	-171	
Crioceratites loryi	/am	-119	-130	
*Base Loryi Subzone/Zone				
Crioceratites matsumotoi	/am	-179	-184	
*Crioceratites nolani	/am			
Criohimantoceras gigas	/am	-39.5	-83	
Criosarasinella furcillata	/am	-64	-75	
*Base Furcillata Subzone of Trinodosum Zone				
Criosarasinella heterocostata	/am	-64	-74	
Criosarasinella mandovi	/am	-72	-74	
Cruasiceras cruasense	/am	-169	-172	
*Base C. cruasense Subzone				
Dichotomites petschi	/am	-28	-43	
Eleniceras nikolovi	/am	-93.5	-93.5	
Eleniceras transylvanicum	/am	-86	-92	
Euptychoceras meyrati	/am	-149	-171	
Himantoceras trinodosum	/am	-39.5	-95	
Jeanthieuloyites quinquestriatus	/am	-65	-92	
*Karakaschiceras aff. biassalense	/am			
*Karakaschiceras aff. karakaschi	/am			
Karakaschiceras pronecostatum	/am	-10	-25.5	
*Base Pronecostatum Subzone of Verrucosum Zone				
Leopoldia leopoldina	/am	-102	-107	
Lyticoceras nodosoplicatum	/am	-143	-150	Base Nodosoplicatum Zone
Neocomites callidiscus	/am	-83	-86	
Neocomites flucticulus	/am	-90	-107	
Neocomites neocomiensis	/am	-1	-14	
Neocomites neocomiensiformis	/am	-1	-14	
Neocomites pachydicranus	/am	-64	-107	
Neocomites peregrinus	/am	-24	-43	ID as Varlheideites
Neocomites platycostatus	/am	-1	-1	
Neocomites polygonius	/am	-78	-78	
*Neocomites praediscus	/am			
*Neocomites subflucticulus	/am			
Neocomites subtenuis	/am	-1	-14	
Neocomites teschenensis	/am	-47	-47	
Neohoploceras depereti	/am	-10	-34	
Neohoploceras submartini	/am	-1	-10	
Olcostephanus balestrai	/am	-33	-73	
Olcostephanus densicostatus	/am	-65	-107	
Olcostephanus jeannoti	/am	-130	-143	Base Jeannoti Subzone of Loryi Zone
*Olcostephanus mittreanus	/am			
Olcostephanus nicklesi	/am	-39.5	-54	Base Nicklesi Subzone of Trinodosum Zone
Olcostephanus sayni	/am	-127	-133	
Olcostephanus tenuituberculatus	/am	-5	-14	
*Olcostephanus thieuloyi	/am			
Olcostephanus variegatus	/am	-142	-147	Base O. variegatus Subzone
Oosterella cultrata	/am	-69	-74	
Oosterella cultrataeformis	/am	-61	-85	
Oosterella fascigera	/am	-23	-47	
Oosterella garciae	/am	-83	-83	
Oosterella stevenini	/am	-46	-69	
Plesiospitidiscus ligatus	/am	-203	-209	Base Ligatus Zone
Protacrioceras puzosianum	/am	-143	-144	
Rodighieroides rutimeyeri	/am	-24	-34	ID as aff. or group
Sarasinella hirticula	/am	-34	-47	
Saynella clypeiformis	/am	-145	-147	
Spitidiscus fasciger	/am	-133	-145	

*Spitidiscus gr. lorioli /am
 Spitidiscus gr. pavlowi /am -126 -145
 Suboosterella heliaca /am -137 -137
 Subsaynella sayni /am -168 -191
 *Base Sayni Zone = Base Upper Hauterivian
 Teschenites callidiscus /am -83 -86
 *Base Callidiscus Subzone of Callidiscus Zone
 Teschenites castellanensiformis /am -96 -102
 Teschenites flucticulus /am -90 -107
 *Teschenites morator /am
 Varlheidites peregrinus /am -24 -43
 *Base Peregrinus Subzone of Verrucosum Zone
 *Marker bed sets of more resistant limestone-marl bed sets;
 *Bulot et al., 1992, 1995 Ph.D. Not included in composite dataset.
 Cycle F2 beds 233-243; Cycle F1 beds 224-base 232; Cycle N beds 218-219;
 Cycle V beds 206-base 213; Cycle P beds 204-206 base.
 *END

LOK.13b La Charce, Vocontian Basin, France

La Charce village in Vocontian basin 75 km NE of Avignon, SE France. Section spans Valanginian/Hauterivian boundary to upper Hauterivian Stage. Complements LOK.13 with new data. Reboulet, Chapter 2. Carnet de Geologie CG2008_BOOK_01, E. Mattioli, ed., fig. 2.1, p. 8 and fig. 3.1, p. 10. Approximates base subchron M10n or Chron M11n dated at 133.9+/-2Ma or 136.4 +/-2Ma.

Data:

*Taxa	Morph Gp	Base	Top m
		*Ammonite Data from Fig. 2.1, p. 8	
*Base Hauterivian = base A. radiatus Zone at bed 189 (= Bulot bed 250) at FO A. rebouli			
Acanthodiscus radiatus	/am	-8.0	-29.5
Acanthodiscus rebouli	/am	-8.0	-29.5 *In text p. 10
*Base A. radiatus Zone Bed 189/250			
*Acanthodiscus sp.	/am	-8.0	-29.5
Breistrofferella castellanensis	/am	-9.0	-31.75
*ID as Breistrofferella			
Himantoceras trinodosum	/am	0	-0.25
Jeanthieuloyites quinquestriatus	/am	0	-10.25
Olcostephanus densicostatus	/am	0	-31.75
Olcostephanus sayni	/am	-35.75	-38.5
Oosterella cultrata	/am	0	-2.0
Oosterella cultrataeformis	/am	0	-2.0
Spitidiscus gr. lorioli	/am	-12.75	-31.75
Teschenites callidiscus	/am	0	-5.25
Teschenites castellanensiformis	/am	-6.75	-13.75
Teschenites flucticulus	/am	-8.0	-30.75
Teschenites pachydicranus	/am	-8.0	-30.75
Teschenites subflucticulus	/am	0	-2.0
Teschenites subpachydicranus	/am	0	-7.0
*Gardin, Chapter 3. Nannofossils Fig. 3.1, p. 11			
Amphizygus infracretacea	/nn	1.25	-52
Braarudosphaera discula	/nn	2.25	-52
Calcicalathina oblongata	/nn	2.25	-52
Chiasozygus tenuis	/nn	1.25	-52
Conusphaera mexicana	/nn	2.25	-52
Cretarhabdus conicus	/nn	2.25	-52
Cretarhabdus surirellus	/nn	2.25	-52
Crucibiscutum salebrosum	/nn	2.25	-52
Cruciellipsis cuvillieri	/nn	2.25	-52
*LO = base Zone CC5			
Cyclagelosphaera margerelii	/nn	2.25	-52

Diadorhombus rectus	/nn	2.25	-52	
Diazomatolithus lehmanii	/nn	2.25	-52	
Discorhabdus rotatorius	/nn	2.25	-52	
Eiffellithus windi	/nn	2.25	-30.75	
*"best approximates Valanginian/Hauterivian boundary is the LO..."				
Ethmorhabdus gallicus	/nn	2.25	-52	
Haqius circumradiatus	/nn	2.25	-52	
Lithraphidites bollii	/NN	-51	-52	
*FAD = base Biozone CC4a w/ Eiffellithus striatus				
Lithraphidites carniolensis	/nn	2.25	-52	
Manivitella pemmatoidea	/nn	2.25	-52	
Micrantholithus hoschulzii	/nn	1.25	-52	
Micrantholithus obtusus	/nn	2.25	-52	
Microstaurus chiastius	/nn	2.25	-52	
Microstaurus quadratus	/nn	2.25	-52	
Nannoconus bucheri	/nn	2.25	-52	
Nannoconus globulus	/nn	0.75	-20.5	
Nannoconus kamptneri	/nn	2.25	-52	
Nannoconus steinmannii	/nn	2.25	-52	
Nannoconus truitti	/nn	1.25	-49	
Nannoconus wassallii	/nn	-0.25	-52	
Parhabdolithus infinitus	/nn	0.75	-49	
Percivalia fenestrata	/nn	1.25	-52	
Pickelhaube furtiva	/nn	0.75	-52	
Retecapsa angustiforata	/nn	2.25	-52	
Rhagodiscus asper	/nn	2.25	-52	
Rotelapillus laffittei	/nn	2.25	-52	
Sollasites horticus	/nn	2.25	-52	
Speetonia colligata	/nn	2.25	-52	
Staurolithites crux	/nn	2.25	-52	
Tegumentum stradneri	/nn	-4.75	-52	
Tubodiscus jurapelagicus	/nn	0.75	-44	
Tubodiscus verenae	/nn	0.75	-50	LO = base Zone CC4
Watznaueria barnesae	/nn	2.25	-52	
Zeugrhabdotus embergeri	/nn	2.25	-52	
Zeugrhabdotus pseudoangustus	/nn	0.75	-51	
Zeugrhabdotus trivectis	/nn	2.25	-52	
Zygodiscus bicrescenticus	/nn	1.25	-47	
Zygodiscus diplogrammus	/nn	2.25	-52	
*END				

LOK.14 Curnier section, Vocontian Basin, France
Busnardo et al. 1992, Table III, p. 22.

Data:

*Taxa	Morph	Gp	Base	Top m
Himantoceras trinodosum	/am		38	38
Karakaschiceras pronecostatum	/am		29	29
Neocomites peregrinus	/am		29.5	31 *ID as Varlheideites
Neocomites subtenuis	/am		2	14
Neocomites teschenensis	/am		2	14
Neohoploceras submartini	/am		9	9
Olcostephanus nicklesi	/am		38	38
Saynoceras verrucosum	/am		7	9
Valanginites bachelardi	/am		7	14
*END				

LOK.15 Moriez (St-Firmin) section, Vocontian Basin, France
Busnardo et al. 1992, Table IV, p. 24.

Data:

*Taxa	Morph Gp	Base	Top m
Neocomites neocomiensis	/am	0.5	14
Neocomites subquadratus	/am	0.5	10
Neocomites subtenuis	/am	6	14
Neohoplloceras provinciale	/am	4	10
Neohoplloceras submartini	/am	9	12
Olcostephanus stephanophorous	/am	0.5	5
Saynoceras verrucosum	/am	9	12
Valanginites bachelardi	/am	8	14

*END

LOK.16 Baumugne section, Hautes-Alpes, France

Busnardo et al. 1992, Table V, p. 25. This section defines the horizon de Baumugne of Bulot, 1990-1993 from the base of bed B21 to top of B22 at 9.5-11 m.

Data:

*Taxa	Morph Gp	Base	Top m
Karakaschiceras pronecostatum	/am	10	11
Neocomites neocomiensis	/am	0	12
Neocomites subtenuis	/am	0	12
Neocomites teschenensis	/am	0	12
Saynoceras verrucosum	/am	0	4

*END

LOK.17 La Charce Combe Reboul

Bulot, 1995 dissertation; this is a key reference section for 2 upper Hauterivian zones. Bulot et al. 1992, Geologie Alpine 68:13-56; La Charce village in Vocontian basin 75 km NE of Avignon, SE France. Section spans middle part of upper Hauterivian Stage.

Data:

*Taxa	Morph	Base	Top m
Acrioceras pulcherrinum	/am	35	40
Acrioceras seringuei	/am	46	46
Balearites balearis	/am	45	49 FO = Base B. balearis zone in upper Hauterivian
Crioceratites duvalii	/am	0	4
Crioceratites basseae	/am	45	45 ID as cf.
Crioceratites fabreae	/am	47	49
Crioceratites remanei	/am	45	45
Crioceratites majorisensis	/am	34	42
Megacrioceras doublieri	/am	43	43
Paraspitoceras precrassispinum	/am	38	38
Plesiospitidiscus ligatus	/am	15	22
*FO = base P. ligatus Zone in upper Hauterivian			
*Plesiospitidiscus aff. ligatus	/am	27	44
Protacrioceras ornatum	/am	42	44
Pseudomoutoniceras annulare	/am	23	23
Subaspinoceras mulsanti	/am	44	44
Subsaynella mimica	/am	9	11
Subsaynella sayni	/am	5	5

*END

LOK.18 Chamaloc-Col du Rousset roadcut

Bulot et al., 199, fig. 1-7, p. 40, guidebook, Basin type Sections. Base section begins at 145 m in pelagic limestones; Hauterivian-Barremian placed at base of bed 333 @ 271.5 m above datum, sharp contact of pelagic limes & marl overlain by hemipelagic argillaceous limestone; this contact is considered to

represent a major tectono-sedimentary change in the basin correlative with SB H7, a tectonically enhanced unconformity.

Data:

*Taxa	Morph	Base	Top m
Base Barremian	/mb	271.5	*
Balearites balearis	/am	255	255
Barremites spp.	/AM	246	246
Crioceratites duvalii	/am	147	180
Crioceratites nolani	/am	180	190
Neolissoceras grasianum	/am	180	180
Plesiospitidiscus ligatus	/am	180	180 ID as cf.
Pseudothurmannia angulicostatum	/am	263	266 ID as cf.
Pseudothurmannia catulloi	/am	266	266
Ptychophylloceras semisulcatum	/am	180	180 ID as cf.
Subsaynella sayni	/am	145	180

*END

LOK.19 Mont Aiguille I, Vercors, France

Busnardo, Clavel, Charollais, & Schroeder, 1991, *Revue de Paleobiologie*, v. 10, p. 359-364; Hauterivian/Barremian at 275 m; maximum flooding at 10 m;; sequeunce boundary at 20 m; TS at 70 m; mfs at 120 m, SB at 150 m; TS at 240 m; mfs at 295 m; SB at 305 m. Ties with section II: 285 m in I = 10 m in II.

Data:

*TAXA	Morph	Base	Top meters
Acrioceras tabarelli	/am	266	266
Crioceratites nolani	/am	55	55
*sp. indet. associated with <i>Crioceratites nolani</i>			
Emericiceras emerici	/am	266	266
Pseudothurmannia picteti	/am	100	100
Sornayites gp. simionescui	/am	100	100
Plesiospitidiscus ligatus	/am	120	250 ID as sp.
Pseudothurmannia angulicostatum	/am	250	250 ID as group
Pseudothurmannia pseudomalbosi	/am	120	120
Barremites spp.	/am	291	292 group difficilis
Emericiceras emerici	/am	291	292
*From section II so 285 m in I == 1 m in II			
Orbitolinopsis flandrini	/FB	304	304
Orbitolinopsis subkiliani	/fb	304	344
Paleodictyoconus cuvillieri	/fb	304	344
Paracoskinolina hispanica	/fb	344	344 ID questioned
Paracoskinolina maynci	/fb	304	344 ID as cf.
Praedictyorbitolina carthusiana	/fb	304	344
Valserina broennimanni	/fb	304	344

*END

LOK.20 Mont Aiguille II, Vercors, France

Busnardo, Clavel, Charollais, & Schroeder, 1991, *Revue de Paleobiologie*, v. 10, p. 359-364; entirely Barremian; maximum flooding at 11 m, sequence boundary at 21 m; section II ties with section I (LOK.19) 10 m in II = 285 m in I.

Data:

*TAXA	Morph	Base	Top meters
Barremites spp.	/am	7	8 group difficilis
Emericiceras emerici	/am	7	8
Orbitolinopsis flandrini	/FB	20	20
Orbitolinopsis subkiliani	/fb	20	60
Paleodictyoconus cuvillieri	/fb	20	60

Paracoskinolina hispanica	/fb		60 ID questioned
Paracoskinolina maynci	/fb	20	60 ID as cf.
Praedictyorbitolina carthusiana	/fb	20	60
Valserina broennimanni	/fb	20	60

*END

LOK.21 Miravetes Section, Spain

Aguado et al. 2000, Cret. Research 21:1-21, fig. 3. Base Valanginian at FO T. pertransiens at 47.3 m

Data:

*TAXA	Morph	Base	Top meters
Berriasella callisto	/am	2.0	36.5
Erdenella paquieri	/am	1.0	41.0
Fauriella boissieri	/am	0.1	41.0
Kilianella lucensis	/am	34.4	49.0
Kilianella roubaudi	/am	47.3	49.0 spelled roubaudiana
Leptoceras studeri	/am	9.8	31.5
Neocomites premolicus	/am	49.0	49.0
Neolissoceras grasianum	/am	0.1	49.0
Olcostephanus drumensis	/am	31.5	52.0
Thurmanniceras gratianopolitense	/am	47.3	49.0
"Thurmanniceras" otopeta	/am	31.5	41.0
"Thurmanniceras" pertransiens	/am	47.3	52.0
Tirnovella alpillensis	/am	2.0	41.0
Calpionella alpina	/ca	30.7	36.5 ID as aff
Calpionellites darderi	/ca	47.3	52.0 ID questioned
Calpionellopsis oblonga	/ca	30.7	52.0
Calpionellopsis simplex	/ca	30.7	34.4
Lorenziella hungarica	/ca	31.5	52.0
Remaniella cadischiana	/ca	51.0	51.0
Remaniella murgeanui	/ca	52.0	52.0 ID as Precalpionellites
Tintinnopsella carpathica	/ca	30.7	52.0
Tintinnopsella longa	/ca	30.7	52.0
Calcicalathina praeoblongata	/nn	7.5	49.0
Percivalia fenestrata	/nn	18.5	50.0
Percivalia nebulosa	/nn	2.0	45.0
Rucinolithus wisei	/nn	4.0	51.0
Speetonia colligata	/nn	10.0	50.0
Tubodiscus jurapelagicus	/nn	7.0	46.0
Tubodiscus verenae	/nn	18.0	50.0

*END

LOK.22 Canada Lengua Section, Spain

Aguado et al. 2000, Cret. Research 21:1-21, fig. 4. Base Valanginian at FO T. pertransiens at 4.4m

Data:

*TAXA	Morph	Base	Top meters
*Magnetochron M16n	/ma	0	0.5
*Falls far right of LOC & would extend base too far			
Berriasella callisto	/am	0.1	3.0
Erdenella paquieri	/am	0.6	3.0
Fauriella boissieri	/am	0.4	3.0
Kilianella lucensis	/am	3.5	5.5
Kilianella roubaudi	/am	5.1	8.3
*spelled roubaudiana	/am		
Leptoceras studeri	/am	2.0	3.5
Neocomites premolicus	/am	5.1	6.5
Neolissoceras grasianum	/am	0.4	8.3
Olcostephanus drumensis	/am	2.5	8.3
Sarasinella eucyrta	/am	5.5	5.8

Thurmanniceras gratianopolitense	/am	5.1	6.5
"Thurmanniceras" otopeta	/am	2.5	3.5
"Thurmanniceras" pertransiens	/am	4.4	8.3
Tirnovella alpillensis	/am	0.4	3.0
Calpionella alpina	/ca	0.1	5.5 ID as cf
Calpionellites caravacaensis	/ca	5.8	7.1
Calpionellites darderi	/ca	4.4	7.1 ID questioned
Calpionellopsis oblonga	/ca	0.1	6.1
Calpionellopsis simplex	/ca	0.1	4.0
Lorenziella hungarica	/ca	0.1	7.1
Remaniella cadischiana	/ca	0.1	7.1
Remaniella murgeanui	/ca	4.0	7.1 ID as Precalpionellites
Tintinnopsella carpathica	/ca	0.1	7.1
Tintinnopsella longa	/ca	0.1	7.1
Calcicalathina praeoblongata	/nn	1.5	5.1
Percivalia fenestrata	/nn	1.5	5.1
Percivalia nebulosa	/nn	1.5	1.5
Rucinolithus wisei	/nn	1.5	5.1
Speetonia colligata	/nn	2.5	3.5
Tubodiscus jurapelagicus	/nn	2.5	4.0
Tubodiscus verenae	/nn	1.5	1.5 ID questioned
*END			

LOK.23 Canada Lengua-2 Section, Spain

Aguado et al. 2000, Cret. Research 21:1-21, fig. 5. Base Valanginian at FO T. pertransiens at 6.6 m.

Data:

*TAXA	Morph	Base	Top meters
Magnetochron M16n	/ma	0.1	2.1
Berriasella callisto	/am	1.9	5.0
Erdenella paquieri	/am	1.9	4.6
Fauriella boissieri	/am	0.8	4.8
Kilianella lucensis	/am	6.6	8.6
Kilianella roubaudi	/am	6.6	9.6*spelled roubaudiana
Leptoceras studeri	/am	4.3	4.3
Neocomites premolicus	/am	6.6	8.0
Neolissoceras grasianum	/am	1.9	9.6
Olcostephanus drumensis	/am	4.3	9.6
Sarasinella eucyrta	/am	6.6	9.6
Thurmanniceras gratianopolitense	/am	6.6	9.6
"Thurmanniceras" otopeta	/am	4.3	5.0
"Thurmanniceras" pertransiens	/am	6.6	9.6
Tirnovella alpillensis	/am	1.9	5.6
Calpionella alpina	/ca	0.1	6.6 ID as aff
Calpionellites caravacaensis	/ca	8.6	9.6
Calpionellites darderi	/ca	6.6	9.6
Calpionellopsis oblonga	/ca	0.1	8.6
Calpionellopsis simplex	/ca	0.1	5.0
Lorenziella hungarica	/ca	0.1	9.6
Remaniella cadischiana	/ca	0.1	9.6
Remaniella murgeanui	/ca	6.6	9.6 ID as Precalpionellites
Tintinnopsella carpathica	/ca	0.1	9.6
Tintinnopsella longa	/ca	0.1	9.3
Calcicalathina praeoblongata	/nn	1.6	9.6
Percivalia fenestrata	/nn	3.3	9.3
Percivalia nebulosa	/nn	1.6	3.8
Rucinolithus wisei	/nn	1.6	9.6
Speetonia colligata	/nn	3.8	9.6
Tubodiscus jurapelagicus	/nn	1.6	9.6
Tubodiscus verenae	/nn	6	9.6
*END			

LOK.24 Barlya Section, Western Balcanides, Bulgaria
 Approx. 43N, 24E, Lakova et al., 1997, Mineralia Slovaca 29:301-303, Fig. 1. Tithonian/Valanginian
 basinal carbonates. Gintsi Fm. 0-34m, Glozhene Fm. 34-71 m, Salash Fm. 71-180 m.

Data:

*TAXA	Morph	Base	Top meters	
Calpionella alpina	/CA	45	75	
Calpionella elliptalpina	/CA	50	50	
Calpionella elliptica	/ca	70	70	
Calpionella grandalpina	/CA	45	50	
Calpionellites darderi	/CA	100	130	
Calpionellites major	/ca	115	130	
Calpionellopsis oblonga	/CA	80	110	
Calpionellopsis simplex	/CA	75	85	
Chitinoideaella boneti	/ca	35	35	
Chitinoideaella dobeni	/ca	30	30	
Praetintinnopsella andrusovi	/ca	40	40	
Remaniella ferasini	/ca	65	65	
Remaniella murgeanui	/ca	95	110	In Praecalpionellites??
Tintinnopsella carpathica	/ca	40	180	
Tintinnopsella longa	/ca	70	130	
Tintinnopsella remanei	/ca	40	40	
Assipetra infracretacea	/nn	60	145	
Calcicalathina oblongata	/nn	150	165	
Conusphaera mexicana	/nn	19	150	
Conusphaera mexicana minor	/nn	17	40	
Cruciellipsis cuvillieri	/nn	50	180	
Diadorhombus rectus	/nn	170	175	
Faviconus multicolumnatus	/nn	19	60	
Micrantholithus speetonensis	/nn	80	180	
Microstaurus chiastius	/nn	45	160	
Nannoconus bermudezii	/nn	155	175	
Nannoconus cornutus	/nn	140	180	
Nannoconus globulus	/nn	60	80	
Nannoconus quadratus	/nn	140	165	
Nannoconus steinmannii	/nn	80	180	
Nannoconus steinmannii minor	/nn	75	125	
Polycostella beckmannii	/nn	20	50	
Polycostella senaria	/nn	30	50	
Tubodiscus verena	/nn	145	165	
Umbria granulosa	/nn	40	130	
Carpistomiosphaera borzai	/dn	0	17	
Carpistomiosphaera tithonica	/dn	17	20	
Carpistomiosphaera valanginiana	/dn	130	165	
Colomisphaera cieszynica	/dn	30	70	
Colomisphaera conferta	/dn	100	180	
Colomisphaera fortis	/dn	40	70	
Colomisphaera helicosphaera	/dn	120	175	
Colomisphaera nagy	/dn	0	17	
Colomisphaera pieniniensis	/dn	0	17	
Colomisphaera tenuis	/dn	30	75	
Colomisphaera volgeri	/dn	130	180	
Parastomiosphaera malmica	/dn	20	30	
Stomiosphaera echinata	/dn	175	180	
Stomiosphaera proxima	/dn	45	90	
Stomiosphaera wanneri	/dn	95	165	

*END

LOK.25 Gyangze Section, Southern Tibet
 Wan et al., 2010, Lethaia, 43, DOI: 10.1111/j.1502-3931.2010.00238.x.

Data:

*TAXA	Morph	Base	Top meters
Biscutum constans	/nn	60	280
Calcicalathina oblongata	/nn	120	310
Cyclagelosphaera deflandrei	/nn	60	280
Cyclagelosphaera margerelii	/nn	60	300
Cyclagelosphaera tubulata	/nn	300	300
Diazomatolithus lehmanii	/nn	120	300
Discorhabdus ignotus	/nn	80	80
Hexalithus magharensis	/nn	100	100
Hexalithus noelae	/nn	60	60
Manivitella pemmatoidea	/nn	60	300
Nannoconus steinmannii	/nn	60	200
Nannoconus steinmannii minor	/nn	80	200
Polycostella senaria	/nn	80	310
Speetonia colligata	/nn	120	310
Watznaueria barnesae	/nn	80	310
Watznaueria biporta	/nn	60	240
Watznaueria fossacincta	/nn	60	310
Watznaueria manivittiae	/nn	60	200
Watznaueria ovata	/nn	60	200
Corongoceras sp.	/am	40	*
Haplophylloceras strigile	/am	40	*
Himalayites sp.	/am	40	*
Spiticeras sp.	/am	50	*
Inoceramus everesti	/bi	50	*

*Position interpolated from Nagarze section by measuring from top of Weimei Fm. and base of Sangxiu Fm.

Marker bed Tuff 136+/-3.0 Ma /mb 220 *

*END

LOK.26 Fiume Bosso Section, Italy

Bralower et al. 1989, Marine Micropaleontology 14:153-235, Fig. 3, p. 162. Lowrie & Channell, 1984, Geology 12:44-47, magnetostratigraphy data.

Data:

*TAXA	Morph	Base	Top meters
Magnetostrat M15n	/ma	*	387
Magnetostrat M15r	/ma	*	380
Magnetostrat M16n	/MA	*	375
Magnetostrat M16r	/MA	*	363
Magnetostrat M17n	/MA	*	355
Magnetostrat M17r	/MA	*	349
Magnetostrat M18n	/MA	*	328
Magnetostrat M19n	/ma	*	320
Magnetostrat M20n	/ma	*	306
Assipetra infracretacea	/nn	338	404
Biscutum constans	/nn	350	350
Braarudosphaera bigelowii	/nn	385	407
Calcicalathina oblongata	/nn	387	399
Conusphaera mexicana	/NN	300	399
Conusphaera mexicana minor	/nn	301	334
Cretarhabdus angustiforatus	/nn	362	404
Cretarhabdus conicus	/nn	356	356
Cretarhabdus surirellus	/nn	323	407
Cruciellipsis cuvillieri	/nn	328	407
Cyclagelosphaera deflandrei	/nn	300	407
Cyclagelosphaera margerelii	/nn	300	407
Diazomatolithus lehmanii	/nn	310	404
Discorhabdus rotatorius	/nn	350	350

Hexalithus noelae	/nn	313	332	
Lithraphidites carniolensis	/nn	310	407	
Manivitella pemmatoidea	/nn	332	404	
Markalius circumradiatus	/nn	350	370	
Micrantholithus hoschulzii	/nn	354	407	
Microstaurus chiastius	/nn	303	404	
Nannoconus bermudezii	/nn	336	372	
Nannoconus broennimannii	/nn	332	385	
Nannoconus globulus	/nn	334	372	
Nannoconus infans	/nn	314	368	
Nannoconus dolomiticus	/nn	322	354	
Nannoconus kamptneri minor	/nn	334	334	
Nannoconus quadratus	/nn	329	350	
Nannoconus steinmannii	/nn	329	407	
Nannoconus steinmannii minor	/nn	326	404	
Nannoconus truitti	/nn	368	368	
Nannoconus wintereri	/nn	323	330	
Parhabdolithus asper	/nn	320	399	
Parhabdolithus embergeri	/nn	301	407	
Parhabdolithus splendens	/nn	354	385	
Percivalia fenestrata	/nn	370	399	
Pickelhaube furtiva	/nn	328	332	
Polycostella beckmannii	/nn	301	315	
Retecapsa octofenestratus	/nn	350	393	ID as Cretarhabdus
Rotelapillus laffittei	/nn	319	380	
Rucinolithus wisei	/nn	400	400	
Umbria granulosa	/nn	315	362	
Vagalapilla stradneri	/nn	323	323	
Watznaueria barnesae	/nn	300	407	
Watznaueria britannica	/nn	302	400	
Watznaueria communis	/nn	300	404	
Zygodiscus erectus	/nn	313	390	
*END				

LOK.27 Fonte Giordano Section, Italy

Bralower et al. 1989, Marine Micropaleo. 14, Fig. 4, p. 163; Miaolica Formation Berriasian Stage

Data:

*TAXA	Morph	Base	Top	meters
Magnetostron M14n	/ma	*	130	
Magnetostron M14r	/ma	*	129	
Magnetostron M15n	/ma	*	119	
Magnetostron M15r	/ma	*	110	
Magnetostron M16n	/ma	*	103	
Magnetostron M16r	/ma	*	84	
Magnetostron M17n	/ma	*	70	
Magnetostron M17r	/ma	*	65	
Magnetostron M18n	/ma	*	33	
Magnetostron M19n	/ma	*	14	
Assipetra infracretacea	/nn	93	131	
Biscutum constans	/nn	65	65	
Calcicalathina oblongata	/nn	131	132	
Conusphaera mexicana	/nn	5	120	
Conusphaera mexicana minor	/nn	46	46	
Cretarhabdus angustiforatus	/nn	95	125	
Cretarhabdus octofenestratus	/nn	76	95	
Cretarhabdus surirellus	/nn	40	132	
Cruciellopsis cuvillieri	/nn	72	132	
Cyclagelosphaera deflandrei	/nn	5	132	
Cyclagelosphaera margerelii	/nn	5	132	
Diazomatolithus lehmanii	/nn	6	132	

Hexalithus noelae	/nn	13	30
Lithraphidites carniolensis	/nn	16	132
Manivitella pemmatoidea	/nn	123	132
Micrantholithus hoschulzii	/nn	99	130
Microstaurus chiastius	/nn	6	95
Microstaurus quadratus	/nn	15	130
Nannoconus bermudezii	/nn	125	125
Nannoconus dolomiticus	/nn	59	59
Nannoconus steinmannii	/nn	40	131
Nannoconus steinmannii minor	/nn	17	127
Nannoconus wintereri	/nn	40	40
Parhabdolithus asper	/nn	16	132
Parhabdolithus embergeri	/nn	5	132
Percivalia fenestrata	/nn	125	131
Polycostella beckmannii	/nn	6	13
Rhagodiscus nebulosus	/nn	100	100
Rotelapillus laffittei	/nn	40	131
Umbria granulosa	/nn	10	76
Watznaueria barnesae	/nn	5	132
Watznaueria britannica	/nn	59	99
Watznaueria communis	/nn	5	125
*END			

LOK.28 Puerto Escano section, Southern Spain

Lat 37deg27'N, long 4deg 17'W, UTM 30SUG449859, Cordoba, Betic Cordillera; Pruner et al., 2010, Cret. Res. 31:192-206. Deep water carbonate deposition Ammonitico Rosso condensed section; see Caracuel et al. 2000, Rivista Italiana Paleo. Strat. 106:353-368. Jurassic/Cretaceous boundary at *Calpionella alpina* epibole 4.3-4.5m. Alternate marker is epibole of *Crassicollaria parvula* at 4.55m

Data:

*Taxa	Morph	Base	Top meters
Calpionella alpina	/ca	2.35	7.50
Calpionella elliptalpina	/ca	3.06	4.15
Calpionella grandalpina	/ca	2.48	4.15
Chitinoidea boneti	/ca	0.24	1.27
Chitinoidea dobeni	/ca	0.1	1.14 In Longicollaria
Chitinoidea slovenica	/ca	0.1	0.1 In Borziella
Crassicollaria brevis	/ca	2.15	4.01
Crassicollaria colomi	/ca	2.88	4.01
Crassicollaria intermedia	/ca	1.60	3.63
Crassicollaria massutiniana	/ca	2.35	4.01
Crassicollaria parvula	/ca	2.80	7.50
Praetintinnopsella andrusovi	/ca	1.05	1.50
Remaniella ferasini	/ca	7.50	7.50
Tintinnopsella carpathica	/ca	1.40	7.50
Tintinnopsella doliphormis	/ca	6.64	7.50
Tintinnopsella remanei	/ca	1.40	2.28
Magnetostratigraphy M18n	/MA	**	7.6
Magnetostratigraphy M18r	/MA	**	6.96
Magnetostratigraphy M19n	/MA	**	5.705
Magnetostratigraphy M19n.1r	/MA	**	5.585 Also known as Brodno event
Magnetostratigraphy M19r	/MA	**	3.18
Magnetostratigraphy M20n	/MA	**	2.58
Magnetostratigraphy M20n.1r	/MA	**	1.57 Also known as Kysuca event
Magnetostratigraphy M20r	/MA	**	0.105
Burckhardticerias peroni	/am	0.1	0.1
Aulacosphinctes sulcatus	/am	0.1	2.15
Berriasella chomeracensis	/am	3.4	7.5
Berriasella jacobii	/am	3.4	7.5
Berriasella tithonica	/am	2.3	3.3
Durangites acanthicus	/am	2.3	3.3

Durangites astillerensis	/am	2.3	3.3
Durangites vulgaris	/am	2.3	3.3
Kutekiceras pseudocolubrinus	/am	0.1	0.1
Micracanthoceras microcanthum	/am	0.5	2.15
Moravisphinctes moravicus	/am	0.5	2.15
Oloriziceras magnum	/am	0.2	0.4
Oloriziceras salariensis	/am	0.2	0.4
Paraulacosphinctes transitorius	/am	0.5	2.15
Protacanthodiscus berriasensis	/am	3.4	7.5
Protacanthodiscus heterocosmus	/am	3.4	7.5

*END

LOK.29 Grindstone Creek Section, Glen County, California
 122deg31'W, 39deg41'N; at State Road 306 between Elk Creek and Newville, sec. 16, T21N, R6W;
 Bralower et al., 1990, Earth & Planetary Science Letters 98:62-73; data from Fig. 2 and text. Great Valley
 Sequence, west side Sacramento Valley.

Data:

*TAXA	Morph	Base	Top meters
Assipetra infracretacea	/NN	0	140
Cretarhabdus angustiforatus	/NN	40	140
Cretarhabdus surirellus	/NN	0	140
Cruciellopsis cuvillieri	/NN	60	130
Eiffelolithus primus	/NN	80	80
Grantarhabdus meddii	/NN	0	13
Micrantholithus hoschulzii	/NN	40	140
Microstaurus chiastius	/NN	0	140
Parhabdolithus asper	/NN	0	140
Rhagodiscus nebulosus	/NN	45	120
Rotelapillus laffittei	/NN	0	140
Buchia pacifica	/BI	55	140
Buchia uncitoides	/BI	0	37
Marker bed A 137.1+/-0.6 Ma	/MB	37.5	37.9
Marker bed B 137.1+/-0.6 Ma	/MB	103.0	103.4

*END

LOK.30 Miravetes-2 Section (Y.Mv)

Rio Argos, SW of Caravaca, Spain 38deg05'35"N 1deg53'32"W. Aguado et al., 2000, Cret.Res. 21:1-21,
 Fig. 3. Short Berriasian/Valanginian interval to constrain boundary. Base of section @ 0m, top @ 53m.

Data:

*Taxa	Morph	Base	Top meters
Calcicalathina praeoblongata	/nn	7	50
Percivalia fenestrata	/nn	18	51
Percivalia nebulosa	/nn	2.2	51
Rucinolithus wisei	/nn	4	52
Speetonia colligata	/nn	10	51
Tubodiscus jurapelagicus	/nn	7	48
Tubodiscus verenae	/nn	18	51
Umbria granulosa	/nn	4	9.9
Berriasella callisto	/am	2.2	38
Erdenella paquieri	/am	1	42
Fauriella boissieri	/am	0.1	42
Kilianella gr.chamalocensis	/am	7	50 new to dictionary
Kilianella lucensis	/am	35.4	50
Kilianella roubaudiana	/am	48	50 new to dictionary
Leptoceras studeri	/am	9.9	31
Neocomites premolicus	/am	50	50
Neolissoceras grasianum	/am	0.1	50
Olcostephanus drumensis	/am	32.5	53
Spiticeras gr. multiforme	/am	0.1	31 new to dictionary

Thurmanniceras gratianopolitense	/am	48	50
"Thurmanniceras" otopeta	/am	32.5	42
"Thurmanniceras" pertransiens	/am	48	50
Tirnovella alpillensis	/am	2.2	42
Calpionella alpina	/ca	32	38 ID as aff.
Calpionellites darderi	/ca	49	51
Calpionellopsis oblonga	/ca	32	53
Calpionellopsis simplex	/ca	32	35.4
Lorenziella hungarica	/ca	32.5	53
Precalpionellites murgeanui	/ca	53	53 new to dictionary
Remaniella cadischiana	/ca	52	52
Remaniella filipescui	/ca	32	37.5 new to dictionary
Tintinnopsella carpathica	/ca	32	53
Tintinnopsella longa	/ca	32	53

*END

LOK.31 Canada Luenga-2 Section (M.CL)

Rio Argos, SW of Caravaca, Spain, 38deg03'59"N 1deg48'39"W. Aguado et al., 2000, Cret.Res. 21:1-21, Fig. 4. Short Berriasian/Valanginian interval to constrain boundary. Base section @ 0m, top @9m.

Data:

*Taxa	Morph	Base	Top meters
Magnetochochron M14r	/MA	***	9.0
Magnetochochron M15n	/MA	***	3.4
Magnetochochron M15r	/MA	***	2.1
Magnetochochron M16n	/MA	***	0.5
Calcicalathina praeoblongata	/nn	1.5	5.3
Percivalia fenestrata	/nn	1.5	5.3
Percivalia nebulosa	/nn	1.5	1.5
Rucinolithus wisei	/nn	1.5	5.3
Speetonia colligata	/nn	2.2	3.8
Tubodiscus jurapelagicus	/nn	1.5	3.8
Berriasella callisto	/am	0.1	3.0
Erdenella paquieri	/am	0.6	3.0
Fauriella boissieri	/am	0.4	3.0
Kilianella gr.chamalocensis	/am	3.0	3.0 new to dictionary
Kilianella lucensis	/am	3.5	5.5
Kilianella roubaudiana	/am	5.1	8.2 new to dictionary
Leptoceras studeri	/am	2.0	6.5
Neocomites premolicus	/am	5.1	6.5
Neolissoceras grasianum	/am	0.4	8.2 new to dictionary
Olcostephanus drumensis	/am	2.5	8.2
Sarasinella eucyrta	/am	5.5	5.7
Spiticeras gr. multiforme	/am	0.4	2.0 new to dictionary
Thurmanniceras gratianopolitense	/am	5.1	6.5
"Thurmanniceras" otopeta	/am	2.5	3.5
"Thurmanniceras" pertransiens	/am	4.4	8.2
Tirnovella alpillensis	/am	0.4	3.0
Tirnovella romani	/am	3.0	3.0 new to dictionary
Calpionella alpina	/ca	0.1	5.1 ID as aff.
Calpionellites caravacaensis	/ca	5.7	7.1 new to dictionary
Calpionellites darderi	/ca	4.4	7.1
Calpionellopsis oblonga	/ca	0.1	6.3
Calpionellopsis simplex	/ca	0.1	4.0
Lorenziella hungarica	/ca	0.1	7.1
Precalpionellites murgeanui	/ca	4.0	7.1 new to dictionary
Remaniella borzai	/ca	5.5	5.6 new to dictionary
Remaniella catalanoi	/ca	0.4	3.5 new to dictionary
Remaniella cadischiana	/ca	0.1	7.1
Remaniella filipescui	/ca	0.1	5.7 new to dictionary
Tintinnopsella carpathica	/ca	0.1	7.1
Tintinnopsella longa	/ca	0.1	7.1

*END

LOK.32 Canada Luenga-3 Section (Y.CL2)

Rio Argos, SW of Caravaca, Spain, 38deg04'05"N 1deg48'45"W. Aguado et al., 2000, Cret.Res. 21:1-21, Fig. 5. Short Berriasian/Valanginian interval to constrain boundary. Base section @ 0m, top @ 9.5m.

Data:

*Taxa	Morph	Base	Top meters
Magnetostratigraphy M14r	/MA	***	9.5
Magnetostratigraphy M15n	/MA	***	6.2
Magnetostratigraphy M15r	/MA	***	4.6
Magnetostratigraphy M16n	/MA	***	2.0
Calcicalathina praeoblongata	/nn	1.5	9.5
Percivalia fenestrata	/nn	3.4	9.0
Percivalia nebulosa	/nn	1.5	3.6
Rucinolithus wisei	/nn	1.5	8.7
Speetonia colligata	/nn	3.6	9.5
Tubodiscus jurapelagicus	/nn	1.5	9.5
Tubodiscus verenae	/nn	6.0	9.5
Berriasella callisto	/am	1.8	5.1
Erdenella paquieri	/am	1.8	4.6
Fauriella boissieri	/am	0.7	4.7
Kilianella gr.chamalocensis	/am	4.7	5.1 new to dictionary
Kilianella lucensis	/am	6.6	8.7
Kilianella roubaudiana	/am	6.6	9.5 new to dictionary
Leptoceras studeri	/am	4.3	4.3
Neocomites premolicus	/am	6.6	8.2
Neolissoceras grasianum	/am	1.8	9.5 new to dictionary
Olcostephanus drumensis	/am	4.3	9.5
Sarasinella eucyrta	/am	6.6	6.6
Spiticeras gr. multiforme	/am	1.8	2.1 new to dictionary
Substreblites callomoni	/am	2.1	2.1 new to dictionary
Thurmanniceras gratianopolitense	/am	6.6	9.5
"Thurmanniceras" otopeta	/am	4.3	5.1
"Thurmanniceras" pertransiens	/am	6.6	9.5
Tirnovella alpillensis	/am	1.8	5.1
Tirnovella romani	/am	5.6	5.6 new to dictionary
Calpionella alpina	/ca	0.1	6.6 ID as aff.
Calpionellites caravacaensis	/ca	8.7	9.5
Calpionellites darderi	/ca	6.6	9.5
Calpionellopsis oblonga	/ca	0.1	8.7
Calpionellopsis simplex	/ca	0.1	5.1
Lorenziella hungarica	/ca	0.1	9.5
Lorenziella dacica	/ca	1.8	1.8 new to dictionary
Precalpionellites murgeanui	/ca	5.7	9.5 new to dictionary
Remaniella borzai	/ca	4.6	6.6 new to dictionary
Remaniella cadischiana	/ca	0.1	9.5
Remaniella catalanoi	/ca	0.1	2.1 new to dictionary
Tintinnopsella carpathica	/ca	0.1	9.5
Tintinnopsella longa	/ca	0.1	9.2

*END

MOWRY.CAT: SECTION FILES
C:\GRAPHCOR\MOWRY.CAT; Date=10/26/2007

MOWRY.1 1 Frewens Castle, WY
MOWRY.2 2 Pike Creek Section, MT
MOWRY.3 3 Central MT Composite Section
MOWRY.4 4 Timber Creek, Winnecook Ranch, MT
MOWRY.5 5 Manitoba Escarpment Composite
MOWRY.6 6 Sikanni Chief River Bridge Section
MOWRY.7 7Greybull WY NW
MOWRY.8 8Gypsum Creek, WY
MOWRY.9 9Old Cloverly Post Office, WY
MOWRY.10 10 Composite Shields Ranch+Tollgate Pass
MOWRY.11 11 Little Thompson+N. Rabbit Mtn., Colo.
MOWRY.12 12 Muddy Creek, Buffalo, WY
MOWRY.13 13 Arminto Section, WY
MOWRY.14 14 Alcova Section, WY
MOWRY.19 19 Nordman Core, Colorado
MOWRY.20 20 Section 26, Quay Co. New Mexico
MOWRY.21 21 I-70 Roadcut W. Denver, CO
MOWRY.22 22 Liberty Mesa, New Mexico
GRANCS.1 Graneros Shale, Kansas
Following sections listed previously:
MIDK.9 MIDK9 Amoco Bounds Core
MIDK.20b MIDK20b Trinity River Section, Texas
MIDK.37 37 Shell Creek
MIDK.46 46 North Colorado Front Range
MIDK.56 56 San Jon, Quay Co., New Mexico

MOWRY.1 Frewens Castle Section, Wyoming

Johnson County, south of Wyoming; SE sec 31, T42N R19W. Mowry Fm. 0-20.9m, Clay Spur Bentonite 19.7-20.9m, Belle Fourche Sh. 20.9-149m; foram data from M. Evetts, 2000; radiolaria by J. Erbacher 29/05/02.

Data:

*TAXA	MORPH	Base	Top m
*Megafossil data and bentonite positions by R.W. Scott (09/07/00)			
Marker bed Clay Spur bentonite	/mb	19.7	20.9
Marker bed Thatcher Mbr.	/mb	149.5	149.8
Inoc eulesanus	/bi	149.5	149.8
Inoc arvanus	/bi	149.5	149.8
Borissiakoceras reesidei	/am	149.5	149.8
*Microfossil data by M.J. Evetts (revised 28/12/02)			
Trochammina gatesensis	/fb	64.9	*
Trochammina mellariolum	/fb	64.9	86.5
Verneuilinoides hectori	/fb	80.9	*
Verneuilinoides perplexus	/fb	3.7	9.5
Gubkinella graysonensis	/fp	29.9	32.7
Clathrocyclas irrasa	/ra	9.7	26.7
Dactyliosphaera maxima	/ra	9.5	8.7
Dactyliodiscus lenticulatus	/ra	9.5	9.7 ID questioned
Rhopalosyringium sp. cf. R. fossile	/ra	12.5	12.7
*PALY DATA BY F. OBOH-IKUENOBE 07/02			
Aptea polymorpha	/DN	12.7	38.7
Apteodinium granulatum	/dn	15.7	15.7
Apteodinium maculatum	/dn	6.7	58.2 use 2nd top
Canninginopsis colliveri	/dn	19.5	79.7
Canningia reticulata	/dn	3.7	54.2

Cassiculosphaeridia reticulata	/dn	9.7	64.7
Chlamydophorella discreta	/DN	29.7	29.9
Chlamydophorella nyei	/DN	0.7	79.7
Circulodinium distinctum	/dn	0.7	79.7
Cribroperidinium cooksoniae	/dn	3.5	3.7
Cribroperidinium edwardsii	/dn	0.7	6.5
Cribroperidinium exilicristatum	/dn	32.9	76.1
Cyclonephelium compactum	/dn	9.7	79.7
Cyclonephelium membraniphorum	/dn	64.7	64.9
Dinogymnium albertii	/dn	62.7	62.9
Dinopterygium cladoides	/dn	16.5	50.7
Dinopterygium tuberculata	/dn	19.0	19.5
*Downiesphaeridium flexuosum	/dn	16.3	16.5 ID ?
Downiesphaeridium multispinosum	/dn	16.5	76.1
Ellipsodinium imperfectum	/dn	15.7	19.0
Ellipsodinium rugulosum	/dn	19.0	19.5
Epelidosphaeridia spinosa	/dn	6.7	15.5
Florentinia radiculata	/dn	79.7	79.9
Florentinia resex	/DN	19.5	44.7
Fromea amphora	/ac	15.7	76.1
Fromea fragilis	/ac	35.9	54.2
Hapsocysta dictyota	/DN	15.7	44.7
*Hapsocysta peridictya	/DN	64.7	64.9 raises top
Isabelidium globosum	/dn	29.7	29.9
Kiokansium corollum	/dn	80.7	80.9
Kiokansium polypes	/dn	79.7	79.9
Leberidocysta chlamydata	/dn	15.5	15.7
Odontochitina operculata	/dn	3.7	47.7
Oligosphaeridium albertense	/dn	16.3	16.5
Oligosphaeridium complex	/dn	0.7	79.7
Oligosphaeridium pulcherrimum	/dn	3.7	6.5
Oligosphaeridium totum	/dn	79.7	79.9
Ovoidinium scabrosum	/DN	9	62.7 raises top
Ovoidinium verrucosum	/DN	0.7	79.7
Palaeohystrichophora infusorioides	/dn	15.7	79.7
Palaeoperidinium cretaceum	/dn	3.7	76.1
Pareodinia ceratophora	/dn	3.7	23.7
Pervosphaeridium pseudhystrichodini	/dn	47.9	79.7
Pervosphaeridium truncatum	/dn	79.7	79.9 *ID as cf.
Prolixosphaeridium conulum	/dn	76.1	76.3
Protoellipsodinium touile	/dn	35.7	35.9
Pseudoceratium eisenackii	/dn	9.7	76.1
Pterodinium cingulatum	/DN	64.7	64.9
Pterodinium cornutum	/DN	0.7	79.7
Sepispinula huguoniotii	/dn	9.5	9.7
Spiniferites lenzi	/dn	79.7	79.9
Spiniferites ramosus ramosus	/dn	3.7	41.7
Subtilisphaera cheit	/dn	35.7	35.9
Subtilisphaera deformans	/DN	6.7	79.7
Subtilisphaera perlucida	/DN	32.9	79.7
Trichodinium castanea	/dn	3.7	64.7
Veryhachium reductum	/AC	35.9	41.7
Veryhachium rhomboidium	/DN	15.7	47.7
Baculatisporties comaumensis	/sp	35.7	35.9
Cicatricosisporites hallei	/sp	0.7	79.7
Classopollis classoides	/sp	0.7	58.2
Costatoperforosp. foveolatus	/sp	16.5	76.1
Cyathidites australis	/sp	6.7	80.7
Cyathidites minor	/sp	3.7	76.1
Gleicheniidites circiniidites	/sp	0.7	80.7
Gleicheniidites senonicus	/sp	0.7	80.7
Lycopodiumsp. austroclavatidites	/sp	54.2	54.4
Todisporites minor	/sp	6.7	62.7

Vitreisporites pallidus /sp 12.7 26.7
 *END

MOWRY.2 Pike Creek Anticline

NW SE 19-13N-25E, Grassrange Area, Montana. Porter et al., 1997, Mont. Bureau Mines & Geology, Rept. Inv. 3, Pl. 5, Table 1. Top Kootenai Fm. @ 6.7 m; top Fall River Fm. @ 13.4 m; top Skull Creek Sh. @ 66.4 m; top sandy mbr. @ 160.8 m; top Shell Creek Sh. @ 192.0 m = top Thermopolis Fm., top Mowry Fm. @ 212.3 m; top section @ 222 m. top depositional cycles @ 6.7, 13.4, 70.9, 92.1, 113.0, 135.1, 145.5, and 160.8 m.

Data:

*TAXA	Morph	Base	Top meters above base of Porter's measured section
Marker bed Clay Spur bentonite	/mb	211.3	212.3
Marker bed Arrow Creek bentonite	/mb	192.0	192.2
*Thin bentonite at base of Mowry is identified as ACB			
Inoc athabaskensis	/bi	150.4	160.2
M.J. Evetts, 12/18/01			
Clathrocyclas irrasa	/ra	179.8	206.9
Radiolaria by J. Erbacher 29/05/02, 02/04			
Rhopalosyringium sp. cf. R. fossile	/ra	179.8	206.9
Stichomitra tosaensis	/ra	197	197 ID questioned
ID by G.G. Thompson, Appendix A; & D.G. Benson, March 2002			
Aptea attadalica	/dn	198.4	198.4
Aptea polymorpha	/dn	66.3	73.5
*=Pseudoceratium polymorphum			
Apteodinium reticulatum	/dn	66.3	69.7
*cf id at 221.3 m by Benson			
Batioladinium jaegeri	/dn	213.4	213.7
Batioladinium micropodum	/dn	66.3	66.3
Canninginopsis colliveri	/dn	66.3	71.0
Catastomocystis spinosa	/dn	221.3	221.3 ID as cf.
Chichaouadinium vestitum	/dn	66.3	198.4
*Porter data @ 66.3	194.5	/dn	
Chlamydophorella nyei	/dn	66.3	213.4
*Porter data @ 66.3	69.7		
Circulodinium asperum	/dn	204.3	204.3
Coronifera albertii	/dn	221.3	221.3 Base @ 179.8?
Cribroperidinium edwardsii	/dn	66.3	150.8
Cribroperidinium exilicristatum	/dn	66.3	150.8
Cribroperidinium muderongense	/dn	186.8	221.3
Cyclonephelium distinctum	/dn	66.3	191.6
*Porter data @ 66.3	69.7		
Cyclonephelium paucispinum	/dn	186.8	186.8
Diconodinium pusillum	/dn	118.3	118.3
Dingodinium cerviculum	/dn	66.3	118.3
Dinopterygium reticulatum	/dn	179.8	221.3
Downiesphaeridium multispinosum	/dn	66.3	194.5 ID as Cleist.
Florentinia berran	/dn	186.8	186.8
Florentinia deanei	/dn	73.5	73.5
Florentinia cooksoniae	/dn	66.3	213.4
*Porter data @ 66.3	150.8		
Ginginodinium evittii	/dn	66.3	204.3
*Porters data top @ 150.8			
Kalyptea aceras	/dn	179.8	213.4
Litosphaeridium arundum	/dn	69.7	150.8
Luxadinium primulum	/dn	71.2	194.5
Luxadinium propatulum	/dn	66.3	198.4
*Porter data @ 66.3			
Microdinium crinitum	/dn	150.8	150.8
Micrhystridium inconspicuum	/dn	71.0	71.2

Muderongia asymmetrica	/dn	66.3	66.3	
Odontochitina costata	/dn	66.3	150.8	
Odontochitina operculata	/dn	186.8	213.4	
Odontochitina singhii	/dn	191.6	191.6	
Oligosphaeridium albertense	/dn	186.8	221.3	
Oligosphaeridium anthophorum	/dn	198.4	213.4	
Oligosphaeridium complex	/dn	69.7	213.4	
*Porter data @ 69.7 118.2				
Oligosphaeridium pulcherrimum	/dn	66.3	213.4	
*Porter data @ 66.3 194.5				
Oligosphaeridium totum	/dn	66.3	179.8	
*Porter data @ 66.3				
Ovoidinium scabrosum	/dn	179.8	198.4	
Ovoidinium verrucosum	/dn	173.0	221.3	
*Porter data @ 194.5 194.5				
Palaeohystrichophora infusorioides	/dn	69.7	191.6	
*Porter data @ 69.7 69.7				
Palaeoperidium cretaceum	/dn	66.3	213.4	
*Porter data @ 66.3 150.8				
Pareodinia ceratophora	/dn	66.3	66.3	
Pseudoceratium anaphrisum	/dn	191.6	204.3	
Pseudoceratium eisenackii	/dn	71.2	213.4	
*Porter data @ 71.2 118.2				
Pseudoceratium expositum	/dn	213.4	213.7	
Pterodinium cingulatum	/dn	213.4	213.7	
Pterospermella australiensis	/dn	173	206.9	
Pterospermella harti	/dn	173	206.9	
Spiniferites membranaceus	/dn	191.6	198.4	ID as cf
Spinidium echinoideum	/dn	197	204.3	
Tanyosphaeridium salpinx	/dn	73.5	73.5	
Trichodinium spinosum	/dn	66.3	69.7	
Trithyrodinium suspectum	/dn	213.4	213.7	
Wallodinium anglicum	/dn	204.3	204.3	
Fromea amphora	/ac	66.3	118.3	
Fromea glabella	/ac	71.2	150.8	
Acanthotriletes varispinosus	/sp	66.3	66.3	
Baculatisportites comaumensis	/sp	109.7	221.3	*Top ID questioned
Cerebropollenites mesozoicus	/sp	186.8	213.4	
Cicatricosisporites hallei	/sp	66.3	189.8	
Classopollis classoides	/sp	204.3	213.4	
Classopollis simplex	/sp	179.8	204.3	
Clavatipollenites hughesii	/sp	69.7	194.5	
Costatoperforosp. foveolatus	/sp	111.1	111.1	
Cyathidites australis	/sp	111.2	213.4	
*Porter data @ 111.2 158.2				
Cyathidites minor	/sp	66.3	234	
*Porter data @ 66.3 234				
Distaltriangulisporites perplexus	/sp	66.3	118.2	
Gleicheniidites circiniidites	/sp	197	221.3	
Gleicheniidites senonicus	/sp	66.3	234	
Ischyosporites crateris	/sp	69.7	69.7	
Januasporites spiniferus	/sp	66.3	66.3	
Lycopodiumsp. austroclavatidites	/sp	111.1	113.5	
Lycopodiumsporites marginatus	/sp	66.3	69.7	
Nyssapollenites albertensis	/sp	66.3	118.3	
Osmundacidites wellmanii	/sp	109.7	158.2	
Perinopollenites elatoides	/sp	66.3	69.7	ID as cf.
Rugubivesiculites rugosus	/sp	71.1	213.4	
*Porter data @ 71.1 118.2				
Tigrisporites reticulatus	/sp	69.7	73.5	
Todisporites minor	/sp	158.2	158.2	
Tricolpites micromunus	/sp	69.7	150.8	
Trilobosporites marylandensis	/sp	66.3	66.3	

Vitreisporites pallidus /sp 109.7 234 Porter data
*END

MOWRY.3 Composite section of Mowry Sections, Montana

Sections 12-Belt Butte, 13-Geysler, 14-Arrow Creek, 18-Ayers, & 19-Teigen; measured and collected by Reeside & Cobban 1960. Redescribed & sampled by R.W. Scott July, 2000. Calibrated to top of Arrow Creek Bentonite at 70.1 m in #13 at Geysler, Montana. Thermopolis Fm. -3 to 61.1 m, Arrow Creek Bentonite Bed 61.1-71.0 m, base Mowry Fm. 71.0-m; Clay Spur Bentonite at section 19-Teigen; negative positions needed to plot normally!!

Data:

*TAXA	MORPH	Base	Top m
Marker bed Arrow Creek bentonite	/mb	61.1	71.0
*Dated 98.52+/-0.41 Ma, Obradovich, 1993			
Marker bed Clay Spur bentonite	/mb	-114.1	-114.5
Foram data by M.J. Evetts, 2000 unpubl.; modified 16-05-02 & 28-12-02 by MJE			
Ammobaculites impexus	/fb	-10.2	-24.0 ID questioned
Ammobaculoides phaulus	/fb	-80.5	-80.5 ID as cf.
Haplophragmoides multiplum	/fb	-80.5	-80.5 ID sp. cf.
Haplophragmoides linki	/fb	-80.5	-80.5
Haplophragmoides uniorbis	/fb	-2.0	-2.0 ID as cf.
Miliammina ischnia	/fb	-2.0	-80.5
Miliammina manitobensis	/fb	-2.0	-80.5
Sacc alexanderi	/fb	-2.0	-24.0
Saccammina lathrami	/fb	-2.0	-2.0 ID ?
Trochammina gatesensis	/fb	-10.2	-24.0
Trochammina wetteri	/fb	-80.5	-80.5 ID ?
Verneuilina canadensis	/fb	-10.2	-24.0
Verneuilinoides hectori	/fb	-10.2	-10.2 ID ?
Verneuilinoides perplexus	/fb	-2.0	-80.5
Clathrocyclas irrasa	/ra	-80.5	-99.3
Other Radiolaria data by J. Erbacher 29/05/02 modified Feb 2004			
Dactyliosphaera maxima	/ra	-76.5	-76.5
Dactyliosphaera acutispina	/ra	-76.5	-114
Rhopalosyringium sp. cf. R. fossile	/ra	-99.3	-99.3
Ammonite data from Reeside & Cobban, 1960, and R.W. Scott, 2000 unpubl.			
Inoceramus mowryensis	/bi	-84.5	-84.5
Metengenoceras aspenanum	/am	-83.1	-106.7
Metengenoceras teigenensis	/am	-96.5	-97.8
*Metoicoceras mosbyensis	/am	-122	-122
*ID by W.Cobban, 2000; collected from float			
Neogastrolites americanus	/am	-84.5	-84.5
Neogastrolites cornutus	/am	-3.0	-71.2
Neogastrolites muelleri	/am	-83.1	-99.1
Paly data by Don Benson 01-01-02			
Aptea attadalica	/dn	-16.9	-16.9
Apteodinium grande	/dn	-76.6	-76.6
Apteodinium granulatum	/dn	-114	-114 ID ?
Batioladinium jaegeri	/dn	-18.4	-80.5
Caligodinium aceras	/dn	-18.4	-111.6 ID as Kalyptea
Canninginopsis colliveri	/dn	-53.6	-111.6
Canningia microciliata	/dn	-84.1	-114
Canningia reticulata	/dn	-2	-2 ID as cf.
Cassiculosphaeridia reticulata	/dn	-2	-18.4
Chichaouadinium boydii	/dn	-18.4	-80.5
Chichaouadinium vestitum	/dn	-2	-80.5
Cleistosphaeridium aciculare	/dn	-18.4	-99.2
Cribroperidinium edwardsii	/dn	-16.9	-111.6
Cribroperidinium exilicristatum	/dn	-2	-80.5
Cribroperidinium intricatum	/DN	-2	-2
Cribroperidinium muderongense	/dn	-89.1	-99.2

Cyclonephelium brevispinatum	/dn	-84.1	-93.1	
Desmocysta plekta	/dn	-18.4	-80.5	ID as cf.
Dingodinium cerviculum	/dn	-2	-18.4	
Florentinia abbreviata	/dn	-89.1	-89.1	
Florentinia berran	/dn	-99.6	-99.6	
Florentinia cooksoniae	/dn	-16.9	-111.6	
Florentinia laciniata	/dn	-16.9	-18.4	ID as cf.
Florentinia mantellii	/dn	-111.6	-111.6	
Florentinia resex	/DN	-85.8	-89.5	ID as cf.
Ginginodinium evittii	/dn	-53.6	-89.5	
Hystrichodinium pulchrum	/dn	-85.8	-85.8	
Hystrichosphaerina schindewolfii	/dn	-53.6	-89.5	
Litosphaeridium arundum	/dn	-18.4	-85.8	
Luxadinium propatulum	/dn	-16.9	-80.5	
Odontochitina rhakodes	/dn	-76.6	-76.6	ID as cf., raises top
Odontochitina operculata	/dn	-53.6	-111.6	
Oligosphaeridium albertense	/dn	-16.9	-111.6	
Oligosphaeridium anthophorum	/dn	-53.6	-111.6	
Oligosphaeridium complex	/dn	-53.6	-111.6	
Oligosphaeridium pulcherrimum	/dn	-18.4	-111.6	
Ovoidinium scabrosum	/DN	-73.1	-111.6	
Ovoidinium verrucosum	/DN	-73.1	-114	
Palaeohystrichophora infusorioides	/dn	-24	-99.2	
Palaeoperidinium cretaceum	/dn	-18.4	-89.5	
Pervosphaeridium truncatum	/dn	-18.4	-18.4	
Pseudoceratium eisenackii	/dn	-16.9	-111.6	
Pseudoceratium expolitum	/dn	-16.9	-20.7	
Pseudoceratium securigerum	/dn	-16.9	-16.9	
Pterospermella australiensis	/dn	-10.2	-76.6	
Pterospermella harti	/dn	-24	-111.6	
Spinidinium echinoideum	/dn	-24.0	-89.5	
Spiniferites cingulatus	/dn	-89.1	-111.6	
Spiniferites membranaceus	/dn	-16.9	-16.9	ID as cf., lowers base
Spiniferites twistringiensis	/dn	-53.6	-93.1	
*ID as Spin ramosus multibrevis				
Stiphrosphaeridium anthophorum	/dn	-18.4	-111.6	ID as Oligosphaeridium
Subtilisphaera perlucida	/dn	-24	-24	
Surculosphaeridium phoenix	/dn	-73.1	-93.1	
Trichodinium brevispinosum	/dn	-2	-2	ID as cf.
Wrevittia cassidata	/dn	-16.9	-16.9	ID as Gonyalocysta
Xenascus plotei	/dn	-99.6	-99.6	ID as cf.
Acanthotriletes varispinosus	/sp	-16.9	-111.6	
Appendicisporites spinosus	/sp	-18.4	-18.4	
Appendicisporites tricornitatus	/SP	-99.2	-99.2	ID as cf.
Asteropollis asteroides	/sp	-20.7	-20.7	
Baculatisporites comaumensis	/sp	-16.9	-111.6	
Camazonosporites insignis	/sp	-80.5	-99.2	
Cerebropollenites mesozoicus	/sp	-2	-114	
Cicatricosisporites brevilaesuratus	/sp	-16.9	-76.6	
Cicatricosisporites hallei	/sp	-16.9	-80.5	
Classopollis classoides	/sp	-24	-111.6	
Classopollis simplex	/sp	-2	-99.6	
Clavifera triplex	/sp	-2	-93.1	
Costatoperforosp. foveolatus	/sp	-16.9	-108.8	
Cyathidites australis	/sp	-2	-114	
Cyathidites minor	/sp	-2	-114	
Dictyophyllidites harrisii	/sp	-18.4	-111.6	
Distaltriang. mutabilis	/sp	-16.9	-76.6	
Distaltriangulisporites perplexus	/SP	-76.6	-80.5	
Gleicheniidites circiniidites	/sp	-2	-114	
Gleicheniidites senonicus	/sp	-2	-111.6	
Inaperturopollenites hiatus	/sp	-2	-114	
Laevigatosporites gracilis	/sp	-18.4	-108.8	

Leiofusa jurassica	/dn	-99.6	-99.6
Lycopodiumsp. austroclavatidites	/sp	-18.4	-58.1
Lycopodiumsp. reticulumsporites	/sp	-16.9	-16.9
Ornamentifera echinata	/sp	-18.4	-76.6
Osmundacidites wellmanii	/sp	-18.4	-85.8
Pilosporites trichopappilosus	/sp	-16.9	-16.9
Rubinella major	/sp	-16.9	-16.9
Schizosporis reticulatus	/sp	-80.5	-80.5
Stereisporites antiquasporites	/sp	-18.4	-53.6
Tigrisporites reticulatus	/sp	-80.5	-80.5
Todisporites minor	/sp	-16.9	-58.1
Vitreisporites pallidus	/sp	-16.9	-114.9
*END			

MOWRY.4 Timber Creek

Winnecook Ranch, 14-7N-16E, Wheatland Co., Montana. Section 11 of Reeside & Cobban 1960; measured and collected by R.W. Scott. Mowry Fm.0-80m, Big Elk Sandstone Mbr. of Mowry 65.5-80 m.

Data:

*TAXA	MORPH	Base	Top m
Ammonite data from Reeside & Cobban, 1960, and R.W. Scott, 2000 unpubl.			
Neogastropilites americanus	/am	45	45
Neogastropilites maclearni	/am	46	71 ID of top specimen questioned
Neogastropilites muelleri	/am	20	20
Foram data by M.J. Evetts, 2000 unpubl.			
Haplophragmoides linki	/fb	10.2	10.2
Haplophragmoides multiplum	/fb	10.2	10.2 ID as cf.
Miliammina manitobensis	/fb	5.7	5.7
Trochammina wetteri	/fb	10.2	10.2
Verneuilinoides perplexus	/fb	5.7	30.1
Clathrocyclas irrasa	/ra	5.7	5.7
Other Radiolaria data by J. Erbacher 29/05/02			
Rhopalosyringium sp. cf. R. fossile	/ra	5.5	5.7
Paly data by Don Benson 11-01-02			
Aptea attadalyca	/dn	65.3	65.5
Batioladinium jaegeri	/dn	0.6	0.6
Caligodinium aceras	/dn	0.6	0.6 ID as Kalyptea
Chlamydochorella nyei	/dn	10.2	39.0 ID as cf.
Chichaouadinium vestitum	/dn	0.6	39.0
Circulodinium asperum	/dn	65.3	65.5
Cleistosphaeridium aciculare	/dn	0.6	19.0
Cribooperidinium edwardsii	/dn	0.6	39.0
Cribooperidinium muderongense	/dn	0.6	39.0
Cyclonephelium paucispinum	/dn	0.6	65.3
Dingodinium cerviculum	/dn	0.6	0.6
Florentinia cooksoniae	/dn	0.6	19.0
Florentinia laciniata	/dn	19.0	19.2
Florentinia resex	/DN	65.3	65.5
Ginginodinium evittii	/dn	0.6	25.6
Kiokansium unituberculatum	/dn	19.0	19.2
Kleithriasphaeridium eoinodes	/dn	0.4	0.6
Luxadinium propatulum	/dn	0.6	39.0
Odontochitina operculata	/dn	0.6	65.3
Oligosphaeridium albertense	/dn	0.6	19.0
Oligosphaeridium anthophorum	/dn	0.6	38.0
Oligosphaeridium complex	/dn	19.2	65.3
Ovoidinium scabrosum	/DN	25.8	65.3
Ovoidinium verrucosum	/DN	5.7	65.3
Palaeohystrichophora infusorioides	/dn	38.2	39.0
Palaeoperidinium cretaceum	/dn	0.6	38.0
Pseudoceratium eisenackii	/dn	0.6	65.3

<i>Pseudoceratium exolitum</i>	/dn	0.6	0.6
<i>Pterodinium cingulatum</i>	/dn	0.6	39.0 ID as Spinidinium
<i>Pterospermella australiensis</i>	/dn	19.2	25.6
<i>Pterospermella harti</i>	/dn	65.3	65.5
<i>Spinidinium echinoideum</i>	/dn	5.7	39.0
<i>Spiniferites membranaceus</i>	/dn	0.6	0.6
<i>Subtilisphaera cheit</i>	/dn	5.5	5.7
<i>Subtilisphaera perlucida</i>	/dn	19.2	39.0
<i>Trichodinium castanea</i>	/dn	0.6	19.0
<i>Xiphophoridium alatum</i>	/dn	19.0	19.2
<i>Fromea amphora</i>	/ac	5.5	5.7
<i>Acanthotriletes varispinosus</i>	/SP	19.0	19.2
<i>Asteropollis asteroides</i>	/sp	5.5	5.7
<i>Baculatisporties comaumensis</i>	/sp	0.6	0.6
<i>Callialasporites dampierii</i>	/sp	19.0	19.2
<i>Cerebropollenites mesozoicus</i>	/sp	0.6	19.0
<i>Cicatricosporites hallei</i>	/sp	19.0	19.2
<i>Classopollis classoides</i>	/sp	0.6	10.0
<i>Classopollis simplex</i>	/sp	0.6	65.3
<i>Clavifera triplex</i>	/sp	0.6	65.3
<i>Costatoperforosp. foveolatus</i>	/sp	0.6	65.3
<i>Cyathidites australis</i>	/sp	0.6	65.3
<i>Cyathidites minor</i>	/sp	0.6	65.3
<i>Gleicheniidites circiniidites</i>	/sp	0.6	65.3
<i>Gleicheniidites senonicus</i>	/sp	0.6	65.3
<i>Lycopodiumsp. austroclavatidites</i>	/sp	0.6	10.0
<i>Osmundacidites wellmanii</i>	/sp	65.3	65.5
<i>Taurocusporites segmentatus</i>	/sp	10.0	10.2
*END			

MOWRY.5 Manitoba Escarpment Composite

SE Saskatchewan & SW Manitoba, Canada, McNeil & Caldwell, 1981, Geol. Assoc. Canada Special Paper No. 21, Text-fig. 43. Ashville Fm. w/ Skull Creek Shale 40 m thick, Newcastle Ss, 15 m thick (55 m), Westgate Sh. Mbr. 20 m(75'), Belle Fourche Sh. Mbr. 30 m(105'); Favel Fm. w/ Keld Mbr. 17 m(122'), base is unconformity, Assiniboine Mbr. 16 m(138'), Morden Sh. Fm. 55 m(193'), overlain by Niobrara Fm.

Data:

*TAXA	MORPH	Base	Top m
Marker bed "X" bentonite	/mb	95	96
<i>Inoc cuvierii</i>	/bi	136	138
<i>Myti labiatus</i>	/bi	111	121
<i>Myti subhercynicus</i>	/bi	117	121.5
<i>Bacu yokoyamai</i>	/am	121.6	122
<i>Coll woollgari</i>	/am	121.6	122
<i>Prio hyatti</i>	/am	165	165 Position estimated
<i>Ostrea beloiti</i>	/bi	95	96
*Measured in well 26 on Text-fig. 22			
<i>Ammodiscus kiowensis</i>	/fb	0	40
<i>Haplophragmoides gigas</i>	/fb	0	50
<i>Haplophragmoides linki</i>	/fb	55	74
<i>Miliammina manitobensis</i>	/fb	15	74
<i>Neob albertensis</i>	/fb	105	200
<i>Pseudobolivina variana</i>	/fb	0	100
<i>Sacc alexanderi</i>	/fb	0	55
<i>Saccamina lathrami</i>	/fb	10	100 ID as cf.
<i>Trochammina depressa</i>	/fb	25	60
<i>Trochammina rainwateri</i>	/fb	75	95
<i>Trochammina wetteri</i>	/FB	50	100
<i>Troc rutherfordi</i>	/fb	45	74
<i>Verneuilina canadensis</i>	/FB	65	65
<i>Verneuilinoides perplexus</i>	/fb	75	100

Clav simplex	/fp	105	110
Clav subcretacea	/fp	105	110
Hedb amabilis	/fp	105	138
Hedb delrioensis	/FP	105	200
Hedb loetterlei	/fp	45	165
Hedb planispira	/fp	105	200
Hedb portsdownensis	/fp	105	138
Heterohelix globulosa	/FP	105	140
Scha cenomana	/FP	105	*
Whit aprica	/fp	105	138
*END			

Mowry.6 Sikanni Chief River Bridge Section

Alcan Highway, 57deg 14'N, 122deg 41'W, NE British Columbia, Canada. Section in Anan-Yorke & Stelck, 1978, Geol. Assoc. Canada SP 18, p. 475, fig. 1.

Sikanni Fm. 83-209 m, First Sikanni Ss 83-100 m, Second Ss 122-140, Third Ss 157-174 m, Fourth Ss 187-209 m; Sully Fm. 209-270 m @ overburden; Fish scales bed about 240-260 m.

Data:

*TAXA	Morph Gp	Base	Top meters
Occurrences by Stelck, 1975, p. 255 in 3rd & 4th Sikanni sands & Jeletsky, 1980, GSC Paper 79-22, Pl. 7, fig. 2, Pl. 10, fig. 3, in mid Buckingham Fm.			
Neogastrolites cornutus	/AM	200	200
Neogastrolites haasi	/AM	165	165
Stelckiceras liardense	/am	50	50
Warren & Stelck, 1969, Bull. Canadian Pet. Geol. 17:529-547; upper Fish Scale bed			
Neogastrolites maclearni	/am	250	250
Neogastrolites americanus	/am	238	238
Estimated to be about 2 m below Fish Scale bed;			
Anan-Yorke & Stelck, 1978, Geol. Assoc. Canada SP 18, figs. 4, 5			
Apteodinium reticulatum	/dn	3	54
Aptea polymorpha	/dn	3	269.5
Batioladinium jaegeri	/dn	3	266
*=Broomea jaegeri in Singh 71 & Imbatodinium jaegeri in Singh 83			
Cribopteridinium edwardsii	/dn	3	265
Cyclonephelium distinctum	/dn	52	230
Dingodinium cerviculum	/dn	50	50
Wrevittia cassidata	/dn	3	263 ID as Gony.
Kleithriasphaeridium loffrense	/dn	3	=Hyst. stellatum in Singh 71
Luxadinium propatulum	/dn	3	230
Odontochitina operculata	/dn	3	268
Oligosphaeridium anthophorum	/dn	210	270
Oligosphaeridium complex	/dn	4	218
Oligosphaeridium pulcherrimum	/dn	3	270
Oligosphaeridium tenuiprocessum	/dn	230	269.5 =Hyst. recurvatum in Singh 71
Oligosphaeridium totum	/dn	3	218
Ovoidinium verrucosum	/dn	210	218
*the basal 2 occurrences at 50 and 52 m extend the base; use 3rd base			
Palaeopteridinium cretaceum	/dn	3	270
Pareodinia ceratophora	/dn	3	215
Pseudoceratium expolitum	/dn	50	54
Pterodinium cornutum	/dn	50	50
Pterospermella aureolata	/dn	3	270
Pterospermella harti	/dn	50	269.5
Spiniferites cingulatus	/dn	54	54
Spiniferites ramosus gracilis	/dn	215	269
Spiniferites ramosus ramosus	/dn	50	260
Spiniferites vestitum	/dn	3	82
Veryhachium rhomboidium	/dn	50	54
Fromea amphora	/ac	50	54
Appendicisporites unicus	/sp	82	229

Stelck, 1975, Geol. Assoc. Canada SP 13:253-275, text-fig. 5

<i>Ammobaculites fragmentarius</i>	/fb	29	156	
<i>Ammobaculites tyrrelli</i>	/fb	6	143	
<i>Glomospira tortuosa</i>	/fb	1	80	
* <i>Haplophragmoides gilberti</i>	/fb	2	80	ID as cf.
* <i>Haplophragmoides linki</i>	/fb	6	11	ID as cf.
<i>Haplophragmoides topagorukensis</i>	/fb	1	45	
<i>Miliammina awunensis</i>	/fb	1	29	
* <i>Miliammina ischnia</i>	/fb	6	80	ID as cf.
<i>Miliammina manitobensis</i>	/fb	1	141	
<i>Reophax minuta</i>	/fb	6	59	
<i>Reophax sikanniensis</i>	/fb	1	120	
<i>Sacc alexanderi</i>	/fb	1	156	
<i>Psamminopelta bowsheri</i>	/fb	1	156	= <i>Spirolocammina bowsheri</i>
* <i>Trochammina rainwateri</i>	/fb	72	150	ID as cf.
<i>Trochammina wetteri</i>	/fb	1	156	
<i>Verneuilina canadensis</i>	/fb	39	50	
<i>Verneuilinoides hectori</i>	/fb	39	141	

*END

MOWRY.7 Greybull WY NW

Eicher's Loc. 19, west flank of Sheep Mountain anticline, sec. 14, T53N, R94W, Big Horn Co., Eicher, D.L., 1960, Peabody Museum of Natural History, Yale Univ., Bull. 15, 126 p., 6 pl. Top eroded ; Shell Creek Shale @ 463', top Muddy Sandstone @ 397', top Thermopolis Fm. @ 356', top "Rusty beds" @ 130', top Cloverly Fm. @ 0 ft; base is top of sample range, top is base of sample.

Data:

*TAXA	Morph	Base	Top ft
<i>Ammobaculites euides</i>	/fb	306	356
<i>Ammobaculites obliquus</i>	/fb	322	346
<i>Ammobaculites petilus</i>	/fb	330	343
<i>Ammobaculites subcretaceus</i>	/fb	330	343
<i>Ammobaculites tyrrelli</i>	/fb	330	343
<i>Ammobaculoides phaulus</i>	/fb	322	343
<i>Ammobaculoides whitneyi</i>	/fb	306	343
<i>Ammodiscus kiowensis</i>	/fb	322	343
<i>Ammomarginulina cragini</i>	/fb	322	322
<i>Glomospira glomerosa</i>	/fb	639	*
<i>Glomospira reata</i>	/fb	322	322
<i>Glomospira tortuosa</i>	/fb	356	*
<i>Haplophragmoides gigas</i>	/fb	356	*
<i>Haplophragmoides linki</i>	/fb	306	356 ID in <i>Alveolophragmium</i>
<i>Haplophragmoides multiplum</i>	/fb	639	639
<i>Haplophragmoides uniorbis</i>	/fb	242	242
<i>Miliammina inflata</i>	/fb	255	330
<i>Miliammina ischnia</i>	/fb	413	625
<i>Miliammina manitobensis</i>	/fb	413	639
<i>Pseudobolivina variana</i>	/fb	322	343
<i>Sacc alexanderi</i>	/fb	322	322
<i>Spirolocammina planula</i>	/fb	413	625
<i>Spirolocammina subcircularis</i>	/fb	255	284
<i>Trochammina depressa</i>	/fb	322	343
<i>Verneuilina canadensis</i>	/fb	412	571
<i>Verneuilinoides hectori</i>	/fb	296	639
* = <i>Gaudryina canadensis</i> in McNeil & Caldwell, 1981			
<i>Verneuilinoides perplexus</i>	/fb	255	346
* <i>Verneuilinoides kansasensis</i> is junior synonym in Eicher, 1965, p. 902			
<i>Clathrocyclas irrasa</i>	/ra	575	625

*END

MOWRY.8 Gypsum Creek, WY

Eicher's Loc. 22, about 1 mi S. of Montana state line, sec. 26, T58N, R96W, Big Horn Co., Eicher, D.L., 1960, Peabody Museum of Natural History, Yale Univ., Bull. 15, 126 p., 6 pl. Eroded top Mowry @ 796', top Shell Creek Shale @ 714', top Muddy Sandstone @ 409', top Thermopolis Fm. @ 366', top "Rusty beds" @ 125', top Cloverly Fm. @ 0 ft; base is top of sample range, top is base of sample.

Data:

*TAXA	Morph	Base	Top feet
Ammobaculites euides	/fb	317	342
Ammobaculites obliquus	/fb	317	317
Ammobaculites petilus	/fb	317	329
Ammobaculites subcretaceus	/fb	317	329
Ammobaculoides phaulus	/fb	317	329
Ammobaculoides whitneyi	/fb	317	342
Ammodiscus kiowensis	/fb	342	342
Glomospira glomerosa	/fb	702	702
Glomopsira reata	/fb	317	329
Glomospira tortuosa	/fb	342	342
Haplophragmoides gigas	/fb	317	342
Haplophragmoides linki	/fb	317	342
Haplophragmoides multiplum	/fb	702	*
Haplophragmoides uniorbis	/fb	690	702
Miliammina inflata	/fb	267	317
Miliammina ischnia	/fb	423	702
Miliammina manitobensis	/fb	437	679
Miliammina sproulei	/fb	280	342 ID as cf
Pseudobolivina variana	/fb	317	506
Sacc alexanderi	/fb	*	342
Spirolocammina planula	/fb	437	690
Spirolocammina subcircularis	/fb	267	280
Trochammina depressa	/fb	293	342
Verneuulinoides perplexus	/fb	267	329
*Verneuulinoides kansasensis is junior synonym in Eicher, 1965, p. 902			
Clathrocyclus irrasa	/ra	632	702

*END

MOWRY.9 Old Cloverly Post Office, WY

Eicher's Loc. 21, sec. 15, T54N, R92W, Big Horn Co., Eicher, D.L., 1960, Peabody Museum of Natural History, Yale Univ., Bull. 15, 126 p., 6 pl. Top of eroded Mowry @ 639'; top Shell Creek Shale @ 634', top Muddy Sandstone @ 391', top Thermopolis Fm. @ 343', top "Rusty beds" @ 107', top Cloverly Fm. @ 0 ft; base is top of sample range, top is base of sample.

Data:

Neogastropylites haasi	/am	578	578
Inoc comancheanus	/bi	318	318
*p. 23, K. Waage collected it about 25' below base Muddy			
Ammobaculites euides	/fb	301	334
Ammobaculites obliquus	/fb	312	323
Ammobaculites petilus	/fb	301	334
Ammobaculites subcretaceus	/fb	323	334
Ammobaculites tyrrelli	/fb	312	323
Ammobaculoides phaulus	/fb	301	334
Ammobaculoides whitneyi	/fb	301	334
Ammodiscus kiowensis	/fb	334	*
Glomopsira reata	/fb	301	323
Glomospira tortuosa	/fb	334	*
Haplophragmoides gigas	/fb	312	334

Haplophragmoides linki	/fb	301	334 ID as Alveolophragmium
Miliammina inflata	/fb	257	323
Miliammina manitobensis	/fb	578	*
Pseudobolivina variana	/fb	290	323
Sacc alexanderi	/fb	301	301
Spirolocammina planula	/fb	551	578
Spirolocammina subcircularis	/fb	257	301
Trochammina depressa	/fb	268	334
Verneuilina canadensis	/fb	551	*
Verneuilinoides hectori	/fb	290	578
*= Gaudryina canadensis in McNeil & Caldwell, 1981			
Verneuilinoides perplexus	/fb	257	334
*Verneuilinoides kansasensis is junior synonym in Eicher, 1965, p. 902			
*END			

MOWRY.10 — Composite of Shields Ranch, Perky Ranch, OK & Tollgate Pass, NM Oklahoma panhandle and NE New Mexico sections in Scott et al., 2004, The Mountain Geologist 41:33-61 and Kauffman et al., 1977, Geol. Soc. Mem. #149, p. 13. Thatcher Limestone Mbr. 0.2 m thick; Lower Graneros Shale Mbr. est. to be 20 m by Kauffman et al. Top Dakota Group @ 35m, base of section @ 0 m is base of Dakota; top Lower Mbr. Mesa Rica Sandstone @ 11.4 m; top Middle Mbr. @ 17.2 m = SB3.2; top Upper Mbr. Mesa Rica Sandstone @ 20.5 m; top Pajarito Fm. @ 32.5 m = SB4; top Romeroville Ss. 35 m.; spl 1=13.1-13.6 m, 2=14.55-14.85 m, 3=24.25-24.45 m, 4=26.25-26.45 m, 5=28.25-28.45 m, 6=30.25-30.45 m; Perky section samples projected into Shields section:1=28.6, 2=29.6 m, 3=32.2 m, 4=32.4 m; Tollgate Pass spls above top Romeroville Ss. @ 35.0 m, e.g., spl 3=35.8 m.

Data:

*TAXA	Morph	Base	Top meters
Marker bed Thatcher Mbr.	/mb	55.0	55.2
Pajarito Fm.	/mb	20.5	32.5
foram analyses by M.J. Evetts reported 18/12/01; 06/02/02; 24/07/03			
Ammobaculites bergquisti	/FB	35.8	35.8
Ammobaculites euides	/fb	28.25	32.4 ID of top specimen cf.
Ammobaculites impexus	/FB	35.6	38.1 Id as ?
Ammobaculites obliquus	/fb	28.25	32.4
Ammobaculites subcretaceus	/fb	28.25	32.4
Ammobaculites phaulus	/fb	28.25	32.4
Ammobaculoides plummerae	/FB	28.25	38.1
Ammodiscus planus	/FB	35.6	37.4
Ammomarginulina cragini	/fb	28.25	32.4 ID ?
Haplophragmoides gilberti	/FB	35.6	38.1 ID ?
Haplophragmoides linki	/FB	28.25	30.45 ID as sp.
Miliammina ischnia	/fb	32.2	32.4
Sacc alexanderi	/fb	35.6	38.1
Textularia rioensis	/FB	37.7	38.1 top questioned
Trochammina lattai	/fb	28.25	30.45
Trochammina mellariolum	/FB	35.6	38.1
Trochammina wickendeni	/FB	35.6	50.3 first top 38.4
Verneuilina alameda	/fb	37.1	37.1
Verneuilinoides hectori	/fb	35.8	37.7
Verneuilinoides perplexus	/fb	28.25	51.3 first top 38.4
*Verneuilinoides kansasensis is junior synonym in Eicher, 1965, p. 902			
*Praeglobotruncana? sp.	/fp	37.7	*
Data from Dakota Gp.-Pajarito Fm. by D.G Benson 2002			
Data from Graneros Shale by F. Oboh-Ikuenobe Jan, 2003			
Aptea polymorpha	/dn	35.6	35.6
Apteodinium grande	/dn	28.6	29.6
Apteodinium granulatum	/dn	28.6	29.6
Canningia reticulata	/dn	35.3	36.2
Canninginopsis colliveri	/dn	37.1	37.1
Cassiculosphaeridia reticulata	/dn	28.6	37.7

Catastomocystis spinosa	/dn	28.6	29.6
Cribroperidinium intricatum	/dn	28.6	29.6
Cribroperidinium muderongense	/dn	28.6	29.6 ID as cf.
Dinopterygium cladoides	/dn	28.6	29.6
Dinopterygium reticulatum	/dn	28.6	29.6
Florentinia cooksoniae	/dn	28.6	29.6
Florentinia mantellii	/dn	35.6	38.1
Florentinia radiculata	/dn	35.3	36.5
Florentinia resex	/dn	35.6	35.6
Fromea amphora	/ac	38.4	38.4
Fromea fragilis	/ac	35.6	35.6
Kleithriasphaeridium eoinodes	/dn	35.3	35.3
Leberidocysta chlamydata	/dn	28.6	29.6
Lecaniella foveata	/dn	24.25	24.45
Luxadinium propatulum	/dn	28.6	29.6
Micrhystridium inconspicuum	/dn	37.7	37.7
Odontochitina operculata	/dn	28.6	37.7
Oligosphaeridium albertense	/dn	28.6	29.6
Oligosphaeridium anthophorum	/dn	28.6	29.6
Oligosphaeridium complex	/dn	35.3	35.6
Oligosphaeridium pulcherrimum	/dn	28.6	35.3
Ovoidinium scabrosum	/dn	28.6	36.8
Ovoidinium verrucosum	/dn	28.6	38.1
Palaeohystrichophora infusorioides	/dn	26.45	36.5
Palaeoperidinium cretaceum	/dn	35.8	38.4
Pterodinium cornutum	/dn	35.3	35.3
Spinidinium echinoideum	/dn	28.6	29.6
Spiniferites lenzi	/dn	35.3	35.3 ID as cf.
Tenua hystrix	/dn	35.3	35.3
Cerebropollenites mesozoicus	/sp	28.6	29.6
Cicatricosisporites hallei	/sp	28.6	29.6
Classopollis simplex	/sp	13.6	14.55
Clavifera triplex	/sp	13.6	14.55 ID as cf.
Costatoperforosp. foveolatus	/sp	28.6	29.6
Cyathidites australis	/sp	13.6	28.6
Cyathidites minor	/sp	14.85	26.25
Gleicheniidites circiniidites	/sp	13.6	14.55
Gleicheniidites senonicus	/sp	13.6	28.6
Rugubivesiculites rugosus	/sp	13.6	14.55
Schizosporis reticulatus	/sp	14.85	24.25

*END

MOWRY.11

Composited section Little Thompson River & North Rabbit Mountain, Colorado
 Sec. 2, T3N, R70W, Boulder Co., in Waage, 1961, USGS Bull. 1102. Note 90' thick interval of Skull Creek from 172-262' repeated by faulting; Little Thompson River section composited at top Muddy 210'. At Little Thompson River base Skull Creek @ top Planview = 0 ft; top Waage's 2nd marker 127'; top Skull Creek @ 192'; at North Rabbit Mountain top Muddy Sandstone @ 210'; top Mowry 236'; top Thatcher Mbr @ 391.3'; top "X" bentonite @ 416.3'.

Data:

*Taxa	Morph	Base	Top ft
Marker bed Thatcher Mbr.	/MB	391.2	391.3
Marker bed "X" bentonite	/MB	416.2	416.3
	*Megafossils by R.W. Scott		
Inoc arvanus	/bi	391.2	391.3
Inoc comancheanus	/bi	100	100
	Foraminifera by M.J. Evetts		
Ammobaculites euides	/fb	131	144
Ammobaculites subcretaceus	/fb	139	144
Bulimina fabilis	/fb	365	366

Gavelinella plummerae	/fb	213	240	
Lenticulina gaultina	/fb	356	357	ID questioned
Miliammina ischnia	/fb	241	278	
Miliammina manitobensis	/fb	241	278	
Neob albertensis	/fb	365	366	
Psamminopelta bowsheri	/fb	241	278	
Trochammina gatesensis	/fb	279	334	
Trochammina mellariolum	/fb	278	279	
Trochammina wickendeni	/fb	241	324	
Trochamminoides apricarius	/fb	325	334	
Valvulineria loetterlei	/fb	365	366	
Verneuulinoides hectori	/fb	241	334	
= Gaudryina canadensis in McNeil & Caldwell, 1981				
Verneuulinoides perplexus	/fb	270	334	
Glob'oides bentonensis	/fp	424	425	
Hedb delrioensis	/fp	213	424	
Hedb planispira	/fp	424	425	
Hete globulosa	/fp	212	213	
Hete pulchra	/fp	356	357	
Rota greenhornensis	/fp	424	425	
Clathrocyclas irrasa	/ra	212	213	
Radiolaria data by J. Erbacher 29/05/02				
Rhopalosyringium sp. cf. R. fossile	/ra	212	213	
ID by Don Benson, Sept. 24, 2002				
Classopollis classoides	/sp	278	279	
Classopollis simplex	/sp	235	304	
Costatoperforosp. foveolatus	/sp	365	366	
Cyathidites australis	/sp	235	240	
Cyathidites minor	/sp	83	356	
Distaltriangulisporites perplexus	/sp	235	324	
Gleicheniidites circiniidites	/sp	139	324	
Gleicheniidites senonicus	/sp	83	334	
Lycopodiumsp. austroclavatidites	/sp	212	213	
Todisporites minor	/sp	134	269	
Canninginopsis colliveri	/dn	218	219	ID as cf.
Chichaouadinium vestitum	/dn	73	365	
basal ID as ?, next lowest @ 210.2				
Chlamydophorella nyei	/dn	210.2	294	
top ID as cf., next top @ 234				
Cribroperidinium edwardsii	/dn	218	219	
Cribroperidinium muderongense	/dn	210.2	240	
Cyclonephelium distinctum	/dn	234	235	
Epelidosphaeridia spinosa	/dn	73	82	
Ginginodinium evittii	/dn	210.2	278	
Luxadinium propatulum	/dn	212	213	
Oligosphaeridium albertense	/dn	356	357	
Oligosphaeridium complex	/dn	145	212	
Ovoidinium scabrosum	/dn	210.2	234	
Ovoidinium verrucosum	/dn	210.2	294	
Palaeohystrichophora infusorioides	/dn	134	413	
Palaeoperidinium cretaceum	/dn	210.2	304	
Pseudoceratium securigerum	/dn	210.2	356	
Pterospermella australiensis	/dn	210.2	334	
Pterospermella harti	/dn	235	278	
Spiniferites cingulatus	/dn	210.2	294	ID ?
Trichodinium castanea	/dn	210.2	234	ID as cf.
Fromea glabella	/ac	304	305	
*END				

MOWRY.12 — 12 Muddy Ck. Buffalo, Johnson Co., WY
Measured by R. Scott & M. Evetts, 26-06-01; Eicher's (1960) section #26. 0 m in RWS section = 55.5 m in Eicher's. Top Thermopolis = 86.5m; top Muddy = 105 m; top Shell Creek = 145 m.

Data:

*Taxa		Base	Top meters
Marker bed Clay Spur bentonite	/mb	204.5	206
Inoceramus mowryensis	/bi	122	123
Foram data by D. Eicher, 1960; M.J. Evetts 08/01/02			
Ammobaculites euides	/fb	82	83
Ammobaculites obliquus	/fb	82.5	83
Ammobaculoides phaulus	/fb	82	83
Ammobaculoides whitneyi	/fb	83	83
Glomospira glomerosa	/fb	126.5	126.5
Haplophragmoides linki	/fb	82.5	83
Involutina kansasensis	/fb	82	83
Miliammina inflata	/fb	73.5	78
Miliammina ischnia	/fb	63	131.5
Miliammina manitobensis	/fb	108	136
Pseudobolivina variana	/fb	82	83
Sacc alexanderi	/fb	83	83
Spirolocammina planula	/fb	110	132
Spirolocammina subcircularis	/fb	64.5	78
*ID as Psamminopelta			
Trochammina depressa	/fb	63	83
Verneuilina canadensis	/fb	114	132
Verneuilinoides hectori	/fb	83	144
*= Gaudryina canadensis in McNeil & Caldwell, 1981, p. 176			
Vern kansasensis	/fb	67	*
Verneuilinoides perplexus	/fb	64.5	144.5
Clathrocyclus irrasa	/ra	138	223.5
Radiolaria data by J. Erbacher 29/05/02			
Archaeospongoprunum praelongum	/ra	150.5	150.5
Cavaspongia euganea	/ra	223.5	223.5
Dactyliosphaera maxima	/ra	144.5	205 top ID questioned
Rhopalosyringium sp. cf. R. fossile	/ra	144.5	223.5
Rhopalosyringium mosquense	/ra	223.5	223.5
Stichomitra navalensis	/ra	150.5	190.5 ID as cf.
Torculum coronatum?	/ra	217	217
Paly Data by D.G. Benson 06/03/02			
Aptea attadalica	/dn	82.5	205
Apteodinium grande	/dn	82.5	205
Batioladinium jaegeri	/dn	205	205
Caligodinium aceras	/dn	205	223.5
Cassiculosphaeridia reticulata	/dn	105.1	217
Chichaouadinium vestitum	/dn	118	223.5
Chlamydophorella nyei	/dn	205	205
Cleistosphaeridium aciculare	/dn	82.5	137
Coronifera oceanica	/DN	144.5	205
Cribooperidinium edwardsii	/dn	121	122.5
Cribooperidinium muderongense	/dn	122.5	199.5
Cyclonephelium paucispinum	/dn	137	137
Dingodinium cerviculum	/dn	137	205
Ellipsodinium imperfectum	/dn	105.1	105.1
Epelidosphaeridia spinosa	/dn	105.1	105.1
Florentinia cooksoniae	/dn	82.5	205
Florentinia laciniata	/dn	137	137
Florentinia resex	/dn	82.5	199.5
Ginginodinium evittii	/dn	108	223.5
Kiokansium unituberculatum	/dn	73.5	82.5
Lecaniella foveata	/dn	64.5	131.5
Litosphaeridium arundum	/dn	82.5	205
Luxadinium propatulum	/dn	121	144.5
Odontochitina operculata	/dn	137	205
Odontochitina rhakodes	/dn	137	137
Oligosphaeridium albertense	/dn	82.5	199.5

Oligosphaeridium anthophorum	/dn	190.5	205
Oligosphaeridium pulcherrimum	/dn	105.1	199.5
Oligosphaeridium totum	/dn	108	108
Ovoidinium scabrosum	/dn	144.5	217
Ovoidinium verrucosum	/dn	199.5	223.5
Palaeohystrichophora infusorioides	/dn	73.5	205
Palaeoperidinium cretaceum	/dn	82.5	205
Pervosphaeridium cenomaniense	/dn	122.5	199.5
Pseudoceratium eisenackii	/dn	108	205
Pseudoceratium expolitum	/dn	199.5	199.5
Pterospermella harti	/dn	73.5	223.5
Spinidinium echinoideum	/dn	126.5	217
Spiniferites cingulatus	/dn	108	205
Spiniferites membranaceus	/dn	137	137
Subtilisphaera cheit	/dn	150.8	150.8
Subtilisphaera deformans	/dn	82.5	150.8
Wallodinium anglicum	/dn	137	137
Appendicisporites jansonii	/sp	118	121
Appendicisporites unicus	/sp	108	121
Baculatisporties comaumensis	/sp	190.5	190.5
Bourkidinium psilatum	/sp	108	108
Cerebropollenites mesozoicus	/sp	73.5	108
Cicatricosisporites brevilaesuratus	/sp	108	108 ID as cf.
Cicatricosisporites hallei	/sp	105.1	205
Classopollis classoides	/sp	82.5	205
Classopollis simplex	/sp	64.5	223.5
Clavatipollenites hughesii	/sp	217	217
Clavifera triplex	/sp	73.5	223.5
Costatoperforosp. foveolatus	/sp	205	205
Cyathidites australis	/sp	73.5	223.5
Cyathidites minor	/sp	73.5	223.5
Distaltriangulisporites perplexus	/SP	118	121
Gleicheniidites circiniidites	/sp	64.5	223.5
Gleicheniidites senonicus	/sp	73.5	190.5
Lycopodiumsp. austroclavatidites	/sp	108	122.5
Lycopodiumsporites marginatus	/sp	105.1	205
Osmundacidites wellmanii	/sp	108	108
Pilosporites trichopappilosus	/sp	121	121
Rugubivesiculites rugosus	/sp	105.1	217
Vitreisporites pallidus	/sp	73.5	205
Todisporites minor	/sp	82.5	121
Fromea amphora	/ac	137	150.8
*END			

MOWRY.13 Arminto, Natrona Co., WY

Measured by R. Scott & M. Evetts, 24-06-01; Eicher's (1960) section #17.

*0 m in RWS section = 55.5 m in Eicher's = top Thermoplolis Sh.; top Muddy = 15 m; top Shell Creek = 83 m; Clay Spur @ 134-136.2 m; top Mowry = 137 m at marker siltstone bed; top of measured section @ 152 m.

Data:

*Taxa		Base	Top meters
Marker bed Clay Spur bentonite	/mb	134	136.2
Foram data by D. Eicher, 1960 modified by Evetts, 06/02/02; 28/12/02			
Miliammina inflata	/fb	0	0
Miliammina ischnia	/fb	17	132.4
Miliammina manitobensis	/fb	17	132.4
Pseudobolivina variana	/fb	17	17
Spirolocammina planula	/FB	17	31
Spirolocammina subcircularis	/FB	-12	-6
Trochammina depressa	/fb	-12	-6
Trochammina wickendeni	/fb	132.5	148.0 ID questioned

Verneuilina canadensis	/fb	16.3	32.5 base ID ?
Verneuilinoides perplexus	/fb	16.3	148.0
Verneuilinoides hectori	/fb	16.3	148.0 base ID ?
Vern kansasensis	/fb	-12	-6
Clathrocyclas irrasa	/ra	72.2	132.4
Radiolaria data by J. Erbacher 29/05/02			
Rhopalosyringium sp. cf. R. fossile	/ra	72.2	132.4
Paly data by Don Benson 06-03-02			
Apteodinium grande	/dn	81.7	82.2 ID as cf.
Batioladinium jaegeri	/dn	72.0	72.2
Caligodinium aceras	/DN	72.2	113.0
Cassiculosphaeridia reticulata	/dn	32.8	84.7
Chichaouadinium vestitum	/dn	32.8	132.4
Chlamydochorella nyei	/DN	82.2	113.0
Cribroperidinium edwardsii	/dn	32.8	120.5
Cribroperidinium muderongense	/dn	113.2	132.4
Cyclonephelium paucispinum	/dn	81.7	82.2 ID as cf.
Dinopterygium reticulatum	/dn	85.0	132.4
Epelidosphaeridia spinosa	/dn	85.0	113.0
Florentinia berran	/dn	132.4	132.6
Florentinia cooksoniae	/dn	132.4	132.6 ID as cf.
Florentinia laciniata	/dn	120.5	120.7 ID as cf.
Florentinia resex	/DN	132.4	132.6
Ginginodinium evittii	/dn	85.0	132.4
Leiofusa jurassica	/dn	132.4	132.6
Luxadinium propatum	/dn	81.7	82.2
Odontochitina operculata	/dn	72.2	120.5
Odontochitina singhii	/DN	120.5	120.7
Oligosphaeridium albertense	/dn	72.2	132.4
Oligosphaeridium complex	/dn	72.2	132.4
Oligosphaeridium pulcherrimum	/dn	82.2	120.5
Ovoidinium scabrosum	/DN	72.2	132.4
Ovoidinium verrucosum	/DN	72.2	132.4
Palaeohystrichophora infusorioides	/dn	72.2	84.7
Palaeoperidinium cretaceum	/dn	72.2	132.4
Pareodinia ceratophora	/DN	120.5	120.7
Pseudoceratium eisenackii	/dn	72.2	132.4
Pseudoceratium exolitum	/dn	113.2	132.4
Pseudoceratium securigerum	/dn	120.5	120.7 ID as cf.
Pterospermella australiensis	/dn	72.2	148.1
Pterospermella harti	/dn	16.5	132.4
Spinidinium echinoideum	/DN	72.2	120.5
Spiniferites twistringiensis	/dn	72.0	72.2 ID as Spin. multibrevis
Stiphrosphaeridium anthophorum	/dn	132.4	132.6 ID as Oligosphaeridium
Appendicisporites jansonii	/sp	32.5	32.8
Cerebropollenites mesozoicus	/sp	113.0	113.2
Cicatricosporites brevilaesuratus	/sp	32.8	32.8
Cicatricosporites hallei	/sp	32.8	113.0
Classopollis simplex	/sp	72.2	132.4
Clavifera triplex	/sp	32.8	120.5
Costatoperforosp. foveolatus	/sp	32.8	120.5
Cyathidites australis	/sp	32.8	132.4
Cyathidites minor	/sp	32.8	132.4
Gleicheniidites circiniidites	/sp	32.8	132.4
Gleicheniidites senonicus	/sp	32.8	132.4
Lycopodiumsp. austroclavatidites	/sp	32.8	113.0
Ornamentifera echinata	/sp	32.5	32.8
Rugubivesiculites rugosus	/SP	32.8	132.4
Taurocusporites segmentatus	/SP	120.5	120.7
Todisporites minor	/sp	97.7	98.0
*END			

MOWRY.14 Alcova, Natrona Co., WY

106deg 41.949W, 42deg 31.895N; sec. 12, T30N, R83W & sec. 30, 30N, 82W.

Measured by R. Scott & M. Evetts, 23-06-01; Eicher (1960) section #28; Eicher 1965, JP 39:875-909, Graneros-equivalent 560' abv Clay Spur; Eicher 1967, JP 41:167-188, textfig. 2; positions rounded up for bases & down for tops; used midpoints for single occurrences; Base of section @ 0 m in stream bank 7.25 m below base of Muddy Ss.; Muddy 7.25-12.45 m, Shell Creek sh. 12.45-30 m, Mowry Sh. 30-69 m, Clay Spur 68-69 m, Belle Fourch/Graneros Sh 69-145.2 m, Frontier Fm 145.2-337.3 m; overlain by Cody Sh. *Eicher, 1960, p. 108-111, measured Shell Creek 7 m, Muddy 15 m, Thermopolis 34 m; Cloverly Ss at base 23 m thick.

Data:

*Taxa	Morph	Base	Top meters
Sciponoceras gracile	/am	326.6	326.6
Eicher, 1967, p. 171			
Marker bed "X" bentonite	/mb	252	254
Marker bed Clay Spur bentonite	/mb	68	69
Foram data by Eicher, 1960, 1965			
Ammobaculites impexus	/FB	151	243
Ammobaculites mosbyensis	/FB	260	284
Ammobaculoides plummerae	/FB	234	245
Haplophragmoides uniorbis	/FB	29	29
Pseudobolivina variana	/FB	201	201
Reophax pepperensis	/FB	260	284
Trochammina gatesensis	/FB	151	270
Trochammina mellariolum	/FB	151	212
Trochammina rutherfordi	/FB	188	198
Trochammina wetteri	/fb	29	284
*Eicher's base at 229 m			
Trochamminoides apricarius	/FB	229	284
Verneuilina alameda	/FB	88.8	88.8 single specimen!
Verneuilinoides hectori	/FB	72.5	237
*Eicher's base at 151 m			
Verneuilinoides perplexus	/fb	72.5	284
*Eicher's base at 151 m			
Spirolocammina planula	/FB	19.0	19.5
ID by D. Eicher, 1960; Evetts reports Spirolocammina sp at 29-57.5m			
Hedb delrioensis	/FP	273	284
Hedb planispira	/FP	284	284
Heterohelix globulosa	/FP	205	205
Foram data by Evetts, 30/10/01			
Haplophragmoides uniorbis	/fb	29.0	29.0
Miliammina ischnia	/fb	20.2	29.0
Miliammina manitobensis	/fb	29.0	29.0
*Trochammina wetteri	/fb	29.0	39.5 ID questioned
*Verneuilinoides hectori	/fb	72.5	72.5
*Verneuilinoides perplexus	/fb	72.5	72.5
J. Erbacher 02/04			
Clathrocyclas irrasa	/ra	57.5	57.7
Rhopalosyringium sp. cf. R. fossile	/ra	57.5	57.7
Paly data by D. Benson, 16/01/02			
Caligodinium aceras	/dn	72.5	72.7 ID as Kalyptea
Chichaouadinium boydii	/dn	33.7	72.5
Chichaouadinium vestitum	/dn	10.8	75.5
Cleistosphaeridium aciculare	/dn	26.2	39.5
Cribroperidinium exilicristatum	/dn	23.0	23.2
Cyclonephelium paucispinum	/dn	26.0	26.2
Eurydinium glomeratum	/dn	29.0	29.2
Ginginodinium evittii	/dn	10.8	75.5
Hystrichodinium pulchrum	/dn	17.0	17.2
Litosphaeridium arundum	/dn	23.0	23.2
Odontochitina operculata	/dn	26.2	33.5
Oligosphaeridium complex	/dn	26.2	33.5

Oligosphaeridium pulcherrimum	/dn	33.5	33.7	
Ovoidinium scabrosum	/dn	36.7	75.5	
Ovoidinium verrucosum	/dn	36.7	75.5	
Palaeohystrichophora infusorioides	/dn	10.8	57.5	
Palaeoperidinium cretaceum	/dn	36.5	36.7	
questioned at 29.2 & 39.5				
Pervosphaeridium cenomaniense	/dn	39.5	39.7	ID questioned
Pterospermella australiensis	/dn	20.2	78.5	
Pterospermella harti	/dn	10.8	78.5	
Spinidium echinoideum	/dn	23.2	36.5	
Stiphrosphaeridium anthophorum	/dn	33.5	33.7	ID as Oligosphaeridium
Subtilisphaera cheit	/dn	33.7	57.5	
Subtilisphaera deformans	/dn	54.7	57.7	ID @ 75.5 cf.
Subtilisphaera perlucida	/dn	39.7	54.5	
Xiphophoridium alatum	/dn	23.0	23.2	
Fromea amphora	/ac	36.7	39.5	
Cerebropollenites mesozoicus	/sp	23.2	60.5	
Classopollis simplex	/sp	17.2	72.5	
Clavifera triplex	/sp	7.2	72.5	
Costatoperforosp. foveolatus	/sp	26.0	26.2	
Cyathidites australis	/sp	4.6	72.5	
Cyathidites minor	/sp	7.2	60.5	
Distaltriang. mutabilis	/sp	23.2	26.0	
Gleicheniidites circiniidites	/sp	4.6	72.5	
Gleicheniidites senonicus	/sp	4.6	45.4	
Osmundacidites wellmanii	/sp	23.0	23.2	
*END				

Mowry.15 Cripple Creek Section, Canada

Leckie et al., 2000, GSA Bull. 112:1179-1198. Westgate Fm. 0-12.85m, Barons Ss.(Fish Scale bed) 12.85-18.45m, Sunkay Mbr. (Belle Fourche Shale) 18.44-215m, Second White Specks 215-261m. Data Table from GSA website data repository on line.

Data:

*TAXA	Morph	Base	Top meters
Ammobaculites fragmentarius	/fb	4.0	12.8
Ammobaculites tyrrelli	/FB	6.0	8.0
Gaud spiritensis	/FB	28.0	62.75
Hapl howardense	/FB	3.8	18.45
Haplophragmoides gilberti	/fb	5.0	5.0
Haplophragmoides spiritense	/fb	211.0	*
Haplophragmoides rota	/FB	3.8	8.0
Haplophragmoides topagorukensis	/fb	3.8	12.8
*highest occurrence in Belle Fourche at 62.75 rare			
Miliammina awunensis	/fb	3.8	12.0
Miliammina manitobensis	/fb	3.8	12.8
Pseudobolivina variana	/fb	11.0	12.0
Reophax deckeri	/FB	211.0	211.0
Reophax sikanniensis	/fb	3.8	11.0
Sacc alexanderi	/fb	3.8	211.0
Saccamina lathrami	/FB	4.0	83.0 placed in Placentamina
Psamminopelta bowsheri	/fb	3.8	12.8
Spiroplectamina ammovitrea	/FB	18.45	28.0 highest occurrence at 201m
Textularia topagorukensis	/fb	3.8	*
Trochammina rainwateri	/fb	18.45	28.0
Trochammina wetteri	/fb	18.45	23.0
Troc rutherfordi	/fb	28.0	55.0 base at 3.8m too low
Verneuilina canadensis	/fb	8.3	12.8
*highest occurrence at 18.45m raises range			
Verneuilinoides perplexus	/fb	18.45	83.0
Hedb delrioensis	/FP	221	261

Hedb loetterlei	/FP	221	261
Hete globulosa	/FP	231	261
*END			

Mowry.16 Cadomin Section, Canada

Leckie et al., 2000, GSA Bull. 112:1179-1198. Westgate Fm. 3.63-31m, Fish Scale bed 31-44.3m, Belle Fourche Shale 44.3-51m; Data Table from GSA website data repository on line.

Data:

*TAXA	Morph	Base	Top meters
Ammobaculites fragmentarius	/fb	4.63	7.93
Ammobaculites tyrrelli	/FB	6.3	7.93
Gaud spiritensis	/FB	32.83	46.4 first base at 5.7m, lowers base
Hapl howardense	/FB	44.4	46.4
Haplophragmoides gilberti	/fb	6.3	6.3 ID as cf.
Haplophragmoides spiritense	/fb	44.4	44.4
Haplophragmoides topagorukensis	/fb	9.93	9.93
*highest occurrence in Belle Fourche at 62.75 rare			
Miliammina awunensis	/fb	7.93	8.93
Miliammina ischnia	/fb	11.0	11.0
Miliammina manitobensis	/fb	3.93	31.6
Sacc alexanderi	/fb	8.93	49.4
Saccamina lathrami	/FB	4.63	4.63 placed in Placentamina
Psamminopelta bowsheri	/fb	7.93	11.0
Verneuilina canadensis	/fb	3.65	7.93
Verneuilinoides perplexus	/fb	32.83	50.4
*END			

Mowry.17 Composite subsurface section, SE Alberta, Canada

Lang and McGugan, 1988, Can. Jour. Earth Sciences 25:316-342. Base Blackleaf Fm. = base Flood Mbr. 840 ft, base Taft Mbr. 740 ft, base Bootlegger Mbr. 646 ft; base Marias River Shale =base Floweree Mbr. unconformity 180 ft, base Cone Mbr. 50 ft, top Cone 0 ft., Fish Scale bed 252 ft. Data Table from GSA website data repository on line.

Data:

*TAXA	Morph	Base	Top feet
Myti mytiloides	/bi	0	0
Ammobaculites fragmentarius	/fb	-590	-230
Miliammina awunensis	/fb	-580	-420
Miliammina manitobensis	/fb	-485	-235
*Reophax pepperensis	/FB	-645	-230 too low!
Reophax sikanniensis	/FB	-550	-230
Psamminopelta bowsheri	/fb	-580	-360
Vern kansasensis	/FB	-465	-430
Hedb delrioensis	/FP	0	0
Heterohelix globulosa	/FP	0	0
Hete globulosa	/FP	0	0
*Rota cushmani	/FP	0	0 too hi!
*END			

Mowry.18 Mount Lebanon section, Montana

Lang and McGugan, 1988, Can. Jour. Earth Sciences 25:316-342. Base Blackleaf Fm. = base Flood Mbr. 840 ft, base Taft Mbr. 740 ft, base Bootlegger Mbr. 646 ft; base Marias River Shale =base Floweree Mbr. unconformity 180 ft, base Cone Mbr. 50 ft, top Cone 0 ft., Fish Scale bed 252 ft. Data Table from GSA website data repository on line.

Data:

*TAXA	Morph	Base	Top feet
<i>Ammobaculites fragmentarius</i>	/fb	-710	-350
<i>Haplophragmoides gigas</i>	/FB	-620	-620
<i>Haplophragmoides gilberti</i>	/FB	-595	-450
<i>Haplophragmoides topagorukensis</i>	/FB	-600	-600
<i>Miliammina awunensis</i>	/fb	-365	-310
<i>Miliammina manitobensis</i>	/fb	-450	-450
<i>Reophax pepperensis</i>	/FB	-100	-35
<i>Reophax sikanniensis</i>	/FB	-390	-290
<i>Sacc alexanderi</i>	/FB	-600	-600
<i>Psamminopelta bowsheri</i>	/fb	-450	-450
<i>Spiroplectammina ammovitrea</i>	/FB	-710	-710
<i>Troc rutherfordi</i>	/FB	-620	-350
<i>Verneuulinoides perplexus</i>	/FB	-595	-560

*END

MOWRY.19 Nordman Core, Colorado

Core of Huntsman Shale, Rocky Mountain Prod. Co. Nordman Trust 42-20, SE NE sec. 20, T6S, R64W, Elbert Co., Colorado, elev. 6271". Dr. J. Puckett, Ok. State Univ., made core available, collected by R.W. Scott, July, 2001. Base Greenhorn Fm. @ 8480', "X" bentonite @ 8485-8482, top "D" ss @ 8575, base "D" unconformity/top Huntsman Sh. @ 8593.2', top "J" ss @ 8623', top Skull Creek Sh. @ 8674'; core 8605-8575'. Base range at top of sample & top range at base of sample, except where taxon in a single sample, then sample range given.

Data:

*TAXA	MORPH	Base	Top ft below surface
Marker bed "X" bentonite	/MB	-8485	-8483 from well log
Foram data by M.J. Evetts, 2001 unpubl.			
<i>Miliammina ischnia</i>	/fb	-8599	-8575
<i>Miliammina manitobensis</i>	/fb	-8602	-8596
<i>Pseudobolivina variana</i>	/fb	-8602	-8596 ID ?
<i>Psamminopelta bowsheri</i>	/FB	-8602	-8578
<i>Spirolocammina planula</i>	/FB	-8602	-8596 ID as cf
<i>Trochammina rutherfordi</i>	/fb	-8596	-8594
<i>Verneuulina canadensis</i>	/fb	-8596	-8594
<i>Verneuulinoides hectori</i>	/fb	-8575	-8575
<i>Verneuulinoides perplexus</i>	/fb	-8602	-8575
Paly data by Franca Oboh-Ikuenobe 01-10-02			
<i>Aptea polymorpha</i>	/dn	-8602	-8575 =Pseudoceratium
<i>Apteodinium granulatum</i>	/dn	-8596	-8594
<i>Apteodinium maculatum</i>	/dn	-8602	-8575
<i>Callaiosphaeridium asymmetricum</i>	/dn	-8601	-8599
<i>Cassiculosphaeridia reticulata</i>	/dn	-8578	-8576
<i>Cribroperidinium auctificum</i>	/dn	-8602	-8578
<i>Cribroperidinium cooksoniae</i>	/dn	-8599	-8575
<i>Cribroperidinium muderongense</i>	/dn	-8602	-8575 ID as Crib. diaphanum
* <i>Cribroperidinium muderongense</i>	/dn	-8602	-8578
<i>Cribroperidinium orthoceras</i>	/dn	-8596	-8596
<i>Cyclonephelium chabaca</i>	/dn	-8596	-8575
<i>Cyclonephelium compactum</i>	/dn	-8602	-8575
<i>Cyclonephelium distinctum</i>	/dn	-8602	-8575
<i>Cyclonephelium maugaad</i>	/dn	-8596	-8594
<i>Cyclonephelium membraniphorum</i>	/dn	-8602	-8578
<i>Dinopterygium cladoides</i>	/dn	-8605	-8602
<i>Downiesphaeridium multispinosum</i>	/dn	-8605	-8602
<i>Ellipsodinium rugulosum</i>	/dn	-8605	-8602 ID as cf.
<i>Florentinia cooksoniae</i>	/dn	-8575	-8575
<i>Florentinia laciniata</i>	/dn	-8599	-8575
<i>Florentinia radiculata</i>	/dn	-8596	-8575

Florentinia resex	/dn	-8578	-8576	
Hystriospheraeridium bowerbankii	/dn	-8599	-8596	
Kiokansium polypes	/dn	-8602	-8578	
Kleithriasphaeridium eoinodes	/dn	-8599	-8596	ID as cf.
Kleithriasphaeridium loffrense	/dn	-8596	-8594	ID as cf.
Odontochitina operculata	/dn	-8602	-8599	
Oligosphaeridium albertense	/dn	-8602	-8578	
Oligosphaeridium complex	/dn	-8602	-8575	
Oligosphaeridium pulcherrimum	/dn	-8596	-8575	
Oligosphaeridium totum	/dn	-8602	-8599	
Ovoidinium verrucosum	/dn	-8602	-8575	
Prolixosphaeridium parvispinum	/dn	-8602	-8575	
Pseudoceratium eisenackii	/dn	-8602	-8575	
Systematophora cretacea	/dn	-8596	-8578	
Tenua hystrix	/dn	-8599	-8596	
Valensiella tazadensis	/dn	-8599	-8596	
Fromea amphora	/ac	-8599	-8575	
Fromea fragilis	/ac	-8602	-8575	
Cyathidites minor	/sp	-8602	-8575	
Baculatisporties comaumensis	/sp	-8596	-8601	ID as cf.
Cicatricosisporites hallei	/sp	-8602	-8575	
Cyathidites australis	/sp	-8602	-8576	
Gleicheniidites circiniidites	/sp	-8602	-8575	
Gleicheniidites senonicus	/sp	-8602	-8575	
Tricolpites micromunus	/SP	-8602	-8578	as Tricolpopollenites
Tricolporollenites aliquantulus	/sp	-8605	-8602	ID as cf.

*END

Mowry.20 Measured section Section 26, Quay Co., New Mexico

Data also from Fife Ranch and Lindsey Ranch measured sections in Scott et al., 2004, The Mountain Geologist 41:33-61. Measured section 26 is standard; base Tucumcari Sh. @ 0 m; base Mesa Rica s.l. @ 14.1 m, base fluvial Mesa Rica s.s @ 17.9 m; base Pajarito @ 32.7 m; top Pajarito/base Ogallala @ Lindsey Ranch @ 54.7 m; Base Pajarito Fm. 32.7.

Data:

*Taxa		Morph	Base	Top m	
	ID by B.S. Kues & R.W. Scott				
Lopha quadriplicata		/BI	42.7	42.7	Peilina now
Neitheia occidentalis		/BI	1.6	5.1	
Peilinia levicostata		/BI	1.6	5.1	
Protocardia texana		/BI	1.6	5.1	
Scabrotrigonia emoryi		/BI	1.5	1.6	
Texi pitcheri		/BI	1.6	5.1	
	M.J. Evetts, April, 2002, Dec. 2002				
Ammobaculites obliquus		/fb	53.6	53.7	
Ammodiscus gaultinus		/fb	1.5	1.6	
Ammodiscus kiowensis		/FB	1.5	1.6	
Citherina kockii		/FB	1.5	1.6	
Cribratina texana		/FB	0.9	14.8	
Gavelinella plummerae		/FB	0.9	1.5	
Lenticulina gaultina		/FB	0.9	1.5	
Lingulogavelinella asterigerinoides		/FB	0.9	1.5	
Marginulina tenuissima		/FB	1.5	1.6	
Textularia rioensis		/FB	0.9	1.5	
Valvulineria loetterlei		/fb	1.5	1.6	
	D.G. Benson April, 2002				
Apteodinium grande		/DN	5.3	5.4	
Circulodinium hystrix		/DN	5.3	5.4	
Coronifera oceanica		/DN	5.3	5.4	
Cribroperidinium exilicristatum		/DN	5.3	5.4	
Cribroperidinium sepimentum		/dn	5.3	5.4	

Circulodinium brevispinosum	/DN	53.6	53.7	
Florentinia abbreviata	/dn	5.4	53.6	
Florentinia resex	/DN	5.3	5.4	
Ginginodinium evittii	/DN	5.3	5.4	
Kalyptea aceras	/DN	5.3	5.4	
Kiokansium unituberculatum	/DN	5.3	5.4	
Kleithriasphaeridium eoinodes	/DN	5.3	5.4	
Odontochitina operculata	/DN	5.3	5.4	
Oligosphaeridium complex	/DN	5.3	5.4	
Oligosphaeridium pulcherrimum	/DN	5.3	5.4	
Palaeohystrichophora infusorioides	/DN	5.3	5.4	
Palaeoperidinium cretaceum	/DN	5.3	5.4	ID as cf.
Palaeoperidinium cretaceum	/DN	53.6	53.7	
Pervosphaeridium cenomaniense	/DN	5.3	5.4	ID as cf.
Pseudoceratium anaphrisum	/DN	5.3	5.4	
Pterospermella harti	/DN	51.8	51.9	
Spiniferites multibrevis	/DN	5.3	5.4	
Subtilisphaera deformans	/DN	0.9	38.2	
Subtilisphaera perlucida	/DN	5.3	5.4	
Xenascus plotei	/DN	5.3	5.4	
Camarozonosporites insignis	/sp	5.4	50.3	
Cicatricosisporites brevilaesuratus	/SP	5.3	5.4	
Classopollis classoides	/sp	5.3	5.4	
Cyathidites australis	/SP	5.3	5.4	
Gleicheniidites circiniidites	/SP	5.4	53.6	
Gleicheniidites senonicus	/sp	5.3	5.4	
Pilosporites trichopappilosus	/SP	5.3	5.4	
Rugubivesiculites rugosus	/SP	5.4	53.6	
Schizosporis parvus	/sp	38.3	51.8	
Schizosporis reticulatus	/sp	38.3	51.8	
Trilobosporites marylandensis	/SP	36.0	36.1	ID as cf.
Fromea amphora	/AC	5.3	5.4	
*END				

Mowry.21 — I-70 Roadcut, Colorado

North roadcut, Jefferson County, Colorado, 39deg42' N, 105deg12' W.

Rojas, 1980 thesis, section #12, Weimer & Land, 1972, section 3.

Measured and sampled by R.W. Scott 28/6/2000. Base Graneros @ 130.3m; base Mowry @ 124.7m; base Horsetooth Ss. @ 103.8m; base Van Bibber Mbr. @ 95m; base Kassler Ss. Mbr. @ 65.5m=SB3.1; base Glencairn Mbr. @ 46.6m; base Plainview Mbr. @ 36.5m; base Lytle Ss. @ 0m.

Data:

*TAXA	Morph	Base	Top meters	
Foram analyses by M.J. Evetts reported 28/12/2002				
Haplophragmoides gilberti	/FB	130.4	132.2	
Miliammina ischnia	/fb	129.3	130.4	
Miliammina manitobensis	/fb	129.3	130.4	
Psamminopelta bowsheri	/fb	129.3	130.4	
Trochammina gatesensis	/fb	128.7	129.3	
Verneuilina alameda	/fb	129.3	130.4	
Verneuilinoides hectori	/fb	129.3	130.4	
Verneuilinoides perplexus	/fb	130.4	132.2	
*Verneuilinoides kansasensis is junior synonym in Eicher, 1965, p. 902				
Paly analyses by F. Oboh-Ikuenobe 12/2000, 25/06/2003				
Cyclonephelium distinctum	/dn	127.9	128.5	ID as sp. cf.
Florentinia radiculata	/dn	100.5	128.7	
Kleithriasphaeridium sarmentum	/dn	96.6	97.5	
Leiofusa jurassica	/dn	100.0	100.5	ID as sp. cf.
Micrhystridium inconspicuum	/dn	97.5	128.7	ID as spp.
Odontochitina operculata	/dn	97.5	100.0	
Oligosphaeridium complex	/dn	96.6	97.5	

Palaeohystrichophora infusorioides/dn	96.6	97.5
Palaeoperidinium cretaceum /dn	97.5	130.4
Prolixosphaeridium parvispinum /dn	100.0	100.5
Appendicisporites jansonii /sp	96.6	97.5
Appendicisporites potomacensis /sp	100.0	100.5 ID as sp. cf.
*Camarozonosporites rudis /sp	96.6	97.5
Classopollis classoides /sp	95.1	95.6
*Classopollis obidoensis /sp	95.1	95.6
Clavatipollenites hughesii /sp	96.6	97.5
Cyathidites australis /sp	96.6	97.5
Gleicheniidites circiniidites /sp	96.6	97.5
Gleicheniidites senonicus /sp	96.6	97.5
*Laevigatosporites ovatus /sp	96.6	97.5
*END		

Mowry.22 Liberty Mesa, New Mexico

Lucas & Hunt, 2000, New Mex. Museum Nat. Hist. & Sci. Bull. 16, p. 97; Tucumcari Fm. 2.25-13.25 m, Mesa Rica Ss. 13.25-19.75 m. Scott 06/2001 placed SB3.1 @ 17 m and top of Mesa Rica @ 24.7m. Scott et al., 2004, The Mountain Geologist 41:33-61. N35°12.294' W103°47.314', sec. 6, T11N, R30E. Base Tucumcari Fm. @ 2.25 m, base Mesa Rica Ss. @ 17 m, base Pajarito Fm. @ 24.6 m.

Data:

*TAXA	Morph	Base	Top meters
Mortoniceras equidistans	/am	13.5	14
Peilinia levicostata	/bi	5.5	6.5
Protocardia texana	/bi	13.5	14
Scabrotrigonia emoryi	/bi	13.5	14
Texi pitcheri	/bi	5.5	6.5
foram analyses by M.J. Evetts reported 18/12/01			
Ammobaculites euides	/fb	25	26.2
Ammobaculites obliquus	/fb	25	26.2
Ammobaculites subcretaceus	/fb	25	26.2
Ammomarginulina cragini	/fb	25	26.2
Verneuilinoides perplexus	/fb	25	26.2
*Verneuilinoides kansasensis is junior synonym in Eicher, 1965, p. 902			
*No paly species identified by D.G Benson 2002			
*END			

GRANCS.1

*GRAN.CAT: Set of sections from Dakota to Greenhorn in Kansas measured by Hattin (1965, Kan. Geol. Sur. Bull 178); megafossil data from Hattin 1965; foram data from Eicher (1965, J. Paleo, 39:875-909, Table 1). Base Greenhorn Fm. @ 44m; base Graneros Sh. @ 10m; base section in upper Dakota.

Section File # / Hattin # - Eicher #.

gran.1 Graneros sec 1-21
gran.2 Graneros sec 8-23
gran.3 Graneros sec 12-24
gran.4 Graneros sec 16-25
gran.5 Graneros sec 20-20
gran.6 Graneros sec 23-8

Composite Data in m Gran.2 section:

	Base	Top m
Ammobaculites bergquisti	12.1537	32.1333
Ammobaculites impexus	25.8433	26.0900
Ammobaculoides plummerae	5.4000	29.1915
Ammodiscus planus	29.1915	29.1915
Borissiakoceras reesidei	29.0000	38.0000
Callistina lamarensis	8.0000	35.5187

Exogyra columbella	28.6800	28.7074
Hedb amabilis	35.5000	43.1690
Hedb brittonensis	18.9574	43.0000
Hedb delrioensis	14.4571	43.0000
Hedb globulosa	33.8660	41.4000
Hedb planispira	40.4628	43.1690
Inoc rutherfordi	33.3667	42.8000
Marker bed "X" bentonite	39.8000	41.3000
Ostrea beloiti	29.0000	42.8000
Pleisiacanthoceras amphibolum	29.0000	29.0000
Reophax minuta	1.5775	36.2000
Reophax pepperensis	11.2750	33.8660
Trochammina depressa	16.6625	16.6625
Trochammina rainwateri	1.5775	33.8660
Trochamminoides apricarius	18.9574	33.8660
Verneuilinoides perplexus	1.5775	33.8660
*END		

CRETACEOUS OCEANIC RED BEDS SECTION FILES (CORB)

CORB382 DSDP 382, Central Atlantic Nashville Seamount

34° 25.04'N, 56° 32.25'W, seafloor 5537m, TD 520.5 m in volcanic breccia; 1979, Initial Reports of the Deep Sea Drilling Project, v. 43, Washington. High Fe₂O₃, +5%, from about 364-520 m in Murdmaa et al, 1979, p. 675-694, Fig. 1. Top Cretaceous @352.12m, volcanic sediments @ 385.18-404.80m; top volcanoclastic unit @473.86m. CORBS @355-374m p. 67-68.

DATA:

*TAXA	Morph	Base	Top meters subsea floor
*Data from McNulty, 1979, p. 491, Table 2			
Globigerinelloides subcarinatus	/fp	-356.17	-355.5
Globigerinelloides volutus	/fp	-358.3	-355.5
Globotruncana arca	/fp	-385.7	-355.5
Globotruncana elevata	/fp	-387.67	-358.06
Globotruncana fornicata	/fp	-387.67	-355.5
Globotruncana lapparenti	/fp	-385.7	-355.5
Globotruncana linneiana	/fp	-385.7	-355.5
Globotruncana stephensoni	/fp	-358.3	-355.5
Globotruncana stuartiformis	/fp	-387.67	-355.5
Globotruncana ventricosa	/fp	-368.16	-365.15
Heterohelix pulchra	/fp	-357.85	-355.5
Heterohelix striata	/fp	-357.85	-355.5
Pseudotextularia elegans	/fp	-385.7	-355.5
*Data from McNulty, 1979, p. 487; interval samples			
Aragonia velascoensis	/fb	-358	-355
Bigenerina gracilis	/fb	-387	-359
Bolivinita eleyi	/fb	-358	-355
Bolivinita planata	/fb	-358	-355
Bolivinopsis emmendorfi	/fb	-358	-355
Bulimina referata	/fb	-358	-355
Dentalina basiplanata	/fb	-358	-355
Fissurina orbignyana	/fb	-358	-355
Gaudryina carinata	/fb	-387	-355
Gavelinella rubiginosa	/fb	-358	-355
Lenticulina velascoensis	/fb	-358	-355
Pleurostomella subnodosa	/fb	-387	-355 ID as cf.
Valvulineria allomorphinoides	/fb	-387	-359
*Data from Okada & Thierstein, 1979, p. 507, 512, Table 2B			
Ahmuellerella octoradiata	/nn	-376.21	-358.63 ID as Vagalapilla
Arkhangelskiella cymbiformis	/nn	-358.63	-358.63
Biscutum constans	/nn	-407.16	-358.63

Broinsonia enormis	/nn	-376.21	-358.63	
Broinsonia parca parca	/nn	-470.77	-358.63	
Ceratolithoides aculeus	/nn	-358.63	-358.63	
Chiastozygus litterarius	/nn	-470.23	-358.63	
Corollithion exiguum	/nn	-369.86	-369.86	
Corollithion signum	/nn	-376.21	-358.63	
Cretarhabdus conicus	/nn	-409.37	-358.63	
Cretarhabdus surirellus	/nn	-470.77	-358.63	
Cribrosphaerella ehrenbergii	/nn	-470.23	-358.63	
Discorhabdus rotatorius	/nn	-369.86	-358.63	
Eiffellithus eximius	/nn	-407.16	-358.63	
Gartnerago obliquum	/nn	-407.16	-358.63	
Lithraphidites carniolensis	/nn	-470.23	-358.63	
Lucianorhabdus cayeuxii	/nn	-365.36	-365.36	
Manivitella pemmatoidea	/nn	-470.77	-358.63	
Microrhabdulus decoratus	/nn	-409.37	-358.63	
Micula decussata	/nn	-472.45	-358.63	
Parhabdolithus angustus	/nn	-358.63	-358.63	
Parhabdolithus asper	/nn	-369.86	-369.86	
Parhabdolithus embergeri	/nn	-376.21	-365.36	
Parhabdolithus regularis	/nn	-376.21	-358.63	
Parhabdolithus splendens	/nn	-365.36	-358.63	
Prediscosphaera cretacea	/nn	-470.77	-358.63	
Prediscosphaera spinosa	/nn	-369.86	-358.63	
Scapholithus fossilis	/nn	-365.36	-365.36	ID as Sollasites
Staurolithites laffittei	/nn	-407.16	-358.63	
Tetrapodorhabdus decorus	/nn	-365.36	-358.63	ID in Parhabdolithus
Tranolithus orionatus	/nn	-407.16	-358.63	
Tranolithus stradneri	/nn	-365.36	-358.63	
Vagalapilla aachena	/nn	-365.36	-365.36	
Vagalapilla matalosa	/nn	-365.36	-365.36	
Vagalapilla stradneri	/nn	-414.28	-358.63	
Watznaueria barnesae	/nn	-472.45	-358.63	
Zygodiscus diplogrammus	/nn	-470.23	-358.63	
Zygodiscus elegans	/nn	-470.23	-358.63	
Zygodiscus spiralis	/nn	-376.21	-365.36	
END				

CORB385 DSDP 385, Central Atlantic Vogel Seamount

37° 22.17'N, 60° 09.45'W, seafloor 4936m, TD 392.9m in volcanic breccia. 1979, Initial Reports of the Deep Sea Drilling Project, v. 43, Washington. High Fe₂O₃, +5%, from about 214-270, Murdmaa et al, 1979, p. 675-694, Fig. 1. Top Cretaceous @ 212.5m, volcanic/clay/sand sediments @ 283.4-392.9m @ TD; CORBS @214-283m p. 170, 183-184.

DATA:

*TAXA	Morph	Base	Top meters sub sea floor	
*Data from McNulty, 1979, p. 494				
Abathomphalus mayaroensis	/fp	-234.85	-234.85	
Gansserina gansseri	/fp	-234.85	-234.85	
Globotruncana arca	/fp	-234.85	-234.85	
Globotruncana contusa	/fp	-234.85	-234.85	
Globotruncana elevata	/fp	-234.85	-234.85	
Globotruncana lapparenti	/fp	-234.85	-234.85	
Globotruncana stuarti	/fp	-234.85	-234.85	
Globotruncana stuartiformis	/fp	-234.85	-234.85	
Globotruncanella petaloidea	/fp	-234.85	-234.85	
Gublerina robusta	/fp	-234.85	-234.85	
Planoglobulina acervulinoides	/fp	-234.85	-234.85	
Planoglobulina multicamerata	/fp	-234.85	-234.85	In Ventilabrella
Pseudoguembelina costulata	/fp	-234.85	-234.85	
Pseudotextularia deformis	/fp	-234.85	-234.85	

<i>Pseudotextularia elegans</i>	/fp	-234.85	-234.85
<i>Racemiguembelina fructicosa</i>	/fp	-234.85	-234.85
<i>Rugoglobigerina hexacamerata</i>	/fp	-234.85	-234.85
<i>Rugoglobigerina milamensis</i>	/fp	-234.85	-234.85

*Data from McNulty, 1979, p. 494

<i>Aragonia velascoensis</i>	/fb	-234.85	-234.85
<i>Gaudryina carinata</i>	/fb	-234.85	-234.85
<i>Nuttallinella florealis</i>	/fb	-234.85	-234.85
<i>Reussella szajnochae</i>	/fb	-234.85	-234.85

*Data from Okada & Thierstein, 1979, p. 520, Table 4

<i>Arkhangelskiella cymbiformis</i>	/nn	-241.00	-213.5
<i>Biscutum constans</i>	/nn	-237.55	-213.99
<i>Broinsonia enormis</i>	/nn	-237.55	-234.00
<i>Ceratolithoides aculeus</i>	/nn	-241.00	-214.15
<i>Chiastozygus litterarius</i>	/nn	-237.55	-213.5
<i>Cretarhabdus conicus</i>	/nn	-241.00	-213.5
<i>Cretarhabdus surirellus</i>	/nn	-241.00	-213.5
<i>Cribrosphaerella ehrenbergii</i>	/nn	-241.00	-213.5
<i>Cyclagelosphaera margerelii</i>	/nn	-241.00	-213.5
<i>Discorhabdus rotatorius</i>	/nn	-214.15	-214.15
<i>Eiffellithus turriseiffelii</i>	/nn	-237.55	-213.5
<i>Lithraphidites carniolensis</i>	/nn	-241.00	-213.5
<i>Lithraphidites quadratus</i>	/nn	-234.00	-213.5
<i>Manivitella pemmatoidea</i>	/nn	-234.00	-213.5
<i>Microhabdulus decoratus</i>	/nn	-234.86	-213.5
<i>Micula murus</i>	/nn	-234.00	-213.5
<i>Micula decussata</i>	/nn	-241.00	-213.5
<i>Parhabdolithus regularis</i>	/nn	-234.86	-213.5
<i>Parhabdolithus splendens</i>	/nn	-241.00	-213.5
<i>Prediscosphaera cretacea</i>	/nn	-241.00	-213.5
<i>Prediscosphaera spinosa</i>	/nn	-213.99	-213.99
<i>Quadrum trifidum</i>	/nn	-234.86	-234.86
<i>Rotelapillus laffittei</i>	/nn	-234.00	-213.99
<i>Vagalapilla stradneri</i>	/nn	-234.86	-213.99
<i>Watznaueria barnesae</i>	/nn	-241.00	-213.5
<i>Zygodiscus diplogrammus</i>	/nn	-237.55	-237.55
<i>Zygodiscus spiralis</i>	/nn	-237.55	-213.5

*Benthic foram data from Kuhnt et al. in

Microfossils and Oceanic Environments, *p. 64, Table 1.

<i>Ammodiscus cretaceus</i>	/FB	-270.87	-214.44	
<i>Ammodiscus planus</i>	/FB	-270.33	-252.28	
<i>Caudammia crassa</i>	/FB	-280.93	-213.48	
<i>Caudammia gigantea</i>	/FB	-270.33	-215.08	
<i>Caudammia ovulum</i>	/FB	-270.33	-204.63	
<i>Clavulinoides parisiensis</i>	/fb	-237.22	-234.51	
<i>Dorothia oxycona</i>	/fb	-237.22	-236.39	
<i>Gaudryina pyramidata</i>	/fb	-282.93	-214.44	
<i>Glomospira charoides</i>	/FB	-282.93	-214.44	
<i>Glomospira diffundens</i>	/fb	-236.39	-215.08	
<i>Glomospirella gaultina</i>	/FB	-280.78	-213.48	
<i>Glomospira gordialis</i>	/FB	-280.93	-213.48	
<i>Glomospira irregularis</i>	/FB	-282.3	-205.64	
<i>Haplophragmoides concavus</i>	/FB	-280.78	-214.44	ID cf.
<i>Haplophragmoides fraudulentus</i>	/fb	-270.33	-270.33	
<i>Haplophragmoides multicamerus</i>	/fb	-270.87	-270.87	
<i>Kalamopsis grzybowskii</i>	/FB	-270.87	-214.44	
<i>Karrerella conversa</i>	/fb	-270.87	-232.83	
<i>Matanzia varians</i>	/fb	-235.26	-213.48	
<i>Praecystammia globigerinaeformis</i>	/FB	-214.44	-214.44	
<i>Pseudobolivina munda</i>	/FB	-270.87	-270.33	
<i>Rzehakina inclusa</i>	/fb	-252.28	-251.20	
<i>Rzehakina epigona</i>	/fb	-254.9	-205.64	
<i>Saccammia placentia</i>	/FB	-282.93	-213.48	ID cf.

Spiroplectamina dentata	/fb	-237.22	-213.48
Trochammina altiformis	/fb	-280.78	-270.33
Trochammina gyroidinaeformis	/FB	-280.78	-215.08
Uvigerinammina jankoi	/FB	-282.3	-270.87

END

CORB398D DSDP 398D, Eastern Atlantic

40° 57.6'N, 60° 10.43.1'W, seafloor 3900m, TD 1740m in sedimentary rocks; 1979, Initial Reports of the Deep Sea Drilling Project, v. 47, Washington. Top Cretaceous @ 795.44m by lith, by forams @ 801.4/800.0m (p. 296); Top Alb/Cen @ 947.75m; CORBS @ 774-947.75m.

DATA:

*TAXA	Morph	Base	Top meters subsea floor
*Data from Sigal, 1979 p. 294-296			
Abathomphalus mayaroensis	/fp	-816.83	-812.83
Globotruncana arca	/fp	-886.65	-801.4
Globotruncana concavata	/fp	-880.68	-880.66
Globotruncana contusa	/fp	-822.0	-801.4
Globotruncana elevata	/fp	-886.65	-831.5
Globotruncana falsostuarti	/fp	-822.0	-801.4
Globotruncana fornicata	/fp	-880.68	-801.4
Globotruncana stuarti	/fp	-822.0	-801.4
Globotruncana stuartiformis	/fp	-880.68	-801.4
Globotruncanella havanensis	/fp	-822.0	-801.4
Pseudotextularia elegans	/fp	-816.8	-812.8
Racemiguembelina fructicosa	/fp	-816.8	-812.8
Ventilabrella glabrata	/fp	-816.8	-812.8
Osangularia lens	/fb	-822.0	-801.4
*Data from Blechschmidt, p. 327 ff.			
Arkhangelskiella cymbiformis	/nn	-886.6	-795.45
Broinsonia parca parca	/NN	-886.6	-801.4
Calculites obscurus	/NN	-823.8	-820.3
Chiastozygus litterarius	/nn	*	-844.6
Cretarhabdus conicus	/nn	-885.9	-829.8
Cretarhabdus surirellus	/nn	-869.5	-797.3
Ceratolithoides aculeus	/nn	-886.6	-797.3
Ceratolithoides kamptneri	/NN	-886.6	-801.4
Cribracorona gallica	/NN	*	-795.45
ID as Cylindralithus			
Cribrospheraella ehrenbergii	/nn	*	-795.45
Eiffellithus eximius	/NN	-886.6	-851.5
Eiffellithus turriseiffelii	/nn	*	-795.45
Gartnerago obliquum	/NN	-886.6	-806.4
Kamptnerius magnificus	/NN	-854.5	-823.2
Lithraphidites quadratus	/nn	*	-795.45
Manivitella pemmatoidea	/nn	*	-841.8
Microrhabdulus decoratus	/nn	-886.6	-795.45
Micula decussata	/nn	*	-795.45
Micula murus	/nn	-806.8	-795.45
Parhabdolithus embergeri	/NN	*	-795.47
Parhabdolithus regularis	/nn	*	-806.4
Prediscosphaera cretacea	/nn	*	-795.45
Quadrum trifidum	/nn	-868.3	-841.8
Quadrum gothicum	/NN	-883.6	-841.9
Stradneria crenulata	/NN	*	-797.3
*ID as Cretarhabdus = Retacapsa			
Watznaueria barnesae	/nn	*	-795.45
Zygodiscus diplogrammus	/nn	*	-833.7
*Benthic foram data from Kuhnt et al. in Microfossils and Oceanic Environments, p. 66-69 Table 3.1.			
Ammodiscus cretaceus	/FB	-916.1	-798.48

Ammodiscus planus	/FB	-916.1	-910.06	
Arenobulimina dorbignyi	/fb	-885.24	-798.48	
Bulbobaculites problematicus	/fb	-917.14	-913.6	
Caudamina crassa	/FB	-916.1	-853.63	
Caudamina gigantea	/fb	-891.63	-798.48	
Caudamina ovulum	/FB	-902.1	-798.48	
Clavulinoides subparisiensis	/fb	-885.97	-822.94	
Dorothia crassa	/fb	-882.23	-798.48	
Dorothia oxycona	/fb	-864.01	-799.7	
Gaudryina pyramidata	/fb	-886.74	-798.48	
Glomospira charoides	/FB	-919.27	-798.48	
Glomospirella gaultina	/FB	-834.6	-798.48	
Glomospira gordialis	/FB	-918.55	-798.48	
Glomospira irregularis	/FB	-918.55	-804.65	
Goesella rugosa	/fb	-885.97	-798.48	
Haplophragmoides bulloides	/fb	-916.1	-899.6	ID as aff.
Haplophragmoides concavus	/FB	-901.1	-900.66	ID cf.
Haplophragmoides fraudulentus	/fb	-902.6	-900.66	
Haplophragmoides herbichi	/fb	-907.59	-899.6	
Haplophragmoides perexplicatus	/fb	-901.1	-886.74	
Kalamopsis grzybowskii	/FB	-915.1	-909.1	
*highest LO @ 818.32 may be reworked??				
Karrerriella conversa	/fb	-917.14	-899.6	
Labrospira pacifica	/fb	-915.1	-910.06	
Matanzia varians	/fb	-845.99	-798.48	
Praecystamina globigerinaeformis	/FB	-916.1	-916.1	
Pseudobolivina munda	/FB	-903.6	-899.6	
Reophax dentaliniformis	/fb	-903.6	-899.6	
*ID as aff., a zone marker				
Rzehakina epigona	/fb	-864.01	-864.01	
Saccamina placenta	/FB	-914.57	-900.66	
Spiroplectamina dentata	/fb	-885.97	-798.48	
Trochammina altiformis	/fb	-916.1	-891.1	
*reworked? next @ 891.1 or 900.66??				
Trochammina gyroidinaeformis	/FB	-917.14	-883.75	
*reworked? next @ 891.63 or 899.6??				
Uvigerinamina jankoi	/FB	-918.55	-886.74	
END				

CORB 603B.1 DSDP 603B Western Atlantic

35° 29.71'N, 70° 01.71'W, seafloor 4644 m, TD @ 1576 mbsf. Van Hinte et al., 1987, Init. Repts. DSDP 93. U. Cret Plantagenet Fm. 1022.78-1119.10 mbsf, unconformities base & top; K/T spherule layer at 1024.28-1024.33 mbsf (pt. 2, p. 1039-1048) on radiolarian chert C/T below Camp @ 1118.98/1056.6m.

DATA:

*TAXA	Morph	Base	Top (m)	
*Benthic forams by Moullad et al., 1988, ODP 103:352, fig. 4				
Ammodiscus cretaceus	/fb	-1137.4	-1021.53	
Caudamina crassa	/fb	-1024.53	-1024.53	
Caudamina gigantea	/fb	-1073.2	-1024.53	in Hormosina
Caudamina ovulum	/fb	-1038.6	-1026.03	
Gerochammina stanislawi	/fb	-1137.4	-1137.4	
*in Dorothia filiformis				
Glomospira charoides	/fb	-1118.98	-1024.53	
Glomospira corona	/fb	-1118.98	-1024.53	
*as gp. corona-charoides				
Glomospira gordialis	/fb	-1097.3	-1084.53	
Glomospirella gaultina	/fb	-1127.5	-1021.53	
Haplophragmoides bulloides	/FB	-1136.5	-1136.5	ID as cf
Haplophragmoides concavus	/FB	-1136.5	-1026.03	ID as cf.
Haplophragmoides perexplicatus	/FB	-1091.0	-1091.33	

Highest @ 1038.6 reworked?			
Haplophragmium lueckei	/fb	-1094.0	-1094.0
Gerochammina gr. lenis_conversa	/fb	-1118.98	-1024.53
ID in Plectina			
Praecystamina globigerinaeformis	/fb	-1095.44	-1091.33
Pseudobolivina gr. munda_lagenaria	/fb	-1118.98	-1038.6
Trochammina altiformis	/fb	-1094.3	-1084.53
Trochammina gyroidinaeformis	/fb	-1118.98	-1090.4
*Highest @1032.02 reworked?			
Uvigerinammina jankoi	/fb	-1118.98	-1048.54
*Dinoflagellates by Habib & Drugg, 1987, DSDP 93, pt. 2, p. 751 ff, fig. 2			
Apteodinium deflandrei	/dn	-1061.39	-1061.39
Alterbia acuminata	/dn	-1078.66	-1061.39
Callaiosphaeridium asymmetricum	/dn	*	-1061.39
Chlamydochorella nyei	/dn	*	-1122.72
Codoniella psygma	/dn	*	-1061.39
Cometodinium whitei	/dn	-1081.45	-1078.66
Cribroperidinium edwardsii	/dn	*	-1122.72
Dinogymnium acuminatum	/dn	-1078.66	-1061.39
Dinopterygium cladoides	/dn	*	-1078.66
Exochosphaeridium bifidum	/dn	*	-1061.39
Hystriodinium pulchrum	/dn	*	-1122.72
Isabelidinium acuminatum	/dn	-1078.66	-1061.39
Kiokansium polypes	/dn	*	-1122.72
Litosphaeridium siphoniphorum	/dn	*	-1122.72
*assubsp.glabrum			
Odontochitina operculata	/dn	*	-1119.3
Odontochitina porifera	/dn	-1078.66	-1061.39
Oligosphaeridium asterigerum	/dn	*	-1122.72
Palaeohystriodina infusorioides	/dn	*	-1078.66
Palaeoperidinium cretaceum	/dn	*	-1122.72
Palaeoperidinium pyrophorum	/dn	-1078.66	-1061.39
Senoniasphaera protrusa	/dn	-1078.66	-1061.39
Spinidinium echinoideum	/dn	*	-1061.39
Spiniferites cingulatus	/dn	*	-1119.3
Spiniferites ramosus ramosus	/dn	*	-1122.72
Subtilisphaera pontismariae	/dn	*	-1119.3
Tanyosphaeridium variecalamus	/dn	*	-1122.72
Trithyrodinium suspectum	/dn	-1141.55	-1122.72
Wallodinium inflatum	/dn	*	-1122.72
Wrevittia cassidata	/dn	-1122.72	-1122.72
Xenascus ceratioides	/dn	*	-1078.66
Xiphophoridium alatum	/dn	*	-1078.66
Rugubivesiculites reductus	/sp	*	-1061.39
Radiolaria by Moullade et al., 1987, DSDP 93, pt.2, p. 356, Fig. 7			
Acaeniotyle umbilicata	/ra	-1122.43	-1122.43
Alievium gallowayi	/ra	-1065.6	-1056.6
Alievium superbum	/ra	-1122.43	-1119.43
Cavaspongia antelopensis	/ra	-1122.43	-1120.93
Cavaspongia californiensis	/ra	-1122.43	-1119.43
Conocaryomma universa	/ra	-1122.43	-1059.06
Crucella cachiensis	/ra	-1122.43	-1119.43
Crucella espartoensis	/ra	-1060.53	-1056.6
Dumitricaia maxwellensis	/ra	-1122.43	-1119.43
Halesium quadratum	/ra	-1122.43	-1122.43
Halesium sexangelum	/ra	-1122.43	-1122.43
Patellula verteroensis	/ra	-1060.53	-1057.53
Patulibrachium californiensis	/ra	-1060.53	-1059.06
Patulibrachium davisii	/ra	-1122.43	-1120.93 ID as cf
Patulibrachium petroleumensis	/ra	-1060.53	-1060.53
Pseudoaulophacus floresensis	/ra	-1119.43	-1056.6
Pseudoaulophacus lenticulatus	/ra	-1119.43	-1057.53
Pseudoaulophacus pargueraensis	/ra	-1119.43	-1056.6

<i>Pseudoaulophacus putahensis</i>	/ra	-1131.4	-1119.43
<i>Pyramispongia glascocksensis</i>	/ra	-1131.4	-1119.43
<i>Amphipyndax pseudoconulus</i>	/ra	-1060.53	-1060.53
<i>Amphipyndax stocki</i>	/ra	-1060.53	-1056.6
<i>Archaeodictyomitra lamellicostata</i>	/ra	-1122.43	-1056.6 ID as cf
<i>Clathropyrgus titthium</i>	/ra	-1059.06	-1056.6
<i>Cryptamphorella conara</i>	/ra	-1122.43	-1060.53
<i>Cryptamphorella macropora</i>	/ra	-1057.53	-1057.53
<i>Dictyomitra formosa</i>	/ra	-1119.43	-1056.6
<i>Dictyomitra koslovae</i>	/ra	-1119.43	-1056.6
<i>Hemicryptocapsa polyhedra</i>	/ra	-1122.43	-1059.06
<i>Neosciadiocapsa diabloensis</i>	/ra	-1060.53	-1059.06
<i>Pseudodictyomitra nakasekoi</i>	/ra	-1122.43	-1119.43
<i>Pseudodictyomitra pseudomacrocephala</i>	/ra	-1122.43	-1119.43
<i>Stichomitra communis</i>	/ra	-1122.43	-1119.43
<i>Theocampe tina</i>	/ra	-1060.53	-1057.53
<i>Afens liriodes</i>	/ra	-1118.98	-1056.6
END			

CORB641A.1 ODP 641A North Central Atlantic

42° 09.3'N, 12° 10.9'W; sea floor @ 4646m; core from 0-63.6m, 63.4% recovery. Boillot, G., Winterer, E.L., et al., 1987. Proc. ODP, Sci. Results, 103. College Station, TX.

Lithostratigraphy by Boillot et al., 1988, ODP Initial Rpt.; Pleistocene 0-0.6m; top Cretaceous Plantagenet fm. 1.5m; top OAE2 53.5m-53.8m; Cenomanian 53.8m-63.6m. Nannos by Applegate & Bergen, 1988, ODP Initial Rpt., v. 103, p. 293 ff. Benthic forams by Moullade et al., 1988, ODP Initial Rpt., v. 103, 349ff, fig. 3; Radiolaria by Thurow, 1988, ODP 103, 379& fig. 7, p. 356. Palynology by Drugg & Habib, 1988, p. 429ff; Definition of OAE2 by Thurow et al., p. 587ff., fig. 2.

DATA:

*Taxa	Morph	Base	Top (meters)
Carbon peak OAE 2	/gc	-53.8	-53.6
<i>Ammodiscus cretaceus</i>	/fb	-53.54	-1.82
<i>Caudammina crassa</i>	/fb	-48.21	-1.82
<i>Caudammina gigantea</i>	/fb	-25.2	-2.64
<i>Caudammina ovulum</i>	/fb	-25.2	-1.82
<i>Glomospira charoides</i>	/fb	-53.54	-2.64
<i>Glomospira corona</i>	/fb	-53.54	-2.64
<i>Glomospira gordialis</i>	/fb	-47.71	-2.64
<i>Glomospira irregularis</i>	/fb	-46.56	-2.64
<i>Glomospirella gaultina</i>	/fb	-47.71	-25.61
<i>Haplophragmium lueckei</i>	/fb	-53.52	-38.35
<i>Haplophragmoides bulloides</i>	/fb	-53.59	-35.08
<i>Haplophragmoides concavus</i>	/fb	-38.35	-38.31 ID as cf.
<i>Haplophragmoides fraudulentus</i>	/fb	-34.8	-15.6
<i>Haplophragmoides linki</i>	/fb	-34.8	-34.8 ID as cf.
<i>Haplophragmoides multicamerus</i>	/fb	-15.6	-4.67
<i>Haplophragmoides multiformis</i>	/fb	-25.61	-25.2
<i>Haplophragmoides perexplicatus</i>	/fb	-35.04	-4.67
<i>Labrospira inflata</i>	/fb	-34.8	-3.31
<i>Labrospira pacifica</i>	/fb	-15.6	-6.0
<i>Praecystammina globigerinaeformis</i>	/fb	-52.33	-25.2
<i>Pseudobolivina munda</i>	/fb	-53.54	-1.82
*ID as group munda-lagenaria			
<i>Trochammina altiformis</i>	/fb	-47.71	-25.2
<i>Trochammina gyroidinaeformis</i>	/fb	-50.78	-6.0
<i>Uvigerinammina jankoi</i>	/fb	-53.43	-17.26

*These taxa were ID to genus only;

these are the only species of these genera in MIDK41.DCT 01/05

<i>Atlantopollis verrucosa</i>	/sp	-54.00	-53.96
<i>Complexiopollis funiculus</i>	/sp	-54.00	-53.96
* <i>Chatangiella verrucosa</i>	/dn	-53.96	-53.96

Protoellipsodinium seghire	/dn	-53.96	-53.96
*These species reported on p. 431:			
Codoniella psygma	/dn	-54.00	-53.52
Odontochitina operculata	/dn	-54.00	-53.52
Palaeohystrichophora infusorioides	/dn	-54.00	-53.52
Spiniferites cingulatus	/dn	-54.00	-53.52
*These may be reworked? p. 390			
Squinabollum fossilis	/ra	-25.82	-25.78
Stichomitra communis	/ra	-25.82	-25.78
*Paly by Thurow et al., 1988, p. 608, Table 3; Some reworked			
*Achomosphaera crassipellis	/dn		
Achomosphaera ramulifera	/dn	-53.97	-53.89
Achomosphaera sagena	/dn	-53.92	-53.89
Aldorfina deflandrei	/dn	*	-53.65
*Chlamydophorella nyei	/dn		
*Codoniella campanulata	/dn	-53.89	-53.54
Coronifera oceanica	/dn	-53.89	
Cyclonephelium chabaca	/dn	-53.89	-53.86
Cyclonephelium compactum	/dn	-53.54	-53.51
*Cyclonephelium distinctum	/dn		
Dapsilidinium laminaspinosum	/dn	*	-53.86
*Ellipsodinium rugulosum	/dn		
*Florentinia mantellii	/dn		
Kiokansium williamsii	/dn	*	-53.89
*Hapsocysta dictyota	/dn		
Heterosphaeridium heteracanthum	/dn	*	-53.86
Hystrichosphaeridium bowerbankii	/dn	*	-53.89
*Hystrichosphaeropsis ovum	/dn		
*Hystrichostrogylon membraniphorum	/dn		
Kleithriasphaeridium loffreense	/dn	*	-53.86
*Leberidocysta chlamydata	/dn		
*Litosphaeridium arundum	/dn		
Litosphaeridium siphoniphorum	/dn	-53.99	-53.97
*Maghrebina perforata	/dn		
Microdinium ornatum	/dn	-53.70	-53.58
*Odontochitina costata	/dn		
*Odontochitina operculata	/dn		
Oligosphaeridium complex	/dn	-53.86	-53.83
*Oligosphaeridium pulcherrimum	/dn		
Oligosphaeridium verrucosum	/dn	*	-53.97
*Ovoidinium scabrosum	/dn		
Palaeohystrichophora infusorioides	/dn	-53.97	-53.54
Pervosphaeridium cenomaniense	/dn	*	-53.65
Pervosphaeridium pseudhystrichodini	/dn	-53.92	-53.89
*Prolixosphaeridium conulum	/dn		
*Pterodinium cingulatum	/dn	*	-53.46
*Spiniferites multibrevis	/dn	*	-53.54
*May be re-worked above unconformity; too hi			
Spiniferites ramosus ramosus	/dn	-53.97	-53.54
*Spiniferites scabrosus	/dn		
*Trichodinium castanea	/dn		
*Trithyrodinium suspectum	/dn	-53.97	-53.54
*Tubulospina oblongata	/dn	-53.54	-53.51
*Xenascus ceratioides	/dn		
Xiphophoridium alatum	/dn	*	-53.89
END			

CORBBYST.1 Beskydy Mountains, Czech Republic

Location: 18° 16.928'; 49° 30.989'; Bystry Creek section, Moravo-Silesian Belt Geological setting: Silesian Unit, Outer Western Carpathians, Czech Republic; Skupien & Vasicek, 2003: Lithostratigraphical and biostratigraphical knowledge of the Bystra potok section by Frenštát P. R. (Upper Cretaceous,

Silesian Unit of the Outer Western Carpathians). Transactions of the VSB-Technical University Ostrava, Mining and Geological Series, Monograph 8, 65-93 (in Czech with English abst.).

Section extend from Upper Albian to Lower Coniacian; Base lower massive sandstone of the Godula Formation = 306 m; Top Mazak Formation = 120 m; Top Lhoty Formation = 25 m, unconformity, base = 0 m in upper part of the Lhoty Formation. Top Albian = 25 m; Top Turonian = 83 m. Revised 09/05 w/ Skupien & Vasicek. Red Beds - Base (m) Top: 26 - 46; 68 - 120; 137 - 157; 183 - 210; 288 - 296.

Data:

Non-calcareous dinoflagellate cyst taxa	Base (m)	Top
Data revision of tops by P. Skupien 09/05		
Acanthaulax wilsonii	/dn 67	249
Chatangiella ditissima	/dn 133	139
Chatangiella madura	/dn 185	295
Chatangiella spectabilis	/dn 147.5	185
Chatangiella tripartita	/dn 249	261
Chatangiella williamsii	/dn 165	261
*original data replaced by Bubik's data	249	261
Endoceratium dettmaniae	/dn 58	58
Epelidosphaeridia spinosa	/dn 20	20
Exochosphaeridium bifidum	/dn 17	20
Isabelidinium acuminatum	/dn 261	261
Isabelidinium bakeri	/dn 165	261
Litosphaeridium conispinum	/dn 6	15
Litosphaeridium siphoniphorum	/dn 0	15
Odontochitina costata	/dn 16	54
Ovoidinium verrucosum	/dn 0	15
Palaeohystrichophora infusorioides	/dn 0	308
Palaeoperidinium pyrophorum	/dn 67	67
Pervosphaeridium truncatum	/dn 0	21
Protoellipsodinium spinosum	/dn 8	21
Senoniasphaera rotundata	/dn 139	165
Tanyosphaeridium salpinx	/dn 20	20
*top @ 54 may be reworked		
Tubulospina oblongata	/dn 17	17
*top @ 54 reworked		
Xenascus ceratioides	/dn 0	217
Preliminary foram and dino data from M. Bubik, 2004, Corb Romanian guidebook, revised 8/04; revised 9/05 from workshop presentation Nat. Inst. Marine Geology; revised from new data 08/04		
*Caudammina arenacea	/fb 820	* new taxon
Caudammina excelsa	/fb 101.75	*
Caudammina gigantea	/fb 120	910
*base too old in this interpretation; consistent occurrence at 920m		
*Hormosina cf. velascoensis	/fb 1140	* new taxon
Karrerulina coniformis	/fb 266.75	*
Plectorecurvoides alternans	/fb *	13.5
Plectorecurvoides irregularis	/fb *	13.5
Rzehakina minima	/fb 75.7	*
Pseudobolivina munda	/fb 44.2	*
Uvigerinammina jankoi	/fb 40.2	820
Uvigerinammina praejankoi	/fb 40.2	131.3
*END		

CORBCOVA.1 Covasna Valley at Siclau

Between Covana & Comandau, Romania. Section by Sandulescu (Mem. Inst. Geol. v. 7)

Lupchianu beds, U. Alb-Turonian @ 0-45 m; Micaceous sands at Marnocalc Massif, lower Senonian @ 45-90; Horgazu Fm. Senonian-Paleocene @90-330 m; Basal beds, Paleocene @330-355 m at fault; Lower Tarcau sand 355-375 m. Tops below 355 m plotted. *Melinte (2004, Field Guidebook, IGCP 463 & 494, p. 38-39) reported E. turriseiffelii, H. chiesta and E. octopetalus in lower mbr of Carnu-Siclau Fm.

and *L. septenarius* in the upper mbr. The lower mbr. seems to be the same as the Lupchianu beds of Sandulescu and the upper mbr. is the gray marl. Corbs are approximately from 250-280m.

Data:

*TAXA	Morph	Base	Top meters	above base section
*Benthic forams by Sandulescu, Mem. Geol. Institut,				
Caudammina gigantea	/fb	60	134	
*in Hormosina; base at 28 is too low, use next lowest spl				
Caudammina ovulum	/fb	36	134	
Dorothia crassa	/fb	262	262	
Eggerella propinqua	/fb	90	90	
Glomospira charoides	/fb	29	29	
Glomospira diffundens	/fb	263	366	
Glomospira gordialis	/fb	28	28	
Glomospira irregularis	/fb	35	335	
Kalamopsis grzybowskii	/fb	16	59	
Karrerulina coniformis	/fb	90	90	
Nodellum velascoensis	/fb	29	180	
*1st top @ 362m; = Hormosina velascoensis				
Gerochammina gr. lenis_conversa	/fb	42	42	*ID in Plectina
Plectorecurvoides irregularis	/fb	34	34	
Rzehakina inclusa	/fb	180	180	
Saccammina placenta	/fb	58	337	
Thalmannammina subturbinata	/fb	22	31	
Uvigerinammina jankoi	/fb	90	90	
Globotruncana lapparenti	/fp	88	88	
*Melinte (2004, Field Guidebook, IGCP 463 & 494, p. 38-39)				
Eprolithus octopetalus	/nn	22	42	
Eiffelithus turriseiffelii	/nn	22	42	
Helenea chiastia	/nn	22	42	
Lithastrinus septenarius	/nn	51	61	
*END				

CORBPOL.14 Zasadne Section, Poland

Data submitted by E. Malata, 12 Dec 2003, CORB Project; Malata & Oszczytko, 1990, NATO ASI Series C, v. 327, p. 507-524; Reported ages: Malinowa Fm.-Turonian-Santonian 0-33m, Haluszowa Fm.-Sant-lower Campanian 33-110m.

Data:

*TAXA	Morph	Base	Top meters	
Ammodiscus cretaceus	/fb	22	22	
Ammodiscus siliceus	/fb	7	106	
Caudammina ovulum	/fb	2	22	
Gerochammina conversa	/fb	1	22	
Gerochammina lenis	/fb	1	22	
*both species also placed in Karrerulina				
Gerochammina stanislawi	/fb	1	22	
Glomospira charoides	/fb	22	22	
Glomospira gordialis	/fb	1	22	
Glomospira irregularis	/fb	7	106	
Glomospirella gaultina	/fb	1	18	
Haplophragmoides kirki	/fb	7	7	ID as cf.
Kalamopsis grzybowskii	/fb	7	106	
Nothia excelsa	/fb	1	106	
Nothia latissima	/fb	7	7	
Praecystammina globigerinaeformis	/fb	1	22	genus ?, sp. as cf.
Pseudobolivina cuneata	/fb	22	22	
Pseudobolivina munda	/fb	22	22	ID as cf
Saccammina placenta	/fb	7	7	
Thalmannammina subturbinata	/fb	2	2	
Trochammina altiformis	/fb	1	22	

Trochammina bulloidiformis	/fb	22	22
Trochammina globigeriniformis	/fb	7	22
Trochammina gyroidinaeformis	/fb	1	18
Uvigerinammina jankoi	/fb	1	22
*END			

CORBROM.1 Pietrosita Section (Ialomita Valley),

East Carpathians, Romania, CORB Project. Melinte, 1999, Acta Palaeont. Romaniae, 2:269-273. Nannofossil data from Melinte (1999) and Melinte & Jipa (in press, Cret. Research). The section extends from Campanian to Paleogene. On Melinte log (figs. 2, 3) Plaiu Formation 100-80 m; Gura Belliei Formation 80 m to 15 m, Paleogene Sotriale Formation at 15 m. CORBs red beds extend from 80 to 15 m, Campanian to lower Paleogene (Danian), 65 m thick. Base of graphed data begins at 100 m and measured from base at 0 m to top at 72 m; revised scale from 07/04.

Data:

*TAXA	Morph	Base	Top m
Marker first red bed-Romania	/mb	20	*
*Nannoconus spp.	/nn	*	25.2
Uniplanarius sissinghii	/nn	22.4	*
Ceratolithoides aculeus	/nn	1	*
Eiffellithus eximius	/nn	44.8	44.8
Lithraphidites praequadratus	/nn	16	*
Lithraphidites quadratus	/nn	48.1	71.2
Micula murus	/nn	53.6	71.2
Micula prinsii	/nn	62.5	71.2
Mass extinction of Cret. Nannos	*	71.2	
Quadrum trifidum	/nn	27.8	39.5 ID as Uniplanarius
Thoracosphaera First bloom	/nn	71.3	*
Braarudosphaera bigelowii First bloom	/nn	71.35	*
Thoracosphaera Second bloom	/nn	71.41	*
Braarudosphaera bigelowii Second bloom	/nn	71.43	*
Marker Last red bed-Romania	/mb	*	85
Thoracosphaera	/nn	71.3	71.41
*Planktic foram data from Neagu & Georgescu, 1991, Rev. Romana Geol. 35:57-74			
Abathomphalus mayaroensis	/fp	60	60
Globotruncana ventricosa	/fp	20	20
Belemnitella carpatica	/am	0	33.7
*END			

CORBRUS.1 Khalagork section, Dagestan,

Eastern Caucasus, Russia. Ekaterina Shcherbinina, Laboratory of micropaleontology, Geological Institute RAS, 10/31/03, CORB Project. CORB at 146-154m in Turonian Zone CC12

Data:

*Taxa	Morph	Base	Top meters above base	
Carbon peak OAE 2	/gc	139.8	139.8	
Cladoceramus undulatoplicatus	/bi	254	263	
Inoc apicalis	/bi	146	154	
Axopodorhabdus albianus	/nn	120	120	
Chiastozygus bifarius	/nn	131	131	
Corollithion kennedyi	/nn	124	124	
Cribrorperidium ehrenbergii	/nn	100	100	
Eiffellithus eximius	/nn	146.2	146.2	
Eiffellithus turriseiffelii	/nn	112.6	112.6	
Gartnerago segmentatum	/nn	131	131	
Gartnerago theta	/nn	120	137	

Lucianorhabdus maleformis	/nn	146.2	146.2
Helenea chiastia	/nn	140	140
Microrhabdulus decoratus	/nn	133.6	133.6
Nannoconus regularis	/nn	104.5	104.5
Parhabdolithus achlyostaurion	/nn	106	106
Parhabdolithus asper	/nn	137.5	137.5
Prediscosphaera columnata	/nn	99.2	99.2
Prediscosphaera cretacea	/nn	133.6	133.6
Quadrum gartneri	/nn	139.6	139.6
Quadrum intermedium	/nn	134	134

*END

CORB.25 Plagersflue section, Switzerland

coord. 590.160/160.625. Guillaume, M., 1986, Inst. de Geol. Univ. de Fribourg, p. 23, 75, 97;
 Base Cretaceous in contact w/ Jurassic at 0m, top Calcarene de la Plagersflue Mbr. 0.3m, top Calcaire de Gerignoz Mbr. 2.0m, top Ronfin Mbr. 23m, top Wildenbach Mbr. = top Rote Platte Fm. 30.1m is a fault, top Pissot Mbr. 35m, top Rayes Mbr. 61.1m, top Beaumont Mbr. = top Forclettes Fm. 62.1m, top Hochmatt Mbr. 63.7m, top Chenaux Rouges Fm. at 82m a fault.

DATA:

*TAXA	Morph	Base	Top	meters above base Cret.
Abathomphalus intermedius	/FP	61	62	
Abathomphalus mayaroensis	/FP	61	62	
Acarinina bullbrooki	/fp	81	81	
Acarinina pentacamerata	/fp	77	77	
Acarinina primitiva	/fp	62	75	
Acarinina soldadoensis	/fp	67	77	
Aragonia aragonensis	/FB	67	82	
Dica algeriana	/FP	0.1	0.2	
Dica canaliculata	/FP	0.1	0.2	
Dica concavata	/fp	10	27	
Dica hagni	/FP	0.1	0.2	
Dica imbricata	/FP	0.1	0.2	
Dica primitiva	/FP	5	25	
Dicarinella asymetrica	/FP	23	30	
Gansserina gansseri	/fp	33	62	
Globotruncana aegyptiaca	/FP	34	58	
Globotruncana arca	/FP	33	62	
Globotruncana bulloides	/FP	38	61	
Globotruncana conica	/FP	35	40	
Globotruncana contusa	/FP	34	62	ID as Rosita contusa
Globotruncana elevata	/FP	31	31	
Globotruncana falsostuarti	/FP	34	58	
Globotruncana fornicata	/FP	27	56	ID as Rosita
Globotruncana linneiana	/FP	33	61	
Globotruncana stuarti	/FP	33	62	
Globotruncana stuartiformis	/FP	32	61	
Globotruncana ventricosa	/FP	32	61	
Globotruncanella petaloidea	/fp	35	59	
Globotruncanella havanensis	/fp	33	39	
Hedbergella flandrini	/fp	8	30	
Helv'ana helvetica	/FP	0.1	0.1	
Helv'ana praehelvetica	/FP	0.1	0.2	
Marginotruncana coronata	/FP	0.2	30	
Marginotruncana pseudolinneiana	/FP	0.1	30	
Marginotruncana renzi	/FP	0.1	27	
Marginotruncana schneegansi	/FP	2	25	
Marginotruncana sigali	/FP	0.1	15	
Morozovella formosa gracilis	/fp	62	77	
Morozovella subbotinae	/fp	62	75	
Racemiguembelina fructicosa	/fp	40	62	

Whit archaeocretacea /fp 0.1 0.2
 *END

CORB.26 Ouzon section, Switzerland

Coord. 538.900/127.800. Hable, R., 1997, Inst. für Geol. und Palaont der U. Freiburg, Dissertation #1166, p. 70-91. Calcaires Plaquettes Fm. 0-11.2m w/ aggregate hardgrounds; Intyamom Fm. 11.2-64.25m w/ intraformational drowning unconformity at 19.6m; Rote Platte Fm. 64.25-70m at fault contact overlain by Intyamom Fm.; reddish pelagic limestone beds at 11.3-11.8m, 13.5-19.1 interbedded w/ gray beds, 22.3-27.1m interbedded w/ gray beds, and 64.4-65.5m in Rote Platte Fm.; repeated section of Intyamom at 71m to 90m overlain by Rote Platte to 99m; interval of reddish pelagic limestone interbedded with gray beds from 89.5-94.8m.

DATA:

*TAXA	Morph	Base	Top meters from base
Biti breggiensis	/fp	27.8	28.8
Dica hagni	/FP	63.8	64.25
Glob'oides algerianus	/fp	11.3	12.4
Glob'oides ferreolensis	/fp	11.3	19.3
Globuligerina hoterivica	/fp	8.1	11.1
Hedb planispira	/fp	19.7	27.1
Hedb trocoidea	/fp	11.3	19.3
Helv'ana helvetica	/fp	63.85	65.15
Helv'ana praehelvetica	/FP	62.0	63.8 Placed in Whiteinella-new
Marginotruncana coronata	/FP	68.15	68.15
Marginotruncana marianosi	/FP	63.9	68.15 ID as cf or aff.
Marginotruncana pseudolinneiana	/FP	64.3	68.15
Marginotruncana schneegansi	/FP	64.45	64.45
Marginotruncana sigali	/FP	64.1	68.15
Marginotruncana sinuosa	/FP	64.45	64.45
Planomalina buxtorfi	/fp	29.0	29.1
Planomalina chenourensensis	/FP	12.4	19.3
Planomalina praebuxtorfi	/FP	28.8	29.0
Praeglobotruncana stephani	/fp	63.85	63.9
Rota appenninica	/FP	29.1	39.0
Rota brotzeni	/FP	34.5	41.8
Rota cushmani	/FP	57.5	63.6
Rota deeckeii	/FP	48.3	63.0
Rota gandolfi	/FP	31.5	61.5
Rota greenhornensis	/FP	54.9	63.6
Rota montsalvensis	/FP	37.5	63.6
Rota reicheli	/FP	37.5	48.3
Tici praeticinensis	/FP	27.9	28.2
Tici primula	/FP	24.8	32.2
Tici raynaudi	/FP	27.8	28.7
*ID as raynaudi digitalis			
Tici roberti	/FP	26.7	28.8
Tici subticinensis	/FP	28.2	28.8
Tici ticinensis	/FP	28.2	30.7
Whit archaeocretacea	/fp	63.8	64.25
Whit paradubia	/fp	63.8	64.1
Whit praehelvetica	/fp	62.0	64.45
*Calpionella alpina	/CA	1.1	11.1 *may be reworked?
Calpionellites darderi	/CA	1.1	5.4

CORB.27 Buchberg Section, Austria

Lat Long 013° 31' 43" E; 47° 56' 09" N. Description Turonian transition into CORB, detailed isotope and geochemical analysis, mineralogy;h.helvetica TRZ. Authors M. Wagreich, S. Neuhuber, I. Wendler. Lithostratigraphy grey and red marls with intercalated limestones.

Tectonic setting Ultrahelvetic Unit, Eastern Alps.

DATA:

*TAXA	Morph	Base m	Top m
Helv'ana helvetica	/fp	0.3	5.835
Marginotruncana coronata	/fp	5.175	6.275
Marginotruncana marianosi	/fp	1.64	5.835
Marginotruncana schneegansi	/fp	0.8	6.275
*Eiffellithus cf. eximius	/nn	5.335	6.875
Eiffellithus eximius	/nn	5.63	6.875
*Eprolithus eptapetalus	/nn	0.3	6.965 = E. moratus
Eprolithus octopetalus	/nn	0.3	6.965
Kamptnerius magnificus	/nn	6.875	6.965
Lucianorhabdus maleformis	/nn	6.875	6.965
Quadrum gartneri	/nn	0.8	6.965
Quadrum intermedium	/nn	0.3	6.965

*END

CORB.28 Section Oberschau, Austria

Lat Long 013° 28' 251" E; 47° 50' 00" N. Description Red shales and marlstones in turbidites; CORB intervals from 6.23 to 6.70m and 30.40 to 41.05m. Authors M. Wagreich, Pavilshina & Malata, Cret. Res, 27:743-753; Lithostratigraphy: Untere Bunte Schiefer; Tectonic setting: Rhenodanubian Flysch Zone, Eastern Alps.

DATA:

*TAXA	Morph	Base m	Top m
*Data from Fig. 6			
Glob'oides bentonensis	/fp	35.7	41
Glob'oides caseyi	/fp	35.7	41
Glob'oides ultramicrus	/fp	30.6	30.6
Guembelitria cenomana	/fp	30.6	35.7
Hedb delrioensis	/fp	22	48
Hedb planispira	/fp	22	48
Hedb simplex	/fp	35.7	48
Heterohelix moremani	/fp	22	48
Praeglobotruncana delrioensis	/fp	35.7	41
Praeglobotruncana stephani	/fp	41	41
Rota appenninica	/fp	41	41
*Rota globotruncanoides	/fp	39	41.05
*ID as cf; 12/06 Wagreich says to ignore			
Schackoina bicornis	/FP	35.7	41
Schackoina cenomana	/FP	30.6	48
*Data from fig. 8			
Axopodorhabdus albianus	/nn	22	48
Biscutum constans	/nn	22	48
Biscutum ellipticum	/nn	30.6	48
Chiastozygus litterarius	/nn	22	48
Corollithion kennedyi	/nn	48	48
Corollithion signum	/nn	35.7	48
Cretarhabdus striatus	/nn	35.7	41
Cribrosphaerella ehrenbergii	/nn	39	48
Eiffellithus turriseiffelii	/nn	6.1	48
Eprolithus floralis	/nn	22	48
Haqius circumradiatus	/nn	35.7	35.7
Helenea chiastia	/nn	48	48
Helicolithus compactus	/nn	35.7	48
Helicolithus trabeculatus	/nn	35.7	48
Isocrystallithus compactus	/nn	48	48
Lithraphidites carniolensis	/nn	22	48
Manivitella pennatoidea	/nn	22	48
Prediscosphaera columnata	/nn	22	30.6

Prediscosphaera cretacea	/nn	6.1	48	ID as cf
Radiolithus planus	/nn	22	39	
Rhagodiscus asper	/nn	22	41	
Rhagodiscus reniformis	/nn		35.7	
Rhagodiscus splendens	/nn	22	48	
Seribiscutum primitivum	/nn	22	22	
Stradneria crenulata	/nn	22	48	
Tranolithus orionatus	/nn	30.6	48	
Watznaueria barnesae	/nn	22	48	
Zygodiscus diplogrammus	/nn	22	41	ID as Zeugrhabdotus
Zeugrhabdotus embergeri	/nn	30.6	48	

*Data from fig. 4

Achomosphaera ramulifera	/dn	8.11	39	
Achomosphaera sagena	/dn	39	39	
Chlamydothorella nyei	/dn	6.1	39	
Circulodinium distinctum	/dn	6.1	48	
Endoscrinium campanula	/dn	8.11	39	
Epelidosphaeridia spinosa	/dn	39	48	
Florentinia ferox	/dn	30.6	39	
Hystrichosphaeridium tubiferum	/dn	39	39	
Leberidocysta chlamydata	/dn	39	48	
Litosphaeridium siphoniphorum	/dn	6.1	48	
Microdinium ornatum	/dn	30.6	30.6	
Odontochitina costata	/dn	6.1	48	
Ovoidinium scabrosum	/dn	6.1	39	
Ovoidinium verrucosum	/dn	6.1	48	
Palaeohystrichophora infusorioides	/dn	6.1	39	
Psalignonyaulax deflandrei	/dn	39	39	
Pterodinium cingulatum	/dn	6.1	39	
Spiniferites ramosus ramosus	/dn	6.1	39	
Wrevittia cassidata	/dn	8.11	39	
Xiphophoridium alatum	/dn	8.11	39	

*END

CORB.29 Section Oberhehenfeld, Austria

Lat Long 013° 38' 09" E; 47° 55' 19" N. Description: Top of red marls/marly limestone grading into gray marls; Campanian; several faults so mid Campanian probably missing; Authors M. Wagneich; Lithostratigraphy: "Buntmergelserie"; Tectonic setting: ultrahelvetic/Helvetic units, tectonic slices, Eastern Alps.

DATA:

*TAXA	Morph	Base m	Top m
Dicarinella asymetrica	/fp	0.1	0.6
Globotruncana calcarata	/fp	9.7	12.3
*ID as Globotruncanita	/fp		
Globotruncana elevata	/fp	0.6	12.4
*ID as Globotruncanita	/fp		
Globotruncana ventricosa	/fp	1.72	*
Arkhangeliskiella cymbiformis	/nn	0.6	12.4
Broinsonia parca constricta	/NN	0.94	12.4
Broinsonia parca parca	/NN	0.94	12.4
Ceratolithoides aculeus	/nn	9	12.4
Lithastrinus grillii	/nn	0.1	0.6
Lucianorhabdus cayeuxii	/nn	0.1	12.4
Uniplanarius sissinghii	/nn	9	12.4

*END

CORB.30 Section Hofergraben, Gosau, Austria

Lat Long 013° 32' 40" E; 47° 34' 19" N. Description: Gray marls grade into red and gray marly limestone grading into gray marls; lowest CORB at 20.5m; Early Campanian; Authors M. Wagreich & Krenmayer, Cret. Res. 2005, fig. 5; Lithostratigraphy: Bibereck Fm. and Ressen Fm.; Tectonic setting: Northern Calcareous Alps, Upper Austroalpine, Eastern Alps

DATA:

*TAXA	Morph	Base m	Top m
Dicarinella asymetrica	/fp	0	16.2
Globotruncana elevata	/fp	0	37.5
*ID as Globotruncanita	/fp		
Globotruncana stuartiformis	/fp	0	37.5
Bolivinooides strigilatus	/fb	0	0.5
Stensioeina pommerana	/fb	0	37.5
Arkhangelskiella cymbiformis	/nn	37.5	37.5
Broinsonia parca parca	/NN	37.5	37.5
Calculites obscurus	/nn	0	37.5
Lithastrinus grillii	/nn	0	37.5
Lucianorhabdus cayeuxii	/nn	0	37.5
Marthasterites furcatus	/nn	0	37.5
Micula decussata	/nn	0	37.5

*END

CORB.31 Section Lattengebirge-Dalsenalm, Austria

Lat Long 012° 52' 25" E; 47° 40' 00" N. Description: Gray marls grade into red marly limestone; lowest CORB at 52.7-66.5m; Early Campanian; Authors M. Wagreich & Krenmayer, Cret. Res. 2005, fig. 5; Lithostratigraphy: Grabenbach Fm. and Nierental Fm., Gosau Gp.; Tectonic setting: Northern Calcareous Alps, Upper Austroalpine, Eastern Alps.

DATA:

*TAXA	Morph	Base m	Top m
Dicarinella asymetrica	/fp	0.15	52.7
Dica concavata	/fp	0.15	52.7
Globotruncana elevata	/fp	38	66.5
*ID as Globotruncanita	/fp		
Globotruncana stuartiformis	/fp	44.5	66.5
Sigalia decoratissima	/fp	0.3	45
Calculites obscurus	/nn	0.3	66.5
Lithastrinus grillii	/nn	0.15	66.5
Lucianorhabdus cayeuxii	/nn	0.15	66.5
Marthasterites furcatus	/nn	0.15	52.7

*END

CORB.32 Section Rehkogel Red, Austria

Lat Long 013° 55' 31" E; 47° 56' 04" N. Description: Red marl-white/pink limestone cycles; Santonian; Authors: Neuhuber & M. Wagreich; Lithostratigraphy: "Buntemergelserie"; Tectonic setting: Ultrahelvtic/Helvetic units, tectonic slices, Eastern Alps.

DATA:

*TAXA	Morph	Base m	Top m
Dicarinella asymetrica	/fp	0	11
Marginotruncana coronata	/fp	0	11
Amphizygus brooksii	/nn	2.85	11
Eprolithus floralis	/nn	0	9.7
Lithastrinus grillii	/nn		11
Lithastrinus septenarius	/nn	0	11
Lucianorhabdus cayeuxii	/nn	0	11
Micula decussata	/nn	0	11
Quadrum gartneri	/nn	0	7.9

*END

CORB.33 Section Rehkogel CT, Austria

Lat Long 013° 55' 30" E; 47° 56' 08" N. Description: transition from gray malr-limestone cycles to black shale and clay to white limestone w/ minor marl; Cenomanian/Turonian; Authors: M. Wagneich; Lithostratigraphy: "Buntemergelserie"; Tectonic setting: Ultrahelvtic/Helvtic units, tectonic slices, Eastern Alps.

DATA:

*TAXA	Morph	Base m	Top m	
Carbon peak OAE 2	/gc	2.65	3.2	
Marker bed Bonarelli	/mb	2.65	3.2	
Helv'ana helvetica	/fp	3.96	5.1	
Marginotruncana marianosi	/fp	4.03	5.1	ID as cf
Rota cushmani	/fp	0.4	2.59	
Axopodorhabdus albianus	/nn	0.4	2.44	
Corollithion kennedyi	/nn	0.4	2.44	
Cretarhabdus striatus	/nn	0.4	2.44	
Eprolithus moratus	/nn	3.66	3.66	ID as cf eptapetalus
Eprolithus octopetalus	/nn	2.95	5.1	
Lithastrinus septenarius	/nn	3.66	5.1	ID as cf
Lithraphidites acutum	/nn	0.4	2.44	
Lithraphidites pseudoquadratus	/nn	0.71	2.44	
Helenea chiastia	/nn	0.555	2.15	
Quadrum gartneri	/nn	4.2	5.1	
Quadrum intermedium	/nn	2.95	5.1	

*END

CORB.34 Section Postalm-Retschegg, Austria

Lat Long 013° 23' 11" E; 47° 36' 44" N. Description: Gray marls grade into red marly limestone grading into gray marls; lowest CORB at 20.5m; Early-Late Campanian, CC17b to CC23; Authors M. Wagneich & Krenmayer, Cret. Res. 2005, fig. 5; Lithostratigraphy: Bibereck Fm. and Nierental Fm., Gosau Gp.; Tectonic setting: Northern Calcareous Alps, Upper Austroalpine, Eastern Alps.

DATA:

*TAXA	Morph	Base m	Top m	
Dicarinella asymetrica	/fp	0	3	
Globotruncana elevata	/fp	0	181.5	ID as Globotruncanita
Broinsonia parca constricta	/nn	20	181.5	
Broinsonia parca parca	/NN	20	181.5	
Calculites obscurus	/nn	0	176	
Ceratolithoides aculeus	/nn	63	181.5	
Eiffellithus eximius	/nn	0	136	
Lithastrinus grillii	/nn	0	63	
Lithraphidites praequadratus	/nn	156	181.5	
Lucianorhabdus cayeuxii	/nn	0	181.5	ID as type B
Lucianorhabdus maleformis	/nn	0	83	
Marthasterites furcatus	/nn	0	20	
Quadrum trifidum	/nn	136	181.5	
Reinhardtites anthophorus	/nn	0	146	
Reinhardtites levis	/nn	95	181.5	ID as cf
Tranolithus orionatus	/nn	0	181.5	
Uniplanarius sissinghii	/nn	116	181.5	

*END

UPPER CRETACEOUS SECTION FILES (UPK/PAL)

UPK.1 Austin Group Composite Section

Austin Texas area, Young & Woodruff, 1985, Austin Geological Society Guidebook 7. Section data in Figs. 1, 2; p. 25, 43. Base of section at 0 meters is base of Austin Group; negative positions are in South Bosque Fm.

DATA:

*TAXA	Morph	Base	Top meters
Australiella pattoni	/am	90	99
Baculites anceps	/am	90	99 ID as cf
Baculites aquilaensis	/am	74	80 ID as cf
Bevahites bevahites	/am	74	80
Bevahites costatus	/am	98	99
Defordiceras hazzardi	/am	50	55
Delawarella campaniense	/am	98	99
Delawarella delawarensis	/am	110	119
Delawarella sabinalensis	/am	121	130
Glyptoxoceras ellisoni	/am	74	99
Menabites belli	/am	101	103
Menabites densinodosus	/am	98	99
Menabites walnutensis	/am	118	119
Parapuzosia americana	/am	98	106
Parapuzosia boesei	/am	101	103
Parapuzosia paulsoni	/am	88	89
Paratexanites sellardsi	/am	32	37
Peroniceras haasi	/am	0	10
Peroniceras westphalicum	/am	12	22
Peroniceras moureti	/am	30	32
Phlycticrioceras douvillei	/am	66	73 ID as cf
Prionocycloceras hazzardi	/am	31	42 ID as cf
Prionocycloceras gabrielense	/am	23	42
Protexanites planatus	/am	30	40
Pseudoschloenbachia mexicana	/am	60	73
Reginaites durhami	/am	74	78
Scaphites hippocrepis	/am	90	99 ID as cf
Scaphites leei	/am	103	104 ID as cf
Submortoniceras chicoense	/am	98	99
Submortoniceras tequesquitense	/am	79	99
Submortoniceras uddeni	/am	98	99
Submortoniceras vanuxemi	/am	101	109
Texanites americanus	/am	56	73
Texanites gallicus	/am	65	73
Texanites lonsdalei	/am	81	86
Texanites roemeri	/am	81	86
Texanites shiloensis	/am	74	80
Texanites stangeri	/am	43	49
Texanites texanus	/am	50	57
Texanites twiningi	/am	65	70

*Rudist reports by Adkins 1930, p. 100, Molineux 2005, unpubl., Scott, 2005,

*Post-Congress Field Trip Guide, p.123, 7th Int. Congress on Rudists, Austin

Durania austinensis	/bi	110	120
Sauvagesia acutocostata	/bi	110	120
*Now in Radiolites fide Pons et al. 2010 MS			
Cladoceramus undulatoplicatus	/bi	43	49
Exogyra erraticostata	/bi	104	119
Exogyra laeviuscula	/bi	98	99
Exogyra ponderosa	/bi	81	99
Lopha travisana	/bi	67	118
Phrygia aucella	/bi	24	110
Globotruncana fornicata	/fp	81	81
Pith ovalis	/CA	74	99

Pith sphaerica	/CA	74	99	
*Data from Pessagno, 1969, GSA Mem. 111. pl. 44; w/ modified taxonomy				
Archaeoglobigerina cretacea	/fp	76	119.5	
Dica concavata	/fp	100.5	103	
Glob'oides asperum	/fp	76	119.5	
Globotruncana abberanta	/fp	100.5	102.5	
Globotruncana bulloides	/fp	76	103.5	
Globotruncana fornicata	/fp	98	103.5	
Globotruncana lapparenti	/fp	79	103.5	
Globotruncana marginata	/fp	103	103	
Hedb delrioensis	/fp	0.6	103.2	
Hedb planispira	/fp	99	99	
Heterohelix reussi	/fp	0.6	103.5	
Marginotruncana renzi	/fp	0.6	0.6	
Ventilabrella deflaensis	/fp	103	103	
*Whit archaeocretacea	/fp	0.6	0.6	reworked??
Whit paradubia	/fp	0.6	100.5	
*Nannofossils from Barrier, 1980, J. Paleo. 54:289-308, text-fig. 3;				
*Smith, 1981, USGS PP 1075, figs. 4, 11				
Ahmuellerella octoradiata	/nn	-2.5	119	original top at -1.0
Axopodorhabdus dietzmannii	/nn	105	109	
Braarudosphaera bigelowii	/nn	-2.5	119	
Biscutum constans	/nn	105	119	
Broinsonia enormis	/nn	105	119	
Calculites obscurus	/nn	105	119	?base Campanian?
Chiastozygus litterarius	/nn	107	119	
Chiastozygus plicatus	/nn	-2.5	10.5	
Corollithion exiguum	/nn	-2.5	119	
Corollithion signum	/nn	-2.5	119	
Cretarhabdus conicus	/nn	-2.5	119	
Cretarhabdus striatus	/nn	105	105	
Cretarhabdus surirellus	/nn	105	119	
Cribrosphaerella ehrenbergii	/nn	-2.5	119	
Cylindralithus asymmetricus	/nn	-2.5	119	
Cylindralithus coronatus	/nn	-2.5	119	
Discorhabdus rotatorius	/nn	105	105	
Eiffellithus eximius	/nn	-2.5	119	
Eiffellithus turriseiffelii	/nn	-2.5	119	
Gartnerago obliquum	/nn	105	119	
Gartnerago segmentatum	/nn	-2.5	10.5	
Grantarhabdus coronadventis	/nn	105	119	ID as Cretarhabdus
Kamptnerius magnificus	/nn	1.0	119	
Helicolithus trabeculatus	/nn	-2.5	119	
*Lithastrinus floralis	/nn	-2.5	119	raises LO - taxon issue
Lithastrinus grillii	/nn	-2.5	10.5	
Lithraphidites carniolensis	/nn	-2.5	10.5	
Lucianorhabdus cayeuxii	/nn	1.0	119	
Manivitella pemmatoidea	/nn	-2.5	119	
Markalius circumradiatus	/nn	-2.5	119	
Marthasterites furcatus	/nn	-2.5	119	
Microrhabdulus decoratus	/nn	-2.5	119	
Micula decussata	/nn	105	119	
Parhabdolithus angustus	/nn	-2.5	10.5	
Parhabdolithus embergeri	/nn	-2.5	119	
Parhabdolithus splendens	/nn	107	119	
Prediscosphaera cretacea	/nn	-2.5	119	
Prediscosphaera spinosa	/nn	-2.5	119	
Reinhardtites anthophorus	/nn	105	119	
*Rotelapillus laffittei	/nn	-2.5	119	raises LO - taxon issue
*Sollasites horticus	/nn	119	119	raises LO - taxon issue
Stradneria crenulata	/nn	-2.5	119	
Tranolithus exiguus	/nn	105	119	
Tranolithus orionatus	/nn	105	119	

Vagalapilla matalosa	/nn	-2.5	10.5		
*Ahmuellerella = Vagalapilla octoradiata	/nn			119	119
Vagalapilla stradneri	/nn	105	105		
Watznaueria barnesae	/nn	-2.5	119		
Watznaueria biporta	/nn	105	119		
Zeugrhabdotus acanthus	/nn	-2.5	10.5		
Zeugrhabdotus bicrescenticus	/nn	-2.5	105	ID as Zygodiscus compactus	
Zygodiscus diplogrammus	/nn	-2.5	119		
Zygodiscus elegans	/nn	-2.5	10.5		

*END

UPK.2 Austin Group Composite Section, Dallas

Dallas Texas area, Larson et al., 1991, Dallas Geological Society guidebook 9. Section data in Fig. 7,11;
Unit thicknesses from Pessagno (1969, p.80): Atco 0-64m, lower chalk 64-131m; upper chalk 131-185m.

DATA:

*TAXA	Morph	Base	Top meters	
Paratexanites sellardsi	/am	61	61	
Peroniceras haasi	/am	23	23	
Peroniceras westphalicum	/am	32	33	
Prionocycloceras hazzardi	/am	60	60	
Protexanites planatus	/am	41.5	57	
Texanites stangeri	/am	61	61	*ID as sp. doubtful
Cladoceramus undulatoplicatus	/bi	64	68	
Crem hannoverensis	/BI	10	11.5	
Crem inconstans	/BI	10.5	12.4	
Crem rotundatus	/BI	10.5	11	
Crem schloenbachi	/BI	22	28	
Inoc deformis	/bi	13.5	17.5	
Inoc erectus	/bi	10.5	12.4	
Inoc platinus	/bi	27	61	
Mytiloides fiegei	/bi	10	10.4	
Mytiloides lusatiae	/bi	10	10.4	
Volviceramus involutus	/bi	32.5	45.5	
Dica concavata	/fp	66	66	

Data from Pessagno, 1969, GSA Mem. 111. pl. 47

Archaeoglobigerina cretacea	/fp	155	184	
Dica concavata	/fp	97	183	
Glob'oides abberanta	/fp	184	*	
Glob'oides asperum	/fp	120	155	
Globotruncana bulloides	/fp	155	184	
Globotruncana elevata	/fp	183	183	
Globotruncana fornicata	/fp	155	184	
Globotruncana lapparenti	/fp	120	184	
Globotruncana linneiana	/fp	97	97	
Globotruncana obliqua	/fp	184	*	
Globotruncana stuartiformis	/fp	183	*	
Globotruncana ventricosa	/fp	183	*	
Globotruncanella havanensis	/fp	120	*	
Hedb delrioensis	/fp	97	155	
Hete globulosa	/fp	183	184	
Heterohelix reussi	/fp	155	155	
Heterohelix striata	/fp	184	*	
Marginotruncana pseudolinneiana	/FP	97	97	
Marginotruncana renzi	/fp	184	184	
Pseudoguembelina punctulatus	/fp	184	*	
Rugoglobigerina rugosa	/fp	184	*	
Rugoglobigerina tradinghousensis	/fp	184	*	
Ventilabrella glabrata	/fp	184	*	
Whit paradubia	/fp	97	155	

*END

UPK.3 Olazagutia section, Northern Spain

Eguibil Marl Quarry, Navarra Province, south-southwest of Alsasua, south of highway No. 1; this is a proposed stratotype of Coniacian-Santonian boundary; Lamolda et al., 1999, Rev. Esp. Micropaleont. 31:337-345; Gallemi et al., 1997, Mineralia Slovaca 29:311; Kuchler, 2002, Proc. 6th Int. Cret. Symp., Austrian Acad. Sci., 15:315-331; Melinte & Lamolda, 2002, Proc. 6th Int. Cret. Symp., Austrian Acad. Sci., 15:351-364; Base Santonian = FO *Platyceramus undulatoplicatus* and FO *Sigalia carpatica*, and bracketed by the FO of *Lithastrinus grillii* below and FO of *Dicarinella asymetrica* above the boundary. Upper Santonian-Campanian data from Kuchler & Wagreich, 2002, Proc. 6th Int. Cret. Symp., Austrian Acad. Sci., 15:333-350, Fig. 3; Section measurements recalibrated so that base at -290 m = 0 m, top = 326 m; Coniacian/Santonian boundary at -196 m = 103 m above base of section; in nanno data of Melinte & Lamolda 18.5 m = -196 m = 103 m above base;

DATA:

*TAXA	Morph	Base	Top meters
Top Coniacian	/ma	*	103
*Nannofossils from Melinte & Lamolda, 2002, Fig. 2, p. 354			
<i>Ahmuellerella octoradiata</i>	/nn	86.5	130.5
<i>Amphizygus brooksii</i>	/nn	86.5	130.5
<i>Biscutum constans</i>	/nn	86.5	125.5
<i>Braarudosphaera bigelowii</i>	/nn	86.5	121.5
<i>Braarudosphaera regularis</i>	/nn	86.5	117.5
<i>Broinsonia enormis</i>	/nn	104.5	112.5
<i>Broinsonia signata</i>	/nn	86.5	116.5
<i>Calculites obscurus</i>	/nn	99.5	130.5
<i>Calculites ovalis</i>	/nn	86.5	130.5
<i>Calculites percenis</i>	/nn	94.5	130.5
<i>Chiastozygus amphipons</i>	/nn	86.5	121.5
<i>Chiastozygus litterarius</i>	/nn	86.5	130.5
<i>Corollithion exiguum</i>	/nn	86.5	121.5
<i>Corollithion signum</i>	/nn	88	121.5
<i>Cretarhabdus conicus</i>	/nn	86.5	125.5
<i>Cribrocorona gallica</i>	/nn	86.5	121.5
<i>Cribrophaerella ehrenbergii</i>	/nn	86.5	130.5
<i>Cyclagelosphaera margerelii</i>	/nn	86.5	130.5
<i>Cyclagelosphaera reinhardtii</i>	/nn	86.5	121.5
<i>Discorhabdus ignotus</i>	/nn	86.5	125.5
<i>Eiffellithus eximius</i>	/nn	86.5	130.5
<i>Eiffellithus turriseiffelii</i>	/nn	86.5	130.5
<i>Eprolithus floralis</i>	/nn	86.5	130.5
<i>Eprolithus septenarius</i>	/nn	88	121.5
<i>Gartnerago segmentatum</i>	/nn	86.5	112.5
<i>Helicolithus trabeculatus</i>	/nn	86.5	130.5
<i>Kamptnerius magnificus</i>	/nn	86.5	125.5
<i>Lithastrinus grillii</i>	/nn	88	130.5
<i>Lithraphidites carniolensis</i>	/nn	86.5	130.5
<i>Lucianorhabdus cayeuxii</i>	/nn	91	130.5
<i>Lucianorhabdus inflatus</i>	/nn	100.5	130.5
<i>Lucianorhabdus maleformis</i>	/nn	86.5	130.5
<i>Lucianorhabdus quadrifidus</i>	/nn	86.5	130.5
<i>Manivitella pennatoidea</i>	/nn	86.5	130.5
<i>Markalius circumradiatus</i>	/nn	86.5	130.5
<i>Marthasterites furcatus</i>	/nn	104.5	110.5
<i>Microrhabdulus belgicus</i>	/nn	86.5	116.5
<i>Microrhabdulus decoratus</i>	/nn	86.5	116.5
<i>Micula concava</i>	/nn	86.5	130.5
<i>Micula decussata</i>	/nn	86.5	130.5
<i>Nannoconus elongatus</i>	/nn	86.5	130.5
<i>Nannoconus multicaudus</i>	/nn	86.5	130.5
<i>Nannoconus regularis</i>	/nn	86.5	130.5

Nannoconus truitti	/nn	86.5	130.5
Octolithus multiplus	/nn	86.5	130.5
Placozygus fibuliformis	/nn	86.5	130.5
Prediscosphaera cretacea	/NN	86.5	130.5
Prediscosphaera grandis	/NN	86.5	130.5
Prediscosphaera spinosa	/NN	86.5	130.5
Quadrum gartneri	/nn	86.5	130.5
Reinhardtites anthophorus	/nn	86.5	116.5
Rhagodiscus angustus	/nn	100.5	116.5
Rhagodiscus splendens	/nn	104.5	112.5
Rotelapillus laffittei	/nn	86.5	125.5
Staurolithites crux	/nn	86.5	121.5
Stradneria crenulata	/nn	86.5	130.5
Tegumentum stradneri	/nn	86.5	125.5
Thiersteinia ecclesiastica	/nn	86.5	130.5
Tranolithus orionatus	/nn	86.5	130.5
Watznaueria barnesae	/nn	86.5	130.5
Zeugrhabdotus embergeri	/nn	86.5	121.5
Zeugrhabdotus erectus	/nn	94.5	110.5
*Data from Kuchler & Wagreich, 2002, fig. 3, p. 339			
Dicarinella asymetrica	/fp	104.8	320
Globotruncana mariei	/fp	290	320
Globotruncana stuartiformis	/fp	290	320
Sigalia carpatica	/fp	96	*
*In Lamolda & Paul, 2007, Cret. Res. 28:37-45			
Echinocorys brevis	/ec	326	*
Echinocorys conica	/ec	326	*
Echinocorys humilis	/ec	326	*
Micraster antiquus	/ec	326	*
Megafossils by Kuchler, 2002, Fig. 2, p. 318; Kuchler & Wagreich, 2002, Fig. 3, p. 339			
Cordiceramus muelleri	/bi	253	300
*potential marker for base Upper Santonian			
Cladoceramus undulatoplicatus	/bi	103	141
Platyceramus cycloides	/bi	123	300.5
Inoceramus subquadratus	/bi	74.5	*
*In Lamolda & Paul, 2007, Cret. Res. 28:37-45 as Magadiceramus			
Jouaniceras hispanicum	/am	286	309
Neocrioceras compressum	/am	195	241
Pseudoschloenbachia inconstans	/am	161	161
Scalarites cingulatum	/am	286	300.5
Tetragonites epigonis	/am	104	210
Texanites gallicus	/am	223	247
Texanites quinquenodosus	/am	223	247
*END			

UPK.3B Olazagutia East quarry face

Kuckler & Wagrich, 2002; Gallemi et al, 2007, Cret. Res. 28:5-17, fig. 5 ; Kuchler, 2002, Proc. 6th Int. Cret. Symp., Austrian Acad. Sci., 15:315-331; Eguibil Marl Quarry, Navarra Province, south-southwest of Alsasua, south of highway No. 1; this section complements the proposed stratotype of Coniacian-Santonian boundary on the west face (UPK.3).

DATA:

*TAXA	Morph	Base	Top	meters
*Kuckler & Wagreich 2002, p. 318; positions ala Gallemi et al.				
Cladoceramus undulatoplicatus	/bi	94.4	105.9	
*Gallemi et al. place it in Platyceramus				
Inoceramus subquadratus	/bi	64	*	Genus Magadiceras
Platyceramus cycloides	/bi	99.1	139.2	
*Pseudoschloenbachia inconstans	/am	135	*	genus uncertain??
Placenticeras polyopsis	/am	148	156	
Offaster nuciformis	/ec	44	121.6	

*Gallemi et al., 2007, Fig. 5, p. 8, Table 1, p. 9

Cordiceramus cordiinitialis	/bi	129	151.6	subspecies riedeli
Cordiceramus koeplitzi	/bi	160	*	
Inoc deformis	/bi	1	*	*In Genus Cremnoceras
Cardiaster integer	/ec	83	156	
Echinocorys scutata	/ec	97.5	156	ex group
Micraster brevis	/ec	30	156	
Micraster matheroni	/ec	147	156	
Pseudoschloenbachia inconstans	/am	139.2	*	

*END

*UPK.4 ZUMAYA SPAIN, north coast

MacLeod, 1994, J. Paleo. 68:1048-1066, fig. 4; Ward and Kennedy 1993, J. Paleo. Mem. 34, fig. 5;
MacLeod & Orr, 1993, Paleobiology, 19:235-250.

DATA:

*Taxa	Morph	Base	Top m	
	*Ward & Kennedy, 1993			
Anagaudryceras politissimum	/AM	58	217	
Anapachydiscus fresvillensis	/AM	77	162	
Anapachydiscus terminus	/AM	210	217	
Baculites anceps	/AM	61	74	
Baculites vertebralis	/AM	52	158	*ID as CF
Brahmites brahma	/AM	61	92	
Desmophyllites larteti	/AM	108	212	
Diplomoceras cylindraceum	/AM	49	187	
Gaudryceras kayei	/AM	217	217	
Glyptoxoceras rugatum	/AM	70	188	
Hauericeras rembda	/AM	65	96	
Hoploscaphtes constrictus	/AM	198	200	
Pachydiscus armenicus	/AM	96	225	
Pachydiscus epiplectus	/AM	23	69	
Pachydiscus gollevillensis	/AM	100	162	
Pachydiscus jacquoti	/AM	87	217	
Pachydiscus neubergicus	/AM	26	158	
Pachydiscus dissitus	/AM	190	208	*ID as CF
Phylloceras surya	/AM	63	150	
Phylloceras ramosum	/AM	45	225	
Phyllopachyceras forbesianum	/AM	100	209	
Phylloptychoceras siphon	/AM	95	130	
Pseudokossmaticeras tencense	/AM	0	0	
Pseudokossmaticeras dureri	/AM	110	158	
Pseudophyllites indra	/AM	70	130	
Saghalinites wrighti	/AM	58	204	
Arkhangelskiella cymbiformis	/NN	221.25	225.0	
Braarudosphaera bigelowii	/NN	225.1	228.4	
Braarudosphaera discula	/NN	225.20	228.2	
Chiastozygus amphipons	/NN	221.25	222.95	
Cretarhabdus conicus	/NN	221.25	224.9	
Cribrosphaerella ehrenbergii	/NN	221.25	225.0	
Cyclagelosphaera reinhardtii	/NN	224.9	228.4	
Eiffellithus turriseiffelii	/NN	223.28	225.0	
Lithraphidites quadratus	/NN	221.25	224.9	
Markalius astroporus	/NN	225.1	228.3	
Microrhabdulus stradneri	/NN	221.25	224.9	
Micula decussata	/NN	221.25	225.4	
Micula murus	/NN	222.95	223.28	
Prediscosphaera cretacea	/NN	221.25	225.4	
Stradneria crenulata	/NN	223.28	225.0	
Thoracosphaera deflandrei	/NN	224.9	228.4	
Thoracosphaera saxea	/NN	224.9	228.4	

Watznaueria barnesae	/NN	221.25	225.1	
*Burnett et al., 1992, Newsletters on Strat. 26:				
Ahmuellerella octoradiata	/NN	153	153	
Arkhangelskiella cymbiformis	/NN	7	219	
Braarudosphaera bigelowii	/NN	7	125	
Ceratolithoides kamptneri	/NN	178	192	
Chiastozygus amphipons	/NN	32.5	212.5	
Corollithion exiguum	/NN	160	160	
Cretarhabdus conicus	/NN	32.5	123	
Cribrocorona gallica	/NN	7	212.5	
Cribrospaerella ehrenbergii	/NN	7	219	
Cylindralithus serratus	/NN	70	113.5	
Eiffellithus parallelus	/NN	15	185	
Eiffellithus turriseiffelii	/NN	7	202	
Lithraphidites carniolensis	/NN	7	219	
Lithraphidites quadratus	/NN	127.5	192	
Lucianorhabdus cayeuxii	/NN	21.5	21.5	
Microrhabdulus decoratus	/NN	7	219	
Micula concava	/NN	103	123	
Micula murus	/NN	202	212.5	
Prediscosphaera cretacea	/NN	7	219	
Prediscosphaera spinosa	/NN	7	219	
Rhagodiscus reniformis	/NN	62	160	
Semihololithus bicornis	/NN	57	212.5	
Semihololithus priscus	/NN	62	212.5	
Thoracosphaera saxea	/NN	50	170	
Watznaueria biporta	/NN	7	123	
Watznaueria barnesae	/NN	7	219	
Zeugrhabdotus acanthus	/NN	94.5	219	
Biscutum magnum	/nn	32.5	32.5	
Calculites obscurus	/nn	7	212.5	
Calculites ovalis	/nn	15	212.5	
Ceratolithoides aculeus	/nn	7	192	
Chiastozygus litterarius	/nn	7	202	
Cyclagelosphaera margerelii	/nn	32.5	219	
Eiffellithus eximius	/nn	113.5	113.5	
Gartnerago obliquum	/nn	7	212.5	
Grantarhabdus coronadventis	/nn	7	178	*ID as Cretarhabdus
Lithastrinus grillii	/nn	219	219	
Lithraphidites praequadratus	/nn	83	219	
Lucianorhabdus maleformis	/nn	7	106.5	
Manivitella pennatoidea	/nn	7	192	
Microrhabdulus belgicus	/nn	117	117	
Micula staurophora	/nn	7	219	
Prediscosphaera grandis	/nn	113.5	113.5	
Prediscosphaera stoveri	/nn	106.5	185	
Quadrum gartneri	/nn	21.5	140	
Reinhardtites levis	/nn	42.5	140	
Tranolithus orionatus	/nn	15	76	
*MacLeod, 1994, fig. 4				
Inoceramus balticus	/bi	40	83	*ID as aff.
Inoceramus goldfussianus	/bi	0	65	
Inoceramus morgani	/bi	70	103	
Inoceramus nahorianensis	/bi	42	55	
Inoceramus pteroides	/bi	20	88	
Platyceramus cycloides	/bi	40	90	*ID as aff
Tenuipteria argentea	/bi	150	213	
*MacLeod & Orr, 1993, fig. 2				
Abathomphalus mayaroensis	/fp	105	*	
Gansserina gansseri	/fp	*	120	
Planoglobulina multicamerata	/fp	*	55	
Racemiguembelina fructicosa	/fp	85	*	

*Pujalte et al., 1995, Earth & Planetary Sci. Letters 136:17-30, fig. 5;

*sequence boundary bases

Marker bed DS-1	/mb	18	*
Marker bed DS-2.1	/mb	150	*
Marker bed DS-2.2	/mb	213	*
Marker bed DS-3	/mb	228	*

*END

UPK.5 El Kef K/T boundary

*Brinkhuis & Zachariasse, 1988, Mar. Microp. 13:153-191, dino data Fig. 5; Keller, 1988, Palaeo-3, 66:153-171, Table 1, benthic forams selected; K/T boundary at 4.45 m above base of section at base of boundary clay; Ammonites by Goolaerts et al. (2004, Cret. Res. 25:313-328) about 300 m NNE of K/P boundary section; all specimens were float but not moved much (p. 314).

DATA:

*TAXA	Morph	Base	Top meters	
				*Ammonites from Goolaerts et al., Fig. 2
Brahmaites brahma	/am	-1.5	0	
Diplomoceras cylindraceum	/am	-1.0	1.0	
Hauericeras renbda	/am	-2.0	-2.0	ID as sp. cf.
Baculites paradoxus	/am	-2.5	2.5	
Indoscaphites cunliffei	/am	-2.5	1.0	
Indoscaphites pavana	/am	-2.5	1.0	
Alisocysta circumtabulata	/dn	4.67	11.54	
Amorphosphaeridium multispinosum	/dn	9.5	11.54	
Andalusiella polymorpha	/dn	3.6	11.54	
Apteodinium australiense	/dn	3.6	11.54	
Apteodinium fallax	/dn	4.45	11.54	
Areoligera senonensis	/dn	4.25	11.54	
Cassidium fragile	/dn	11.54	11.54	
Cerodinium diebelii	/dn	3.6	11.54	*in Ceratiopsis
Cerodinium granulostriatum	/dn	3.6	11.54	*in Ceratiopsis
Cerodinium pannucea	/dn	4.05	11.54	*in Ceratiopsis
Cerodinium speciosa	/dn	3.6	11.54	*in Ceratiopsis
Cerodinium striata	/dn	3.6	11.54	*in Ceratiopsis
Cordosphaeridium commune	/dn	3.6	4.25	
Cordosphaeridium exilimurum	/dn	4.67	11.54	
Cordosphaeridium fibrospinosum	/dn	4.45	11.54	
Cordosphaeridium inodes	/dn	4.45	11.54	
Cordosphaeridium varians	/dn	3.6	5.27	
Cribooperidinium pyrum	/dn	3.6	4.62	
Cyclapophysis monmouthensis	/dn	3.6	11.54	
Cyclonephelium castelcasiense	/dn	3.6	11.54	
Danea californica	/dn	4.62	11.54	
Dinogymnium acuminatum	/dn	3.6	5.37	
Diphyes colligerum	/dn	4.05	11.54	
Fibrocysta essentialis	/dn	9.5	11.54	
Fibrocysta licia	/dn	3.6	4.87	
Fibrocysta ovalis	/dn	4.87	11.54	
Florentinia mantellii	/dn	3.6	9.5	
Glaphrocysta semitecta	/dn	3.6	11.54	
Hystrichokolpoma bulbosum	/dn	5.17	11.54	
Hystrichokolpoma granulatum	/dn	4.5	11.54	
Hystrichokolpoma unispinum	/dn	3.6	11.54	
Impagidinium cristatum	/dn	3.6	11.54	
Impagidinium ovum	/dn	4.05	11.54	
Impagidinium pentahedrias	/dn	3.6	11.54	
Kenleyia leptocerata	/dn	5.77	11.54	
Kenleyia lophophora	/dn	5.12	11.54	
Kenleyia nuda	/dn	5.37	11.54	
Kenleyia pachycerata	/dn	4.67	11.54	

Lejeunecysta cinctoria	/dn	7.52	11.54	
Lejeunecysta communis	/dn	9.5	11.54	
Lejeunecysta globosa	/dn	3.6	11.54	
Lejeunecysta hyalina	/dn	4.05	11.54	
Manumiella druggii	/dn	3.6	11.54	
Membranilarnacia tenella	/dn	5.67	11.54	
Microdinium ornatum	/dn	6.47	11.54	
Palaeocystodinium australinum	/dn	4.45	11.54	
Palaeocystodinium golzowense	/dn	3.6	11.54	
Palaeocystodinium scabratum	/dn	3.6	4.67	
Palaeotetradinium silicorum	/dn	7.52	11.54	
Phelodinium magnificum	/dn	3.6	4.87	
Renidinium gracile	/dn	3.6	11.54	
Riculacysta perforata	/dn	3.6	11.54	
Senegalinium biclavatum	/dn	3.6	11.54	
Senegalinium psilatatum	/dn	3.6	11.54	
Spinidinium densispinatum	/dn	11.54	11.54	
Tanyosphaeridium isocalamus	/dn	3.6	11.54	
Tanyosphaeridium variecalamus	/dn	3.6	11.54	
		*Data from Fig. 3		
*Globotruncana contusa	/fp	3.6	4.5	*in Rosita
*Rugoglobigerina scotti	/fp	3.6	4.57	
*Chiloguembelina taurica	/fp	5.57	11.0	
*Eoglobigerina edita	/fp	5.57	11.0	
*Eoglobigerina fringa	/fp	4.62	11.0	*in Parvularugoglobigerina
Globigerina eugubina	/fp	4.63	10.5	in Parvulo.
*Guembelitra cretacea	/fp	3.6	11.54	
		*range in Keller Table 1 = 0 to 8		
Morozovella pseudobulloides	/fp	5.57	11.0	*in Neogloboquadrina
*Subbotina trilocolinoides	/fp	5.57	11.54	*basal specimens are primitive
		*Data from Keller, 1988, Table 1		
Archaeoglobigerina blowi	/fp	0	2	
Globigerinelloides multispinata	/fp	0	4.45	
Globigerinelloides subcarinatus	/fp	0	4.57	
Globigerinelloides volutus	/fp	0.5	4.5	
Hedbergella holmdelensis	/fp	0	4.25	
Hedb planispira	/fp	0	4.5	
Rugoglobigerina hexacamerata	/fp	0	4.57	
Rugoglobigerina rugosa	/fp	0	4.57	
Rugoglobigerina scotti	/fp	0	4.5	
Ventilabrella eggeri	/fp	0	4.25	
Chiloguembelina taurica	/fp	8	14.5	
Eoglobigerina edita	/fp	4.72	12.5	
Eoglobigerina eobulloides	/fp	5.52		
Eoglobigerina fringa	/fp	4.57	12.5	
Gansserina gansseri	/fp	0.5	3.5	
Globigerina eugubina	/fp	5.07	9.5	
Globoconusa daubjergensis	/fp	7.12	14	
Globotruncana aegyptiaca	/fp	0	4.45	
Globotruncana arca	/fp	0	4.5	
Globotruncana contusa	/fp	0.5	4.5	
Globotruncana falsostuarti	/fp	0.5	4.5	
Globotruncana stuarti	/fp	0	4.5	
Globotruncana stuartiformis	/fp	0	4.25	
Globotruncana trinidadensis	/fp	2.5	4.45	
Globotruncanella havanensis	/fp	0	4.45	
Gublerina cuvillieri	/fp	0	4.45	
Heterohelix glabrans	/fp	0	5.27	
Heterohelix globulosa	/fp	0	4.5	
Heterohelix striata	/fp	0	7.12	
Planoglobulina brazoensis	/fp	0	4.5	
Planoglobulina carseyae	/fp	0	5.47	
Pseudoguembelina costata	/fp	0	5.61	

Pseudoguembelina costulata	/fp	0	7.12
Pseudoguembelina palpebra	/fp	0	5.82
Pseudotextularia deformis	/fp	0	4.57
Pseudotextularia elegans	/fp	0	4.25
Subbotina triloculinoides	/fp	9.5	14.5
Allomorphina trochoides	/fb	1.5	4.45
Ammodiscus cretaceus	/fb	5.02	9
Ammodiscus glabratus	/fb	0	10
Anomalina praeacuta	/fb	0	11.54
Astacolus richteri	/fb	1	4.25
Bolivinoidea draco draco	/fb	0	11.54
Bulimina midwayensis	/fb	0	4.5
Cibicidoides alleni	/fb	4.72	4.82
Dentalina basiplanata	/fb	0.5	6.42
Dentalina gracilis	/fb	0	11.54
Dorothia bulletta	/fb	0.5	1.5
Dorothia oxycona	/fb	0	9
Fissurina orbignyana	/fb	0.5	4.45
Gaudryina pyramidata	/fb	0	4.5
Glomospira charoides	/fb	4.25	6.07
Gyroidina girardana	/fb	0	4.5
Gyroidina orbicularis	/fb	4.25	10
Lagena hispida	/fb	0	6.27
Lagena sulcata	/fb	1.5	11.54
Lenticulina muensteri	/fb	0	11.54
Oridorsalis umbonatus	/fb	0	3.85
Oolina apiculata	/fb	0	11.54
Osangularia cordieriana	/fb	0	11.54
Praebulimina reussi	/fb	0	11.54
Pullenia quinqueloba	/fb	0.5	4.5
Saracenaria navicula	/fb	0	4.5
Saracenaria triangularis	/fb	0	4.45
Tappanina selmensis	/fb	5.47	11.54
END			

UPK.6 HENDAYE

*Ward and Kennedy 1993, Figure 8.

DATA:

*Taxa	Morph	Base	Top m
Anagaudryceras politissimum	/AM	128	130
Anapachydiscus terminus	/AM	98	130
Anapachydiscus fresvillensis	/AM	18	94
Brahmaites brahma	/AM	55	130
Desmophyllites larteti	/AM	92	95
Diplomoceras cylindraceum	/AM	110	124
Eubaculites carinatus	/AM	94	95
Hoploscaphtes constrictus	/AM	86	86
Pachydiscus armenicus	/AM	97	130
Pachydiscus dissitus	/AM	95	120
Pachydiscus gollevillensis	/AM	100	125
Pachydiscus jacquoti	/AM	98	125
Pachydiscus neubergicus	/AM	8	25
Phylloceras surya	/AM	97	120
Phyllopachyceras forbesianum	/AM	95	120
Pseudophyllites indra	/AM	95	95
*END			

UPK.7 BIDART (Coupe I & III)

*Ward and Kennedy 1993, J. Paleo. Mem. 34, fig. 13; MacLeod, 1994, J. Paleo., 68:1048-1066, fig. 2.

DATA:

*Taxa	Morph	Base	Top m	
Anapachydiscus fresvillensis	/AM	95	153	
Anapachydiscus terminus	/AM	161	210	
Baculites vertebralis	/AM	65	69	*ID as CF
Desmophyllites larteti	/AM	114	122	
Diplomoceras cylindraceum	/AM	69	210	
Eubaculites carinatus	/AM	122	122	
Glyptoxoceras rugatum	/AM	123	123	
Hauericeras rembda	/AM	69	69	
Hoploscaphites constrictus	/AM	114	120	
Pachydiscus jacquoti	/AM	110	210	
Pachydiscus armenicus	/AM	147	210	
Pachydiscus epiplectus	/AM	32	32	
Pachydiscus neubergicus	/AM	35	113	
Pachydiscus gollevillensis	/AM	144	144	
Phylloceras surya	/AM	117	157	
Phylloceras ramosum	/AM	154	198	
Phyllopachyceras forbesianum	/AM	33	198	
Pseudokossmaticeras dureri	/AM	210	210	
Pseudophyllites indra	/AM	200	210	
*Forams by Haslett, 1994, Cret. Res. 15, figs. 1, 2				
Archaeoglobigerina blowi	/fp	177	208	
Eoglobigerina fringa	/fp	210.3	210.5	*Parvularugoglobigerina
Gansserina gansseri	/fp	177	207	
Globigerina eugubina	/fp	210.3	210.5	*Parvularugoglobigerina
Globigerina triloculinoides	/fp	208	229	
Globigerinelloides subcarinatus	/fp	177	208	
Globoconusa daubjergensis	/fp	218	229	
Globotruncana aegyptiaca	/FP	177	209.8	
Globotruncana arca	/FP	177	209.8	
Globotruncanella citae	/fp	184	208	
Globotruncana contusa	/fp	177	209.8	*Contusotruncana
Globotruncana fornicata	/fp	177	193	*Contusotruncana
Globotruncana falsostuarti	/fp	184	209.8	
Globotruncana insignis	/fp	184	187.5	
Globotruncanella havanensis	/fp	177	209.8	
Globotruncana patelliformis	/fp	204.3	207	*Contusotruncana
Globotruncana rosetta	/fp	184	209.8	
Globotruncana stuarti	/fp	184	209.8	*Globotruncanita
Globotruncana stuartiformis	/fp	177	209.8	*Globotruncanita
Globotruncana subcircumnodifer	/fp	193.3	204.3	*Rugotruncana
Globotruncanella petaloidea	/fp	193.3	209.8	
Guembelitra cretacea	/fp	210.3	210.5	
Heterohelix americana	/fp	177	209.8	
Heterohelix globulosa	/fp	177	209.8	
Heterohelix striata	/fp	177	209.8	
Morozovella angulata	/fp	226.5	229	
Morozovella pseudobulloides	/fp	212.3	229	
Morozovella trinidadensis	/fp	218	229	
Planoglobulina acervulinoides	/fp	177	209.8	
Planorotalites compressus	/fp	212.3	229	
Pseudoguembelina costulata	/FP	184	209.8	
Pseudoguembelina palpebra	/FP	184	209.8	
Pseudotextularia deformis	/fp	177	209.8	
Pseudotextularia elegans	/FP	177	209.8	
Rugoglobigerina hexacamerata	/fp	184	210	
Rugoglobigerina rugosa	/fp	177	209.8	
Subbotina inconstans	/fp	218	229	*as Morozovella
*Burnett, Kennedy & Ward, 1992, Newsletters on Stratigraphy, 26:145-155, fig. 4				
Ahmueллерella octoradiata	/nn	20	45	
Amphizygus brooksii	/nn	32.5	210	

Arkhangelskiella cymbiformis	/nn	20	210	
Biscutum ellipticum	/nn	20	208	
Braarudosphaera bigelowii	/nn	91	115	
Broinsonia parca parca	/nn	26.5	38.5	
Broinsonia signata	/nn	79	79	
Calculites obscurus	/nn	20	208	
Ceratolithoides aculeus	/nn	20	210	
Ceratolithoides kamptneri	/nn	120.5	210	
Chiastozygus amphipons	/nn	56	210	
Chiastozygus bifarius	/nn	20	210	
Chiastozygus litterarius	/nn	20	204	
Chiastozygus tenuis	/nn	20	206	
Corollithion exiguum	/nn	56	210	
Cretarhabdus conicus	/nn	20	206	
Cretarhabdus striatus	/nn	32.5	210	
Cribracorona gallica	/nn	20	210	
Cribrosphaerella ehrenbergii	/nn	20	210	
Cyclagelosphaera margerelii	/nn	20	210	
Cylindralithus biarcus	/nn	20	200	
Cylindralithus nudus	/nn	96	96	
Cylindralithus serratus	/nn	32.5	150	
Discorhabdus ignotus	/nn	20	210	
Eiffellithus eximius	/nn	20	115	
Eiffellithus parallelus	/nn	20	210	
Eiffellithus turriseiffelii	/nn	20	210	
Gartnerago obliquum	/nn	197	197	
Gephyrorhabdus coronadventis	/nn	20	206	
Helicolithus anceps	/nn	26.5	208	
Helicolithus trabeculatus	/nn	20	210	
Lithraphidites carniolensis	/nn	20	200	
Lithraphidites praequadratus	/nn	26.5	210	
Lithraphidites quadratus	/nn	110	210	
Manivitella pemmatoidea	/nn	20	206	
Microrhabdulus decoratus	/nn	20	210	
Micula concava	/nn	20	210	
Micula decussata	/nn	20	210	
Micula murus	/nn	120.5	210	
Micula prinsii	/nn	200	206	
Microrhabdulus decoratus	/nn	20	210	
Microrhabdulus helicoideus	/nn	62	197	
Nephrolithus frequens	/nn	206	206	
Octolithus multiplus	/nn	26.5	210	
Petrarhabdus copulatus	/nn	20	20	
Placozygus fibuliformis	/nn	20	210	
Prediscosphaera grandis	/nn	26.5	208	
Prediscosphaera cretacea	/nn	20	210	
Prediscosphaera spinosa	/nn	26.5	210	
Prediscosphaera stoveri	/nn	20	208	
Quadrum gartneri	/nn	20	20	
Quadrum trifidum	/nn	20	20	*LO @ 204 too hi
Reinhardtites anthophorus	/nn	20	20	
Reinhardtites levis	/nn	20	56	*LO @ 200 too hi
Repagulum parvidentatum	/nn	115	120.5	
Rhagodiscus angustus	/nn	20	210	
Rhagodiscus reniformis	/nn	20	210	
Rhagodiscus splendens	/nn	26.5	208	
Rotelapillus crenulatus	/nn	91	206	
Semihololithus bicornis	/nn	26.5	210	
Semihololithus priscus	/nn	32.5	208	
Staurolithites crux	/nn	26.5	150	
Thoracosphaera saxea	/nn	62	62	
Tranolithus minimus	/nn	20	210	
Tranolithus orionatus	/nn	20	45	

Watznaueria barnesae	/nn	20	210
Watznaueria biporta	/nn	26.5	200
Watznaueria fossacincta	/nn	26.5	210
Watznaueria manivittiae	/nn	20	210
Zeugrhabdotus acanthus	/nn	20	137.5
Zeugrhabdotus embergeri	/nn	79	197
Zeugrhabdotus erectus	/nn	20	210
	*MacLeod, 1994, J. Paleo. 68, fig. 2		
Endocostea baltica	/bi	50	69 *ID as aff.
Endocostea pteroides	/bi	35	75
Inoceramus goldfussianus	/bi	47	69
Inoceramus nahorianensis	/bi	47	47
Platyceramus cycloides	/bi	47	72
Tenuipteria argentea	/bi	95	200
*END			

UPK.8 SOPELANA 1 & 2

*Ward and Kennedy 1993, Figure 6; *Fault just below 70 m.

DATA:

*Taxa	Morph	Base	Top m
Diplomoceras cylindraceum	/AM	27	70
Hauericeras rembda	/AM	21	21
Pachydiscus epiplectus	/AM	21	28
Pachydiscus gollevillensis	/AM	77	77
Pachydiscus jacquoti	/AM	80	80
Pachydiscus neubergicus	/AM	0	40
Phyllopachyceras forbesianum	/AM	110	110
Phylloptychoceras siphon	/AM	70	70
*END			

UPK9 Gredero Section, SE Spain

*Romein, 1977, Koninkl. Nederlandse Akad. Wetensch. Proc. series B, 80:256-279. Von Hillebrandt, 1975, Cuad. Geol. 5:135-153. Continuous exposure of Upper Maastrichtian to Eocene. Cretaceous/Paleogene boundary between spl 501b & 503 @ 9.195m.

DATA:

*Taxa	Morph	Base	Top m
	*Romein, 1977, Fig. 1		
Actinozygus splendens	/NN	0.7	12.2
Ahmueллерella octoradiata	/NN	0.7	17.0
Biantholithus sparsus	/NN	9.2	16.0
Bidiscus rotatorius	/NN	0.7	16.5
Braarudosphaera bigelowii	/NN	9.19	17.0
Ceratolithoides kamptneri	/NN	0.7	9.0
Chiastozygus amphipons	/NN	0.7	14.2
Corollithion exiguum	/NN	9.21	9.27
Corollithion madagaskarensis	/NN	0.7	13.2
Crepidolithus fossus	/NN	10.5	17.0
Crepidolithus neocrassus	/NN	10.0	17.0
Crepidolithus thiersteinii	/NN	0.7	13.6
Cretarhabdus conicus	/NN	0.7	16.5
Cretarhabdus crenulatus	/NN	0.7	16.5
Cribracorona gallica	/NN	0.7	17.0
Cruciplacolithus tenuis	/NN	17.0	17.0
Cyclagelosphaera reinhardtii	/NN	9.2	17.0
Cylindralithus crassus	/NN	0.7	13.6 *ID as CF
Cylindralithus serratus	/NN	0.7	9.24
Cylindralithus stradneri	/NN	0.7	11.6

Eiffellithus parallelus	/NN	9.18	9.43
Eiffellithus trabeculatus	/NN	0.7	9.18
Eiffellithus turriseiffelii	/NN	0.7	17.0
Goniolithus fluckigeri	/NN	9.7	14.6
Lithraphidites carniolensis	/NN	0.7	9.43
Lithraphidites quadratus	/NN	0.7	17.0
Lucianorhabdus cayeuxii	/NN	9.2	9.21
Markalius astroporus	/NN	9.2	17.0
Markalius perforatus	/NN	0.7	10.7
Micrantholithus fornicatus	/NN	13.2	14.6
Microrhabdulus decoratus	/NN	0.7	14.6
Microrhabdulus stradneri	/NN	0.7	14.6
Micula murus	/NN	0.7	13.2
Parhabdolithus angustus	/NN	0.7	12.6
Parhabdolithus embergeri	/NN	0.7	9.43
Podorhabdus decorus	/NN	0.7	11.6
Pontosphaera multicarinata	/NN	0.7	17.0
Prediscosphaera bukryi	/NN	0.7	14.6
Prediscosphaera cretacea	/NN	0.7	16.5
Prediscosphaera spinosa	/NN	0.7	12.6
Rhagodiscus reniformis	/NN	0.7	9.21
Semihololithus bicornis	/NN	0.7	11.6
Semihololithus priscus	/NN	0.7	11.6
Stephanolithion laffittei	/NN	0.7	9.34
Tetralithus aculeus	/NN	0.7	13.2
Tetralithus multiplus	/NN	9.5	17.0
Tetralithus nitidus	/NN	0.7	9.22
Tetralithus pyramidus	/NN	0.7	9.7
Toweius petalosus	/NN	12.2	14.6
Vekshinella crux	/NN	0.7	15.2
Watznaueria barnesae	/NN	0.7	17.0
Watznaueria biporta	/NN	0.7	3.0
Zygodiscus acanthus	/NN	0.7	9.335
Zygodiscus sigmoides	/NN	9.7	17.0
Zygodiscus spiralis	/NN	0.7	17.0
Zygodiscus tarboulensis	/NN	0.7	12.2
Thoracosphaera operculata	/CA	0.7	17.0

*END

***UPK.10 Tiefenbach, Brandenburg, Austria**

Section measured by D. Sanders; collected by Sanders & Scott Oct 2002. Fischer, 1964, Mitt. Bayer. Staatssamml. Palaont. hist. Geol. 4:127-144; Herm et al., 1979, Mitt. Bayer. Staatssamml. Palaont. hist. Geol. 19:27-92; Immel et al., 1982, Zitteliana, 8:3-32; Troger & Summesberger, 1994, Ann. Naturhist. Mus. Wien, 96A:161-197; Mergeliger Kalksandstein 0-33 m, Grauer Mergel 33-80 m in part. Interval from 0 to at least 36 m is Lower Santonian by T & S, p.179, & 185. SB at 0 m base of B4, 33 m base of B5, 55.5 m base of B6 by D. Sanders.

DATA:

*TAXA	Morph	Base	Top meters
	*sequences defined by D. Sanders, unpubl.		
Marker bed Sant SB 1	/mb	0	*
*contact with Hauptdolomite, base of seq. B4			
Marker bed Sant SB 2	/mb	33	*
*contact with hardground, base of seq. B5			
Marker bed Sant SB 3	/mb	55.5	*
*base of debris flow bed, base of seq. B6			
*in Immel et al., p. 7 by E.G. Kauffman in Herm et al. 1979, p. 39;			
*in Troger & Summesberger, p. 175;			
Cladoceramus undulatoplicatus	/bi	36	44
*photo of in situ specimen Oct 2002			
Platyceramus cycloides	/bi	8	36

*photo of in situ specimen Oct 2002

Sphenoceras cardissoides	/bi	36	36	
Echinocorys ovatus	/ec	36	36	
Micraster coranguinum	/ec	36	36	
				*Immel et al, p. 29
Diplomoceras indicum	/am	20	25	
Diplomoceras subcompressum	/am	20	25	
Hauericeras gardeni	/am	20	25	
Paratexanites serratomarginatus	/am	20	20	
Texanites quinquenodosus	/am	20	36	
*Partial data from Fischer, 1964; lower assemblage from red marl, upper from grey marl				
*Ammodiscus gaultinus	/fb	11	13	raises top greatly
*Dentalina communis	/fb	11	13	same
*Dorothia pupa	/FB	11	13	
*Gaudryina laevigata	/FB	11	13	*ID as cf
Gaudryina pyramidata	/FB	11	30	
Gaudryina rugosa	/fb	11	13	
Glomospira charoides	/fb	11	13	
*Gyro nitidus	/fb	11	13	*ID as cf
Pleurostomella obtusa	/fb	11	13	
*Planularia liebusi	/fb	11	30	
Pleurostomella subnodosa	/fb	11	13	
*Quadriformina allomorphinoides	/fb	11	13	
Saracenaria triangularis	/fb	11	30	
*Spiroplectamina praelonga	/fb	11	13	
*Dica concavata	/fp	11	30	
*Globotruncana bulloides	/fp	11	13	base in upper Sant
*Globotruncana fornicata	/fp	11	13	
*Globotruncana lapparenti	/fp	11	30	base in mid Con
*Globotruncana rosetta	/fp	11	13	base in Camp
*Globotruncanella havanensis	/fp	11	13	base in Camp
*Heterohelix globulosa	/fp	11	30	
*Heterohelix striata	/fp	11	13	base in Camp
*Marginotruncana coronata	/FP	11	30	
*Marginotruncana marginata	/FP	11	13	
*Pseudotextularia elegans	/fp	11	30	=P. nutallii
*Foram report by E. Malata 11/02/03; 21/02/03; 25/02/03 w/ Fischer's data				
Archaeoglobigerina cretacea	/fp	42	45	
Dicarinella asymetrica	/fp	42	76	
Dica concavata	/fp	11	45	
Glob'oides bentonensis	/fp	42	65	*ID as cf
Glob'oides ultramicrus	/fp	42	65	
Globotruncana arca	/fp	76	77	
Globotruncana arca	/fp	76	77	
Globotruncana lapparenti	/fp	11	65	
Globotruncana linneiana	/fp	42	45	
Globotruncana spinea	/fp	44	45	
Hedb delrioensis	/fp	41	42	
Hedbergella flandrini	/fp	45	65	*ID as cf
Hedb planispira	/fp	42	65	
Heterohelix globulosa	/fp	11	76	
Heterohelix reussi	/fp	42	65	
Marginotruncana angusticarinata	/fp	37	45	
Marginotruncana coronata	/fp	11	76	
Marginotruncana marginata	/fp	11	45	
Marginotruncana pseudolinneiana	/fp	34.5	76	
Marginotruncana renzi	/fp	36	37	
Marginotruncana sinuosa	/fp	34.5	76	
Pseudotextularia nuttalli	/fp	11	45	
Globotruncana fornicata	/fp	11	76	*In Rosita
Schackoina multispinata	/fp	45	46	*ID as cf
Sigalia deflaensis	/fp	44	46	
Sigalia carpatica	/fp	42	45	

Whit baltica	/fp	41	42	
Whit brittonensis	/fp	44	45	*ID as cf
Dorothia pupa	/fb	11	44	
Gaudryina cretacea	/fb	34.5	76	
Gaudryina laevigata	/fb	11	76	
Gerochammina conversa	/fb	44	45	
Marssonella oxycona	/fb	34.5	45	
Marssonella trochus	/fb	33.5	34.5	
Pseudoclavulina gaultina	/fb	44	46	
Pseudoclavulina subparisiensis	/fb	44	45	
Spiroplectammina navarroana	/fb	44	45	
Spiroplectinella praelonga	/fb	11	44	
Tritaxia pyramidata	/fb	34.5	76	
Tritaxia tricarinata	/fb	41	42	
Gyroidinoides nitidus	/fb	11	76	
Lenticulina muensteri	/fb	34.5	45	
*Lenticulina sp.	/fb	45	46	
Marginulinopsis curvisepta	/fb	45	46	
Neoeponides hillebrandti	/fb	44	46	
Neoflabellina gibbera	/fb	42	45	*ID as cf
*Osangularia sp.	/fb	44	46	
Planularia liebusi	/fb	11	45	
Praebulimina pussila	/fb	44	46	
Pyramidina szajnochae	/fb	45	76	
Quadrimorphina allomorphinoides	/fb	11	46	
Ramulina aculeata	/fb	44	46	*ID as cf
Stensioeina ex. gr. exculpta	/fb	37	45	

*Nannofossil data by M. Wagreich, 25 Feb 2003

Amphizygus brooksii	/nn	44	45	
Biscutum constans	/nn	33.5	34.5	
Braarudosphaera bigelowii	/nn	42	65	
Calculites obscurus	/nn	66	76	*ID as cf
Calculites ovalis	/nn	44	45	
Chiastozygus litterarius	/nn	34.5	76	
Corollithion exiguum	/nn	45	46	
Corollithion signum	/nn	34.5	44	
Cribrosphaerella ehrenbergii	/nn	34.5	76	
Eiffellithus eximius	/nn	34.5	65	
Eiffellithus turriseiffelii	/nn	34.5	65	
Helicolithus trabeculatus	/nn	34.5	45	
Lithraphidites carniolensis	/nn	34.5	76	
Lucianorhabdus cayeuxii	/nn	34.5	76	
Lucianorhabdus maleformis	/nn	34.5	76	
Manivitella pemmatoidea	/nn	33.5	34.5	
Marthasterites furcatus	/nn	34.5	76	
Microrhabdulus belgicus	/nn	65	66	
Microrhabdulus decoratus	/nn	34.5	76	
Micula decussata	/nn	37	44	
Nannoconus truitti	/nn	34.5	41	
Prediscosphaera cretacea	/nn	34.5	76	
Reinhardtites anthophorus	/nn	65	65	*ID as cf.
Reinhardtites fenestratus	/nn	34.5	44	*ID as sp. aff.
Rhagodiscus reniformis	/nn	36	37	*ID as cf.
Stradneria crenulata	/nn	34.5	76	*ID as Cretarhabdus
Tranolithus orionatus	/nn	45	76	
Watznaueria barnesae	/nn	34.5	76	
Zygodiscus diplogrammus	/nn	34.5	76	
Zygodiscus spiralis	/nn	44	45	

*END

UPK.36 Montesquiú-Orca section, Spain

Central Pyrennes Mountains, northern Spain near Tremp. Foram data by Gomez-Garrido, 1987, U. Autònoma de Barcelona, Ph.D. thesis, fig. 16; Drowning contact SQ4 = 0m; SQ5-top Herbavavina Fm./base Salas Fm. = 400m; Approximate Base Aren Fm. = 750m; top of section 1170m. Sequence stratigraphy by Simo, 1993, AAPG Mem 56, p. 325-335.

Data:

*TAXA	Morph	Base	Top meters	
Dica concavata	/fp	10	80	
Globotruncana arca	/fp	100	300	
Globotruncana elevata	/fp	220	300	In Globotruncanita
Globotruncana fornicata	/fp	100	300	D as Rosetta, as cf
Globotruncana linneiana	/fp	100	300	
Globotruncana stuartiformis	/fp	100	300	In Globotruncanita
Marginotruncana coronata	/fp	10	300	
Marginotruncana sinuosa	/fp	10	80	
Marginotruncana tarfayaensis	/fp	10	210	
*END				

UPK.37 Waxahachie Dam Spillway, Ellis County Texas

Gale et al. Cret. Research 29:131-167. Proposed GSSP of base Campanian at LO *Marsupites testudinarius* at 14.8 m.

Data:

*TAXA	Morph	Base	Top meters	
	*Nannofossils	Table 2,	p. 145-147	
Acuturris scotus	/nn	-1.0	16.9	
Ahmuellerella octoradiata	/nn	-1.0	17.1	
Amphizygus brooksii	/nn	-1.0	17.7	
Arkhangelskiella cymbiformis	/nn	0.0	17.7	
Assipetra terebrodentarius	/nn	14.85	14.85	
Axopodorhabdus dietzmannii	/nn	16.9	16.9	
Biscutum coronum	/nn	14.8	15.8	
Biscutum ellipticum	/nn	-1.0	17.7	
Braarudosphaera bigelowii	/nn	-1.0	17.1	
Broinsonia enormis	/nn	-1.0	17.7	
Broinsonia matalosa	/nn	-1.0	17.1	
Broinsonia parca constricta	/nn	17.7	17.7	
Broinsonia parca parca	/nn	17.7	17.7	
Broinsonia signata	/nn	-1.0	17.7	
Bukryolithus ambiguus	/nn	-1.0	17.1	
Calculites obscurus	/nn	-1.0	17.7	
Calculites ovalis	/nn	-1.0	17.1	
Calculites percenis	/nn	-1.0	16.7	
Chiastozygus bifarius	/nn	-1.0	17.1	
Chiastozygus garrisonii	/nn	13.9	13.9	
Chiastozygus litterarius	/nn	-1.0	17.7	
Corollithion exiguum	/nn	13.75	14.8	
Corollithion signum	/nn	-1.0	17.1	
Corollithion madagaskarensis	/nn	5.7	17.1	
Cribrosphaerella ehrenbergii	/nn	-1.0	17.7	
Cyclagelosphaera margerelii	/nn	-1.0	16.9	
Cyclagelosphaera reinhardtii	/nn	-1.0	16.9	
Cylindralithus coronatus	/nn	-1.0	16.9	
Cylindralithus nudus	/nn	-1.0	17.1	
Cylindralithus serratus	/nn	-0.5	17.7	
Discorhabdus ignotus	/nn	-1.0	17.1	
Eiffellithus eximius	/nn	-1.0	17.7	

Eiffellithus turriseiffelii	/nn	-1.0	17.7	
Gaarderella granulifera	/nn	13.1	17.1	
Gartnerago segmentatum	/nn	-1.0	17.7	
Grantarhabdus coronadventis	/nn	6.9	15.8	
Haqius circumradiatus	/nn	14.5	16.2	
Helicolithus anceps	/nn	-1.0	17.7	
Helicolithus compactus	/nn	-1.0	17.1	
Helicolithus trabeculatus	/nn	4.7	17.1	
Kamptnerius magnificus	/nn	17.7	17.7	
Lithastrinus grillii	/nn	-1.0	17.7	
Lithraphidites carniolensis	/nn	-1.0	17.7	
Lucianorhabdus arcuatus	/nn	-1.0	17.1	
Lucianorhabdus cayeuxii	/nn	-1.0	17.7	
Lucianorhabdus maleformis	/nn	-1.0	17.1	
Lucianorhabdus quadrifidus	/nn	-1.0	16.9	
Manivitella pemmatoidea	/nn	-1.0	17.7	
Marthasterites furcatus	/nn	2.8	17.7	
Microrhabdulus belgicus	/nn	-1.0	17.1	
Microrhabdulus decoratus	/nn	-1.0	17.7	
Microrhabdulus helicoideus	/nn	6.9	17.7	
Microrhabdulus undosus	/nn	-1.0	16.2	
Micula concava	/nn	1.65	17.7	
Micula staurophora	/nn	-1.0	17.7	
Octolithus multiplus	/nn	-1.0	16.7	
Orastrum campanensis	/nn	15.45	16.2	
Placozygus fibuliformis	/nn	-1.0	17.7	
Prediscosphaera arkhangelskyi	/nn	13.75	13.75	
Prediscosphaera cretacea	/nn	-1.0	17.7	
Prediscosphaera grandis	/nn	-1.0	17.1	
Prediscosphaera spinosa	/nn	-1.0	17.7	
Prediscosphaera stoveri	/nn	0.0	16.2	
Reinhardtites anthophorus	/nn	-1.0	17.7	
Repagulum parvidentatum	/nn	-1.0	17.7	
Rhagodiscus angustus	/nn	-1.0	17.7	
Rhagodiscus reniformis	/nn	-1.0	17.1	
Rhagodiscus splendens	/nn	-1.0	17.1	
Rotelapillus crenulatus	/nn	2.1	17.7	
Staurolithites crux	/nn	0.0	14.85	
Staurolithites laffittei	/nn	-1.0	17.7	
Tegumentum stradneri	/nn	2.8	16.9	
Tetrapodorhabdus decorus	/nn	-1.0	17.1	as decoratus
Thoracosphaera saxea	/nn	-1.0	16.2	
Tranolithus gabalus	/nn	14.75	14.75	
Tranolithus minimus	/nn	-1.0	17.7	
Tranolithus orionatus	/nn	-1.0	17.7	
Watznaueria barnesae	/nn	-1.0	17.7	
Watznaueria biporta	/nn	-1.0	17.7	
Watznaueria fossacincta	/nn	-1.0	17.7	
Watznaueria manivitiae	/nn	-1.0	17.7	
Watznaueria ovata	/nn	5.7	15.7	
Zeugrhabdotus birescenticus	/nn	-1.0	17.1	
Zeugrhabdotus biperforatus	/nn	-1.0	17.7	
Zeugrhabdotus embergeri	/nn	-1.0	16.9	
Zeugrhabdotus erectus	/nn	-1.0	17.1	
Zygodiscus diplogrammus	/nn	-1.0	16.9	in Zeugrhabdotus
				*Table 3 p. 148
Archaeoglobigerina cretacea	/fp	-1.0	17.25	
Dicarinella asymetrica	/fp	-1.0	17.5	
Dica concavata	/fp	-1.0	17.5	
Glob'oides bollii	/fp	-1.0	17.25	
Globigerinelloides multispinata	/fp	-1.0	13.9	as multispinus
Globotruncana arca	/fp	-1.0	17.7	
Globotruncana bulloides	/fp	2.8	17.7	

Globotruncana fornicata	/fp	-1.0	17.7	In Contusotruncana
Globotruncana linneiana	/fp	-1.0	17.7	
Globotruncana stuartiformis	/fp	1.0	17.7	ID Globotruncanita
Hasterigerinoides subdigitata	/fp		16.25	
Hedbergella flandrini	/fp	0.0	15.8	
Hedbergella planispira	/fp	-1.0	17.7	
Heterohelix globulosa	/fp	-1.0	17.7	
Heterohelix pulchra	/fp	-1.0	17.5	In Laeviheterohelix
Heterohelix striata	/fp	-1.0	15.8	
Marginotruncana coronata	/fp	1.0	14.6	
Marginotruncana marginata	/fp	-1.0	14.75	
Marginotruncana pseudolinneiana	/fp	0.0	8.05	
Marginotruncana renzi	/fp	-1.0	14.35	
Marginotruncana schneegansi	/fp	-1.0	-1.0	
Marginotruncana sinuosa	/fp	-1.0	15.8	
Marginotruncana tarfayaensis	/fp	1.0	14.35	
Pseudotextularia nuttalli	/fp	-1.0	16.7	
Rugoglobigerina rugosa	/fp	12.95	12.95	
Sigalia deflaensis	/fp	0.0	12.0	
Ventilabrella eggeri	/fp	-1.0	17.7	
Ventilabrella glabrata	/fp	2.1	15.8	
*Crinoids fig.12, p. 142				
Marsupites laevigatus	/cr	3.3	9.6	
Marsupites testudinarius	/cr	9.9	14.8	
Uintacrinus anglicus	/cr	15.1	16.2	
Uintacrinus socialis	/cr	0.0	2.1	
*Fig. 14, p. 151				
Cordiceramus germanicus	/bi	5.0	7.8	
Cordiceramus muelleri	/bi	5.0	7.8	ID as ex gr.
Inoceramus balticus	/bi	5.0	7.8	ID as Cataceramus
Platyceramus ahnsenensis	/bi	9.1	12.1	
Platyceramus ezoensis	/bi	12.2	15.6	ID as cf.
*Fig. 24, p. 163, events				
Marker bed Ca SB TA 1	/mb	17.5	*	
Carbon peak Sant-Camp	/gc	7.0	16.0	Fig. 8, p. 139
Submortonicerans tequesquitense	/am	14.1		
*END				

UPK 38, Section 1, Bey Daglari, Turkey

Sari, 2006, J. Foram. Research 36:241-261, fig. 4; on Rt. E87 a few km W. of Korkutel. Top Bey Daglari Fm. 0-18.8 m at regional hardground, top Akdag Fm. 27 m unconformity below Paleocene; *D. concavata* Interval Zone 4-9.5m; top *D. asymetrica* Total Range Zone 18.7 m; top *G. gansseri* I.Z. 27 m.

Data:

*TAXA	Morph	Base	Top meters
Vaccinites praegiganteus	/bi	1	2
Archaeoglobigerina blowi	/fp	24.5	24.5
Archaeoglobigerina cretacea	/fp	19.4	19.4 ID uncertain but range is ok
Contusotruncana plummerae	/fp	26.8	26.8
Dicarinella asymetrica	/fp	18.1	18.5
Dica concavata	/fp	9.5	18.5 Top ID uncertain but range is ok
Gansserina gansseri	/fp	21.6	25.5
Globotruncana aegyptiaca	/fp	20.8	20.8
Globotruncana arca	/fp	19.4	26.8
Globotruncana bulloides	/fp	19.2	26.8
Globotruncana calcarata	/fp	20.0	26.5 In Rugoglobigerina group
Globotruncana contusa	/fp	19.0	19.0 In Contusotruncana
Globotruncana falsostuarti	/fp	19.2	26.8
Globotruncana fornicata	/fp	18.3	26.5 In Contusotruncana
Globotruncana insignis	/fp	19.0	24.5
Globotruncana linneiana	/fp	19.4	26.8 In group w/pseudolinneana

Globotruncana mariei	/fp	19.2	23.8	
Globotruncana rosetta	/fp	25.5	26.5	
Globotruncana ventricosa	/fp	19.0	23.8	
Globotruncana stuarti	/fp	19.2	24.5	
Globotruncana stuartiformis	/fp	19.5	24.5	both in Globotruncanita
Marginotruncana coronata	/fp	4.5	14.5	
Marginotruncana pseudobulloides	/fp	18.3	18.5	Uncertain base at 4.5 m
Marginotruncana pseudolinneiana	/fp	4.5	18.5	In group w/ G. linneiana
Marginotruncana schneegansi	/fp	9.5	15.5	
Marginotruncana sigali	/fp	14.5	14.5	
Marginotruncana sinuosa	/fp	15.5	18.3	ID uncertain but range is ok
Rugoglobigerina rugosa	/fp	19.5	25.5	

*END

UPK 39 Section 2, Bey Daglari, Turkey

Sari, 2006, J. Foram. Research 36:241-261, fig. 5; on Rt. E87 a few km W of Korkuteli. Top Bey Daglari Fm. 0-9 m at regional hardground, top Akdag Fm. 84 m unconformity below Paleocene; top D. asymerica Total Range Zone 9 m; top R. calcarata Total Range Zone 51 m; top G. falsostuarti Partial Range Zone 76 m; top G. gansseri I.Z. 84 m.

Data:

*TAXA	Morph	Base	Top meters	
Archaeoglobigerina cretacea	/fp	15.0	82.5	
Archaeoglobigerina cretacea	/fp	44.0	61.5	
Dicarinella asymerica	/fp	0	8.1	
Dica canaliculata	/fp	0	0	
Dica concavata	/fp	2.0	8.1	
Dica primitiva	/fp	2.0	3.0	ID uncertain but range is ok
Gansserina gansseri	/fp	77.5	83.5	Top id uncertain but range is ok
Gansserina wiedenmayeri	/fp	78.0	81.0	
Globotruncana arca	/fp	8.5	83.0	
Globotruncana bulloides	/fp	8.5	83.5	
Globotruncana calcarata	/fp	8.5	10.5	In Radotruncana group
*Globotruncana conica	/fp	8.5	82.0	
*In group w/ G. atlantica; base of conica too low				
Globotruncana elevata	/fp	8.5	35.0	
Globotruncana falsostuarti	/fp	11.0	83.5	
Globotruncana fornicata	/fp	10.0	78.0	In Contusotruncana
Globotruncana insignis	/fp	8.5	83.5	
Globotruncana linneiana	/fp	8.1	83.5	
Globotruncana mariei	/fp	8.1	83.5	
Globotruncana patelliformis	/fp	64.0	74.0	In Contusotruncana
Globotruncana rosetta	/fp	12.5	83.5	
Globotruncana ventricosa	/fp	8.1	83.5	
Globotruncana stuarti	/fp	76.5	81.0	
Globotruncana stuartiformis	/fp	8.1	82.5	
*both in Globotruncanita				
Marginotruncana coronata	/fp	1.0	8.1	
Marginotruncana pseudolinneiana	/fp	0	8.1	In group w/ G. linneiana
Marginotruncana schneegansi	/fp	8.1	8.1	ID uncertain but range is ok
Marginotruncana sinuosa	/fp	3.0	8.1	
Rugoglobigerina rugosa	/fp	57.0	83.5	
Whit baltica	/fp	3.5	3.5	ID uncertain but range is ok

*END

UPK.40 Urbasa-2 core, Spain

Grafe & Wendler, 2003, SEPM SP 75, p. 22-262, fig. 7. Basque-Cantabrian Basin. Sequence boundaries: UC1=-2020, UC2=-1990, UC3=-1960, UC4=-1930, UC5=-1920, UC6=-1880, UC7=-1840, UC8=-1815, UC9=-1710m; top of core=-1500, base=-2100m.

Data:

*TAXA	Morph	Base	Top meters
Dica imbricata	/fp	-1919	-1860
Globotruncana fornicata	/fp	-1670	-1500
*ID in Rosita cf.; base at -1880 too low			
Globotruncana lapparenti	/fp	-1540	-1500 In subspecies tricarinata
Hedb washitensis	/fp	-2100	-2000
Helv'ana helvetica	/fp	-1880	-1815
Marginotruncana coronata	/fp	-1900	-1550
Marginotruncana pseudolinneiana	/fp	-1650	-1500
Marginotruncana renzi	/fp	-1919	-1920
Marginotruncana schneegansi	/fp	-1825	-1525
Marginotruncana sigali	/fp	-1919	-1690
Praeglobotruncana delrioensis	/fp	-2025	-1970
Praeglobotruncana gibba	/fp	-1929	-1900
Praeglobotruncana stephani	/fp	-2010	* Top at -1600 m too high
Rota appenninica	/fp	-2025	-1970
Rota cushmani	/fp	-2000	-1925
Rota deeckeii	/fp	-1955	-1925
Rota greenhornensis	/fp	-2000	-1925
Rota montsalvensis	/fp	-1955	-1935
Tici roberti	/fp	-2100	-2015
Tici ticinensis	/fp	-2100	-2015 ID as Rotalipora
Whit paradubia	/fp	-1919	-1895
Arenobulimina conoides	/fb	-1895	-1500
Dorothia filiformis	/fb	-2100	-1931
Dorothia gradata	/fb	-2100	-1931
Gaudryina laevigata	/fb	-1920	-1500
Gaudryina rugosa	/fb	-1670	-1500 ID cf.
Gavelinella intermedia	/fb	-2100	-2015
Gyroidinoides nitidus	/fb	-1850	-1640
Marginulina trilobata	/fb	-1630	-1500
Marssonella trochus	/fb	-1990	-1500
Tritaxia tricarinata	/fb	-1890	-1870

*END

UPK.41 Galarreta/Gordoa section, Spain

Grafe & Wendler, 2003, SEPM SP 75, p. 22-262, fig. 8. *Basque-Cantabrian Basin. Sequence boundaries: UC2=20m, UC3=50, UC4=68, FAULT=135-140, UC8=158, UC9=235m; top section 255m, base @ 0m. See also Graf & Wiedman, 1998, SEPM SP 60, fig. 8B, UC8=85, UC9=155, UC10=345, UC11=425.

Data:

*TAXA	Morph	Base	Top meters
Archaeoglobigerina cretacea	/fp	250	255
Dica algeriana	/fp	98	150
Dica canaliculata	/fp	140	200
Dica hagni	/fp	132	170
Dica imbricata	/fp	102	205
Dica primitiva	/fp	200	255
Glob'oides bentonensis	/fp	0	135
Globotruncana fornicata	/fp	220	255
Hedbergella delrioensis	/fp	0	135
Hedbergella flandrini	/fp	245	250
Hedb planispira	/fp	0	95
Hedb simplex	/fp	3	135
Helv'ana helvetica	/fp	140	155
Helv'ana praehelvetica	/fp	89	155
Marginotruncana coronata	/fp	160	255
Marginotruncana marginata	/fp	160	255

Marginotruncana marianosi	/fp	140	170
Marginotruncana pseudolinneiana	/fp	150	255
Marginotruncana renzi	/fp	140	180
Marginotruncana schneegansi	/fp	149	235
Marginotruncana sigali	/fp	148	245
Praeglobotruncana aumalensis	/fp	39	135
Praeglobotruncana delrioensis	/fp	0	85
Praeglobotruncana gibba	/fp	44	150
Praeglobotruncana stephani	/fp	0	140
Rota appenninica	/fp	0	40
Rota cushmani	/fp	32	135
Rota deeckeii	/fp	55	122
Rota globotruncanoides	/fp	0	57
Rota greenhornensis	/fp	3	132
Rota montsalvensis	/fp	8	55
Rota reicheli	/fp	17	35
Whit aprica	/fp	140	220
Whit archaeocretacea	/fp	107	235
Whit baltica	/fp	94	165
Whit brittonensis	/fp	65	230
Whit paradubia	/fp	67	225
*END			

UPK.42, 43 No Data

UPK 44, Sierra del Maigmo Section, Spain

Chacon et al. 2004, Cret. Research 25:585-601, fig. 6; Base Carche Fm -3.5 m at gradational contact, base Raspay Fm. 72m. Top at 112m unconformity below Paleocene poorly exposed; base G. elevata zone -3.0m; 20m base G. ventricosa; base calcarata zone at 28m; G. falsostuarti zone 53m; G. gansseri 67m; A. mayaroensis 110m.

Data:

*TAXA	Morph	Base	Top meters
Abathomphalus mayaroensis	/fp	110	110
Archaeoglobigerina blowi	/fp	37	85
Archaeoglobigerina cretacea	/fp	28	78
Gansserina gansseri	/fp	85	110
Globotruncana aegyptiaca	/fp	85	111
Globotruncana arca	/fp	-3.5	46
Globotruncana bulloides	/fp	15	78
Globotruncana calcarata	/fp	28	53 In Rugoglobigerina group
Globotruncana contusa	/fp	110	111 In Contusotruncana
Globotruncana elevata	/fp	-3.5	32
Globotruncana falsostuarti	/fp	85	110
Globotruncana fornicata	/fp	15	110 In Contusotruncana
Globotruncana linneiana	/fp	-3.5	111 In group w/pseudolinneana
Globotruncana mariei	/fp	15	53
Globotruncana patelliformis	/fp	46	100
Globotruncana rosetta	/fp	15	85
Globotruncana ventricosa	/fp	20	28
Globotruncana stuarti	/fp	55	111
Globotruncana stuartiformis	/fp	-3.5	111 both in Globotruncanita
Globotruncana subspinosa	/fp	23	85
Globotruncanella havanensis	/fp	67	82
Hedbergella holmdelensis	/fp	20	82
Hedbergella monmouthensis	/fp	20	82
Racemiguembelina fructicosa	/fp	110	111
Rugoglobigerina hexacamerata	/fp	110	111
Rugoglobigerina rugosa	/fp	40	110
Rugoglobigerina scotti	/fp	110	110

*END

UPK 45, Sierra de Aixorta Section, Spain

Chacon et al. 2004, Cret. Research 25:585-601, fig. 7; Base Carche Fm 0m at gradational contact, mid-Maast. debris/unconformity 93m; base Raspay Fm. 96m. top at unconformity at ~145m below Paleocene; *base G. elevata zone 0.1m; 9m base G. ventricosa; base calcarata zone at 14.5m; G. falsostuarti zone 18m; G. gansseri 47m; C. contusa at 96m; A. mayaroensis 118m.

Data:

*TAXA	Morph	Base	Top meters
Abathomphalus mayaroensis	/fp	118	142
Archaeoglobigerina blowi	/fp	47	91
Archaeoglobigerina cretacea	/fp	14.5	86
Gansserina gansseri	/fp	47	105
Globigerinelloides subcarinatus	/fp	70	135
Globotruncana aegyptiaca	/fp	17	105
Globotruncana arca	/fp	1	99
Globotruncana bulloides	/fp	15	92
Globotruncana calcarata	/fp	15	17 In Rugoglobigerina group
Globotruncana conica	/fp	15	135
Globotruncana contusa	/fp	96	142 In Contusotruncana
Globotruncana elevata	/fp	1	14.5
Globotruncana falsostuarti	/fp	18	105
Globotruncana fornicata	/fp	11	99 In Contusotruncana
Globotruncana linneiana	/fp	0.1	98 In group w/pseudolinneana
Globotruncana mariei	/fp	15	80
Globotruncana rosetta	/fp	9	84
Globotruncana ventricosa	/fp	10	92
Globotruncana stuarti	/fp	17	142
Globotruncana stuartiformis	/fp	1	141 both in Globotruncanita
Globotruncana subspinosa	/fp	14	98
Globotruncanella havanensis	/fp	54	105
Hedbergella holmdelensis	/fp	0.1	105
Hedbergella monmouthensis	/fp	15	135
Planoglobulina acervulinoides	/fp	76	105
Pseudoguembelina costulata	/fp	33	135
Racemiguembelina fructicosa	/fp	99	142
Rugoglobigerina hexacamerata	/fp	86	90
Rugoglobigerina milamensis	/fp	80	80 ID uncertain
Rugoglobigerina rotundata	/fp	135	135
Rugoglobigerina rugosa	/fp	33	138
Rugoglobigerina scotti	/fp	135	135

*END

UPK.46, Sierra del Carche Section, Spain

Chacon et al. 2004, Cret. Research 25:585-601, fig. 5; Base Carche Fm 0m at regional hardground, base Raspay Fm. drowning 64m. Top 76.5 m at unconformity below Paleocene; top D. asymerica Total Range Zone 1.0 m & base G. elevata zone; 13m base G. ventricosa; base calcarata zone at 21m; G. falsostuarti zone 24m; G. gansseri I.Z. 46 m; C. contusa zone 65m; A. mayaroensis 71 m.

Data:

*TAXA	Morph	Base	Top meters
Abathomphalus mayaroensis	/fp	71	71
Archaeoglobigerina blowi	/fp	18	18 ID uncertain
Archaeoglobigerina cretacea	/fp	30	57
Dicarinella asymerica	/fp	0.1	0.1
Dica concavata	/fp	1	1
Dica primitiva	/fp	1	1 ID uncertain
Gansserina gansseri	/fp	46	46 ID uncertain

Globotruncana aegyptiaca	/fp	33	58	
Globotruncana arca	/fp	1		
Globotruncana bulloides	/fp	18	57	
Globotruncana calcarata	/fp	22		In Globotruncanita group
Globotruncana contusa	/fp	65	76	In Contusotruncana
Globotruncana elevata	/fp	2	8	ID in Globotruncanita
Globotruncana falsostuarti	/fp	55	76	
Globotruncana fornicata	/fp	1	58	In Contusotruncana
Globotruncana linneiana	/fp	0.5	63	In group w/pseudolinneana
Globotruncana mariei	/fp	35	61	
Globotruncana patelliformis	/fp	10	67.5	
Globotruncana rosetta	/fp	22	62	
Globotruncana ventricosa	/fp	13	46	
Globotruncana stuarti	/fp	55	76	
Globotruncana stuartiformis	/fp	18	76	both in Globotruncanita
Globotruncanella havanensis	/fp	33	63	
Hedbergella holmdelensis	/fp	18	62	
Hedbergella monmouthensis	/fp	18	76	
Marginotruncana tarfayaensis	/fp	10	10	ID as cf.
Racemiguembelina fructicosa	/fp	65	68	
Rugoglobigerina rugosa	/fp	22	76	

*END

UPK.47 North Fork, Wyoming

Lithologic Units: Fox Hills 3900 - 4200; Upper Lewis Shale 3680 to 3900; Mid Lewis Shale 3145 to 3280; Lower Lewis Shale 3033 to 3100; Teapot Sandstone 2921 to 3033; Upper Mesaverde Formation 2839 to 2921; Parkman Member of Mesaverde 2355 to 2760; Sandstone interval 1620 to 1650; Base of Ardmore Bentonite 1512; Shannon Sandstone 099 to 1170; Cody Shale 0 to 1099 feet.

Data:

*Taxa	Morph	Base	Top ft
Baculites asperiformis	/am	1720	1810
Baculites eliasi	/am	3193	3193
Baculites mclearni	/am	1620	1620
Baculites perplexus	/am	1935	2309
Baculites reesidei	/am	3072	3072
Baculites scotti	/am	2790	2790
Baculites smooth	/am	1049	1125
Baculites weak ribs	/am	1352	1495
Scaphites hippocrepis	/am	799	799
Marker bed PS Ardmore bentonite	/mb	1512	***

*END

UPK.48 Glenrock, Converse County, Wyoming

Sec 5, 6 & 24, 33N,75W, sec 1, 11, 22, 33N, 76W. Merewether et al., 1977, USGS O&G Invest. Map OC75, section 34. Lithologic units: Lance Formation 3220 feet; Fox Hills Formation 2845 to 3220; Lewis Shale 1550 2845; Shale interval 2570 2845; Sandstone interval 2225 2570; Shale interval 1550 to 225; Mesa Verde Formation 665 to 1550; Teapot Member 1415 to 1550; Shale interval 1055 1415; Parkman Member 665 to 1055; Cody Formation 0 to 665 above Ardmore Bentonite.

Data:

*Taxa	Morph	Base	Top ft
Baculites clinolobatus	/am	2845	2845
Baculites eliasi	/am	1765	1950
Baculites gilberti	/am	35	775
Baculites grandis	/am	2510	2510
Baculites jenseni	/am	1590	1590
Baculites perplexus	/am	35	775
Baculites scotti	/am	1115	1115

Didymoceras nebrascense	/am	1160	1160
Didymoceras stevensoni	/am	1220	1290

*END

UPK.49 Powder River Outcrop

Sec 29,30,32, T36N, R85W, Natrona Co, Wy. Merewether et al., 1977, USGS O & G Invest. Map-OC 74, section 15. Lithologic Units: Meeteese Fm. 2703 feet; Fox Hills 2675 to 2703; Lewis Formation (Shale) 2450 to 2675; Teapot Sandstone Member 2275 to 2450; of Mesa Verde Fm., base = SB @ 2275; Parkman Member 1835 to 2275; Base Mesa Verde Fm., Fales Member 1450 to 1565; Sussex Sandstone Member, Cody Fm. 495 to 740; Cody Shale 0 to 495.

Data:

*Taxon	Morph	Base	Top ft
Baculites eliasi	/am	2650	2650
Baculites gilberti	/am	1827	1827
Baculites jenseni	/am	2580	2580
Baculites obtusus	/am	930	930
Baculites smooth	/am	0	125
Baculites weak ribs	/am	507	742
Marker bed PS Ardmere bentonite	/mb	530	530

*END

UPK.50 Northwestern Black Hills, 56N,67W, Crook Co, WY.

Lithologic Units: Fox Hills Formation 3580 feet; Shale interval 2900; Red Bird Silty Mbr. 2600 to 2900; Mitten Member 2455 to 2600; Gammon Member 1570 to 2455; Niobrara Formation 1420 to 1570; Carlile Formation 832 to 1420; Greenhorn Formation 745 to 832; Belle Fourche Formation 0 to 745; Mowry Formation 0 feet.

Data:

*Taxon	Morph	Base	Top ft
Baculites asperiformis	/am	2509	2509
Baculites eliasi	/am	3572	3572
Baculites gregoryensis	/am	2650	2650
Baculites perplexus	/am	2582	2582
Baculites reesidei	/am	3459	3459
Baculites scotti	/am	2865	2865
Baculites smooth	/am	2410	2410
Baculites weak ribs	/am	2315	2315
Exiteloceras jenneyi	/am	3249	3249
Didymoceras cheyennense	/am	3373	3373
Didymoceras nebrascense	/am	2935	2935
Didymoceras stevensoni	/am	3070	3070
Prionocyclus wyomingensis	/am	995	995
Scaphites corvenus	/am	995	995
Scaphites hippocrepis	/am	1924	2190

*END

PAL.111 ODP 758A Ninetyeast Ridge, Indian Ocean

5deg 23.05'N 90deg 21.67'E; Peirce, Weissel et al., 1989, Proc. ODP, Initial Repts, 121; Olig-Mio @ 195-197 mbsf; Unconformities @ 248.3 CS U Eoc-Olig.; Begin Upper Cretaceous file at 256 mbsf., 256.85 top Paleocene, 295.5 top Maastrichtian, 431.2 top tuff. Core spl 27X-cc @ 256.9 is CS w/ mixed biota; separate bases from tops by 0.1 cm and place unconformity between. Data begins below 150 m.

DATA:

*Taxa	Morph	Base	Top mbsf
*Data from van Eijden & Smit, 1991, ODP v. 121, p. 103-109.			
Acarinina coalingensis	/fp	-269.3	-256.9

Chiloguembelina midwayensis	/fp	-288.5	-256.9	
Eoglobigerina fringa	/fp	*	-335.7	
Eoglobigerina edita	/fp	*	-335.7	
Globanomalina pseudomenardii	/fp	-287.4	-266.6	*ID as Planorotalites
Globigerina triloculinoides	/fp	-294.9	-269.4	
Globigerina velascoensis	/fp	-288.9	-261.1	
Globoconusa daubjergensis	/fp	-293.4	*	
Morozovella acuta	/fp	-285.9	-261.1	
Morozovella aequa	/fp	-288.9	-256.9	
Morozovella angulata	/fp	-291.9	-284.1	
Morozovella conicotruncata	/fp	-288.9	-285.9	
Morozovella convexa	/fp	-261.0	-256.9	
Morozovella marginodentata	/fp	-262.5	-261.1	
Morozovella praecursoria	/fp	-294.9	-291.9	
Morozovella pseudobulloides	/fp	-294.9	-261.1	
Morozovella trinidadensis	/fp	-294.9	*	
Morozovella uncinata	/fp	-293.4	-291.9	
Morozovella velascoensis	/fp	-269.3	-261.1	
Planorotalites chapmani	/fp	-288.9	-280.8	
Planorotalites compressus	/fp	-294.9	-280.8	
Planorotalites imitatus	/fp	-291.5	-261.1	
Planorotalites planoconicus	/fp	-280.4	-269.4	
Subbotina inconstans	/fp	-294.9	-291.9	*ID as Morozovella
Abathomphalus mayaroensis	/fp	-314.9	*	
Archaeoglobigerina blowi	/fp	-527.1	-343.9	
Globigerinelloides volutus	/fp	-527.1	-295.6	
Globotruncana arca	/fp	-369.8	-295.6	
Globotruncana linneiana	/fp	-367.3	-306.5	
Globotruncana rosetta	/fp	-295.6	*	
Globotruncana ventricosa	/fp	-295.6	*	
Heterohelix globulosa	/fp	-527.1	-295.6	
Heterohelix planata	/fp	-527.1	-295.6	

*Data from Nomura, 1991, ODP v. 121, p.3-29, Table 1 in pocket (Maast.-Eoc.). only those taxa in common with DSDP 516F are recorded. Also data from Initial Rept., 89, v. 121:385-386

Alabamina creta	/FB	-370.9	*	
Ammodiscus glabratus	/fb	-284.1	*	
Anomalina praeacuta	/FB	-435.1	*	
Anomalinoides capitatus	/FB	-335.8	*	
Anomalinoides semicribratus	/FB	-328.1	*	
Aragonia aragonensis	/FB	-334.3	*	
Bolivinooides delicatulus	/FB	-365.4	*	
Bolivinooides draco draco	/FB	-435.1	-358.9	
Bulimina trinitatensis	/FB	-358.4	*	
Cibicidoides dayi	/FB	-435.1	*	
Cibicidoides velascoensis	/FB	-435.1	*	
Coryphostoma incrassata	/FB	-403.1	-358.4	
Coryphostoma midwayensis	/FB	-435.1	*	
Gaudryina laevigata	/FB	-435.1	*	*ID as cf
Globorotalites conicus	/FB	-394.5	-365.4	
Gyroidina orbicularis	/FB	-295.4	*	
Gyroidina soldanii	/FB	-435.1	*	
Gyroidinoides planulatus	/FB	-435.1	*	
Nonion havanense	/FB	-274.4	*	
Nuttallides trumpyi	/FB	-403.2	*	
Nuttallinella florealis	/FB	-435.1	-432.0	
Oridorsalis umbonatus	/FB	-419.3	*	
Osangularia cordieriana	/FB	-384.3	*	
Osangularia velascoensis	/FB	-435.1	-229.9	
Pleurostomella alternans	/FB	-307.0	-284.1	
Pullenia coryelli	/FB	-435.1	*	
Pullenia cretacea	/FB	-435.1	-278.1	

Pyramidina rudita	/FB	-268.4	-258.8
Stensioeina beccariiiformis	/FB	-435.1	*
Stilostomella gracillima	/FB	-297.5	*
Tritaxia globulifera	/FB	-358.4	*

*END

PAL.121 ODP 762C Exmouth Plateau, west of Australia,
 19°53.23'S, 112°15.24'E. File for UPK composite data set. Haq et al., 1990, Proc. ODP Initial Repts., v.
 122, p. 213-288. Sea floor at 1360m; core 940 m, 69% recovery; Unit IV from 554.8-838.5mbsf is
 nannofossil chalk and minor clay; top Cretaceous at 554.8mbsf. CORBs at 603.5-697mbsf and 780.0-
 810.0mbsf. Top of Cenomanian/Turonian dark brown-black, organic-rich clay 23 cm thick at 810.65m;
 Albian/Cenomanian at 820.2mbsf.

DATA:

*TAXA	Morph	Base	Top mbsf
*Magnetostratigraphy by Galbrun, 1992, ODP 122:699-710, Fig. 7.			
C25n	/ma	*	-422.5
*C26r	/ma	*	-459.5
*C27n	/ma	*	-513
*C28n	/ma	*	-519
C29n	/ma	*	-540
C30n	/ma	*	-562
*C31n	/ma	*	-595
C32n 1n	/ma	*	-613
C33n	/ma	*	-640
C34n	/ma	*	-741
*Haq et al., p. 234, & 281.			
Carbon peak OAE 2	/gc	-810.86	-810.65
*Paleogene Forams from Haq, von Rad et al., Initial Report, 1990, v. 122, p. 242-243.			
Globanomalina pseudomenardii	/fp	-469.0	-431.0 *ID as Planorotalites
Morozovella aequa	/fp	-421.5	-398.0
Morozovella angulata	/fp	-478.5	-478.5
Morozovella aragonensis	/fp	-369.5	-322.0
Morozovella caucasica	/fp	-331.5	-322.0
Morozovella formosa	/fp	-369.5	-341.0
Morozovella marginodentata	/fp	-398.0	-379.0
Morozovella pseudobulloides	/fp	-545.0	-488.0
Morozovella velascoensis	/fp	-421.5	-421.5
Planorotalites compressus	/fp	-545.0	-488.0
Subbotina triloculinoides	/fp	-545.0	-488.0
*Cretaceous forams by Wonders, 1992, Proc. ODP Sci. Results, 122:587-594, Fig. 3.			
Abathomphalus mayaroensis	/fp	-593.12	-554.87
Dicarinella asymmetrica	/fp	-765.62	-756.11
Dica concavata	/fp	-775.62	-765.62
Dica hagni	/fp	-810.22	-807.93
Dica imbricata	/fp	-810.22	-785.66
Glob'oides asperum	/fp	-795.68	-738.62
Globotruncana arca	/fp	-767.12	-554.87
Globotruncana arca	/fp	-767.12	-554.87
Globotruncana bulloides	/fp	-710.12	-621.62
Globotruncana contusa	/fp	-555.96	-554.87
Globotruncana elevata	/fp	-754.61	-718.12
Globotruncana falsostuarti	/fp	-593.12	-564.82
Globotruncana fornicata	/fp	-767.12	-654.62
Globotruncana linneiana	/fp	-767.12	-607.07
Globotruncana rosetta	/fp	-664.10	-640.62
Globotruncana stuarti	/fp	-555.96	-554.87
Globotruncana stuartiformis	/fp	-683.12	-683.12
Globotruncana ventricosa	/fp	-767.12	-593.12
Globotruncanella havanensis	/fp	-640.62	-593.12
Gublerina cuvillieri	/fp	-593.12	-554.87

Hedbergella flandrini	/fp	-782.12	-746.62
Heterohelix globulosa	/fp	-797.18	-555.96
Heterohelix pulchra	/fp	-756.11	-756.11
Marginotruncana angusticarinata	/fp	-795.68	-765.62
Marginotruncana coronata	/fp	-801.62	-745.12
Marginotruncana sinuosa	/fp	-785.66	-745.12
Marginotruncana marginata	/fp	-775.62	-746.62
Marginotruncana marianosi	/fp	-807.93	-807.93
Marginotruncana pseudolinneiana	/fp	-801.62	-746.62
Marginotruncana renzi	/fp	-800.12	-797.18
Marginotruncana tarfayaensis	/fp	-797.18	-754.61
Planoglobulina acervulinoides	/fp	-555.96	-554.87
Planoglobulina multicamerata	/fp	-554.87	-554.87
Planoglobulina riograndensis	/fp	-650.12	-650.12
Pseudotextularia elegans	/fp	-593.12	-554.87
Rugoglobigerina milamensis	/fp	-654.62	-593.12
Rugoglobigerina rugosa	/fp	-688.62	-583.60
Whit archaeocretacea	/fp	-810.22	-782.12

*Paleogene Nanno data by Siesser & Bralower, 1992, ODP 122:601-620, Table 4.

Biantholithus sparsus	/nn	-554.4	-373.5
Campylosphaera eodela	/nn	-412.0	-360.0
Chiasmolithus bidens	/nn	-488.1	-388.5
Chiasmolithus consuetus	/nn	-465.1	-465.1
Cruciplacolithus edwardsii	/nn	-551.1	-516.5
Cruciplacolithus primus	/nn	-551.1	-497.5
Cruciplacolithus tenuis	/nn	-545.0	-421.5
Discoaster mohleri	/nn	-440.5	-405.5
Discoaster multiradiatus	/nn	-421.5	-388.5
Discoaster nobilis	/nn	-405.0	-370.5
Ellipsolithus distichus	/nn	-470.0	-403.5
Ericsonia subpertusa	/nn	-538.0	-403.5
Fasciculithus tympaniformis	/nn	-479.5	-394.0
Fasciculithus ulii	/nn	-488.0	-488.0
Helicolithus kleinpellii	/nn	-459.5	-440.5
Helicolithus riedelii	/nn	-422.5	-399.0
Neochiastozygus junctus	/nn	-413.0	-402.0
Prinsius bisulcus	/nn	-536.3	-431.5
Semihololithus kerabyi	/nn	-412.0	-412.0
Sullivania danica	/nn	-528.3	-480.1 ID as Chiasmolithus
Toweius eminens	/nn	-462.1	-412.0
Toweius pertusus	/nn	-470.0	-440.5
Tribrachiatus bramlettei	/nn	-403.5	-388.5
Tribrachiatus contortus	/nn	-406.5	-394.0
Zygrhablithus bijugatus	/nn	-422.5	-422.5
Thoracosphaera	/nn	-554.4	-554.4

*Cretaceous Nanno data by Bralower & Siesser, 1992, ODP 122:529-548, Table 2.

*Base arbitrarily placed at base core 72 & near base Coniacian

Ahmuellerella octoradiata	/nn	-744.7	-575.3 ID as Vagalapilla
Arkhangelskiella cymbiformis	/nn	-614.8	-555.0
Biscutum constans	/nn	-795.3	-555.0
Biscutum coronum	/nn	-700.4	-578.3
Broinsonia enormis	/nn	-790.3	-555.0
Broinsonia parca constricta	/nn	-744.7	-602.0
Broinsonia parca parca	/nn	-744.7	-603.8
Broinsonia signata	/nn	-795.3	-614.8
Ceratolithoides aculeus	/nn	-697.0	-568.3 FO @ -757.3 too old
Chiastozygus garrisonii	/nn	-781.8	-555.0
Chiastozygus litterarius	/nn	-795.3	-578.3
Corollithion exiguum	/nn	-684.3	-574.8
Corollithion madagaskarensis	/nn	-630.5	-556.3
Corollithion signum	/nn	-627.3	-612.8
Cretarhabdus conicus	/nn	-795.3	-556.3
Cretarhabdus surirellus	/nn	-799.5	-555.0

Cribrocorona gallica	/nn	-799.5	-555.0	*ID as Cylindralithus
Cribrosphaerella ehrenbergii	/nn	-799.5	-555.0	
Cribrosphaerella linea	/nn	-744.5	-558.3	
Crucibiscutum salebrosum	/nn	-689.3	-555.0	
Cyclagelosphaera margerelii	/nn	-768.3	-596.7	
Diazomatolithus lehmanii	/nn	-790.3	-559.8	
Discorhabdus rotatorius	/nn	-689.3	-571.3	
Eiffellithus eximius	/nn	-799.5	-608.3	
Eiffellithus turriseiffelii	/nn	-799.5	-555.0	
Eprolithus floralis	/nn	-799.5	-785.7	
Eprolithus moratus	/nn	-799.5	-780.3	
Eprolithus septenarius	/nn	-795.0	-791.8	
Gaarderella granulifera	/nn	-744.7	-564.0	ID as Manivitella
Gartnerago obliquum	/nn	-799.5	-555.0	
Grantarhabdus coronadventis	/nn	-799.5	-641.8	ID as Cretarhabdus
Helicolithus trabeculatus	/nn	-799.5	-586.3	
Kamptnerius magnificus	/nn	-795.3	-555.0	
Lithastrinus grillii	/nn	-785.0	-708.4	
Lithraphidites carniolensis	/nn	-799.5	-555.0	
Lithraphidites praequadratus	/nn	-587.8	-555.0	
Lithraphidites quadratus	/nn	-578.3	-555.0	
Lucianorhabdus cayeuxii	/nn	-770.0	-555.0	
Lucianorhabdus maleformis	/nn	-765.0	-735.0	
Manivitella pemmatoidea	/nn	-796.9	-558.4	
Markalius circumradiatus	/nn	-799.5	-717.8	
Markalius inversus	/nn	-697.0	-555.0	
Marthasterites furcatus	/nn	-781.8	-738.3	
Microrhabdulus belgicus	/nn	-678.0	-555.0	
Microrhabdulus decoratus	/nn	-785.0	-555.0	
Microrhabdulus elongatus	/nn	-663.8	-568.8	
Micula concava	/nn	-611.0	-560.8	
Micula decussata	/nn	-790.0	-555.0	
Micula murus	/nn	-565.8	-555.0	
Nephrolithus corystus	/nn	-613.3	-558.4	
Nephrolithus frequens	/nn	-597.2	-555.0	
Parhabdolithus achlyostaurion	/nn	-565.3	-565.3	
Parhabdolithus angustus	/nn	-701.9	-555.0	
Parhabdolithus asper	/nn	-559.8	-559.8	
Parhabdolithus embergeri	/nn	-799.5	-556.3	
Parhabdolithus regularis	/nn	-744.7	-555.0	
Parhabdolithus splendens	/nn	-771.3	-571.3	
Petrarhabdus copulatus	/nn	-668.8	-589.3	
Prediscosphaera arkhangelskyi	/nn	-736.8	-573.5	
Prediscosphaera cretacea	/nn	-799.5	-555.0	
Prediscosphaera grandis	/nn	-769.8	-555.0	
Prediscosphaera spinosa	/nn	-790.3	-555.0	
Quadrum gartneri	/nn	-799.5	-622.2	
Quadrum gothicum	/nn	-687.8	-556.3	
Quadrum trifidum	/nn	-665.3	-612.8	
Reinhardtites levis	/nn	-760.0	-602.0	
Reinhardtites anthophorus	/nn	-799.5	-605.3	
Rhagodiscus reniformis	/nn	-630.5	-568.8	
*this is second lowest base; lowest at 744.5				
*Scapholithus fossilis	/nn	-574.8	*	
Staurolithites aachena	/nn	-766.8	-565.8	ID as Vagalapilla
Tegumentum stradneri	/nn	-799.5	-775.3	
Tetrapodorhabdus decorus	/nn	-795.3	-555.0	ID as Axopodorhabdus
Tranolithus orionatus	/nn	-799.5	-597.2	
Vagalapilla matalosa	/nn	-754.0	-725.5	
Vagalapilla stradneri	/nn	-689.3	-568.3	
Watznaueria barnesae	/nn	-799.5	-555.0	
Watznaueria communis	/nn	-559.8	-559.8	
Zygodiscus diplogrammus	/nn	-796.9	-568.8	

Zygodiscus elegans	/nn	-795.3	-571.3
Zygodiscus spiralis	/nn	-717.8	-555.0

*END

PAL.131 DSDP 516F, Southwest Atlantic Ocean

30.28S, 35.29W, water depth 1313m; Initial Rept. DSDP v. 72, 1983; coring began at 169.1 mbsf, TD at 1270.6 m. Iridium anomaly at 963.92 mbsf, base brown clay above ls @ 963.90m = K/T.

Upper Cretaceous unconformities @ 1017m & 1140m suggested by absence of calcarata zone and series of bases directly above these levels; no lithologic evidence from descriptions or photo logs.

Top Igneous basement @ 1252 mbsf. Paleomagnetostratigraphic interpretation by Berggren et al., p. 939-947, Fig. 2. Cretaceous magnetochrons by Hamilton et al., p. 723 ff.

DATA:

*TAXA	Morph	Base	Top meters	
K-T Iridium anomaly	/gc	-963.92	-963.71	
C25n	/ma	*	-898	
*C25r	/ma	*	*	
C29n	/ma	*	-957	
C29r	/ma	*	-962.5	
C30n	/ma	*	-971	
*C30r	/ma	*	*	
C32n 1n	/ma	*	-1032	
*C32n 1r	/ma	*	*	
*Planktic forams by C. Pujol, DSDP v. 72, p. 636-645; core 516F, Table 6.				
Acarinina acarinata	/fp		-906.8	-900.6 *ID as Globorotalia
Acarinina angulosa	/fp		-851.9	-851.9 *Base @ 860.3 too high
Acarinina broedermanni	/fp		-841.6	-738.1
Acarinina bullbrookii	/fp		-860.3	-701.1
Acarinina collactea	/fp		-692.1	-663.4 ID as Truncorotaloides
Acarinina mckannai	/fp		-929.1	-900.6
Acarinina pentacamerata	/fp		-857.2	-775.9
Acarinina primitiva	/fp		-807.5	-654.1
Acarinina soldadoensis	/fp		-851.9	-857.2 ID as Globigerina
Acarinina triplex	/fp		-903.7	-827.3 ID Globorotalia
Globanomalina pseudomenardii	/fp		-929.1	-906.8 ID as Globorotalia
Globigerina eocaena	/fp		-860.3	-754.7
Globigerina eugubina	/fp		-963.88	*
*ID as Parvularugoglobigerina; base in Hamilton, p. 950				
Globigerina triloculinoides	/fp		-963.75	-889.9
Globigerina velascoensis	/fp		-939.1	-889.9 ID as Acarinina
Globoconusa daubjergensis	/fp		-963.75	-963.60 ID Globigerina
Igorina spiralis	/fp		-949.03	-946.70 ID as Globigerina
Morozovella aequa	/fp		-942.5	-900.6
Morozovella angulata	/fp		-944.03	-935.6
Morozovella aragonensis	/fp		-851.9	-820.9
Morozovella conicotruncata	/fp		-944.0	-938.6
Morozovella convexa	/fp		-950.62	-933.66
Morozovella lehneri	/fp		-741.5	-716.6
Morozovella lensiformis	/fp		-941.6	-941.6 Base @ 900.6 uncertain;
Morozovella praecursoria	/fp		-962.78	-946.7
Morozovella pseudobulloidis	/fp		-963.75	-942.53
Morozovella quetra	/fp		-860.3	-765.9
Morozovella spinulosa	/fp		-835.1	-663.1
Morozovella subbotinae	/fp		-906.6	-906.6 Base @ 916.2 uncertain;
Morozovella uncinata	/fp		-949.03	-945.6
Morozovella velascoensis	/fp		-942.5	-900.6
Muricella pusilla	/fp		-938.6	-919.6 ID as Globorotalia
Parasubbotina varianta	/fp		-963.75	-949.03 ID as Globorotalia
Planorotalites chapmani	/fp		-942.5	-920.0 ID as Globorotalia
Pseudohastigerina wilcoxensis	/fp		-841.6	-779.1
Subbotina frontosa	/fp		-854.7	-701.1 ID as Gg.

Subbotina inconstans	/fp	-962.78	-946.7	ID as Morozovella
Truncorotaloides topilensis	/fp	-814.7	-644.3	
Turborotalia possagnoensis	/fp	-765.9	-693.7	
Turborotalia pomeroli	/fp	-693.7	-578.1	
*Data by W. Weiss, Chapter 31 Appendix for Coniacian-Santonian to Maastrichtian				
Abathomphalus intermedius	/fp	-1016.50	-965.80	*ID as Racemiguembelina
Abathomphalus mayaroensis	/fp	-1016.50	-963.91	
*top from p. 950, Hamilton; top in Appendix = 965.80				
*Dicarinella asymetrica	/fp	-1147.33	-1147.33	
*ID as Globotruncana cf. asymetrica; too hi, do not use				
Dica concavata	/fp	-1196.11	-1181.32	
*ID as Globotruncana cf. concavata				
Gansserina gansseri	/fp	-1016.50	-1001.80	ID as cf.
Globotruncana aegyptiaca	/fp	-1045.96	-964.11	
Globotruncana arca	/fp	-1157.38	-965.80	
Globotruncana bulloides	/fp	-1126.15	-1073.73	highest specimen @ 1056.04
Globotruncana concavata	/fp	-1196.11	-1181.32	ID as cf.
Globotruncana contusa	/fp	-1016.50	-964.11	
Globotruncana coronata	/fp	-1201.01	-1137.61	
Globotruncana falsostuarti	/fp	-1054.04	-1017.95	
Globotruncana fornicata	/fp	-1166.93	-1019.81	reworked top @ -1016.50
Globotruncana galeoidis	/fp	-991.22	-964.11	
Globotruncana insignis	/fp	-1015.21	-1005.77	
Globotruncana lamellosa	/fp	-1016.50	-964.11	
Globotruncana linneiana	/fp	-1136.11	-972.23	
Globotruncana obliqua	/fp	-1077.06	-1062.58	
Globotruncana paraconcavata	/fp	-1197.61	-1149.61	
Globotruncana patelliformis	/fp	-1001.80	-964.11	
Globotruncana renzi	/fp	-1201.01	-1143.61	
Globotruncana rosetta	/fp	-1139.11	-1000.43	
Globotruncana scitula	/fp	-1075.32	-1015.21	
Globotruncana sinuosa	/fp	-1182.73	-1173.74	
Globotruncana stephensoni	/fp	-1137.61	-1025.61	
Globotruncana stuarti	/fp	-1017.95	-964.11	
Globotruncana stuartiformis	/fp	-1139.11	-964.11	
Globotruncana trinidadensis	/fp	-1038.86	-1029.89	
Globotruncana ventricosa	/fp	-1137.61	-1075.32	
Globotruncanella havanensis	/fp	-1054.04	-964.11	
Gublerina cuvillieri	/fp	-1042.33	-964.11	
Gublerina robusta	/fp	-1048.96	-989.91	
Heterohelix globulosa	/fp	-1148.11	-965.80	
Heterohelix pseudotessera	/fp	-1077.06	-1020.91	
Heterohelix planata	/fp	-1119.57	-965.80	
Heterohelix pulchra	/fp	-1142.11	-978.23	
Heterohelix semicostata	/fp	-1016.50	-964.11	
Heterohelix striata	/fp	-1123.92	-964.11	
Planoglobulina acervulinoides	/fp	-1013.26	-964.11	
Planoglobulina brazoensis	/fp	-1015.21	-964.11	
Planoglobulina carseyae	/fp	-1063.58	-965.80	
Pseudoguembelina costulata	/fp	-1109.11	-965.80	
Pseudoguembelina costata	/fp	-1016.50	-964.11	
Pseudoguembelina palpebra	/fp	-1013.26	-965.80	
Pseudotextularia elegans	/fp	-1157.38	-964.11	
Pseudotextularia deformis	/fp	-1024.40	-964.11	
Pseudotextularia fructicosa	/fp	-1016.50	-964.11	*as Racemiguembelina
Rugoglobigerina hexacamerata	/fp	-1032.06	-972.23	
Rugoglobigerina milamensis	/fp	-1038.86	-974.72	
Rugoglobigerina rugosa	/fp	-1122.58	-964.11	
Ventilabrella eggeri	/fp	-1182.73	-1139.11	
*Benthic Forams (data from Dailey in 516F, Appendix, p. 770-772)				
Alabama creta	/FB	-1054.9	-914.8	
Allomorphina minuta	/FB	-1106.8	-906.8	
Allomorphina trochoides	/FB	-1198.4	-964.1	

<i>Ammodiscus cretaceus</i>	/FB	-1139.3	-965.5	
<i>Anomalinoides welleri</i>	/FB	-963.1	-901.9	
<i>Aragonia velascoensis</i>	/FB	-1037.9	-914.8	
<i>Astacolus gibbus</i>	/FB	-981.4	-906.8	
<i>Astacolus richteri</i>	/FB	-1125.5	-964.6	
<i>Bolivinooides delicatulus</i>	/FB	-963.88	-906.8	
<i>Bolivinooides draco draco</i>	/FB	-1045.5	-963.5	
<i>Bolivinooides draco miliaris</i>	/FB	-1106.8	-989.9	
<i>Bolivinooides granulatus</i>	/FB	-1139.3	-989.9	
<i>Bolivinooides strigilatus</i>	/FB	-1198.4	-1175.4	
<i>Bulimina beaumonti</i>	/FB	-947.9	-906.8	
<i>Bulimina midwayensis</i>	/FB	-965.5	-910.4	
<i>Bulimina trinitatensis</i>	/FB	-963.80	-929.3	
<i>Bulimina velascoensis</i>	/FB	-951.6	-901.9	
<i>Cibicidoides dayi</i>	/FB	-964.00	-959.5	
<i>Cibicidoides pseudoperlucidus</i>	/FB	-947.9	-901.9	
<i>Coryphostoma incrassata</i>	/FB	-1054.9	-970.7	
<i>Coryphostoma limonense</i>	/FB	-1069.4	-906.8	
<i>Dentalina basiplanata</i>	/FB	-1139.3	-963.80	
<i>Dentalina gracilis</i>	/FB	-1008.2	-964.0	
<i>Dentalina legumen</i>	/FB	-1106.8	-963.5	
<i>Dorothia belooides</i>	/FB	-959.5	-901.9	
<i>Dorothia bulletta</i>	/FB	-1198.4	-964.6	
<i>Dorothia cubensis</i>	/FB	-963.85	-906.8	
<i>Dorothia oxycona</i>	/FB	-1198.4	-959.5	
<i>Dorothia pupa</i>	/FB	-1096.5	-1032.0	
<i>Dorothia retusa</i>	/FB	-1139.3	-929.5	
<i>Ellipsoglandulina exponens</i>	/FB	-1184.3	-963.84	
<i>Ellipsopolymorphina velascoensis</i>	/FB	-1175.4	-1001.8	
<i>Eouvigerina americana</i>	/FB	-974.2	-963.80	
<i>Fissurina alata</i>	/FB	-1153.5	-906.8	
<i>Fissurina orbignyana</i>	/FB	-1106.8	-916.1	
<i>Gaudryina laevigata</i>	/FB	-1198.4	-1045.5	
<i>Gaudryina pyramidata</i>	/FB	-1106.8	-921.6	
<i>Gavelinella beccariiiformis</i>	/FB	-1198.4	-906.8	
<i>Gavelinella danica</i>	/FB	-1008.2	-906.8	
<i>Gavelinella eriksdalensis</i>	/FB	-1198.4	-964.0	
<i>Gavelinella hyphalus</i>	/FB	-970.7	-906.8	
<i>Gavelinella nacatohensis</i>	/FB	-1184.3	-989.9	
<i>Gavelinella stephensoni</i>	/FB	-1125.5	-981.4	
<i>Gavelinella velascoensis</i>	/FB	-1096.5	-906.8	
<i>Globorotalites conicus</i>	/FB	-1025.6	*	
* <i>Globorotalites multiseptus</i>	/FB	-1198.4	-1175.4	*Unknown taxon
<i>Globulina subsphaerica</i>	/FB	-1106.8	-916.1	
<i>Glomospira gordialis</i>	/FB	-1125.5	-961.7	
<i>Guttulina communis</i>	/FB	-962.8	-910.4	
<i>Gyroidinoides beisseli</i>	/FB	-1198.4	-1001.8	
<i>Gyroidinoides depressus</i>	/FB	-1059.7	-906.8	
<i>Gyroidinoides girardanus</i>	/FB	-1079.9	-906.8	
<i>Gyroidinoides globosus</i>	/FB	-1153.5	-901.9	
<i>Gyroidinoides goudkoffi</i>	/FB	-1175.4	-1001.8	
<i>Gyroidinoides nitidus</i>	/FB	-1198.4	-964.0	
<i>Gyroidinoides octocameratus</i>	/FB	-962.20	-906.8	
<i>Gyroidinoides praeglobosus</i>	/FB	-1198.4	-1175.4	
<i>Gyroidinoides quadratus</i>	/FB	-1153.5	-914.8	
<i>Lagena gracilis</i>	/FB	-964.6	-906.8	
<i>Lagena hispida</i>	/FB	-1145.4	-962.9	
<i>Lagena sulcata</i>	/FB	-1139.3	-929.5	
<i>Lenticulina macrodisca</i>	/FB	-1125.5	-901.9	
<i>Lenticulina midwayensis</i>	/FB	-962.9	-901.9	
<i>Lenticulina muensteri</i>	/FB	-1198.4	-965.5	
<i>Lenticulina velascoensis</i>	/FB	-1037.9	-906.8	
<i>Lenticulina whitei</i>	/FB	-939.1	-901.9	

Neoeponides hillebrandti	/FB	-1069.4	-906.8
Neoeponides lunata	/FB	-1059.7	-916.2
Neoflabellina semireticulata	/FB	-962.8	-910.4
Nodosaria velascoensis	/FB	-1045.5	-901.9
Nonion havanense	/FB	-965.5	-901.9
Nuttallides trumpyi	/FB	-1096.5	-901.9
Nuttallinella florealis	/FB	-1139.3	-981.4
Oolina apiculata	/FB	-1008.2	-929.3
Oolina morsei	/FB	-1153.5	-910.4
Oridorsalis biconvexa	/FB	-1121.0	-1088.1
Oridorsalis umbonatus	/FB	-1001.8	-901.9
Osangularia cordieriana	/FB	-1184.3	-1025.6
Osangularia lens	/FB	-965.5	-963.85
Osangularia plummerae	/FB	-963.80	-959.5
Osangularia velascoensis	/FB	-963.85	-939.1
Planularia liebusi	/FB	-1184.3	-1106.8
Pleurostomella subnodosa	/FB	-1175.4	-1017.9
Praebulimina carshyae	/FB	-1096.5	-970.7
Praebulimina cushmani	/FB	-1139.3	-970.7
Praebulimina reussi	/FB	-1198.4	-963.8
Praebulimina triangularis	/FB	-1054.9	-989.9
Pseudouvierina plummerae	/FB	-1079.9	-989.9
Pullenia coryelli	/FB	-1198.4	-906.7
Pullenia cretacea	/FB	-1153.5	-964.6
Pullenia jarvisi	/FB	-1115.8	-906.8
Pyramidina rudita	/FB	-1069.4	-916.2
Quadriformina allomorphinoides	/FB	-1198.4	-910.4
Reussella szajnochae	/FB	-1121.0	-981.4
Saracenaria navicula	/FB	-1125.5	-1037.9
Saracenaria triangularis	/FB	-1096.5	-966.2
Spiroplectamina dentata	/FB	-981.4	-962.9
Spiroplectamina praelonga	/FB	-1121.0	-1008.2
Spiroplectamina spectabilis	/FB	-963.81	-906.8
Spiroplectamina subhaeringensis	/FB	-962.80	-914.8
Tritaxia amorpha	/FB	-1153.5	-1098.1
Tritaxia aspera	/FB	-1096.5	-945.1
Tritaxia globulifera	/FB	-963.96	-906.8
Tritaxia trilatera	/FB	-1115.8	-914.6

*Nannoplankton data from summary section, p. 170; no check list available.

*many data reported as occurring somewhere within a core interval, but not precise.

*so depths of core section base used for a top and the section top for a base.

*At K/T boundary Danian nannos overlap with Maastrichtian forams evidently

*because the nannos are piped down into Maast limestone (see p. 949).

Arkhangelskiella cymbiformis	/nn	-1023.6	-1014.6
Biantholithus sparsus	/nn	-963.8	*
*963.93 base in Hamilton, p. 950 down-section contamination			
Broinsonia parca parca	/nn	-1172.1	-1154.1
Ceratolithoides aculeus	/nn	-1118.1	-1104.6
Cruciplacolithus tenuis	/nn	-961.4	-961.2
Discoaster lodoensis	/nn	-860	-859.6
Discoaster mohleri	/nn	-921.5	*
Discoaster multiradiatus	/nn	-913.1	-910
Discoaster sublodoensis	/nn	-859.6	-786.1
Ellipsolithus macellus	/nn	-943.5	*
Fasciculithus tympaniformis	/nn	-942.1	-937.1
Helicolithus kleinpellii	/nn	-935.6	-921.5
Helicolithus riedelii	/nn	-920.0	-914.7
Lithraphidites quadratus	/nn	-1006.8	-1005.1
Isthmolithus recurvus	/nn	*	-577.6
Markalius inversus	/nn	-963.8	-961.2
Marthasterites furcatus	/nn	-1239.6	*

*this top is too young, may be reworked @ -1127.1

Micula murus	/nn	-976.6	-963.94
Nephrolithus frequens	/nn	-995.6	-967.1
Quadrum gothicum	/nn	-1109.1	-1095.6
Quadrum trifidum	/nn	-1095.6	-1029.6
Sullivania danica	/nn	-961.4	-946.2 *ID as Chiasmolithus

*END

*PAL.141 ODP 752A+B, Broken Ridge, Indian Ocean
 30 deg 53.475'S, 93 deg 34.652'E; *Proc. ODP Init. Rept. v. 121, p. 111 ff.
 *Sea floor @ 1415 m; TD @ 435.6 mbsf; *Begin Upper Cretaceous data at about 300 mbsf.

Data:

*TAXA	Morph	Base	Top mbsf
*Geochemical Data from Michel et al., 1991, ODP Proc. Sci Results, 121:415.			
K-T Iridium anomaly	/gc	-358.73	-358.71
*Data from Pospichal et al., Proc. ODP Sci. Results, v. 121, 721-741.			
*Incomplete recovery results in depressed tops			
C26n	/ma *	*	-229.1
C26r	/ma *	*	-232.1
C27n	/ma *	*	-306.7
C27r	/ma *	*	-312.2
C28n	/ma *	*	-336.8
C28r	/ma *	*	-345.3
C29n	/ma *	*	-346.8
*C29r	/ma *	*	*
C30n	/ma *	*	-364.7
C30r	/ma *	*	-387.5
*C31n	/ma *	*	-393.3; too low
C31r	/ma *	*	-396.2
*Data from van Eijden & Smit, Proc. ODP Sci. Results, 121:77ff.			
Globigerina triloculinoides	/fp	-345.1	-209.8
Morozovella pseudobulloides	/fp	-352.7	-298.2
Planorotalites compressus	/fp	-348.9	-298.2
Abathomphalus mayaroensis	/fp	-412.6	-358.8
Archaeoglobigerina blowi	/fp	-435.6	-369.8
Globotruncana arca	/fp	-431.7	-358.8
Globotruncana linneiana	/fp	-422.3	-403.0
Globotruncanella havanensis	/fp	-387.4	-387.4
Heterohelix globulosa	/fp	-422.3	-364.4
Heterohelix planata	/fp	-435.6	-358.8
Heterohelix punctulata	/fp	-387.4	-358.8
Planoglobulina acervulinooides	/fp	-364.4	-358.8
Pseudoguembelina palpebra	/fp	-393.3	-364.4
Rugoglobigerina hexacamerata	/fp	-435.6	-412.6
Rugoglobigerina rugosa	/fp	-435.6	-358.8
*Nanno data from Pospichal, 1991, ODP Proc. Sci Results, 121:395-410, Table 1.			
Biantholithus sparsus	/nn	-358.2	-354.7
Biscutum castrorum	/nn	-358.8	-349.6
Biscutum constans	/nn	-369.3	-358.7
Coccolithus pelagicus	/nn	-355.0	-349.0
Cruciplacolithus primus	/nn	-355.8	-349.0
Cruciplacolithus tenuis	/nn	-353.9	-349.0
Cyclagelosphaera reinhardtii	/nn	-358.5	-352.9
Prinsius tenuiculum	/nn	-353.4	-349.0
Ahmueллерella octoradiata	/nn	-372.3	-356.2
Arkhangelskiella cymbiformis	/nn	-373.0	-354.0
Cretarhabdus conicus	/nn	-373.0	-355.8
Cribrosphaerella ehrenbergii	/nn	-373.0	-354.0
Cribrosphaerella daniae	/nn	-373.0	-354.0

Eiffellithus turriseiffelii	/nn	-373.0	-353.5
Kamptnerius magnificus	/nn	-373.0	-351.1
Lithraphidites quadratus	/nn	-367.8	*
Markalius inversus	/nn	-368.5	-349.0
Micula decussata	/nn	-373.0	-349.6
Nephrolithus frequens	/nn	-373.0	-354.7
Neocrepidolithus cruciatus	/nn	-358.5	-351.4
Prediscosphaera cretacea	/nn	-373.0	-354.7
Prediscosphaera spinosa	/nn	-373.0	-354.3
Prediscosphaera stoveri	/nn	-373.0	-354.0
Zeugrhabdotus sigmoides	/nn	-371.5	-349.0
*ID as Zygodiscus; second base @ 358.7			
Zygodiscus spiralis	/nn	-373.0	-355.8
*END			

PAL.151 DSDP 550+550B, Porcupine Basin, NE Atlantic

*DSDP v. 80, Pt. 1, 1985, p. 251-355. Unconformities at 310.00 mbsf, 310.70, 425.50, 468.85, and 575.00 m. *Begin Upper Cretaceous data at 470 mbsf.

DATA:

*TAXA	Morph	Base	Top mbsf		
*Data from Townsend, 1985, v. 80, Pt. 1, p. 389-414, Table 4, Figs. 16 & 17.					
C28r	/ma	*	-461.78		
C29n	/ma	*	-466.73		
C29r	/ma	*	-468.71		
C30n	/ma	*	-478.21		
*C30r	/ma	*	*		
C31n	/ma	*	-513.75		
C31r	/ma	*	-525.21		
C32n 1n	/ma	*	-526.81		
C32n 1r	/ma	*	-536.80		
C32n 2n	/ma	*	-544.64		
C32r 1r	/ma	*	-548.17		
C32r 1n	/ma	*	-551.35		
C32r 2r	/ma	*	-555.78		
C33n	/ma	*	-560.82		
*Data from Snyder & Waters, 1985, v. 80, Pt. 1, p. 439-472					
Chiloguembelina midwayensis	/fp		-468.8	-427.02	
Globoconusa daubjergensis	/fp		-468.8	-460.55	*ID as Eoglobigerina
Morozovella pseudobulloides	/fp		-468.8	-427.02	
Morozovella trinidadiansis	/fp		-468.8	-451.04	
Subbotina inconstans	/fp		-468.8	-468.60	
Subbotina triloculinoides	/fp		-468.8	-427.02	
*Data in DSDP v. 80, Pt. 1, p. 267-268.					
Globotruncana arca	/fp		-503	-469	
Globotruncana contusa	/fp		-503	-469	
Globotruncana stuarti	/fp		-503	-469	
Pseudotextularia elegans	/fp		-503	-469	
*Nannofossils by Muller, 1985, DSDP vol. 80, Pt. 1, p. 573-597, Tables 9, 10, 11.					
Arkhangelskiella cymbiformis	/nn		-552.0	-468.9	
Biantholithus sparsus	/nn		-468.8	-468.8	
Broinsonia parca parca	/nn		-570.1	-524.8	
Cribrosphaerella ehrenbergii	/nn		-570.0	-477.2	
Eiffellithus turriseiffelii	/nn		-573.6	-477.2	
Kamptnerius magnificus	/nn		-570.1	-468.9	
Lithraphidites quadratus	/nn		-524.3	-485.2	
Lucianorhabdus cayeuxii	/nn		-570.0	-526.5	
Manivitella pemmatoidea	/nn		-524.8	-477.2	
Microrhabdulus decoratus	/nn		-570.1	-475.0	
Micula decussata	/nn		-573.6	-468.9	
Micula murus	/nn		-513.3	-468.9	

Nephrolithus frequens	/nn	-494.0	-477.2
Parhabdolithus regularis	/nn	-497.3	-477.2
Prediscosphaera cretacea	/nn	-573.6	-468.9
Reinhardtites anthophorus	/nn	-570.1	-524.8
Watznaueria barnesae	/nn	-573.6	-475.0

*END

PAL.161 DSDP 548A, NE Atlantic

Graciansky et al., 1985, Init. Repts DSDP, 80:33-59. Begin Upper Cretaceous data at about 450 mbsf.

DATA:

*TAXA	Morph	Base	Top mbsf
*Magnetochron data from Townsend, 1985, DSDP 80:389-414, Table 2, Fig. 6.			
C29r	/ma	*	-471.2
C30n	/ma	*	-476.5
C30r	/ma	*	-500.5
C31n	/ma	*	-501.8
C31r	/ma	*	-509.9
C32n 1n	/ma	*	-512.1
*Plank foram data from Snyder & Waters, 1985, DSDP 80:439-472, Fig. 3			
Morozovella aequa	/fp		-468.6 -459.1
Morozovella formosa gracilis	/fp		-465.7 -415.1
Morozovella lensiformis	/fp		-465.7 -413.4
Morozovella marginodentata	/fp		-468.6 -440.5
Morozovella pseudobulloides	/fp		-471.3 -471.3 *ID as Subbotina
Morozovella quetra	/fp		-462.6 -435.8
Morozovella spinulosa	/fp		-411.8 -376.9
Morozovella subbotinae	/fp		-468.6 -413.4
Planorotalites chapmani	/fp		-466.9 -435.8
Planorotalites compressus	/fp		-471.3 -471.3
Subbotina inconstans	/fp		-471.3 -471.3
Subbotina triloculinoides	/fp		-471.3 -471.3
Subbotina velascoensis	/fp		-468.6 -453.1
*Nanno data from Mueller, 1985, DSDP 80:573-599, Tables 3-5			
Biantholithus sparsus	/nn		-471.5 -471.5
Cruciplacolithus tenuis	/nn		-471.5 -469.9
Discoaster multiradiatus	/nn		-469.8 -465.6
Ellipsolithus macellus	/nn		-469.5 -451.1
Ericsonia subpertusa	/nn		-471.5 -469.6
Fasciculithus tympaniformis	/nn		-469.5 -469.5
Markalius inversus	/nn		-471.5 *
Neochiastozygus junctus	/nn		-469.5 -462.6
Neococcolithes dubius	/nn		-462.6 * -367.4
Rhomboaster cuspis	/nn		-469.5 -469.5
Toweius callosus	/nn		-469.8 -436.3
Zygrhablithus bijugatus	/nn		-471.5 * -344.0
*Cretaceous Nannos from Mueller, Table 6			
Arkhangelskiella cymbiformis	/nn		-535.5 -471.5
Broinsonia parca parca	/nn		-535.5 -509.5
Chiastozygus litterarius	/nn		-481.9 -471.5
Cribrosphaerella ehrenbergii	/nn		-535.5 -471.5
Eiffellithus eximius	/nn		-535.5 -528.9
Eiffellithus turriseiffelii	/nn		-535.5 -471.5
Kamptnerius magnificus	/nn		-535.5 -471.5
Lithraphidites quadratus	/nn		-509.5 -471.5
Lucianorhabdus cayeuxii	/nn		-535.5 -473.5
Manivitella pemmatoidea	/nn		-535.5 -473.5
Microrhabdulus decoratus	/nn		-535.5 -471.5
Micula decussata	/nn		-528.5 -471.5
Micula murus	/nn		-490.5 -471.5
Nephrolithus frequens	/nn		-477.0 -475.0

Parhabdolithus embergeri	/nn	-477.0	-471.5
Prediscosphaera cretacea	/nn	-535.5	-471.5
Reinhardtites anthophorus	/nn	-535.5	-509.5
Watznaueria barnesae	/nn	-535.5	-471.5

*END

PAL.211 DSDP 690B Weddell Sea Antarctic Ocean

65.16S, 1.20E, water depth 2914 m; Composite section 0-321.2 mbsf, Pleist-Camp above basalt;
 *First graph round shows some magnetochrons too low, so they have been withheld. Ttop Cretaceous
 basalt @ 319.7 mbsf. Revisions by Ramsay & Balduf, 1999, Geol. Soc. Mem. 18, Table 11, p. 37.
 Unconformities @ 18.30, 42.00, 51.50, & 91.00 m; top Upper Cretaceous data at about 240 mbsf.

DATA:

*Taxa	Morph	Base	Top mbsf
		*Data from Hamilton, 1990, p. 258, Table 1.	
*C29n	/ma	*	*
C29r	/ma	*	-247.55
C30n	/ma	*	-252.28
*C31r	/ma	*	-272.25 *at this position it is too young
C32n 1n	/ma	*	-283.39
C32r 1r	/ma	*	-302.78
C33n	/ma	*	-308.02
		*Data from Wei & Wise, 1990, ODP Sci. Results, v. 113, Table 2, p. 639ff	
		*Pospichal & Wise, 1990, Table 1, p. 520;	
		*Pospichal & Wise, 1990, Tables 3, 4, 5, p. 622-628.	
Biantholithus sparsus		/nn	-248.31 -247.08
Hornibrookina edwardsii		/nn	-248.73 -247.08
		*Cret Taxa (Pospichal & Wise, 1990, Table 2, p. 470-471 & Table 1, p. 520-521)	
Acuturris scotus		/nn	-316.4 -247.08
Ahmuellerella octoradiata		/nn	-312.94 -247.08
Arkhangelskiella cymbiformis		/nn	-316.4 -247.90
Arkhangelskiella specillata		/nn	-316.4 -247.90
Bidiscus rotatorius		/nn	-303.69 -274.67
Biscutum castrorum		/nn	-271.40 -247.08
Biscutum constans		/nn	-316.4 -265.11
Biscutum coronum		/nn	-316.4 -292.59
Biscutum dissimilis		/nn	-311.44 -281.10
Biscutum magnum		/nn	-314.44 -277.76
Biscutum notaculum		/nn	-314.44 -274.17
Broinsonia enormis		/nn	-316.4 -314.44
Calculites obscurus		/nn	-314.44 -282.41
Centosphaera barbata		/nn	-286.90 *
Chiastozygus garrisonii		/nn	-314.44 -263.61
Cretarhabdus conicus		/nn	-316.4 -247.08
Cretarhabdus surirellus		/nn	-314.44 -274.17
Cribrosphaerella daniae		/nn	-286.90 -247.08
Cribrosphaerella ehrenbergii		/nn	-314.44 -247.08
Cyclagelosphaera margerelii		/nn	-314.44 -298.24
Cyclagelosphaera reinhardtii		/nn	-302.20 -227.90
Eiffellithus turrisieffellii		/nn	-316.4 -247.08
Gartnerago obliquum		/nn	-316.4 -247.23
Gartnerago segmentatum		/nn	-316.4 -247.90
Kamptnerius magnificus		/nn	-314.44 -247.08
Lucianorhabdus arcuatus		/nn	-288.41 -283.91
Lucianorhabdus cayeuxii		/nn	-316.4 -282.41
Markalius inversus		/nn	-304.99 *
Micula decussata		/nn	-316.4 -247.41
Misceomarginatus pleniporus		/nn	-314.44 -283.91
Monomarginatus pectinatus		/nn	-314.44 -274.17
Monomarginatus quaternarius		/nn	-306.71 -274.17
Neocrepidolithus watkinsii		/nn	-316.4 -291.11

Nephrolithus corystus	/nn	-304.99	-274.17	
Nephrolithus frequens	/nn	-277.76	-247.08	
Octocyclus magnus	/nn	-304.99	-301.72	
Prediscosphaera cretacea	/nn	-316.4	-247.08	
Prediscosphaera spinosa	/nn	-316.4	-247.69	
Prediscosphaera stoveri	/nn	-316.4	-247.08	
Psyktosphaera firthii	/nn	-303.69	-282.41	
Reinhardtites levis	/nn	-314.44	-281.10	
Rhombolithion rhombicum	/nn	-306.71	-291.11	
*ID as Corollithion				
Teichorhabdus ethmos	/nn	-310.10	-283.91	
Tranolithus orionatus	/nn	-316.4	-303.69	
Watznaueria barnesae	/nn	-314.44	-247.90	
Zeugrhabdotus bicrescenticus	/nn	-314.44	-281.10	*ID as Zygodiscus compactus
Zeugrhabdotus sigmoides	/nn	-316.4	*	*ID as Zygodiscus
Zygodiscus diplogrammus	/nn	-306.71	-292.59	
Zygodiscus spiralis	/nn	-316.4	-247.90	

*Data from Stott & Kennett, 1990, ODP v. 113, chap. 34, Appendix II.

*top Oligocene spl. @ about 63.46 mbsf

*top Eocene spl @ about 93.95

*top Paleocene spl. @ 171.76

*top Cretaceous spl. @ 247.818, base Paleocene spl. @ 247.815 (p. 520)

Abathomphalus mayaroensis	/fp	-278.3	-246.31	
Chiloguembelina midwayensis	/fp	-247.75	-247.68	
Chiloguembelina taurica	/fp	-247.75	-246.31	
Eoglobigerina fringa	/fp	-248.24	-246.15	
Eoglobigerina edita	/fp	-248.24	-247.22	
Eoglobigerina eobulloides	/fp	-247.68	-246.15	
*Gansserina gansseri	/fp	-316.78	-234.3	
*top in Paleogene is consistent occurrence!; ID as Hedbergella monmouthensis				
*Hedbergella monmouthensis	/fp	-316.78	-252.90	
Globoconusa daubjergensis	/fp	-247.68	-231.46	
Heterohelix glabrans	/fp	-251.96	-246.31	
Heterohelix globulosa	/fp	-251.96	-246.31	
Heterohelix pulchra	/fp	-251.96	-247.75	
Igorina spiralis	/fp	-246.31	-206.64	
Morozovella pseudobulloides	/fp	-247.75	*	
Parasubbotina varianta	/fp	-224.7	-210.56	*ID as Subbotina
Planorotalites compressus	/fp	-247.22	-226.96	
Subbotina inconstans	/fp	-236.56	-223.6	
Subbotina triangularis	/fp	-246.85	*	
Subbotina triloculinoides	/fp	-247.68	*	
*Cret Taxa (Huber, 1990, Table 3, p. 496-497)				
Abathomphalus intermedius	/fp	-282.29	-252.90	
Abathomphalus mayaroensis	/fp	-281.10	-252.90	
Archaeoglobigerina australis	/fp	-316.78	-252.90	
Archaeoglobigerina mateola	/fp	-316.78	-255.14	
Globigerinelloides multispinata	/fp	-316.78	-252.90	
Globigerinelloides impensus	/fp	-316.78	-315.17	
Globigerinelloides subcarinatus	/fp	-272.59	-252.90	
Globotruncana bulloides	/fp	-286.79	-274.00	
Globotruncana subcircumnodifer	/fp	-290.80	-281.10	
Globotruncanella citae	/fp	-255.14	*	
Globotruncanella havanensis	/fp	-308.58	-265.99	
Globotruncanella petaloidea	/fp	-283.79	-252.90	
Gublerina robusta	/fp	-281.10	-261.80	
Guembelitra cretacea	/fp	-297.86	-252.90	
Hedbergella holmdelensis	/fp	-316.78	-303.08	
Hedbergella sliteri	/fp	-308.58	-252.90	
Heterohelix dentata	/fp	-316.78	-252.90	
Heterohelix globulosa	/fp	-316.78	-252.90	
Heterohelix planata	/fp	-316.78	-252.90	
Rugotruncana circumnodifer	/fp	-290.80	-254.40	

Schackoina multispinata /fp -316.78 -282.29
 *END

PAL.2b Gubbio, Bottaccione Gorge, Italy

Tremolada 2002, *Revista Italiana di Paleontologia e Stratigrafia*, 108:441-456;
 Appendices 1-4; outcrop measured from base 0m up to 500m. Premoli Silva & Sliter, 1994,
Paleontographia Italica, 82:1-89. Scisti a Fucoidi Fm. 0-47m; top Scaglia Bianca 115m; top Scaglia Rossa
 380m.

DATA:

*TAXA	Morph	Base	Top m		
		*Premoli Silva & /Sliter, 1994, p. 17			
C29r	/ma	*	374		
C30n	/ma	*	368		
C30r	/ma	*	360.8		
C31n	/ma	*	360.6		
C31r	/ma	*	350		
C32n 1n	/MA	*	330		
C32n 1r	/MA	*	327		
C32n 2n	/MA	*	324		
C32r 1n	/MA	*	*		
C32r 1r	/MA	*	*		
C32r 2r	/MA	*	314		
C33n	/MA	*	307		
C33r	/MA	*	244		
*Top Maastricht	/ma	*	372.6		
		*Tremolada, Appendices 1-4			
Arkhangelskiella cymbiformis	/nn		217	224	
Assipetra infracretacea	/nn		0.6	5.48	
Axopodorhabdus albianus	/nn		15.74	90.27	
Braarudosphaera africana	/nn		8.8	9.65	
Braarudosphaera regularis	/nn		1.32	5.86	
Biscutum constans	/nn		0.6	110.66	
		*Top last consistent occurrence			
Broinsonia parca parca	/nn		220	224	
Broinsonia signata	/nn		79.7	150	
Calculites obscurus	/nn		191	221	
Chiastozygus litterarius	/nn		0.6	224	
Corollithion achylosum	/nn		8.8	93.65	ID as Stoverius
Corollithion exiguum	/nn		50.65	87.14	
Corollithion kennedyi	/nn		68.74	110.78	
Cretarhabdus angustifloratus	/nn		1.32	54.84	
Cretarhabdus conicus	/nn		1.05	223	
Cretarhabdus surirellus	/NN		0.6	224	
Cribrosphaerella ehrenbergii	/nn		8.6	224	
Cyclagelosphaera margerelii	/NN		1.32	133	
Diazomatolithus lehmanii	/nn		5.86	51.48	
Discorhabdus rotatorius	/nn		0.6	224	
Eiffellithus eximius	/nn		112.94	224	
Eiffellithus monechiae	/nn		35.55	52.61	
Eiffellithus turriseiffelii	/nn		37.8	223	
*Eprolithus eptapetalus	/nn		114.86	115.17	Synonym of E. moratus
Eprolithus moratus	/nn		113.07	216	In Lithastrinus
Eprolithus octopetalus	/nn		112.94	141	
Flabellites oblonga	/nn		0.6	50.65	
Gartnerago nanum	/nn		91.66	108.71	
Gartnerago obliquum	/nn		109.52	217	
Gephyrorhabdus coronadventis	/nn		1.05	66.43	
Grantarhabdus coronadventis	/nn		1.05	53.93	
Helenea chiastia	/nn		0.6	111.95	
Kamptnerius magnificus	/nn		119	165	

Lithraphidites acutum	/nn	93.16	106.12
Lithraphidites carniolensis	/nn	2.09	224
Lithastrinus floralis	/nn	0.6	171
*Lordia xenotus	/nn	may be z.	
Lucianorhabdus cayeuxii	/nn	184	195
Lucianorhabdus maleformis	/nn	165	220
Manivitella pemmatoidea	/nn	51.01	224
Marthasterites furcatus	/nn	150	187
Microrhabdulus decoratus	/nn	107.92	222.5
Microrhabdulus stradneri	/nn	0.6	52.98 ID as v.
Micula concava	/nn	179	215
Micula decussata	/nn	173	222
Nannoconus truitti	/nn	0.6	159.5
Parhabdolithus achlyostaurion	/nn	23.61	223.5
Parhabdolithus angustus	/nn	1.32	176
Parhabdolithus asper	/nn	0.6	114.68
Parhabdolithus embergeri	/nn	8.6	224
Parhabdolithus splendens	/nn	1.32	64.34
*Top is last persistent occurrence			
Prediscosphaera columnata	/nn	5.86	108.77
Prediscosphaera cretacea	/nn	61.12	222.5
Prediscosphaera spinosa	/nn	6.93	54.84
Quadrum gartneri	/nn	112.59	224
Reinhardtites anthophorus	/nn	175	223.5
Reinhardtites fenestratus	/nn	7.53	62.75 Second highest occurrence
Rucinolithus irregularis	/nn	0.6	54.65
Rucinolithus terebrodentarius	/nn	0.6	141
Tegumentum stradneri	/nn	0.6	108.04
*Top is last persistent occurrence			
Tranolithus orionatus	/nn	34.78	221
Vagalapilla matalosa	/nn	41.05	54.65
*Top is last persistent occurrence			
Watznaueria barnesae	/nn	0.6	224
Watznaueria britannica	/nn	1.32	54.84
Watznaueria communis	/nn	0.6	224
Watznaueria manivitiae	/nn	0.6	224
Zeugrhabdotus elegans	/nn	0.6	222
Zygodiscus diplogrammus	/nn	1.05	224
*Premoli Silva & Sliter, Tables 1-6			
Marker bed Bonarelli	/mb	111	*
Abathomphalus mayaroensis	/fp	350	372.6
Archaeoglobigerina blowi	/fp	144	365
Archaeoglobigerina cretacea	/fp	143	349
Biti breggiensis	/FP	28	51.2
Biti subbreggiensis	/FP	27.4	33
Dica algeriana	/fp	74.5	140
Dicarinella asymetrica	/fp	181	222
Dica canaliculata	/fp	97.5	176
Dica concavata	/fp	149	221.5
Dica hagni	/fp	110.95	135
Dica imbricata	/fp	96.3	176
Dica primitiva	/fp	141	165 Second high occurrence
Gansserina gansseri	/fp	318	360
Glob'oides bentonensis	/fp	27.4	73
Glob'oides bollii	/fp	144	323
Glob'oides caseyi	/fp	49.5	218
Globigerinelloides subcarinatus	/fp	204.5	372.6
Glob'oides ultramicrus	/fp	32	365
Globotruncana aegyptiaca	/fp	309	372.6
Globotruncana arca	/fp	195	372.6
Globotruncana bulloides	/fp	204.5	350
Globotruncana calcarata	/fp	288	298 In Radotruncana
Globotruncana conica	/fp	333	345 In Globotruncanita

Globotruncana contusa	/fp	343	372.6	In Contusotruncana
Globotruncana elevata	/fp	204.5	287	In Globotruncanita
Globotruncana falsostuarti	/fp	286	355	
Globotruncana fornicata	/fp	163	350	In Contusotruncana
Globotruncana lapparenti	/fp	166	365	
Globotruncana linneiana	/fp	298	360	
Globotruncana mariei	/fp	230.5	360	
Globotruncana patelliformis	/fp	250	355	In Contusotruncana
Globotruncana rosetta	/fp	246	372.6	
Globotruncana stuarti	/fp	303	372.6	
Globotruncana stuartiformis	/fp	209	372.6	
Globotruncana subspinosa	/fp	287	300	In Radotruncana
Globotruncana ventricosa	/fp	244	347	
Globotruncanella havanensis	/fp	290	372.6	
Globotruncanella petaloidea	/fp	300	372.6	
Hedb delrioensis	/fp	27.4	211.5	
Hedbergella flandrini	/fp	134	***	top at 281 too high
Hedb gorbachikae	/fp	33.7	40.1	
Hedbergella holmdelensis	/fp	222	372.6	
Hedbergella monmouthensis	/fp	268	372.6	
Hedb planispira	/fp	27.4	269	
Hedb simplex	/fp	33	178	
Helv'ana helvetica	/fp	117	133	
Heterohelix glabrans	/fp	252	372.6	
Hete globulosa	/fp	192	372.6	
Heterohelix moremani	/fp	45.7	220	
Hete navarroensis	/fp	333	372.6	
Hete pulchra	/fp	195	365	
*Placed in Laeviheterohelix by S. Nederbragt				
Heterohelix pulchra	/fp	195	365	
Heterohelix reussi	/fp	92.4	232	
Heterohelix striata	/fp	222	372.6	
Marginotruncana coronata	/fp	132	279	
Marginotruncana marginata	/fp	135	230.5	
Marginotruncana marianosi	/fp	129	140	Second high occurrence
Marginotruncana pseudolinneiana	/fp	129	259	
Marginotruncana renzi	/fp	120	214	
Marginotruncana schneegansi	/fp	126	217	Second high occurrence
Marginotruncana sigali	/fp	120	230.5	
Marginotruncana sinuosa	/fp	133	181	
Marginotruncana tarfayaensis	/fp	137	144	
Planoglobulina acervulinoidea	/fp	318	372.6	
Planoglobulina carseyae	/fp	320	360	
Planomalina buxtorfi	/fp	49.5	59.8	
Planomalina praebuxtorfi	/fp	47.2	53.8	
Praeglobotruncana delrioensis	/fp	46.5	86.8	
Praeglobotruncana stephani	/fp	49	130	
Pseudoguembelina costulata	/fp	226.5	360	
Pseudotextularia deformis	/fp	312	370	
Pseudotextularia elegans	/fp	221.5	372.6	
Racemiguembelina fructicosa	/fp	343	372.6	
Rota appenninica	/fp	49.5	96.3	
Rota brotzeni	/fp	61.2	83.8	
Rota cushmani	/fp	69.1	110.95	
Rota deeckeii	/fp	75.7	110.95	
Rota gandolfi	/fp	61.8	66.8	
Rota greenhornensis	/fp	69.1	110.95	
Rota montsalvensis	/fp	67	86.8	
Rota reicheli	/fp	68.1	69	
Rugoglobigerina hexacamerata	/fp	333	372.6	
Rugoglobigerina rugosa	/fp	243	372.6	
Tici praeticinensis	/FP	27.4	50.5	
Tici primula	/FP	27.4	58.2	

Tici raynaudi	/FP	35.8	54
Tici roberti	/FP	35.8	53.8
Tici subticinensis	/FP	38.8	55
Tici ticinensis	/FP	43.1	62
Ventilabrella austinana	/fp	175	183
*May be a morphotype of <i>H. globulosa</i> fide S. Nederbragt.			
Ventilabrella eggeri	/fp	182	243
Ventilabrella glabrata	/fp	185	246
Whit aprica	/fp	77	131
Whit archaeocretacea	/fp	112.6	129
Whit baltica	/fp	76.2	213
Whit brittonensis	/fp	78	126
Whit paradubia	/fp	114	116
Whit praehelvetica	/fp	92.5	124
*END			

TIBET SECTION FILES (TIBETK)

Tibetk.1 Zongshan Section, Gamba, Tibet

Unpublished data of X. Hu and Chengshan Wang, c. 2000, Table 1; Wang et al., 2001, Cret. Res. 22:481-490, figs. 2, 3, 5; Wan et al., 2002, Lethaia 35:131-146. Cenomanin-Turonian-Campanian-Maastrichtian Gamba & Zongshan formations. Base spls at 158m in Lengqingre Fm., base Xiawuchubo Fm at 375m; base Jiubao Fm at 475m; base Zongshan Fm at 660m; top section faulted at 830m. Unconformity at 586 m.

DATA:

*TAXA	Morph	Base	Top (m)
Carbon peak OAE 2	/gc	340	353
Dica algeriana	/fp	287	374.3
*Dicarinella asymerica	/fp	583	583
*Not known to overlap with <i>D caniculata</i> (Premoli Silva & Sliter 2002)			
Dica canaliculata	/fp	495	583
Dica concavata	/fp	543	622
Dica hagni	/fp	338	446
Dica imbricata	/fp	482	573
Dica primitiva	/fp	482	583
Glob'oides bentonensis	/fp	279	335
Globotruncana bulloides	/fp	591.6	609
Globotruncana elevata	/FP	591.6	617
Globotruncana ventricosa	/FP	609	609
Globotruncana fornicata	/FP	591.6	609
Globotruncana linneiana	/FP	609	625
*Globotruncana stuarti	/fp	591.6	591.6
*Base is U. Camp c. 75Ma, too low here, single occurrence			
Globotruncana stuartiformis	/FP	591.6	681
Hedb delrioensis	/FP	283	583
Hedbergella holmdelensis	/FP	495	578
Hedb planispira	/FP	239	583
Hedb portsdownensis	/fp	374.3	439
Hedb simplex	/FP	287	434
Helv'ana helvetica	/FP	374.3	451
Helv'ana praehelvetica	/FP	350	464
Hete globulosa	/FP	350	625
Heterohelix moremani	/FP	477	495
Hete navarroensis	/fp	504	609
Hete pulchra	/FP	343	533
Heterohelix reussi	/FP	340	583
Marginotruncana coronata	/FP	533	622
Marginotruncana pseudolinneiana	/FP	482	601
Marginotruncana renzi	/FP	434	559
Marginotruncana schneegansi	/FP	374.3	583

Marginotruncana sigali	/FP	533	591.6
*top @ 591.6 m in Maast-too young			
Marginotruncana tarfayaensis	/fp	482	517
Praeglobotruncana stephani	/fp	273	343
Rota appenninica	/fp	158	301
Rota cushmani	/fp	273	338
Rota evoluta	/fp	194	273
Rota deeckeii	/fp	279	338
Rota greenhornensis	/fp	273	338
Rota montsalvensis	/fp	279	338
Whit aprica	/FP	343	446
Whit archaeocretacea	/FP	340	578
Whit baltica	/FP	297	573
Whit brittonensis	/FP	340	482
Whit paradubia	/FP	482	489
Ammodiscus cretaceus	/fb	287	346
Anomalina solis	/fb	220	338
Astacolus howchini	/fb	309	315
Biplanata peneropliformis	/fb	407	419
Dorothia conicula	/fb	273	613
Dorothia gambaensis	/fb	294	326
Dorothia oxycona	/fb	609	622
Dorothia sphaeroidalis	/fb	239	338
Gavelinella intermedia	/fb	279	309
Gyroidina excerta	/fb	273	333
Gyroidina infracretacea	/fb	220	220
Gyroidina primitiva	/fb	273	335
Gyroidina tendami	/fb	273	273
Lagena apiculata	/fb	283	320
Lenticulina franki	/fb	220	434
Lenticulina warregoensis	/fb	309	434
Neoflabellina leptodisca	/fb	294	315
Orbitoides apiculata	/FB	740	769
Orbitoides macroporus	/FB	723	808
Orbitoides media	/FB	723	769
Orbitoides tissoti	/FB	681	711
*END			

Tibetk.2 Tingri section, Gamba, Tibet

Data from Willems et al., 1996, Geol. Rundschau, 86:723-754, Fig. 20. Profile L; Fault zones: 430-446 m; 715-750 m; spl 42 at 499 m is quartzose bioclastic packstone above unconformity @ 498.9 m; Gamba Gp. @ 0-600 m, Zhepure Shanbei Fm. @ 600-757 m, Zhepure Shanpo Fm. @ 757-880 m. Gamba = pelagic-hemipelagic open marine basin to slope; Zhepure Shanbei = outer shelf; Megafossil data from Lehman et al., 2005, Earth Sci. Frontiers 2:105-112, fig. 2. Revised 10/01/06.

DATA:

*TAXA	Morph	Base	Top (meters above base)
Abathomphalus intermedius	/FP	765	825
Abathomphalus mayaroensis	/FP	825	825
Archaeoglobigerina blowi	/FP	540	765
Archaeoglobigerina cretacea	/fp	685	715
Dica algeriana	/fp	430	483
*ID as cf. 85-400 m; use base above cf ID; reworked at 500 m			
Dicarinella asymetrica	/fp	655	715 base @ 655 m cf
Dica concavata	/fp	675	715 base @ 510 m cf
Dica hagni	/fp	435	483
Dica imbricata	/fp	430	495 reworked at 499 m
Dica primitiva	/fp	500	580
Gansserina gansseri	/FP	760	825
Globoconusa daubjergensis	/FP	850	850
Globotruncana aegyptiaca	/FP	760	825

Globotruncana arca	/FP	667	825	base @ 655 m cf
Globotruncana bulloides	/FP	667	765	base @ 667 m cf
Globotruncana calcarata	/FP	735	737	ID as G'ita
Globotruncana subcircumnodifer	/fp	760	860	
Globotruncana conica	/fp	760	825	ID as Globotruncanita
Globotruncana elevata	/FP	675	715	
ID as Globotruncanita gp; base @ 675 m cf				
Globotruncana ventricosa	/FP	715	760	base @ 715 m cf
Globotruncana falsostuarti	/FP	760	825	
Globotruncana fornicata	/FP	715	765	ID as Rosita; base @ 655 m cf
Globotruncanella havanensis	/FP	715	825	FO @ 715m too old; use next
Globotruncana contusa	/fp	760	825	
Globotruncana linneiana	/FP	675	850	base @ 675 m cf; ID as gp
*Globotruncana mariei	/FP	727	727	
Globotruncana rosetta	/FP	760	825	
Globotruncana stuarti	/FP	715	825	
Globotruncana stuartiformis	/FP	715	767	
base @ 715 m cf; ID as Globotruncanita				
Globotruncana subspinosa	/fp	760	765	ID as Globotruncanita
Hedb delrioensis	/FP	30	360	
Hedb planispira	/FP	0	360	
Hedb simplex	/FP	85	400	
Helv'ana helvetica	/FP	435	445	reworked at 499 m
Helv'ana praehelvetica	/FP	435	495	
Marginotruncana coronata	/FP	685	715	base @ 500 m cf
Marginotruncana marginata	/FP	720	725	base @ 500 m cf
Marginotruncana marianosi	/FP	435	495	reworked at 499 & 500 m
Marginotruncana pseudolinneiana	/FP	500	715	ID as gp; base at 445 m too low
Marginotruncana renzi	/FP	495	645	ID as gp
Marginotruncana sigali	/FP	435	645	ID as gr
Marginotruncana sinuosa	/fp	700	715	
Planomalina buxtorfi	/FP	125	125	
Planorotalites compressus	/FP	860	860	
Praeglobotruncana delrioensis	/FP	30	305	
Praeglobotruncana stephani	/FP	63	495	reworked at 499 m
Rota appenninica	/FP	0	360	
Rota brotzeni	/FP	30	360	
Rota cushmani	/FP	260	480	
Rota deeckeii	/FP	305	480	
Rota greenhornensis	/FP	240	480	
Rota montsalvensis	/FP	240	463	
Rota reicheli	/FP	240	260	
Rugoglobigerina hexacamerata	/fp	760	825	
Rugoglobigerina rugosa	/fp	760	860	
Whit aprica	/FP	430	483	reworked at 499-506 m
Whit archaeocretacea	/FP	446	506	
Whit baltica	/FP	320	510	
Whit brittonensis	/FP	375	510	top at 620 too hi
Orbitoides macroporus	/FB	755	755	
Orbitoides media	/FB	760	760	
Crem hannoverensis	/bi	512	512	
Crem waltersdorfensis	/bi	512	512	
Forresteria sp.	/am	512	512	

*END

Tibetk.3 Tingri section, Bamba, Tibet

Unpublished data of Xiamian Hu & Chengshan Wang, c. 2000, Table; Cenomanian-Turonian, Tingri Section, Tibet; compare w/ tibetk.2.

DATA:

*TAXA Morph Base Top (m above base)

Dica canaliculata	/fp	1194.2	1194.2	
Dica hagni	/fp	1194.2	1194.2	
Dica imbricata	/fp	1167.2	1167.2	
*Dica primitiva	/fp	1219.2	1219.2	base too low, single specimen
Glob'oides bentonensis	/fp	1039.3	1046.3	
Hedb delrioensis	/FP	524.4	1219.2	
Hedb planispira	/FP	650.6	1247.2	
Hedb simplex	/FP	1074.3	1247.2	
Helv'ana helvetica	/FP	1167.2	1167.2	
Heterohelix moremani	/FP	1118.3	1118.3	
Heterohelix reussi	/FP	1194.2	1247.2	
*Marginotruncana coronata	/FP	1194.2	1194.2	base too low, single specimen
Marginotruncana pseudolinneiana	/FP	1269.3	1269.3	
Marginotruncana renzi	/FP	1194.2	1247.2	
Marginotruncana schneegansi	/FP	1269.3	1269.3	
Marginotruncana sigali	/FP	1269.3	1269.3	
*Planomalina praebuxtorfi	/fp	1082.3	1098.3	raises top
Praeglobotruncana stephani	/fp	1056.6	1118.3	
Rota appenninica	/fp	524.4	925.4	
Rota brotzeni	/fp	983	1133.3	
Rota cushmani	/FP	1109.3	1148.3	
Rota deeckeii	/FP	1118.3	1133.3	
Rota gandolfi	/fp	983	1106.3	
Rota greenhornensis	/fp	1074.3	1133.3	
Rota montsalvensis	/FP	1039.3	1148.3	
Rota reicheli	/FP	1056.6	1056.6	
Whit baltica	/FP	1167.2	1167.2	
Whit brittonensis	/FP	1194.2	1194.2	
Clav simplex	/fp	1109.3	1118.3	
Dorothia gambaensis	/fb	650.6	1074.3	
Dorothia sphaeroidalis	/fb	650.6	1056.6	
*END				

Tibetk.4 Gamba A1

Unpublished data of Weidlich, 1983, Table, from H. Willems 12/2002 . Albian-Campanian, Gamba A1 Section, Gamba, Tibet.

Tibetk.5 Gamba Section A2, Gamba, Tibet

Unpublished data of Weidlich, 1983, from H. Willems, 12/2002 Table 1; lowest measurement @ 231 m. This section is same location as A1 and repeats part.

Tibetk.6 Gamba section B Gamba, Tibet

*Unpublished data of Weidlich, 1983, from H. Willems, 12/2002 Table 1.

Tibetk.7 Chuangde section at Jyangze, Tibet

MS by Wan. Lamolda, Li and Si. Base of section unknown; base Gyabula Fm. = 340 m, beds 30 & 31; base Chuangde Fm. = 380.5 m, Red Beds from 5-31 m on fig. 2 (380.5-409.5 m); base Zonghuo Fm. = 409.5 m with breccia 31-55 m in fig. 2.

DATA:

*TAXA	Morph	Base	Top (m)
*data from fig. 2 of unpubl. MS			
Globotruncana aegyptiaca	/fp	407.2	414.2
Globotruncana arca	/fp	403.7	414.2
Globotruncana bulloides	/fp	382.5	402.2
Globotruncana calcarata	/fp	403.7	407.2

Globotruncana elevata	/FP	382.5	399.4	*ID as Globotruncanita
Globotruncana falsostuarti	/fp	399.4	403.7	
Globotruncana ventricosa	/FP	388	407.2	
Globotruncana fornicata	/FP	402.2	414.2	
Globotruncana lapparenti	/fp	382.5	414.2	
Globotruncana linneiana	/FP	382.5	407.2	
Globotruncana stuarti	/fp	402.2	414.2	
Globotruncana stuartiformis	/FP	382.5	414.2	
Globotruncana subspinosa	/fp	388	414.2	
Globotruncanella havanensis	/fp	403.7	414.2	
Hedbergella holmdelensis	/FP	382.5	402.2	
Hete globulosa	/FP	382.5	407.2	

*END

Tibetk.8 Gongzha section, Tingri, Tibet

Li et al., 2006, J. Geol. Soc. London, 162(2):37-382. Cenomanian-Campanian, Tingri Section, Tibet; compare w/ tibetk.2 & 3; No CORBs; Lengqingre Fm. 0-53; Gamba Cunkou Fm. 53-255; Zongshan Fm to top @ 270m.

DATA:

*TAXA	Morph	Base	Top (m above base)	
Archaeoglobigerina cretacea	/fp	111.75	161.95	
Dica algeriana	/fp	66.65	66.65	
Top at 93.4 too hi, mid Turonian				
Dicarinella asymetrica	/fp	143.9	161.65	
Dica canaliculata	/fp	86.7	92.2	
Dica concavata	/fp	81.75	160.9	
Dica hagni	/fp	53.2	76.3	
*Top above 80 m too hi 157.1, no younger than Turon				
Dica imbricata	/fp	103.3	103.3	
*Top at 143.9 too hi, mid Coniacian				
Dica primitiva	/fp	87.35	146.15	
Globotruncana arca	/fp	143.9	252.95	
Globotruncana bulloides	/fp	202.35	202.35	
Globotruncana elevata	/fp	147.8	235.45	
*Globotruncana falsostuarti	/fp	227.6	236.25	
*This occurrence is very low compared to its expected age of Uamp-Maast.				
Globotruncana fornicata	/fp	213.9	254.25	
Globotruncana lapparenti	/fp	150.8	250.0	
Globotruncana linneiana	/fp	147.8	251.3	
Globotruncana stuarti	/fp	233.15	233.15	Base at 194.6 too low
Globotruncana stuartiformis	/fp	154.0	251.3	
Globotruncana subspinosa	/fp	248.65	248.65	
*Base at 150.8 is too low, known at L Camp				
Globotruncana ventricosa	/fp	175.8	235.45	
Hedb delrioensis	/FP	36.8	53.2	
Hedb planispira	/FP	52.2	64.75	
Helv'ana helvetica	/FP	67.3	75.9	
Helv'ana praelhelvetica	/fp	39.7	66.3	
Hete globulosa	/fp	217.85	217.85	
Heterohelix reussi	/FP	67.0	161.65	
Marginotruncana coronata	/FP	116.7	160.06	
Marginotruncana marginata	/fp	61.6	152.95	
Marginotruncana marianosi	/fp	78.7	167.8	
Marginotruncana pseudolinneiana	/FP	86.15	207.75	
Marginotruncana renzi	/FP	64.35	154.0	
Marginotruncana schneegansi	/FP	98.1	159.0	
Marginotruncana sigali	/FP	86.15	154.0	
Marginotruncana sinuosa	/fp	87.05	167.8	
Praeglobotruncana delrioensis	/fp	39.7	68.7	
Praeglobotruncana stephani	/fp	48.9	65.7	

Pseudotextularia elegans	/fp	191.15	235.45
Rota appenninica	/fp	14.8	14.8
*Top at 36.15 too high, mid Cenomanian			
Rota brotzeni	/fp	13.6	14.8
*Top at 46.6 too hi, mid Cenomanian			
Rota cushmani	/FP	14.8	45.6
Rota greenhornensis	/fp	25.7	46.25
Rota montsalvensis	/FP	13.6	13.6
Rota reicheli	/FP	14.8	14.8
Whit archaeocretacea	/fp	36.8	93.1
Whit baltica	/FP	67.0	92.2
Whit paradubia	/fp	45.9	93.7
Carbon peak OAE 2	/gc	45	65

*END

Tibetk.9 Tingri by Hu

Planktic foraminifera data from the Zhepure Shanpo section, 500 m east of the section by Willems et al. (1996). Fossil identified by Mr. Wu Cong, Nanjing University. Zhepureshanbei Fm. -16 to 0.5 m; Zhepureshanpo Fm. 0.5 to 38 m; Compare with Willems stratigraphy: Zhepureshanbei Fm. Member I -16 to 5 m; ZB Member II 5 to 6 m; ZB Member III 6 to 17 m; Zhepureshanpo Fm. 18 to 38 m. Erosional unconformity .

DATA:

*Taxa	Morph	Base	Top meters
Archaeoglobigerina cretacea	/fp	-16	5
Globotruncana fornicata	/fp	2	31 ID as Contusotruncana
Globotruncana patelliformis	/fp	1	31 ID as Contusotruncana
Dicarinella asymetrica	/fp	-14	0
Dica concavata	/fp	-16	0
Gansserina gansseri	/fp	6	11
Globotruncana arca	/fp	0	29
Globotruncana aegyptiaca	/fp	9	31
Globotruncana bulloides	/fp	1	29
Globotruncana calarata	/fp	1	1 ID as Radotruncana
Globotruncana coronata	/fp	-16	0 ID as Marginotruncana
Globotruncana elevata	/fp	1	7 ID as Globotruncanita
Globotruncana falsostuarti	/fp	1	27
Globotruncana lapparenti	/fp	-5	31
Globotruncana linneiana	/fp	1	24
Globotruncana mariei	/fp	1	30
Globotruncana orientalis	/fp	1	30
Globotruncana stuarti	/fp	1	31 ID as Globotruncanita
Globotruncana stuartiformis	/fp	1	25 ID as Globotruncanita
Globotruncana ventricosa	/fp	1	31
Globotruncanita pettersi	/fp	2	15
Marginotruncana marginata	/fp	-14	-3
Marginotruncana pseudolinneiana	/fp	-16	-1
Marginotruncana sigali	/fp	-12	-2
Marginotruncana sinuosa	/fp	-16	-3
Marginotruncana tarfyaensis	/fp	-11	-3
Marginotruncana undulata	/fp	-13	-11

*END

MISCELLANEOUS SECTION FILES (COST/GALLUP)

Cost B-2 Well, Offshore New Jersey

*Data from USGS Geological & Operational Summary, Open-file report 76-774, 1976, p. 36-49.

*Both tops and bases listed for single samples; dinoflagellate taxonomy updated.

DATA:

*TAXA	Morph	Base	Top feet	
Discoaster multiradiatus	/nn	-4964	-4964	
Achomosphaera ramulifera	/dn	-14116	-11100	
Aptea eisenackii	/dn	-8893	-7735	
Australiella victoriensis	/dn	-5173	-5173	
Cerbia tabulata	/dn	-10000	-10000	
Cribroperidinium edwardsii	/dn	-10000	-10000	
Cribroperidinium longicorne	/dn	-11600	-11100	*ID as G. longicornis
Ctenidodinium elegantulum	/dn	-11600	-11100	
Cyclonephelium distinctum	/dn	-6857	-6063	
Kleithriasphaeridium eoinodes	/dn	-11600	-11100	
Muderongia simplex	/dn	-14116	-10100	
Muderongia staurota	/dn	-11600	-11100	*ID as cf.
Odontochitina costata	/dn	-5941	-5537	
Oligosphaeridium anthophorum	/dn	-11600	-11100	
Oligosphaeridium complex	/dn	-5941	-5537	
Oligosphaeridium pulcherrimum	/dn	-6903	-6903	*ID as O. pulcherri
Palaeohystrichophora infusorioides	/dn	-5173	-5173	
Palaeoperidinium cretaceum	/dn	-10000	-10000	
Pareodinia ceratophora	/dn	-14650	-14650	
Pseudoceratium pelliiferum	/dn	-14116	-10100	
Subtilisphaera perlucida	/dn	-10000	-7057	
Subtilisphaera pirnaensis	/dn	-10000	-10000	
Surculosphaeridium longifurcatum	/dn	-5941	-5537	
Tanyosphaeridium variecalamus	/dn	-5941	-5537	
Appendicisporites tricornitatus	/sp	-5940	-5940	
Araucariacites australis	/sp	-5940	-5940	
Complexiopollis funiculus	/sp	-6857	-6857	*ID as cf.
Contignisporites dorsostriatus	/sp	-15961	-15961	
Klukisporites pseudoreticulatus	/sp	-8200	-8200	
Pilosporites trichopappilosus	/sp	-15961	-8200	
Rugubivesiculites rugosus	/sp	-7888	-5173	
Taurocusporites segmentatus	/sp	-5940	-5940	
Trilobosporites apiverrucatus	/sp	-15961	-8200	
Trilobosporites variverrucatus	/sp	-8200	-8200	
Braarudosphaera africana	/nn	-8200	-7735	
Polycostella senaria	/nn	-12120	-12120	
Globotruncana aegyptiaca	/fp	-5090	-5000	
Globotruncana arca	/fp	-5090	-5000	
Globotruncana carinata	/fp	-5736	-5736	
Globotruncana concavata	/fp	-5824	-5824	
Globotruncana coronata	/fp	-5736	-5736	
Globotruncana duwi	/fp	-5736	-5100	
Favusella washitensis	/fp	-8130	-8130	
Globotruncana fornicata	/fp	-5100	-5000	
Globotruncana lapparenti	/fp	-5100	-5000	
Globotruncana marginata	/fp	-5736	-5100	
Globotruncana stuartiformis	/fp	-5736	-5100	
Helv'ana helvetica	/fp	-7057	-7057	
Hedb planispira	/fp	-7683	-7683	
Hedbergella planispira	/fp	-7683	-7683	
Hedb simplex	/fp	-7683	-7683	
Heterohelix moremani	/fp	-7683	-7683	
Marginotruncana marginata	/fp	-5736	-5100	
Marginotruncana schneegansi	/fp	-7057	-7057	

Planomalina buxtorfi	/fp	-8130	-8130	
Praeglobotruncana stephani	/fp	-7683	-7683	
Praeglobotruncana turbinata	/fp	-7683	-7057	
Rota cushmani	/fp	-7683	-7610	
Rota greenhornensis	/fp	-7683	-7683	
Tici roberti	/fp	-8840	-8840	
*Whit aprica	/fp	-5736	-5100	*Too high/young
Bolivinooides decorta	/fb	-5736	-5100	
Epistomina caracolla	/fb	-12100	-11530	
Epistomina spinulifera	/fb	-9530	-8690	
Lenticulina muensteri	/fb	-12100	-12100	*ID as cf.
Lenticulina nodosa	/fb	-8620	-8620	
Lingulogavelinella turonica	/fb	-8040	-8040	
Robulus muensteri	/fb	-9530	-8690	
Tritaxia pyramidata	/fb	-9530	-8690	*as T. pyramidalis
Ventilabrella grabens	/fb	-5736	-5736	
*END				

Cost B-3 Well, Offshore New Jersey

*Data from USGS Geological & Operational Summary, 1979, p. 26-30. Both tops and bases listed for single samples; dino taxonomy updated.

DATA:

*TAXA	Morph	Base	Top feet	
Discoaster lodoensis	/nn	-5525	-5525	
Callaiosphaeridium asymmetricum	/dn	-6740	-6740	
Cerbia tabulata	/dn	-9530	-9530	
Chichaouadinium vestitum	/dn	-8690	-8690	
Coronifera oceanica	/dn	-8095	-8095	
Ctenidiodinium panneum	/dn	-12400	-12400	
Ctenidiodinium culmulum	/dn	-12400	-12400	
Cyclonephelium distinctum	/dn	-6200	-6200	
Dinopterygium cladoides	/dn	-6560	-6560	
Exochosphaeridium bifidum	/dn	-6086	-6086	
Hystrichodinium pulchrum	/dn	-6086	-6086	
Hystrichosphaerina schindewolfii	/dn	-9890	-9890	
Isabelidinium cretaceum	/dn	-6086	-6086	
Muderongia simplex	/dn	-10070	-10070	
Muderongia staurota	/dn	-10070	-10070	
Odontochitina costata	/dn	-6200	-6200	
Odontochitina porifera	/dn	-6380	-6380	
Pseudoceratium pelliiferum	/dn	-10610	-10100	
Tanyosphaeridium variecalamus	/dn	-6560	-6560	
*Corolina torosus	/pol	-8630	-8630	
Alterbia minor	/sp	-6086	-6086	
Cicatricosisporites perforatus	/sp	-6920	-6920	
Exesipollenites tumulus	/sp	-8095	-8095	
Perinopollenites elatoides	/sp	-8180	-8180	
Pilosisporites trichopappilosus	/sp	-9530	-9530	
Pilosisporites verus	/sp	-9530	-9530	
Schizoporis reticulatus	/sp	-6920	-6920	
Arkhangelskiella cymbiformis	/nn	-6070	-6070	
Braarudosphaera africana	/nn	-8770	-8770	
Broinsonia parca	/nn	-6070	-6070	
Broinsonia parca parca	/nn	-6070	-6070	
Conusphaera mexicana	/nn	-9850	-9850	
Eiffellithus eximius	/nn	-6280	-6280	
Helenea chiastia	/nn	-8200	-8200	*ID as Cruciellipsis chiasta
Marthasterites furcatus	/nn	-6470	-6470	
Micula staurophora	/nn	-6070	-6070	
Nannoconus broennimannii	/nn	-11920	-11920	

Nannoconus bucheri	/nn	-8770	-8770	
Nannoconus globulus	/nn	-9640	-9640	
Polycostella senaria	/nn	-11920	-11920	
Tetralithus aculeus	/nn	-6070	-6070	
Tetralithus nitidus	/nn	-6086	-6086	
Gansserina gansseri	/fp	-6040	-6040	
Globotruncana calcarata	/fp	-6200	-6200	
Globotruncana carinata	/fp	-6500	-6500	
Globotruncana concavata	/fp	-6500	-6500	
Globotruncana conica	/fp	-6040	-6040	
Globotruncana contusa	/fp	-6040	-6040	
Globotruncana elevata	/fp	-6200	-6200	
Globotruncana stuarti	/fp	-6040	-6040	
Favusella washitensis	/fp	-9470	-9470	
Glob'oides bentonensis	/fp	-8180	-8180	
Globotruncana fornicata	/fp	-6200	-6200	
Globotruncana lapparenti	/fp	-6200	-6200	
Helv'ana helvetica	/fp	-8000	-8000	
Hedb washitensis	/fp	-9470	-9470	
Marginotruncana coronata	/fp	-6500	-6500	
Marginotruncana schneegansi	/fp	-7110	-7110	
Marginotruncana sigali	/fp	-7110	-7110	
Praeglobotruncana stephani	/fp	-8040	-8040	
Praeglobotruncana turbinata	/fp	-8040	-8040	
Rota cushmani	/fp	-8180	-8180	
Rota greenhornensis	/fp	-8180	-8180	
Rota reicheli	/fp	-8180	-8180	
Epistomina spinulifera	/fb	-9530	-8690	
Lingulogavelinella turonica	/fb	-8040	-8040	
Robulus muensteri	/fb	-9530	-8690	
Tritaxia pyramidata	/fb	-9530	-8690	*as T. pyramidalis

*END

Gallup A1.1, Composite section A1 of Gallup Formation, NW New Mexico

*Location of The Mound section 1: NW1/4 sec.25 to NE1/4 sec. 26, T34N, R19W, ~37deg 10' N, 108deg 50' W, Montezuma Co. Colorado. Molenaar, Nummedal & Cobban, 1996, USGS Oil & Gas Invest. Chart OC-143. Based on stratigraphic sections in cross section A-A', sections 1, 2A & 6. Measurements at section 1: 63.5-78.5 m Tocito Lentil of Mancos Fm.; 63.5 m Erosional unconformity at base of Tocito Sandstone Lentil removed Juana Lopez Mbr.; 0-63.1 m Mancos Fm. lower part.

DATA:

*Taxa	Morph	Base	Top	
Inoc deformis	/bi	64	64	
Inoceramus dimidius	/bi	30	58	
Inoceramus perplexus	/bi	63	63	
Lopha lugubris	/bi	58	58	
Lopha sannionis	/bi	64	64	
Platyceramus stantoni	/bi	64	75	
Peroniceras tridorsatum	/am	64	64	
Prionocyclus macombi	/am	30	30	
Prionocyclus hyatti	/am	26	26	*ID questioned
Prionocyclus wyomingensis	/am	58	58	
Scaphites whitfieldi	/am	63	63	

*END

Gallup-A2.1, *Composite section A2 of Gallup Formation, NW New Mexico

*Location of section 18, Toadlena: NW1/4 sec. 16, T23N R19W, ~36deg 15' N, 108deg, 55' W, San Juan Co. New Mexico. Molenaar, Nummedal & Cobban, 1996, USGS Oil & Gas Invest. Chart OC-143. Based on stratigraphic sections in cross section A-A', section 18. Stratigraphy: 177-218 m Mulatto tongue of

Mancos Fm.; 173-177 m Dilco Member uppermost shale; 143-173 m Torrivio Member sandstone; 137-143 m Dilco Member, basal shale; 124-137 m C Tongue, top is erosional unconformity with Dilco Mbr of Crevasse Canyon Fm.; 116-122 m D Tongue; 50 m Top of Juana Lopez Member; 0-116 m Mancos Shale lower unit.

DATA:

*Taxa	Morph	Base	Top
<i>Inoceramus perplexus</i>	/bi	48	61
<i>Lopha lugubris</i>	/bi	17.5	30
<i>Prionocyclus novimexicanus</i>	/am	59.2	59.2
<i>Prionocyclus wyomingensis</i>	/am	42	42
<i>Scaphites warreni</i>	/am	42	42

*END

Gallup B.1, Composite section B of Gallup Formation, NW New Mexico location of 29B: NW1/4 NE1/4, sec. 1, T15N, R18W, ~35deg 35' N, 108deg 45' W, McKinley Co. Molenaar, Nummedal & Cobban, 1996, USGS Oil & Gas Invest. Chart OC-143. Based on stratigraphic sections 101, 29B, 39B, & 40A in cross section B-B'. Fossil data from Two Wells and Whitewater Arroyo tongues in Cobban, 1977, New Mexico Geol. Soc. Guidebook 28th Field Conf., p. 213-220. Erosional unconformity between Gallup & Dilco Mbr. Crevasse Canyon Fm. Section 40A: 403-430 m Dalton Member of Crevasse Canyon Fm.; 385-403 m Mulato tongue, base is transgressive contact; 332-385 m Dilco Member upper part; 328-332 m Torrivio Member; 316-328 m Dilco Member lower part, base is erosional sequence boundary' 236-316 m Gallup Sandstone; 300-316 m D Tongue. Section 39B: 270-300 m Mancos tongue ; 264-270 m E Tongue ; 246-264 m Mancos tongue ; 236-246 m F Tongue of Gallup Sandstone (section 39B) ; 207-236 m Mancos Fm.; sections stacked on traceable sandstone bed. Section 29B: 67-207 m Mancos Fm. lower part. Section Gallup 101 well log: 57-67 m Twowells Tongue of Dakota, top is transgressive contact; 36-57 m Whitewater Arroyo Tongue Mancos Fm.; 0 m Base Dakota Fm. on Morrison Fm. - sequence boundary.

DATA:

*Taxa	Morph	Base	Top	
<i>Inoceramus dimidius</i>	/bi	207	207	
<i>Lopha lugubris</i>	/bi	207	207	
<i>Mytiloides mytiloides</i>	/bi	92	92	
* <i>Pycnodonte kellumi</i>	/bi	68	68	*as sp. aff
<i>Pycnodonte newberryi</i>	/bi	75	75	
* <i>Rhynchostreon levis</i>	/bi	68	68	*ID as <i>Exogyra levis</i>
<i>Collignonicerias woollgari</i>	/am	137	137	
<i>Prionocyclus macombi</i>	/am	200	207	
<i>Prionocyclus novimexicanus</i>	/am	272	272	
<i>Prionocyclus percarinatus</i>	/am	154	154	
<i>Sciponoceras gracile</i>	/am	75	75	

*END

Gallup C.1, Composite section C of Gallup Formation, NW New Mexico SE1/4 sec. 17 to NW1/4 sec/ 21, T6N, R10W, ~35deg N, 107deg 45'W, Cibola Co., New Mexico. Data from Molenaar et al., 1996 and from Cobban & Hook, 1989, New Mexico Geol. Soc. Guidebook 40th Field Conf. p. 247-264, for Tres Hermanos Fm. Molenaar, Nummedal & Cobban, 1996, USGS Oil & Gas Invest. Chart OC-143. Based on stratigraphic sections 56, 60B, 61B, & 53B in cross section C-C'. Section 53B: *244-272 m Base Mancos Shale-upper part with Tocito Sandstone Lentil & Mulatto Tongue & lateral equivalent Borrego Pass Sandstone Lentil of Crevasse Canyon Formation; TS 244 m; 187 m Base Dilco Mbr. Crevasse Canyon Fm., sequence boundary; 98-187 m Gallup Sandstone; 163-187 m C tongue, sharp base = regressive marine erosion. Measurements at West side of Cebollita Mesa section 56: 144-163 m D tongue, sharp base = regressive marine erosion; 122-136 m E tongue, sharp base = regressive marine erosion; 98-100 m F tongue, sharp base = regressive marine erosion; 50-122 m D-Cross Tongue Mancos Shale in part a facies of Gallup Sandstone; top Juana Lopez projected at ~80m; 0-50 m Tres

Hermanos Formation, 14-50 m Carthage Mbr. grades into Fite Ranch Mbr. 38-50 m; 0=14m Atarque Mbr. of Tres Hermanos .

DATA:

*Taxa	Morph	Base	Top	meters
Inoceramus dimidius	/bi	48	84	
Inoceramus erectus	/bi	260	260	
Inoceramus perplexus	/bi	126	126	*ID as aff.
Lopha bellaplicata	/bi	48	60	
Lopha lugubris	/bi	48	70	
Lopha sannionis	/bi	94	140	
Baculites yokoyamai	/am	10	10	
Coilopoceras inflatum	/am	67	67	
Collignonicerias woollgari	/am	10	10	
Forresteria sp.	/am	245	245	
Prionocyclus macombi	/am	48	48	
Prionocyclus novimexicanus	/am	84	101	
Scaphites ferronensis	/am	72	72	
*Spathites rioensis	/am	10	10	
Scaphites warreni	/am	70	70	
Scaphites whitfieldi	/am	84	94	

*END

Gallup 58.1, Measured section 58A of Gallup Formation, NW New Mexico

Location of 58A, Table 3: NW1/4, sec. 6, T2N, R5W, Socorro Co. *~34deg 15' N, 107deg 25' W, Socorro Co. Hook, Molenaar & Cobban, 1983, New Mexico Bureau Mines & Mineral Resources Circular 185, p. 7-28. Based on stratigraphic section 58A in cross section NW-SE, Sheet 1. Stratigraphy:

*353-383 m Crevasse Canyon Formation, top of section; 338-353 m Tocito or Dilco, not Gallup Sandstone D tongue; 328-338 m Crevasse Canyon fm. not D-Cross Tongue Mancos Formation; 308-328 m Gallup Sandstone E Tongue; 263-308 m D-Cross Tongue of Mancos Fm.; 248-263 m Fite Ranch Member of Tres Hermanos Formation reference section; 208-248 m Carthage Member, top is transgressive contact; 188-208 m Atarque Member; 118-188 m Rio Salado Tongue Mancos Formation, Type section; 108-118 m Twowells Tongue Dakota Formation, top is TS; 18-108 m TS at base Mancos Fm.; 0 m Base Dakota Fm. on Triassic strata-sequence boundary.

DATA:

*Taxa	Morph	Base	Top	meters
Inoceramus dimidius	/bi	268	268	
Inoceramus erectus	/bi	328.5	328.5	
Inoc rutherfordi	/bi	53	53	
Mytiloides fiegei	/bi	307.5	307.5	
Mytiloides mytiloides	/bi	135	135	
Ostrea beloiti	/bi	30	30	
Pycnodonte newberryi	/bi	123	123	
Collignonicerias woollgari	/am	165	189	
Metoicoceras geslinianum	/am	123	123	
Metoicoceras mosbyense	/am	108.5	108.5	
Morrowites depressus	/am	165	165	
*Neostlingoceras kottlowskii	/am	73	73	
Prionocyclus novimexicanus	/am	275	327.5	
Scaphites ferronensis	/am	268	268	
Scaphites whitfieldi	/am	275	290	
Sciponoceras gracile	/am	123	123	
Spathites rioensis	/am	165	165	
Turrillites acutus	/am	30	30	*ID as subspecies americanus

*END

Gallup 59.1, Measured section 59 of Gallup Formation, NW New Mexico

Location of 59, Table 2: SE1/4 SE1/4, sec. 8, & NE NE SEC. 17, T5S, R2E, ~33deg 45' N, 106deg 40' W, Socorro Co. Hook, Molenaar & Cobban, 1983, New Mexico Bureau Mines & Mineral Resources Circular 185, p. 7-28. Based on stratigraphic section 59 in cross section NW-SE, Sheet 1. Stratigraphy: 345-355 m Crevass Canyon Formation, top of section; 325-345 m Gallup Sandstone D tongue; 239-325 m D-Cross Tongue of Mancos Fm.; 216-239 m Fite Ranch Member of Tres Hermanos Formation; 181-216 m Carthage Member, top is transgressive contact; 155-181 m Atarque Member; 25-155 m TS at base Mancos Fm.; 0 m Base Dakota Fm. on Triassic strata-sequence boundary.

DATA:

*Taxa	Morph	Base	Top	
Inoc arvanus	/bi	26	26	
Lopha bellaplicata	/bi	218.5	218.5	
Lopha sannionis	/bi	238.5	325.5	
Mytiloides fiegei	/bi	290	290	
Mytiloides mytiloides	/bi	105	105	
Mytiloides subhercynicus	/bi	138	160	
Ostrea beloiti	/bi	26	26	
Pycnodonte newberryi	/bi	95	95	
Calycoceras canitaurinum	/am	75	75	*ID questions generic assignment
*Coilopoceras colleti	/am	218.5	218.5	
Coilopoceras inflatum	/am	238.5	238.5	
Collignonicerias woollgari	/am	138	157	
Mammites nodosoides	/am	105	105	
*Metengonoceras sp.	/am	45	45	
Metoicoceras geslinianum	/am	95	95	
Morrowites depressus	/am	140	140	
*Placenticerias sp.	/am	290	290	
Prionocyclus macombi	/am	218.5	238.5	
Prionocyclus novimexicanus	/am	239.5	239.5	
Sciponoceras gracile	/am	95	95	
Spathites rioensis	/am	140	157	
Turrilites acutus	/am	35	35	*ID as subspecies americanus
*END				