

#### IV. RESULTS OF SHORE LABORATORY STUDIES ON MESOZOIC PLANKTONIC FORAMINIFERA FROM LEG 26 SITES 255, 256, 257, AND 258

Emile A. Pessagno, Jr., Geosciences Division, University of Texas at Dallas, Dallas, Texas  
and

Fouad Y. Michael, Atlantic Richfield Company, Geological Science Group, Dallas, Texas

The zones and subzones used in this report are those proposed by Pessagno, (1967, 1969). Some samples contained Radiolaria; though poorly preserved, they were identified whenever possible. The radiolarian classification and zonation given by Pessagno (in press) is herein followed. Due to the sparsity of the fauna, the data was not tabulated.

TA = Total abundance of all planktonic foraminifera in the sample.

TA rads = Total abundance of all Radiolaria in the sample.

RA = Relative abundance of each taxon. Symbols used are:

- 0—Absent
- 1—Rare (1-10 specimens)
- 2—Moderately rare (11-25 specimens)
- 3—Common (26-50 specimens)
- 4—Abundant (51-100 specimens)
- 5—Very abundant (>100 specimens)

##### SITE 255

###### 26-255-10-1, 21-24 cm.

Hard limestone and chert, no foraminifera were isolated. *Inoceramus* prisms are frequent. Pyritized spherical and discoidal pellets are common, coprolites?

Biostratigraphic determination: Cretaceous?

##### SITE 256

26-256-6-6, 105-109 cm. TA: 0. TA rads: 3.

###### RA

- 2 *Alievium gallowayi* (White)
- 3 *Dictyomitra formosa* Squinabol
- 3 *Dictyomitra napaensis* Pessagno
- 2 *Dictyomitra torquata?* Forman
- 3 *Praeconocaryomma universa* Pessagno
- 3 *Pseudoaulophacus floresensis* Pessagno
- 3 *Pseudoaulophacus lenticulatus* (White)

Biostratigraphic determination: *Alievium gallowayi* Zone to *Crucella espartoensis* Zone, *Patulibrachium lawsoni* Subzone. Early Santonian to middle Campanian.

26-256-7-3, 95-97 cm. TA: 0. TA rads: 3.

###### RA

- 1 *Dictyomitra pseudomacrocephala* Squinabol (reworked?)
- 1 *Dictyomitra* sp.
- 4 *Praeconocaryomma universa* Pessagno
- 1 *Pseudoaulophacus floresensis* Pessagno

Biostratigraphic determination: The *Dictyomitra* sp. found in this sample is similar to a form reported in the Albian of California by Pessagno. The *D. pseudo-macrocephala* is an Aptian-Cenomanian form; it is probably reworked. The same early Santonian to middle Campanian age is assigned to this core.

26-256-8-1, 60-63 cm. TA: 0.

26-256-8-3, 75-77 cm. TA: 0.

26-256-8-6, 75-79 cm. TA: 0.

In these three samples, few broken benthonic forms were reported.

26-256-9-1, 127-131 cm. TA: 2.

###### RA

- 1 *Hedbergella planispira* (Tappan)
- 1 *Hedbergella* sp.

Biostratigraphic determination: Probably Albian to Cenomanian?

##### SITE 257

26-257-4-2, 75-79 cm. TA: 0.

Sponge spicules abundant.

26-257-5-2, 75-79 cm. TA: 0.

26-257-6-1, 60-69 cm. TA: 0.

26-257-7-2, 75-79 cm. TA: 0.

26-257-7-5, 70-75 cm. TA: 0.

Sparse, badly preserved benthonic forms were reported in these samples.

Biostratigraphic determination: Undetermined.

26-257-8-1, 99-104 cm. TA: 1.

###### RA

- 1 *Hedbergella planispira* (Tappan)
- 1 *Hedbergella amabilis* Loeblich and Tappan

Benthonic forms common.

26-257-8-2, 100-105 cm. TA: 1.

###### RA

- 1 *Hedbergella planispira* (Tappan)
- 1 *Hedbergella* sp.

Benthonic forms abundant.

Biostratigraphic determination: These two samples of Core 8 are probably of Albian or Cenomanian age.

26-257-9-2, 29-31 cm.

TA: 0.

Benthonic forms abundant.  
Biostratigraphic determination: Probably middle Albian via superposition.

26-257-10-1, 101-103 cm. TA: 0. TA rads: 5.

RA

- 4 *Archaeodictyomitra* sp.?
- 3 *Crucella* sp.
- 4 *Dictyomitra spicularia* Aliev
- 4 *Orbiculiforma* sp.
- 5 *Praeconocaryomma* sp.

Biostratigraphic determination: The *Orbiculiforma* sp. found in this sample is similar to a form reported by Pessagno from the Albian of California. The Radiolaria is very poorly preserved. It is probably of Albian age.

## HOLE 258A

26-258A-9-2, 114-149 cm.

TA: 4.

RA

- 3 *Globigerinelloides asperus* (Ehrenberg)
- 4 *Globotruncana lapparenti* (Brotzen)
- 4 *Heterohelix reussi* (Cushman)
- 4 *Globigeria* sp. (Tertiary forms?)

Biostratigraphic determination: The sample contains Cretaceous and Tertiary forms due to either downhole contamination or reworking. The first possibility is more likely. *Whiteinella archaeocretacea* Subzone to *Marginotruncana concavata* Subzone; middle Turonian to early Santonian.

26-258A-9-5, 60-64 cm.

TA: 5.

RA

- 4 *Globigerinelloides asperus* (Ehrenberg)
- 3 *Globigerinelloides* sp.
- 2 *Globotruncana lapparenti* (Brotzen)
- 4 *Heterohelix globulosa* (Ehrenberg)
- 4 *H. reussi* (Cushman)
- 3 *H. rumseyensis* Douglas
- 4 *Marginotruncana canaliculata* (Reuss)
- 3 *M. coronata* (Bolli)

*Inoceramus* prisms abundant.

Biostratigraphic determination: Late Turonian to early Santonian.

## SITE 258

26-258-5-1, 113-115 cm. TA: 5. TA rads: 4.

RA

- 5 *Globigerinelloides* sp. cf. *G. asperus* (Ehrenberg)
- 5 *Heterohelix globulosa* (Ehrenberg)
- 5 *H. reussi* (Cushman)
- 5 *H. rumseyensis* Douglas
- 1 *Marginotruncana coronata* (Bolli)
- 1 *M. marginata* (Reuss)

3 *Whiteinella* sp.2 *Archaeochictyomitra squinaboli* Pessagno3 *Dictyomitra* sp.

Sponge spicules and benthonic forms abundant.

Biostratigraphic determination: *Whiteinella archaeocretacea* Subzone to *Globotruncana fornicata* Subzone; middle Turonian to late Santonian.

26-258-5-3, 75-77 cm.

TA: 5.

RA

- 3 *Globigerinelloides asperus* (Ehrenberg)
- 3 *Heterohelix globulosa* (Ehrenberg)
- 4 *H. reussi* (Cushman)
- 3 *H. rumseyensis* Douglas
- 1 *Marginotruncana angusticarenata* (Gandolfi)
- 2 *M. canaliculata* (Reuss)
- 2 *M. coronata* (Bolli)
- 3 *M. pseudolinneiana* Pessagno
- 1 *M. renzi* (Gandolfi)
- 1 *Archaeodictyomitra* sp.
- 1 *Dictyomitra* sp.

Biostratigraphic determination: Late Turonian to Santonian; probably Coniacian.

26-258-6-2, 75-77 cm.

TA: 5.

TA rads: 3.

RA

- 5 *Globigerinelloides asperus* (Ehrenberg)
- 3 *Heterohelix reussi* (Cushman)
- 4 *Marginotruncana canaliculata* (Reuss)
- 1 *Schackoia cenomana* (Schacko)
- 5 *Whiteinella* sp.
- 2 *Archaeodictyomitra squinaboli* Pessagno
- 3 *Dictyomitra* sp.

Biostratigraphic determination: Late Turonian-Santonian.

26-258-6-4, 60-62 cm.

TA: 5.

TA rads: 1.

RA

- 1 *Archaeoglobigerina blowi* Pessagno
- 3 *Archaeoglobigerina* sp.
- 4 *Globigerinelloides asperus* (Ehrenberg)
- 4 *Globigerinelloides* sp.
- 1 *Heterohelix globulosa* (Ehrenberg)
- 3 *H. reussi* (Cushman)
- 1 *H. rumseyensis* Douglas
- 5 *Marginotruncana angusticarinata* (Gandolfi)
- 4 *M. pseudolinneiana* Pessagno
- 3 *Whiteinella archaeocretacea* Pessagno
- 4 *Whiteinella* sp.
- 1 *Bolivonoides* sp.
- 1 *Dictyomitra* sp.?

Biostratigraphic determination: Late Turonian to Santonian.

26-258-7-2, 75-77 cm.

TA: 5.

TA rads: 2.

RA

- 4 *Archaeoglobigerina* sp.
- 4 *Globigerinelloides asperus* (Ehrenberg)

- 3 *Hedbergella* sp.  
 2 *Heterohelix globulosa* (Ehrenberg)  
 4 *H. reussi* (Cushman)  
 2 *Whiteinella archaeocretacea* Pessagno  
 3 *Whiteinella* sp.  
 2 *Archaeodictyomitra* sp.  
*Inoceramus* prisms abundant.  
 Biostratigraphic determination: Same as above.

26-258-9-1, 70-72 cm. TA: 5. TA rads: 3.

- RA  
 4 *Globigerinelloides asperus* (Ehrenberg)  
 4 *Globigerinelloides* sp.  
 3 *Heterohelix globulosa* (Ehrenberg)  
 3 *H. reussi* (Cushman)  
 1 *H. rumseyensis* Douglas  
 2 *Marginotruncana coronata*  
 3 *M. pseudolinneiana* Pessagno  
 4 *Marginotruncana* sp.  
 1 *Schackoina* sp.  
 1 *Whiteinella archaeocretacea* Pessagno  
 4 *Whiteinella* sp.  
 1 *Alievium* sp.  
 1 *Archaeodictyomitra squinaboli* Pessagno  
 3 *Dictyomitra* sp.  
 2 *D. densicostata* Pessagno  
 2 *Orbiculiforma quadrata* Pessagno  
 3 *Orbiculiforma* sp.

Biostratigraphic determination: On the basis of the radiolarian species identified, the age of this sample can be restricted to the late Coniacian or early Santonian.

26-258-10-2, 87-90 cm. TA: 4. TA rads: 2.

- RA  
 4 *Globigerinelloides* sp.  
 2 *Heterohelix* sp.  
 4 *Whiteinella* sp.  
 2 *Archaeodictyomitra squinaboli* Pessagno  
 1 *Dictyomitra* sp.

Biostratigraphic determination: The sample is very poorly preserved. No specific identification was possible. Via superposition the sample is no older than late Turonian and no younger than early Coniacian.

26-258-11-2, 95-97 cm. TA: 4. TA rads: 2.

- RA  
 1 *Globigerinelloides asperus* (Ehrenberg)  
 2 *Globigerinelloides* sp.  
 2 *Heterohelix reussi* (Cushman)  
 1 *H. rumseyensis* Douglas  
 3 *Marginotruncana canaliculata* (Reuss)  
 3 *M. loeblichae* (Douglas)  
 3 *Whiteinella* sp.  
 2 *Archaeodictyomitra squinaboli* Pessagno  
 2 *Dictyomitra* sp.

Biostratigraphic determination: Late Turonian to early Coniacian.

26-258-12-2, 27-29 cm. TA: 1. TA rads: 3.

- RA  
 1 *Heterohelix* sp.  
 1 *Marginotruncana* sp.  
 1 *Whiteinella* sp.  
 3 *Alievium* sp.  
 2 *Archaeodictyomitra squinaboli* Pessagno  
 4 *Dictyomitra formosa* Squinabol  
 4 *Dictyomitra* sp.  
 3 *Orbiculiforma monticelloensis* Pessagno  
 4 *Orbiculiforma* sp.  
 3 *Pseudoaulophacus* sp.

Biostratigraphic determination: Coniacian to early Santonian.

26-258-12-5, 75-77 cm. TA: 0.

26-258-13-2, 92-94 cm. TA: 0.

26-258-13-4, 98-100 cm. TA: 0.

26-258-14-1, 137-139 cm. TA: 4. TA rads: 3.

- RA  
 2 *Hedbergella amabilis* Loeblich and Tappan  
 3 *H. delrioensis* (Plummer)  
 5 *H. planispira* (Tappan)  
 3 *Hedbergella* sp.  
 Sponge spicules  
 3 *Dictyomitra* sp.  
 3 *Orbiculiforma cachensis* Pessagno

Biostratigraphic determination: Cenomanian.

26-258-15-2, 79-83 cm. TA: 1. TA rads: 2.

- RA  
 1 *Hedbergella delrioensis* (Plummer)  
 1 *Praeglobotruncana delrioensis* (Plummer)

Biostratigraphic determination: *Rotalipora* s.s. Zone; Cenomanian.

26-258-15-5, 35-39 cm. TA: 1. TA rads: 1.

- RA  
 1 *Hedbergella planispira* (Tappan)  
 1 *Praeglobotruncana* sp.  
*Inoceramus* prisms abundant.  
 1 *Archaeodictyomitra* sp.

Biostratigraphic determination: *Rotalipora* s.s. Zone?; possibly Cenomanian.

26-258-16-2, 75-79 cm. TA: 2. TA rads: 2.

- RA  
 1 *Hedbergella amabilis* Loeblich and Tappan  
 1 *H. delrioensis* (Plummer)  
 2 *H. planispira* (Tappan)  
 1 *Globigerinelloides bentonensis* (Morrow)  
 1 *Globigerinelloides* sp. cf. *G. caseyi* (Bolli, Loeblich and Tappan)  
 2 *Archaeodictyomitra* sp.

Biostratigraphic determination: *Rotalipora s.s.* Zone; Cenomanian.

26-258-16-5, 75-77 cm. TA: 0.

26-258-17-2, 75-77 cm. TA: 0. TA rads: 5.

RA

- 5 *Orbiculiforma maxima* Pessagno
- 5 *Orbiculiforma* sp.
- 5 *Praeconocaryomma* sp.

Biostratigraphic determination: *Rotaforma hessi* Zone, *Cassideus riedeli* Subzone; early Cenomanian.

26-258-17-4, 74-76 cm. TA: 0. TA rads: 2.

RA

- 1 *Praeconocaryomma nummulitica* Aliev
- 2 *Praeconocaryomma* sp.

Biostratigraphic determination: The *P. nummulitica* Aliev is a Berriasian-Valanginian form. It is probably reworked?

26-258-18-2, 75-77 cm. TA: 1. TA rads: 1.

RA

- 1 *Hedbergella planispira* (Tappan)
- 1 *Hedbergella* sp.

Biostratigraphic determination: Possibly Albian.

26-258-18-4, 71-73 cm. TA: 0.

26-258-20-1, 71-73 cm. TA: 0.

26-258-21-1, 75-77 cm. TA: 0.

26-258-21-3, 75-77 cm. TA: 0.

26-258-22-3, 75-78 cm. TA: 1.

RA

- 1 *Hedbergella planispira* (Tappan)
- 1 *Hedbergella* sp.

Biostratigraphic determination: Possibly Albian.

26-258-23-2, 77-79 cm. TA: 0.

26-258-24-3, 39-43 cm. TA: 0.

26-258-24-5, 47-49 cm. TA: 0.

26-258-25-2, 88-90 cm. TA: 0.

SUMMARY

Samples from Site 258, Cores 5 to 11, contain fauna that range in age from late Santonian to middle or early Turonian. Core 12, Section 2, contains Radiolaria that indicate an age no older than Coniacian. Cores 12 and 13 are barren; Core 14, Section 1, contains Cenomanian fauna down to Core 17. Via superposition, it can be established that all strata above Core 12 cannot be older than Coniacian. It is possible that the Turonian is not represented. This view is supported by the fact that *Marginotruncana helvetica* (Bolli) and *M. sigali* (Reichel), characteristic Turonian species, are absent in the samples.

REFERENCES

- Pessagno, E. A., Jr., 1967. Upper Cretaceous foraminifera from the western Gulf Coastal Plain: *Paleont. Am.*, v. 5 (37), p. 245-445.
- Pessagno, E. A., Jr., 1969. Upper Cretaceous stratigraphy of the western Gulf Coast area of Mexico, Texas and Arkansas: *Geol. Soc. Am. Mem.* 111, p. 1-139.
- Pessagno, E. A., Jr., in press. Radiolarian zonation and stratigraphy of the Upper Cretaceous portion of the Great Valley Sequence, California Coast Ranges: *Micro-paleontology*, Spec. Pub.