or at least the environment where the greatest quantities of their transported remains occur, apparently was in broad, shallow embayments between contemporaneous deltaic depocenters (Ball *et al.*, 1977).

Although those on both sides of the argument are able to present evidence to support their conclusions, a combination of the two interpretations best serves to explain the distribution of phylloid-algal facies found in the Farley Limestone. Evidence for both models will be presented later in this paper.

Skeletal Wackestone-Packstone

The skeletal wackestone-packstone facies (Fig. 2.9) consists of thin to medium-bedded (25 to 50 cm) medium- to light-gray (N5-N7) deposits. This facies is differentiated from the phylloid algal facies by a much lower percentage of phylloid-algal remains, typically around 15 to 20 percent of the total fauna, and a higher density of associated fauna. The skeletal wackestone-packstones also exhibit thinner average bedding (35 cm) than the phylloid algal facies. The most common skeletal constituents include both whole and fragmental brachiopods, bryozoans, crinoids, fusulinids, and gastropods as well as other unidentified skeletal fragments. Phylloid algae are present but typically occur as fragments of 5 cm or less and show no cellular preservation. Instead, the phylloid algal fragments occur as molds of algal thalli that have been filled with blocky calcite spar.

The dominant depositional fabric observed in hand samples is packstone. Patches of densely packed skeletal remains are often observed within individual thin sections (Figure 2.10). The accumulations range in size from 2-3 mm to 3-5 cm in both length and width.

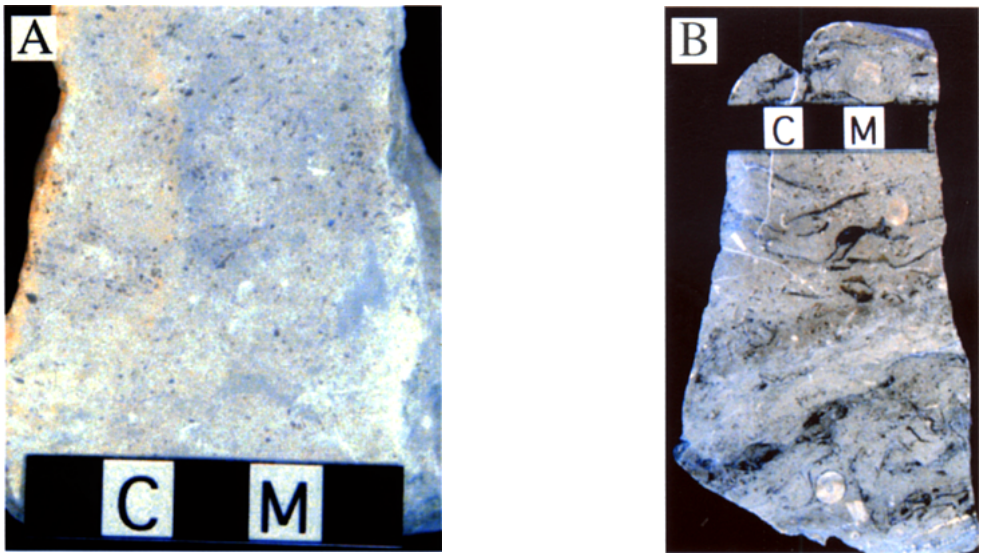

Figure 2.9. Hand samples showing skeletal wackestone-packstone facies. (A) This sample contains dominantly fine-grained skeletal material and so appears to be a mudstone in hand sample. See Figure 2.10b for photomicrograph showing true fabric (sample BS-4); (B) This sample demonstrates the more typical expression of the facies with coarser skeletal material and fragmental phylloid algal remains (sample RW-2).

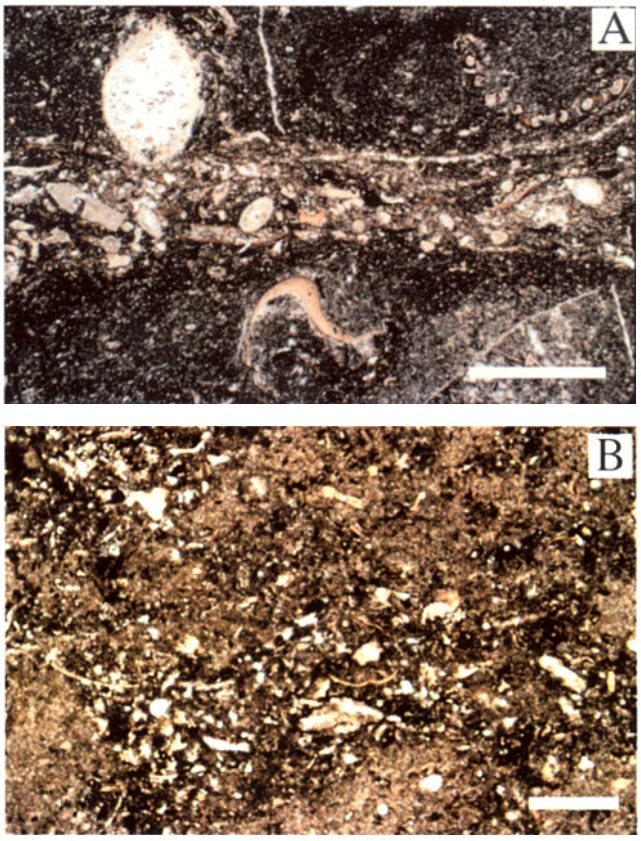

Figure 2.10. Photomicrographs showing various skeletal wackestone-packstone fabrics. (A) This sample exhibits depositional micrite matrix with densely accumulated skeletal material in a linear arrangement. This likely represents a burrow filled with skeletal material (sample RW-5; transmitted light; scale bar = 2 mm). (B) Skeletal wackestone with depositional micrite matrix and fine grained skeletal material Photomicrograph taken from hand sample shown in Figure 2.9a (transmitted light; sample BS-4; scale bar = 1 mm).

Although present in a few thin sections, the clotted micrite fabric, which dominates the phylloid-algal facies, is much less common in the skeletal wackestone-packstone facies. Instead, the matrix is dominantly depositional micrite that has been recrystallized to microspar (Figure 2.10). Coarse spar is found filling fractures and geopetal cavities, but overall the facies contains a much smaller percentage of coarse spar than does the phylloid algal facies (15 to 25 percent in the skeletal wackestone-packstone facies versus 25 to 50 percent in the phylloid algal facies). The skeletal wackestone-packstone facies is similar to the phylloid-algal facies in terms of its distribution of amount of argillaceous debris.

Environmental Interpretation

The matrix of the skeletal wackestone-packstone facies is dominantly depositional micrite. The facies lacks abundant phylloid algae or abundant microbial micritic framework that would have trapped and bound carbonate mud. Therefore, the skeletal wackestone must have been deposited in a low-energy environment that allowed the deposition of fine carbonate matrix.

The diverse, unabraded fauna provides further evidence of a quiet, open-marine environment. The presence of organisms such as bryozoans, brachiopods, echinoderms, and corals indicates a marine environment of normal salinity (Heckel, 1972b). Additionally, the irregular patches of skeletal packstone in the facies are evidence of bioturbation with patches of dense skeletal material that probably represent the accumulation of skeletal material in burrows. It has been shown that these irregular patches of packstone-grainstone in modern settings may be produced by storm infilling of excavated burrow systems (Tedesco & Wanless, 1989).