APPENDICES FOR GSA DATA REPOSITORY

Appendix DR1: Several specimens were CT-scanned and subsequently slabbed and thin-sectioned to examine the nature of sedimentary structures underlying and overlying medusae impressions. For example, we serially sectioned a large slab from horizon at 6.70 m in Krukowski Quarry, which contained a large medusoid impression in its center and a small impression at far left (A). Ten slices were made through the center of larger specimen (B, C) to examine the nature of sediments underlying the medusoid impression. All slabs (1-11) exhibit parallel lamination, low-angle inclined lamination, or layers of unlaminated sediment bounded by laminations on upper and lower surfaces. Similarly, overlying sediments (e.g., Appendix DR4A-C) are characterized by similar bed-parallel sedimentary features, and exhibit no postdepositional bed disruption. Based on these observations, an inorganic mode of formation for medusae impressions is rejected. Slab in A is 145 cm wide, and fields of view in images 1-11 are approximately 50 cm wide.

Appendix DR2: Magnified view of slab number 7 from Appendix DR1, illustrating bed-parallel laminations underlying the entire medusoid impression. Note the absence of sedimentary structures in sediment which makes up the convex central mound of the medusoid (white arrows), suggesting deposition of this sediment without wave/tidal influence. These features are consistent with sediment which may have been deposited from collapse of gastrovascular cavities and/or that was reworked during post-stranding contraction of medusae bells. Field of view is 22 cm wide.

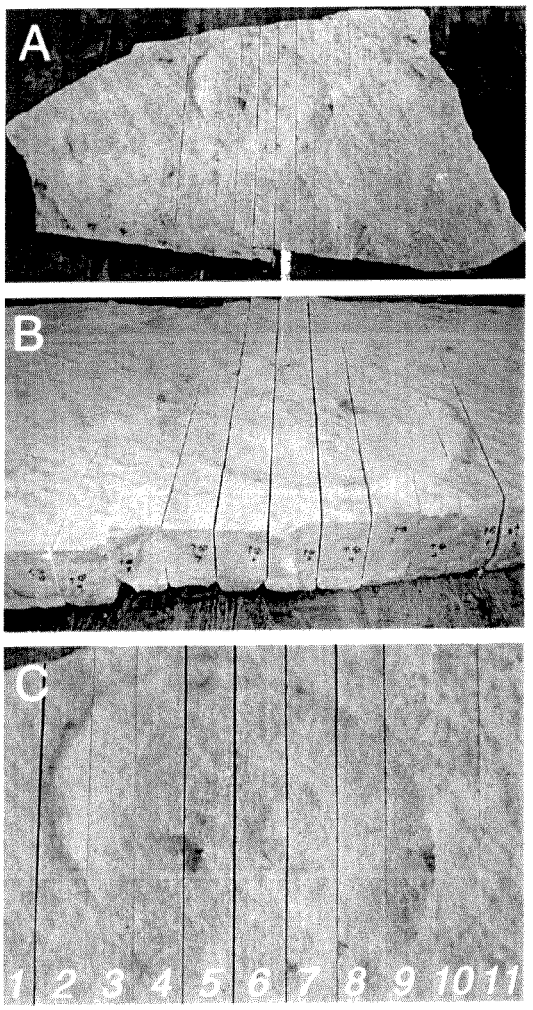
Appendix DR3: Contextual biostratigraphic and paleoenvironmental information from the Krukowski quarry, including data from bed soles (A, C-F) and bed surfaces (B). Fossils which are most relevant to biostratigraphic and paleoenviromental interpretations are a thin

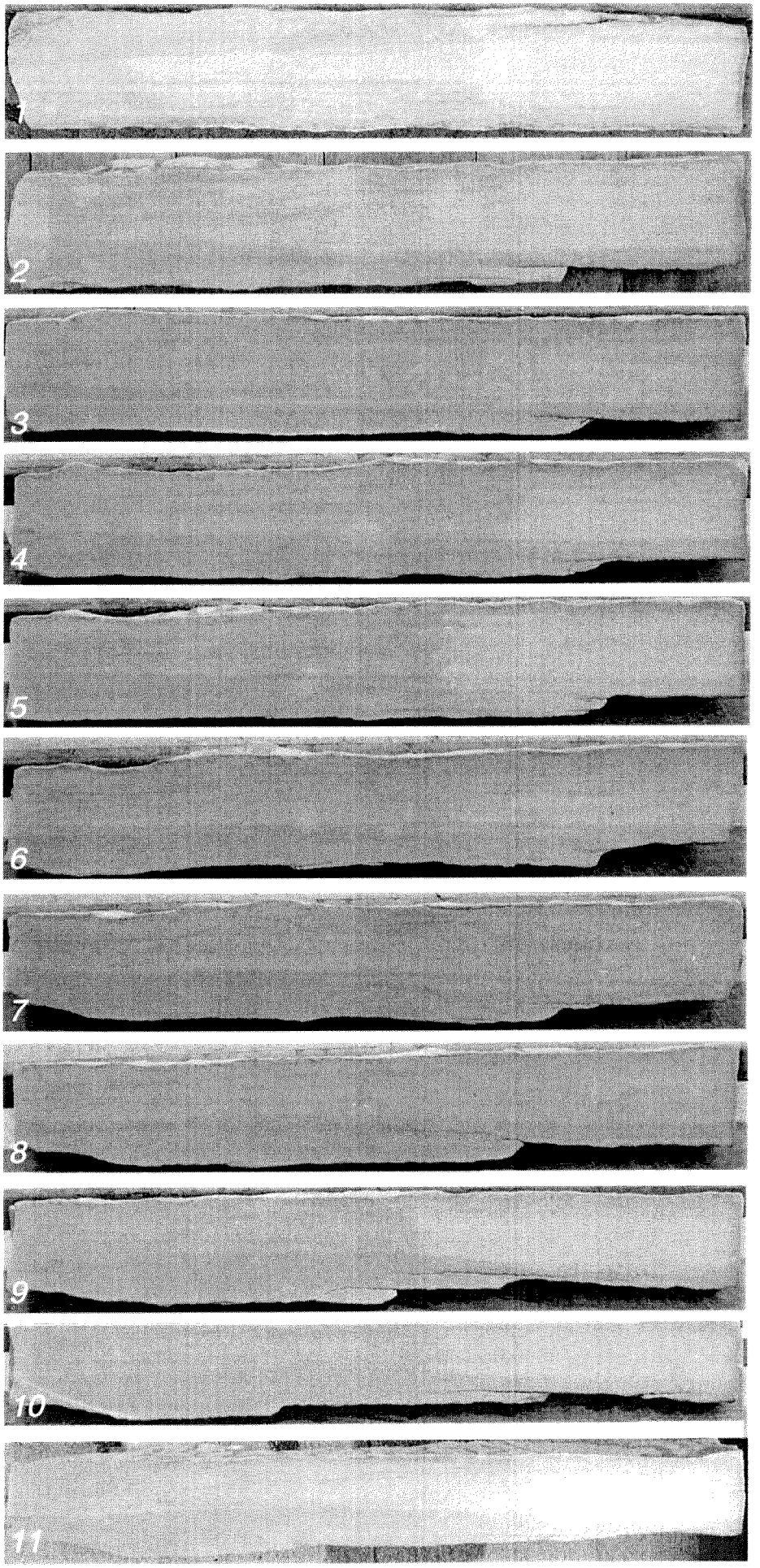
coquina of hyolithid molds (A), and trace fossils such as *Protichnites* (B, C), *Rusophycus* (D), and *Climactichnites* (E). Whereas the majority of these trace fossil producers and hyolithids likely inhabited marine settings, it has been suggested that the organisms that produced *Climactichnites* and *Protichnites* may have also ranged into settings that were subaerially exposed (Yochelson and Fedonkin, 1993; MacNaughton et al., 1999). Inorganic evidence for subaerial exposure is also found in the quarry, including desiccation features such as sand-loaded polygonal mudcracks (F). Width of field of view: in A, 11 cm; in B, 30 cm; in C, 50 cm; in D, 26 cm; in E, 110 cm; and in F, 65 cm.

Appendix DR4: Medusae impressions exhibit a wide range of morphologies, and are preserved in convex and concave epirelief on bed surfaces (A-F, J, K), and bed soles (G-I). Although most beds overlying medusae were examined in-situ, some part-counterpart specimens were extracted intact, whereby overlying layers could be separated from the initial stranding surface. For example, A-C illustrate a typical rippled surface characterized by three medusae impressions; in these images the overlying layer is successively removed (including the sediment ring which forms around the carcass) revealing a small mound of sediment presumably representing the margins of the medusoid carcass or its gastrovascular cavity. This sediment mound is not rippled like the remainder of the inferred stranding surface (C), and in many cases exhibits weak radial or tripartate or quadripartate cracks in the center (upper specimen in C, I). Many specimens are elongated parallel to inferred current directions (E, F, H, K), suggesting post-stranding orientation of specimens, perhaps concomitant with organism escape behaviors (e.g., far right specimen in H). Some specimens exhibit rills on sediment rings deposited around carcass margins (K), and multiple generations of ripples in adjacent and overlying sediments (G), suggesting carcass exposure through multiple tidal cycles and possible reworking of sediments

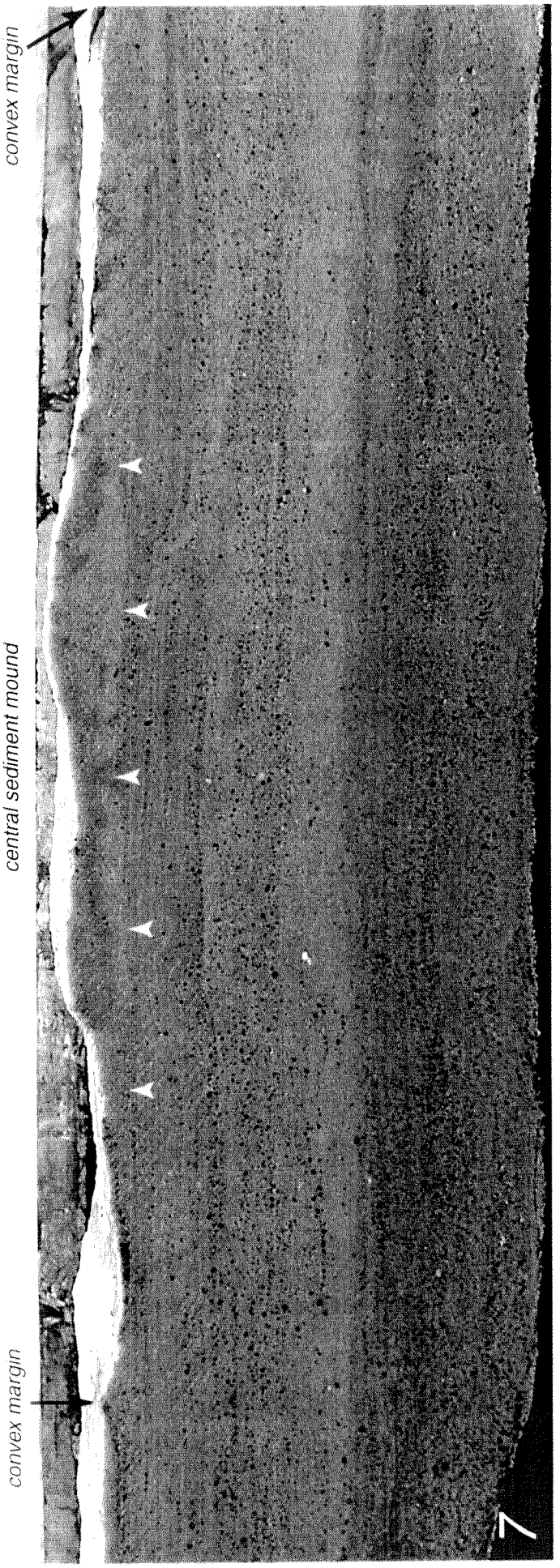
within marginal rings after carcass decay. Rare foam marks (D) on thin sediment layers overlying specimens are consistent with deposition in an intertidal setting. Width of field of view: in A-C, 65 cm; in D, 85 cm; in E, 90 cm; in F, 40 cm; in G, 75 cm; in H, 85 cm; in I, 43 cm; in J (foreground), 95 cm; and in K, 29 cm.

Appendix DR1

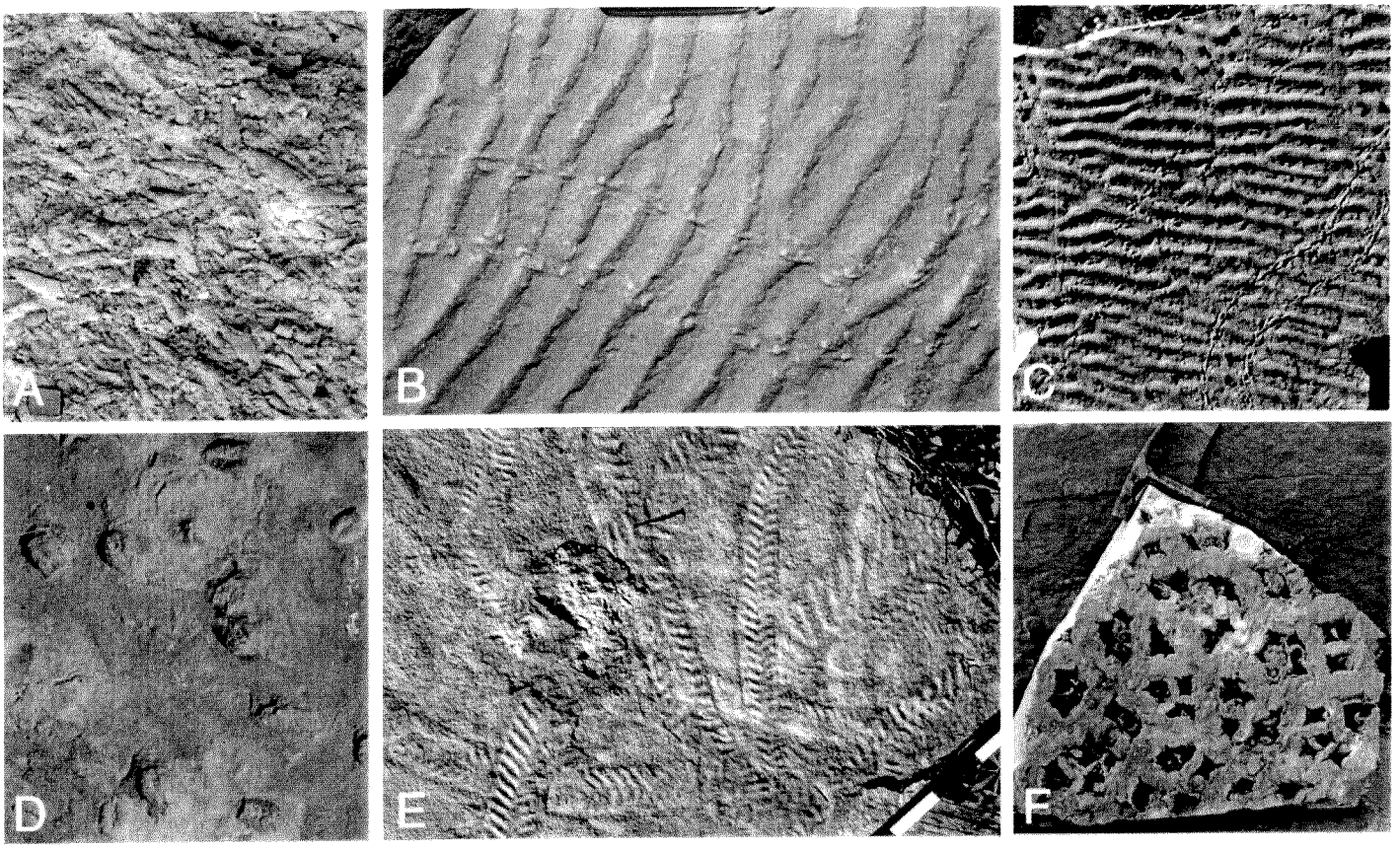




Appendix DR2



Appendix DR3



Appendix DR4