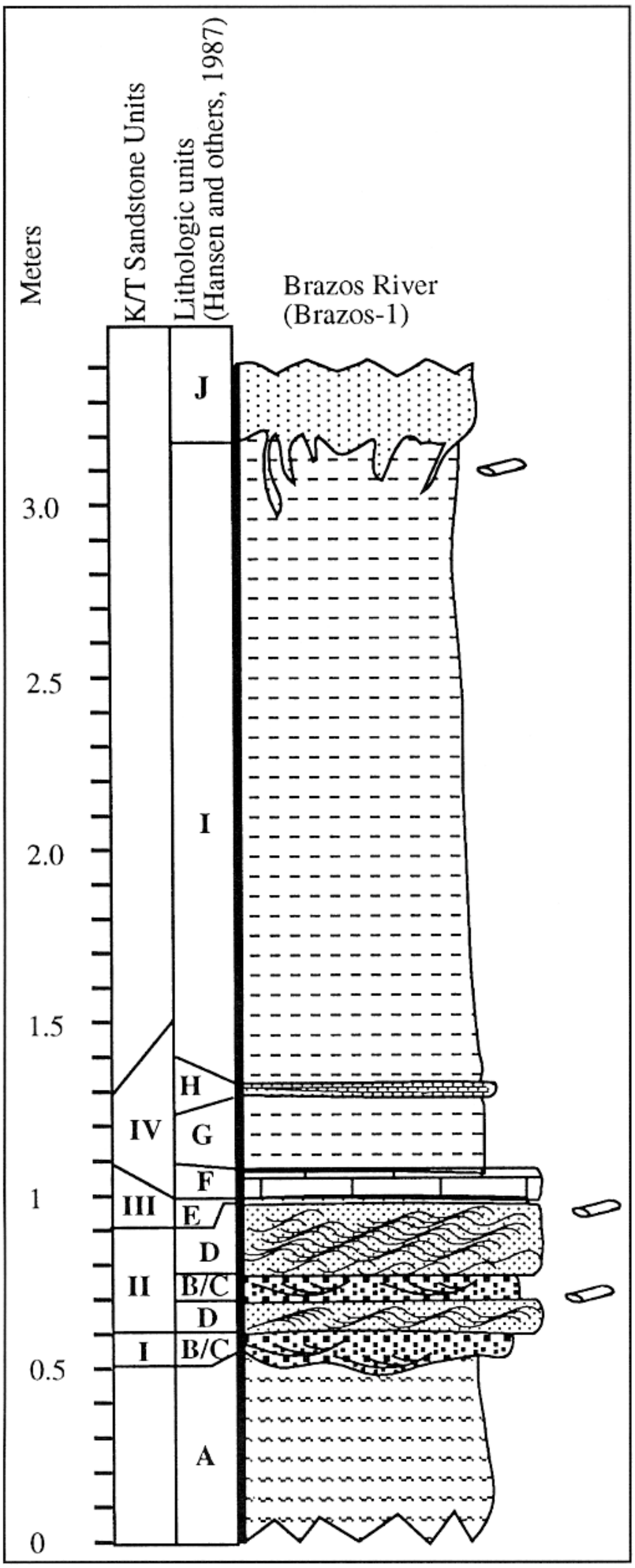

Figure 6. Lithologic column of the Brazos River section, showing the subdivision A–J of Hansen et al. (1987) (see text) and the subdivision into K/T sandstone complex units I–IV.

taken for glauconite grains. However, glauconite grains—also present in the shell hash—can be easily distinguished by their bright green colors, irregular outline, and absence of spherical cavities. Reexamination of earlier thin sections of the coarse "shell hash" of the Brazos 1 and 3 and Cottonmouth Creek (CMC) outcrops (Hansen et al., 1987) reveals that spheroids occur frequently also in those outcrops, in the lower B/C units (Fig. 6). However, the spheroids are strongly corroded and hardly recognizable. Often only an aggregate of the calcite-filled cavities remains (Fig. 5C). Another characteristic component of the basal sandstone is abundant, rounded carbonate fragments, 1 to 5 mm in diameter (Fig. 5D). These fragments often display irregular, concentric banding and contain rare, internal spherical cavities. The fragments are coarsely crystalline in the interior and have a <0.l-mm-thick, darker, often-corroded rim of micro-sparry calcite. An $^{87}Sr/^{86}Sr$ ratio of 0.707564 (K. Beets, personal communication, 1992) is consistent with a Campanian age of the carbonate (MacDougall, 1988). Carbonate fragments of the same size and with an identical texture were found in all other Gulf Coast basal K/T sandstone beds, including DSDP site 540 and Beloc, Haiti. The fragments are easily identifiable in thin section (Fig. 5D, G, H) in the basal sands of all Brazos River sections and appear to have better survived diagenetic alteration than the bubbly spheroids.

A salient lenticular layer of well-lithified, current-rippled medium- to fine-grained sandstone (unit D, 0 to 35 cm thick) quite sharply overlies the basal sands (unit B/C). The ripple structures are invariably asymmetrical and include steeply climbing ripples, climbing ripples-in-drift, and linguoid ripples. These ripple types change vertically and laterally into each other. Oscillation-type ripple structures, hummocky cross-stratification, or other symmetrical or asymmetrical wave ripple structures have not been observed, although it is often hard to distinguish the ripple structures observed in a section perpendicular to the current direction from wave ripple structures.

Current directions measured in unit D of the Brazos 1 and 3 outcrops are dominantly toward N100–110E but shift to N180 near the top of the layer. The basal sands and rippled sandstone (units B through D) repeat up to three times stratigraphically in the outcrops in the Brazos river bed, Brazos 3, CMC, and Darting Minnows Creek (DMC) (Hansen et al., 1987; Bourgeois et al., 1988). The second sequence (units B through D) is more continuous, and the second current-rippled sandstone (unit D) is often the thickest. The Brazos 1 section contains only one unit B through D sequence, but it could not be observed whether the first or second (units B through D) sequence outcrops in the Brazos 1 section.

Conspicuous, 1-cm-diameter, tubelike, branching *(Ophiomorpha?)* burrows occur on the top surface of both the first and the second rippled sandstone (unit D). These burrows were not observed in the interior of the rippled sandstone. It is not clear whether these burrows penetrated from above and spread out at these particular surfaces after deposition of the entire sandstone