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Eustatic controls on recurrent mud mound systems in the Devonian-Carboniferous sequence of the Bolshoi Karatau Mountains (Kazakhstan)?

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The Bolshoi Karatau, a small mountain chain in southern Kazakhstan, represents a wide carbonate platform which developed on the western side of the palaeocontinent Kazakhstania during Devonian and Carboniferous times. The seaward margin of this platform was structurally controlled by the rifted edges of a passive continental margin and its overall geometry was controlled by thermal subsidence and local tectonics. In comparison with similar depositional systems known from the Palaeozoic the Bolshoi Karatau carbonate platform is unique. Numerous, large mud mounds developed on its seaward margin and on the upper slope. Many of them demonstrate an original, very high (more than 100m) topographic relief. Cook et al. (2002) described a large number of mounds occurring in at least six stratigraphic levels within the Famennian to Bashkirian sequence. However, our preliminary study revealed that Tournaisian and late Visean lenticular limestone units, interpreted previously as mud mounds, represent, in fact, debris flows containing rich fauna of corals, crinoids and algae derived from the platform margin. The oldest mound generation is formed by small, a few-m-thick Famennian buildups which developed on the platform margin and within the subtidal facies. They are predominantly formed by algal (*Renalcis*, *Girvanella*) boundstones containing also rugose corals and sponges as accessory elements. In contrast, mounds developed on the slope during the early-middle Visean were large, up to 400m high. Their biotic components, including predominantly fenestrate bryozoans, sponges, calcareous algae, and crinoids, and sedimentary structures resemble those of the typical Carboniferous Waulsortian mounds. The youngest, early Bashkirian mounds developed on the platform margin and their biota was dominated by algae (*Donezella*, *Archaeolithoporella*, phylloid algae) and brachiopods. Repetitive facies pattern and stratigraphy appear to suggest that mounds were formed during major sea-level rises when the carbonate platform was drowned.

Cook, H.E., Zhemchuzhnikov, V.G., Zempolich, W.G., Zhaimina, V.Y., Buvtyshkin, V.M., Kotova, E.A., Golub, L.Y., Zorin, A.Y., Lehmann, P.J., Alexeiev, D.V., Giovannelli, A., Viaggi, M., Fretwell, N., LaPointe, P.A., Corboy, J.J. (2002) Devonian and Carboniferous carbonate platform facies in the Bolshoi Karatau, southern Kazakhstan; outcrop analogs for coeval carbonate oil and gas fields in the North Caspian Basin, western Kazakhstan. Special Publication - Society for Sedimentary Geology 74: 81-122.