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AN INTEGRATED STRATIGRAPHY OF THE SARMATIAN (UPPER MIDDLE MIOCENE) IN THE WESTERN CENTRAL PARATETHYS

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The Vienna Basin and the Styrian Basin have been cornerstones for the definition and description of the Central European Sarmatian Stage. New inter- and intrabasin correlations of well-logs and surface outcrops reveal a rather uniform development of depositional systems in all considered basins, which excludes local autocyclic processes as the sole trigger. The more than 1000-m-thick Sarmatian basin-fill is recorded in geophysical logs by a characteristic succession of serrated funnel- to bell-shaped curves separated by shale-line intervals. The correlative floodings are well preserved in marginal settings and accessible in surface outcrops. Slight falls of the relative sea-level are also reflected in the littoral zone by erosive surfaces, caliche formation and progradation of fluvial facies.

Geophysical and lithological logs of two main target areas in the Vienna Basin are involved in this study, namely logs from the northern Vienna Basin along the Steinberg fault (Niedersulz, Eichhorn, Gösting, Zistersdorf and from the field Matzen in the central part of the basin (Matzen, Schönkirchen, Prottes). Further logs and 2-D seismic data from the eastern Styrian Basin have been integrated. Log-data derive from the papers of Friedl (1936), Janoschek (1942; 1943), Kreutzer (1974), Wessely (2000), and Kosi et al. (2003). Further information was kindly provided by the OMV AG and RAG companies. For a reasonable inter- and intrabasin correlation, the general trends in geophysical logs have been compared. Despite the different sedimentation rates and the different tectonic settings, all considered areas display several parallel trends. The correlation of various wells in the northern Vienna Basin allows a comparison of marginal logs such as Niedersulz 5-9 with basinal settings as represented by the Eichhorn 1 section. The correlative intervals in that area display rather similar thicknesses. Local tectonics and different basin subsidence is expressed in slightly different sedimentation rates. The major trends, however, are similar. The same hypothesis is applied to the interbasin correlation between the Vienna and the Styrian Basins. Balancing the higher sedimentation rate of the Vienna Basin against that of the Styrian Basin resulted in an extremely good fit of the curves. Hence, the characteristic long-term coarsening upward trend is visible in the Styrian Gleisdorf Formation as well as in the ssynchronous Skalica Formation of the Vienna Basin. In the same way, the log-shape of the Carinthian Gravel is highly reminiscent of that of the time-equivalent deposits in the Vienna Basin.

This interbasin correlation, combining data from 4 different basins and subbasins, suggests the Sarmatian stage to be a product of a single 3rd order eustatic cycle. being composed of two lithologically quite different 4th order cycles. A peltic-siliciclastic, strongly transgressive Lower Sarmatian cycle contrasts with a mixed siliciclastic-oolitic Upper Sarmatian cycle. This shift in lithology correlates conspicuously with the run of the 2.35-Ma component of eccentricity and might reflect the turning point from its maximum towards the minimum phase. A further influence of the 400-Ka eccentricity band might explain the position of the maximum flooding surfaces of each 4th order cycle. Within that hypothetic scheme, some regional processes influenced the general trends. Thus, the progradation of fluvial facies during the initial 3rd order HST correlates not only with a minimum of the 400-Ka component. The deposition of the Carinthian Gravel and its equivalents in the Vienna Basin and the

Eisenstadt-Sopron basins also coincided with the final retreat of the Paratethys Sea from the Molasse Basin. Hence, it seems reasonable that tectonic uplift might have amplified the HST conditions. This is further supported by the fact that the increasing amounts of gravel deriving from Alpine units could be linked with an increased relief in the hinterland. Another hint at a tectonic modulation of the relative sea-level is the tilting of the Mistelbach block at the boundary between the upper *Ervilia* Zone and the *Sarmatimactra vitaliana* Zone. The late Middle Miocene uplift phase at 12.1-12.3 ma might thus be a regional "eastern Alpine" phenomenon.

Our new but still tentative calibration of the depositional sequences with astronomical target curves would require a refinement of the position of the Sarmatian stage within "traditional" chronostratigraphic tables. Based on the performed correlation, the Badenian/Sarmatian boundary should not be placed at 13.0 Ma as done in many published tables because this would cause a misfit between log-response and target curves. Based on the correlation, the boundary is suggested to be somewhere between 12.6 and 12.8 Ma. This date, moreover, fits excellently to the glacio-eustatic isotope event MSI-3 at 12.7 Ma (Abreu and Haddad 1998).