on Karpatian faunas.
A current FWF/DFG project yielded new data on Rupelian to Burdigalian mollusc faunas of the eastern Mediterranean. Investigations of early to middle Burdigalian sections in the Turkish Mut Basin and the Iranian Qom Basin together with comparisons with Burdigalian gastropods from the Italian Colli Torinesi also furnish evidence for a rather advanced late Lower Miocene gastropod fauna, which contribute to a large amount taxa which appear in the Paratethys during the Karpatian and Badenian, such as *Gibbula affinis, Gibbula buchi, Murex spinicosta,* and *Pleuroploca tarbelliana.* From that, neither the Karpatian migration nor the Badenian turnover necessarily was fed by an Indo-Pacific species-pool, but got its constituents largely from a well-established Mediterranean province fauna, which acted as a centre of origin in Lower Miocene times.
A detailed focus on the Austrian gastropod faunas spanning an interval from the Karpatian to the lower Badenian thus suggests an at least threefold migrationwave from the Mediterranean area. The first wave took place during the Karpatian, being documented by the gastropod fauna of the Korneuburg Basin and the Laa Formation, the second wave introduced the fauna of the Grund Formation, being characterised by an acme of some "old-fashioned" Karpatian species such as *Ficus cingulata, Volema cornuta, Euthriofusus burdigalensis* and *Tudicla rusticula.* Finally, the third wave resulted in the establishment of the typical Badenian fauna, being characterised by the assemblages of the Baden Formation.

Paleoenvironments of the Pielach Formation (Oligocene, Lower-, Upper Austria) - a case study for mollusc-based facies analysis

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The Oligocene Pielach Formation is characterised by bluish, greyish to black clay and silt with scattered coal-seams. It formed during the Kiscellian and early Egerian as a limnic, brackish and marine littoral facies of the Paratethys Sea along the Bohemian Massif in Lower and Upper Austria. The predominating NW-SE and NE-SW fault system in the southern part of the Massif caused a crystalline peninsula which extended as far south as Amstetten. A rather steep shelf formed along its western coast, whereas a flat, protected shelf developed in its eastern part. The Oligocene sea found a fissured shoreline with several small embayments, resulting in lagoonal environments and small-scale facies patterns. These patterns are reflected by a rich and well preserved mollusc fauna which reveals rapid vertical and lateral changes in composition, whilst the pelitic sediment displays an usually rather homogenous character. Additionally, these patterns document local oscillations of sea level and fluctuating freshwater influx, instead of one simple regression-transgression cycle.
The initial limnic stage cannot be detected by molluscs but is often characterised by dark clay with rootled beds. With the ingression of the sea, soon lagoonal and swampy environments established, in which a typical littoral, euryhaline mollusc fauna flourished. A rare community type in the Pielach Formation, consisting mainly of fluvial-estuarine species is the *Melanopsis impressa - Neritina picta* community. The scarceness of pure estuarine assemblages points to a more distal position, since the estuarine species are usually associated with taxa such as *Polymesoda convexa* and *Mesohalina margaritacea.* This composition reflects rather lagoonal conditions under weak estuarine influence, pointing to salinities between 5 and 10 ‰. The extended littoral mudflats of the lagoons were inhabited by large populations of potamidids which avoid agitated waters of exposed shorelines. These *Granulolabium plicatum - Mesohalina margaritacea* communities pass locally into *Ostraea fimbriata*-beds. With decreasing numbers of potamidids and oysters the communities are replaced by *Mytilus aquitanicus* communities and finally by *Turritella venus - Pelycyora polytropa* communities. This succession marks the transition to shallow sublittoral but still protected environments which offered at least polyhaline salinities.
As documented by a temporal section during a railway tunnelling project at Melk, the described community-succession from littoral-oligohaline to littoral-mesohaline and finally sublittoral-polyhaline communities is not one-directional. Typically, the various communities can be found several times in vertical and lateral direction. Additionally, the section hardly offers the ideal ecological succession, but usually different types follow without transitional stages, indicating rapid shifts of habitats within a coastal environment, which is dominated by lagoons.

Palecological significance of selected mollusc assemblages during the lower to middle Pannonian in the Northern Vienna Basin

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An about 30 m thick siliciclastic section of gravel, sand, silt and clay was studied in the Northern Vienna Basin. The outcrop Pellendorf is situated at the north-western part of the Kronberg uplift block close to the Bisamberg fault zone, which seems to have been affecting sedimentation during the investigated time interval. During field work, focusing on the excellent flora which will be presented soon in a paper by Kovar-Eder & al., the associated mollusc faunas turned out to be of major importance for synecological reconstruction of the sedimentary environment.
The basal part of the section is formed by about 12 m fluvial gravel of the lower Pannonian Mistelbach Formation. Psammitic parts of the formation bear an synchronous allochthonous landsnail fauna, predominated by genera such as *Carychium, Semilimax, Gastrocopta* and *Acanthinula.* The good preservation of the fauna suggests a rather short transport. The actualistic approach - relying on ecological requirements of extant relatives - documents an origin from adjacent, moist habitats surrounding the rivulets. The sandy, gravely part is overlain by 2-4 m of greyish pelits with a diverse flora. Basal layers consist mainly of stems (<1.5 cm) and of accumulated leaves of *Decodon,* whilst floating and submerged aquatic plants get abundant towards the top of the unit. The abrupt change of paleoenviroment is reflected not only in sedimentation and flora but also in the composition of the mollusc fauna. Autochthonous occurrences of anodontid bivalves and the limnic gastropods *Radix* and *Bithynia* replace the landsnail fauna of the underlying unit completely. Obviously the fluvial system was pushed back or changed its course and a zone of stagnant lakes formed along the landward side of Lake Pannon. The first ingression of the brackish waters of Lake Pannon resulted in littoral conditions and an increase of water energy. More than 10 m of interbedded and crossbedded silt and sand was deposited, lacking any anodontids. Instead of these, *Unio atavus* appears, accompanished by *Melanopsis bouei* and *Brotia escheri.* After this high energy phase a new decrease in water energy is reflected by the overlaying 5 m of dark clay. A sudden deepening of the investigation area beyond wave base (at least 10-15 m) resulted in the deposition of these pelits which bear only scattered suspension feeders, such as *Congeria partschi* and Limnocardiids but lack any herbivorous molluscs. The abrupt transition from littoral facies

to "offshore" facies was probably connected with synsedimentary activity of the Bisamberg fault. This interpretation seems to be confirmed by a thickening of the sedimentary units towards the fault which are interpreted as minor roll-over structure. Additionally two beds of finesand which were transported from nearshore environments into the "*Congeria*-pelits" might also be triggered by synsedimentary activity.
Therefore the mollusc associations allow a reconstruction of a transgression of Lake Pannon in the Northern Vienna Basin, causing a shift in facies from fluvial to limnic and brackish-littoral environments. The final deepening - reflected by pelitic sedimentation - has to be seen in context with local tectonic activities, rather than with a transgressive event.

Palaeobiogeography of molluscs in the East Mediterranean and W Indo-Pacific during the Oligo/Miocene

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Study of fossiliferous sections in Central Iran (Qom Basin, Esfahan-Sirjan Basin) and the Zagros Mountains, in the Mut and Sivas Basins (Turkey), the Mesohellenic Trough (N-Greece), and the Suez District in the Eastern Desert (Egypt) were carried out within joint projects between the Austrian and German Science Foundations. The main goal of this study was the exact dating of the closure of the seaway between the Eastern Mediterranean and W Indo-Pacific and proof by biogeographic data.
In this presentation, we deal with molluscs only, focussing on gastropods and pectinid bivalves. The sections and co-occurring fossils allow a comparison of several time slices, particularly in the Late Oligocene and the Early Miocene. The faunal distribution within the sections gives clear proof that the seaway was fully intact during the Late Oligocene and the Aquitanian. According to the occurrence of several gastropod and pectinid taxa, the closure took place in the middle or late Burdigalian. Besides this clear timing, another interesting result is that the biogeographic influence is not unidirectional from the Indo-Pacific to the Mediterranean but that a high Mediterranean faunal input into the Iranian area occurred. Based on gastropod data (e.g., strombids, melongenids, turritellids, potamidids, cerithids), a major biogeographic province boundary was located between the studied Iranian and (literature based) Pakistani localities. Related to these patterns is the important observation that the spatial distribution of many taxa does not match and biogeographical entities are incongruous.

Geoarchäologische Untersuchungen in Norddeutschland

Beginnende Landwirtschaft und ihr Einfluss auf den nacheiszeitlichen Landschaftswandel im Oldenburger Graben vor dem Hintergrund anhaltenden Meeresspiegelanstiegs

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Die Analyse der sedimentologischen Entwicklung von Niederungsgebieten an der Ostseeküste erfordert die Abschätzung der natürlichen und anthropogenen Faktoren. Für diese Aufgabe bedarf es der Zusammenarbeit von Geologen und Archäologen. Die Niederung des Oldenburger Grabens auf der wagrischen Halbinsel in Ostholstein mit ihrem weitgehend ungestörten holozänen Sedimentarchiv sowie einer Fülle von ur- und frühgeschichtlichen Fundplätzen stellt hierfür ein ideales Forschungsgebiet dar. Zur Zeit der Litorina-Transgression erstreckten sich an dieser Stelle ein bis zwei Meeresarme von der Hohwachter zur Mecklenburger Bucht. Weite Teile der heutigen Niederungsflächen liegen unter dem Meeresspiegel und werden künstlich entwässert. Der Fundplatz Wangels LA 505 wurde in den letzten vier Jahren anhand mehrerer Grabungsschnitte intensiv aufgearbeitet. Das Umfeld der Grabung wurde mittels Rammkernsondierungen und Kernbohrungen sowie Georadar-Profilen detailliert aufgenommen.
Die archäologischen Ergebnisse zeigen für Wangels LA 505 ein differenziertes Bild der Besiedlungsabfolge einer endmesolithisch/frühneolithischen Küstensiedlung. Eine mehrphasige Nutzung beginnt am Ende der Ertebølle-Kultur um 6300 BP. Bis um 6000 BP nehmen bäuerliche Komponenten mit entwickelter Haustierzucht sowie Getreideanbau bzw. –nutzung zu. Die Auswertung von Tierresten ergab, daß das Leben nicht primär auf marine Resourcen und Jagd konzentriert war. An Funden wurden aus einem Schilftorf Holzartefakte wie Beilschäfte und Paddel geborgen, aus einer Kulturschicht weiterhin Keramik, Werkzeuge und Schmuckstücke aus organischem Material sowie Flint- und Felsgesteinartefakte.
Die geologisch-sedimentologischen Untersuchungen sowie die paläogeographischen Rekonstruktionen ergaben für Wangels LA 505 eine Lage am nordöstlichen Ufer einer kleinen Insel. Diese lag im Bereich des ehemaligen Ostseefjordes, der von der Hohwachter Bucht bis zur heutigen Stadt Oldenburg reichte. Der Inselcharakter ergibt sich aus anstehenden spät- und postglazialen Sanden, Schluffen und Tonen, die an dieser Stelle eine Kuppe bilden. Die Lage im Fjord belegen mächtige, der Besiedlung zeitgleiche Mudden im Umfeld der Insel, die zahlreiche marine und marin-brackische Mollusken enthalten. Die Verbindung des Meeresarmes zur offenen Ostsee, die ca. 3,5 bis 4 km weiter westlich lag, war zu dieser Zeit offensichtlich noch nicht durch Strandwälle abgeriegelt.
Weitere Untersuchungen sollen klären, ob sich der Wechsel von Natur- zur Kulturlandschaft auch in den Sedimenten der Umgebung wiederspiegelt. Die Rekonstruktion der paläogeographischen Verhältnisse zu unterschiedlichen Phasen der Besiedlung soll auf den gesamten Niederungsbereich ausgedehnt werden. Es soll u. a. der Frage nachgegangen werden, ob eine Verbindung der Hohwachter Bucht zum östlichen Meeresarm und somit zur Mecklenburger Bucht bestanden hat. Zudem ist zu klären, zu welcher Zeit der Fjord von der offenen Ostsee abgeriegelt wurde und wie die darauf folgende limnische Phase der Niederung in einen Zusammenhang mit der Besiedlungsgeschichte zu stellen ist. Der jeweilige Küstenlinienverlauf und die Tiefe der Transgressionskontakte wird im Zusammenhang mit den Datierungen zu einer Weiterentwicklung der Meeresspiegelanstiegskurve für diesen Bereich führen.

3-D Radar- und Aquifer-Sedimentologie an heterogenen glaziofluviatilen Kieskörpern

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Zur Charakterisierung von Aquiferen, für Altlastensanierungen oder zur Modellierung von Schadstoff-Transport im Grundwasser, ist die Kenntnis der 3-D räumlichen Verteilung von sedimentären Heterogenitäten im Untergrund eine essentielle Vorausset-