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Im Jahre 1902 wurde Lienenklaus zum Oberlehrer ernannt. Schon drei Jahre später, am 6. Mai 1905, starb Ernst Lienenklaus infolge einer tückischen Krankheit in Ribbesbüttel bei Braunschweig/Niedersachsen. Die Drucklegung (1905) seiner letzten Monographie über „Die Ostrakoden des Mainzer Tertiärbeckens“) durfte er nicht mehr erleben.

Seine persönliche Sammlung wurde 1905 aufgeteilt; der erste Teil – seine Ostrakodensammlung – wurde zwei Wochen vor seinem Tod im Mai 1905 für 500 Reichsmark von Adolf von Koenen (1837–1915) für das Naturhistorische Museum an der Universität Göttingen erworben (heute in den Sammlungen des Geowissenschaftlichen Zentrums der Universität Göttingen). Der zweite Teil, bestehend vornehmlich aus Makrofossilien des Tertiärs und Karbons, wurde vom Museum Osnabrück erworben (ANONYMUS, 1907).

Die Ostrakodensammlung E. Lienenklaus in Göttingen enthält mehr als 10 000 Ostrakoden aus dem Tertiär und Quartär von Deutschland, Frankreich, der Schweiz, Belgien, Italien, Ungarn, Rumänien, Serbien, der Nordsee sowie dem Arktischen Ozean.

Das Wissen um den Verbleib der Sammlung ging jedoch bald darauf verloren. TRIEBEL (1950, 1952) und STRAUß (1952) benutzten für die Revision Lienenklausscher Arten ausschließlich die von Ernst Lienenklaus im Senckenberg-Museum in Frankfurt/M. hinterlegte Parallelsuite – in der Annahme, die Originalsammlung sei verschollen. Triebel bekam wenig später den Hinweis über den Verbleib der Sammlung in Göttingen, wovon als erster der Schweizer H. J. OERTLI (1956) profitierte. Auch MOOS (1963 ff.) revidierte zahlreiche Taxa anhand des Göttinger Originalmaterials. Moos begann auch mit der Rettung und Neuordnung der Ostrakoden-Sammlung, deren Katalogisierung jetzt zu ca. 75 % abgeschlossen ist.

Ernst Lienenklaus lieferte wesentliche Beiträge zur Kenntnis der europäischen Oligozän/Miozän-Ostrakoden; seine vorbildlichen und ausführlichen taxonomischen Beschreibungen (inklusive von Extern- und Internstrukturen der Schale) von mehr als 380 Arten (130 davon neu) waren maßgebend für viele nachfolgende Mikropaläontologen. Mit seinen Arbeiten belegte er erstmals die hohe Diversität oligozäner/miozäner Ostrakodenfaunen in Deutschland.

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A FOURTH ST. GALLEN FORMATION CYCLE (?) IN THE KARPATIAN UPPER MARINE MOLASSE OF CENTRAL SWITZERLAND

Bettina REICHENBACHER [1], Daniel KÄLIN [2] & Jürg JOST [3]

[1] Department of Earth and Environmental Sciences, Section Palaeontology and GeoBioCenter, Ludwig-Maximilians-University, Richard-Wagner Str. 10, D-80333 Munich; e-mail: b.reichenbacher@lmu.de, tel. 0049(0)89 21806603, fax. 0049(0)89 21806603.
[2] Rainweg 2A, CH-3314 Schalunen.
[3] Bärenhubelstraße 10, CH-4800 Zofingen.

The stratigraphic succession in the Molasse Basin is conventionally subdivided into two transgressive-regressive megacycles. Each of these starts with marine deposits and ends with freshwater deposits. The lithostratigraphic units in the first megacycle are the Lower Marine Molasse (Kiscellian), the Lower Brackish Molasse, and the Lower Freshwater Molasse (Egerian). The lithostratigraphic units in the second megacycle, to which the present study

refers, are the Upper Marine Molasse (Eggenburgian to early Karpatian), the Upper Brackish Molasse (late Ottnangian), and the Upper Freshwater Molasse (Karpatian to Pannonian). The two megacycles cannot readily be recognized in the eastern part of the Molasse Basin in Germany (east of Munich) and in the Molasse Basin in Austria. In these areas, marine conditions prevailed through into the late Lower Miocene.

Conventionally, the Upper Marine Molasse is subdivided into two transgressive-regressive fining-upward cycles, with a hiatus between. In Switzerland, the cycles are composed respectively of the Luzern Formation and the St. Gallen Formation; the former was correlated with the Eggenburgian in age, the latter with the Ottnangian to early Karpatian. In southwestern Germany, the cycles are composed of the so-called Heidenlöcher Beds and "Sand Shales", and of the overlying Baltringen Beds and "Fine Sand Series". It must be noted that there is uncertainty in the correlation of the cycles between Switzerland and South Germany, especially for the Eggenburgian and lower Ottnangian (cf. HAGN, 1961; WENGER, 1987).

The aim of this study is to provide some new data that lead to a better understanding of the sedimentary history in the northern Alpine foreland basin during the Upper Marine Molasse. These data bear on a previously unknown marine-oligohaline-marine sequence within the Upper Marine Molasse of the Mauensee and Schmiedrued sections in central Switzerland, west and north of Lake Sempach. Each section exposes the upper part of the Upper Marine Molasse, and one section (Mauensee) exposes also the lower part of the Upper Freshwater Molasse.

Biostratigraphic analysis of mammals and fish otoliths shows that both sections are of early Karpatian age. Palaeoecological analysis of the biota indicates an oligohaline intercalation within the marine part of the sections that evidences a change from a marine environment to an oligohaline lake within the Karpatian Upper Marine Molasse. The connection to the open sea obviously was interrupted, and the remaining water body freshened rapidly due to precipitation and river inflow. The fact that the oligohaline deposits are thin suggests that this event probably was short. Subsequently, there occurred a flooding from the sea, and the oligohaline lake became again marine. The presence of an oligohaline sequence is additionally confirmed by the oxygen isotopic compositions of fish otoliths from the Mauensee section.

Two different events could be responsible for the change from marine to oligohaline and again to marine conditions: (1) a sedimentological "event" or (2) a sea-level change due to eustatics or tectonics. A sedimentological event might have happened if some large near-coastal water body had become isolated as a result of coastal sedimentation processes (e.g. storms). In that case, the change back to marine conditions was due to the re-opening of the connection between this bay (now a lake) and the sea. On the first glance, this explanation seems reasonable because the sections represent a near-shore environment at the eastern margin of the Napf fan-delta, where high sediment supply might have created a restricted lagoonal environment that developed into an oligohaline lake. In this case, no tectonic or eustatic event would be involved and the marine-oligohaline-marine sequences of the Mauensee and Schmiedrued sections would not be correlative with any other event in the Molasse basin. However, the fish assemblages in the oligohaline sediments do not support a locally restricted, near-shore lagoon, because in such an environment also stenohaline-marine fishes and a variety of marine-euryhaline species would be expected. Instead, a diverse oligohaline to freshwater fish fauna is present in Mauensee and Schmiedrued. It contains freshwater taxa (e.g. *Palaeocarassius mydlovariensis*, *Aphanius konradi*, *A. gubleri*) that are widespread from southwest Germany to central Switzerland (REICHENBACHER, 1993; REICHENBACHER et al., 2004). Such a fish fauna indicates an extended inland water system, and some distance from the coast. Consequently, it seems to be a more probable explanation

that the marine-oligohaline-marine sequence was due to a sea-level change, which caused a vast regression in central Switzerland, and which was followed by a recurrent transgression.

On the basis of the lithostratigraphy and biostratigraphy, the Mauensee and Schmiedrued sections belong to the younger part of the Upper Marine Molasse and thus to the St. Gallen Formation. In eastern Switzerland, the St. Gallen Formation is generally subdivided into three small cycles, each of them starting with coarse conglomerate flows and ending with a regressive sequence of fine-grained clastics and a subsequent hiatus. The early Karpatian age of the Mauensee and Schmiedrued sections evidence their correlation with the third small cycle of the St. Gallen Formation. Consequently, the oligohaline intercalations can be interpreted as belonging to the regressive phase of that third small cycle. Thus, the overlying marine sequence may represent a fourth cycle in the St. Gallen Formation that might perhaps indicate a Karpatian transgression from the Mediterranean Sea, which has not previously been recognized.

Biostratigraphic comparison shows that the sedimentation of the Upper Freshwater Molasse began at the base of the Karpatian in southwest Germany and eastern Switzerland, and in the middle Karpatian in central Switzerland. The presence of a Karpatian marine sedimentation area in central Switzerland may explain that the terrestrial sedimentation of the Upper Freshwater Molasse began at such different times.

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DER TEUFEL LIEGT IM DETAIL – HISTOLOGISCHE VERÄNDERUNGEN PLEISTOZÄNER UND HOLOZÄNER SÄUGETIERKNOCHEN IM ZUGE DER KNOCHENDEKOMPOSITION

Christina Karla REIMANN

Geologisch-Paläontologisches Institut und Museum der Universität Münster, Corrensstr. 24, 48149 Münster;
e-mail: reimi@uni-muenster.de

Bei näherer Betrachtung der mikroskopischen Strukturen eines Knochens ist es möglich, Unterschiede zwischen frischem und fossilem Knochen festzustellen.

Bei den durchgeführten Untersuchungen werden die verschiedenen Kriterien der Veränderungen an histologischen Dünnschliffen im Einzelnen beschrieben um herauszufinden, in welchem Zusammenhang diese zueinander stehen. Zu diesen Kriterien zählen: das Auftreten von Mikrorissen im Bereich der Osteone, größere Risse innerhalb der Kompakta, die Anisotropie des Kompaktknochens, die Anisotropie der häufig verfärbten Außenbereiche des Knochens, die Verteilung der Verfärbungen, das Erscheinungsbild der Osteon-Lakunen und die Füllungen der Haversschen Kanäle.