Taunus.
Das südlich an den Taunus anschließende Rotliegend war in der Tunneltrasse als Fanglomerat aus Taunusmaterial aufgeschlossen. Drei Kilometer weiter südlich wurde es erst in 145 m Teufe in feinkörniger Fazies erbohrt.
Im Taunus zeigt sich ein noch intensiverer Schuppenbau als bisher angenommen. Im Einzelfall konnten Teilschuppen, Überschiebungsbahnen, Mylonite und Brekzien dokumentiert werden. Im Bereich wechselnd kompetenter Gesteine des Taunuskammes ist eine hohe Zahl von Schuppen entwickelt. Erstmalig waren im Vordertaunus zahlreiche nach SE gerichtete spätvaristische Rücküberschiebungen zu beobachten. Außerdem tritt dort abweichendes N-S- bis NW-SE-Streichen auf. Die Taunus-Südrand-Störung ist durch eine saigere rechtshändige Seitenverschiebung versetzt. Häufig sind postvaristische Dehnungsgefüge im varistischen Gebirge, die z. T. mineralisiert sind (u. a. mit Quarz, Calcit, Dickit, Pyrit).
Die varistisch konsolidierten Gesteine des Taunus sind nur selten Festgesteine. Denn spät- und postvarstisch sind sie durch Tektogenese, hydrothermale Aktivität und Verwitterung unterschiedlich entfestigt worden.
Diese Ergebnisse haben gezeigt, dass selbst nach 150 Jahren Geologischer Landesaufnahme in schlecht aufgeschlossenen Gebieten noch wesentliche neue Erkenntnisse über den Untergrund zu gewinnen sind.

Criteria for Recognizing an Orbitally Forced Cyclic Hierarchy: The 'Purbeckian' at the Classic Sierra del Pozo Section (Berriasian) Southern Spain

ANDERSON, E.J.

Geology Department, Temple University, Philadelphia, PA 19122, andy@astro.temple.edu

The Lower Cretaceous Sierra del Pozo Formation is totally divisible into meter-scale cycles that can be bundled in a three-tiered hierarchy (fig. 1). The smallest scale cycles (6th order), thought to be the product of precessionally forced sea-level change average less than a meter in thickness, shallow upward and are bounded by surfaces where deeper facies abruptly overlie shallower facies. These 6th order cycles may be grouped into sets (5th order sequences) of 2 to 6 cycles by periodic change (100 ka) in the eccentricity of the Earth's orbit. These larger-scale, 5th order sequences, are recognized by an asymmetric pattern in the degree of facies change internal to successive, constituent meter-scale cycles. Near the base of a 5th order set (i.e. in the first or second 6th order cycle) the magnitude of facies change at the basal cycle boundary is greater than that in subsequent cycles in the set. The next larger tier in the hierarchy (4th order) comprises sets of four 5th order sequences. This tier is the product of a longer term variation (400 ka) in eccentricity. Typically a maximum degree of eccentricity (and a resulting maximum degree of facies change) is observed near the base of the second 5th order sequence of the 4th order bundle. That is high eccentricity causes the strongest precessional signals in the second 5th order sequence in a 4th order set.
Jimenez de CISNEROS & VERA (1993) described 141 cycles in a 280 m interval in the Sierra del Pozo section. Their cycle boundaries are defined at surfaces where suhtidal-facies abruptly overly tidal-flat facies, where there is evidence of exposure (i.e. karst or soil) or at marked discontinuities. Cycle thicknesses on their log (varying between 1-4 m) are precise and and reproducible. They conclude that the average duration of the cycles they describe is approximately 40 ka and that this time interval suggests that obliquity-forced sea-level change is the most probable explanation of the origin of the cycles.
Re-evaluation of the cyclicity in this section applying a 'Milankovitch' based hierarchic genetic model (ANDERSON & GOODWIN

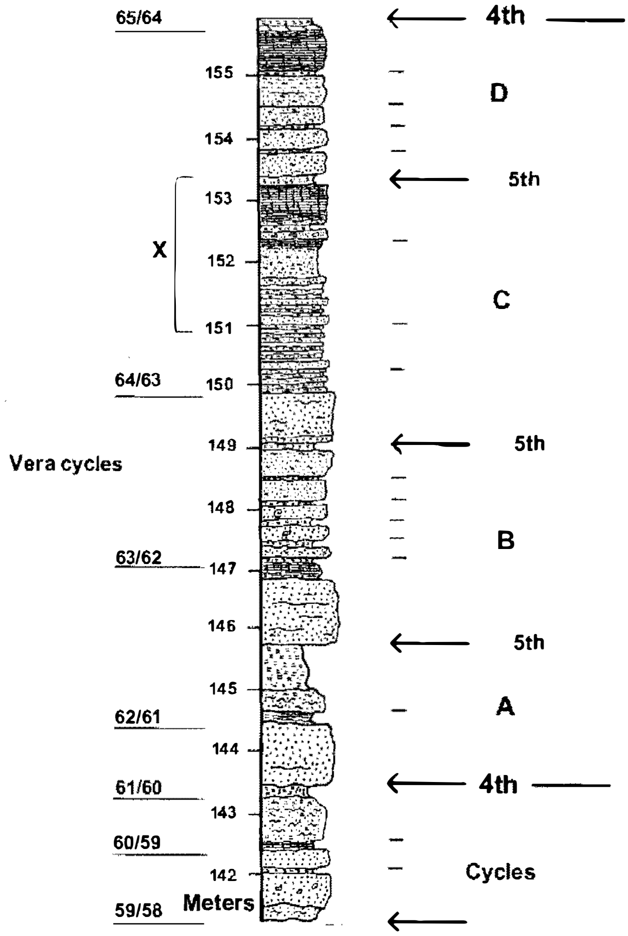

Fig. 1: Stratigraphic log of part of the Sierra del Pozo Formation. Cyclic hierarchy on right and Vera cycles on left. Dashes show 6th order cycles.

1990, GOODWIN & ANDERSON 1997) indicates that the thicker cycles described by Jimenez de Cisneros and Vera are composite cycles and that meter-scale cycles (some of which are recognized by CISNEROS & VERA 1993) are bundled in a 3 tiered hierarchy. This hierarchy conforms well with the tiered cyclic struc-ture described by STRASSER & HILGARTNER (1998) in rocks of the same age (and similar facies) in the French Jura. The 3-tiered stacking patterns and time limitations observed in both areas support a 'Milankovitch' forcing mechanism.
Work supported by NSF Grant No. 9902680.

ANDERSON, E.J. & GOODWIN, P.W. (1990): The significance of meter-scale allocycles in the quest for a fundamental stratigraphic unit. - Jour. of the Geol. Soc., **147**: 507-518, London.
GOODWIN, P.W. & ANDERSON, E.J. (1997): Stratigraphic incompleteness: Milankovitch in the Manlius at the margin. - Field Trip Guide, New York State Geol.Assoc., 69th Annual Meeting, 237-249.
JIMENEZ DE CISNEROS, C. & VERA, J.A. (1993) Milankovitch cyclicity in Purbeck peritidal limestones of the Prebetic (Berriasian, southern Spain). - Sedimentology, **40**: 513-537, Amsterdam.
STRASSER, A. & HILLGARTNER, H. (1998): High-frequency sea-level fluctuations recorded on a shallow carbonate platform (Berriasian and Lower Valanginian of Mount Saleve, French Jura). - Eclogae geol. Helvetica, **92**: 375-390, Basel.