

# PETROLEUM GEOLOGISCHE KRING

KONINKLIJK NEDERLANDS GEOLOGISCH MIJNBOUWKUNDIG GENOOTSCHAP



PGK

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<b>Venue:</b> PGK's monthly lectures are held at the KIVI building, Prinsessegracht 23, Den Haag. Drinks are served from 5 PM; the lecture starts at 6 PM.	<b><a href="http://www.pgknet.nl">www.pgknet.nl</a></b>
<b>Membership:</b> Apply for membership by contacting the secretariat. Euro 15,-	
<b>Accounts:</b> VSB Bank: 88 65 82 733 (PGK, Haarlem)	Postbank: 4074482 (PGK, Haarlem)

## JUNE NEWSLETTER

### **19 JUNE: MEETING**

The next monthly meeting will be on Wednesday 19 June. As usual, social hour (free drinks) between 17:00 and 18:00 hrs. A lecture will be given by professor **Wolfgang Schlager (VU Amsterdam)** with the title:

### **“CARBONATE DEPOSITION - FACTORIES TO SEQUENCES”**

*Please see other side of this newsletter for the June lecture abstract.*

### **SUMMER RECESS**

In July and August there will be no PGK activities. The June meeting of the 19<sup>th</sup> is the last activity before the start of the summer. The first PGK meeting of the autumn will be on the 24<sup>th</sup> of September 2002 (please note that this is a Tuesday).

### **ONE DAY EXCURSION**

#### **The Winterswijk Quarry, Saturday 5 October 2002**

Provisional plan (the pit is only open on one day every month):

8:00 departure by bus from The Hague (central Station);

10:00 arrival at geological museum in Winterswijk; and lecture given by Willem Pelletier on the local geology;

12:00 lunch at the hotel Frederikshof near the museum;

13:00 visit Ratum Quarry (open till 16.30); drinks at the hotel and drive home.

### **NEW MEMBERS**

Applications for membership have been received from Theo Mulder (TotalFinaElf). If no objections are received prior or during the next meeting he is automatically elected a member of our society.

### **NEW JOB POSTING SERVICE**

PGK is initiating on its web page [www.pgknet.nl](http://www.pgknet.nl) a job vacancy site. Companies interested might contact the President ([b.scheffers@nitg.tno.nl](mailto:b.scheffers@nitg.tno.nl)) with a description of the vacancy. This will be placed on the website for free as a service to our sponsors.

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**Monthly meeting:** Wednesday 19 June, 2002  
**Address:** KIVI building, Prinsessegracht 23, Den Haag  
**Social hour:** (free drinks) between 17:00 and 18:00 hrs  
**Lecture:** at 18:00hrs

## **“CARBONATE DEPOSITION - FACTORIES TO SEQUENCES”** **Prof. Wolfgang Schlager (VU Amsterdam)**

Carbonate precipitation in the ocean proceeds in three basic modes – abiotic, biotically induced, i.e. triggered by organisms, and biotically controlled, i.e. fully determined by organisms. The three modes combine in a variety of ways to produce carbonate sediment. When viewed on the scale of formations and global facies belts, three carbonate production systems, or “factories”, emerge: (1) the tropical shallow-water factory, dominated by biotically controlled, mainly autotrophic, and abiotic precipitates; (2) the cool-water factory, dominated by biotically controlled, mainly heterotrophic, precipitates; and (3) the mud-mound factory, dominated by abiotic and biotically induced (mainly microbial) precipitates.

**Sequences** of the three factories differ in composition, geometry and facies patterns and some of these differences appear prominently in seismic data. The characteristic accumulation of the tropical factory is the flat-topped platform with a rim of reefs or sand shoals. This rim has the highest production. It is, therefore, often elevated and progrades in two directions - towards the empty lagoon and towards the basin. Tropical carbonates shed most material into the basin during highstands because production peaks when the flat top is flooded and material lithifies rapidly upon exposure during lowstands. Tropical systems are drowned when the rate of relative sea-level rise exceeds their growth potential. In open-marine settings, the resulting drowning unconformities may be very pronounced and associated with hiatuses of tens of millions of years. The long hiatuses are caused by submarine erosion, driven by the interaction of tidal waves and the sharp topography of the drowned platform. Cool-water carbonates have only weak rim-building capability and tend to produce seaward-sloping shelves similar to siliciclastic systems. Cool-water carbonates lithify slowly and are easily flushed basinward during lowstands. Lowstand-shedding is the result. The sequence stratigraphy of the mud-mound factory is poorly known. The typical accumulation are convex mounds that normally form on gentle slopes in hundreds of meters of water depth with little indication of pronounced sea-level signals. The mounds develop flat tops when they reach wave base. Systems tracts as in the tropical factory appeared during those times of earth history when the mud-mound factory built flat-topped shallow platforms that temporarily substituted for the tropical factory after biotic crises (e.g. Late Devonian and Triassic).

**Seismic imaging.** Carbonate rocks present specific problems in seismic interpretation. Pseudo-unconformities are a case in point. Most of the output of the carbonate factories accumulates in situ. The carbonate build-ups are therefore often surrounded by terrigenous muds with rapid lateral facies changes at the carbonate-clastic boundaries. These interfingering patterns are difficult to image seismically. At the limit of resolution, seismic tends to show pseudo-unconformities, i.e. false lap-out patterns, instead of the interfingering. To avoid such pitfalls in seismic interpretation and at the same time take maximum advantage of the potential of modern seismics, sedimentologists need to develop criteria for environmental interpretation that are specifically tailored to the need and possibilities of the seismic interpreter. The success of sequence stratigraphy creates an urgent need for better seismic sedimentology.

**Please post it on the board of your office building. New members and guests welcome!**

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