MEETINGS REPORTS

1. Sequence stratigraphy - applications to basins in Northern England: Leeds, UK

This meeting was held at Leeds University in November, 1993, as part of the Yorkshire Geological Society’s series of autumn general meetings. M. A. Leeder (Leeds University) opened the proceedings with a critical review of the principles and practices of sequence stratigraphy, by comparing and contrasting the competing models of Vail, Galloway and Einsele. He particularly stressed the importance of viewing basin-fill in a 3D perspective, and the importance of realising that non-linear feedback mechanisms probably operate in most sedimentary systems.

Succeeding talks highlighted the application of sequence stratigraphy to outcrop-scale data. Hesselbo (Oxford University) and Parkinson (BP Research) took the Yorkshire Lias as their example. They demonstrated that a third-order sedimentary cyclicity of approximately one million years duration is superimposed upon a second-order, ten million year, cyclicity. Only one of the third-order cycles (the Early Toarcian transgressive-regressive event) can be demonstrated to occur outside the region, thereby implying a eustatic forcing mechanism. But, they argued, the sedimentary signature is identical to that of the other cycles in Yorkshire, and therefore, by implication, eustasy may be a dominant controlling factor in all the cycles. Precise stratigraphic correlation underpins much of these conclusions, and Hesselbo demonstrated a new highly-refined strontium isotope curve for the Early Jurassic, which should help inter-regional correlation.

Two other talks presented detailed sequence stratigraphic interpretations of the well-known Middle and Upper Jurassic strata of Yorkshire. Knox (BGS, Keyworth) described the Ravenscar Group, where a combination of changes in the patterns of subsidence with possible overprint by eustatic sea-level variations appears to be the main control on sedimentary facies associations. Coe (Durham University) demonstrated that the Oxfordian of the Cleveland Basin consists of a second-order regressive-transgressive cycle with six third-order cycles superimposed upon it. Correlation regionally appears more straightforward at this level in the Jurassic, and a virtually identical series of events can be discerned in the Oxfordian of the Wessex Basin.

A theme of such meetings is the need for a high-resolution framework to correlate sequences from any one basin. More fundamental is the underlying mechanism behind the third-order cyclicity that appears to be so omnipresent in many epicontinental basin fills, such as the Yorkshire Jurassic, since glacio-eustasy is clearly out of the question.

P.B. Wignall
(University of Leeds)

2. Tectonostratigraphic correlation of the NW Caribbean: Dominican Republic

Since 1992, a group of Caribbean geologists, headed by John Lewis (The George Washington University), Grenville Draper (Florida International University), Salvador Brouwer (Falconbridge Dominicana) and this Author, have been visiting key localities in the area and discussing possible regional correlations. Previous workshops have visited NE Cuba (March, 1992) and Western Cuba (August, 1992).

The 3rd Workshop took place in the Dominican Republic last October, with 30 delegates coming from Cuba (9), Dominican Republic (9), the USA (8), Jamaica and France. The event was sponsored by the National Science Foundation, Dirección General de Minería, Falconbridge Dominicana, Rosario Dominicana, and several private sources.

During the first day, delegates discussed problems related to Greater Antilles geology. G. Draper noted that tectonostratigraphic terranes have been recognized in Hispaniola, Puerto Rico and the Virgin Islands, all of which are located on a plate boundary that...
underwent strike-slip eastwards movements during the late Tertiary. On Cuba, however, the principal tectonic units (ophiolites, island-arc suites and continental-margin rocks) were thrust and amalgamated as a foldbelt, with little strike-slip motion. It was concluded that, in Cuba, the original zonation of the foldbelt was better preserved; the task is therefore to reorganize the terranes to the east of Cuba, in order to establish their position before strike-slip motion. **B. Mercier de Lepinay (France)** presented stratigraphic data which dated as Early Miocene the initial dislocation of Hispaniola from Cuba. **M. Iturralde-Vinent (Cuba)** supported this view with additional information, and described Oligocene folding and thrusting in the south of eastern Cuba (along the Oriente fault), and unique, large clinoforms in the Middle Miocene deposits facing the Cayman Trough. This conclusion suggests that Oligocene and older rocks in both islands are similar, and may belong to the same foldbelt.

During field trips, it was observed that latest Eocene to early Miocene clastic deposits in NW Hispaniola are remarkably similar to those developed in NE Cuba. The unusual Maastrichtian to Eocene sections in NE Cuba and NW Hispaniola are also closely similar. Maastrichtian rocks are distinctive serpentinite-gabbroid-derived sandstones, conglomerates and breccias, while the Paleocene-Eocene section includes white, andesitic tuffaceous rocks.

Various presentations reported on the geology of Hispaniola, and its correlation with Cuba and Puerto Rico. The Samaná Peninsula was described by **J. Joyce** (Puerto Rico). **G. Millán** (Cuba) studied similar marbles and phyllites in eastern Cuba (Asunción complex), and agreed that both the Samaná and Asunción complexes probably belong to the former Bahamian slope— but similar rocks are not known from other Greater Antilles islands.

Field observations indicate that in Cuba, Hispaniola and Puerto Rico, there are at least two different types of ophiolites. Those in northern Cuba have been described as of back-arc—marginal sea origin and are highly deformed, with high-P metamorphic inclusions. Correlatable mélanges have been reported from Northern Hispaniola and are associated with layered gabbroids and serpentinites, as in northern Cuba. Another type of ophiolite is found in Cuba and the Cordillera Central of Hispaniola (Duarte complex), and Puerto Rico (Bermeja complex). These are derived from ancient oceanic crust, partially metamorphosed under high-T conditions, and include amphibolites, ultramafic rocks, splites and Late Jurassic cherts, intruded by island-arc plutons.

Additional data bearing on this problem were presented by **H. Montgomery**, who found Jurassic “red ribbon” cherts within the Bermeja and Duarte complexes. He believed that these cherts (and the related ocean crust) belong to the Pacific Realm, but **M. Iturralde-Vinent** argued that “red ribbon” cherts are well developed in the Bahamian slope deposits (Caribbean crust).

Cretaceous and Paleocene-Eocene volcanic-arc suites were studied during the workshop, and observed in the Cordillera Central and Puerto Plata areas. Cretaceous volcanic rocks are remarkably similar in Central Cuba and Hispaniola, comprising spilitic basalt, unconformably covered by late Albian rudist-bearing limestones, Late Cretaceous agglomerates, tuffo-breccias and epiclastic volcaniclastic rocks.

Another important conclusion reached by some delegates was that there have been three volcanic-arc cycles in the Caribbean since the Cretaceous, dated as Cretaceous, Paleocene-Middle Eocene, and late Eocene to Recent. Mapping indicates that plutons have different orientations, and do not belong to a single disrupted arc.

On the last day of the workshop, delegates were invited to the Dominican Dirección General de Minería, for the presentation of the new 1:250,000-scale geologic Map of the Dominican Republic, prepared jointly by Dominican and German geologists. **G. Ellis**, Director of the Dirección General de Minería, noted that recent seismic studies offshore the southern coast will lead to drilling in the future at Punta Las Salinas.
The next opportunity for Caribbean geologists to get together will probably be during the Symposium on Geological and Biological Evolution of the Caribbean Region (a birthday celebration in honour of Professor Edward Robinson). This meeting will be held at the University of the West Indies, Jamaica, in October 1994. For more information, contact Trevor Jackson or Stephen Donovan: Fax 809-927-1640.

**M. A. Iturralde-Vincent**  
(*Museo Nacional de Historia Natural, Havana, Cuba*)

**Correction**

In Dr Iturralde-Vincent’s paper in our last issue, page 52, line 40 should read: The Albian-Cenomanian sections are isolated basalts interbedded with tuffs, tuffites and sandstones. The Turonian-Campanian rocks are tuffs, tuffites, sandstones and limestones, with few interbedded andesite-dacite flows.