

REPORT

Joint meeting of the East Midlands Geological Society/Yorkshire Geological Society, 17th October, 1998

Recent Advances in Understanding the Geology of the East Midlands

This meeting, jointly organised by the EMGS and the Yorkshire Geological Society, was held in the De La Beche Conference Centre at the British Geological Survey, Keyworth on 17th October, 1998. The meeting was well attended with upwards of 80 people present. A welcome address by Dr Peter Allen (BGS) launched the morning session, which concentrated on 'basement' geology.

The first talk, by John Carney (BGS), was devoted to the Late Precambrian Charnian Supergroup. Accounts of the Bardonia and Whitwick volcanic centres of north-western Charnwood Forest were followed by a discussion on the precise age of Charnian volcanism; this focused on a discrepancy of 20 million years between the faunal and radiometric evidence. In the final part of the talk, new Ar/Ar radiometric data was presented confirming the Acadian (Siluro-Devonian) age of the Charnian cleavage.

The next talk was due to have been given by Helen Boynton (formerly Leicester University, now retired), but unfortunately her voice had still not recovered from the effects of a bad cold. Trevor Ford, also formerly of Leicester University and a co-collaborator on Charnian Precambrian palaeontology, deputised and delivered a wide-ranging talk on the morphology and likely origins of the Ediacaran (Late Precambrian) fossils of Charnwood Forest. New discoveries have confirmed that these faunas are present in the Ives Head Formation, about 3km stratigraphically below the youngest fossiliferous horizon in the Charnian Supergroup.

In the final talk of the morning session, Ian Hill of Leicester University discussed how geophysical techniques reveal details of basement rocks when they are deeply buried beneath younger strata. There are still many problems, but the integration of geophysical interpretation with geological control from outcrop and/or boreholes points the way forward.

At lunchtime, most participants visited the core store, where samples from the new BGS boreholes at Ticknall and Worthington were on display and demonstrated by BGS staff.

The afternoon session commenced with a linked series of presentations by Keith Ambrose and John Carney both of BGS. Keith began with a review of the Dinantian (Carboniferous Limestone) and Namurian (Millstone Grit) sequences around Breedon, Ticknall and Melbourne. This highlighted recent revisions to nomenclature and regional

correlations, and discussed the significance of a major intra-Dinantian (Early Chadian-?Holkerian) unconformity exposed in Cloud Hill Quarry, near Breedon on the Hill. In the overlying Namurian strata, further important sedimentary breaks are indicated by correlations between boreholes, which include the new BGS Worthington Borehole. John Carney then talked briefly about syn-Dinantian structure, revealed as spectacular slump folds above the unconformity in Cloud Hill Quarry, and discussed the role of end-Variscan compression that tilted strata to the vertical at the Breedon quarries. Keith then returned to describe recent investigations on the mode of formation and age of Trias-filled caves in Breedon Hill Quarry. The principal finding of this work is that the caves had formed by the end of the early Triassic and were filled with sediments by the beginning of Middle Triassic times.

After tea, Andy Howard (BGS) reviewed aspects of the stratigraphy and sedimentology of the Mercia Mudstone Group — one of the most areally important units in the East Midlands. Following recent lithostratigraphical revisions it is now possible to map the distribution of several formations within this group throughout the East Midlands. These formations can also be traced further afield in eastern England and below the southern North Sea because of their distinctive 'profiles' on gamma-ray and various other type of borehole geophysical log. These geophysical properties reflect the changing proportions of the types of clay minerals that are present within the mudstones, and this in turn may provide clues to the environments in which they originally accumulated.

For the final talk of the day, Allan Brandon (BGS) gave a wide-ranging review of the evolution of the Trent basin during the Quaternary. Major drainage systems, of probable Plio-Pleistocene age, were destroyed by the Anglian glaciation which commenced about half a million years ago. The present landscape evolved after the retreat of this ice and it is clear from the evidence of sequential river terraces that a delicate balance existed between fluvial deposition and tectonic uplift, the consequence being a complex history of landscape rejuvenation involving major drainage diversions. With the help of well-correlated and dated river terraces, it is now possible to view these events against the Quaternary chronological framework provided by the deep sea oxygen isotope stages.

Trevor Ford's return to summarise the meeting was particularly appropriate, since he was co-editor of the 'Geology of the East Midlands' volume, published by Leicester University exactly 30 years ago. As Trevor noted, the geology has not changed but our perceptions and techniques for resolving its complexity certainly have. Doubtless there are many new discoveries to be made in this fascinating and geologically diverse region.

John Carney