

protection for Britain's caves, which are increasingly under threat from development and over-use. It should help caving to be perceived as a more 'responsible' sport. I would firmly encourage all members to find a copy, read it and act on it. Otherwise it will be us, cavers, who lose out when our caves are ruined or destroyed.

BROWN A G (Ed), 1995, *Geomorphology and Groundwater*, John Wiley & Sons, Chichester, 213pp hardback £45.00 ISBN 0-471-95754-2  
(Reviewed by Steve Hobbs)

*Geomorphology and Groundwater* is the result of a joint meeting of the British Geomorphological Research Group and the Hydrogeology Research Group of the Geological Society, held in 1993. Ten papers presented at the meeting are included in the book covering a range of topics broadly organised around three themes: aquifers in Pleistocene sediments, surface water groundwater interactions, and groundwater and landforms including karst. The papers are as follows:

1. *Geomorphology and Groundwater: Convergence and Diversification* by A.G. Brown and C. Bradley. pp. 1-20
2. *Groundwater Flow and Quality in an Alluvial Aquifer Recharged from River Bank Infiltration, Torgau Basin, Germany* by T. Grischek, J. Dehnert, W. Nestler, P. Neitzel and R. Trettin. pp. 21-36
3. *Shallow Groundwater Modelling and the Overbank Contribution to a Small Floodplain Bog* by C. Bradley and A.G. Brown. pp.37-52
4. *Assessing River-Aquifer Interactions within the Hyporheic Zone* by I.P. Maddock, G.E. Petts, E.C. Evans and M.T. Greenwood. pp.53-74
5. *Landform-Groundwater Interactions in the Gwenlais Karst, South Wales* by P. Hardwick and J. Gunn. pp. 75-92
6. *The Origin and Age of Karstic Depressions in the Darwin-Koolpinyah Area of the Northern Territory of Australia* by M.J. McFarlane, S. Ringrose, L. Giusti and P.A. Shaw. pp.93-120
7. *Karst and Pseudokarst: An Artificial Distinction?* by P.L. Younger and J.M. Stunell. pp.121-142
8. *Bils and the Barind Aquifer, Bangladesh* by K.M. Ahmed and W.G. Burgess. pp.143-156
9. *Groundwater Recharge and Outflow Patterns in a Dunefield of North east Nigeria* by R.C. Carter. pp.157-176
10. *Hydrogeological Provinces in Central Sudan: Morphostructural and Hydrogeomorphological Controls* by J.J. Burke. pp.177-208

Only papers 5, 6 and 7 concern Karst and will be considered here.

Hardwick and Gunn discuss the geology, geomorphology and hydrogeology of the "Gwenlais Karst". This 1.9 km<sup>2</sup> area of Carboniferous Limestone lies on the northern side of the north crop of the Carboniferous Limestone on the margin of the South Wales Coalfield. Recharge to the area is dominantly dispersed, although some concentrated recharge has been identified; conduit flow is evident in the area as indicated by dye traces which yield minimum

flow velocities of 2 to 2400 m/d; and a number of sinks and risings have been identified in the area, in addition to several caves.

The paper concentrates on Pant y Llyn, an ephemeral lake which has no inflow or outflow points, and where the water level varies seasonally from being dry in summer to having over 4.5 m depth of water in winter. Hardwick and Gunn suggest that this is a turlough, similar to those found in Ireland, and the only such feature known in Britain.

The paper is well researched and reasonably well presented, although some of the maps are not particularly clear. The discussion also lacks a topographical/geological cross section which would aid interpretation. Graphical presentation of the water level data would also allow the seasonality of the lake, one of its key defining features, to be better appreciated.

Paper 6 by Ringrove *et al*, discuss the origin and age of rounded depressions in the Northern Territory of Australia. The depressions are generally a few metres deep, some of them are seasonally water logged whilst others are permanently saturated. The area is covered with Cretaceous sediments including claystones, siltstones and clayey sandstones, which overlie dolomite marble with sandy dolomite limestones. The Cretaceous deposits have been significantly altered by weathering.

The distribution of the depressions is examined in addition to the chemistry of the water they contain, and the composition of the clay infill in the base of the depressions. Water table movements and leaching history associated with the depressions is also discussed and a model formulated for their formation. The simple theory of subsidence of Cretaceous sediments into solution hollows in the underlying dolomite is discarded. Instead a complex model is proposed whereby the Cretaceous sediments themselves undergo collapse due to dissolution of clay minerals associated with lateritisation. The depressions are thought to be an expression of long term changes in water level due to climatic and eustatic change.

The paper is very detailed, but is unlikely to appeal to the “general interest” karst reader, especially as it deals dominantly with clay mineralogy and weathering. It would benefit from a short glossary of some of the more esoteric terms to be easily readable by the lay person.

The final karst paper in the book, by Younger and Stunell discusses the distinction that is often drawn between true Karst areas and those areas where karst like features are formed in non-limestone strata by dominantly physical processes. These “pseudokarst” formations are discussed with reference to two case studies.

The first study area referenced is in north Northumberland where a series of “pseudokarst” features, including karren, caves, arches and dolines have been identified in Lower Carboniferous sandstones. The origin of these features is suggested as physical weathering of less well cemented zones within the sandstone strata. It is also suggested that localised oxidation of pyrite cements and biochemical weathering aid the physical erosion process.

The second case study examines “peat pipe pseudokarst” – soil pipes within peat and associated sinkholes and depressions in Northumberland. The morphology of a series of pipes is detailed, along with their development and hydrological response to rainfall.

Following the case studies the use of the term “pseudokarst” is discussed. Younger & Stunell suggest that it is feature morphology and function that is important in defining karst, not its origin. They also suggest that the term karst should not be reserved for “limestone” strata, but for all terrains “characterised by sinking streams, caves, enclosed depressions, fluted rock outcrops and large springs”.

This easily readable paper details a number of karst features on "non-karst strata" and is likely to be of value to all those interested in "pseudokarst". It is especially useful as grid references are quoted for the location of many features of interest, although for the smaller features 8 rather than 6 figure references would have been more appropriate.

This book cannot be recommended as one for the bookshelves of the discerning speleologist. At £45 it is expensive for three karst papers, one of which is very specialised and unlikely to be of general interest to the British speleologist. The book may be of more interest to the academic geomorphologist/hydrogeologist who has a wider area of study than just karstic landforms.

CLEAL, R.M.J., WALKER, K.E. and MONTAGUE, R., 1995. Stonehenge in its landscape. Twentieth-century excavations. *English Heritage Archaeological Report* 10. xxi + 618 pp, 297 figs + 4 plans in wallet, 69 tables, 8 colour pl. £70. ISBN 1 85074 605 2.  
(Reviewed by A.M. ApSimon)

The publication of this monumental study of the world-famous, unique, but enigmatic construction that is Stonehenge, is without doubt a major event in British archaeology, and one on which both the progenitors, English Heritage, and the three principal authors and 14 major contributors, as well as a host of other labourers in the field, are to be most warmly congratulated. Particularly meritorious is the speed with which, once commissioned, this report was produced.

Its major achievement is the integration of the records of previous excavators, notably Prof. Gowland in 1901, Lt-Col. Hawley in 1919-26 and Profs Stuart Piggott and Richard Atkinson between 1950 and 1964. It is a tribute to the conscientiousness of these earlier excavators, that so satisfactory a synthesis has been achieved, despite the imperfections of Hawley's often highly detailed record, and despite the lack of any daily written descriptive record of contexts and stratification found by Atkinson and Piggott's technically much more accomplished excavations. It is sad that Prof Atkinson was not able to complete a definitive account of his work at Stonehenge and that his death in 1994 has robbed of us of his comments on this, but the complete reappraisal given here is a substantial compensation.

The presentation of the volume is generally excellent, with clear type and numerous well designed illustrations, many with phase coding and other information in colour, and some beautiful colour plates. The reviewer found it very easy to use, the index good. Unfortunately inadequate final proof reading has left an irritating sprinkle of mis-spelt words and omissions. The bibliography would have been easier to read if hanging indents had been used for entries. Curiously, the initial pages are numbered in the Contents, but not on the pages.

The report is divided into four parts. Part 1 covers introduction, previous work and methods, and description of Stonehenge and its modern setting. Part 2 presents the archaeology of the monument and the history of development of the surrounding landscape, divided into 5 sections: a Mesolithic and Neolithic prelude before Stonehenge, three sections covering the main phases of the monument, and a coda of later 'use and abuse'. Interpolated throughout are sections summarising environmental and archaeological evidence for the surrounding area. Part 3 presents the artifacts and environmental data, and Part 4, Discussion, expounds the new phasing developed by the authors and places these phases in a changing landscape.