The first of the "summary" chapters presents an overview of groundwater sources and quality including histograms and scattergrams of borehole yield, depth and specific capacity. The groundwater quality discussion is very brief and consists of a short paragraph or two on each of: water hardness, iron, nitrate, E Coli, chloride, and hydrogen sulphide content. This at least gives the reader an indication of background water quality in lithological units in the area. the summary is however lacking in that the results discussed are, on the whole, spot measurements. The flashy hydrochemical response which is so typical of many karstified spring discharges is almost totally ignored.

The final chapter, which discusses pollution prevention, is an attempt by the authors to apply some of their findings to the problems of pollution in the region. However, the chapter sits relatively awkwardly in the report and in my opinion fails to effectively link pollution problems and karstification. Although an interesting two pages, the chapter is too short to be of major benefit to the intended main readers of the report (i.e. hydrogeologists), and contains no references from which the lay person can obtain greater detail.

In summary, then, Drew and Daly have completed an invaluable task by collecting, collating and summarising a mass of hydrogeological data, much of which is not easily obtainable in its original form. However, due to the variable manner in which each sub–region is treated and the lack of tabulated data, the report does not realise its full potential. Nonetheless it is a useful starting point for anyone interested in the hydrogeology of this part of Ireland.

GUNN, J. (Ed.), 1994. An Introduction to British Limestone Karst Environments. British Cave Research Association Cave Studies Series. 5. 40pp. ISBN 0 900265 18 3.
(Reviewed by P.L. Smart)

This book was produced to mark the joint meeting of the Unesco International Geological Correlation Programme Project 299 (Geology Climate, Hydrology and Karst Formation), the Karst Commission of the International Association of Hydrogeologists and the Commission on Environmental Changes and Conservation in Karst Areas of the International Geographical Union in the UK. The 40 pages of text provide an introduction to the geology, geomorphology and hydrology of British carbonate terranes, with the biogeographical and human elements of the environment only briefly covered. In fact when faced with the chapter heading Jurassic Limestone Environments I can't help feeling the term terrane would rather more reflect the coverage provided. I found it difficult not to think of depositional environments!

The book commences with general overviews of the geomorphology and hydrogeology of Britain. The former is clear and well referenced, but the latter is in places overgeneralised (for instance the section on water quality), and lacks leads into the literature. It also deals with non limestone aquifers such as the Coal Measures and Greensand, although I would agree that this sets the utilisation of the carbonate aquifers within the wider context. The summary of aquifer abstraction figures is useful, and could have been further broken down into areal data, for instance there are major contrasts in usage between Northern England and the Mendips for the Carboniferous Limestone aquifer.

The remainder of the book deals with Carboniferous Limestone (12 pages) Jurassic Limestone (5 pages), Chalk (5 pages) and minor carbonate (2 pages) terranes. There are significant differences in style between the chapters, those on the Chalk and Jurassic Limestones drawing extensively on the published literature and adopting a more academic approach, reflecting the greater study that these important aquifers have received from hydrogeologists. Contrasts in the content and style of the sections dealing with individual Carboniferous Limestone areas are also apparent, as is a significant degree of imbalance. North Wales is given 2 pages, South Wales 3, but Yorkshire only 1½, and Devon affectionados will be even more disappointed to see their favoured area accorded only 10 lines! The account of the Welsh karst benefits substantially from the longer text, being more complete in coverage, and presenting a better overview than some of the other sections. There is perhaps a tendency to dwell on stratigraphy and rock units at the expense of presenting on adequate summary of the distinctive character of the geomorphology and hydrology of each area. The Mendip chapter for instance, could have been fleshed out to encompass the importance of the progressive eastward stripping of the Mesozoic cover from the Triassic landscape, the effects this has had on the maturity of the karst, the association of thick unsaturated zone resulting from this exhumation, and deep saturated zone controlled by the dip of the strata, and the distinctive looping pattern of the water-filled conduits recognised by Ford. Indeed it is surprising that none of the seminal references by Ford, Stanton, Smith and Atkinson on karst development and hydrology were included. Thus some minor expansion of the text of the Carboniferous Limestone regions would have proved beneficial and had had a negligible effect on the overall cost of publication. This might also have allowed inclusion of one or possibly two figures in addition to the basic maps to illustrate aspects of the geology and hydrogeology, as was done in the Chalk and Jurassic Limestone chapters. For instance one of Waltham's generalised sections through the Dales to illustrate the relations between caprocks and limestone, and the important structural controls on cave development would have been very useful, or even a simplified survey of a classic cave such as the Kingsdale system and its hydrology.

The text is generally free from typographical errors, clean and crisp, and the layout good. However, I do think the maps would have benefited from being a little larger. For instance the Derbyshire area map could have occupied the whole page width, and have included names of the springs mentioned in the text. There are also numbered caves which are not referenced in text or key. In contrast Table 3 is overly large, and also contains only 3 analyses from carbonate aquifers. There is a minor error in the key of Figure 1 (displaced question mark) and it is perhaps misleading to suggest that the Devensian ice advanced to the limits shown at 65,000 BP. More important we really need to be more careful how ages are quoted. The text and Figure 1 both refer to BP without any unit (years I presume); for elapsed time the abbreviation "y" should be used (My, ky being for millions and thousands of years), with "a" (annum) together with appropriate suffixes for a date. "Before present" or "ago" should not be used, apart from in the internationally agreed form for radiocarbon dating; "yr BP" indicating the age is in radiocarbon years calculated from 1950 AD using the original half life of 5568 ± 30 years ("cal yr BP" being used if a correction to calendrical years has been made). One or two of the technical terms included must have foxed the overseas recipients (eg. Cornstone), diffusivity (hydraulic conductivity/storativity) is little used to characterise

aquifers, and I have no idea what a mesotropic brown earth is (the only soil mentioned in the book). Notwithstanding these criticisms, this is a useful book, which I shall certainly distribute to people who ask me about the nature of British carbonate terranes.

KELLAWAY, G.A. and WELCH, F.B.A., 1993. Geology of the Bristol District. *Memoir of the* British Geological Survey. London. H.M.S.O. 199pp. ISBN 0 11 884466 0.
(Reviewed by Andy Farrant)

This book has finally come into print, 21 years after the Bristol District Special Sheet was published, and long overdue. The book cover s most of the major aspects of the region's geology, and is guaranteed to become the main reference work for the geology of the Bristol area, which includes the northern part of the Mendip Hills. The book is divided up into nine chapters, including a good introductory chapter which has a nice account of the history of early geological research in the area. This is particularly welcome given the importance of the Bristol region in the early history of geological research in Britain. The rest of the chapters follow on in stratigraphical order, except for one chapter on economic geology which for some reason comes before the Pleistocene and Recent. The layout is generally good, with some good clear diagrams and maps, which are not over reduced and the text is generally very readable. The use of colour photographs overlain with text for the Avon Gorge section is particularly commendable.

However, there are some major criticisms, not least that imperial measurements are used throughout. For what should be an up to date geological text this seems a little absurd although in the preface they state that metrification would introduce errors because of problems of recognition of the thicknesses on the old borehole logs. They suggest the reader is better off converting the figures into metric values, which seems a bit of a mystery. In fact the whole book appears to be somewhat dated, less than ten percent of the cited references date from the 1980's or later, and many of the observations are not placed in a modern geological context. For example the Carboniferous Limestone series is not described in sequence stratigraphy terms and there are several recent works, for instance on the Triassic faunas at Tytherington quarry, which have not been cited. This is almost certainly a result of the long gestation period of the book and reduces the books appeal a little. As with many of the geological memoirs the Pleistocene is dealt with very superficially (if you pardon the expression!), the chapter being just over four pages long. This is a shame as the Pleistocene is perhaps one of the more important geological periods. Only one paragraph is devoted to cave deposits, which often provide the only hard evidence for the changing environment over the last million years. Another major omission is the lack of a chapter on the structure and tectonics of the region. Although this is dealt with in a separate paper by Kellaway and Hancock (1983), its omission here is rather frustrating, especially in a structurally complex area such as that covered by the memoir. The same can be said for the publication of the Lower Jurassic stratigraphy in a separate memoir (Donovan and Kellaway, 1984), when its inclusion here would have been far more satisfactory.

Those criticisms aside, what is in the book is generally of high quality and reads very well. Although its appeal may be limited for the average spelaeologist, for anyone interested in geology, or who needs to know about the geology of the Bristol district this book is useful. It