SJG
Scottish Journal of Geology
Vol. 52 | 2016 | pp. 113–114

Book review

A Geological Excursion Guide to the Stirling and Perth Area, edited by M.A.E. Browne & C. Gillen. 2015. Edinburgh Geological Society in association with NMS Enterprises Ltd. 231 pp. ISBN 978-1-905267-88-0, £15.99.

'Stirling and Perth' is the fourth in the series of geological excursion guides published by the Edinburgh Geological Society in association with National Museums Scotland. Its predecessors had focused on established icons of Scottish geology – Rum, the NW Highlands and the Moine succession – but this latest contribution explores the possibilities of a less-celebrated region, and demonstrates that it has much to offer. But in these days of apps and smartphones, if a traditional excursion guidebook is to succeed, it needs to simultaneously satisfy several requirements: an attractive format, clear and concise navigation and locality descriptions integrated into the broader pattern of the regional geology, and the capacity to tempt the reader along unexpected byways. How does 'Stirling and Perth' fare in these respects? Very well, I think.

The layout of the book is familiar from the earlier excursion guides in the series and works well. There are plenty of well-chosen colour illustrations and the maps and diagrams, equally colourful, are clear and purposeful. An introduction to the local geology is followed by itineraries for 18 excursions, each of which commences with an introductory panel summarizing its overall purpose and providing useful details of logistics and complementary Ordnance Survey topographical and British Geological Survey geological maps. A location and route map with adequate geology accompanies the beginning of each itinerary (all credited to Angus Miller), which is then laid-out to a common pattern so that the book develops a consistent identity, despite being the work of 16 different contributors. Credit for this must lie with the editors. Mike Browne and Con Gillen take the lead but they acknowledge additional input from Kathryn Goodenough and David Stephenson; the 'meticulous' efforts of the latter are perhaps responsible for the pleasingly clean text.

It is hard for the editors of this kind of book to anticipate the level of familiarity with the regional geological background that readers can be assumed to have, and the opening section of the guide, the 'Summary of Geology', could pose a challenge when introducing the Dalradian. Pannotia may not be the most familiar of Neoproterozoic palaeocontinental names and, wherever its 'SE' margin was, it probably lay on the more remote fringes of Baltica or Amazonia. Trying to get these palaeogeographical concepts across without the aid of a map is difficult, and the inclusion of a couple of simple reconstructions would have been beneficial, both for the Dalradian scene-setting at the margin of Laurentia and for the subsequent introduction of Devonian Laurussia. The introductory summary then goes on to introduce four episodes of Caledonian deformation that affect the Dalradian, whilst subsequent excursions introduce the same deformations as parts of either a polyphase Grampian Event (Excursion 12) or a D_1 to D_4 series without mention of either Caledonian or Grampian (Excursion 18). Although the detail provided in each case should be sufficient to eliminate any confusion, the variation does illustrate the different levels of prior knowledge that are presumed for different excursions.

The Grampian Event is introduced in the context of the Highland Border Complex which, I feel, is somewhat underplayed in the introductory summary. Although recent debate as to the extent of the Complex and its relationship with the Dalradian is well covered, its importance as an oceanic relic within the major terrane boundary (Highland Boundary Fault) mentioned earlier in the introduction does not really come across. More could possibly have been made of the local influences of Scotland's broader structural pattern.

Moving on to the Upper Palaeozoic, the introductory summary is a good account of the Devonian and Carboniferous stratigraphy and sedimentology, and of the associated range of igneous rocks, both volcanic and intrusive. It is these aspects of the regional geology that dominate the excursion itineraries, making up 12 of the 18 on offer and encompassing a remarkably broad range of geological phenomena. The introductory summary also provides a good review of the region's Quaternary history, so much so that it is almost a surprise to find that there is then only one excursion focused on those deposits and landforms, which with the prospect of a rising sea-level allows us to speculate that here the past might be the key to the future. Single excursions also explore the Dalradian's Southern Highland Group, the still-enigmatic Highland Border Complex and the mining relics from exploitation of the unusual silver mineralization at Alva; the programme is rounded off by opportunities to examine the building stone heritages of the two titular towns. The excursions are ordered in a vaguely geographical sense, circling around Stirling and then meandering NE towards Perth; perhaps a more geologically ordered arrangement might have encouraged more 'compare and contrast' visits.

The Upper Palaeozoic excursions afford a breadth of experiences that might surprise those unfamiliar with the geological complexities of Scotland's Midland Valley, which has also generated a plethora of local stratigraphical names. These could perhaps have been more fully correlated although, for most readers, the group level utilized is probably sufficient. As a sample of the lithologies covered we have: coarse alluvial-fan conglomerates, terrestrial red beds and fluvial sandstones, limestones and coal measures

cyclothems; the igneous examples include dykes, sill complexes and the extensive lavas of the Clyde Plateau. There is certainly plenty to choose from and most excursions touch on several geological themes. Fascinating cultural associations are also made by several contributors: the development of Bridge of Allan as a spa town (based on waters draining from old copper mines!), a link with James Hutton and John Clerk of Eldin and, not least, the source of Scotland's 'Stone of Destiny'. And, of course, many of the building stones to be seen in Stirling and Perth were derived from the local Upper Palaeozoic rocks.

In their Editorial Introduction, Browne and Gillen make reference to the long history of preparation that has gone into the Stirling and Perth excursion guide. All the more impressive then that the excursion accounts are up to date and take account of recent research. Nowhere is this more apparent than in Excursion 12, describing the Keltie Water section through the Highland Border Complex, a unit that has been the subject of recent interpretational controversy. Those arguments are well rehearsed and referenced, with key sections described in support of the establishment of a Dalradian Trossachs Group in conformable succession to the Southern Highlands Group and incorporating some of what would historically have been assigned to the Highland Border Complex.

The long-history of preparation is also reflected in the sadly posthumous publication for four of the contributors, whilst at least nine others are now in retirement. All the more important then that their wealth of local knowledge is made available to the wider geological community, particularly in the light of current concern over the seeming decline in educational status of geological fieldwork. It is information such as that contained in 'Stirling and Perth' that underpins the descriptions, maps and 3D models now available digitally to all manner of mobile devices. There is a growing consensus that this digital provision of field geology data, far from competing with hard-copy field guides, is actually complementary to the traditional medium and can lead to increased sales of the original publications. Even so, the Edinburgh Geological Society is to be congratulated for the bold and generous move that has seen its guidebook series incorporated into the British Geological Survey's web-based, open access and collaborative data delivery platform *Earthwise* (http://earthwise.bgs.ac.uk/index.php/Main_Page) (McIntosh 2016). In time, 'Stirling and Perth' will join its predecessors there, hopefully to inspire the digital generation of geologists to get their boots on. Like those of us who still prefer our field directions in a neat little package of paper, they could ask for no better introduction to the varied geology of the Stirling and Perth area than this excellent guidebook.

Reference

McIntosh, R. 2016. Earthwise – evolution or revolution? *The Edinburgh Geologist*, **59**, 23–27.

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https://doi.org/10.1144/sjg2016-005