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# **Fife and Angus geology: an excursion guide**

A. R. MacGregor

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Third Edition

(Front cover)

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## **Preface**

Fife and Angus Geology was first published in 1968, a second edition appearing in 1973. These early editions owed much to the encouragement of the late Professor C. F. Davidson and the critical appraisal of R. Johnston, both of the St Andrews University Geology Department.

By 1985, however, Fife and Angus Geology was out of print and much new work on the geology of the area had been published. The opportunity was therefore taken to re-write completely the introductory chapters, incorporating new information into all the itineraries, omitting from the guide book the excursions to the area between Stonehaven and Aberdeen and to South Queensferry since both are very well covered by the Aberdeen and Lothian guides respectively, and combining or modifying some of the previous itineraries. Two new itineraries have resulted, one for the North Fife Hills and the other for the area lying between Dundee and Perth.

Over the years gentle but persistent encouragement to produce a new edition came from Douglas Grant and many other friends and colleagues and I am grateful to them all for this, as I am to my wife for reading and rereading the manuscript over a considerable period. The manuscript was put on the word processor by Sue Canfield and Margaret Connolly with patience and understanding. The maps and tables were entirely redrafted or are new, the work of Graeme Sandeman and Janet Mykura of the Cartographic and Graphic Services of the School of Geography and Geology, University of St Andrews.

## **Acknowledgements**

I am grateful for the financial support of North East Fife District Council, the Edinburgh Geological Society, the Geological Society of Glasgow, and the Geology Department of the University of St Andrews.

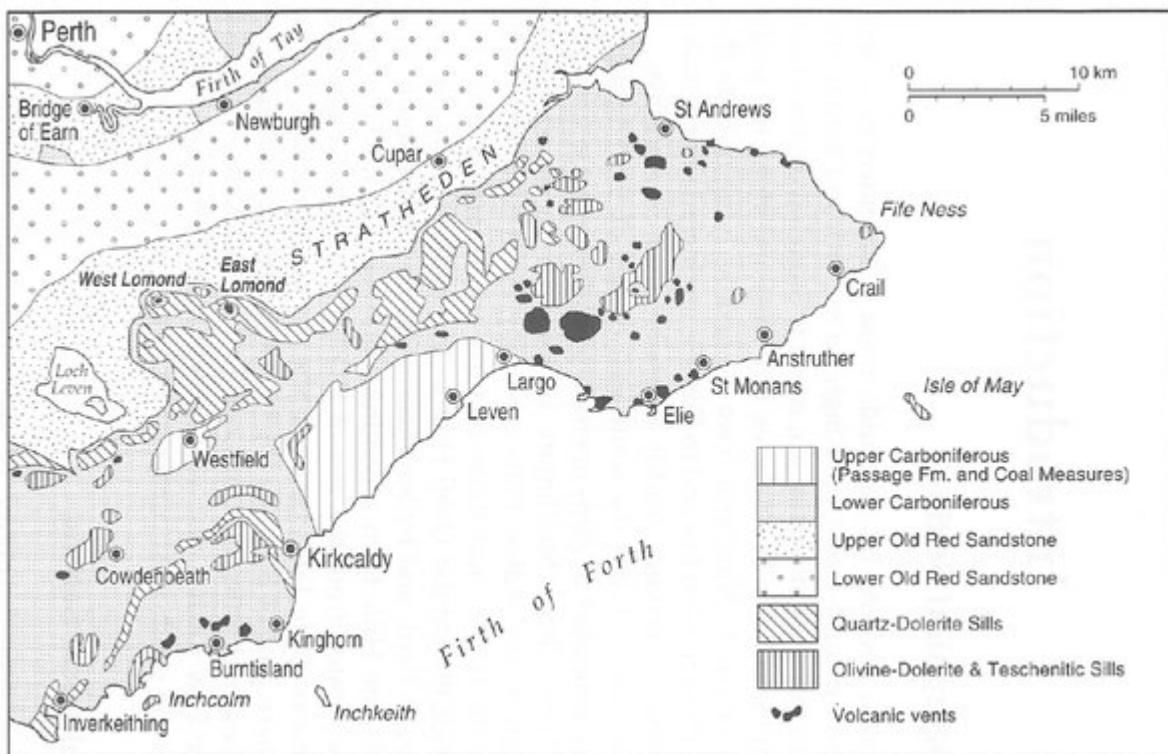
Itineraries in the guidebook are based partly on the literature referred to after each excursion, partly on the author's own field work and partly on information freely supplied over many years by his colleagues, past and present, in the Department of Geography and Geology, St Andrews University. The chapter on the Quaternary has benefited greatly from the advice of Professor C. Ballantyne. Earlier editions benefited from discussions with Professor E. H. Francis and Messrs I. H. Forsyth and J. I. Chisholm of the Geological Survey when they were re-mapping much of East Fife for the

North Berwick and Arbroath map sheets for the Geological Survey. For this revised edition, David Walker walked almost all the excursion itineraries and I am grateful for his helpful comments.

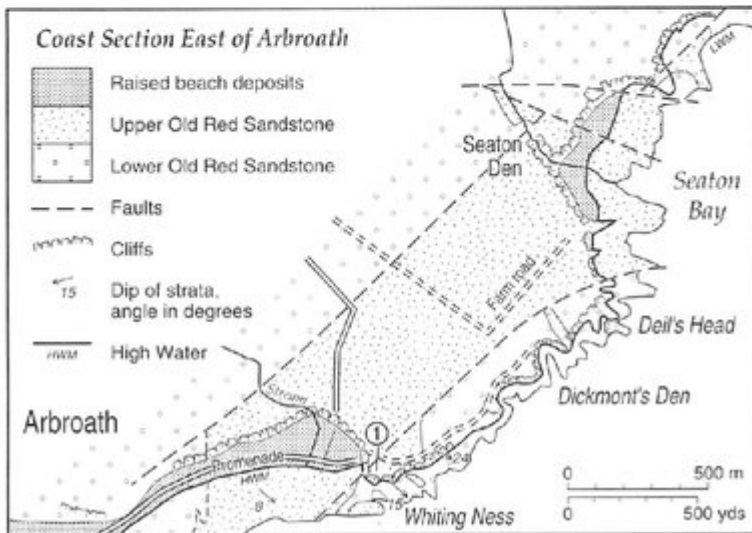
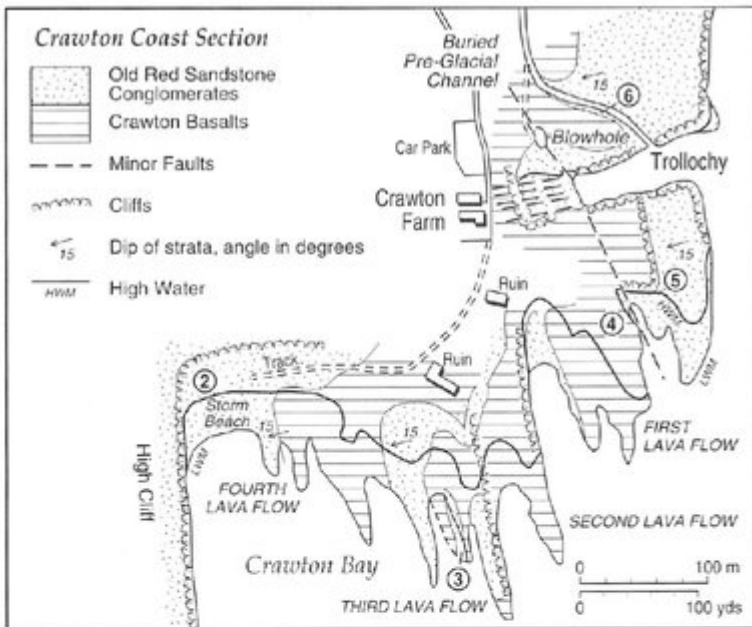
The following maps are based, at least in part, on previously published work: (Map 2), (Map 3), (Map 4), (Map 7), (Map 12), (Map 21), (Map 22) and (Map 23) on maps of the Geological Survey; (Map 5) on the work of D. Peacock; (Map 6) on the work of B. Harte; maps (Map 8) and (Map 9) on the manuscript maps of the late W. T. Harry; (Map 11) on the work of C. Rice; (Map 14) on a map of D. Balsillie; (Map 15) is after S. R. Kirk and (Map 18) and (Map 19) after Francis and Hopgood.

(Plate 6) is reproduced by permission of the Director, British Geological Survey: Crown copyright reserved.

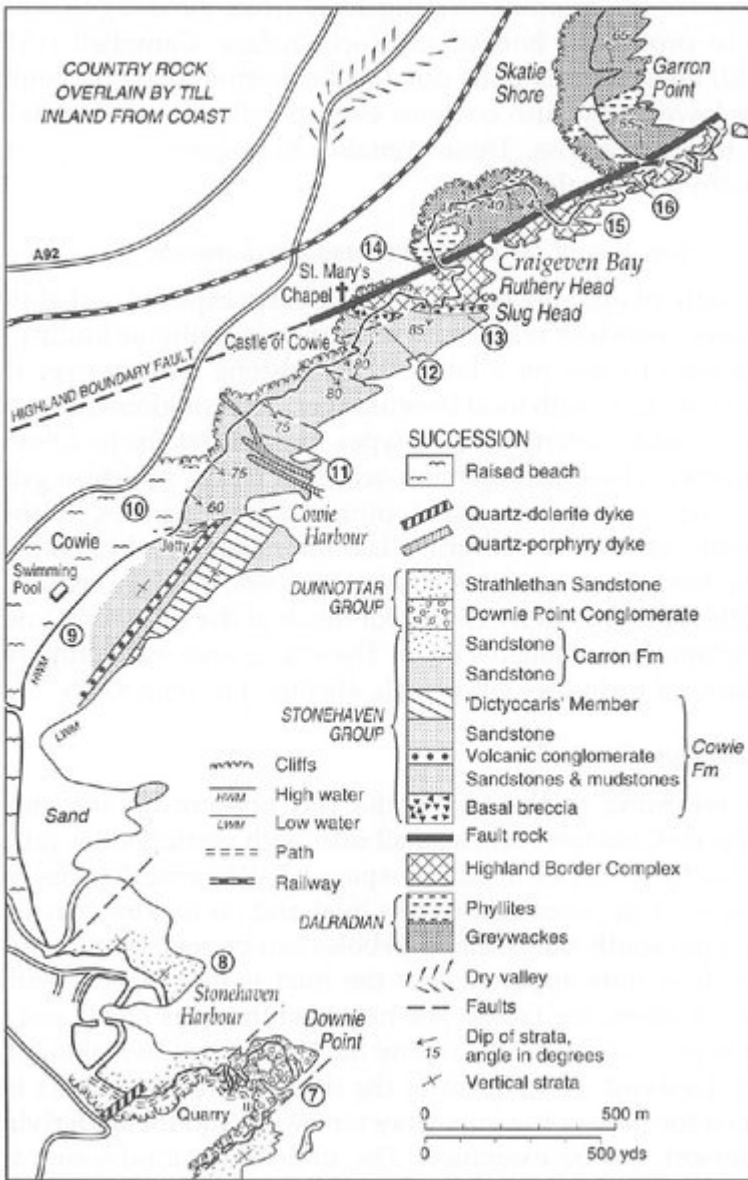
(Figure 1) The Lomond Hills seen from the Bow of Fife. The peaks are the eroded remnants of two Carboniferous–Permian volcanic necks now standing above the general level of the Midland Valley Sill which forms the marked scarp beneath the summit of the West Lomond on the right. The Howe of Fife in the foreground is covered by fluvioglacial deposits overlying horizontal Upper Old Red Sandstone sediments.



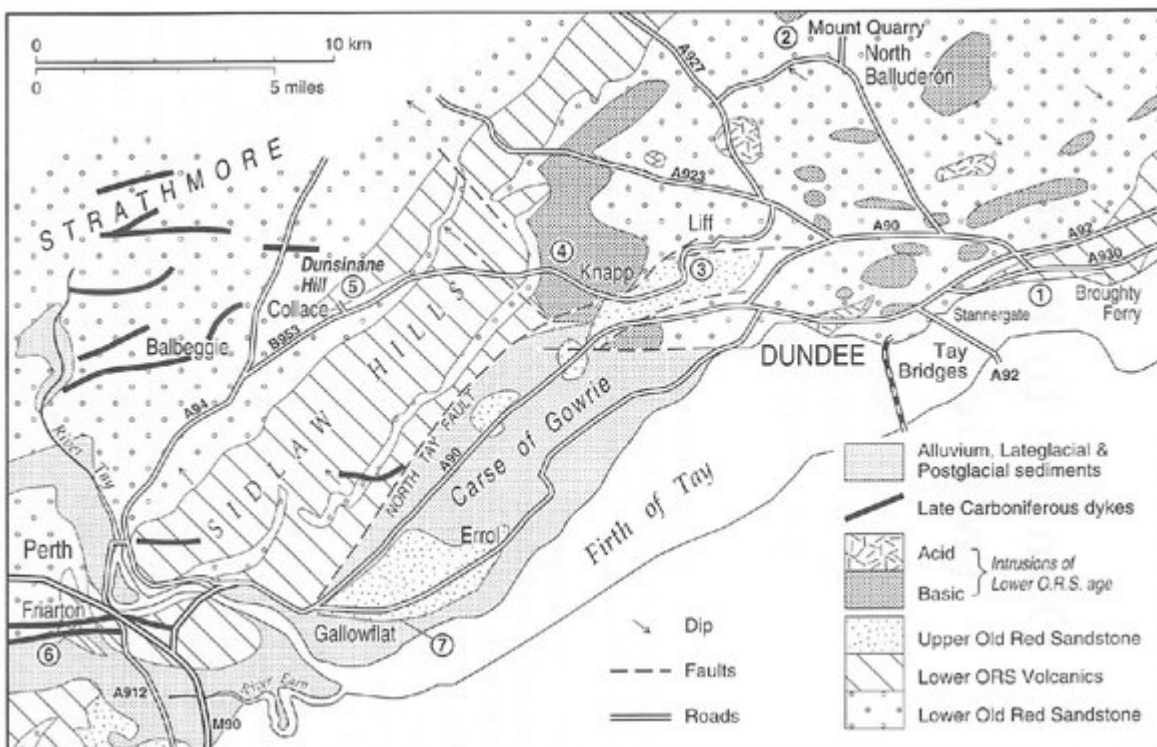
(Map 2) Simplified geological map of Fife.



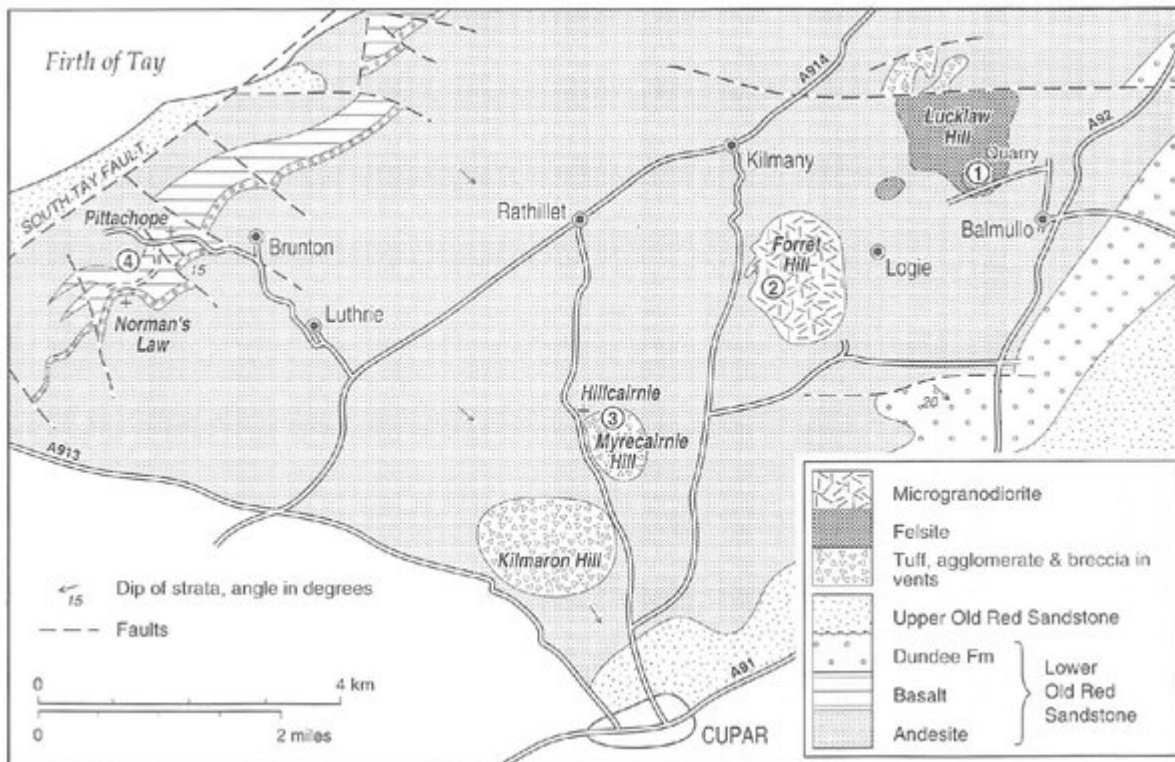
(Map 3) Arbroath and Crawton



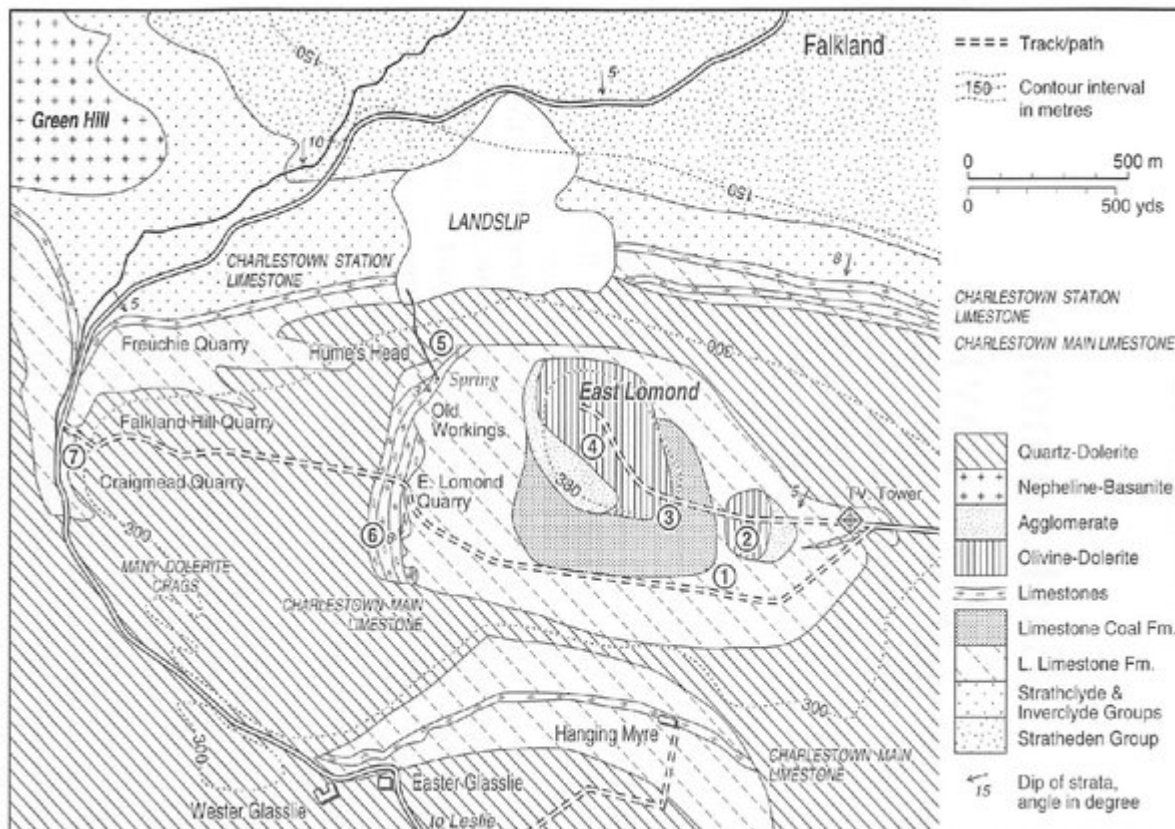
(Map 4) Stonehaven.



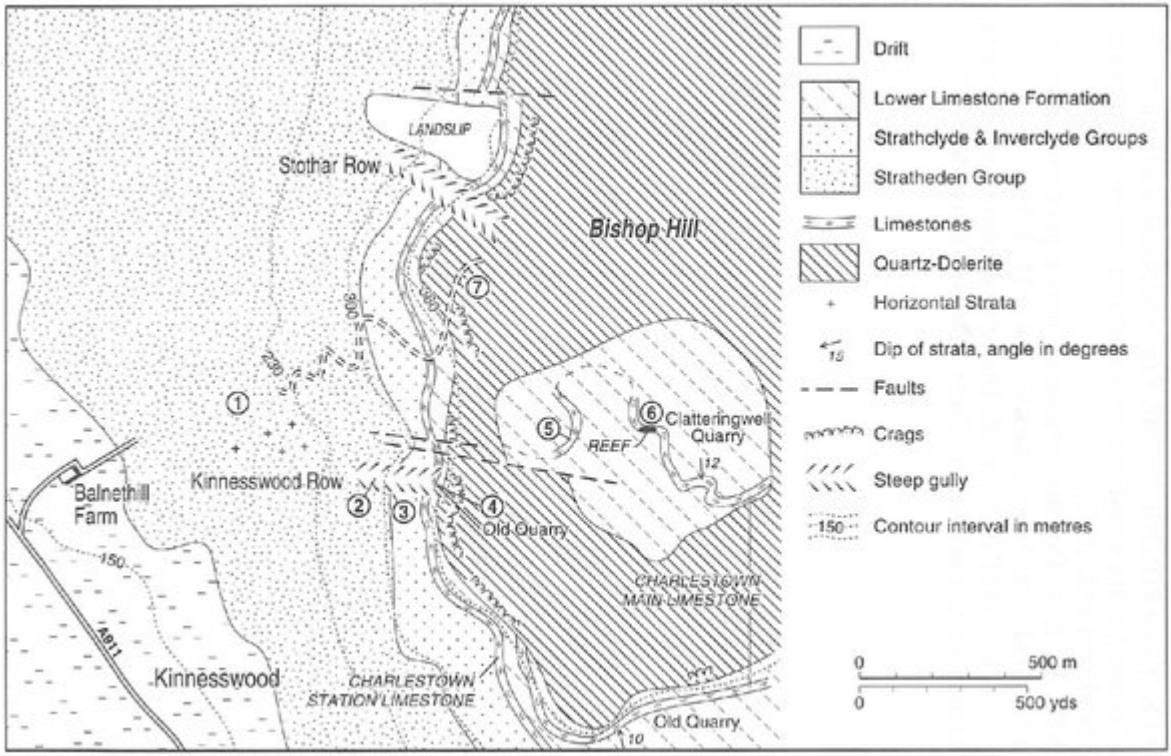
(Map 7) Dundee and Perth district.



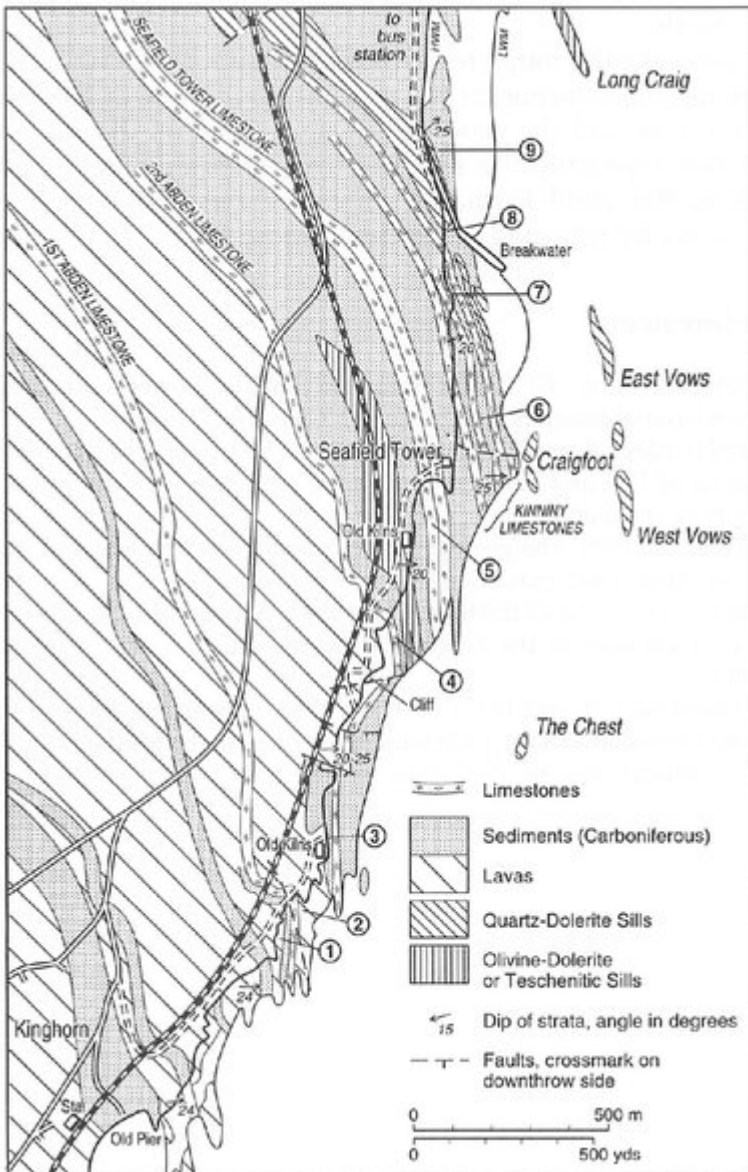
(Map 12) North Fife Hills.



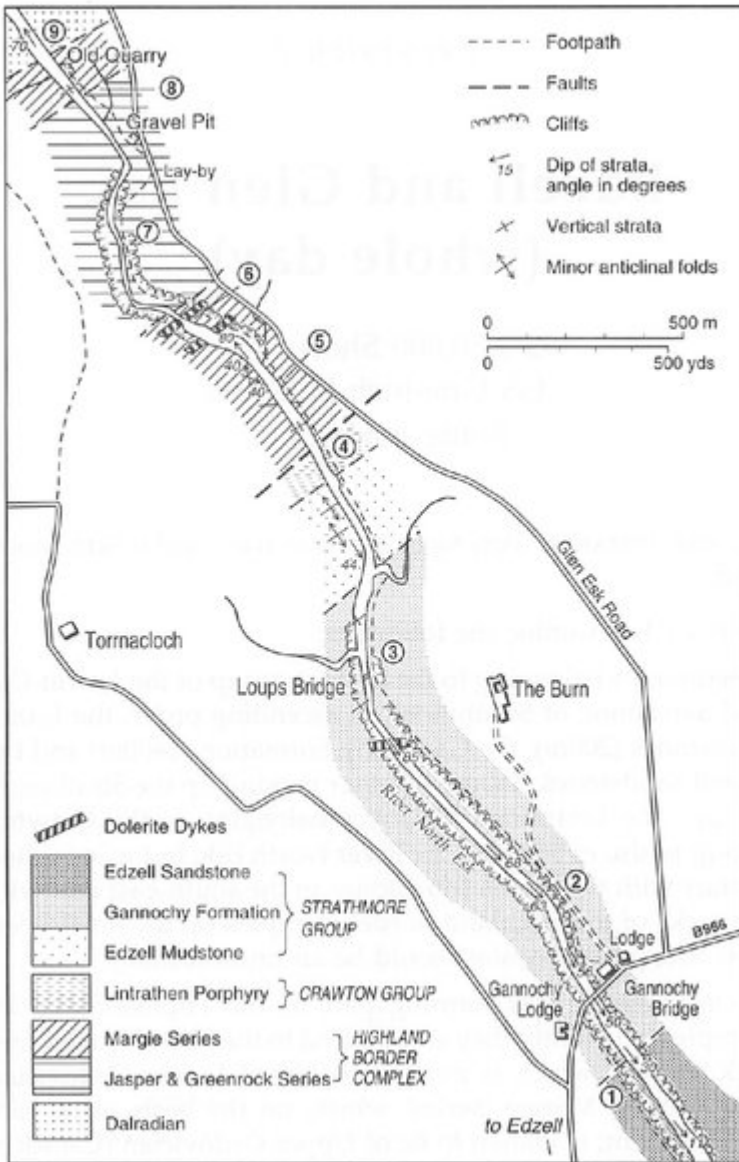
(Map 21) East Lomond.



(Map 22) Bishop Hill.

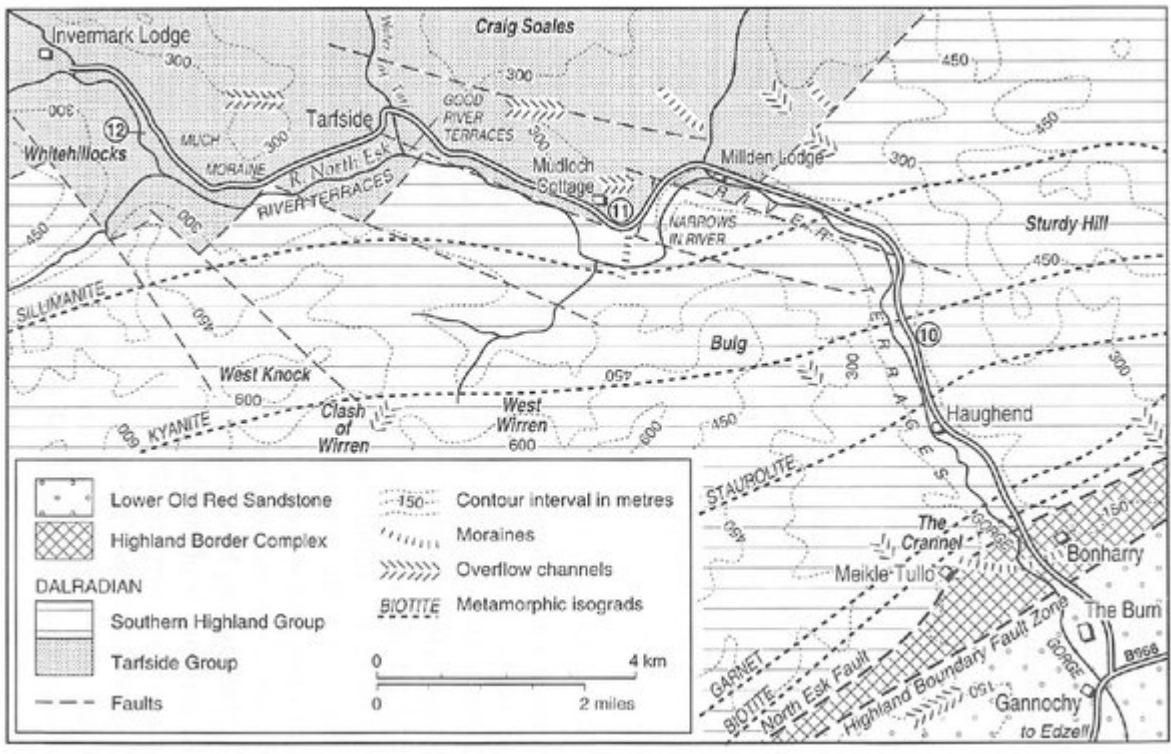


(Map 23) Kinghorn–Kirkcaldy.

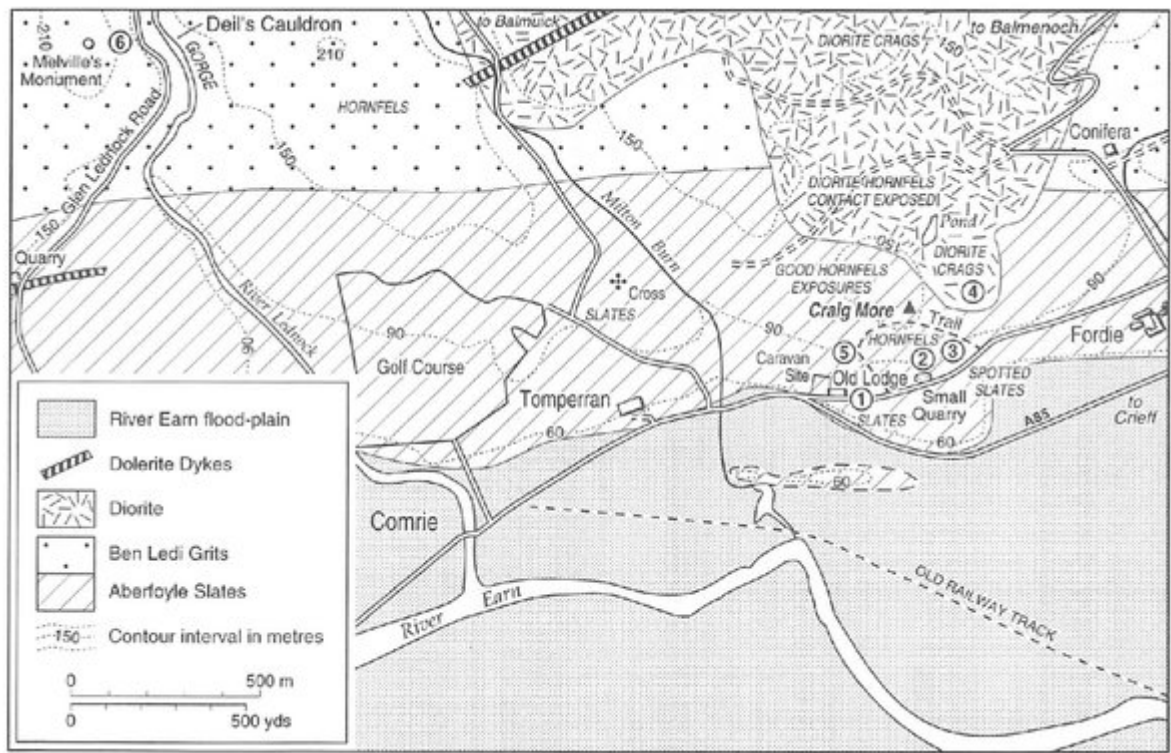


(Map 5) River North Esk, Edzell.



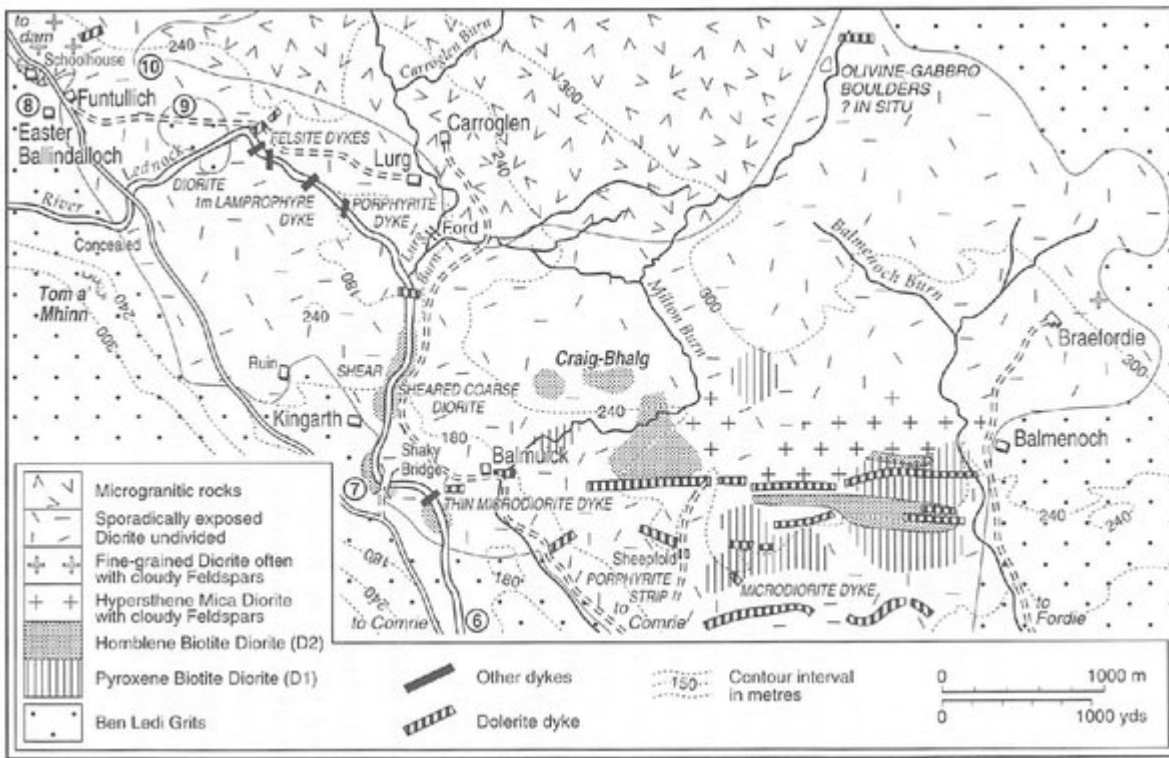


(Map 6) Metamorphic zones, Glen Esk.

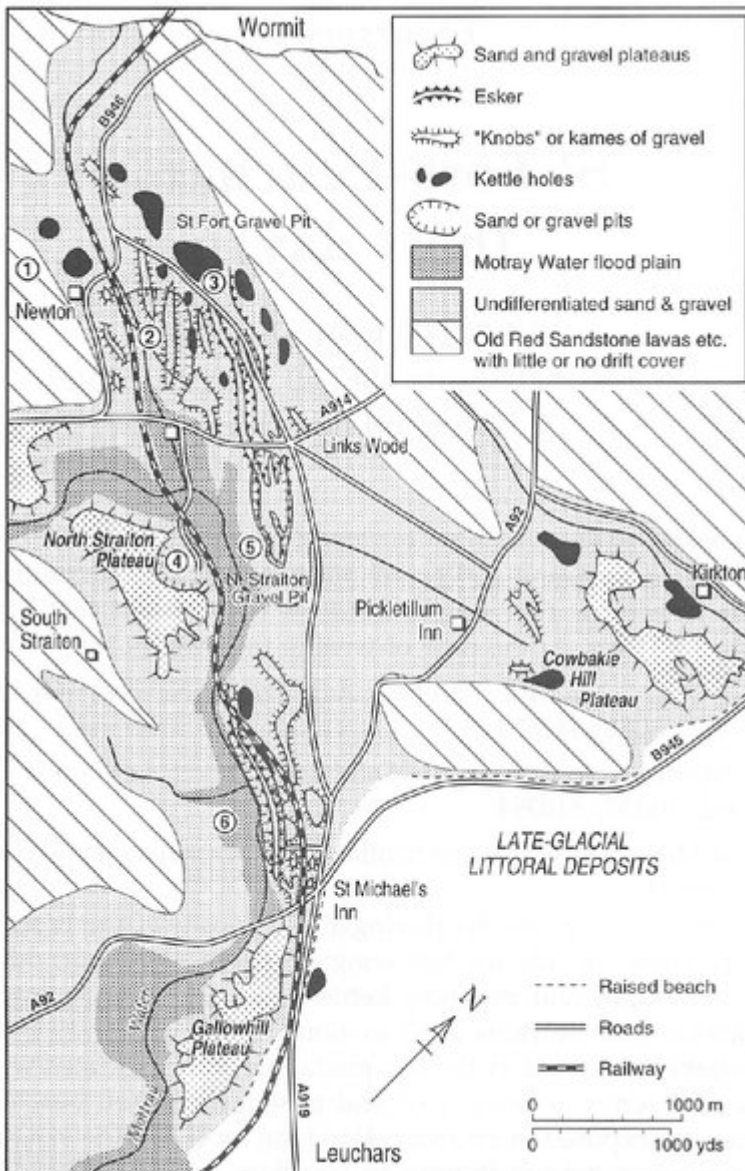


(Map 8) Comrie district.

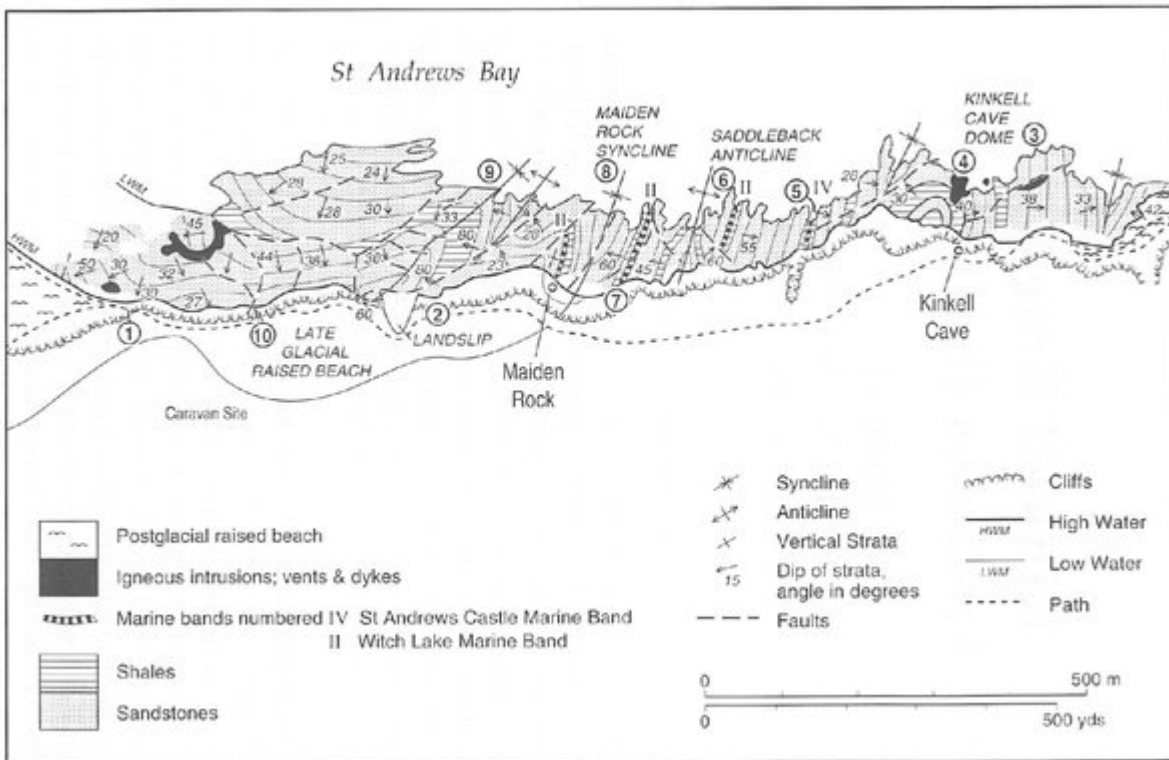




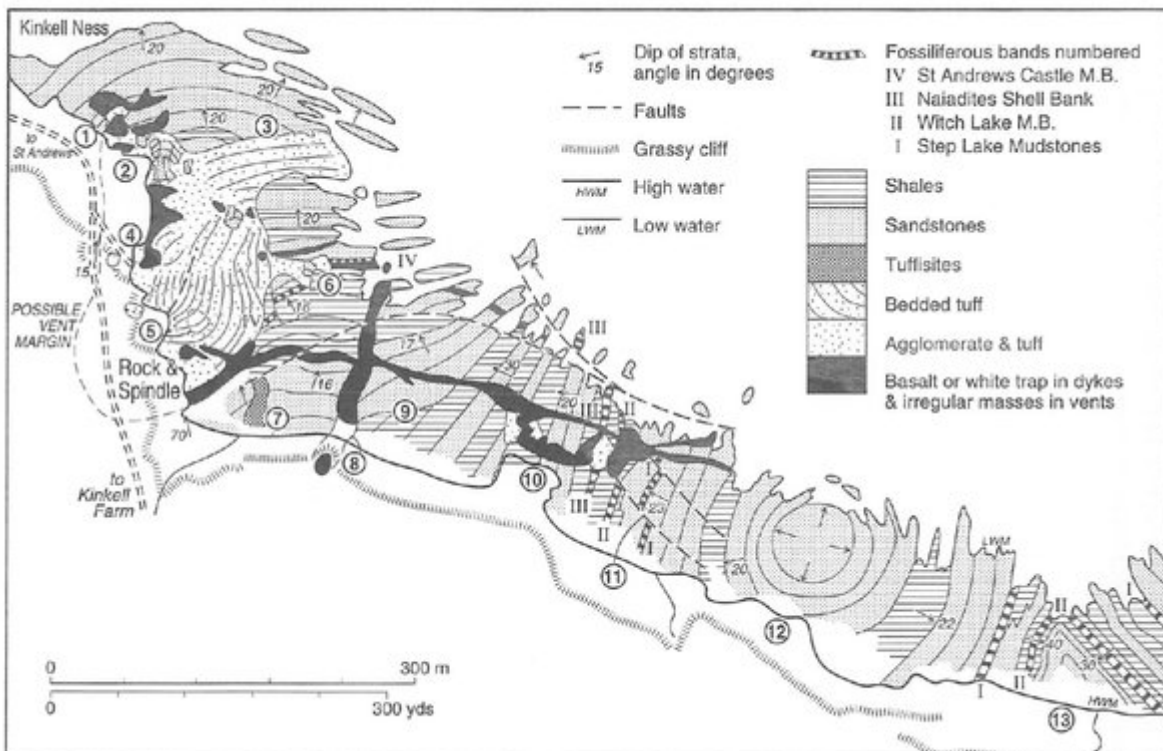
(Map 9) Part of the Comrie Igneous Complex



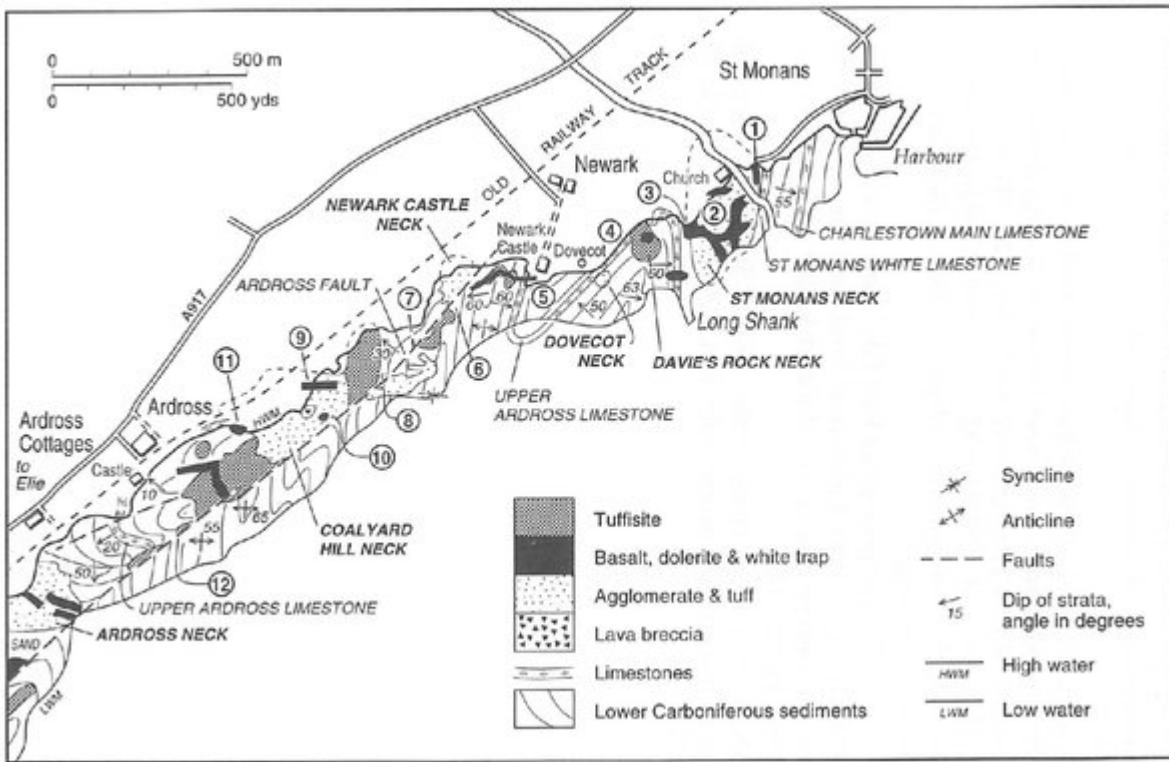
(Map 11) Glacial geology, St Fort–Leuchars.



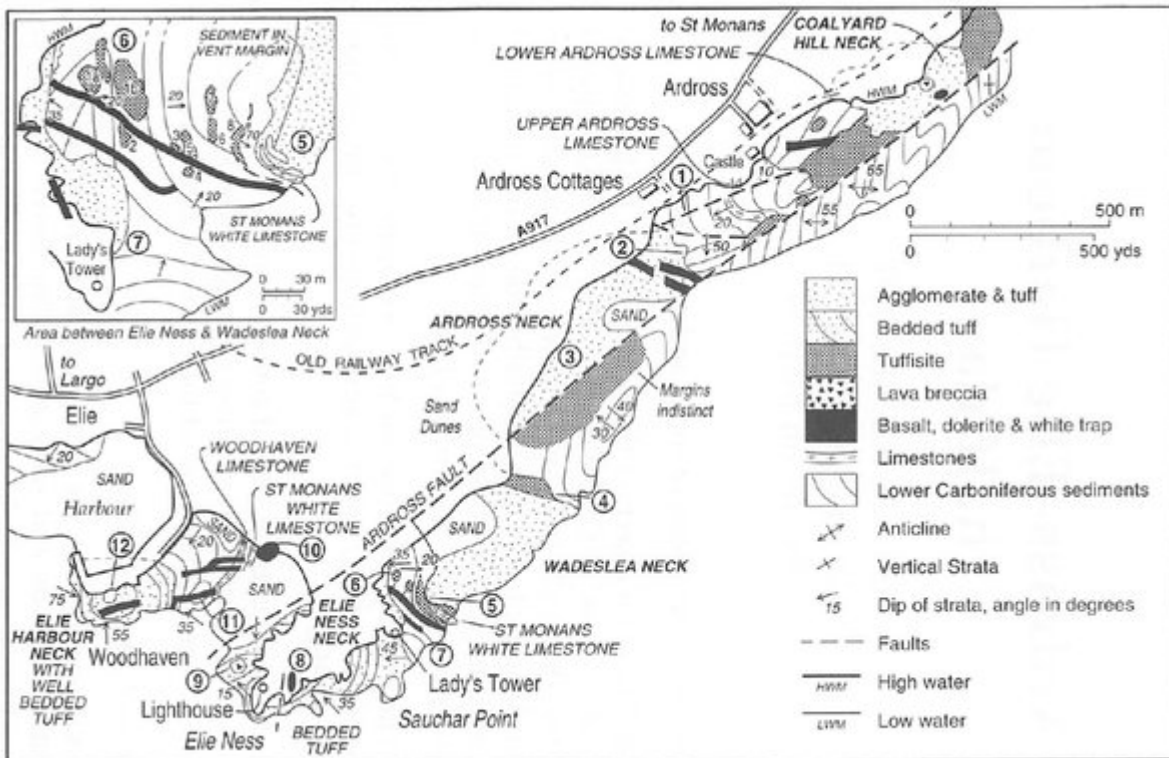
(Map 14) Kinkell Braes, St Andrews.



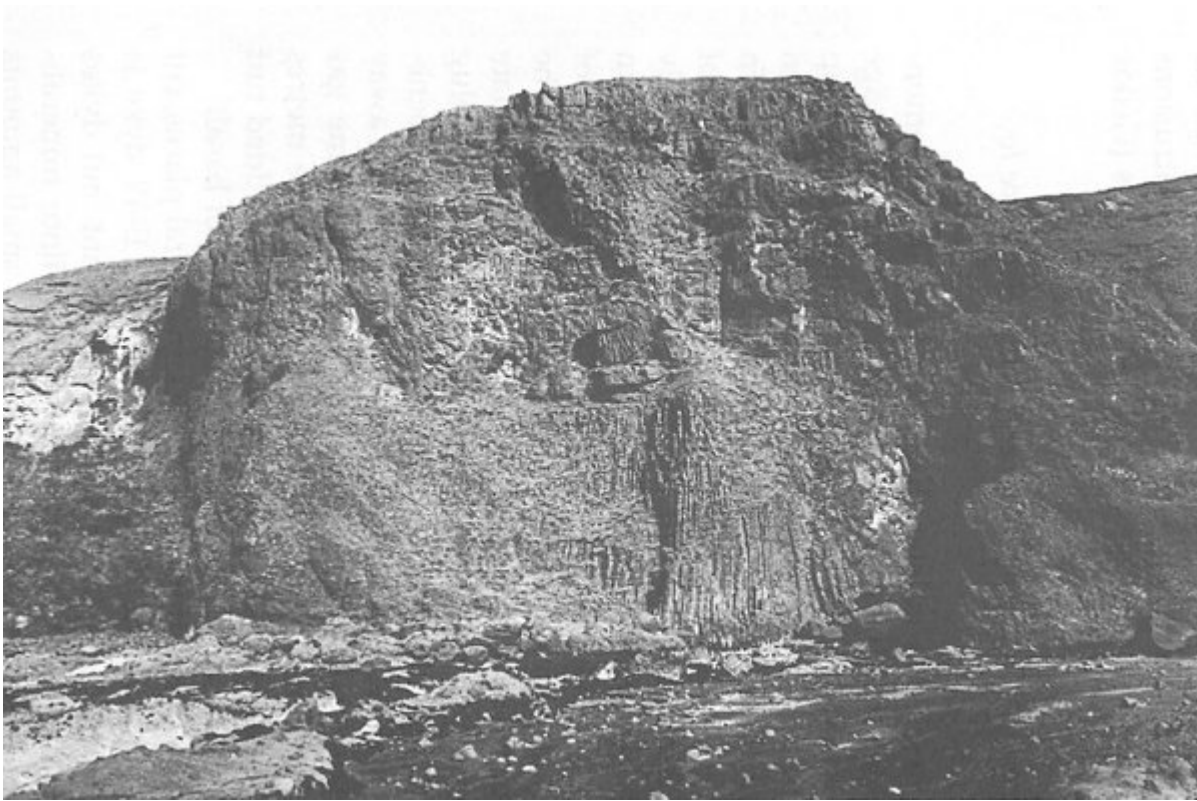
(Map 15) Rock and Spindle–Craigduff, St Andrews.



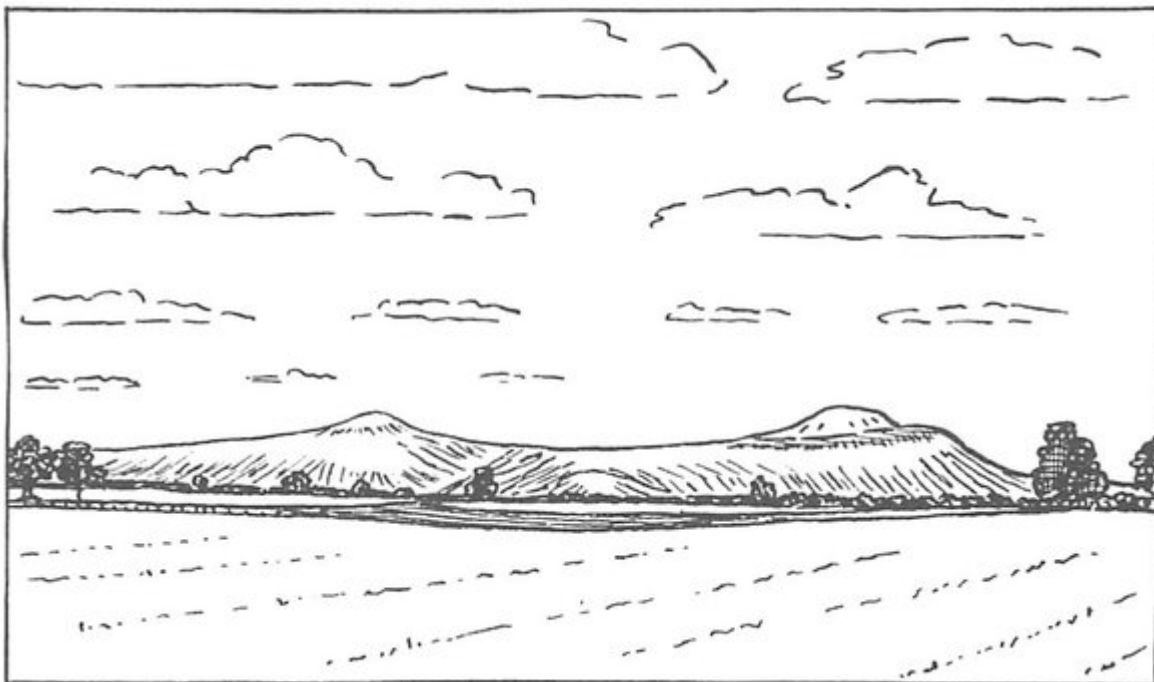
(Map 18) St Monans–Ardross.



(Map 19) Ardross–Elie Harbour.



(Plate 6) Columnar-jointed basalt in the main plug, Kinraig Neck, Elie. The wave-cut platform in the foreground truncates bedded tuff dipping towards Centre 2 within the neck. Excursion 15, Location 8. (Geological Survey Photo, Crown Copyright Reserved).

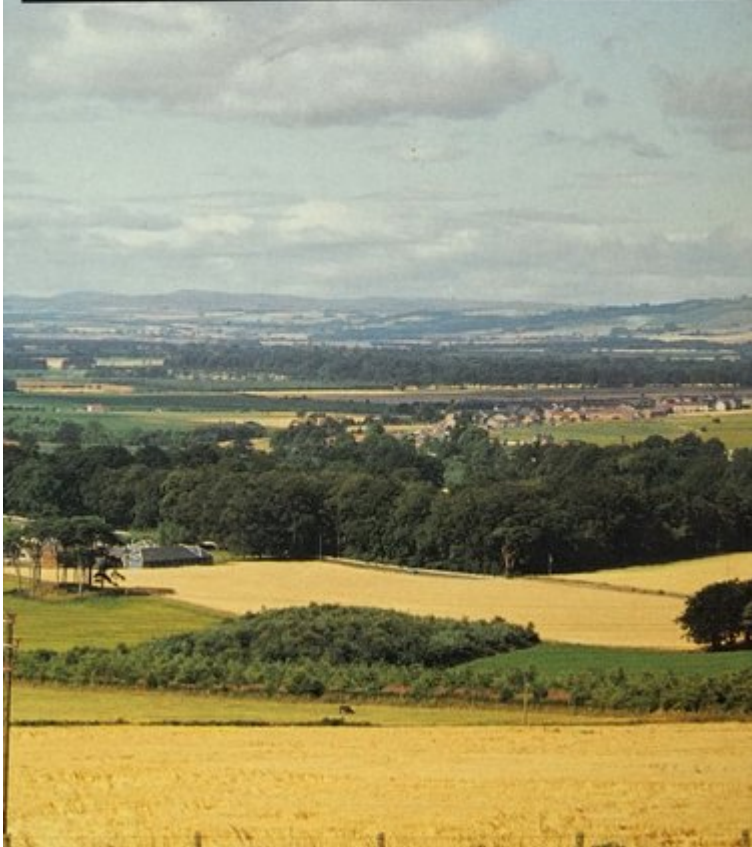


(Figure 1) The Lomond Hills seen from the Bow of Fife. The peaks are the eroded remnants of two Carboniferous–Permian volcanic necks now standing above the general level of the Midland Valley Sill which forms the marked scarp beneath the summit of the West Lomond on the right. The Howe of Fife in the foreground is covered by fluvioglacial deposits overlying horizontal Upper Old Red Sandstone sediments.

# **FIFE AND ANGUS**

## **GEOLOGY**

**A. R. MACGREGOR**



*Front cover.*