

---

# Geological excursions around Glasgow & Girvan

Edited By J.D. Lawson and D.S. Weedon

The Geological Society of Glasgow 1992

Geological Society of Glasgow, Department of Geology & Applied Geology Lilybank Gardens University of Glasgow  
Glasgow G12 8QQ.

ISBN Number 0 902892 09 6

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of The Geological Society of Glasgow.

British Library Cataloguing in Publications data

British Library Cataloguing-in-Publication Data A catalogue record for this book is available from the British Library.

## **Bibliographical Reference**

Reference should be made to this publication as follows:

Lawson, J.D. and Weedon, D.S. 1992. Geological Excursions around Glasgow and Girvan. Geol. Soc. Glasgow. 1992 pp.496

Prepared for printing in the U.K. by Carnmor Print and Design, Preston

Cover picture: View looking NNW up Loch Lomond from the hill of Duncryne [NS 435 859], near Gartocharn. To the left are the hills around Luss where slate was once extensively quarried. The distant jagged hill left of centre is Ben Arthur ('The Cobbler'): Ben Lomond is the snow-covered mountain right of centre. All these hills are part of the Dalradian block, eroded by ice and water from schistose greywackes, mica schists and slates.

On the right the village of Balmaha can be seen along the shore of the loch: the wooded ridge behind is the westerly continuation of Conic Hill, formed of steeply-dipping conglomerates of the Lower Old Red Sandstone. These rocks continue to the left as wooded islands across the loch. Between these ridges and the higher ground of Dalradian rocks to the north, lie the Highland Border Complex and the Highland Boundary Fault. This fault is a terrane boundary separating the Dalradian block from the Midland Valley block: in Ordovician times these two terranes had such entirely different histories that they could not then have been adjacent to one another.

The foreground is underlain by soft, easily eroded sandstones and mudstones of the Lower Old Red Sandstone. The hill of Duncryne, composed of agglomerate and basalt, is an eroded volcanic plug of Lower Carboniferous age.

## **Other guide books and pamphlets published by The Geological Society of Glasgow**

Other guide books and pamphlets published by The Geological Society of Glasgow and obtainable from the Publications Officer at the address below:

An excursion guide to the Geology of the Isle of Skye by B.R. Bell and J.W. Harris.

Macgregor's excursion guide to the Geology of Arran edited by J.G. MacDonald and A. Herriot.

Building Stones of Glasgow by Judith Lawson.

An excursion guide to Dob's Linn by S. Henry Williams

Excursion guide to the geology of the Isle of Eigg by Judith Lawson.

Also, in association with the Edinburgh Geological Society: An excursion guide to the Moine geology of the Scottish Highlands edited by I. Allison, F. May and R.A. Strachan.

## **Contents**

1. Building Stones of Glasgow
2. Fossil Grove
3. Milngavie and Mugdock
4. Baldernock And Blairskaithe
5. Campsie Glen
6. Corrie Burn
7. Dumbarton Rock
8. Ardmore Point and Auchensail
9. Balmaha
10. Aberfoyle District
11. Loch Lomondside
12. Sithean Sluaigh
13. Rosneath Peninsula And Loch Long
14. Greenock To Largs
15. Great Cumbrae
16. Upper Old Red Sandstone of the Firth of Clyde
17. Saltcoats
18. Loanhead Quarry
19. Boyleston Quarry
20. Trearne Quarry
21. Hagshaw Hills
22. Lesmahagow
- 23: Lugar Sill and Mauchline
24. Heads Of Ayr

The Girvan-Ballantrae District

25. Pinbain Block

26. Knocklaugh

27. Bennane Head To Downan Point

28. Dow Hill, Byne Hill And Ardmillan Braes

29. Upper Stinchar Valley And Adjacent Areas

30. Girvan Foreshore

31. The Craighead Inlier

32. Dob's Linn

33. Quaternary

## **Acknowledgement**

The Geological Society of Glasgow is grateful to the following companies and organisations for their financial contributions towards the production of this excursion guide.

Clyde Petroleum plc Lomond Associates Reservoir Research Ltd Thorburn plc

List of contributors

Bluck, B.J., Department of Geology & Applied Geology, University, Glasgow, G12 8QQ.

Bowes, D.R., Department of Geology & Applied Geology, University, Glasgow, G12 8QQ.

Bowes, G.E., Department of Geology & Applied Geology, University, Glasgow, G12 8QQ.

Burton, C.J., Department of Geology & Applied Geology, University, Glasgow, G12 8QQ.

Durant, G.P., Hunterian Museum, University, Glasgow, G12 8QQ.

Gribble, C.D., Department of Geology & Applied Geology, University, Glasgow, G12 8QQ.

Ingham, J.K., Hunterian Museum, The University, Glasgow, G12 8QQ.

Jardine, W.G., Department of Geology & Applied Geology, University, Glasgow, G12 8QQ.

Keen, M.C., Department of Geology & Applied Geology, University, Glasgow, G12 8QQ.

Lawson, J.D., 47 Southbrae Drive, Glasgow, G13 1PU. Lawson, Judith A., 47 Southbrae Drive, Glasgow, G13 1PU.

MacDonald, J.G., Department of Adult and Continuing Education, University, Glasgow, G12 8LW.

Patterson, E.M., 25 Caldwell Road, West Kilbride, KA23 9LF. Rolfe, W.D.I., Royal Museum of Scotland, Edinburgh, EH1 1JF.

Tanner, P.G.W., Department of Geology & Applied Geology, University, Glasgow, G12 8QQ.

Todd, J.G., 'Eastfield', Tandlehill Road, Kilbarchan, PA10 2DQ. Weedon, D.S., 9 Montgomerie Terrace, Skelmorlie, PA17 5DT.

Williams, S.H., Department of Earth Sciences, Memorial University of Newfoundland, St. Johns, Newfoundland, Canada.

Deceased

Mykura, W.

White, F.

## **Foreword**

### **Scope of the guide**

Glasgow can justly claim to have a greater variety of geology which can be visited on single day excursions than any other city in Britain. The first account of these excursions was published in 1958 in Dr D.A. Bassett's 'Geological Excursion Guide to the Glasgow district'. It was updated in 1973 by the guide edited by Dr B.J. Bluck. A projected guide to the Girvan area never reached fruition. The present guidebook makes good that deficiency by including seven excursions in the Girvan to Ballantrae areas together with illustrated discussions of the fundamental problems. The Dob's Linn locality may seem to be well outside Glasgow's province but it can easily be visited in a day and, indeed, has been a regular excursion for students from Glasgow University. The comparison with the Girvan rocks of similar age has long been a matter of great interest. It is also the nearest locality which yields abundant graptolites and contains the international stratotype for the Ordovician-Silurian boundary; the section has recently been redescribed by S. Henry Williams when a research student at Glasgow University and he is the main author of the excursion account. As for the Glasgow area itself, most of the excursions in the 1973 guide have been retained in revised forms. However the Lugton quarries are now flooded and the Boyleston Quarry has deteriorated considerably although a brief account is still included. The Great Cumbrae excursion has been simplified and Little Cumbrae omitted because of access difficulties. There are new excursions around the Rosneath peninsula, to Loanhead Quarry, on the Old Red Sandstone of the Clyde coast and the Building Stones of Glasgow.

Many of the excursions are suitable for beginners in the subject of geology but others are at a higher level. In these more complex excursions, however, an attempt is made to provide guidance for the amateur who wishes to advance his knowledge: there are extended explanations with helpful illustrations. For instance the Firth of Clyde Old Red Sandstone excursion explains the interpretation of some sedimentary structures, the Trearne excursion instructs in palaeoecology, the Balmaha excursion discusses terranes, the Rosneath excursion explains the interpretation of structures in metamorphic rocks and the Ballantrae excursions introduce plate tectonic concepts.

A glossary of all except the commonest technical terms is appended and the words listed appear in bold type at first mention in the text of an excursion. The definitions are, however, brief and without illustration. Fuller explanations will be found in the various dictionaries of geology. However it is strongly recommended that the reader should study some elementary texts in order to obtain an integrated picture of the subject. An indication of the standard of the various excursions is given in the subsequent Excursion Planner.

Additional geological excursions which can be undertaken in a day trip from Glasgow are included in Lothian Geology (Edinburgh Geological Society) and Fife and Angus Geology (St Andrews University—new edition in preparation).

### **Behaviour and conservation**

The rapid increase in geological field studies in recent years has often resulted in the deterioration or even destruction of important outcrops and has also caused considerable inconvenience (and even financial loss) to landowners. Visitors are therefore exhorted to follow both the Country Code and the Geologists' Association's 'A Code for Geological Field Work' (copies free from the G.A., c/o Burlington House, Piccadilly, London W1V 9AG). Some of the main points are highlighted

below.

- Ask permission to enter private land or quarries
- Park cars sensibly—not in front of field gates or obstructing narrow roads
- Close gates—unless they obviously need to be kept open Do not damage stone walls or fences
- Do not walk through crops—including meadow grass Do not interfere with machinery e.g. in quarries Do not hammer indiscriminately or unnecessarily Wear protective goggles when hammering Do not undermine hedges or walls
- Keep collecting to a minimum: collect from debris Do not litter fields or roads with rock debris Drop no litter—take it home if necessary Observe the Mountain Safety code
- Avoid loosening rock on steep slopes
- Do not enter old mine workings or cave systems
- Do not get cut off by the tide
- Wear safety hats in quarries or below cliffs
- Do not disfigure outcrops with paint or core-holes

Some of the localities recommended in this guide are Sites of Special Scientific Interest (SSSIs), designated by the Nature Conservancy Council. The function of this body is to conserve the scientific interest of these sites and for that reason their whereabouts are not widely publicised. Whilst the existence of these sites is public knowledge, most of them are in private ownership: designation as an SSSI does not confer any increased rights of access for the public. Some of the sites do not, at present, require prior permission but the usual courtesies should still be observed. The geological visitor is expected to respect their status and restrict hammering to a minimum. In some cases, however, (clearly indicated in the guide) a special permit is required from the NCC to cover access and limited collecting. Where relevant, the present landowner's name and address is provided in the appropriate excursion. If prior written permission is required it is advisable to write several months in advance as the landowner may have to consult the NCC. The local contact address for the Nature Conservancy Council is: The Castle, Balloch Castle Country Park, Balloch, Dunbartonshire, G83 8LX. Tel. (0389) 58511. At the time of writing there are proposals to reorganise and rename the NCC in Scotland, as part of Scottish Natural Heritage.

## **Transport and accommodation**

Most of the excursions assume the availability of a private car but it is possible to use public transport in some cases, as indicated in particular excursion accounts, albeit with some loss of convenience and time, plus extra walking distance.

Information on routes and time-tables can be obtained from the following:

Rail Service Enquiries: (041) 204.2844

The Travel Centre, St Enoch Square, Glasgow (041) 226.4826

Buchanan St Bus Station, Glasgow (041) 332.9644 (for longer distance buses)

The Tourist Information Office in St Vincent Place, Glasgow, can provide maps and advice on accommodation (041) 204.4400

## **Acknowledgements**

The editors wish firstly to thank the authors for their expert contributions and to their institutions for providing facilities. Special thanks are due to Professor B.E. Leake of the Department of Geology and Applied Geology at the University of Glasgow for providing expert secretarial assistance from Mrs Mary Fortune, Mrs Betty Mackenzie, Mrs Irene Wells and Miss Jeanette Wylie and draughting work by Mrs Sheila Hall. Drs. G.E.Bowes and C.Farrow deserve our gratitude for their unfailing help in solving 'Word-processing' problems.

Dr. J.P. Burlison of the Nature Conservancy Council kindly took the time to advise us on the Sites of Special Scientific Interest, and their protection.

We are also indebted to the following for permission to reproduce figures from their publications:

- Chapman and Hall Limited for (Figure 21.2)c, 22.1a
- Linnaean Society for (Figure 21.2) e,f
- Schweitzerbart'sche Verlagsbuchhandlung for (Figure 22.2) Dr. A. Ritchie for (Figure 22.1)h
- Royal Society of Edinburgh for (Figure 10.2) and 10.3, reproduced with permission from Curry et al in the Transactions of the Royal Society of Edinburgh vol. 75, pp. 113–133, Figure 7 and 8 (1984).

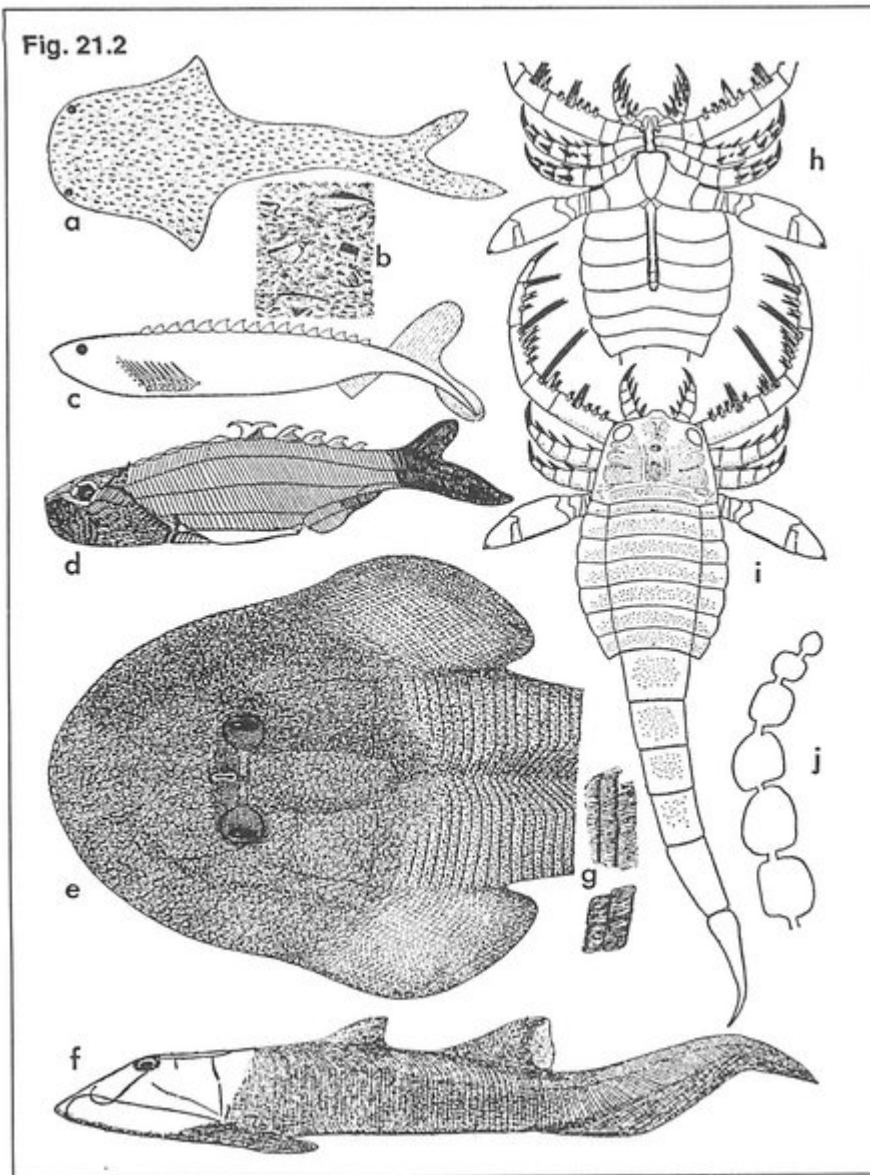
The commercial organisations who generously donated money to help in the production of this guide are acknowledged separately on page 8.

Finally, we would like to express our personal gratitude to Brian and Aileen Evans of Carnmor Print & Design for their patient and friendly advice during the preparation of this Guide.

J.D. Lawson D.S. Weedon

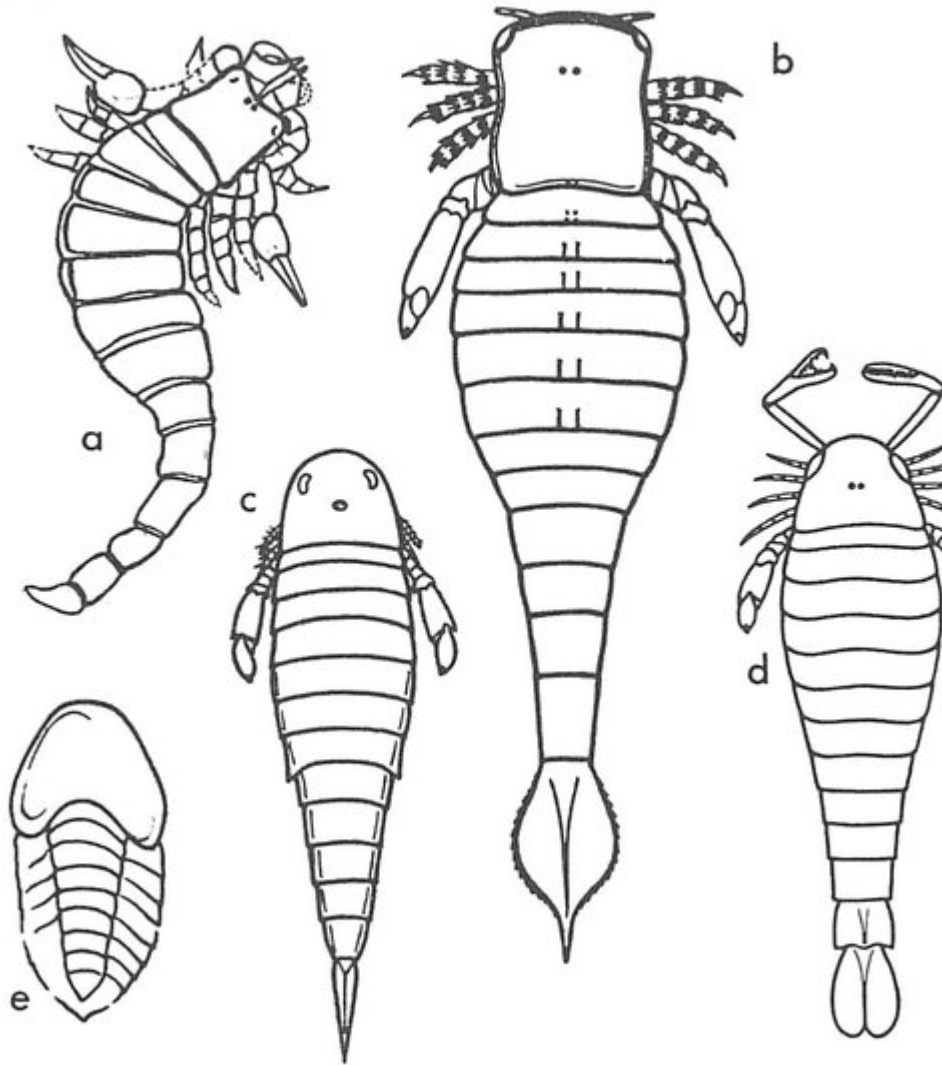
## **Disclaimer**

The routes recommended in this guide are not necessarily public rights of way. Responsibility for obtaining access permission lies with the user. Property often changes ownership and even existing owners may change their minds about allowing access to their land, particularly if they have experienced trouble and even damage from geological parties failing to follow the Code for Geological Field Work. Any information (e.g. change in footpaths and access, filling in of quarries, threats to SSSIs, new exposures) that would update and improve a revised edition of this guide would be welcomed by the Society.



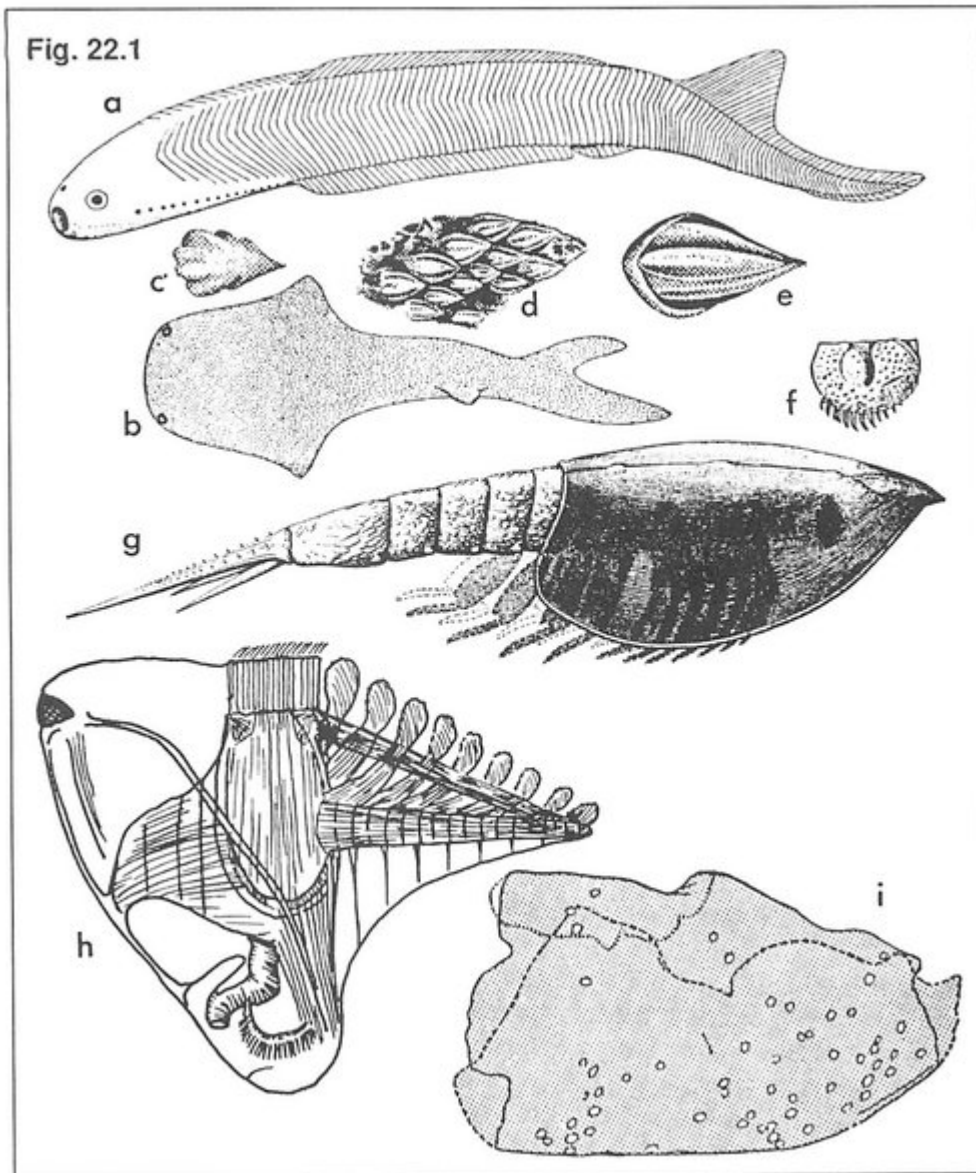
(Figure 21.2) Some of the fish (a-g), eurypterids (h, i) and plant (j) fossils that occur in the Fish Bed: all natural size unless otherwise indicated. a, b, thelodont *Lanarkia spinosa* (after Traquair), a, as it appears flattened in the rock (*Logania taiti* also occurs here—compare with (Figure 22.1) b); b, detail of trunk denticles ( $\times 6$ ); c, unarmoured anaspid *Lasanius problematicus* (after Parrington and Miles); d, armoured anaspid *Birkenia elegans* (after Stetson, Heintz and Ritchie) denticles are sub-circular, crenulated and interlocking, whereas posteriorly they become more elongate and spined ((Figure 22.1) c-e) The thelodonts *Lanarkia horrida*, *L. spinosa* and *L. spinulosa* are similar to *Logania* in body form, but their denticles are distinctive in being relatively long, hollow, conical spines ((Figure 21.2) a, b).

Fig. 22.2

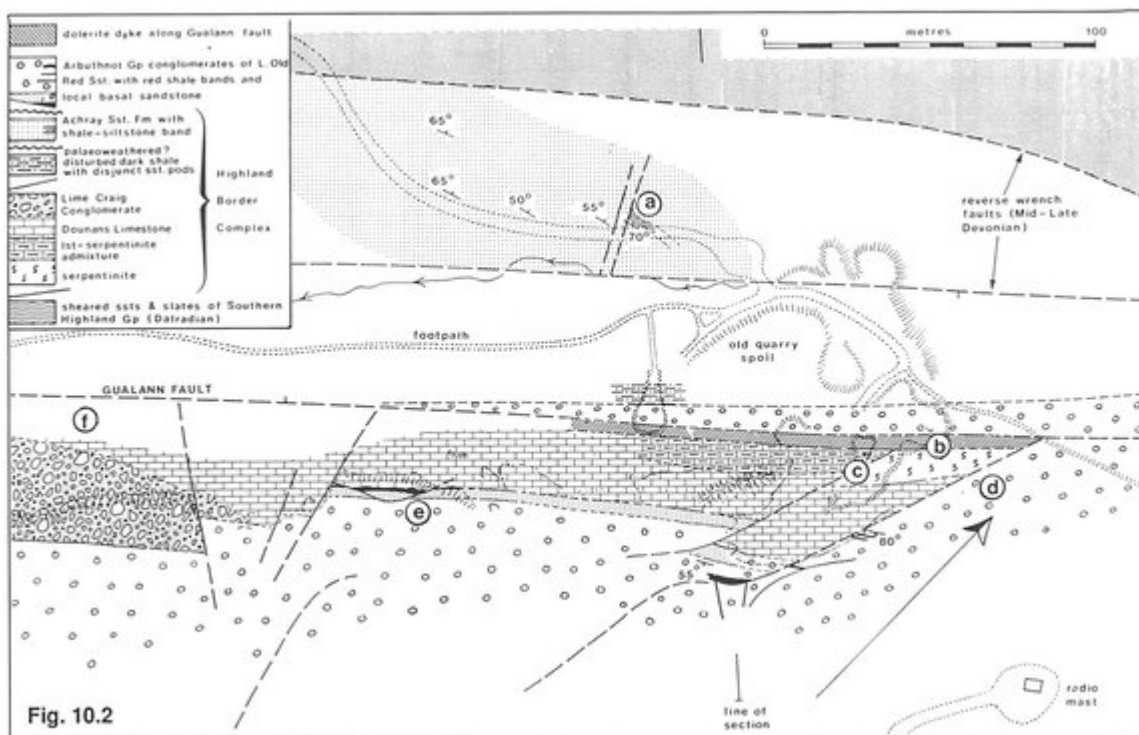


(Figure 22.2) Some of the fossil chelicerates from the Jamoytius horizon. a, ?aquatic scorpion *Allopalaeophonus caledonicus*  $\times 2112$  (after Petrunkevitch); b-d, eurypterids (water-scorpions, after Størmer); b, *Slimonia acuminata*  $\times 116$ ; c, *Hughmilleria lanceolata*  $\times 112$ ; d, *Erettopterus* [*Pterygotus*] *bilobus*,  $\times 1/6$ ; e, early king crab *Cyamocephalus loganensis*  $\times 2/3$  (after Størmer) The eurypterids are rare at this horizon, but occur more abundantly at Shank Castle, Dunside.





(Figure 22.1) Some of the fossils at the Jamoytius horizon: two-thirds natural size unless otherwise indicated. a-e, jawless fish: a, anaspid *Jamoytius kerwoodi* (after Miles and Ritchie); b-e, *Logania* [*Thelodus*] *scotica*, b, dorsal aspect as it appears flattened in the rock, (after Traquair); c-e, details of skin denticles; c, head denticle,  $\times 24$ ; d, e, trunk denticles; showing d, how they occur on the body,  $\times 8$ , e,  $\times 24$  (c, e, after Gross; d, after Traquair) f, g, crustaceans; f, water-flea *Beyrichia* cf. *kloedeni*.  $\times 6$  (modified from Henningsmoen); g, pod-shrimp *Ceratiocaris papilio*, (after Rolfe); h, ?sea-squirt *Ainiktozoon loganense* (after Ritchie; i, fragment of the possible crustacean *Dictyocaris*  $\times 114$  (after Størmer), stipple indicates network ornament.



(Figure 10.2) Geological map of Limecraig Quarry and environs, with locality numbers (From Bluck et al 1984).