Field Guide to the Geology of some localities in County Dublin.

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ISBN 0 9521066 0 4

First published 1993 by the Department of Geology, Trinity College,
Dublin and ENFO - The Environmental Information Service,
17 St Andrew Street, Dublin 2.

CONTENTS

FIGURES

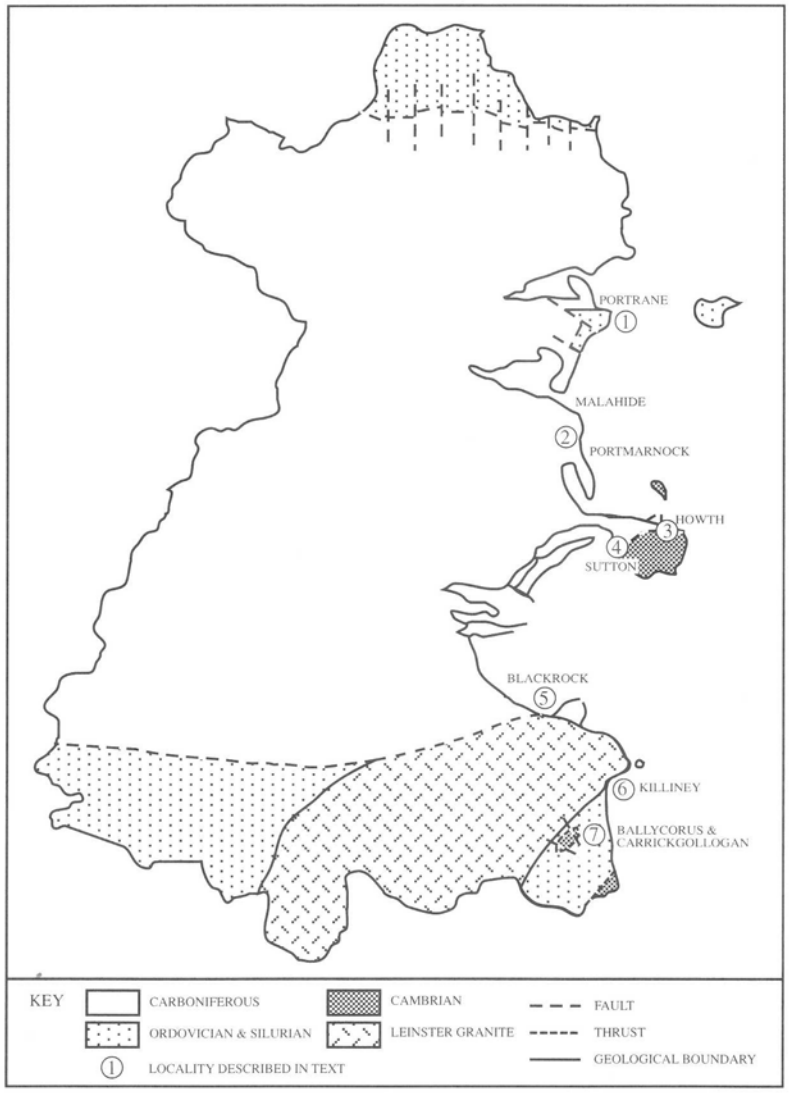

Figure 1. Sketch map of the geology of Co. Dublin with the location of the sites described in this guide.

INTRODUCTION

This short field guide to a number of localities in County Dublin has been produced so that members of the general public and more especially teachers and their pupils, may be able to examine various rock types in the field. It has been produced by members of the Department of Geology, Trinity College, Dublin, in conjunction with ENFO, to coincide with the exhibition *The Geology of County Dublin* which took place in ENFO during March 1993.

The geology of Co. Dublin spans a period of just over 250 million years from what geologists call the Cambrian to the Lower Carboniferous periods. During that time the environment changed markedly through time. Marine conditions gave way to periods of great volcanic and tectonic activity, granites were intruded into pre-existing rocks, and the sea migrated backwards and forwards over the land surface. At other times the land was dry and desert-like, while later tropical balmy conditions prevailed, in which reef-like structures developed.

The geological evolution of Co. Dublin may be unravelled by searching for various clues. What sort of sediment makes up the rocks? Do they contain fossils? If so, can one tell anything about the mode of life of these animals and plants? Where did volcanic eruptions occur, and why? When was the Leinster granite intruded, and what effect did it have on the surrounding rocks? Which rocks are faulted? Can we tell when these faults propagated, and how much movement took place along them?

The rocks in Co. Dublin yield these clues. Once you have gathered them, and considered them in the light of present day processes, and with regard to modern biological information, you will begin to understand what happened in Dublin during its geological past.

This book attempts to guide the user through the geology of seven localities in Co. Dublin were , generally speaking, different facets of geology can be examined. There is some overlap between different localities. The arrangement of the localities in this guide are simply from north to south - we do not suggest that the reader has to visit the localities in numerical order; rather it would perhaps be better to visit them in chronological order (according to their geology): Howth, Sutton, Portrane, Ballycorus and Carrickgollogan, Killiney, Blackrock, and Portmarnock to Malahide. However, we leave that up to your own discretion.

We have written this guide to be as comprehensible to anyone with no training in geology. If your appetite is stimulated by what you read and see, we have included addresses from where more information may be got. In order that you get full enjoyment from these trips, please remember the following points: Access should be all right for each site, but check in case the situation has changed. Be safety conscious near cliffs in case of slippery or loose rocks. Take a note of the tides and the weather, and tell somebody where you are going and when you hope to return. The authors of this guide book have attempted to ensure that all the sites described are safe,and cannot be held liable for accidents. Please do not destroy any of the localities mentioned - there is no need for the use of a hammer. You may collect loose pebbles if you must, but it is better that you bring an identification guidebook, a camera and a notebook with you, so that the features you came to see are there for the next person.

Enjoy yourself!

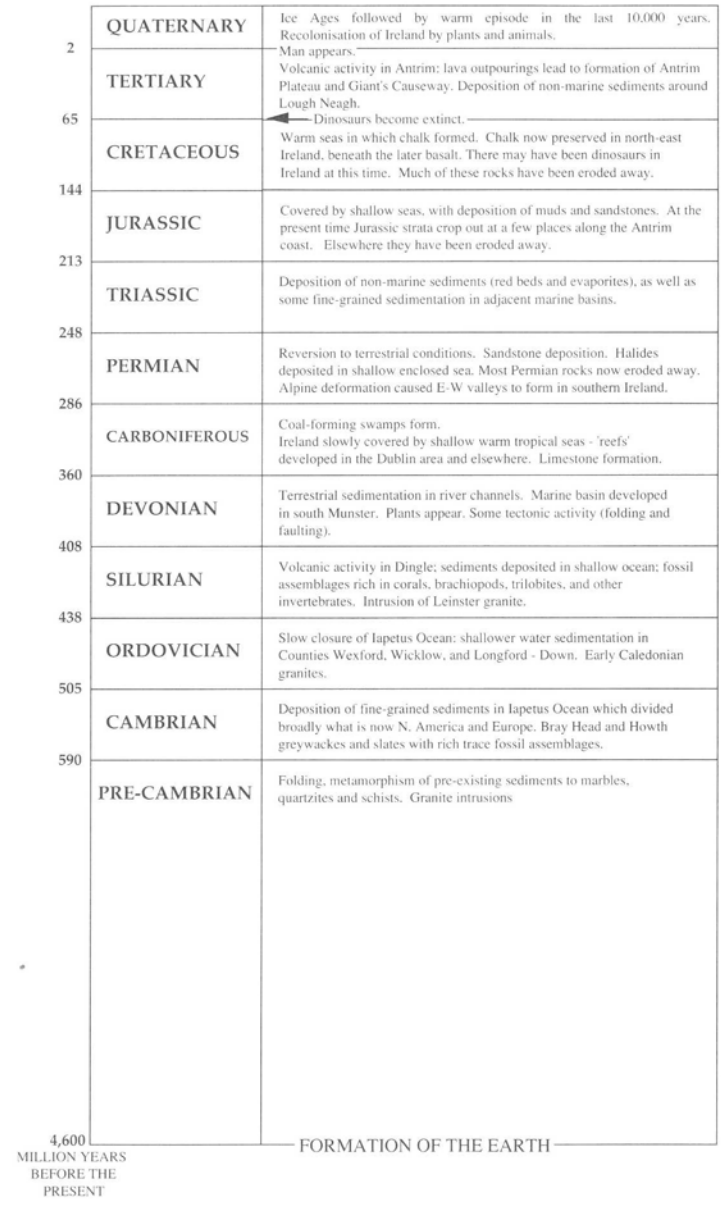

Figure 2. Geological timescale, and Ireland's geological history.

Stop 4. Stop at the base of the hill and look at the rocks on the ground. Are they granite? No, they are quite different. They are quartzites, pale grey to buff in colour, and composed of interlocking grains of quartz, which are some 150 million years older than the Leinster granite. How did they get on top of the younger granite? One possibility would be that they were folded. If that was the case then we would expect to find obvious signs of distortion and cleavage in the quartzites - there aren't any. The explanation that geologists have come up with is that the mass of quartzite that makes up the hill of Katty Gollagher was shunted from the south along a flat-lying thrust fault. These rocks are identical to the quartzites of Bray Head and the Sugar Loaf mountains, which are Cambrian in age. The quartzite started off as sand deposits which were consolidated. They were subsequently uplifted and later faulted into their present position high above sea level.

Stop 5. Continue along the path, which rounds the hill rather like a helter-skelter, and climb to the summit (912 feet). From here on a good clear day you can see the coastline of Wales to the east and the Mourne Mountains to the north. To the south Bray Head and the Sugar Loaf Mountains seem to appear as barriers to would be southern travellers. Many people have been told that these cone-shaped peaks are the remains of volcanoes - this is NOT the case. The resistant nature of the quartzite that make them up results in their unusual shape (which may also be seen in Mount Errigal, Co. Donegal, another quartzite peak). Stretching away towards the southeast are the rounded peaks of the granitic Wicklow Mountains which can be traced from Killiney Hill (note the obelisk) to the northeast, to the southwest where they continue into Co. Waterford. Between the Killiney and Bray rocks of Ordovician age underlie the lowlying areas, and to the north and northeast, beyond the granite, is Dublin and the Central Plain under which is Carboniferous limestone.

After taking in the splendid views return to you car or to the bus stop on the Enniskerry road, taking care on the path going down the hill.

SUGGESTED FURTHER READING

HAMILTON, W.R., WOOLLEY, A.R. and BISHOP, A.C. 1980. *The Country Life Guide to Minerals, Rocks and Fossils.* Country Life Books/Hamlyn Publishing, London.

HOLLAND, C.H. (editor). 1981. *A geology of Ireland.* Scottish Academic Press, Edinburgh. [The most up to date account of Irish geology].

HOLLAND, C.H. 1987. *Irish Scenery.* Irish Heritage Series, Easons, Dublin.

IRISH GEOLOGICAL ASSOCIATION. Field Guides on the geology of various locations in Ireland (for details see address below).

MITCHELL, G.F. 1986. *The Shell Guide to Reading the Irish Landscape.* Michael Joseph, London and Country House, Dublin.

RYAN, N.M. 1992. *Sparkling Granite.* Stone Publishing, Dublin. [Describes the history of quarrying in the Three Rock Mountain area of Co. Dublin].

WHITTEN, D.G. with BROOKS, J.R.V. 1983. *A Dictionary of Geology.* Penguin, London.

WHITTOW, J.B. 1974. *Geology and Scenery in Ireland.* Penguin, London.

Further information may got from serial publications including *The Irish Journal of Earth Sciences, The Geological Survey of Ireland Bulletin, The Proceedings of the Royal Irish Academy*, and *The Scientific Proceedings of the Royal Dublin Society.* Additional valuable information can be derived from the maps of the Geological Survey of Ireland.

GEOLOGICAL EXHIBITIONS IN DUBLIN

The Story of the Earth, Geological Museum, Department of Geology, Trinity College, Dublin 2 [Open Monday-Friday 10.00-4.30; group bookings please contact Patrick Wyse Jackson (telephone: 7021477 or 7021074)].

Introduction to Geology, National Museum of Ireland, Merrion Row, Dublin 2 [Open Tuesday-Saturday 10.00-5.00].

Down to Earth, Geological Survey of Ireland, Haddington Road, Dublin 4 [Open Tuesday-Friday 10.00-12.30].

MORE INFORMATION, INCLUDING LECTURES AND EXTRA-MURAL COURSES (*), ABOUT GEOLOGY AND DUBLIN'S GEOLOGY MAY BE OBTAINED FROM THE FOLLOWING INSTITUTIONS

Department of Geology, Trinity College, Dublin 2* (7021477/7021074).

Department of Geology, University College, Belfield, Dublin 4* (2693244).

Geological Survey of Ireland, Haddington Road, Dublin 4 (609511).

National Museum of Ireland, Merrion Row, Dublin 2 (618811).

Irish Geological Association (IGA)
c/o Department of Geology, Trinity College, Dublin 2.

Irish Association for Economic Geology (IAEG)
c/o Geological Survey of Ireland, Haddington Road, Dublin 4.

Irish Quaternary Association (IQUA)
c/o Geological Survey of Ireland, Haddington Road, Dublin 4.