

A PALAEOGEOLOGICAL MAP  
of the  
LOWER PALAEOZOIC FLOOR  
below the cover of UPPER DEVONIAN,  
CARBONIFEROUS AND LATER FORMATIONS

with inferred and speculative reconstructions of Lower  
Palaeozoic and Precambrian outcrops in adjacent areas

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Not to seek in any subject greater accuracy than its nature admits.  
Aristotle.

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## PREFACE

It is four years since Professor Wills produced his outstanding pre-Permian Palaeogeological Map of England and Wales, published by this Society with an explanatory memoir and now to be found on the walls of many working offices across the country. He was then 89 and it was assumed that this was his final production, a remarkable achievement in the face of great physical frailty.

Nevertheless he immediately moved on to a map of a stratigraphically deeper level — a palaeogeological map of the rocks following the Caledonian movements and the subsequent erosion, the surface of which would be exposed by the removal of Upper Devonian and later strata. This was completed and printed in 1975, and Wills began the equally complex task of writing an accompanying memoir to explain the way he had interpreted and applied the varied evidence of the deep structure. This process however led him to undertake still another map, that of the pre-Devonian rocks of a belt extending from East Anglia to South Wales, which has been completed this year. These two maps form the coloured plates accompanying this memoir.

The memoir is also illustrated by a map of the Basal Elements, and by three Phanerozoic Time Scale sections, which illustrate the point which Wills has made before — that in the dominantly shelf environment of Britain the stratigraphical record is largely incomplete, with the lacunae at least comparable in time terms to the periods represented by sediments.

This publication, then, represents the further remarkable achievement of a man of 93 (— “and a half”, as he emphasises — he feels that months count now), working in a country study without technical support, his activity sharply limited by eye trouble and by a heart condition. It would have been a notable production for a fit man half his age. Both economic and academic geologists are already deeply indebted to Wills for his map of the pre-Permian surface; these further compilations add more organised data and more food for thought about the past history and deep structure of Britain.

P. E. KENT, F.R.S.  
Fellow of the Geological Society  
Past Chairman, Petroleum Exploration Society

September 17, 1977  
Natural Environment Research Council.

## FOREWORD

During the preparation of the map in Memoir No. 7 I made sections across the map with the object of seeing whether the limits of the stratigraphical units shown in the sections agreed with the boundaries shown or implied by the reconstructions given in my Palaeogeographical Atlas, 1948. Nothing, however, came from this except the invention of the P.T.-S. Section, now known as a hiatograph, two of which were incorporated in Memoir No. 7 as Figs. 1 and 2. The present Fig. 2 shows the top of the 'Floor' and the bottom of the 'Cover' by ornamentation which shows how the stratigraphical age of the 'basal elements' varies from place to place; and how the 'Floor' on which a particular Basal Element rests may also vary. In the text of Mem. No. 7 no significance was attached to these features. Thus I failed to recognise the significance of 'Basal Elements' *as a pile of tattered carpets*, each carpet giving a stratigraphical date to the particular part or parts of the Floor on which it lies.

The sections are often very conjectural below the Carboniferous, but Fig. 2 shows clearly the well-known unconformity between the Upper and Lower Old Red Sandstone-Devonian in South Wales, which in my ponderings, I became convinced recorded the surface of the 'Old Red Sandstone Continent'. The same unconformity had long ago been discovered by James Hutton in Scotland. It is strikingly displayed by the break between Lower Palaeozoic rocks and the Carboniferous Limestone of the Pennines and North Wales. Here I thought was the surface of the very first continental land — surely a suitable subject for a second palaeogeological map of England and Wales. I found however that there were far fewer boreholes than were available for the map in Memoir No. 7. There was also a dearth of papers (Bott's 1967 paper on the structure of the North of England is a brilliant exception) and a want of agreement on, for example, radiometric ages.

As the map stands, it looks simple enough, but one should expect this since all the Upper Palaeozoic, Mesozoic and Tertiary complications of sedimentation, tectonics, magmatic intrusions and erosion are assumed to have been omitted. The Memoir however has to take account of these latter factors, which necessitate the inclusion of two supplementary maps and a complicated diagram (Fig. 1) illustrating the various manifestations of cyclicity throughout Phanerozoic Time, and five Hiatographs which demonstrate how much of Phanerozoic Time is *unrecorded* by sediment from place to place.

However the map that I produced was welcomed by the few geologists and geophysicists who saw it as an attempt to depict the geology of England and Wales at the end of the Caledonian orogeny. It was redrawn beautifully by Mr A. A. Miles, Senior draughtsman of British Petroleum Ltd., at their expense, and colour printed at the expense of the Petroleum Exploration Society of Great Britain. Even before this, I discovered that the surface that I thought was Middle Devonian in age, was in reality the Palaeozoic Platform fashioned by erosion at seven different geological dates ranging from Upper Devonian to Gault! This involved the drawing of two more figures (Figs. 1 and 2). Later another map, Plate 2, became necessary to demonstrate the putative interpretation of the geology concealed by the outcrops of Lower and, in places, Middle O.R.S.-Devonian shown on Plate 1 in South Wales and S.E. England. These figures have been redrawn from my originals by Mr Colin Knipe.

At long last the text of Memoir No. 8 has been completed about a map whose very title is wrong! It should read — 'A palaeogeological map of the Palaeozoic Platform below the Cover of Upper Devonian and younger Formations'.

Partly as an outcome of this work I am now the proud recipient of the Honorary Fellowship of the Geological Society of London and of the Honorary Membership of the Petroleum Exploration Society of Great Britain, and I take the opportunity again to express my gratitude to the two Societies and to many individual members who have helped me, in particular Sir Peter Kent and Dr L. V. Illing, and others named in the acknowledgements.

Work on the maps and memoir has taken an old man (I went to Cambridge in 1903) into the complexities of a good many modern 'ologies' such as sedimentology, ecology, radiometric dating and plate tectonics. The reader will notice that the memoir makes no reference to many modern theories although some must have inevitably invalidated many of the conceptions on which I was brought up.

*Ave atque Vale*

L. J. WILLS

1977

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**N.B.** The crimson colour for the Silurian has been inadvertently omitted from the map between the putative interpretation and the coastline in Yorkshire.  
    Bobbing should be 9 km S.W. of Sheerness B.H.  
    Fobbing, add Cambrian? below M.Devonian.
- Plate 2. An inferred palaeogeological map of Wales and of England south of National grid Latitude 40 North, assuming the removal of all O.R.S.-Devonian and later formations, to reveal the outcrops at the close of Silurian times. The map records the sites of some 111 boreholes that reached the L. Palaeozoic or Precambrian formations, plus the sites of certain magnetic anomalies and other features. For a list of these, see Appendix. Scale: 1/625,000 or about ten miles to one inch. Completed August 1977.

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