With the range of properties available from the well, true depth modelling that allows the realistic environmental conditions of the stratigraphic facies to be propagated laterally, between the locations of the seismic grid, into the model cells is now possible. However desirable such large models are for precision, this degree of physical detail cannot be utilised in practice, and the papers presented at the conference, and selected for publication by the Geological Society of London, describe the range of approaches used in developing the smaller simulation models that have guided the successful future development of hydrocarbon reservoirs.

The availability of this publication could well allow future model makers to confidently assert that their practices and simulation results are adequate for reliable decision making.

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Turramurra

Madingley Rise and early geophysics at Cambridge

CA Williams
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The author, Carol Williams, is in an ideal position to write this book, and the Earth Science community worldwide benefits from her having done so. She has been associated with Madingley Rise at Cambridge for some 40 years and she knows well the leading figures over this period. She contributes a nice watercolour painting of the Madingley Rise house itself.

A history needs a point to start, and a point to finish. Often the latter is more difficult to set, not least when progress continues whilst a book is being written. This book takes as its concluding point the incorporation of the Department of Geophysics and Geodesy in 1980 into a larger Department of Earth Sciences. This end point makes for a neat history, from many points of view.

The eight chapters of the book are contained between a preface by DP McKenzie, and then a postscript by the same author. There is a Bibliography, containing a selection of the most significant publications of geophysics over a century, connected to the contents of the book.

The first chapter gives the setting of geophysics at Cambridge in its most general terms. It starts seven centuries ago and explains the development of the colleges, and then of the university itself. It was only in the 19th century that the University of Cambridge took its present form. The legacy of mathematics and science from that time was very rich, and led into the 20th-century setting for the development of geodesy. This first chapter also gives an erudite account of the history of physics. Significantly, marine science enters with the Challenger expedition of 1872–1876.

The second chapter concentrates on HF Newall (1857–1944), a pivotal figure. A professor of astronomy, in 1891 he built Madingley Rise as his family house, near the low hills where the Cambridge observatory was situated. He tirelessly advocated the establishment of a department of geodesy. He bequeathed his house to Trinity College, whence it later became the distinctive home of the Department of Geodesy and Geophysics.

In Chapter 3 we meet G Lenox-Conyngham (1866–1956), whom Newall met in India on an expedition to view an eclipse. Lenox-Conyngham was the surveyor coming to a second career, having been knighted in 1919 for his service to the Trigonometrical Survey of India. It is significant that he was appointed on the basis of his practical experience. The view at that time was that Cambridge was well-endowed with mathematicians, and needed a field man for the comprehensive training of geodesists.

In Chapter 4 a School of Geodesy is established at Cambridge, in 1921, largely due to Newall's efforts. This development partly arises from WWI, and partly it reflects the need to train surveyors for service throughout the British Colonial Empire. The course consists of surveying instruction by Lenox-Conyngham, and lectures by the likes of H Lamb on seismology, H Jeffreys on physics of the Earth, and GI Taylor on tidal theory. In 1924 a pendulum house is established at the Madingley Rise site, the first move of geophysics to that site.

After 10 years, in Chapter 5 the School of Geodesy expands in1931 to become a Department of Geodesy and Geophysics. EC Bullard is recruited as a research student in experimental physics in the Cavendish Laboratory under Rutherford, and sets to work with the pendulum apparatus. His immediate duties are to make gravity measurements in support of Lenox-Conyngham's research interest, and his traverse across the African rift valley forms a second part of his PhD thesis. As well as making important improvements to gravity measurements (for example in the timing of the pendulums) he expands into other topics of geophysics. These expansions foreshadow much of what is to come.

Chapter 6 picks up the story post-WWII. Equipment had now entered a new phase, as had particularly marine geophysics, with ships and personnel experienced from the war. Also, significantly, the Department of Geodesy and Geophysics moves to the old Newall family home at Madingley Rise. Bullard however leaves for different pastures in 1948 (to return to Madingley Rise, knighted, in 1955) and other names take the lead. SK Runcorn, for example, creates a palaeomagnetism group which demonstrates that Europe and America have different polar-wander curves, demanding continental drift.

Chapter 7, covering the decade from 1956, describes what might be termed the golden age at the Madingley Rise house. Bullard assumes headship of the department in 1960. Milestones are the 1963 Vine-Matthews paper, the 1965 Bullard-Everett-Smith fit of the continents around the Atlantic, and much more. The social cohesion of successful research groups is of known importance, and the significance to the success of this group of its own home in an attractive country house, with an outstanding leader, is clear.

Chapter 8, for the period 1966–1980, is perhaps the denouement of this golden age. The flowerings of the subject opened up by the demonstrations of plate tectonics are numerous. There is perhaps a no more succinct summary for this period than the UNESCO map, given on p 140–141, of the ages of the ocean floors and continents, covering the whole Earth. JA Jacobs becomes head of department, following Bullard's retirement in 1974. Then, in 1980 with Jacobs' own retirement imminent, the department combines with those of mineralogy and petrology, and geology, to form Earth Sciences.

Before the concluding postscript, there are biographies of Hill, Browne, Stoneley, Bullard, Jeffreys, Runcorn and Matthews. There is a list of 134 students, and their submitted theses.

The book describes much of the development of geophysics during the 20th century. Especially, it gives an inside account of a group of distinguished scientists who took a remarkable lead in the plate-tectonics revolution. It is also, to an international reader, a wonderful commentary on English social history over a century. The book is hard-cover and produced at a high standard. There are many photos and illustrations, printed at high quality. Besides being educational reading, its beautiful presentation means that, left on a coffee table, it will also be browsed with great interest.

And finally, with his large field expeditions carrying heavy theodolites, what would Lenox-Conyngham have made of the extraordinary developments in modern geodesy? Lasers, satellites and computers currently produce remarkable results for Earth's gravity field, and measure geodynamic movement. Surely Lenox-Conyngham would, with satisfaction, see the present as a golden age of geodesy: one perhaps yet to reach its peak.

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