

## **Geological Society Memoir No. 20 - United Kingdom Oil & Gas Fields, Commemorative Millennium Volume**

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having a useful table of contents, the book closes with nine pages of indexed terms.

To comment on the book itself, I like its small size (9 x 6 inches). The fact that it is wire bound is good because it can be folded for reading. What I do not like is the use of two colours for text - when it is to be reprinted the author should look into another means of highlighting. The regular text is completely readable. However, the text used as a highlight to stress important points is red and thus hard to read, especially when it is in italics. This then creates the opposite effect of what the highlighting is meant to do - I know it is important, but I cannot read it easily. Even *Geolog* blue might have been a better choice than red.

The user of this book should remember that although Grant's advice is good, some parts are in his own style, and if you are submitting a manuscript to a journal their guidelines must be followed. Grant ends his book with valuable Internet resources and several pages of "Sources of Rules & Inspiration". Some of these sources are especially useful - for example, the GSC's *Guide to Authors* - GSC Open File 3600 (1998, 194 pp., \$15.00). It was written, like its previous versions, to act a guide to writers of GSC publications. But it too contains a wealth of information on the editorial side of writing. It can be seen in web form in English at: ([http://www.nrcan.gc.ca/ess/pubs/guide/index\\_e.html](http://www.nrcan.gc.ca/ess/pubs/guide/index_e.html)), and in French at: ([http://www.nrcan.gc.ca/ess/pubs/guide/index\\_f.html](http://www.nrcan.gc.ca/ess/pubs/guide/index_f.html)).

Another useful, and inexpensive book is *The Canadian Style: A Guide to Writing and Editing*, which was originally produced in 1985 by the Department of the Secretary of State of Canada. The 1997 version (ISBN 1-55002-276-8) is a revised and expanded edition. This has a counterpart - *Guide du rédacteur de l'administration fédérale*. The English version can be found on Amazon.com for as little as \$10.87 US, and can be ordered from the government's publications website (<http://publications.gc.ca/>) for \$29.37 including taxes and shipping.

*Geoscience Reporting Guidelines* is the best of these three (despite its red highlights), but for relatively little cost, students and professionals, and editors could have all three.

## **Geological Society Memoir No. 20 - United Kingdom Oil & Gas Fields, Commemorative Millennium Volume**

**Edited by J. G. Gluyas and H. M. Hitchens**

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This long awaited book has finally arrived. As soon as the Geological Society of London announced the forthcoming publication of this book, I immediately ordered it for our library. More than a year later I was not disappointed. This volume is the most comprehensive, complete and second heaviest (at 3.9 kg) reference book on the UK's oil and gas fields, which has been published to-date. For the record, the heaviest reference book is the "Millennium Atlas: Petroleum Geology of the Central and Northern North Sea", which was published by the GSL in 2002 and weighs in at 10.3 kg.

The Memoir 20 editors, J.G. Gluyas and H.M. Hitchens, have put together an excellent publication of extremely high-quality and with lavish illustrations. This new volume updates my very used and patched up "United Kingdom Oil and Gas Fields, 25 Years Commemorative Volume", GSL Memoir 14 edited by I.L. Abbotts (1991). This book was a best-seller but was out of date within five years of first printing because it only contains details on half the fields that were in production at that time. The Gulyas and Hitchens volume is subject to the same problem, since a number of major new fields are prominent by their absence. This problem is to be expected given the time and effort required to bring hundreds of authors and reviewers together to publish a volume such as this.

It should be mentioned that the book "Geology of the Norwegian Oil and Gas Fields" edited by A.M. Spencer

et al. (1987) was used as the template for both the Abbotts' and Gluyas and Hitchens' volumes. The Norwegians should update their oil and gas field data in a similar fashion so that the first 35 years of knowledge and innovations in this incredible North Sea geological province are fully documented.

There have been a number of changes in the UK oil and gas scene since Abbotts' 1991 publication, including significant technological advances. Many of the significant geological and geophysical advances were presented at the Petroleum Geology of Northwest Europe Conference in 1992 and 1997; they are nicely documented in the resulting publications. Advances were made in the integration of 3D seismic with sequence stratigraphic analysis and in modelling from a reservoir and basin perspective. Improvements in both, extended reach and horizontal drilling, use of minimum facility platforms, introduction of sub-sea completions using FPSO technology, and stimulation of low permeability reservoirs have made production much more efficient. These technological advances reduced geological uncertainty, improved economics and allowed the development of smaller fields. The Abbotts' volume describes 64 fields, from the UK's first 25 years, which have an average reserve size of greater than 300 mmboc (million barrels of oil equivalent). The Gluyas and Hitchens' volume, from the following 12-year period, describes about 130 oil and gas fields, which have an average reserve size of 100 mmboc. This smaller reserve size reflects the mature stage of exploration in the North Sea, which is reflected by a plateau in production and a decline in the number of wells drilled and exploration expenditures.

The introduction contains two useful summaries of the UK North Sea story, the 35 year history of exploration and development, and the geological history. R.F.P. Hardman (Amerada Hess International Ltd, UK) covers the former and describes the exploration lessons that can be applied elsewhere in the world, partly from an anecdotal point of view. He goes on to describe the first hydrocarbon discovery at the West Sole gas field in 1964 in the Permian Rotliegendes in the southern North Sea. In 1969, the industry drilled to the north in the Central Graben, looking for

a Rotliegendes gas target and discovered oil serendipitously at Arbroath, in the Paleocene. This was such a surprise that the galley was raided for pickle jars to store samples of their new found oil. This oil, of course, originated from the Late Jurassic Kimmeridge Clay Formation. Hardman then goes on to tell the story on how the Viking Graben was finally drilled in 1971 and 1972 with the discovery of Brent and Beryl, respectively, creating the North Sea black gold rush. He also recounts some interesting exploration stories about fields not being discovered by their first well, such as Scott. In 1975, this field was originally drilled on its crest, where the Upper Jurassic Sands are missing. However, it was 1984 before a 440 mmboe recoverable field was discovered surrounding this 1975 dry well.

The second part of the introduction, by John R. Underhill (University of Edinburgh), describes the tectonic and stratigraphic framework of the UK oil and gas fields. This chapter sets the stage nicely for the field summaries that follow in the book. He first describes the plate tectonic framework from the Late Cambrian to the Early Cenozoic, which set this area up for deposition of the source rocks, the Late Jurassic Kimmeridge Clay Formation. Underhill then goes on to describe, using clear diagrams and maps, the tectonic and stratigraphic controls on the development of the oil and gas plays through geological time, with reference to relevant fields described in the volume.

The next 900 pages are divided into eight sections describing specific geographical and geological areas, both offshore and onshore: East Irish Sea Fields, Atlantic Margin Fields, Viking Graben Fields, Moray Firth Fields, Central Graben Fields, southern North Sea Gas Fields, East Midlands Basin Fields, Weald and Wessex Basin Fields. A reference map is included at the beginning of each section. Each section is then further divided into chapters that describe a field or cluster of fields. Each chapter ranges from 7 to 30 pages with most of them being 10 to 15 pages in length. Each is set up, for the most part, with the following template which is very logical, consistent and concise: LOCATION HISTORY – pre-discovery to post discovery, STRUCTURE – tectonic history, regional and local,

STRATIGRAPHY - in general, TRAP-type, seals and faults, RESERVOIR - depositional setting, pore types and diagenesis, porosity and permeability, reservoir engineering, petrophysics and pressure relationships, SOURCE – source beds, maturation, migration and charge, RESERVES AND PRODUCTION - petroleum in place and reserves, cumulative production, recovery factors

through time and production rate. Each of these field chapters is clearly illustrated using a location map, structure maps, seismic lines, cross sections and reservoir summary logs, many in colour. There is also a table of reservoir data at the end of each field description. It is extremely easy to find quick facts on a field. Only 22 of the fields covered by the Abbotts' volume are described in



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this volume so the two are largely complementary. In fact, the former one is still available at £ 30.

Appendix 1 summarizes the geology, the reservoir properties and fluid properties of the 130 fields described in the volume. The data include trap style, depth to crest, lowest closing contour, OWC or GWC, hydrocarbon column height, pay formation, age, thicknesses, porosity, permeability, petroleum saturation, oil and gas densities, viscosities and bubble points, gas/oil ratio, formation volume factor, water salinity and resistivity, reservoir pressure and temperature, field area, rock volume, oil/gas in place, recovery factor, start up date, production rates and number of wells. This is an incredible database that will satisfy most geological and engineering statisticians.

Appendix 2 lists the 300+ oil and gas fields in the UK with key references for each one. For example, the "missing" Schiehallion Field is referenced. The editors mention in the overview that the intention was to have all the fields in this reference. This was not possible for a number of reasons including, unfortunately, a few companies refusing to participate. The fields that are not covered in the book are at least shown on the location map at the beginning of each section.

The "United Kingdom Oil and Gas Fields" volume is a must have for anyone, engineers included, working the rift margins and frontiers of the world. The field examples can provide information and analogies for exploration as well as for development and reservoir engineering. This book, however, may have limited use for the average geologist working in Western Canada. Some may complain that the price is a bit steep but a discounted price of £105 is available to AAPG/SEPM/GSA/RSA members and of £100 for GSL/IGI members. These books should come out automatically with an included CD-ROM version.

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