

Harold Garnar Reading 1924-2019

Harold Reading

Pioneering sedimentologist who inspired generations of students

Early years

Harold was born on the 28th April 1924 in Beckenham, Kent (second of four children). His parents were Eric Reading and Kathleen Reading. Harold's early years were determined by the work of his father, Eric, who was a shipping solicitor working in insurance/loss adjustment. Following Harold's birth in Kent, his father's job took him to Liverpool, where he lived initially in Birkenhead and, subsequently, in the Sefton Park area of Liverpool. From the age of eight Harold went to The Leas School in Hoylake on the Wirral, where he was a boarding student. Harold enjoyed his days as a prep-school student and flourished in the boarding school environment. Later, Harold's father's work required another move back to southern England and the family home was established in Woking (Surrey). At the same time, and now aged thirteen, Harold began his secondary school education as a boarder at the Aldenham School in Hertfordshire - an old public school to the north-west of London. He was a highly motivated student and continued to enjoy all aspects of his schooling.

The war years

Like all his contemporaries, the Second World War interrupted Harold's formal education. Immediately after completing his schooling in 1942, he joined The Guides Cavalry (10th Queen Victoria's Own Frontier Force), Indian Army. This was not Harold's first choice of military service; along with all his friends it was the RAF that was his first attraction. Harold failed the entrance test for the RAF on the basis of his eyesight, but any disappointment was offset by the excitement of the opportunities for travel offered by the Indian Army.

University education

Like many other ex-service personnel, Harold was keen to move on from the tremendous destruction and hardship that had dominated the war years. Harold wanted to study Forestry, but his choice was severely limited, Oxford being the only university to offer such a degree program. His application to Oxford was successful and he started his forestry degree in 1947, somewhat to the dismay of the Reading family who had all gone to Cambridge, including his father. Harold's first 'Honour Moderations', year required three subjects to be studied, of which botany and zoology were obvious first choices. He selected geology as a subsidiary subject, albeit with little knowledge of what this might entail. He was, however, quickly inspired by the teaching of J.V. Harrison, who had previously worked for the Anglo-Iranian Oil Company (the forerunner of BP) in Persia (now Iran). Harold, and around 17 other forestry students, went on an Easter field trip with Harrison to the Isle of Arran, as a consequence of which, two students changed degree subjects to geology: Harold and his long-term friend, and future best man, Myles Bowen. A combination of inspirational teaching by Harrison and others, the potential career opportunities in the growing petroleum industry, and the lack of jobs in forestry, were the deciding factors for these two budding geologists who would become hugely influential, although for different reasons.

Harold and Bowen were both pursued during their undergraduate days by a Shell geologist called Gunther who viewed them as potential recruits to the company. Upon graduation both were offered Shell-funded PhD scholarships to study at Durham and Edinburgh, respectively. This was to bring their education in line with their Dutch counterparts and ensured that both of their careers would have

a strong Shell influence (Bowen became Exploration Director for Shell UK in the heyday of North Sea exploration). Harold's close links with Shell were no less significant, particularly with regard to sedimentary facies analysis (discussed later). Harold worked under the hands-off supervision of Sir Kingsley Dunham on a mapping project in the Pennines, which was a stratigraphic and structural synthesis of the Upper Carboniferous Yoredale Group in the Stainmore Trough. He derived enormous satisfaction from producing a detailed geological map that correlated strata on both sides of the basin. This was based on many months of diligent field mapping and section measurement in stream-beds in the bleak and remote moorlands of the North Pennines!

Harold's PhD studies were conducted mainly from a caravan, parked just outside Durham. But this was no real hardship because he had recently married Bobbie, a girl from Oxford, who had worked for the WRENS (Women of the Royal Naval Services) during the war, including service at the 'ULTRA' code-breaking establishment at Bletchley Park. Harold and Bobbie were married in 1951, just before he started his PhD.

The Shell years

Gunther was successful in recruiting both Harold and Myles Bowen into Shell in 1954, but they traveled in opposite directions, with Harold being posted immediately to Venezuela (and Bowen to Borneo). Harold, accompanied by Bobbie and their first son, John, worked mainly on field mapping around the Lake Maracaibo area. This involved spending four weeks in the field, away from the 'Shell Colony', followed by shorter, de-briefing periods of about a week, back in the office. At that time, geophysical methods were rudimentary and field mapping in this tropical setting involved compiling detailed stream sections, which was similar to his PhD work in the Pennines, albeit under much warmer conditions. This period provided an invaluable geological education, for various reasons. The most profound encounter resulted from a Shell-sponsored visit to Venezuela by Professor Philip Kuenen from the University of Groningen. He taught Harold two key lessons: (1) the importance of 'surficial deposits', previously classified as 'drift', and (2) the process significance of sedimentary rocks, which stemmed from his seminal experimental work on turbidity currents and turbidites. This visit sowed seeds that would ultimately flourish in Oxford. A second highlight was comparing his own meticulous mapping style (dip, strike, hand-lens, samples, etc.) with the larger-scale approach of Swiss geologists, most notably Erdl Frankl, who emphasized the importance of the 'Swiss rock hammer' (binoculars) and the necessity to think continuously about what was being measured: i.e. the need to combine meticulous attention to detail with creative thinking.

Unfortunately, these geological insights suddenly became inconsequential when the Reading's second son, Peter, contracted polio when only 5 months old. Bobbie and the children returned immediately to Oxford, living with her mother, in relatively close proximity to what was then a rare polio hospital. Meanwhile, Harold completed the remaining 6 months of his Shell contract before resigning and returning to Oxford. Fortunately for Harold, it turned out that, quite separately and unbeknown to him, the Geology Department in Oxford was searching for their former student with a proposal!

Early days in Oxford

In 1957, Harold returned from Venezuela to his family in Oxford, where he initially contemplated a new career in farming, following in the footsteps of his younger brother. However, Harrison, Lawrence Wager (Head of Department) and the indomitable Nina Phipps (Departmental Administrator) eventually tracked him down with an offer that he could hardly refuse. The good news was that Harold was offered

a lectureship, but the bad news was that it was specifically for somebody to teach vertebrate palaeontology! This stemmed from the Oxford Museum's unique dinosaur collection. Harold reacted to this proposal along the lines of "anything but vertebrate paleontology!" Fortunately, he was successful in persuading the Department to instead, let him pursue his growing interests in sedimentology, which had been ignited by Kuennen's visit to Venezuela.

So in 1957 Harold started his Oxford academic career as a Lecturer in Geology. He began by delivering a new course in stratigraphy and palaeontology; 'sedimentology' was still in its infancy and did not feature in undergraduate courses at that time. He delivered lectures to small undergraduate classes (total of c. 27 students over the 3-year degree course) and assisted J.V. Harrison, now a close colleague, with the Arran field course.

Harold's initial contribution to sedimentology was developed around two geological successions: (1) the Upper Carboniferous of the British Isles (stimulated by his PhD on the Yoredales), and (2) the Late Precambrian-Cambrian of Finnmark, North Norway (initially motivated by an Oxford University Expedition to the Digermul Peninsula in his undergraduate days). With regard to his Upper Carboniferous work, perhaps most significant was his early association with Maurits de Raaf, then Head of Geological Research in Shell's Research Laboratory in Rijswijk, The Netherlands (KSEPL), plus two of Shell's leading lights in sedimentology: Cornelis Kruit and Eppo Oomkens, who gave Harold his initial education in the discipline. The development of new ideas was at this time was closely tied to the work of Harold's second doctoral student, Roger Walker, who was working on the Upper Carboniferous 'Shale Grit' succession in the Peak District of Derbyshire. De Raaf, Reading and Walker were all striving to develop a better understanding of the relationship between deltas and deeper-water turbidites. Their collaboration on the Upper Carboniferous in the Culm Basin of SW England resulted in one of the most influential papers in the history of sedimentary facies analysis [1]. This was closely followed by one of the first papers on Late Precambrian glacial deposits [2], linking Harold's undergraduate days to his now rapidly expanding research interests. However, his decision to return to Norway was also pragmatic: at a time of limited funds for geological research in the UK, the Norwegian Geological Survey were paying UK academics and their students to map Norway!

On the personal front, Harold's 3-year stint with Shell in Venezuela had left him 'very wealthy' and he and Bobbie purchased their one and only house, in Wolvercote, North Oxford. The family home not only saw the birth of the younger Reading children (Caroline and Simon), but became a place visited by many of the world's leading sedimentologists as the maturity of the subject rapidly evolved.

Sedimentology, Reading and Oxford

Throughout his career (1957-91) in the Department of Geology and Mineralogy (now Earth Sciences) at Oxford, Harold single-mindedly developed the field of sedimentology through a combination of personal research, scholarly synthesis and, especially, through the supervision and mentoring of 35 successful DPhil graduate students from 6 continents and 10 countries (including Brazil, Canada, China, Iraq, Lebanon, Malaysia, New Zealand, Nigeria, UK and USA). Harold and his DPhil students worked closely on a wide range of sedimentological topics and in a spirit of complete openness and collaboration. Harold's supervisory style tended to be 'hands off', but he could always be relied upon to ask penetrating (and potentially terrifying) questions during the informal lunchtime seminars that provided a venue for intense discussion amongst the 'soft-rock' group of students.

His single greatest legacy will forever be ‘the book’: *Sedimentary Environments and Facies*, which was first published in 1978. This book was conceived in late 1974 and was intended to provide a single comprehensive synthesis of modern and ancient sedimentary environments, mainly for research workers and professional geologists. To achieve this ambitious aim, Harold assembled a group of authors, mostly former PhD students, who knew each other well, shared the ethos of the book and could discuss topics in an open and non-confrontational way. However, the editorial task fell squarely on Harold’s shoulders, - and it was immense: Most chapters had to be reduced to half their original length, balancing content, readability and cost. Harold read every single word of each draft and stamped his knowledge and authority on each chapter. He insisted that every chapter had to be referred to by the author’s name (only Chapter 14, by Mitchell and Reading, was co-authored). As ever, he acknowledged the contributions of others in developing his thinking and motivation, but distinguished Professor Maurits de Raaf (by then at the University of Utrecht in The Netherlands) for special mention because “He has taught us to combine careful facies analysis and an examination of every detail in a rock with unceasing search for sedimentary models” (Preface to the First Edition).

The successful formula used in the first edition was repeated for the second (1986) and third (1996) editions, with the latter version re-titled *Sedimentary Environments: Processes, Facies and Stratigraphy*. This change was in order to acknowledge the rapid rise in the significance of sequence stratigraphy and its inextricable linkage with sedimentary facies analysis, which dominated the first two editions. Each edition started with the proverbial ‘blank sheet of paper’, with several changes to the chapter authors, but still guided by a common ethos and aided by the lessons learnt from the monumental first edition. The three editions of the ‘Sedimentary Environments’ textbook provide the ultimate celebration and legacy of Harold’s lifetime contribution to sedimentology.

Other notable contributions include his early recognition of the importance of concepts of Plate Tectonics, particularly the critical role of tectonics and sedimentation in a wide variety of global settings, which he developed with Andrew Mitchell. Harold will also be remembered for emphasizing the importance of sediment calibre in controlling facies types and sediment distribution in a wide range of clastic depositional systems. This latter work was undertaken in parallel with the massive upsurge in deep-water exploration and the revision of submarine fan models in the 1990s, which was undertaken in collaboration with Marcus Richards at BP and has provided a cornerstone for interpreting deep-water clastic systems.

In the 1970s-80s, he was persuaded to join John Collinson and Trevor Elliott in delivering field- and classroom-based courses in clastic sedimentology, that made full use of their vast collective experience, well-honed teaching skills, and the spectacular Carboniferous outcrops in Western Ireland. He found teaching professional ‘students’ especially stimulating, not least in terms of what *he* learnt in the process. This drove his active membership of the JAPEC (Joint Association for Petroleum Exploration Courses) committee, which delivered a raft of North Sea-focused training courses for petroleum professionals. His links with the petroleum industry endured throughout his career and he acknowledged that most facies sedimentology had been driven by the need to characterize petroleum reservoirs. He worked through the emergence and development of the North Sea oil fields, and celebrated the change from initial suspicion to greater openness between industry and academic institutes: “it has been a joy over the past 30 years to see how industrial/academic collaboration now seems quite natural.” (Ref. AAPG’s Grover Medal response in 1997).

Professional appreciation

The geological community has acknowledged Harold's global influence, both in research and teaching, with a string of prestigious awards: (1) Murchison Fund (1972), Prestwich Medal (1981) and Coke Medal (2001) from the Geological Society of London; (2) Honorary Membership of the International Association of Sedimentologists (IAS) (1991); (3) Twenhofel Medal (1994) from the Society for Sedimentary Geology (SEPM); (4) AAPG's Grover E. Murray Memorial Distinguished Educator Award (1997); and (5) The Geological Society's Petroleum Group Silver Medal (2001).

Special Publication Number 22 of the IAS was indeed special, as captured in the title: *Sedimentary Facies Analysis – A tribute to the Research and Teaching of Harold G. Reading*. As Guy Plint (Editor) explained in the Introduction, this volume had a dual celebratory purpose. Firstly, the papers were mainly written by highly appreciative former students and provided a snapshot of the breadth and depth of Harold's research interests and philosophy. These include some old favourites (e.g. Bude Formation in the Culm Basin, Millstone Grit cyclicity, and the Lower Cretaceous Woburn Sands), plus new and expanding topics (e.g. seismic and sequence stratigraphy, reservoir sedimentology and facies models in volcanic terrains). Secondly, it enabled Harold's long-term involvement in the development of the IAS to be acknowledged (see the Preface by Peter Homewood). Harold was pivotal in guiding the IAS towards the truly international organization that we see today, working tirelessly over a 30-year period as Publications Secretary, General Secretary and President.

Most recently, the British Sedimentology Research Group (BSRG) created the Harold Reading Medal in 2015, which is awarded annually to a young researcher who has shown excellence in sedimentology and/or stratigraphy based on a publication stemming from their PhD project. This award strikes at the essence of what drove Harold throughout his long and distinguished academic career: nobody placed students higher in terms of their importance to a university, and to the fledgling BSRG, which Harold helped nurture.

The student legacy

As much as 'the book', Harold's other great legacy has been through the work of his students, and *their* students, and so it continues! The early days were perhaps the most profound and he found two early disciples in Roger Walker and John Collinson, closely followed by Trevor Elliott, Kevin Pickering and Guy Plint, among others. Their academic careers, developed on either side of the Atlantic, ensured that there was an expanding international stable of new trainees. A significant proportion joined the petroleum industry and applied their sedimentological education to evaluating basins and petroleum reservoirs around the world; these including Nigel Banks, Marc Edwards, Ray Young, Bruce Levell, David James, plus many more. A third group have followed Harold's early career and worked in both industry and academia, including Joe Cartwright, Alan Heward, Howard Johnson and Grant Wach. Others have served governmental organisations, such as Bob Burne, Malcolm Laird, and Carol Pudsey. All applied the 'Reading ethos' to their professional careers.

No less significant was Harold's influence on literally hundreds of undergraduate students, including those who he encouraged to join Oxford University Expeditions. One large group followed his own experience in going to Finnmark (North Norway) in the 1970s-80s, where they worked as field assistants to his PhD students and postdoctoral researchers. Harold shared the view that the close association of all ages of students benefitted everyone's education. Some of the same undergraduate students pursued sedimentology PhD degrees elsewhere and followed academic careers, such as Brian Rust, Martin Gibling and Julia Miller (nee Hunter). Others followed diverse careers, without forgetting the profound influence that Harold exerted on their education. Simon Winchester (author and former

undergraduate) is one such person who memorably stated that Harold “displays all the attributes of a human turbidity current that seems to go on forever.”

Harold’s legendary support of all students will continue long into the future: be it through those who he taught directly, or supervised, or the many more that he influenced indirectly through his work, especially through ‘the book’. This will remain Harold’s most cherished and long-lasting legacy. What a man, what a life and what an enviable legacy!

Harold passed away peacefully at his family home in Upper Wolvercote, Oxford, after a long illness, on Sunday 13th October 2019. His wife, Bobbie, pre-deceased Harold, who is survived by his children John, Peter, Caroline and Simon, and by 11 grandchildren.

Compiled by Howard Johnson with additional comments by Guy Plint.

[1] De Raaff, J.F.M., Reading, H.G. and Walker, R.G. (1965) Cyclic sedimentation in the Lower Westphalian of north Devon, England. *Sedimentology*, 4, 1-52.

[2] Reading, H.G. and Walker, R.G. (1966) Sedimentation of Eocambrian tillite and associated sediments in Finnmark, northern Norway. *Paleogeogr., Palaeoclimatol., Palaeoecol.*, 2, 177-218

Images.

Image 1.



John Collinson, Harold Reading and David Beynon preparing to launch a boat, Finnmark, North Norway, 1964.

Photo courtesy of Roger Walker.

Image 2.



Harold Reading looking for rocks in an Irish stream-bed, February 1978.
Photo courtesy of Carol Pudsey.