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Preface

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Introduction: special issue commemorating the 155th anniversary of *Geological Magazine*

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This special issue of *Geological Magazine* commemorates the 155th anniversary of the journal's publication. Henry Woodward (1832–1921), a British geologist and palaeontologist of the British Museum, launched the journal in 1864. His intellectual spirit and forward thinking may be seen as the main driver for the foundation of the journal. Originally the journal was known under the title *The Geological Magazine, or Monthly Journal of Geology: with which is incorporated 'The Geologist'*. Today, it is simply known as *Geological Magazine*. The journal proved highly successful through the rest of the nineteenth century and became well established in the twentieth century. Without a doubt, *Geological Magazine* is one of the oldest and best-known scientific journals in earth sciences in the twenty-first century.

The success of a scientific journal is largely dependent on the core editorial team, i.e. the editor-in-chief and executive editors, who define the overall strategy of the journal and, together with the editorial board, scrutinize the submitted manuscripts for originality, quality and rigour before sending them out for review. Thus, all of us who benefit in one way or another from the journal's existence, whether as authors, afforded a platform to publish our work, or as readers, provided with the information we are keen to receive, owe much to the services of the *Geological Magazine* editorial team that helped establish the journal in the international scientific community. Everyone who has been associated with the publication of the journal can also be proud of it.

Issue 1 (July 1864) of Volume 1 of *Geological Magazine* was edited by the British geologist and palaeontologist T. Rupert Jones (1819–1911), Professor of Geology in the Royal Military College, Sandhurst, and by Henry Woodward, the sole editor-in-chief from July 1865 until the end of 1918. The following correspondence by Woodward's nephew emphasizes Henry Woodward's pre-eminent role in the foundation and management of the journal: *'it may be of interest to state that although Professor Rupert Jones' name appears on the early numbers of the Magazine as "Editor", he was in no way responsible for its conduct. In a letter to me, dated 9th February, 1915, my uncle explained ... that he not only originated but edited the Magazine from the very first. Professor Rupert Jones' name was originally placed first because the publishers (Longman & Co.), acting on the opinion of their advisers, did not consider that at the time my uncle's name carried sufficient weight. The Professor, however, left the whole work to Dr. Woodward'* (Woodward, 1922).

From January 1919 till December 1920, Henry Woodward received support from Robert H. Rastall (1871–1950), a British geologist and University Lecturer in Mineralogy and Petrology at the University of Cambridge. Rastall strove to ensure consistency and improve the general standard of presentation of papers in *Geological Magazine* (Anonymous, 1950), and published a piece of advice entitled 'On the preparation of geological manuscripts' (Rastall, 1933). He was a principal upholder of *Geological Magazine*'s duty to publicize unorthodox views, a traditional ideal that he inherited from his predecessor and that inspired his successor (Anonymous, 1950). He was sole editor-in-chief from 1921 till 1933. From 1934 onward, he was assisted by Oliver M. B. Bulman (1902–1974), a British palaeontologist and Professor of Geology at the University of Cambridge. Rastall stepped down as an editor at the end of February 1950.

From April 1950 till the end of 1955, the editorial work was shared by Bulman and Stephen R. Nockolds (1909–1990), a British geochemist, petrologist and Reader in Geochemistry at the University of Cambridge. In early 1956, the editorial duo was joined by W. Brian Harland (1917–2003), a British geologist at the University of Cambridge and founder of the Cambridge Arctic Shelf Programme (CASP). This threesome lasted till the end of 1972 when Bulman stepped down from his role as editor-in-chief.

In early 1973, the British palaeontologist Christopher P. Hughes, of the Sedgwick Museum at the University of Cambridge, joined the editorial team. Nockolds stepped down at the end of 1974, and was succeeded in early 1975 by the British geologist Graham A. Chinner, formerly Curator of Mineralogy and Petrology at the Sedgwick Museum. In November 1981, Chinner was succeeded by the British volcanologist R. Stephen J. Sparks, Professor of Geology at the University of Bristol. During his time as editor, Sparks was a lecturer at the Department of Earth Sciences at the University of Cambridge. The new core editorial team comprising Harland, Hughes and Sparks carried on till January 1988.

In March 1988, the British geologist Nigel H. Woodcock, Emeritus Reader in Earth Sciences at the University of Cambridge, and in July 1988, another British geologist Ian N. McCave, Professor Emeritus of Geology at the University of Cambridge, joined *Geological Magazine*'s core editorial team. By the end of October 1989, Harland and Sparks had stepped down from their editorial roles; the new person joining was British geologist Michael J. Bickle, Professor of Geology at the University of Cambridge. The core editorial team of Hughes, Woodcock, McCave and Bickle lasted from November 1989 till November 1996. In January 1997, Hughes was succeeded by British geologist Timothy J. Palmer, formerly a Senior Lecturer at Aberystwyth University. The core editorial team of Bickle, McCave, Palmer and Woodcock lasted from January 1997 till September 2001.

In November 2001, Palmer was succeeded by British palaeontologist Graham E. Budd, Professor of Palaeobiology at the University of Uppsala, Sweden. Bickle and Woodcock stepped down as editors in early 2003. They were replaced in March of that year by British geologist Mark B. Allen, Professor of Geology at the University of Durham, who became the new editor-in-chief, and British volcanologist David M. Pyle, Professor of Earth Sciences at the University of Cambridge. Thus, from March 2003 till January 2008, the core editorial team comprised Allen, Budd, McCave and Pyle.

At the end of January 2008, McCave stepped down as executive editor. He was succeeded in March 2008 by Andrew G. Whitham (1960–2019), a British sedimentologist with focus on the Arctic and Antarctic, and Chief Geologist and Managing Director of CASP in Cambridge. In mid-2010, Pyle was succeeded by British geologist Philip T. Leat, of the British Antarctic Survey in Cambridge. In mid-2014, Whitham stepped down from his role as an executive editor. Thus, from July 2014 till September 2015, the core editorial team comprised Allen, Budd and Leat.

From September 2015 till the end of 2016, Jürgen Schieber, a German geologist and Professor of Geology at the University of Indiana, USA, briefly joined the core editorial team. At the end of 2015, Budd and Leat stepped down from their editorial positions which were filled in January 2016 by Chad D. Deering, an American igneous petrologist and geochemist and Professor of Geology at the Michigan Technological University, and by Paul Upchurch, a British palaeontologist and Professor of Palaeobiology at University College London.

After 14 years as editor-in-chief, in May 2017 Mark B. Allen handed over his position to Peter Clift, a British geologist and Professor of Geology at Louisiana State University, who has led and overseen the journal since then. Also in May 2017, Stephen M. Hubbard, an American sedimentologist and Associate Professor at the University of Calgary, and Oliver Lacombe, a French geologist and specialist in structural geology and tectonics and Professor at the Sorbonne University, joined *Geological Magazine* as executive editors. At the end of March 2019, Upchurch resigned his position as an editor, which was taken over in April by Dutch geologist Bas van de Schootbrugge, Assistant Professor at the University of Utrecht. At the end of May 2019, Deering resigned and his position was filled in June 2019 by Kathryn Goodenough, a British geologist working for the British Geological Survey in Edinburgh.

This brief historical account of the the journal's leadership since its foundation in 1864 highlights the dominance of British, and especially Cambridge, scientists in *Geological Magazine*'s core editorial team throughout the 20th century. As of recent times, it also includes colleagues from overseas.

The first issue (July 1864) of the journal begins with a four-page introductory section entitled 'The past and present aspects of geology'. Its first paragraph reads, *'The publication of the First Number of a new Journal of Geology seems a fit opportunity for noticing the present aspects of the Science, as compared with those it presented during the few principal epochs into which the short term of its existence may be divided; and also for contrasting the ideas that during each of those epochs guided the course of geological investigation, forming for the time, so to speak, the rudder of geological thought'* (Anonymous, 1864). The section ends with the following statement, which is still be regarded as valid today: *'Finally, by favouring no one school or theory more than another, criticizing fearlessly and uncompromisingly where it appears necessary, though laudatory where it is desirable, we hope to establish for the GEOLOGICAL MAGAZINE that independent character which will alone cause it to be regarded as an impartial tribunal, whose verdict will command respect by reason of its justice'* (Anonymous, 1864).

The first original article published in *Geological Magazine* was by John William Salter (1820–1869), an English geologist and palaeontologist who had worked for the Geological Survey, and is entitled 'On some points in ancient physical geography, illustrated by fossils from a pebble-bed at Budleigh Salterton, Devonshire'. Therein, Salter (1864) reports on Palaeozoic fossils, chiefly of trilobites, large bivalve shells and brachiopods from Budleigh Salterton in East Devon. Since the journal's foundation, a large number of original articles, editorial notes, book reviews, correspondences and obituaries, among others, have been published in *Geological Magazine*. The three most widely cited papers published in *Geological Magazine* before 1950 were by Spath (1926), Lapworth (1873), and Richthofen (1882). The three most widely cited since 1950 are by Bott (1959), Harley (1989) and Marshall (1992).

Originally, the journal was printed by the publishing company Longman & Co. in London. The journal has changed publishing company a few times, and since 1970 has been published by Cambridge University Press. Since January 1986 the journal has offered a student subscription rate and the opportunity to publish colour plates. A limited number of free colour plates each year were made available to authors; the editors decided which plates to accept on their scientific merit (Anonymous, 1985).

Today, many publishers face challenges in maintaining high standards while keeping publication costs at a reasonable level. The push toward Open Access publishing, making the research outputs freely available online, is another challenge. The request that authors pay for some or all of the publication costs seems to have been ongoing for a long time. The following *Geological Magazine* editorial notes from January 1921 bring to light the financial struggle being faced by the editors about 100 years ago: *'They still, however, find themselves faced with financial difficulties of a serious nature, arising from the continued increase in the cost of production. For the first half of 1920 a small profit was made, but this was almost wiped out by a considerable further rise in the cost of printing in the middle of the year. An important item in expenses is the cost of plates, and they are regretfully compelled to inform their contributors that it will under present conditions be impossible to produce plates at the expense of the Magazine. They feel sure, however, that their friends will not hesitate to incur the expense involved in meeting the cost of the illustrations, which are so necessary to bring out the full value of their papers. Many of them have done so voluntarily in the past, and the Editors trust that even under the present conditions, that bear so heavily on people of moderate means, they will be able to continue to provide them ... we should*

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like also to take our readers and subscribers into our confidence and to inform them that although arrangements have been made which, at any rate, ensure continuance for 1921, there are limits to this sort of thing. In the first place it should be made quite clear that the Editors receive no remuneration, and arc, as a matter of fact, slightly out of pocket as the result of their labours. Nevertheless, they do their work gladly in the interests of geological science, which they earnestly hope is really benefited by the continued existence of the Magazine, and they would feel the greatest regret if they were compelled by force of circumstances to relinquish their self-imposed labour of love' (Anonymous, 1921).

With these insightful editorial notes in mind and the brief historical account of the journal's early days onward, we now move on to the collection of papers in this special issue of *Geological Magazine* highlighting various topics of the earth sciences to commemorate the 155th anniversary of the journal's publication.

The diversification of complex life during the early Palaeozoic, when all modern marine phyla first appeared, is a research topic of great interest. **Harper *et al.*** provide a review of biodiversity curves of the marine organism for the Cambrian–Silurian and show that a single, long-term, background radiation of life took place during that time interval, including both the 'Cambrian Explosion' and the 'Great Ordovician Biodiversification Event'. Different regional radiations, however, at smaller scales, can be recognized geographically. The availability of more complete datasets, with better global coverage, and more advanced analytical techniques, will allow further insights into studies of biodiversity through time.

Grazhdankin *et al.* discuss the Tommotian Regional Stage of the Siberian Platform that has been closely linked to the idea of the 'Cambrian Explosion'. They use a multidisciplinary approach, including biostratigraphy, carbonate $\delta^{13}C$ values and U–Pb zircon dates, among others, to study an informal 'synstratotype' of the lower Tommotian boundary in the upper Mattaia Formation, Kessyusa Group in the Olenek Uplift, NE of the Siberian Platform. A section of the upper Mattaia Formation is suggested here as a model for the Global Boundary Stratotype Section and Point (GSSP) for the base of the Cambrian Stage 2.

During the early Cambrian, the first trilobites appear in the fossil record. They are a group of extinct marine arthropods that lived throughout the majority of the Palaeozoic Era. ***Paterson*** briefly reviews the complex history of trilobite classification over the last century, including a discussion on the phylogenetic links between major post-Cambrian trilobite clades and their Cambrian sister taxa. He also highlights some of the perpetual problems that impair the systematics of this invertebrate group, and outlines future directions for research on trilobite systematics.

Another research topic of great interest is the colonization of land by living organisms, as this profoundly affected Earth's biosphere, geosphere and atmosphere. The Devonian Rhynie chert Konservat-Lagerstätte located in Aberdeenshire, Scotland, is well known for its terrestrial fossil record, preserving an important early terrestrial ecosystem, including plant, fungal, bacterial and arthropod fossils. **Garwood *et al.*** review the geological setting of the Rhynie Basin, the palaeoenvironment at the time of deposition of the cherts which host the famous fossils, and the taphonomy of the fossils themselves. Without any doubt, the Rhynie ecosystem provides unique insights into early life on land.

On several occasions in Earth's history, life has been challenged by mass extinction events. The largest and therefore arguably the most important is the Permian–Triassic boundary extinction event which killed off more than 95 % of the marine and 70 % of the terrestrial species on Earth. Studying stratigraphic sections across the Permian–Triassic boundary is therefore important for better understanding the precise timing of this and other events. **Ellwood *et al.*** show that the expanded Permian–Triassic boundary succession at Lung Cam in Vietnam is a high-resolution proxy which can be well correlated to the Permian–Triassic boundary GSSP located at the Meishan D section in China and can be effectively used to correlate to successions where the GSSP-defining fossils and related biostratigraphy are not well defined or are missing.

Another important boundary succession covers the time interval from the Eocene to the Oligocene, which coincides with the main climatic shift from relatively warm to relatively cold conditions in the Cenozoic Era and represents a greenhouse to icehouse transition. Well-constrained regional to global high-resolution correlation and timing is essential for better understanding such transition. **Ellwood *et al.*** use a multi-proxy approach, including a combination of lithostratigraphic, magnetostratigraphic (magnetic susceptibility), geochemical and biostratigraphic methods, to unravel various changes across the Eocene–Oligocene transition in five successions located in the SE United States Gulf Coastal Plain and to correlate those to the GSSP in the Massignano section located near Ancona in central Italy. For example, magnetic susceptibility data reflect relatively well-defined, low-magnitude climate cycles during a time of slight climate warming in the uppermost Eocene, whereas relatively large-magnitude cycles occur in the lowest Oligocene as climate slowly begins to cool.

The final contribution in this special issue focuses on metamorphic core complexes. **Searle & Lamont** discuss the evolution of the metamorphic core and how rocks that formed at lower crustal depths were uplifted to high structural levels. Also, low-angle ductile shear zones and normal faults that bound the upper level of metamorphic core complexes are addressed. The observed extensional fabrics in compressional orogenic settings challenge the widely accepted definition of metamorphic core complexes. The authors suggest that compressional core complexes are as common as extensional core complexes, and many core complexes previously attributed to lithospheric extension and isostatically driven uplift may need to be re-examined.

As shown in this special issue and previous issues, *Geological Magazine* publishes original scientific papers covering the complete spectrum of earth sciences topics, with high-quality illustrations. Its worldwide circulation and high production values, combined with Rapid Communications and Book Review sections, keep the journal at the forefront of the field. All of this is only possible with the help and support of the editors and referees, and the publishing staff at Cambridge University Press, who ensure that the high publication standards of the journal are maintained. Many thanks are also due to the authors who have contributed to publications in *Geological Magazine* to date.

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