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# Cave and Karst Science

*The Transactions of the British Cave Research Association*



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Irish and British cave biology mid–19th to early 20th century: history and insights

Fear of Halley's Comet in 1910, preserved in a cave in southern Puerto Rico

Zero and pre-Darcy flow, and an update on speleogenesis research

Cave pearls: origin, morphology, growth and mobility

Bibliography of Red Hills Road Cave, Jamaica

*Forum*

## Cave and Karst Science — Notes for Contributors

### Scope of articles

Authors are encouraged to submit articles for publication in *Cave and Karst Science* – the *Transactions of the British Cave Research Association* – to one or both editors via the editorial addresses shown on the Contents page. Submissions fall into five broad categories...

**Papers:** Scientific papers, normally up to 6,000 words but may be longer subject to editorial agreement, on any aspect of karst or speleological science, including archaeology, biology, chemistry, conservation, geology, geomorphology, history, hydrology and physics. Manuscript papers, which should be of a high standard, will be subject to peer review by two referees.

**Reports:** Shorter contributions, normally 500–3,000 words, on aspects of karst or speleological science, as listed above, or more descriptive material, such as caving expedition reports and technical articles. The Editorial Board will review manuscripts unless the subject matter lies outside their fields of expertise, in which case assessment by an appropriate expert will be sought.

**Features:** Articles of appropriate length (by editorial agreements) for the core topic that do not fall readily into either the Paper or Report categories but are longer than normal Forum contributions (see below). Such items might include, for example, new translations of historical milestone publications, appreciations of the work of major contributors to the many cave and karst science fields, or considerations of past activities and/or future ways forward in the cave and karst sciences.

**Forum:** Personal statements, normally up to 1,000 words, on topical issues; discussion of published papers, and book reviews. Where appropriate, statements should put forward an argument and make a case, backed-up by examples used as evidence.

**Abstracts:** Authors (or supervisors) of undergraduate or postgraduate dissertations on cave or karst themes are encouraged to submit abstracts for publication. Please indicate whether the thesis is available *via* inter-library loan. Abstracts of papers presented at BCRA (and related) conferences or symposia are also welcome. Normally, **Abstracts** appear as part of **Forum**.

Prospective authors are welcome to contact the editors (see the Contents page for current addresses), who will be pleased to advise on manuscript preparation.

**Photo Feature:** Introduced in 2022, this is intended to encourage cavers to submit one to three photographs together with a brief explanation of their scientific significance.

### Open access

In 2024 the BCRA Council agreed that all articles accepted for publication in *Cave and Karst Science* will be Open Access, meaning that the article can be downloaded freely, and will be marked as meeting the open access requirements of **UKRI.org**. However, the BCRA Council encourages those submitting a paper to **make a donation** towards the costs of publication, particularly if they are affiliated to an academic institution

*The following notes are intended to help authors prepare their material in the most advantageous way. Time and effort are saved if the guidelines below are followed. Queries regarding the content or format of the material should be made before submitting the manuscript. On publication, authors will be provided with access to downloadable digital copies of their contributions.*

### Manuscript style

**Text:** Material should be presented in a style as close as possible to that adopted by *Cave and Karst Science* since 1994. Subheadings within an article should follow the system used in *Cave and Karst Science*. A consistent set of primary, secondary and, if necessary, tertiary subheadings should be indicated clearly.

**Abstract:** Submitted material should normally be accompanied by an abstract, stating the essential results of the investigation or the significance of the contribution, for use by abstracting, library and other services.

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**Acknowledgements:** Any person or organization that has given a grant or helped with the investigation or with preparation of the article should be acknowledged. Contributors in universities and other institutions are reminded that grants towards publication costs may be available, and that they should make related enquiries as early as possible. Some expedition budgets include an element to help publication, and the editors should be informed of this.

**Speleological expeditions** have a moral obligation to produce reports (contractual in the case of expeditions supported by Ghar Parau Foundation awards). These should be concise and cover the results of the expedition as soon as possible after the return from overseas, so that later expeditions are informed for their planning. Personal anecdotes should be kept to a minimum, but useful advice such as location of food supplies, medical services, *etc.*, may be included, preferably as appendices.

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### Submission media

Unless a suitable alternative is agreed in advance with the Editor(s), manuscripts should be sent by email, with the Text and Tables as separate Word documents and with each figure and photograph as a separate jpg or tif file. If the file attachments exceed 20Mb they should be sent to one or both of the editorial addresses shown on the Contents page, using a file-transfer service such as WeTransfer.

**File naming:** Files can be difficult to track. The editors advise that all related file names (including photos and graphics files) should begin with the same character string, e.g. lead author's surname. If submitting a large number of files it is especially helpful to include an index – a file containing a list of file names and their contents.

### Manuscript format

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**Layout:** Material should be compatible with the *Cave and Karst Science* 'house style' regarding headings, *etc.*, but do not attempt to match the layout. Text should be in a single column and 'double-spaced'. Character formatting (bold, italic, sub- and superscript) can be used, but please do **not** apply paragraph formatting, which will be stripped out during DTP.

**Symbols:** Special symbols, including accented Roman characters, Greek letters, fractions, mathematical symbols, and some icons, can be generated using the MS Word character map accessible via Insert/Symbol. If the required symbol is not available here, please check for an alternative in the Symbol font. To avoid confusion and assist the editors, authors who employ special symbols should provide an explanatory list (digitally) of the nature, meaning and font of the characters used.

**Tables, graphics and photos:** Tables and Figures (both diagrams and photographs) should be referred to in the text, where necessary, as (Table 4), (Fig.3), *etc.* Preferred approximate positions of tables, graphics and photos can be indicated by, e.g., <Insert Figure 1>. A full list of captions should be submitted at the end of the manuscript, after a hard page break. Photo captions should include the photographer's name unless the photographer is also the sole author. Any material not created by the author(s) must acknowledge that permission is granted for its use.

**Avoid** submitting composite illustrations containing mixed photos, diagrams, charts, *etc.* It is inefficient and time-consuming to optimize them for printing or viewing and overall outcomes can be inferior to using separate figures at appropriate sizes. The large footprint needed to ensure legibility of full-page composites also reduces options for appropriate positioning of illustrations among the text. If composite figures are considered essential or advantageous, and if approved by the editors, please submit separate high-resolution copies of all components and a template of the required layout.

**Tables** should be submitted in a separate MS Word (Doc) file, numbered in sequence and provided with captions. Use a simple table design that is easy to edit. For example, use tabs or table cells rather than spaces to separate data, and merge table cells only where strictly necessary. For submission, separate each table using a **hard** page break.

**Graphical illustrations** should be designed to make maximum use of page space. Preferred **final** widths are 1-column, 1.5-columns or 2-columns (90mm, 143mm or 188mm respectively); these might be adjusted to make best use of available space during layout. Maximum column height is 267mm but, if designing a potentially full-page illustration, remember to allow for caption space below. Maps (and cave surveys) must have bar scales only. When submitting graphics, bear in mind that referees may request revisions, so submission of a draft version is advised.

Various digital graphics formats are acceptable, but some are not recommended – e.g. MS Word's built-in facilities (auto-shapes, text boxes and MS Draw) can cause problems. Charts generated within MS Excel are becoming increasingly popular. For these to retain their initial clarity during production it is best to provide each chart removed from its parent data and saved as a separate, appropriately named, sheet within an Excel workbook file.

Remember that graphics, photos and tables might have to be reduced (or, more rarely, enlarged) from the size envisaged during compilation, to fit the column heights and widths described above. Lettering should be of a suitable size to be readable at the anticipated dimensions of use; generally use of a simple sans-serif typeface such as "Arial" (or a closely similar font) is preferred.

**Photographs** should be provided at full resolution. **Do not sharpen**. Tif or larger size jpg files are currently the preferred formats. Other formats might be acceptable or adaptable; please check with the editors if in doubt.



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**Front Cover photograph:** unusual – including some hexagonal – 'cave pearls' in the Xe Bang Fai River Cave, Hin Nam No National Park, Laos, with Mr Tua, a local ranger who guides visitors at the cave. The image was taken by **Chris Howes** in 2014, during a trip to photograph and to laser-scan (the latter by Richard 'Roo' Walters) what might be the world's biggest active cave river passage. An estimated maximum resurgent flow of c.2,000m<sup>3</sup>/s would make it the world's largest known karst spring. The 'pearls' are high above river level within a series of terraced, steeply descending, gours that were dry when the photograph was taken. During the rainy season the pools fill up, and the 'pearls' would be active.

In the above text the word pearl is quoted, because this image illustrates some of the difficulties in deciding what is, or is not, a cave pearl. Expert opinion is divided. Considering the image, one expert's view is that "The smaller rocks just look like gravel washed into the pool. The larger rounder rocks do have some secondary deposit on them, but I am not convinced that they are cave pearls. They do have some parts of their surface coated with calcite. I suppose it raises the question, 'how many layers of a secondary deposit does a nucleus need to become a cave pearl?'. Without sectioning one of those large rocks in the pool, one would never know. I do think it is a real stretch to call them cave pearls". Another expert's opinion is: "These are indeed cave pearls, although VERY MUCH extreme cases. They are coated clasts for sure, but that is OK as 'rolling'/transport is not a requirement for cave pearls". Whatever the verdict, all agree that this superb photograph is worthy of being on the front cover of the journal. As editors we also felt that it was useful to feature a *challenging* photograph, to complement the images included on the rear cover and inside the journal, of speleothems that can confidently be described as cave pearls.

The **Rear Cover** collage comprises six illustrations of cave pearls, photographed by **Garry Smith**, relating to various aspects discussed in his Paper (pp.51–60) in this Issue. Brief descriptions of the six images are provided below.

|   |   |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---|---|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a | b | Image a | Cave pearls up to 30mm in diameter in shallow rimstone dams (now dry) at survey station 23-313 in Cave KNI159, part of the Sphinx Cave System, Ningbing Range, far north Western Australia.                                                                                                                                                                                                                                                                                                            |
|   |   | Image b | Cave pearls cover a section of floor in cave BAA34, Judbarra–Gregory Karst Region, Northern Territory, Australia. Deb Hunter examines pearls up to 60mm in diameter in the passage called 'Under Fifties Only' (UFO) – July 2013.                                                                                                                                                                                                                                                                      |
| c |   | Image c | Cave pearls on the floor of Hennings Cave (J39), Jenolan, New South Wales, Australia, in an area subject to drips falling 5m, such that water would not immerse the pearls fully during their growth (July 2003).                                                                                                                                                                                                                                                                                      |
|   |   | Image d | Cave pearls in Nice Cave (KNI050) in the Ningbing Range, far north Western Australia. These cave pearls have a fine coralline appearance and internal crystalline dendritic structure.                                                                                                                                                                                                                                                                                                                 |
| d | e | Image e | Cave pearls with a rough coralline appearance that have an internal crystalline dendritic structure (similar to ones shown in figures 3 and 7B of this Issue's Paper; pp.52 and 53). The cave pearls illustrated here, which are up to 80mm in diameter, are in cave KNI184, Ningbing Range, far north Western Australia.                                                                                                                                                                              |
|   | f | Image f | Cave pearls in cave KNI184, Ningbing Range, far north Western Australia, forming around broken fragments of stalactites and straws that become pearl nuclei. During the wet season the rimstone dam fills with water to a depth of up to 300mm, immersing the pearls fully, while coarsely crystalline dendritic layers of calcite are deposited around each nucleus. Agitation related to compression waves generated by splashing water prevents the pearls from adhering to the bottom of the pool. |

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## EDITORIAL

John Gunn and David Lowe

As we write this Editorial, we are looking forward to the celebrations to mark the first UNESCO *International Day of Caves and Karst* (IDCK) on 13 September. As many readers are aware, the IDCK proposal was developed by the International Speleological Union (UIS) and submitted formally to UNESCO by the Government of the Republic of Slovenia. Many international and national bodies, including BCRA and BCA, supported the proposal, which was co-sponsored by more than 60 UNESCO Member States. At the General Conference of UNESCO in Samarkand (12 November 2025) the proposal was accepted, and 13 September was proclaimed officially as the *International Day of Caves and Karst*, to be celebrated every year. In summary, the objective of the IDCK is: “to help people better understand why caves and karst matter and why they deserve protection”. An inaugural international celebration will take place in Postojna, Slovenia, from 10 to 13 September 2026, organized jointly by the Karst Research Institute (IZRK ZRC SAZU) and the UIS, with the support of the Slovenian National Commission for UNESCO and numerous partner institutions. For further information visit [ <https://uis-speleo.org/> ], but the programme will include the international scientific conference “*Explore, Understand and Protect: Towards Sustainable Management of Caves and Karst*”, bringing together researchers, cave explorers, managers of protected areas, educators, and conservation specialists from around the world. Keynote lectures will address cave and karst protection, sustainable management of karst water resources, geoparks, indigenous knowledge, and the role of science in conservation. As Nadja Zupan Hajna, the UIS Treasurer and Past President has said: “*The proclamation of the International Day of Caves and Karst by UNESCO was a remarkable achievement, but it marks only the beginning of a long-term global initiative. Its future success depends on the enthusiasm, creativity, and commitment of the global cave and karst community*”. Our hopes and expectations are that BCRA members, and the wider British caving community, will make an important contribution to IDCK events both in 2026 and in the future.

Just two weeks after the inaugural IDCK there will be another significant event, this one highlighting the best of British Caving – the annual BCRA- and BCA-sponsored *Hidden Earth* meeting at Llangollen in northern Wales. For more information visit [ <https://hidden.earth/> ]. Three weeks later, the 37<sup>th</sup> annual BCRA Cave Science Symposium will be held at the University of Salford. For more information see page 88 of this Issue.

As Editors, we like to believe that there are *pearls of wisdom* in every Issue of CaKS, but this is undeniably the case in the present Issue, because we have a *Photo Feature* devoted to the eponymous pearls that reside – sadly now buried under a mudflow – in a New Zealand cave. Cave pearls also feature on the Issue’s covers and, most notably, in a paper by Garry Smith: “*Cave pearls: origin, morphology, growth and mobility*”. As Garry points out, correctly, cave pearls have commonly been overlooked by speleologists, compared with the attention paid to more-prominent speleothems such as stalactites, stalagmites and flowstone. Hence, further contributions of papers, reports or photo features relating to them would be welcomed.

The contents of this Issue comprise two “longish” and one shorter papers, two reports, a *Forum* section and a *Photo Feature*. Whereas two of the papers are of world-wide applicability, the other Paper and the two reports are focussed specifically upon topics related to Ireland and Britain (considered historically as a geographical entity), to Jamaica, and to Puerto Rico. As mentioned above, Garry Smith has provided an overview consideration of cave pearls that, in addition to the aspects already described, investigates and makes recommendations about the nomenclature of cave pearls and of other geological entities that can appear similar to them. Max Moseley has added to his series of papers related to the history of “*cave biology*”, by examining aspects of related scientific development in “the British Isles”, focussed upon significant related Irish and British activities. In a rather shorter, but concentrated, Paper, Trevor Faulkner revisits ideas about zero and pre-Darcy flow, and considers the implications of what he discusses with regard to ideas about speleogenesis. Though one of them includes some wider issues, two closing reports relate to the Caribbean region. Abel Méndez and Ángel Acosta-Colón analyse the significance of localized cave-art/graffiti in a cave on the main island of the Puerto Rico archipelago, but also looking at issues related to fear that was felt around the world prior to the predicted arrival of Halley’s Comet in 1910. Also in the Caribbean area, Stephen Donovan provides a summary of the history of investigations in the Red Hills Road Cave on Jamaica, and the potential future value of research into the fossil-rich sedimentary deposits within what remains of the cave; a bibliography covering related publications is also presented. The Issue’s *Forum* section opens with brief details of this year’s (37<sup>th</sup>) annual BCRA Cave Science Symposium and Field Meeting, as mentioned above. Finally catching up with an editorial oversight during 2025, two additions to the occasional “*Notes for Authors*” series (by Stephen Donovan) are presented, alongside a listing of previous series contributions intended to inform new readers or those who might have missed them previously. We are also pleased to report a welcome return of a *Photo Feature* in its traditional, closing-page, position; this feature adds an intriguing lateral aspect to the already plentiful words and images related to cave pearls in this Issue. As several times in the recent past, we point out here that a *Photo Feature* is a simple way for authors from any cave- and karst-related background to publish brief thoughts on a potentially wider topic... perhaps leading to follow-up discussions and “*the shedding of light*”!

With great sadness we end this Editorial by reporting the recent death of Dr J C (John) Frankland. John was one of the “founding” Honorary Life Members of the BCRA and, among his many contributions to speleology, he served as BCRA President from 1997 to 2001. His other contributions to the BCRA included several publications in our forerunner journals, the *BCRA Transactions* and *Cave Science*. He will also be remembered as a caving doctor, who made his knowledge and skills available, not only to expedition cavers (in, for example, Papua New Guinea and Guangxi), but also in his role as part of the *Cave Rescue Organization* in the “Yorkshire Dales” and adjacent areas. Our expectation is that John’s contributions to the sport of caving, and to “speleology” in general, will be described and celebrated by more-detailed and specific appreciations in the cave-related media. He will certainly be remembered by many, of various generations, across the breadth of UK caving... and beyond.