The Palaeontology Newsletter

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Reminder: The deadline for copy for Issue no. 117 is 30th September 2024.

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Editorial

Phew, summer (in the Northern Hemisphere) is always a busy season for academics! This year there have been many big international conferences – amongst others, the North American Palaeontological Congress (at the University of Michigan, USA, which was brilliant, congratulations **Matt Friedman** and team!), Evolution 2024, and the World Biodiversity Forum, plus upcoming meetings including the International Geological Congress (Busan, South Korea). This editor finds conferences to be one of the most enjoyable parts of an academic job, though difficult to fit around what has also been an exciting schedule of fieldwork! Have you attended any great conferences, or been doing any fieldwork?

Nevertheless, your Council and our correspondents have managed to get together issue 116 of the *Palaeontology Newsletter!* This issue, we have a hugely varied correspondence highlighting many ongoing concerns in our field, including commentary on the importance of naming an Anthropocene epoch by colleagues in the UK and USA, a number of personal experiences regarding breastfeeding in academic settings collated by our Diversity Officer **Nidia Alvarez Armada, Jan Zalasiewicz**'s discussion on coralline algae and its potential responses to climate change, and Education Officer **Joe Keating**'s meeting with a UK secondary school robotics club building an app to help families identify fossils in the field.

Nidia also brings us a report on the Council diversity figures for this year, and we have the usual sections of A Palaeontologist Abroad by **M. Gabriela Suárez** and a Careers Q&A by Technical Specialist **Liz Martin-Silverstone**. **Nora Corthésy** gives us some insights into the life of Swiss palaeontologist Alice Schnorf-Steiner (born in Lausanne, where your editor and Nora work!), and **Clare Mateke** tours us around the collections of the Livingstone Museum in Zambia, which contain many historical and important specimens for both the country and palaeontology. What an amazing place to visit if you get the chance! The *Newsletter* team, including the hard-working Jo Hellawell and Nick Stroud, hope you enjoy this issue and, as ever, please get in touch if you want to contribute to a future *Newsletter* in any of our recurrent sections or on any other relevant topic!

Harriet B. Drage Newsletter Editor

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Postcards from the President

Rachel Wood continues her new series to highlights issues of particular topical relevance.



I am writing this minutes after the end of a very successful and enthusiastic Council Away Day, with many exciting new initiatives proposed. To ensure we can future-proof these and all the Association's endeavours, we have decided to make a modest increase of the Ordinary Membership to £50, the first increase since 2018, whilst maintaining the Student and Retired Memberships at £20. As ever, please feel free to get in touch with me or any member of Council if you have any suggestions or queries about the Association.

> Rachel Wood President

#5: Eocene

London Clay Formation, southern England 50 myr ago Foreground: Allaeochelys (pig-nosed turtle), Nymphaeaceae (water lilies) Background: Kentisuchus spenceri (crocodile), Coryphodon

eocaenus (large plant-eating mammal), Nypa (palm trees), Cupressaceae (Cypress), Dasornis (large seabirds in sky)

Image by James McKay, © The Palaeontological Association

Association Business

Annual Meeting

Notification of the 68th Annual Meeting

The 2024 Annual Meeting of the Palaeontological Association will be held at the Friedrich-Alexander-Universität (FAU) Erlangen-Nürnberg, Germany, on 9th – 13th December as an in-person meeting, and is organized by Dr Emma Dunne, Dr Thomas Clements, Prof. Rachel Warnock and colleagues.

Annual General Meeting (AGM) 2024

Information on the 2024 AGM

The Annual General Meeting (AGM) will be held in December 2024 during the Annual Meeting at Friedrich-Alexander-Universität (FAU) Erlangen-Nürnberg, Germany.



AGENDA

- 1. Apologies for absence
- 2. Minutes of the 67th AGM
- 3. Trustees Annual Report for 2023
- 4. Accounts and Balance Sheet for 2023 and reappointment of financial examiner
- 5. Election of Council and vote of thanks to retiring members
- 6. Report on Council Awards
- 7. Annual address

Draft AGM Minutes 2023

The 67th AGM took place as a virtual meeting of the Membership on 20th December 2023.

- 1 Apologies for absence: Chris Mays, Liam Herringshaw, Katherine Tuley.
- **1.1** Due to the online nature of the meeting the Secretary asked any member with apologies to e-mail these details so they may be recorded. Names received have been added to the minutes. Total attendance at AGM: 161 total peak attendance; 119 online at start. The AGM formally commenced at *c*. 16:29 after some technical issues.

2 Minutes of the 66th AGM

2.1 The draft minutes of the 66th AGM were first published in *Palaeontology Newsletter* Issue 113, and also in the 'yellow pages' section of *Newsletter* issue 114 (pp.1–3). The motion "Does the membership accept the draft AGM minutes from 2022 as a true record?" was put to the vote via a Zoom poll of attendees. The vote had three options: Yes, No, and Abstain. The results were: 82% (70/85) Yes; 0% (0/85) No; 18% (15/85) Abstain. Therefore the motion passes.

3 Trustees Annual Report for 2022

3.1 The Trustees' Report was first published in *Palaeontology Newsletter* issue 113, and also in the 'yellow pages' section of *Newsletter* 114 (pp.3–9). The motion "Does the membership accept the Trustees' Report from 2022 as published?" was put to the vote via a Zoom poll of attendees. The vote had three options: Yes, No, and Abstain. The results were: 77% (71/92) Yes; 0% (0/92) No; 23% (21/92) Abstain. Therefore the motion passes.

4 Accounts and Balance Sheet for 2022

4.1 The Accounts and Balance sheet ('the Accounts') for 2022 were first published in *Palaeontology Newsletter* Issue 113, and re-published in the 'yellow pages' section of *Newsletter* 114 (pp.10–20). The motion "Does the membership accept a) the Accounts from 2022 as published; and, b) the re-appointment of the financial examiner (M.R. Corfield – Corfield Accounts Ltd.)?" was put to the vote via a Zoom poll of attendees. The vote had one question with three options: Yes, No, and Abstain. The results were: 86% (77/90) Yes; 0% (0/90) No; 14% (13/90) Abstain. Therefore the motion passes.



5 Overview of the Association's activities 2023

- 5.1 Undergraduate Research Bursaries: The following Undergraduate Research Bursaries were awarded by Council 2023 and reported at the Annual General Meeting: Ilhan Ahmad (University College London, UK) for 'Neuroanatomy of the Early Eocene crocodylian *Kentisuchus spenceri* from the UK and implications for early gavialoid evolution' supervised by Philip D. Mannion; Ellie Defty (University of Leeds, UK) for 'Lilliput sharks and marine apex predators of the Permo-Triassic' supervised by Alexander M. Dunhill; Lucy Jackson (University of Oxford, UK) for 'Understanding the evolution of pharyngeal structures in fossil echinoderms' supervised by Frankie S. Dunn; Eren Tasimov (Friedrich-Alexander Universität Erlangen-Nürnberg, Germany) for 'Veggiesaurus rex: diversification of herbivorous theropods in the Early Cretaceous' supervised by Emma M. Dunne; Rhys Edmunds (University of Cambridge, UK) for 'Exploring the evolution of calcite shell layers in muricid gastropods' supervised by Elizabeth M. Harper. These awards amounted to a total of £13,858.60.
- 5.2 Postgraduate Travel Grants: During 2023, the Association agreed to support a total of two palaeontological meetings, symposia or workshops worldwide. In 2023 the Association awarded Postgraduate Travel Funds to 12 individuals (up to £200 per applicant): K. Delahooke, University of Cambridge, UK for Palaeo Down Under 3; S. Edayiliam, Central University of Kerala, India for EGU 2023; M. Fursman, Goethe University Frankfurt, Germany for International Sclerochronology Conference 2023; M. Grohganz, University of Bristol, UK for EAVP 2023; A. Haldar, IIT Kharagpur, India for SVP 2023; T.M. Khan, University of Cambridge, UK for CPEG 2023; C. Morrison, University College London, UK for the 14th Conference on Mesozoic Terrestrial Ecosystems; F. Pym, University of Exeter, UK for the XXI INQUA Congress 2023; M.A. Saparin, University of Adelaide, Australia for Palaeo Down Under 3; N. Stephenson, University of Cambridge, UK for Palaeo Down Under 3; and F. Wenger, University of Saskatchewan, Canada for the V Simposio Latinoamericano de Icnología. The Association's support enabled the worldwide dissemination of research to the benefit of the global palaeontological community. The total awarded was £2,400.
- 5.3 Grant-in-Aid: The Association provided funds to support the following meetings and workshops in 2023, totalling £4,000: S.C.R. Maidment for the meeting '200 years of the dinosaurs: a global insight and recent advances' (£2,000); A. Noubhani for 'Eighth International Meeting on the Valorization and Preservation of Paleontological heritage (RIV3P8)' (£2,000).
- **5.4** Engagement Grants: These awards are made to encourage educational outreach, public engagement, and related initiatives in palaeontological themes. No Engagement Grants were awarded by Council in 2023.
- 5.5 Career Development Grants: The following grants have been made by Council and were reported at the 2023 AGM: Romy Rayner (£2,500); Cecily Nicholl (£2,500); Alavya Dhungana (£2,425).
- **5.6** Small Grant Awards: The small grants awarded by the Association for funding in 2023 include the Sylvester-Bradley, Collomon Award, Whittington and Stan Wood awards. Council agreed that the following applicants should receive the awards. Sylvester-Bradley Award: Laura Devine,



'The effects of wave action on arthropod taphonomy: comparative analysis between Sirius Passet and taphonomic experiments'; Abi Crane, 'A novel approach to skeletochronology in an underutilised analogue for non-avian dinosaurs'; Panagiotis Kampouridis, 'Internal bone morphology and locomotory adaptations of chalicothere finger bones using micro-computed tomography'; Cassius Morrison, 'Dental microwear of South American theropods: testing ecological niche partitioning among Cretaceous carnivores'. The Callomon Award: Ogechi Ekwenye 'Palaeoecology and palaeoenvironments of tropical West Africa across the Cretaceous-Paleogene transition'. Note this is the final grant from the Callomon fund. The Whittington Award: Hady George, 'A redescription of material referred to *Neosteneosaurus edwardsi* (Crocodylomorpha, Thalattosuchia)'. The Stan Wood Award: Manon Hullot, 'Palaeontological research in the middle Miocene of Gers (southwestern France)'. A total of £9,979.18.

- 5.7 Research Grant Awards: In 2023 Council agreed the following applicants should receive awards: J. Luque for 'Exceptional preservation in tropical settings: a glimpse into the Cretaceous of the equatorial Neotropics' (£9,695); and N.J. Minter for 'Re-tracing arthropod ichnology: ichnotaxonomy of arthropod trackways, trails, and imprints' (£9,796.50). A total of £19,491.50.
- 5.8 PalAss Exceptional Lecturer: It was announced that Alex M. Dunhill has been appointed as the PalAss Exceptional Lecturer for 2024/25. Alex will present the Innovations in Palaeontology Lecture Series (proposed title: 'Species loss, community collapse, and ecosystem recovery during times of mass extinction?').

6 Council Elections and thanks to retiring Council

- 6.1 Retiring/Retired Council in 2023 were: Paul M. Barrett (Vice-President); Susannah C. R. Maidment (Editor Trustee); Emilia Jarochowska (Newsletter Editor); Thomas Clements (Reviews Editor); Farid Saleh (Diversity Officer); Robert Theodore (Ordinary Member). They were thanked for their service.
- **6.2** Also thanked by the President were: Alex Liu and team (Annual Meeting 2023, University of Cambridge, UK); Samuel Cross, Amber Wood-Bailey and Matthew Dempsey (ProgPal 2023, University of Liverpool, UK).
- 6.3 After tallying of votes (all electronic) and scrutineering of the results by Dr Christine A. Bischoff (TRE ALTAMIRA, Milano, Italy) the following were duly elected as Council members in 2023: Susannah C. R. Maidment (Vice-President); Harriet B. Drage (Newsletter Editor); Richard P. Dearden (Reviews Editor); Joseph N. Keating (Education Officer); Nidia Álvarez-Armada (Diversity Officer); Laura B. Porro (Ordinary Member); Daniela Schmidt (Ordinary Member); Christian Klug (Editor Trustee).
- **6.4** The new President-Elect who will become President at the 2024 AGM was announced as Philip C. J. Donoghue.
- **6.5** The President also thanked everyone who stood in the election: Kirsten Flett; Omar Rafael Regalado Fernández; Romy Rayner; Chris Mays; Amalia Robertson; and Alex M. Dunhill. It was noted that the Association is run by members for members. Without these dedicated and selfless individuals putting themselves forward for election we would not be able to continue our work to promote and support the palaeontological community.



7 Announcement of Council Awards

- 7.1 The Hodson Award 2023 was presented to: Rachel C.M. Warnock.
- 7.2 The President's Medal 2023 was presented to: Richard J. Butler.
- 7.3 The Lapworth Medal 2023 was presented to: Else Marie Friis.
- 8 The formal business of the 67th AGM was closed at: 17.23

Trustees Annual Report 2023

Annual Report of the Trustees for the Year Ended 31 December 2023

The Trustees present their annual report with the financial statements of the charity for the year ended 31 December 2023. The Trustees have adopted the provisions of *Accounting and Reporting by Charities: Statement of Recommended Practice (SORP)* applicable to charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) (effective 1 January 2019).

1. OBJECTIVES AND ACTIVITIES

1.1 Aims and objectives: The objectives of the Association are to advance education for the public benefit in Palaeontology and its allied sciences by: a) promoting research and publishing the useful results thereof; b) holding public meetings for the reading of original papers and the delivery of lectures; c) extending knowledge of the science through demonstration and publication; d) awarding grants and bursaries; and e) by such other means as the Council of charity trustees may determine.

1.2 Code of Conduct & Professional Standards and Behaviour declarations: In 2023 the Association continued to roll out the new Professional Standards and Behaviour declaration and the Code of Conduct (CoC) for Members, as well as continuing to revise existing policies on professional behaviour and ethical standards. All members will now agree upon renewal of their membership to be bound by the new CoC. The CoC reinforces that: 1) the Association will not discriminate on the basis of race, colour, ethnic origins, immigration status, religion, age, marital status, parental status, sex, sexual orientation, gender identity or expression, socioeconomic background, educational background or disability; 2) that all members should promote a culture of scientific and research integrity, respect, fairness and inclusivity, and avoid conflicts of interest. Any behaviour that affects or causes damage to a person or a group on the basis of the aforementioned categories will be considered unacceptable and is prohibited by the CoC; and 3) that all members are expected to report any sort of prohibited or unacceptable behaviour while acting in good faith. The new Code of Conduct must be respected by members in any professional workplace.

1.3 Advocacy within the palaeontological community: In 2023 Council, on behalf of the Association, responded to issues raised by Members who attended IPC6. The Association will continue to monitor and support the IPA in advancing their own policies so improvements in professional standards and behaviour can be enacted for IPC7.



1.4 Grants-in-aid for meetings and workshops: The Association provided funds to support the following meetings and workshops in 2023, totalling £4,000: S.C.R. Maidment for the meeting '200 years of the dinosaurs: a global insight and recent advances' (£2,000); and A. Noubhani for the 'Eighth International Meeting on the Valorization and Preservation of Paleontological heritage (RIV3P8)' (£2,000).

1.5 Public meetings: Two public meetings were held in 2023, and the Association extends its thanks to the organizers of these meetings.

67th Annual Meeting. The Association's Annual Meeting is its flagship meeting and this year was an in-person event held between 18th and 24th September 2023, hosted by the University of Cambridge, UK. The Meeting was organized by Dr Alex Liu and colleagues, and included an earlycareer researcher event: 'Palaeontologists for the Future', pre-conference workshops and museum / collections tours, a symposium on 'Ecosystem engineering through deep time', the Annual Dinner at Girton College and a field-trip to the Eocene and Pliocene deposits of Bawdsey, Suffolk. There were 330 registrants. The Annual Address was given by Dr Greg Edgecombe (Natural History Museum, London, UK), entitled 'Fossils, molecules and arthropods'. President's Prizes for the best oral presentations by early-career researchers were awarded to: Mickaël Lheritier (Université Claude Bernard Lyon 1, France); Anna McGairy (University of Leicester, UK); Aaron Quigley (University College Cork, Ireland); Amy Shipley (University of Leeds, UK); and Philip Vixseboxse (University of Cambridge, UK). Council Poster Prizes for best poster presentations by early-career researchers were presented to: Neil Adams (Natural History Museum, London, UK); Daniel Cirtina (University College Cork, Ireland); Zishan Fu (University of Edinburgh, UK); and Luke Meade (University of Birmingham, UK).

Progressive Palaeontology. This is an annual, open meeting for research students in palaeontology and allied sciences to present their work to an audience of their peers. The 2023 meeting was hosted by the University of Liverpool, UK and organized by Samuel Cross (co-chair), Matthew Dempsey (co-chair) and Amber Wood-Bailey (co-chair), with over 90 delegates.

1.6 Publications: The journals *Palaeontology* and *Papers in Palaeontology* are produced by Wiley. During 2023, the following volumes were published: *Palaeontology* volume **66**, comprising six issues; and *Papers in Palaeontology* volume **9**, comprising six issues. The *Palaeontology Newsletter*, consisting of three issues, was also published in 2023. Council thanks Mr N. Stroud for assistance with the typesetting and production of the *Palaeontology Newsletter*.

1.7 Research Grants: A total of nine applications (two of which were deemed ineligible) were received for Palaeontological Association Research Grants. Two were recommended for funding in 2023, totalling £19,491.50; these were: Javier Luque (University of Cambridge, UK) for 'Exceptional preservation in tropical settings: a glimpse into the Cretaceous of the equatorial Neotropics' (£9,695) and Nicholas J. Minter (University of Portsmouth, UK) for 'Re-tracing arthropod ichnology: ichnotaxonomy of arthropod trackways, trails, and imprints' (£9,796.50).

1.8 Small Grants Scheme: The scheme received 15 applications (three of which were deemed ineligible). Seven were recommended for funding in 2023, totalling £9,979.18. The small grants awarded by the Association for funding in 2023 include the Sylvester-Bradley, Callomon, Whittington and Stan Wood awards. Council agreed that the following applicants should receive the awards: Abi Crane (University of Southampton, UK) for 'A novel approach to skeletochronology in an underutilized analogue for non-avian dinosaurs' (Sylvester-Bradley Award, £1,500); L.



Devine (University of Portsmouth, UK) for 'The effects of wave action on arthropod taphonomy: comparative analysis between Sirius Passet and taphonomic experiments' (Sylvester-Bradley Award, £1,470); Ogechi Ekwenye (University of Nigeria, Nigeria) for 'Palaeoecology and palaeoenvironments of tropical West Africa across the Cretaceous–Paleogene transition' (Callomon Award, £1,500); Hady George (University of Bristol, UK) for 'A redescription of material referred to *Neosteneosaurus edwardsi* (Crocodylomorpha, Thalattosuchia)' (Whittington Award, £1,049.18); Manon Hullot (Bayerische Staatsammlung für Paläontologie und Geologie, Germany) for 'Palaeontological researches in the middle Miocene of Gers (southwestern France)' (Stan Wood Award, £1,497); Panagiotis Kampouridis (Eberhard Karls Universität Tübingen, Germany) for 'Internal bone morphology and locomotory adaptations of chalicothere finger bones using micro-computed tomography' (Sylvester-Bradley Award, £1,470); and Cassius Morrison (University College London, UK) for 'Dental microwear of South American theropods: testing ecological niche partitioning among Cretaceous carnivores' (Sylvester-Bradley Award, £1,493).

1.9 Undergraduate Research Bursary Scheme: The scheme attracted nine applications, of which five were recommended for funding in 2023, totalling £13,858.60. The awardees were as follows: Ilhan Ahmad (University College London, UK) for 'Neuroanatomy of the Early Eocene crocodylian *Kentisuchus spenceri* from the UK and implications for early gavialoid evolution' supervised by Philip D. Mannion; Ellie Defty (University of Leeds, UK) for 'Lilliput sharks and marine apex predators of the Permo-Triassic' supervised by Alexander M. Dunhill; Rhys Edmunds (University of Cambridge, UK) for 'Exploring the evolution of calcite shell layers in muricid gastropods' supervised by Elizabeth M. Harper; Lucy Jackson (University of Oxford, UK) for 'Understanding the evolution of pharyngeal structures in fossil echinoderms' supervised by Frankie S. Dunn; and Eren Tasimov (Friedrich-Alexander Universität Erlangen-Nürnberg, Germany) for 'Veggiesaurus rex: diversification of herbivorous theropods in the Early Cretaceous' supervised by Emma M. Dunne.

1.10 Publicity, outreach and engagement: The Association continues to promote palaeontology and its allied sciences to print/online media, radio and television. The Association is a major financial supporter of the Lyme Regis Fossil Festival and the Yorkshire Fossil Festival. The Public Engagement Group (PEG), consisting of the Outreach Officer, Education Officer, Publicity Officer, Executive Officer, President and Treasurer, decided on expenditure of the group budget (£19,000 for 2023) in support of recurring festival activities.

1.11 Engagement Grants: No Engagement Grants were awarded by Council in 2023 as the scheme underwent a review, with an updated scheme expected to take its place in 2024.

1.12 Career Development Grants: The Career Development Grant is to assist talented early-career researchers who have recently completed their PhD to strengthen their CVs to help them achieve a career in palaeontology. In 2023 the Council awarded a total of £7,425 to three early-career researchers from eight applications received; these were awarded to: Romy Rayner, Cecily Nicholl and Alavya Dhungana.

1.13 Diversity Group: The Diversity Group continues to implement the Mentor Scheme, and diversity and inclusion remain key topics covered in the *Newsletter*, particularly in the 'Spotlight on Diversity' section. The Diversity Group has also updated the diversity and inclusion statement for our grants and awards to make it more inclusive. Diversity data at the Association and its events continues to be monitored. The Diversity Group has initiated discussions on a plan to enhance



accessibility at the Annual Meeting. The Diversity Officer collaborated with the Early Research Career Officer to select the panel for the webinars organized to inform early-career researchers about specific grant schemes. In 2023 Council, with input from the Diversity Group, as part of ongoing communication with other external organizations, made clear the Association view that problematic behaviour and unprofessional conduct reported at non-Association events have no place in our community.

1.14 Palaeontological Association Exceptional Lecturer scheme: Dr Donald Prothero (Natural History Museum of Los Angeles County, USA) was selected in a competitive process to become the Palaeontological Association Exceptional Lecturer for 2023/2024. Under the Innovations in Palaeontology Lecture Series Dr Prothero agreed to deliver a talk entitled 'How do animals respond to climate change? Lessons from the prehistoric birds and mammals of La Brea Tar Pits' at multiple institutions, as well as giving an invited talk after the 2023 AGM.

1.15 Online activities: The Association is sunsetting its old server which has become obsolete, so is gradually assisting the organizations and journals it hosts sites for in transferring their web presence to other servers. At the close of 2023, it continues to host sites for the online-only journal *Palaeontologia Electronica* and support *Carnets Geol*. and the *Journal of Paleontological Techniques*, as well as palaeontological online resources (EDNA fossil insect database, the Kent Fossil Database, SPIERS Software), palaeontological networking sites (European Coalfield Conservation Opportunities) and online outreach projects (Palaeontology [Online]). The Association continues to run its Internet activities on cloud-based services provided by AWS, located on EU-based servers, whilst e-mail, file hosting and internal e-mail lists are operated on GoogleWorkspace through its non-profit provision, and code versioning is achieved through GitHub non-profit provision.

1.16 Awards: The Lapworth Medal, awarded to people who have made a significant contribution to the science by means of a substantial body of research, was presented to Prof. Else Marie-Friis (Aarhus University, Denmark and the Swedish Museum of Natural History, Sweden). The President's Medal, awarded to a palaeontologist within 15 to 25 years of their PhD in recognition of outstanding contributions in their earlier career, coupled with an expectation that they will continue to contribute significantly to the subject in their further work, was presented to Prof. Richard J. Butler (University of Birmingham, UK). The Hodson Award, for a palaeontologist within ten years of award of their PhD who has made an outstanding contribution to the science through a portfolio of original published research, was awarded to Prof. Rachel C. M. Warnock (FAU Erlangen-Nürnberg, Germany). Council also awards undergraduate prizes to outstanding students in university departments worldwide where Palaeontology is taught beyond Level 1; a total of 15 were awarded throughout the year.

1.17 Forthcoming plans: The Association will continue to make substantial donations from General and Designated funds to promote the charitable aims of the Association. Resources will be made available to continue a similar programme of grants, meetings, outreach and public engagement activities. The 2024 Progressive Palaeontology meeting is to be hosted by University of Bristol, UK in June 2024, and the 68th Annual Meeting will be hosted by FAU Erlangen-Nürnberg, Germany in December 2024; both are planned as in-person meetings. The Diversity Group will continue to implement the recommendations of the Diversity Study, removing barriers to participation and increasing access to palaeontology for under-represented groups. Continual surveys of the membership will aid with monitoring progress.

1.18 Public benefit: The Trustees confirm that they have referred to the Charity Commission's guidance on public benefit when reviewing the charity's aims and objectives, in planning future activities and setting the grant-making policy for the year.

2. ACHIEVEMENTS AND PERFORMANCE

2.1 Meetings support: During 2023, the Association agreed to support a total of two palaeontological meetings, symposia or workshops worldwide. In 2023 the Association awarded Postgraduate Travel Funds to 12 individuals (up to £200 per applicant): K. Delahooke, University of Cambridge, UK for Palaeo Down Under 3; S. Edayiliam, Central University of Kerala, India for EGU 2023; M. Fursman, Goethe University Frankfurt, Germany for International Sclerochronology Conference 2023; T.M. Khan, University of Bristol, UK for CPEG 2023; C. Morrison, University of Cambridge, UK for the 14th Conference on Mesozoic Terrestrial Ecosystems; F. Pym, University of Exeter, UK for the XXI INQUA Congress 2023; M.A. Saparin, Universiti Teknologi PETRONAS, Malaysia for the 2nd Asian Palaeontological Congress; M. Slodownik, University of Adelaide, Australia for Palaeo Down Under 3; N. Stephenson, University of Cambridge, UK for Palaeo Down Under 3; and F. Wenger, University of Saskatchewan, Canada for the V Simposio Latinoamericano de Icnología. The Association's support enabled the worldwide dissemination of research to the benefit of the global palaeontological community.

2.2 Publications: During 2023, Volume **66** of *Palaeontology* (42 papers) and Volume **9** of *Papers in Palaeontology* (55 papers) were published. Both journals are currently hybrid, but 57% of *Palaeontology* articles were published Open Access, and 51% of *Papers in Palaeontology*.

2.3 Support for research: In 2023 the Association agreed to fund the research activities of 17 earlycareer researchers and undergraduates. Apart from directly benefiting the career development of the individuals concerned, the Association's funds continue to enable more palaeontological research to be undertaken worldwide than would otherwise be the case. Compared to 2022, application numbers for the Research Grants were lower (nine applications (seven eligible); two awarded; 22% success rate). The applications to the Small Grants Scheme increased (from ten to 15), with seven awarded, and the success rate consequently was 47%. In 2023 three Career Development Grants were awarded from a total of eight applications. Applications to the Undergraduate Research Bursary Scheme decreased slightly in 2023 compared to 2022 (from 12 to nine applications) with a success rate of 56%.

2.4 Mentor scheme for early career palaeontologists: In 2017 the Association established a mentoring scheme. Priority areas were identified and in the first instance the focus was on the transition from postdoctoral positions to permanent jobs, but the scheme was expanded in 2020 to also cover postgraduate researchers studying for a PhD. In 2022-23 a total of 20 palaeontologists in permanent positions offered to act as mentors and, to date, 40 early-career palaeontologists have either been enrolled, or have taken part, in the scheme (25 currently). The Association mentoring scheme is via direct mentoring, via e-mail, video calls or other forms of communication, with the scheduling and nature of these meetings at the discretion of the paired mentor/mentee.

2.5 Outreach, education and public engagement: During 2023, the Association provided £3,000 to support for the Yorkshire Fossil Festival. The Association's X (formerly Twitter) and Facebook



accounts continue to enable engagement with wider audiences, and rapid dissemination of news about research, events and palaeontology outside the academic world. The Association's YouTube channel (accessible at <https://www.youtube.com/thepalaeontologicalassociation>) hosts videos for a general audience as well as recordings of talks from 2023's PalAss Exceptional Lecturer. At the end of 2023 members of the Association Facebook group numbered 2,607 and the Facebook page had 1,267 followers. The Association's X account had 11,684 followers.

3. FINANCIAL REVIEW

3.1 Reserves: As of 31st December 2023, the Association holds reserves of £860,749 in General Funds, which enable the Association to generate additional revenue through investments, and thus to keep subscriptions for individuals at a low level, whilst still permitting a full programme of meetings to be held, publications to be produced, and the award of research grants and Grantsin-aid. They also act as a buffer to enable the normal programme to be followed in years in which expenditure exceeds income, and allow new initiatives to be pursued. The Association holds £112,344 in Designated Funds, which contribute interest towards the funding of the Sylvester-Bradley, Hodson, Callomon, Whittington and Stan Wood Awards and towards the Jones-Fenleigh Fund. Total funds carried forward to 2023 totalled £973,093.

3.2 Reserves policy: The Association maintains a minimum of General Fund reserves at a level sufficient to fund at least one year's expenditure, based on a three-year average of expenditure, in addition to Designated Fund reserves. This policy is reviewed and approved annually by the Trustees.

3.3 Summary of expenditure: Total charitable expenditure, through grants to support research, scientific meetings and workshops in 2023, was £421,432. Governance costs were £19,069. Total resources expended were £484,820. The Association continues its membership of the International Palaeontological Association and remains a Tier 1 sponsor of *Palaeontologia Electronica*, and the *Treatise on Invertebrate Paleontology*.

4. STRUCTURE, GOVERNANCE AND MANAGEMENT

4.1 Nature of the governing document: The Palaeontological Association was originally formed on 27th February 1957 as an unincorporated association, which was established as a registered charity (number 276369) on 21st August 1978. At an Extraordinary General Meeting on 16th March 2016, the membership voted in favour of the Association becoming a charitable incorporated organization (CIO) under the Charities Act 2011. All contracts and assets were transferred to the new organization on 1st January 2017. As a CIO the charity is an independent legal entity and, in the unlikely event of its being wound up, the members (including the Trustees) will have no liability for any outstanding contractual debts that the CIO cannot meet. However, the Trustees will continue to have the normal trustee liability for negligence or fraudulence in managing the charity's affairs. The charitable objectives of the Association number (1168330) and constitution since 2017. The governing document of the Palaeontological Association is the Constitution adopted at the AGM on 17th December 2020.

4.2 Management: The Association is managed by a Council of up to 20 Trustees, which is led by the President. The Association employs an Executive Officer and a Publications Officer who serve



on Council but are not Trustees. The Trustees are elected by vote of the Membership at the Annual General Meeting, following guidelines laid down in the Constitution.

4.3 Membership: Membership on 31st December 2023 totalled 1,049. Of these, there were 538 Ordinary Members, 173 Retired Members, 15 Honorary Members and 323 Student Members.

4.4 Risk. The Trustees consider that the Association is in a sound financial position. Membership numbers and revenues from publications remain strong. The Trustees highlight the changing publications landscape; this will affect the Association's publication revenue in the future, and may require a reduction in future spending to compensate for the loss of income be considered. The Trustees and the Risk Management committee continue to regularly assess the Association's risks.

5. REFERENCE AND ADMINISTRATION

5.1 Name and Charity Number: The Palaeontological Association is a Charity registered in England and Wales, Charity Number 1168330.

5.2 Address: The contact address of the Association is The Palaeontological Association, Alport House, 35 Old Elvet, Durham, DH1 3HN, UK.

5.3 Trustees: The following members were elected at the AGM on 21st December 2022 to serve as Trustees in 2023: R.A. Wood (President); P.M. Barrett (Vice President); U. Balthasar (Vice President); A.R.T. Spencer (Secretary); M. Sakamoto (Treasurer); P. Taylor (Editor-in-Chief); S.C.R. Maidment (Editor Trustee); E. Kustatscher (Editor Trustee); E. Jarochowska (Newsletter Editor); T. Clements (Reviews Editor); N. Vuolo (Publicity); E. Dowding (Outreach Officer); R.J. Garwood (Internet Officer);
S. Wheatley (Deputy Internet Officer); R.S. Sansom (Meetings Coordinator); F. Saleh (Diversity Officer);
O. Bath Enright (ECR Officer); H.B. Drage (Ordinary Member); and R. Theodore (Ordinary Member).

5.4 Professional services: The Association's Bankers are NatWest, 42 High Street, Sheffield, S1 2GE, UK. The Association's Independent Examiner is Ms M.R. Corfield ACA ACMA, Corfield Accountancy Ltd., Myrick House, Hendomen, Montgomery, Powys, SY15 6EZ, UK. The Association's investment portfolio is managed by Quilter Cheviot Investment Management, Senator House, 85 Queen Victoria Street, London, EC4V 4AB, UK.

Approved by order of the Board of Trustees on 9th July 2024.



Independent Examiner's Report to the Trustees of The Palaeontological Association

Independent examiner's report to the Trustees of The Palaeontological Association ('the Charity') I report to the Charity Trustees on my examination of the accounts of the above charity for the year ended 31 December 2023 set out on pages 15 to 23.

This report is made solely to the Charity's Trustees, as a body, in accordance with Section 145 of the Charities Act 2011. My work has been undertaken so that I might state to the Charity's Trustees those matters I am required to state to them in an Independent Examiner's report and for no other purpose. To the fullest extent permitted by law, I do not accept or assume responsibility to anyone other than the Charity and the Charity's Trustees as a body, for my work or for this report.

Responsibilities and basis of report

As the Charity's Trustees, you are responsible for the preparation of the accounts in accordance with the requirements of the Charities Act 2011 ("the Act"). You are satisfied that the accounts of the Charity are not required by charity law to be audited and have chosen instead to have an independent examination.

I report in respect of my examination of the charity's accounts as carried out under section 145 of the Charities Act 2011 ('the 2011 Act'). In carrying out my examination I have followed the Directions given by the Charity Commission under section 145(5) (b) of the 2011 Act.

Independent examiner's statement

Since your charity's gross income exceeded £250,000 your examiner must be a member of a listed body. I can confirm that I am qualified to undertake the examination because I am a member of the Institute of Chartered Accountants in England and Wales (ICAEW) and the Chartered Institute of Management Accountants (CIMA), which are two of the listed bodies.

I have completed my examination. I confirm that no matters have come to my attention in connection with the examination giving me cause to believe:

- 1. accounting records were not kept in respect of the Charity as required by section 130 of the 2011 Act; or
- 2. the accounts do not accord with those records; or
- 3. the accounts do not comply with the applicable requirements concerning the form and content of accounts set out in the Charities (Accounts and Reports) Regulations 2008 other than any requirement that the accounts give a true and fair view which is not a matter considered as part of an Independent Examination.

I have no concerns and have come across no other matters in connection with the examination to which attention should be drawn in this report in order to enable a proper understanding of the accounts to be reached.

Ms M. R. Corfield ACA ACMA Corfield Accountancy Limited Chartered Accountants Myrick House Hendomen Montgomery Powys SY15 6EZ

Date: 26th May 2024.

Statement of Financial Activities for the Year Ended 31 December 2023

	Notes	Unrestricted funds £	Designated funds £	31.12.23 Total funds £	31.12.22 Total funds £
Donations and legacies		37,418	5,417	42,835	34,313
Charitable activities Public Meetings Publications		63,689 342,341		63,689 342,341	32,114 312,910
Investment income	2	12,730	3,376	16,106	15,134
Total		456,178	8,793	464,971	<u>394,471</u>
EXPENDITURE ON					
Raising funds	3	44,319	_	44,319	50,400
Charitable activities					
Public Meetings		84,166	—	84,166	65,200
Grants & Awards		50,736	16,536	67,272	73,237
Administration		64,412	—	64,412	73,211
Publications		205,582	—	205,582	204,630
Governance Costs		19,069		19,069	20,615
Total		468,284	16,536	484,820	487,293
Net gains (losses) on investments		64,001		64,001	(93,808)
NET INCOME/(EXPENDITURE)		51,895	(7,743)	44,152	(186,630)
RECONCILIATION OF FUNDS					
Total funds brought forward		808,854	120,087	928,941	<u>1,115,571</u>
TOTAL FUNDS CARRIED FORWARD		860,749	112,344	973,093	928,941

The notes form part of these financial statements.



Balance Sheet 31 December 2023

		Unrestricted	Designated	31.12.23 Total	31.12.22 Total
		funds	funds	funds	funds
	Notes	£	£	£	£
FIXED ASSETS					
Investments	6	613,515	112,344	725,939	695,862
CURRENT ASSETS					
Debtors	7	208,121	—	208,121	188,416
Cash at bank		49,264		49,264	54,811
		257,385	_	257,385	243,227
CREDITORS					
Amounts falling due within one year	8	(10,231)		<u>(10,231)</u>	<u>(10,148)</u>
NET CURRENT ASSETS		247,154		247,154	233,079
TOTAL ASSETS LESS CURRENT LIABILIT	IES	860,749	112,344	<u>973,093</u>	928,941
NET ASSETS		860,749	112,344	973,093	928,941
FUNDS					
Unrestricted funds	9			973,093	928,941
TOTAL FUNDS				973,093	928,941

The notes form part of these financial statements.

The financial statements were approved by the Board of Trustees and authorized for issue on 9th July 2024, and were signed on its behalf by Dr M. Sakamoto – Trustee.

Notes to the Financial Statements for the Year Ended 31 December 2023

1. ACCOUNTING POLICIES

Basis of preparing the financial statements

The financial statements have been prepared in accordance with the Charities SORP (FRS 102) 'Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) (effective 1 January 2019)', Financial Reporting Standard 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland' and the Charities Act 2011.

The Palaeontological Association meets the definition of a public benefit entity under FRS102. Assets and liabilities are initially recognized at historical cost or transaction value unless otherwise stated in the relevant accounting policy.

Income

The charity's income principally comprises subscriptions from individuals and institutions which relate to the period under review, and sales of scientific publications.

All income is recognized in the Statement of Financial Activities once the charity has entitlement to the funds, it is probable that the income will be received and the amount can be measured reliably.

Expenditure

Liabilities are recognized as expenditure as soon as there is a legal or constructive obligation committing the charity to that expenditure, it is probable that a transfer of economic benefits will be required in settlement and the amount of the obligation can be measured reliably. Expenditure is accounted for on an accruals basis and has been classified under headings that aggregate all cost related to the category. Where costs cannot be directly attributed to particular headings they have been allocated to activities on a basis consistent with the use of resources.

Allocation and apportionment of costs

Administrative costs have been allocated to the various cost headings based on estimates of the time and costs spent thereon.

Taxation

The charity is exempt from corporation tax on its charitable activities.

Fund accounting

General Funds are unrestricted funds which are available for use at the discretion of Council in furtherance of the general objectives of the charity and which have not been designated for other purposes.



Notes to the Financial Statements – *continued* for the Year Ended 31 December 2023

1. ACCOUNTING POLICIES - continued

Designated funds comprise unrestricted funds that have been set aside by Council for particular purposes. The aim of each designated fund is as follows:

- Sylvester-Bradley Fund: Grants made to permit palaeontological research.
- Jones-Fenleigh Fund: Grants to permit one or more delegates annually to attend the Symposium of Vertebrate Palaeontology and Comparative Anatomy (SVPCA) meeting.
- Hodson Fund: Awards made in recognition of the palaeontological achievements of a researcher within ten years of the award of their PhD.
- Callomon Fund: Grants made to permit palaeontological research with a strong fieldwork element.
- Whittington Fund: Grants made to permit palaeontological research with an element of study in museum collections.
- Stan Wood Fund: Grants in the area of vertebrate palaeontology ideally involving fieldwork, due to generous donations in memory of the Scottish fossil collector Mr Stan Wood.

2. INVESTMENT INCOME

	31.12.23	31.12.22
	£	£
Deposit account interest	1,487	230
Investment Income	14,619	14,904
	16,106	15,134

3. RAISING FUNDS

	31.12.23	31.12.22
	£	£
Voluntary Income Costs: Administration	40,395	45,994
Investment Management Costs: Stockbroker Fees	3,924	4,406
	44,319	50,400

4. TRUSTEES' REMUNERATION AND BENEFITS

There were no Trustees' remuneration or other benefits for the year ended 31 December 2023 nor for the year ended 31 December 2022.

Trustees' expenses

The total travelling expenses reimbursed to 19 Members of Council (2022:20) was £3,763 (2022: £6,709).

Notes to the Financial Statements – *continued* for the Year Ended 31 December 2023

5. STAFF COSTS

Analysis of Staff Costs and Remuneration

	2023 (£)	2022 (£)
Salaries	110,517	101,301
Social Security Costs	7,741	7,115
Pension Costs	10,452	10,160
Total	128,710	118,576

The average monthly number of employees during the year was as follows:

	2023	2022
Publications	1	1
Administration	1	1
	2	2

No employees received emoluments in excess of £60,000.

6. FIXED ASSET INVESTMENTS

Investments are initially recognized at their transaction value and subsequently measured at their fair value as at the balance sheet date. The statement of financial activities includes the net gains and losses arising on revaluation and disposals throughout the year.

7. DEBTORS: AMOUNTS FALLING DUE WITHIN ONE YEAR

	31.12.23	31.12.22
	£	£
Sundry Debtors	208,121	188,416

8. CREDITORS: AMOUNTS FALLING DUE WITHIN ONE YEAR

	31.12.23	31.12.22
	£	£
Trade creditors	2,416	2,419
Subscriptions in advance	7,815	7,729
	10,231	10,148



Notes to the Financial Statements – *continued* for the Year Ended 31 December 2023

9. MOVEMENT IN FUNDS

		Net movement	
	At 1.1.23	in funds	At 31.12.23
	£	£	£
Unrestricted funds			
General fund	808,854	51,895	860,749
Sylvester-Bradley	7,202	(4,007)	3,195
Jones-Fenleigh	30,521	(2,097)	28,424
Hodson	114	3	117
Callomon	1,356	327	1,683
Whittington	15,038	(1,840)	13,198
Stan Wood	65,856	(129)	65,727
TOTAL FUNDS	928,941	44,152	973,093

Net movement in funds included in the above are as follows:

	Incoming resources	Resources expended	Gains and losses	Movement in funds
	£	£	£	£
Unrestricted funds				
General fund	456,178	(468,284)	64,001	51,895
Sylvester-Bradley	491	(4,498)	—	(4,007)
Jones-Fenleigh	4,620	(6,717)	—	(2,097)
Hodson	3	—	—	3
Callomon	327	—	—	327
Whittington	711	(2,551)	_	(1,840)
Stan Wood	2,641	(2,770)		(129)
TOTAL FUNDS	464,971	(484,820)	64,001	44,152

Notes to the Financial Statements – *continued* for the Year Ended 31 December 2023

9. MOVEMENT IN FUNDS — continued...

Comparatives for movement in funds:

	Net movement	
At 1.1.22	in funds	At 31.12.22
£	£	£
991,870	(183,016)	808,854
12,417	(5,215)	7,202
28,880	1,641	30,521
112	2	114
1,609	(253)	1,356
15,017	21	15,038
65,666	190	65,856
1,115,571	(186,630)	928,941
	At 1.1.22 £ 991,870 12,417 28,880 112 1,609 15,017 <u>65,666</u> <u>1,115,571</u>	Net movement At 1.1.22 in funds \pounds \pounds 991,870 (183,016) 12,417 (5,215) 28,880 1,641 112 2 1,609 (253) 15,017 21 65,666 190 1,115,571 (186,630)

Comparative net movement in funds included in the above are as follows:

	Incoming resources	Resources expended	Gains and losses	Movement in funds
	t	Ĺ	t	£
Unrestricted funds				
General fund	388,926	(478,134)	(93,808)	(183,016)
Sylvester-Bradley	461	(5,676)	—	(5,215)
Jones-Fenleigh	2,498	(857)	—	1,641
Hodson	2	_	_	2
Callomon	292	(545)	—	(253)
Whittington	502	(481)	—	21
Stan Wood	<u> 1,790 </u>	(1,600)		190
TOTAL FUNDS	394,471	(487,293)	(93,808)	(186,630)



Notes to the Financial Statements – *continued* for the Year Ended 31 December 2023

9. MOVEMENT IN FUNDS — continued...

A current year 12 months and prior year 12 months combined position is as follows:

		Net movement	
	At 1.1.22	in funds	At 31.12.23
	£	£	£
Unrestricted funds			
General fund	991,870	(131,121)	860,749
Sylvester-Bradley	12,417	(9,222)	3,195
Jones-Fenleigh	28,880	(456)	28,424
Hodson	112	5	117
Callomon	1,609	74	1,683
Whittington	15,017	(1,819)	13,198
Stan Wood	65,666	61	65,727
TOTAL FUNDS	1,115,571	(142,478)	973,093

A current year 12 months and prior year 12 months combined net movement in funds included in the above are as follows:

	Incoming resources £	Resources expended £	Gains and losses £	Movement in funds £
Unrestricted funds				
General fund	845,104	(946,418)	(29,807)	(131,121)
Sylvester-Bradley	952	(10,174)	_	(9,222)
Jones-Fenleigh	7,118	(7,574)	_	(456)
Hodson	5	_	_	5
Callomon	619	(545)	_	74
Whittington	1,213	(3,302)	_	(1,819)
Stan Wood	4,431	(4,370)		61
TOTAL FUNDS	859,442	(972,113)	(29,807)	(142,478)

Notes to the Financial Statements – *continued* for the Year Ended 31 December 2023

10. RELATED PARTY DISCLOSURES

There were no related party transactions for the year ended 31 December 2023.

11. INVESTMENT GAINS AND LOSSES

All gains and losses are taken to the Statement of Financial Activities as they arise. Realized gains and losses on investments are calculated as the difference between sales proceeds and their opening carrying value or their purchase value if acquired subsequent to the first day of the financial year.

Unrealized gains and losses are calculated as the difference between the fair value at the year end and their carrying value. Realized and unrealized investment gains and losses are combined in the Statement of Financial Activities.

Investment Gains/Losses	31st December 2023	31st December 2022
	£	£
Realized Gain/(Loss)	402	_
Unrealized Gain/(Loss)	63,599	(93,808)
Total per Statement of Financial Activities	64,001	(93,808)

12. INVESTMENT PORTFOLIO 2023

In July 2020 the Association's investments held with Quilter Cheviot Ltd were transferred to their Global Income and Growth Fund for Charities launched early in 2020. The funds held by Quilter Cheviot represent approximately 60% of the Association's investment portfolio. The remaining 40% of invested assets are with CCLA Investment Management and of these approximately 20% are held in a COIF Charities Fixed Interest Fund and the remaining 80% were transferred in July 2021 to their COIF Charities Ethical Investment Fund. The combined portfolio movements are shown below:

Opening Balance at 01/01/2023:	£695,861.66
Purchases:	—.—
Sales:	(£30,000)
Gains/(Losses):	£64,001.02
Stockbroker Fees:	(£3,924)
Closing balance at 31/12/2023:	£725,938.68



Detailed Statement of Financial Activities for the Year Ended 31 December 2023

	31.12.23	31.12.22
	Unrestricted funds	Total funds
	£	£
INCOME AND ENDOWMENTS		
Donations and legacies		
Donations	12,301	7,205
Subscriptions	30,534	27,108
	42,835	34,313
Investment income		
Deposit account interest	1.487	230
Investment Income	14,619	14,904
	16,106	15,134
Charitable activities	,	,
Scientific Journals	335 438	306 984
Special Papers	447	712
Field Guides	5 979	4 885
Distribution	487	329
Scientific Meetings	63 680	32 114
Scientific Meetings	406.020	245.024
Total in coming recourses	400,050	345,024
Total incoming resources	404,971	594,471
EXPENDITURE		
Raising donations and legacies		
Administration	40 395	45 994
Investment management costs	10,000	10,001
Stockbroker Fees	3 974	4 406
Charitable activities	5,521	1,100
Scientific Journals	37 000	53 138
Nowslattars	27,909	15 260
Marketing	1 226	1 705
Markeling Dublication Costs	1,520	1,705
Fublication Costs	95,159	04,412
Euronal Costs	48,5/9	50,115
Public Meetings & Costs	84,166	65,200
Grants & Awards	43,500	48,527
Research Grants	23,//2	24,/10
Administration	64,412	73,211
	421,432	416,278
Support costs		
Governance costs		
Trustees' expenses	3,763	6,709
Accountancy and legal fees	595	595
Administration	11,711	13,311
Consultancy	3,000	
	19,069	20,615
Total resources expended	484,820	487,293
Net income before gains and losses	(19,849)	(92,822)
Recognized gains and losses		
Recognized gains/(losses) on fixed asset investments	64,001	(93,808)
Net income	44,152	<u>(186,630)</u>

This page does not form part of the statutory financial statements.

Nominations for Council

At the upcoming AGM in December 2024, the following vacancies will occur on Council:

- Vice-President (two-year term)
- Editor-in-Chief (three-year term)
- Publicity Officer (three-year term)

Nominations are now invited for these posts. Please note that each candidate must be proposed by at least two members of the Association and that any individual may not propose more than two candidates. Each nomination must be accompanied by the candidate's written agreement to stand for election, and a short personal statement (less than 200 words) describing their interests for publication in the *Newsletter*, and a completed Professional Standards and Behaviour Self-Declaration form filled in by the candidate. Full details of the nomination procedure and form to download can be found online <hr/>https://www.palass.org/association/how-stand-election-council>.

All potential Council Members are asked to consider the following: since the Palaeontological Association is a Registered Charity, in the eyes of the law most Council Members become a Trustee of that Charity. Under the terms of the Charities Act 2011, Trustees have independent control over, and legal responsibility for, a charity's management and administration. Further information on the responsibilities of Trustees can be obtained from the Charity Commission for England and Wales.

The closing date for nominations is **1st September 2024**. They should be sent in PDF format to the Secretary, by e-mail to <**secretary@palass.org**>.

Council vacancies: 'job descriptions':

Vice-President (x1 vacancy; two-year term)

The Vice-President is one of the more loosely defined Council offices. Vice-Presidents are normally long-serving Council members who have previously held one of the other offices. They have no formal portfolio or duties other than to deputize for the President if and when required, but are present on Council to provide independent input on all matters, backed up by experience arising from their long service. They are also expected to lead or at least participate in important subcommittees, particularly those tasked with making recommendations for the awards of grants.

Editor-in-Chief (x1 vacancy; three-year term)

The Editor-in-Chief's primary roles are to:

- oversee the production of the Association's publications and provide vision and leadership for their future development; act as line manager for the Publications Officer and set priorities and goals for the journals.
- select and invite members onto the Editorial Board to ensure that gender balance, geographical coverage and disciplinary representation are achieved.
- vet the quality of papers being accepted for publication in *Palaeontology* and *Papers in Palaeontology*; act as a member of the Editorial Board in the preliminary sift of all papers submitted. Assign papers of suitable quality to a science editor and write rejection letters to the rest.



- vet the recommendations made by the Editorial Board with respect to whether papers are fit and ready for publication in light of referees' reports received. Make a final decision.
- fire-fight any issues arising from the publication process (*e.g.* disgruntled authors, referees or readers).
- line manages the Publications Officer.

In addition they may carry out many secondary roles, such as to:

- carry out a final check of all papers accepted to catch grammatical errors prior to typesetting.
- have oversight of the *Field Guides to Fossils* series (each has its own editors to steer through to production, so input required is minimal).
- identify key topics and seek submission of high-quality review papers from potential authors.
- chair and organize the selection of Best Paper Awards for each journal.

Publicity Officer (x1 vacancy; three-year term)

Together the Publicity Officer, Outreach Officer and Education Officer comprise the Public Engagement Group (PEG). These posts have responsibility for the Palaeontological Association outreach activities. Currently they include organizing the Association's presence at Lyme Regis Fossil Festival and the Yorkshire Fossil Festival, co-ordinating the Engagement Grants, answering relevant enquiries, and initiating other activities that promote and develop palaeontological outreach and education for the Association. The members of PEG work closely together and their roles often overlap; responsibilities particularly associated with the Publicity Officer post, include leading the Association's publicity and promotion via social media and other outlets.

Upcoming Awards and Prizes in 2024

The Palaeontological Association recognizes excellence in our profession by the award of medals and other prizes. The Association sees its lists of medals and award winners as a record of the very best palaeontologists worldwide, at different career stages, and offering different kinds of contributions to the field. The Association stresses the importance of nominations and encourages all members to make nominations. Members considering making nominations should first read the Palaeontological Association 'Statement of Diversity':

Statement of Diversity

The Palaeontological Association has an *Unconscious Bias* document, the recommendations of which will be adhered to at all times. All decision-making for Palaeontological Association awards and prizes will be carried out objectively and professionally. The Association is committed to making award and prize decisions purely on the basis of the merit of the individual(s). No nominee for awards or prizes will receive less favourable treatment on the grounds of: gender, marital status, sexual orientation, gender re-assignment, race, colour, nationality, ethnicity or national origins, religion or similar philosophical belief, spent criminal conviction, age or disability. Equally, all nominations will be assessed on equal terms, regardless of the gender, age and/or ethnicity of the nominee. Nominations will therefore be assessed and graded on their merits, in accordance with the criteria and the aims and objectives set for each award or medal. Due consideration will

be given to any period away from science due to parental leave, illness and any other such career break. Nominators are reminded that neutral language (*e.g.* gender neutral) should be used in all nominations.

The Palaeontological Association acknowledges the existence of various academic career paths and recognizes the challenges associated with balancing an academic career alongside personal commitments. When assessing applicants' eligibility and experience, the Association will take into account periods spent outside the academic environment. These periods may be the result of ill health, parental and/or adoptive leave, caring responsibilities, career breaks, *etc.* (note that this list is not exhaustive). Applicants who have taken periods outside the academic environment are strongly encouraged to include this information in any grant/award application. Furthermore, individuals with any disabilities are strongly encouraged to highlight these aspects in their applications. In the event that these factors apply to an applicant, even if no work leave was taken, we strongly advise that applicants make these factors known during the application process as we are aware that such factors can significantly slow down past and ongoing academic careers.

In the case of awards granted through the nomination schemes, we ask that nominators bring attention to these aspects if they are aware of them. In the event that the nominators are unsure, they are strongly advised to contact the Diversity Officer (e-mail <**diversity@palass.org**>), who can approach the nominee directly and enquire whether they would like to disclose any career breaks or other relevant factors that should be taken into consideration during the evaluation of the award. The Diversity Officer can be contacted at any time for advice and assistance.

Annual Meeting President's Prize and Council Poster Prize

The President's Prize is awarded for the best talks and the Council Poster Prize is awarded for the best posters at the Annual Meeting. All student members of the Palaeontological Association, and all members of the Association who are early-career researchers within one year of the award of a higher degree (PhD or MSc), excluding periods of parental or other leave, are eligible for consideration for these awards. Individuals may nominate themselves for consideration when submitting abstracts for the Meeting. The prizes are announced immediately after the oral sessions at the end of the Annual Meeting. Winners will receive an official certificate and free membership of the Association for one year.

Best Paper Awards

The aim of these awards is to recognize papers published in *Palaeontology* or *Papers in Palaeontology* and reward excellence in our field of science. The selection criteria are as follows: scientific breadth and impact; novelty of approach; and quality of writing and illustration. The awards are open to all authors irrespective of age and nationality; membership of the Association is not required. Frontiers reviews, rapid communications and regular research articles are all eligible. The selection procedure is that a list of all papers published in the year is drawn up (when papers for the final part are allocated) and circulated around the science editors. The science editors are asked to nominate any papers that stand out, providing two to three sentences explaining why



they are deserving. The Editor-in-Chief then draws up a shortlist of no more than five papers with supporting statements to circulate to the Editorial Board. The Editorial Board then selects winners by vote. Corresponding authors of winning papers will be offered 'Gold open access' paid for by the Association for one nominated paper submitted to *Palaeontology* or *Papers in Palaeontology* within the following 18 months (and subsequently accepted). In the case of joint authorship papers, the corresponding author can, by agreement, transfer the prize to one of the co-authors. The Editor-in-Chief will contact the winning authors and write a short synopsis for the *Newsletter*. An announcement of the awards will normally be made at the AGM.

Undergraduate Prize Scheme

The Undergraduate Prize Scheme annually invites all university departments where a palaeontology course or module is taught after the first year as part of a degree programme to recommend one of their undergraduate students to receive this award. The award consists of a certificate and free membership of the Association for the rest of the year in question, plus the following calendar year. It provides electronic access to both of our journals, postal copies of the *Newsletter*, and all the other advantages of membership. Receipt of the award also looks good on a recipient's CV.

Departments may use any criterion for selection, though most prefer to use the scheme as an acknowledgement of best performance in a relevant exam or project. Only one nomination will be accepted from any one institution in each calendar year. The nominee must be an undergraduate student, not a postgraduate, when they are selected. Normally the award is made to a student in their penultimate year of study, but a final-year candidate may be chosen if this is deemed more appropriate for the department in question.

Contact **<executive@palass.org**> with the nomination (name and e-mail address) and we will arrange to sign up the student as a member and send them a certificate. There is no deadline for this award and it is open to universities anywhere in the world.

Innovations in Palaeontology Lecture Series and the PalAss Exceptional Lecturer

The Innovations in Palaeontology Lecture Series, to be given by the PalAss Exceptional Lecturer, aims to promote palaeontology to the wider academic community and to recognize excellence in research among palaeontologists. The PalAss Exceptional Lecturer is selected in a competitive process. This scheme aims to:

- improve the dissemination of cutting-edge palaeontological research to the broader academic community;
- raise the profile of palaeontology within the Earth sciences and related fields;
- recognize outstanding research and science communication in palaeontology among members of the Association.

Format of the scheme:

- One PalAss Exceptional Lecturer will be selected each year in a competitive process.
- The PalAss Exceptional Lecturer will be expected to give five lectures at five different institutions over a nine-month period, both in person and online/virtual.

- In addition, the Exceptional Lecturer will deliver the Innovations in Palaeontology lecture at the Annual Meeting (or a similar event), which may be live-streamed on the Association's YouTube channel or similar.
- The successful applicant will receive the Innovations in Palaeontology Lecture Series Grant, which will be administered by the home institution of the PalAss Exceptional Lecturer.
- The Grant may only be used to pay the reasonable travel costs incurred by the PalAss Exceptional Lecturer to visit each of the host institutions (up to £2,000 for the total Innovations in Palaeontology Lecture Series with a maximum of £500 for any individual lecture). The host institutions will cover costs for accommodation (where necessary) and hospitality.
- Any academic institution (universities and/or museums) from any country can apply to participate in the Innovations in Palaeontology Lecture Series as a host institution.
- Any unused funds must be returned to PalAss after delivery of the final lecture. Should the PalAss Exceptional Lecturer move institutions within the timeframe of the lecture series, any unspent funds must remain available to the PalAss Exceptional Lecturer.
- Host institutions will be selected by the Exceptional Lecturer and the Association with the goal of maximizing the scheme's impact.

Eligibility and selection process of the PalAss Exceptional Lecturer:

- Eligible candidates will have a PhD in palaeontology or a related field.
- Eligible candidates can demonstrate (for example through their publication record) significant innovative scientific work in palaeontology.
- Applicants can reside in any country, but must be members of the Association.
- Candidates must self-nominate.
- To self-nominate, a two-page CV, full list of publications, and statement of motivation (max. 300 words) must be submitted via the Association's webpage as a single PDF file (max. 8 MB). In addition, a 60 second video summary (in MP4 format; max. size 30 MB) of a proposed seminar topic must be submitted via the Association's webpage.
- To self-nominate, candidates must provide via our online submission form a brief abstract (max. 300 words) and title for their proposed lecture which outline the subject matter of the proposed lecture and how it communicates innovation in palaeontology as a science that is of interest to related academic disciplines; a brief summary of their educational history; and a list of up to five of their publications that are relevant to the proposed lecture.
- After review of the submissions, short-listed applicants will be invited to present a five-minute lightning talk to the Association's Exceptional Lecturer committee to demonstrate their ability to communicate their chosen topic in an engaging manner and to clearly articulate how this topic is innovative and of broad interest to one or more related discipline(s).

Selection of host institutions:

- Institutions interested in participating in the Innovations in Palaeontology Lecture Series should apply via the PalAss webpage and suggest a timeframe within which the lecture should be given.
- The PalAss Exceptional Lecturer will receive the list of potential host institutions after the 1st May deadline, and will choose their preferred hosts and liaise directly with them. Applications after 1st May will be considered depending on the remaining availability.



Expectations for host institutions:

- Each lecture must be widely advertised across the host institution. We particularly encourage advertisement of the Innovations in Palaeontology Lecture Series on social media.
- Host institutions are expected to pay for hospitality and offer a meal in a social environment to the PalAss Exceptional Lecturer.
- If the PalAss Exceptional Lecturer has to travel more than three hours to the host institution or cannot return home at a reasonable time, the host institution must offer at least one night of accommodation.

Deadlines each year:

• 15th November 23:59 GMT: Deadline for nominations for the PalAss Exceptional Lecturer.

• December:	The PalAss Exceptional Lecturer will be announced at the Annual General Meeting.
• March:	The call for host institutions to participate in the Innovations in Palaeontology Lecture Series will be published in the <i>Newsletter</i> .
• 1st May 23:59 GMT:	Deadline for applications from host institutions.
 September – May: 	Delivery of lectures.

Application:

Applications are via online forms. See <https://www.palass.org/awards-grants/awards/ innovations-palaeontology-lecture-series-and-palass-exceptional-lecturer>.

Upcoming Grants in 2024

Palaeontological Association grants are offered to encourage research, education and outreach through different means. Undergraduates, early-stage researchers, and otherwise unfunded persons are given special encouragement to apply. All of these awards and grants are core to the charitable aims of the Palaeontological Association. A full list of the Association's grants may be found on the Association's website (<htps://www.palass.org/awards-grants>). Those with deadlines in the next six months or run throughout the year are detailed below.

Grants-in-aid: meetings, workshops and short courses

The Association is happy to receive applications for grants from the organizers of scientific meetings, workshops and short courses that lie conformably with its charitable purpose, which is to promote research in palaeontology and its allied sciences.

The Association will, via the Grants-in-Aid programme, consider applications to financially support workshops to be held as part of the Annual Meeting and Progressive Palaeontology. There are further details on the next page.

General Regulations for all applications The Association will consider applications up to £2,000 GBP.

- Applications must be received by the deadline of either 1st March or 1st September each year.
- Application must be made in good time. The proposed event must commence no earlier than six months after the application round deadline applied to.
- All applications are to be made by the scientific organizer(s) of the meeting using the online application form at <https://palass.org/awards-grants/grants/grant-aid-application-form>.
- Applications will be considered by Council at either the May or the October Council Meeting each year.
- Applicants will normally be informed of the application outcome by the end of May or October (*i.e.* 2-3 weeks after the May or October Council meeting).
- If the application is successful, we require that the support of the Association is acknowledged, preferably including reproduction of the Association's logo, in the meeting/workshop/short course literature and other media.
- Any monies granted must only be used for the specified purposes stated in the original grant application. Should circumstances change and the monies cannot be used then it is expected that all unspent amount is returned to the Association.
- Retrospective changes to grant applications, *i.e.* after the proposed event, are not allowed.
- In the event of unforeseen changes in circumstances prior to the start of the proposed event (*e.g.* due to the current COVID pandemic, illness of keynote speakers, *etc.*) advice should be sought from the Association's Executive Officer and/or the Secretary.

Please see also the Palaeontological Association Grant Ethics and Conditions:

<https://www.palass.org/awards-grants/grants/grant-ethics-and-conditions>.

Pre-submission enquiries may be made to the Secretary (e-mail <secretary@palass.org>).

Financial support via the Grants-in-Aid programme for workshops at the Annual Meeting and Progressive Palaeontology

Workshops have been an important part of both the Annual Meeting and Progressive Palaeontology in recent years. These have typically been held the day before each meeting. The workshops are arranged in consultation with the local meeting organizer; the local organizer has the final decision as to how many and which events to select for inclusion in any workshop programme. It may (subject to the local organizer being able to facilitate it) be possible to arrange a hybrid event. Our preference, however, is to run the workshop as either an in-person or a virtual event. We especially welcome suggestions for workshops that help the Association advance its commitments to EDI-related issues.

We invite those organizing workshops at either the Annual Meeting or Progressive Palaeontology to apply for competitive funding via the Grants-in-Aid programme to help offset costs (*e.g.* travel, accommodation) incurred by those delivering the workshop, and/or to provide an honorarium (to a maximum of £250 GBP) for contributors. An honorarium may be appropriate to support ECRs/ precariously-employed workers, others not in full-time, permanent employment, or where the contributions are by subject specialists on topics that do not necessarily form part of their core research activities. These examples are not exhaustive.

Before applying for funding, please liaise with the local meeting organizer and secure their support for the proposed activities. You should confirm in your application that this support is in place.



This is to avoid potential issues such as there not being the infrastructure available locally (rooms, *etc.*), or time in the schedule, to accommodate the workshop.

The Association may support a maximum of two workshops at each of the Annual Meeting and Progressive Palaeontology.

Making an application for meeting or workshop/short course support

Applications must be made through online submission, for which you will need the following information:

- Title of meeting / workshop / short course
- · Date and Place of proposed event
- Name, position and affiliation of the organizer(s)
- Brief description (not more than ten lines) of the rationale behind the meeting / workshop / short course
- · Anticipated number of attendees
- Amount requested
- Other sources of funding applied for
- · Specific use to which requested funds will be put

Note 1: If funds are requested to support one or more keynote speakers, then full details of their names, affiliations and titles of presentations must be included.

Note 2: The application will be strengthened if the keynote speaker(s) agrees to submit their paper as a review article for possible publication in *Palaeontology* or *Papers in Palaeontology*.

Deadlines are **1st March** (for events commencing on or after 1st September in the same year) and **1st September** (for events commencing on or after 1st March the following year).

Postgraduate Travel Fund

Financial assistance is offered to postgraduate students who are members of the Association to attend international meetings that are not directly supported by the Association through the Grantsin-Aid scheme. A list of directly-sponsored meetings is given below. The funding is only intended for conferences that are explicitly scientific in nature.

Terms and Conditions

Please read the following notes before applying:

- 1. The award is specifically for travel.
- 2. Applicants must be delivering a presentation (poster or oral) that falls within the scope of the Association's charitable aims.
- 3. The maximum amount awarded will be £200 GBP.
- 4. Successful awards will be paid retrospectively on the submission of receipts for reasonable travel costs.
- 5. Applications must be made online no later than two months prior to the beginning of the conference.
- 6. The total fund and number of awards will be at the discretion of Council.
- 7. Only one travel grant will be awarded per applicant per year, but subsequent applications can be made.

- 8. Applications are to be made through the Association website, and should include the personal details of the applicant and their career stage, the title of the accepted abstract, and details of other funding obtained towards the cost of the meeting. Two letters must also be attached, in a PDF document: a letter of confirmation from the meeting convenor which states the acceptance of the applicant's abstract, and a short status-confirming letter from the applicant's supervisor.
- 9. Funding from the Association must be acknowledged on your poster or in your presentation.

Directly-sponsored meetings (NOT eligible for the Postgraduate Travel Fund):

- The Palaeontological Association's Annual Meetings.
- Progressive Palaeontology.
- Lyell Meetings.
- Any other meetings that have been awarded funds to support student attendance from the Association's Grants-in-Aid scheme.

There is **no deadline** for this fund. Enquiries should be made to the Meetings Coordinator (e-mail <**meetings@palass.org**>).

Palaeontological Association Carer's Bursary

Bursaries are made to support attendance at Association meetings by researchers with caring responsibilities. Normally the budget for an individual bursary will be a maximum of £250 GBP. Applications must include a supporting statement and a breakdown of anticipated expenses, supported by quotes where possible. Appropriate costs include attendance of a carer or use of local childcare facilities (for care of accompanying young children), or other caring costs at home.

Bursaries will be awarded to applications received prior to the application deadline. Applications will be assessed by the PalAss Diversity Group; if there are several eligible applicants, awards will be made on a first-come first-served basis. No subsequent report on expenditure is required.

Successful applicants will be invited to submit a brief statement (<60 words) describing the impact of the bursary on their career. This statement may be used in publicity for the bursary scheme and thus should not contain any confidential or sensitive information.

The principal applicant must be a member of the Association. Applications must be submitted electronically via the Association website. Any associated publicity must mention the support of the Association.

Successful awards will be paid retrospectively on the submission of receipts for reasonable costs (*e.g.* economy air fares or train tickets, accommodation, subsistence, care costs).

Required supporting information:

- A cover letter detailing the case for support (no more than one A4 page)
- Receipts or quotations for expenses
- · Details of any pending or previous applications for funds

These documents must be submitted in a single PDF file.

The deadline for the Annual Meeting 2024 is 8th November.



Engagement Grants

Awards are made to encourage educational outreach, public engagement, and related initiatives in palaeontological themes. Normally, the budget for an individual grant would be less than £5,000 GBP (or equivalent currency in the applicant's country at the time the funds are disbursed). In exceptional circumstances, a budget of up to £8,000 GBP for an individual application will be considered. Grants can support either stand-alone complete projects, or they can be 'proof of concept' case studies that have their own outcomes but that form the groundwork for a larger bid elsewhere. Applications from any country and applicants of any nationality are welcomed.

Applications for salary costs are permitted, providing a full justification is given, but if awarded all legal and financial liability will lie with the applicant (see: Categories of expenditure for which the Palaeontological Association does not provide support, below).

Other conditions:

- Proposals must fit with the charitable aims of the Association.
- Preference is given to applications for a single purpose (rather than top-ups of grants for existing projects). We particularly encourage applications with an innovative aspect, such as engaging with new media, and especially cases that will disseminate good practice. We also encourage applications aimed at supporting under-represented groups in palaeontology (see the Diversity Study for more details).
- If the principal applicant is a member of the Association they should be signed into the website when submitting the form. Applicants can contact the Executive Officer Dr Jo Hellawell (e-mail <**executive@palass.org**>) for further information regarding membership.
- Preference will normally be given to candidates who have not previously won an award. The application deadline is **1st September** and funds will normally be available from 1st November each year. The awards will be announced at the Annual General Meeting.

Proposals will be ranked on the following criteria:

- Fit to the charitable aims of the Association
- Imaginative quality, innovation, and likely spread and impact of the proposal
- · Feasibility, value for money and cost effectiveness
- · Track record of the investigator in engagement and education initiatives

At the end of the award period a final report (including receipted accounts) will be submitted for review by the Trustees or, where appropriate, external referees. Appropriate parts of the final report will be published in the Association *Newsletter*. Any publicity associated with the activity must mention the support of the Association.

Applications must be submitted electronically via the webpage. Feedback on unsuccessful applications will be provided upon request to the Secretary.

Categories of expenditure for which the Palaeontological Association does not provide support:

Applicants are advised that the Association does not offer funding for the following costs, and hence none of these items may be included in any budget proposal submitted to the Association.

- Core funding or overheads for institutions. The Association will fund the directly-incurred costs of the engagement/educational initiative but, as a charity, we expect the general running costs (*e.g.* indirect costs, estate costs, support services, directly allocated staff costs) to be otherwise covered. We will therefore not fund on a proportion of full economic costs (FEC) basis. Attention is drawn to paragraphs 3.31 to 3.37 of the Science and Innovation Investment Framework 2004–2014, HM Treasury (July 2004), which explains arrangements for the provision of overheads linked to charity funding to academic institutions.
- Individual items of equipment over £1,000 GBP, sites, buildings or other capital expenditure. Artwork and similar specially-commissioned outreach tools are not considered to be equipment, and will be considered for funding.
- A shortfall resulting from a withdrawal of or deficiency in public finance.
- Student tuition fees and summer research bursaries. If you would like to support a summer research project see the Undergraduate Research Bursaries for more detail.

The application deadline is **1st September** and funds will normally be available from 1st November each year. The awards will be announced at the Annual General Meeting. For more information please contact the Association's Outreach Officer (e-mail **<outreach@palass.org**>).

Small Grants Scheme

The Association offers multiple awards each year, in honour of four donors, to fund palaeontological research, travel and fieldwork; these are integrated together under the Small Grants Scheme. These grants are open to any member of the Association, although preference is given to students, early-career researchers, and members of the Association who are retired.

- Sylvester-Bradley Awards: Multiple awards of up to £1,500 each, for palaeontological research.
- Callomon Award: An award of up to £1,500 for a project which is normally field-based.
- Whittington Award: An award of up to £1,500 for a project which is normally based on museum collections.
- Stan Wood Award: An award of up to £1,500 for projects in vertebrate palaeontology, and ideally involving fieldwork and fossil collecting.

There is one online application form with a deadline of **1st November**. The successful applications will be reported at the December Council meeting, and at this meeting Council will decide on the allocation of the awards based upon the nature of the project made in the application. The awards will be announced at the AGM, and funds will normally be available from 1st January.

Successful applicants will be required to produce a final project report that will be published in the Palaeontological Association *Newsletter*, and are asked to consider the Association's meetings and publications as media for conveying the research results.

Further information, including eligibility criteria, and a full list of terms and conditions for the Small Grants Scheme can be found on the appropriate page of the Association's website. Enquiries may be made to the Secretary (e-mail <secretary@palass.org>).

The deadline is 1st November each year.



Career Development Grant

The Career Development Grant is to assist talented early-career researchers who have recently completed their PhD to strengthen their CVs to help them achieve a career in palaeontology (research or curation). The grant provides funding of up to £2,500, to be paid after submission of thesis and cessation of funding, for any purpose that would lead to the strengthening of the CV via completion of a measurable activity or output. Successful applicants will be notified in the December following the application deadline, with funding available for use from January of the calendar year following the deadline. Under normal circumstances, applicants must be able to take up the funding by April of the calendar year following the deadline.

The grantee is also automatically enrolled in the PalAss mentoring scheme and will be assigned a mentor by agreement.

Some examples of things that the grant could be used for include (but are not limited to):

- Help with living costs while turning a PhD chapter into a publication;
- Help with living costs while writing a fellowship or grant application;
- Further data collection that would allow a chapter to become publishable;
- · A training course that would lead to skills enhancement;
- A training or research internship in another research group.

The grant cannot be used to pay overheads, open access or page charges, and cannot be used to support employment of another *e.g.* a student research assistant. Applicants must be members of the Association, should be submitting their PhD in the near future or have recently submitted their PhD (within one year), and should have no other form of substantial financial support on cessation of PhD funding. Applicants who have been awarded a postdoc or fellowship after their PhD, or who have already held a postdoc or fellowship, are not eligible to apply. Upon completion of the activity, applicants are asked to write a short report, which may be published in the Association's *Newsletter*. Proposals to make up a funding shortfall from other sources are not eligible. Proposals must fit within the charitable aims of the Association and will be subject to appropriate research ethics considerations.

Proposals will be ranked on the following criteria:

- · Demonstrable need for funding;
- A clear and well-explained future career plan;
- How the funding will help the candidate to strengthen their CV to achieve their future career plan;
- Feasibility;
- Value for money and cost effectiveness.

The deadline is **7th October** each year. Successful applicants will be notified in December and funds will normally be available in January. A full list of awards will be announced at the AGM.


ASSOCIATION MEETINGS



68th Annual Meeting of the Palaeontological Association Erlangen, Germany 9 – 13 December 2024

The 68th Annual Meeting of the Palaeontological Association will be held at Friedrich-Alexander-Universität (FAU) Erlangen-Nürnberg, in the city of Erlangen, Bavaria, Germany. This will be the first time that the Annual Meeting takes place in Germany! The organizing committee is chaired by Emma Dunne, Thomas Clements and Rachel Warnock with support from colleagues in the Paleobiology Research Group, student volunteers and colleagues at FAU's GeoZentrum Nordbayern.

Programme outline

The conference will take place between 9th and 13th December 2024, with a one-day preconference field-trip and museum visit on 9th December and a one-day post-conference field-trip on 13th December. Tuesday 10th December will begin with an assortment of workshops in the morning, followed by the annual Symposium in the afternoon. Scientific sessions (oral presentations and posters) will take place on Wednesday 11th and Thursday 12th December in the Heinrich-Lades-Halle on Rathausplatz, close to Erlangen's city centre.

Symposium: 'Extinction'

The annual Symposium will take place on the afternoon of Tuesday 10th December in Heinrich-Lades-Halle. The broad topic of 'Extinction' will showcase cutting-edge research from early-mid career researchers based in research institutions across Europe. The speakers are as follows:

- Dr Baran Karapunar (University of Leeds, UK): The collapse of biodiversity and restructuring of ecosystem across the Permian–Triassic mass extinction.
- Dr Bethany Allen (ETH Zürich, Switzerland): Inferring extinction rates from phylogenies.
- Dr Simon Darroch (Senckenberg Gesellschaft für Naturforschung, Frankfurt, Germany): *Getting* to grips with extinction in the late Ediacaran.
- Dr Evelyn Kustatscher (Naturmuseum Südtirol, Italy): Green Resilience: plants through the end-Permian Mass extinction.
- Dr James Witts (Natural History Museum, London, UK): Lessons for crises past and present? Extinction and resilience in Cretaceous–Paleogene marine ecosystems.
- Eileen Straube (Universität Bayreuth, Germany): From fossils to forecasts: enhancing conservation with palaeontological records.

Field and museum trips

A pre-conference trip to Naturkundemuseum Bamberg (Bamberg's Natural History Museum) will take place on Monday 9th December, where director Dr Oliver Wings will take participants on a private guided tour. Afterwards there will be an opportunity to explore the city and experience the local Christmas market.



There are two conference field-trips. The pre-conference field-trip is to the famous Jurassic Solnhofen fossil quarries. The post-conference field-trip is to the spectacular Grube Messel (Messel Pit) fossil site near Frankfurt. These trips are limited in number of attendees and interest has been extremely high! Keep an eye on the opening of registration to reserve your place.

Further details regarding these trips can be found on the Association's website.

Workshops

Four workshops will be on offer at the Annual Meeting, see below for titles and leaders. These workshops stem from the various foci of the Paleobiology Research Group at FAU and are supported by local colleagues. All workshops take place on the morning of Tuesday 10th December. Each venue is within 15 minutes' walk of the main train station, with the majority being within five minutes' walk. Please note that each workshop is limited to a specific number of participants. Further information about each workshop can be found on the Association's website.

- Fossils in thin section, led by Prof. Axel Munnecke and Anna Merkel (FAU).
- Fossil sampling biases and phylogenetics, led by Dr Bethany Allen (ETH Zürich), Laura Mulvey (FAU) and Prof. Rachel Warnock (FAU).
- Rotten fossils: experimental design in taphonomy, led by Dr Thomas Clements (FAU) and Dr Orla Bath Enright (Stuttgart State Museum of Natural History).
- Deep-time paleogeography in R, led by Dr Adam Kocsis (FAU) and Dr Elizabeth Dowding (FAU).

Annual dinner

The Annual Dinner will take place on the evening of Wednesday 11th December in the Redoutensaal, a Baroque theatre situated in the centre of Erlangen's Altstadt (old town). A delicious menu of locally sourced food will be served alongside a variety of local beers and non-alcoholic drinks. The evening will end with the traditional after dinner speeches, a viewing of some of the excellent PalaeoVision[™] entries, a pub quiz hosted by Thomas Clements and Elizabeth Dowding (be sure to brush up on your German general knowledge!), and an opportunity to shake off the cobwebs from your dancing shoes. Delegates are welcome to purchase additional tickets for 'plus ones'.

Annual Address

The Annual Address, a public lecture, will be given by Prof. Sarah E. Gabbott (University of Leicester, UK).

The city of Erlangen

Situated at the heart of Franconia, the historic Baroque city of Erlangen has lots to offer visitors. The city's many open squares host markets, festivals and cultural events throughout the year. The Altstadt (old town) with its winding alleyways, independent crafts shops and traditional restaurants is a must-see, and if you stroll through the Schlossgarten (Palace Gardens) and botanical gardens you might spot a red squirrel or two!

At the time of the Annual Meeting in December the Christmas markets will be in full swing, with lots of traditional Bavarian winter food, Glühwein, and live music. We strongly recommend the 'drei im weckla', a classic Nürnberg sausage sandwich, for a hearty warm feed by the fireside.

A short train ride south takes you to the historic city of Nürnberg, home to one of the oldest and most famous Christmas markets in the world, the Christkindlesmarkt. To the north of Erlangen is



Getting to Erlangen

Erlangen's train station is located right in the centre of the city; it is approximately ten minutes' walk from the main conference venue and less than five minutes' walk from the GeoZentrum Nordbayern building. Erlangen has excellent rail connections to most German cities and the rest of Europe, including direct rail routes to Munich and Berlin, while connections to other major cities, such as Frankfurt and Vienna, are possible through the nearby station of Nürnberg. For train times and ticketing, we recommend downloading the Deutsche Bahn app for your smartphone before arrival in Germany.

For travellers flying to the conference, Nürnberg airport lies only a short bus, train or taxi ride from Erlangen. There are direct flights to several major European airports, including Amsterdam, Paris and London. Both Frankfurt and Munich international airports are conveniently located within less than three hours of Erlangen via train. When arriving in Erlangen, bus travel within the city centre is free. For details and a map of free routes, please check the city's webpage: <https://erlangen.de/themenseite/aktiv/kostenloser-oepnv>.

Please note that Germany still relies heavily on cash transactions and that options to use debit cards will not always be available, especially for transport such as buses and taxis.

Accommodation

There are numerous hotels and guesthouses within a five- to 20-minute walk of the main conference venue and the centre of the city. Delegates are strongly encouraged to book their accommodation as early as possible, as the city is a popular destination for visitors during Christmastime. We are delighted to be able to offer delegates a special discount on a selection of local hotels for the duration of the Annual Meeting. A bespoke code will be made available to delegates upon registration but can be requested before registration opens via e-mail to the meeting organizers at specific@annualmeeting2024@palass.org. Alternatively, accommodation can be booked using the usual online resources, as well through short-term let websites, such as AirBnB. There are also numerous accommodation options in nearby Nürnberg, which is connected to Erlangen through regular trains throughout the day.

Student travel grants

The Palaeontological Association runs a programme of travel grants to assist student members (doctoral and earlier) to attend the Annual Meeting in order to present a talk or poster. Grants of up to £100 will be available to student presenters who are travelling from outside Erlangen. The actual amount available will depend on the number of applicants and the distance travelled. Payment of these awards is given as a disbursement at the Meeting, not as an advance payment. Students interested in applying for an Association travel grant should contact the Executive Officer, Dr Jo Hellawell (e-mail <**executive@palass.org**>) once the organizers have confirmed that their abstract is accepted. Please title the e-mail "Travel Grant Request". No awards can be made to those who have not followed this procedure. The deadline for applications is **8th November 2024**.



Our logo

Our logo featuring ginkgo leaves was designed and illustrated by Thomas Clements and represents the beautiful Ginkgo biloba tree that stands in the garden of our institute. With so many research interests among the Paleobiology Research Group and several famous local fossils to choose from (including Jurassic ammonites from Buttenheim or the sauropodomorph *Plateosaurus*), we decided that the ginkgo best represents us as the symbol of the home of our research.

On behalf of the organizing committee, we look forward to welcoming you to Erlangen in December! Registration will be announced soon so keep an eye on the meeting website for the announcement. Association members will receive an e-mail when registration opens.







The Palaeontological Association

Reg. Charity No. 1168330

Code of Conduct for Palaeontological Association meetings

The Palaeontological Association was founded in 1957 and has become one of the world's leading learned societies in this field. The Association is a registered charity that promotes the study of palaeontology and its allied sciences through publication of original research and field guides, sponsorship of meetings and field excursions, provision of web resources and information, and a programme of annual awards.

The Palaeontological Association holds regular meetings and events throughout the year. The two flagship meetings are the Annual Meeting, held at a different location each December, and the annual Progressive Palaeontology (ProgPal) meeting, run by students for students with the support of the Palaeontological Association. The Association Code of Conduct relates to the behaviour of all participants and attendees at annual events.

Behavioural expectations: It is the expectation of the Palaeontological Association that meeting attendees behave in a courteous, collegial and respectful fashion to each other, volunteers, exhibitors and meeting facility staff. Attendees should respect common sense rules for professional and personal interactions, public behaviour (including behaviour in public electronic communications), common courtesy, respect for private property and respect for intellectual property of presenters. Demeaning, abusive, discriminatory, harassing or threatening behaviour towards other attendees or towards meeting volunteers, exhibitors or facilities staff and security will not be tolerated, either in personal or in electronic interactions.

Digital images and social media: Do not photograph a poster or record a talk without the author's express permission. While the default assumption is to allow open discussion of presentations on social media, attendees are expected to respect any request by an author to not disseminate the contents of their talk or poster.

Reporting unacceptable behaviour: If you are the subject of unacceptable behaviour or have witnessed any such behaviour, please notify the meeting coordinator Dr Emma Dunne (e-mail <**emma.dunne@fau.de**>) and/or a designated member of the Palaeontological Association Council (Executive Officer Dr Jo Hellawell <**executive@palass.org**>; President Prof. Rachel Wood <**president@palass.org**>; Vice-Presidents Dr Susannah Maidment <**vicepresident1@palass.org**>, or Dr Uwe Balthasar <**vicepresident2@palass.org**>.

Anyone experiencing or witnessing behaviour that constitutes an immediate or serious threat to public safety, or a criminal act, is expected to contact the emergency services by phoning the police on **110** (for an ambulance or the fire brigade call **112**). Those witnessing a potential criminal act should also take actions necessary to maintain their own personal safety.





Palaeontology in the news

Only the thick-skinned can conquer land

A recent study published in *Current Biology* details the remarkable discovery of a 3D fossil of skin in isolated, razor-thin sheets of carbon from a 289- to 286-million-year-old cave system. The fossilized skin has exceptional preservation of the internal structure, allowing 3D reconstruction and in-depth analysis.

The fossil is from a cave system near Richard Spur in Oklahoma, USA, an extensive karst network known for being the richest assemblage of terrestrial vertebrates from the entire Palaeozoic Era. The texture of the fossil skin resembles that of modern crocodiles, providing insights into early therapods' adaptation to living on land. In fact, the early reptiles that emerged from prehistoric amphibians in the late Carboniferous deployed several evolutionary innovations to adapt to the new environment. Skin modification is crucial to prevent water loss. With respect to that of amphibians, reptiles' skin has a thicker epidermis, with differentiated alpha and beta keratin proteins that provide a stratum corneum.

The remarkable fossil found at Richard Spur highlights the critical innovations that early amniotes needed to conquer land, but also the influence of cave conditions and oil seep hydrocarbons on the production of exceptional fossils.

- MOONEY, E. D., MAHO, T., PHILP, R. P., BEVITT, J. J. and REISZ, R. R. 2024. Paleozoic cave system preserves oldest-known evidence of amniote skin. *Current Biology*, **34**, 417–426.
- MAHO, T. and MOONEY, E. D. 2024. It's hard to find fossil skin, but a rare discovery reveals clues about the evolution from water to land. *The Conversation*, published online 28 May. <https://theconversation.com/its-hard-to-find-fossil-skin-but-a-rare-discovery-reveals-clues-about-the-evolution-from-water-to-land-225501>

Celeste's journey home: from Scotland to Jamaica

New acquisitions are always joyful moments for a museum, and they should be celebrated. But there are cases in which handovers also deserve celebration, especially where colonialism is involved. Celeste is a preserved lizard that was collected in Jamaica in the 1850s and was housed in the Hunterian Museum, University of Glasgow, Scotland, until April 2024 when it was returned to the Natural History Museum of Jamaica.

In past centuries, European museums grew their collections by collecting items from other countries, often colonies. These items were generally taken without consent and are now housed in museums and libraries across Europe. However, a growing movement towards repatriation seeks to return these objects to their places of origin, and institutions all over Europe must confront the colonial pasts of their collections.

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We talked about the case of the Brazilian dinosaur *Ubirajara jubatus*, sent back to Brazil after a collective protest that had a huge resonance on social media. In Celeste's case, the decision was much smoother, with an agreement between the University of Glasgow's museum and researchers from the Natural History Museum of Jamaica and the University of the West Indies, Mona campus, who gladly accepted the restitution of the specimen. Celeste is not only a symbol of Europe facing its colonialist past, but has a great scientific importance as well. In fact, this lizard (*Celestus occiduus*) is classified as critically endangered and possibly extinct, therefore scientists from Jamaica have never been able to see or study it. Until now.

Celeste is the first natural history specimen to be repatriated to the Caribbean, and follows significant returns of other artefacts such as the British Museum's 2009 return of the Anthony Robinson Volumes to Jamaica and the 2016 donation of 10,000 aerial photographs from the University of London's Royal Holloway to the University of the West Indies.

Returning Celeste to its country is more than a symbolic act, as it will help local scientists to grow their own knowledge and protect the natural heritage of their island, which has been endangered by introduced species and the exploitation of their territories to grow monocultures. "While largely symbolic, Celeste's return acknowledges how colonialism facilitated multiple forms of plunder with lasting consequences, and shows the need for decolonization in natural history. Rather than sitting in storage, Celeste has returned to Jamaica to be a centrepiece in the story of Jamaican environmental history" writes Alex A. Moulton, Assistant Professor of Geography and Environmental Science at Hunter College, CUNY, and Thera Edwards, Lecturer in Geography and Map Curator, University of the West Indies, Mona.

MOULTON, A. A. and EDWARDS, T. 2024. Returning a 170-year-old preserved lizard to Jamaica is a step toward redressing colonial harms. *The Conversation*, published online 3 June. <https://theconversation.com/returning-a-170-year-old-preserved-lizard-to-jamaica-is-a-step-toward-redressing-colonial-harms-229339>

Nicola Vuolo Publicity Officer

News bites

Living at the bottom of the sea, half-drowning in mud and being always ready to shut your shell closed in case of predators – or just to expel mud in case you are suffocating – doesn't seem a very successful lifestyle. It was, however, at least for a while, at least for Strophomenoids, an extinct group of brachiopods. Brachiopods, filter-feeding clam-like marine animals, are common as fossils, but are rare in modern oceans. Strophomenoids are extinct nowadays, but they dominated sea floors before dinosaurs existed. Paradoxically, these forms lacked the typical organ of attachment, and their two shells fit together like spoons, leaving little room for the living parts. Palaeontologists have debated how these enigmatic forms could live on soft substrates without being buried, or filter-feed without choking on mud. By anatomical analysis of several specimens of a typical strophomenoid, *Rafinesquina alternata*, researchers determined that they could lay on the seafloor with their shells wide open, filtering nutrients out of the water above the sediment, and quickly slamming their shells shut to expel suffocating mud or when threatened.

DATTILO, B., FREEMAN, R. L., HARTSHORN, K., PETERMAN, D., MORSE, A., MEYER, D. L., DOUGAN, L. G. and HAGADORN, J. W. 2024. Paradox lost: wide gape in the Ordovician brachiopod *Rafinesquina* explains how unattached filter-feeding strophomenoids thrived on muddy substrates. *Palaeontology*, **67**, e12697.



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They may not be as impressive as *Dune* sandworms, but a 426-million-year-old group of fossil worms called palaeoscolecids have been almost as mysterious for quite a long time. The fossils were found near the village of Leintwardine, Herefordshire, UK in the 1920s and have been re-studied using state-of-the-art imaging techniques. These allowed the authors to determine the fine-scale anatomy of these worms and infer their true evolutionary affinity. The worms appear to belong to a long-lasting genus (*Radnorscolex*) that survived a previous mass extinction, and are the last known palaeoscolecids in the fossil record. The palaeoscolecids appear to have gone extinct shortly after the Leintwardine fossils were preserved, possibly due to a global oceanic crisis.

HOWARD, R. J., PARRY, L., D'SOUZA, L., CLATWORTHY, I. and EDGECOMBE, G. 2024. Palaeoscolecids from the Ludlow Series of Leintwardine, Herefordshire (UK): the latest occurrence of palaeoscolecids in the fossil record. *Papers in Palaeontology*, **10**, e1558.

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Nicola Vuolo Publicity Officer

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Medals and awards from other bodies

Recently several palaeontologists, including from among our membership, have been recognized with fellowships, medals and awards from various societies.

Prof. Anjali Goswami FRS

Prof. **Anjali Goswami** FRS has been elected a Fellow of the Royal Society. She is an evolutionary biologist at the Natural History Museum, London, UK, specializing in vertebrate evolution and development, with a particular focus on the emerging area of evolutionary phenomics. Anjali and her research group use new approaches to capture the complex three-dimensional shapes of organisms in order to reconstruct the evolution of biodiversity. She is particularly interested in understanding how development, ecology and large-scale environmental change interact to influence animal evolution through deep time. Her work spans insects to dinosaurs, but her main interest is in the evolution of mammals. To fill key



Photo courtesy of Anjali Goswami.

gaps in the palaeontological record, Anjali has searched for fossils from Svalbard to Madagascar, with her primary fieldwork being based in South India.

Prof. Stephen Brusatte FRSE



Photo © FRSE.

The Royal Society of Edinburgh (RSE) has elected a new cohort of Fellows for 2024 from institutions in countries around the world and some across Scotland, including one geographically very close to the Society, Prof. **Steve Brusatte** based at the University of Edinburgh, UK. Steve studies the anatomy, genealogy and evolution of dinosaurs and other extinct animals, with the aim of understanding how evolution works over long timescales and how the Earth changes over time. He is also a keen communicator of science, having written several books for kids and adults, including *The Rise and Fall of the Dinosaurs, The Rise and Reign of the Mammals* and the textbook *Dinosaur Paleobiology*. Steve often appears on television and radio, and regularly consults with the press.

Geological Society medal and awards

Recipients of the Geological Society's awards, medals and funds are selected on criteria that include making a significant contribution to scientific research or eminent contributions to any branch of geology, or distinction in the practice of geology. Several palaeontologists and members of the Association have been recognized in the 2024 awards. Prof. **Daniela Schmidt** (University of Bristol, UK) was awarded the mid-career Bigsby Medal for eminent services to geology. Daniela's research focuses on understanding the causes and effects of climate change on marine systems, working with a wide range of techniques and organisms. The Sue Tyler Friedman Medal was awarded to



Photo © Disability Commissioner Germany/Anna Spindelndreier.



PD Dr Martina Kölbl-Ebert (Ludwig-Maximilians-Universität München, Germany) for distinguished contributions to the history of geology, where Martina's main research subjects are women in geology, including many palaeontologists. The recipients of their inaugural President's Awards were **Princess Aira Buma-at** (University of Cambridge, UK) and **Mónica Alejandra Gómez Correa** (Universität Hamburg, Germany and Geolatinas coleader) for showing significant early-career promise and future leadership potential.



Linnean Society medals

Photo courtesy of Princess Buma-At.



Photo © The Linnean Society of London.

The Linnean Society aims to promote the study of all aspects of the biological sciences, and through the awarding of medals and grants they acknowledge and encourage excellence in these sciences.

The Linnean Medal for 2024 has been awarded to Prof. **Paul Upchurch** (University College London, UK) in recognition of his outstanding contribution to the fields of palaeobiology, systematics and phylogenetics. Paul is globally renowned for transforming our understanding of the taxonomy and phylogenetic relationships of sauropod dinosaurs, as well as important phylogenetic and taxonomic contributions to

other dinosaurian and tetrapod groups. As a member of the Royal Society's Diversity and Inclusion Committee and chair

of its disability subcommittee, he promotes diversity in science.

The Linnean Society Darwin–Wallace Medal, awarded to those who have made major advances in evolutionary science, has been given to Prof. Sir **Peter Crane** FRS (Yale University, USA). Peter's palaeobotanical discoveries, combined with phylogenetic analyses of morphological data, have profoundly altered our outlook on early angiosperm evolution. Peter has always spearheaded innovation, inclusion and engagement, including as a past president of the Association.



Photo C The Linnean Society of London.

The Palaeontographical Society Medal

The biennial award of the Palaeontographical Society Medal is given to recognize a sustained and important series of contributions to taxonomic and systematic palaeontology. In particular, the Society seeks to honour those who have made an exceptional contribution to the micropalaeontology, palaeobotany, or invertebrate or vertebrate palaeontology of Great Britain and Ireland, including those who have applied these data to solve problems of palaeogeography,

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Photo courtesy of Paul Taylor.

palaeoecology and phylogeny. Dr **Paul Taylor** (Natural History Museum, London, UK) was awarded The Palaeontographical Society Medal for 2024 during the Society's 177th AGM in April. The Medal was awarded in recognition of Paul's extraordinary long-term and continuing contributions to palaeontology in the British Isles and the wider world, particularly on bryozoans and other invertebrates. Paul is currently the Editor-in-Chief of the Association's journals.

The Palaeontographical Society Marsh Palaeoart Award

For the inaugural Palaeontographical Society Marsh Palaeoart Award three winners were selected from a large number of nominations,

with work ranging from traditional drawings and physical sculptures to digital paintings, threedimensional digital models and animations. The Award is to recognize talent in the depiction of fossil fauna and flora, in keeping with the foundational aims of the Society. The overall winner was **Bob Nicholls** with his digital painting *The Primeval Clevedon Bay*, depicting the marine environment of Clevedon Bay in Somerset, UK during the Early Carboniferous Period. The judges found the work both educational and creatively accomplished, breathing life into 'everyday' fossils. The painting is exhibited on a large graphic board overlooking Clevedon Bay, and on the Clevedon Pier website.



Primeval Clevedon Bay. Copyright © Bob Nicholls 2022.

Artwoks by Júlia d'Oliveira and Matt Humpage were highly commended. Júlia's work *Turnersuchus: The Crocodile in the Sea of Belemnites* accompanied a paper by Wilberg *et al.* (2023) published in the *Journal of Vertebrate Paleontology*, and was also used as the cover for that issue. Matt's work *Asteroxylon mackiei: an extinct plant from the Rhynie Chert*, a photorealistic life reconstruction, was commissioned to accompany the publication of Turner *et al.* (2023), published in *Science*.

Please let us know of any other recent medal and award recipients that should be featured by contacting <**newsletter@palass.org**>. Don't forget to nominate your colleagues for these and for the Association medals and awards. The deadline for nominations for our medals and awards is **31st March** each year.

Jo Hellawell Executive Officer



Publishing palaeontology

The fundamental purpose of the Palaeontological Association is to promote the study of palaeontology and allied disciplines. Publication of primary research articles in the two Association journals, *Palaeontology* and *Papers in Palaeontology*, is a means to this end. Traditionally, the journals have had the added benefit of providing a significant income, which has allowed the Association to fund other ways of furthering its mission in the form of research, conference, educational and travel grants. It has also allowed us to provide financial support to other relevant publishing programmes, such as *Palaeontologia Electronica*, the *Treatise on Invertebrate Paleontology* and the *Journal of Paleontological Techniques*. The importance of this income stream was recognized in 2013 by the appointment of a full-time professional editor to oversee the quality of the output, one who has the advantage of having a palaeontological background.

In a recent edition of this *Newsletter*, it was noted that there are currently significant problems in the publishing landscape (Drage and Wong Hearing 2023). I agree that there is plenty of room for improvement but, with some care and attention, I believe that there is also still a place for some aspects of the traditional workflow. Society-owned journals are not immune to the current pressures in the publishing landscape, but have the freedom to invest more in their publishing programme at the same time as being reliant on it as a source of income. Many smaller societies (and an increasing number of larger ones) find that it is more cost effective to work with a commercial partner to disseminate research. These partners offer a service that is superior to what we could manage alone without significant investment, in particular a robust web platform with global reach and negotiating power for institutional open-access agreements. Without the latter, we would simply not be able to fund our current grants and awards programme.

Diamond open access journals are now a welcome and important part of the academic infrastructure, but they rely on the goodwill of academics to contribute their time and energy to maintain a quality output without financial compensation. A more traditional model bought the services of a professional editorial community that is sadly much reduced due to the cost cutting introduced by commercial publishers. Academic or learned societies across all disciplines have stepped into this vacuum by increasing their financial contribution even when they partner with a commercial publisher. For example, the Palaeontological Association continues to fund a professional copy editor, and takes an active role in the whole publication process, rather than relying on third-party services offered by their publishing partner.

It is important to distinguish between peer review (which is a reciprocal arrangement: an academic will give and receive) and professional services (*e.g.* copy editing, typesetting, platform development, marketing) which a commercial publisher is undertaking to make a profit (or in the case of a not-for-profit, to fund charitable aims). Over the years, it is true that the quality of these professional services has been eroded and, in my personal opinion, asking the research community to fund a poor service is unacceptable. So what do we offer for the cost of an article-processing charge (or subscription fee)?

It is generally accepted that academic editorial workloads are too high and asking referees to spend more time reviewing and checking papers for errors adds to this workload; the Association pays a professional instead. We are very grateful to those referees who do check references and point out typographical errors to authors, but state in our invitation letters that this is not a requirement. I'm sorry to say that the editorial quality of articles that we receive is not always high. We have even received papers with a respected senior co-author that contain errors (*e.g.* incorrect or missing specimen numbers, captions that don't match figures, figures with errors or that are illegible, typographical errors, missing references). I support first-time authors in particular by providing detailed feedback on figure presentation, for example. It is clear that not all early-career researchers receive sufficient guidance in how to craft a good paper and disseminate their research effectively. I hope that we help with this. Many of our papers have authors who are not working in their native language, and we are happy to adjust language to help them to better communicate their research. I would welcome flawless 'camera ready copy' articles to publish in our journals, but in reality this is often far from the case.

To save time and cost, our commercial publishing partner would prefer us not to proofread papers before publication but leave this entirely to the author and typesetter. We do still check a final revised proof and ensure that any author or editorial corrections have been implemented as requested. It is an unfortunate truth that it is very difficult for anyone to proofread their own work, tending to see what was intended and not always spotting simple errors. Taking out an editorial proof-reading stage would reduce our production times by one or two days, but a fresh pair of eyes is more likely to spot those little slips that can occur (or, as many of you have no doubt found, are introduced by a typesetter working too quickly on too many papers or relying on an automated system to make corrections...). Commercial publishers certainly take a share of the profit, but it should be remembered that this is on a narrower margin than the manufacturer of the device on which you are likely to be reading our articles (potentially purchased through an academic grant?).

I have no doubt that a great number of *Newsletter* readers will not recognize in their own work the types of error alluded to in some of my comments above – and I ask for your indulgence as they are not intended to cause offence to anyone. Please remember that not everyone is as careful as you are. Not everyone is as fluent in English as you might be, or have had the same mentoring opportunities. Also, with the best will in the world, we are all busy people and sometimes cut corners and make mistakes. The Editorial Board would like to encourage greater diversity in our authorship, and this will perhaps require more effort on our part.

In summary, why does the Association still partner with a commercial publisher? I think for two main reasons: firstly, to give our journals visibility and to disseminate them as widely as possible; and secondly, to help us to maintain an income that allows us to invest in producing quality journals as well as other projects to support the palaeontological community. Looking to the future, I would like to share some thoughts on various aspects of article publishing in a regular short note in the *Newsletter*. I would ask you to support your Association in maintaining a high standard of research dissemination by getting involved in the journals as an author, reviewer or editor. Or indeed by encouraging colleagues to share best practice wherever they choose to publish. We welcome offers on all of these fronts.

Sally Thomas

Publications Officer <sally.thomas@palass.org>

REFERENCE

DRAGE, H. B. and WONG HEARING, T. W. 2023. A new model for publishing. *Palaeontology Newsletter*, **114**, 46–48.



Webinars for the ECR community – strategies for success

The academic research landscape is ever-evolving, but securing funding remains crucial for postdoctoral researchers on their pathways to success. In the past year, the Palaeontological Association has initiated an early-career researcher (ECR) webinar series, 'Postdoc Funding Chats,' to help ECRs in understanding the available funding pathways and in taking their next steps. We hope the series provides invaluable insights into obtaining major grants by featuring successfully-funded applicants sharing their journeys and strategies to success.

In my inaugural term as Early Research Career Officer on Council, my primary goal has been to provide useful material to help the ECR community navigate academic life. Whether you are a student, postdoc, or applying for a permanent position, ECRs go through multiple career crossroads and often lack the necessary mentorship¹ to handle all the complexities we encounter. While reviewing our annual survey data from 2021, I noted that 60 % of members who attended the Annual Meeting do not have permanent contracts and that 71 % of attendees expressed a desire for more online events hosted by the Association. To address this, and to deliver advice and mentorship to our ECR community regarding their career opportunities, I decided to offer practical advice and guidance through open and free web-based seminars (webinars). This platform also provides greater accessibility and geographical flexibility, with follow-up surveys allowing us to determine what participants would like to see from us in the future.

The first webinar series, which ran from November 2023 to January 2024, focused on four prestigious fellowships: the Leverhulme Trust Early Career Fellowship, 1851 Royal Commission Research Fellowship, the Royal Society Newton International Fellowship, and the European Research Council Starting Grant. If you missed any of these previous events with our fantastic panellists you can now find them on the Association's YouTube channel. Each webinar began with a five-minute introduction to the funding body and fellowship to be covered, followed by our engaging panel speakers, each with their own ten-minute presentation on their grant experiences. The feedback from these presentations was that it was equally insightful and refreshing to hear successful applicants speak openly about their experiences, from rejections to triumphs in securing specific grants. Following the panel discussion, we had open Q&A sessions where attendees were invited to participate and ask questions. This segment was engaging and had varied topics raised, such as project ideas, how to find collaborators, and host institutions' roles in the application process.

Given the success of this series, we hope to expand to other themes for the webinars. For example, training and tools to prepare for project management, leadership, and dealing with stress in a highly pressurised environment. These will help postgraduate students and postdoctoral researchers alike navigate their career paths effectively.

¹ If you are looking for mentorship you can apply to the Association's Mentor Scheme via our webpage at ">https://www.palass.org/careers>.

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We started the latest ECR webinar series of Postdoc Funding Chats in mid June. This series is focusing on a range of major funding bodies across Europe and features a fantastic line-up of panel speakers. For more details on registration, visit the Association's website or social media, or contact <**erc@palass.org**>.

See you at the webinars!

Dr Orla Bath Enright

Early Research Career Officer





School kids are replacing us with a robot!

I received an e-mail from a young man named Saketh in UK school year 8. Saketh is a member of Cambourne Electronics and Robotics Club near Cambridge and was seeking some advice for his group's entry into the FIRST® LEGO® League. Colour me intrigued... But what on earth is a 'FIRST® LEGO® League'? And why did an electronics and robotics club want to chat with a palaeontologist?

After a quick Google search, I found out that the FIRST® LEGO® League is an international competition for children aged 4–16. It introduces them to STEM subjects through hands-on problem-solving challenges. In the competition, each team identifies a real-world problem related to an annual theme, researches the issue, then develops an innovative solution using technology. They present their solution to a panel of judges, showcasing their understanding and creativity. This year's theme is 'MASTERPIECE', which challenges participants to combine art and technology to express their hobbies and interests.

Grand. But what has this got to do with palaeontology? Well it turns out that Saketh and team want to use their technological wizardry to aid in the hobby of fossil hunting. Specifically, they aim to tackle the issue that fossil hunting is perceived by non-experts, particularly families, as requiring expert knowledge – a significant barrier to entry. Their solution is to develop an app, named 'Fossil Eyes', that uses AI to help families identify fossils in the field. In Saketh's own words, Fossil Eyes "allows families to identify six different types of commonly found fossils. You can also ask any question about fossils to the app using your voice and it will provide answers. Finally, you can learn more about common fossils, where to find them and a whole fact file about them".

I arranged a time to meet with Saketh, and a couple of weeks later I found myself on Zoom with twenty or so young members of Cambourne Electronics and Robotics Club, their parents/guardians and the team supervisors. The team gave a very professional presentation and I learnt that their app was developed using block coding - a tool that makes coding visual and intuitive for young people by allowing them to build programs by connecting blocks together like a jigsaw puzzle. After their presentation, I fielded some questions from the kids and parents. During this Q&A session, it emerged that one of the key challenges the team had faced was finding suitable images to train the AI. Databases from museums tend to include well-preserved, articulated and exquisitely prepared fossils. Of course this is not how we find fossils in the field. They asked me if I knew of any database of fossil photos from the field. I confessed I did not (does this exist?). Instead, I pointed them to some fossil-hunting websites with user-submitted specimen photos. One of the big challenges for Fossil Eyes is incomplete fossils. We discussed the possibility of using geological information to help solve this. I showed them a geological map of the UK and explained how different rock formations contain specific types of fossils. So knowing the geology of the area might help narrow down the fossils you expect to find. The team told me they were planning to field-test their app on a day excursion to Hunstanton Beach in Norfolk. Reporting back a few weeks later, this was clearly a wild success.

I was frankly astonished by the incredible hard work and ingenuity of the Cambourne Electronics and Robotics Club. It's amazing (and a tiny bit scary) to think that these young people are learning to code complex programs and harness the power of AI to solve a problem as tricky and nuanced as identifying fossils. I'm sure that Fossil Eyes will be a useful resource for families on their first

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fossil hunts, but thankfully I don't think it is going to put us out of a job just yet. It was interesting to discuss the particular challenges of applying AI, or indeed any kind of automation, to the fossil record. These challenges include variation in preservation, articulation and occurrence between localities, which many of us know all too well! But if these diligent students are a sign of things to come, who knows what they could accomplish if they put their minds to palaeontology.



Cambourne Electronics and Robotics Club field testing their app, which might just put us all out of our jobs! Photo courtesy of Siddharth Dave.

You can check out the YouTube channel of the Cambourne Electronics and Robotics Club here:

<https://www.youtube.com/@CERCActiv8/videos>

Joe Keating Education Officer

Is there news that you'd like to see included in the **Newsletter**? *Let us know by e-mailing Nick at* **<publicity@palass.org**>, *sending a link to the news and explaining its significance.*





From our Correspondents

A Palaeontologist Abroad

Highlighting early career researchers who have taken posts outside their home country and the opportunities they used. This issue's palaeontologist is María Gabriela Suárez.

María Gabriela Suárez is a Colombian PhD student in Switzerland.

Q1: How did you end up in Switzerland?

After a hard time looking for PhD opportunities, I found a very interesting project at the University of Zurich supervised by Prof. Michael Hautmann. I had the feeling that this project was made for me. It was completely aligned with my palaeontological interests: invertebrate palaeontology and quantitative data analysis. Moreover, it was at a highly competitive university with a great advisor, in a very interesting country.

Q2: How is your position funded?

My PhD project is funded by a Swiss National Science Foundation grant awarded to my supervisor, Michael Hautmann.

Q3: What is your project about?



María Gabriela Suárez in Hamar Laghdad. Bhoto courtesy of Amin El Eassi El Eabr

I'm currently focused on the effects of mass extinctions, *Photo courtesy of Amin El Fassi El Fehr.* biotic recoveries and macroecological changes on taxonomic distinctness in bivalves.

Q4: What has been the biggest challenge for you living in Switzerland?

To be honest, everything is completely different from my home country. In my case, the language is a big barrier, but I'll talk more about this later. Integration is the second biggest challenge for me here. The people are very polite, but getting into a Swiss social circle is almost impossible.

Q5: What is the best thing for you about living in Switzerland?

The security and the feeling of confidence when taking a very late train at night is incomparable to any other country. I feel safer here than I have ever felt in my life.

Q6: Apart from friends and family, what do you miss most about Colombia?

The Latino culture is incredibly warm and open to foreigners. I miss the loud music, the small talk everywhere, the fruits, and the charming people.

Q7: What forms of support for an expat in your position have been the most helpful for you? What form of support do you miss most?

The most helpful support for me has been the international and inclusive environment in the palaeontology department at the University of Zurich. Something extra is that the university



offers various open sports courses that have been helping me meet new people and feel more integrated in Zurich. However, I always miss my family support.

Q8: What role does the language of Switzerland play in your academic and private life? Has the language been a challenge and how did you go about tackling this?

Language is a significant barrier, especially in my personal life. I live in the German-speaking region of Switzerland, where people can generally communicate with you in English, especially in Zurich. However, it often feels like hitting a wall when trying to integrate into different social circles outside of the palaeontology department. This is even more difficult in my case due to living in a small town outside Zurich. Fortunately, all topics related to the university can be discussed in English, so it's not a problem in that regard.

Q9: What was the biggest benefit of your move abroad? What was the biggest sacrifice? The greatest advantage, without a doubt, is the opportunity to learn from leading scientists and immerse oneself in a different culture. On the other hand, moving away from your family and traditions is always challenging.

Q10: What are your experiences with DEI (diversity, equality, inclusion) aspects in Switzerland? We are curious about your personal experiences as well as observations on policies and attitudes.

My personal experience related to DEI in Switzerland, particularly in Zurich, has been positive. A significant advantage of living in Switzerland, especially in one of its largest cities, is that people are very open, and you can feel the diversity everywhere. I feel completely free to be myself here. I can enjoy the tranquillity of kissing my girlfriend on public transportation without being afraid of being physically or verbally attacked. I feel comfortable openly showing my sexual orientation. I don't feel discriminated against for being Latina. In terms of diversity, equality and inclusion, it is clear that Europe, in general, is way more advanced than my home country. I am not well-informed in terms of official policies; however, I am sure that there are some measures promoting equal opportunities and fighting discrimination here.

Ma. Gabriela is on X at @MGSuarez0325.

Legends of Rock

Alice Schnorf-Steiner: a hidden treasure from Switzerland, a pioneering and innovative woman palaeontologist

Thanks to the fossil record, which provides us with valuable information about the appearance of life and its evolution, it is now accepted that the first traces of life on Earth date back 3.8 billion years. Since ancient history, humans have been interested in fossils, and have pondered their origins and how to interpret them. Over the centuries, numerous fossil sites have been discovered, giving scientists the opportunity to study them and contribute to our knowledge of ecosystems of the past. Yet, despite this long history of study, it is only very recently that women



and their contributions have been accepted in the field of palaeontology. Among the long list of renowned palaeontologists over the last few decades there are relatively few women, although this list includes Alice Schnorf-Steiner, a Swiss woman.

Alice Steiner was born on 2nd May 1904 in Lausanne in the canton of Vaud, in French-speaking Switzerland. After obtaining her bachelor's degree in literature in 1924, she turned her attention to the sciences, studying chemistry, zoology, anatomy, geology, palaeontology, plant physiology, bacteriology and parasitology. She obtained her master's degree in 1928 from the University of Lausanne. The following year, she presented her master's thesis on the morphology of glaciers in the canton of Valais and was awarded a prize for her excellent work. It was only after graduating that she developed a passion for palaeontology, deciding to carry out her PhD on the stromatoporoid sponges of the Mesozoic, still at the University of Lausanne. In 1931, she completed her PhD thesis and was awarded the title of Doctor of Science. A year later, her thesis was published. Her work was so remarkable that some twenty years after its publication the Belgian palaeontologist Marius Lecompte named the genus *Steinerella* for her, stating that Dr Steiner had accomplished one of the most important works in the study of stromatoporoids.

After obtaining her PhD, Alice Steiner married and took the name Schnorf-Steiner. In the following years, Alice Schnorf-Steiner withdrew somewhat from the world of science, choosing to devote herself to her life as a wife and mother of three children. However, she kept in touch with her scientific colleagues and worked as a substitute teacher at the cantonal science college in Lausanne. She decided to maintain an active role in the scientific community by becoming an Ordinary Member of the Société vaudoise des Sciences naturelles.

It was not until 1952, following the untimely death of her husband, that Schnorf-Steiner began her work as conservator at the Musée cantonal de géologie in Lausanne's Palais de Rumine. As well as updating the classifications and information in the Museum's exhibits, she undertook renovation of the palaeontology room and collected new field specimens to enrich the collections. In addition to her rigorous and fastidious work at the Museum, she again studied stromatoporoids in order to deepen her knowledge, publishing 11 articles on the subject over the following years. The opinion of some of her colleagues that stromatoporoids are one of the most boring and rudimentary groups did not discourage her from studying them.

"I have made a modest contribution to this research by focusing on one of these groups of *bad* fossils, ungrateful and disdainful, these awful encrusting and encrusted fossils, which are as difficult to remove from the rock as they are to classify. And yet I became attached to them, because they still hold so many undiscovered secrets that arouse our curiosity and spice up research." [Translated from French by this author.]

Always an active member of the Société vaudoise des Sciences naturelles, Schnorf-Steiner became its first ever woman president in 1958. At the same time, she joined the committee of the Société paléontologique suisse. After serving as vice-president of this group, she became its president in 1963. Schnorf-Steiner was thereby the first woman president of both the Société vaudoise des Sciences naturelles and the Société paléontologique suisse. As with her other work, she brought innovation and reform to the societies, attracting a new scientific community, and put a great deal of energy into improving the Société paléontologique suisse, bringing to it a breath of fresh air.



Alice Schnorf-Steiner was a strong-willed and inspiring woman. Her story evokes the words 'change' and 'renewal' through her determination to innovate her work and improve the system in which she lived. Despite the fact that she chose to pursue a career that was difficult and inhospitable to women in her day, she persevered and made a name for herself in the world of science. In a way, her inspiring efforts opened the doors of this inaccessible world to women of later generations. All of her work, which contributed to the progress of the Musée cantonal de géologie and the Société paléontologique suisse, was always carried out with modesty, reminding us that we are small compared to the complexity of life that fossils tell us about.

"Fossils provide us with information about the life that has always flourished, long before man appeared, and which may well disappear with him, and through him..." [Translated from French by this author.]

Nora Corthésy

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Stromatoporoid sponge (Labechia sp.), Ordovician, Ohio, USA <https://www.flickr.com/photos/jsjgeology/34606181352>. Copyright CC BY 2.0, photo by James St. John.

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Behind the Scenes at the Museum

The Livingstone Museum, Livingstone, Zambia



The Livingstone Museum in Livingstone, Zambia. Photo by Clare Mateke.

The Livingstone Museum is the oldest and largest museum in Zambia. It was established in 1934 so this year is celebrating 90 years since it opened its doors to the public. The Museum began as an ethnographical museum, but over the years the collections were expanded to include historical and archaeological artefacts, archival material and natural history specimens. The Museum is located in the historic town of Livingstone that dates back to 1905, just after the railway reached this part of the continent from the south. The town is the tourist capital of Zambia, being home to the mighty Victoria Falls (Mosi-o-tunya). The Museum has a large collection of memorabilia of the famous Scottish explorer and missionary, Dr David Livingstone, after whom both the city and the Museum were named.

The exhibitions cover the story of humans in Zambia from the Early Stone Age to the present, including culture, natural environment and political history. The Natural History Gallery showcases a variety of Zambian wildlife, from invertebrates to mammals, with an emphasis on the need to conserve it. Research departments include history, ethnography and archaeology in the humanities and social sciences, and mammalogy, ornithology, entomology, botany, ichthyology and herpetology in the natural sciences. The Natural History Department holds the largest collection of biodiversity in the country, including approximately 28,000 bird specimens, 5,000 mammal specimens, 4,500 entomology specimens and 2,000 herpetology specimens. The Museum serves as an important repository of natural history collections, as it is the only museum in Zambia with extensive collections in this field.

Although the Museum does not as yet have a Palaeontology Section, it does house a small palaeontology collection that dates back to the 1960s. The majority of Zambia's vertebrate fossils have come from the Luangwa and Zambezi River basins. Fossils were first found in the upper Luangwa Valley in 1925. It was later investigated in 1928 and 1935. Due to the remoteness of the area, it was not re-examined until an expedition in 1960 and 1961 confirmed that the area was rich in fossil reptiles and collected nearly 500 specimens. The next expedition, in 1963, resulted in 220 specimens. The majority of these never made it into any Zambian institution but were exported out of the country.

Angielczyk *et al.* (2014) presented a comprehensive taxonomic revision of the dicynodonts of the Luangwa Basin, taking into account specimens in all major museum collections. The authors stated that to date collecting efforts have resulted in several hundred specimens that are distributed among the Iziko South African Museum, the Bernard Price Institute for Palaeontological Research in Johannesburg, the Livingstone Museum, the Natural History Museum, London and the University of Oxford. According to the authors, much of this material remains unstudied. There are also a few specimens in the very small Geological Survey Department 'museum' in Lusaka. The fossils at the University of Oxford were apparently later transferred to the Natural History Museum, London. However, recently, some specimens collected during a 2009 expedition to Zambia involving Dr Kenneth Angielczyk, Prof. Christian Sidor, Steve Tolan and others, were returned to the Livingstone Museum after analysis and it is hoped that more may be returned in the near future following several more expeditions up to 2019. Many are new species to science and have been published in scientific publications.

One of the oldest fossils in the collection is a skull fragment of *Zambiasaurus submersus*, a large dicynodont. It is part of a set of bone fragments from 18 different individuals discovered in the Middle Triassic Ntawere Formation in the upper Luangwa River valley of northeastern Zambia in 1963 and described by Cox (1969). The type specimens are in the British Museum. *Zambiasaurus*, which was named after Zambia, is a stahleckeriid closely related to *Stahleckeria* of the Middle Triassic of Brazil. It is the earliest known stahleckeriid, and the first known outside South America. Some other fossils, collected during the same expedition and from the same formation, belong to the kannemeyeriid dicynodont *Sangusaurus edentates*, which



Skull fragment (holotype) of Zambiasaurus submersus (8 cm *long). Photo by Clare Mateke.*

is known from only a few fragments of skull and shows some similarities to *Ischigualastia* of the Middle or Upper Triassic of Argentina.

The first vertebrate fossil to go on display in the Livingstone Museum, and possibly in any national museum in Zambia, was the almost complete skull of *Odontocyclops whaitsi*, which was mounted in the Natural History Gallery in 2020. This fossil was first discovered in 2005 in the Luangwa Valley of Zambia by Zambian-based amateur palaeontologist Steve Tolan. In 2009 he led a team of experts on an expedition funded by the National Geographic Society to see the skull. It was collected specifically to be displayed in Zambia, since at the time there was nothing of its kind in any Zambian museum.



Research team collecting the Odontocyclops specimen in the Luangwa Valley. Photo by Christian Sidor

One of the team members was Dr Ken Angielczyk from the Field Museum in Chicago, USA, a world expert on dicynodonts. The research team sent it to the Iziko South Africa Museum in Cape Town where it was cleaned and prepared for public display then sent back to the Livingstone Museum. *Odontocyclops* is an extinct genus of dicynodonts that lived in the Late Permian era. They are believed to be the first major assemblage of terrestrial herbivores and, according to Angielczyk (2002), are closely related to Rhachiocephalus and Oudenodon. Odontocyclops fossils have been found in the Karoo Basin of South Africa and the Luangwa Valley of Zambia. Although they were first discovered in Zambia in 1938, this is the first specimen on display in Natural History Gallery



Odontocyclops whaitsi skull fossil (approximately 60 cm long). Photo by Clare Mateke



to be stored or exhibited in a Zambian museum.

Biarmosuchian skull and mandible (11 cm long) from the upper Madumabisa Mudstone Formation of Zambia. Photo by Clare Mateke

A fossil biarmosuchian skull and mandible was illegally collected from North Luangwa National Park sometime in 2009 or 2010 and exported to the United States. It was later turned over to palaeontologist Prof. Christian Sidor of the University of Washington in Seattle for repatriation. This fossil was the first occurrence of a biarmosuchian therapsid from the upper Madumabisa Mudstone Formation of the Luangwa Basin of northeastern Zambia (Sidor 2015).

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The Livingstone Museum, like many museums in the world, has had challenges of limited qualified staff and funding. However, over the years, it has made significant contributions to science and education through publications, exhibitions and educational and other public programmes. It has also enjoyed collaborations with both local and international researchers. The Museum welcomes researchers to make use of its valuable collections.

Clare Mateke

Livingstone Museum, Livingstone, Zambia

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Website: <https://livingstonemuseum.org>

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Resurrection rock

There are some things in life that transcend mere disciplinary specialization and habit. My own career, now, has been more or less firmly fixed down the clastic route, with muds and mudstones, sand and sandstones stretching as far as the eye can see. But among other kinds of rocks, encountered tourist-fashion, as it were, along the journey, it was often limestones that had the star quality, and stuck in the memory. Especially the reef limestones, with their plethora of fossil marvels and their evocation of the kind of cornucopia of life that took centre stage in those David Attenborough TV documentaries of earlier, more innocent days. Resilient life, one might think. Only, as it turns out, it's not.

The idea that coral reefs as an ecosystem are threatened, largely by the effects of fossil-fuel burning, has been voiced for a few decades now. But, optimists that we are, those warnings were generally qualified by hopeful words that it might not happen, that emissions might be halted in the nick of time, that heat-tolerant corals might be engineered, that new coral nurseries might be nurtured, perhaps (and this is the latest wheeze) on solar-powered floating islands. But, one day along came an ecologist, Roger Bradbury, indeed way back in 2012, who, in a *New York Times* op-ed¹, ripped the sugar coating off the pill with the most grimly memorable of novel word-pairings. Coral reefs, he said flatly, were "zombie ecosystems", and they *will* – overtly using the unqualified future tense – collapse as a global ecosystem "within a human generation". He cited over-fishing, pollution and over-acidification as the main forces involved, each with lethal capacity. A capacity, he said, that was assured by them acting in concert.

That was then a contentious statement, and indeed fighting talk. But how does it pan out now? And, of course, first, to locate ourselves properly in this trajectory, how long is a human generation? This, traditionally the roughest of yardsticks, has now been measured for humans in the most precise way by the analysis of genomic data going back a quarter of a million years (Wang *et al.* 2023). Ten thousand generations ago a generation averaged a little over 25 years; a thousand generations ago it had climbed to about 28 years, before falling back, then rising again over the last 200 generations to some 30 years², which is hence the figure to use for this most contemporary of purposes. To rigorously test out Bradbury's projection, therefore, we need to wait until the year 2042. But, even at not yet quite the half-generation mark, we can still take stock.

The Bradbury thesis seems, all too plausibly, to be on track, though the chief killer has become none of the main mechanisms he identified, but simple, brutal heat³. In one of those reminders of how sped up the scientific publishing cycle has become, Thomas Goreau and Raymond Hayes published a paper early this year (2024) on the effect, up to the end of last year, of the fourth great global coral bleaching event (the others being in 1998, 2010, and 2014–2017, while regional-scale events began in the 1980s). This one is shaping up to be the biggest yet: unsurprising, given the way that global sea surface temperatures suddenly, worryingly, and mysteriously (Schmidt 2024) took off in April 2023 to become (and remain) in lonely isolation

¹ <https://www.nytimes.com/2012/07/14/opinion/a-world-without-coral-reefs.html>.

² The figure is consistently, over this time, a few years higher for men than it is for women; a complication that needs several cups of tea to think through, but that need not concern us here.

³ This is not to downplay the effects of the kill mechanisms; indeed, as I write, Joel Wong and colleagues underline them in tracking the synergistic effects of warming, acidification and deoxygenation through the whole ocean. Threats, they note, add as well as multiply.

about a quarter of a degree Celsius higher than the pack of those of the previous 40 years. Severe bleaching this time has impacted more areas as well, including all of the Caribbean, affecting almost all corals in Jamaica, for instance. The authors note that "coral reefs ... are on the precipice of a mass extinction", thus retaining a degree of 'maybe' in the grand tradition of scientific caution, though Goreau in commentary afterwards is more blunt: "most coral around the world has been killed, and the survivors can't take more warming" ⁴.

More warming, alas, is inevitable as with 1.1 trillion tons and rising of extra carbon dioxide in the atmosphere the Earth will carry on absorbing more heat than it radiates for some time yet, even if emissions cease; therefore, it must get hotter. And so the Bradbury thesis seems rather more likely than not. Now, one can explore all of this terrain and more at length, if not *ad infinitum*, by navigating among the reports that now emerge almost daily on climate and on corals, but let us take that simple probability, and ask 'what now?' And how might palaeontology be relevant to this, if at all?

For Bradbury, the inevitable 'what now' was to be "an algal-dominated hard ocean bottom with lots of microbial life" and "lots of jellyfish grazing on the microbes ... slimy, and a lot like the ecosystems of the Precambrian". That is one way to fill this newly vacated territory, certainly. But, this prophecy comes with an inbuilt ambiguity, for there are algae and algae. Taking over many areas of reef today are soft green algae – seaweed, that is – not simply because the corals are in retreat, but because populations of primary regulators of algae such as sea urchins are crashing too, currently via a wave of pathogenic protozoans spreading (or rather, being carried by shipping) through the oceans (Roth *et al.* 2024).

It's the other algae that deserve a little thought here: the ones that are also rocks. They tend to be low down on the tourist scuba divers' must-see lists, and they're often neglected in palaeontology's usual channels too. So while I've listened to (and given) more lectures on fossil corals than one can shake a stick at, these particular organisms mostly passed me by in my working years. They didn't pass by Darwin's keen eye, of course, as, when the *Beagle* made a short stop in its peregrinations in 1836, he explored the biological treasures of the Keeling (now Cocos) atolls, using a 'leaping pole' to help him get to the reef's edge. There, he paid attention to different forms of the 'Nullipora' that flourished in that narrow zone; some sheet-like, some knobbly, some branching. In what we might see today as a pleasing symmetry, the nullipores ('organisms with no pores') had been recognized and named by Lamarck. Darwin, although noting that they "belong to the lowest classes of the vegetable order", saw that these organisms armoured the front of the reef, and protected it from destruction by the waves. They made rock, strongly and more effectively in that hostile environment than did the corals.

We now know them as coralline algae. They were once thought to be animals (Littler and Littler 2013), which is another pleasing symmetry, as the corals from which their name derives were originally thought to be plants (though the symmetry turns out to not be quite exact, as we will see). The suggestion that corals might be animals rather than the seemingly obvious interpretation as plants (after all, they are brilliantly colourful, and possess 'petals') was made by the physician and savant Jean-André Peysonnel. He had been a good and courageous physician – so celebrated for his efforts to save his fellow citizens during an outbreak of the plague in

⁴ <https://www.eurekalert.org/news-releases/1043350#:~:text=%E2%80%9CCoral%20reefs%2C%20the%20 most%20vulnerable,paper's%20lead%20author%2C%20Thomas%20Goreau>.



Marseille in 1720 that the King awarded him a life pension, allowing him to devote his life to marine science. Six years later, he challenged the orthodoxy that corals were plants, and he was, for his pains, initially shouted down by the great and the good of the Académie Française (undaunted, he simply gathered more evidence, and the academicians were later persuaded to change their minds).

The coralline algae story started before all of this, with another physician and savant, Hans Sloane; one who was to become yet more celebrated, for he is the Sloane of Sloane Square in London and, for good measure, the Hans of Hans Place and of Hans Crescent too. He navigated the upper echelons of society with aplomb as physician to the aristocracy, and collected indefatigably – his collections went on to become the foundational cores of the British Museum, the British Library and the Natural History Museum in London. He fitted in squarely within the great and good of British society, although these days at least the second of these adjectives would be looked at askance: he married the heiress of a plantation, invested in the trade of enslaved peoples, and wrote with equanimity about the punishments meted out to enslaved people, of which among the less gruesome was castration. No Humboldt, he.

Sloane's encounter with coralline algae dates from 1687, when he travelled to Jamaica as personal physician to the Duke of Albemarle, who was to be Governor there. He was not hugely successful, for his patient died two months after they landed (the pirate Henry Morgan became another patient locally, though he also died under Sloane's care). As his patients thinned out, Sloane had time to amass a large natural history collection on the islands, which he described in a monograph in which the first volume, published in 1707, was devoted to the plants he collected. And, among these, there are descriptions of seven kinds of 'coralline shrubs' of the seashore that he assigns to what we would understand today as a genus he called *Corallium*, though instead of a specific name (this was pre-Linnaeus) the suffix of each was not a single species name, but a string of Latin words that presumably acted as some kind of diagnosis or description. As he identified them with 'corallines', and as this was before Peysonnel's insights, the alignment of them with plants at this point seems clear.

Half a century later in 1758, one of these, the tuft-like *Corallina minima capillacea*, was included by Linnaeus in his *Systema Naturae*, as *Corallina fragilissima*. Here, it, and other *Corallina* species, are listed on pages headed "VERMES. ZOOPHYTA", and so – courtesy, it seems, of Peysonnel's discovery and some confusion with corals proper – they were transferred to the animal kingdom.

Coralline algae finally found their way back amongst the vegetables through the observations of Rodolfo Amando Philippi (or Rudolph Amandus Philippi, depending on nationalist perspective). But this was a mere footnote in the prodigious career of that nineteenth century savant who, by contrast to Sloane, was, if not quite Humboldt personified, admired by the great man, who taught him and wrote him recommendations and letters of reference as he set up residence in Chile to carry on his research. This resettling was in part a forced one for Philippi, in flight from his native Germany as part of a scientific diaspora in the aftermath of the failed 1848 revolution. The scientific attractions of South America were by then well known; Darwin had written in 1834 from his own sojourn in Valparaiso to his mentor, John Henslow, that "Chili fairly swarms with Collectors; there are more Naturalists in the country, than Carpenters or Shoemaker[s] or any other honest trade" (Kabat and Coen 2017).

It was fertile ground still when Philippi arrived. He mostly explored the molluscs, with ~2,500 new taxa, living and fossil, dipterans, or house flies and such (>400 new taxa), and many others⁵, building a reputation in his newly adopted country that saw his funeral, at the end of a long and distinguished career, marked by a cortege of 284 horse-drawn vehicles containing the entire Chilean parliament, making its way along a route lined by some 30,000 people. Kabat and Coen (2017) observed that "it is safe to say that no other zoologist or paleontologist had such a large turnout at his funeral". It eclipsed that of even Humboldt.

Even before all this, Philippi had found time to publish a paper in 1837 on "evidence, that the Nullipores are plants". Plants of a kind, at least. They are photosynthetic but as 'red' algae (pinkish, usually). And these 'living rocks', though relatively inconspicuous amid the more flamboyant corals, not only make up the resistant reef edge but provide the cement that holds the coral reef framework together, and create reef mass in the form of myriad free-rolling 'rhodoliths', like some kind of rocky undersea tumbleweed. They're helpful to corals in other ways, too, making good surfaces for attachment of coral larvae. Coralline algae are big if widely unappreciated players among reefs (and in marine settings away from reefs too). So, in these times of coral decline, what might be their role? Can they step up to help to keep reefs going, or will they suffer in equal measure as the thermometer rises?

There's some evidence that their role might grow. In the Miocene, for instance, corals declined, especially in the tropics, where coralline algae took over as the main carbonate rock builders (*e.g.* Esteban 1996). The Miocene was a time of climate change, including a 'Mid-Miocene Climate Optimum' that is increasingly regarded as an analogue for the near-future climate (Steinthorsdottir *et al.* 2020), as we seem set to power past the Pliocene-like state that has been our main analogue for the future greenhouse world so far. The Miocene was also a time with an inferred tendency for a glut of nutrients entering the marine realm – another similarity to modern times, and which, it is thought, might have suited the coralline algae rather better than the corals.

Do the coralline algae, then, take the heat better than do the delicate and easily thermallystressed corals? The data from field observations have been inconsistent - some studies suggested yes, some no and some maybe, not least because humans have triggered a whole variety of reef stresses, from pollution to eutrophication to over-fishing and more. In the evermore-complicated great outdoors, causes and effects are increasingly difficult to disentangle. And so, Eric Kriegert and colleagues (2023) took coralline algae into the laboratory to keep all variables constant except for temperature. They took four assorted morphological forms, including two of that venerable taxon Corallium, and subjected them to the equivalent of the marine heat waves that take place now and those that might be expected later this century. Somewhat to their surprise, all morphotypes survived the experience, carried on photosynthesizing, and continued calcifying too. The reaction of coralline algae to the ocean acidification that comes with high atmospheric carbon dioxide levels is a little more complicated. Experiments show that coralline algae, although initially harmed by the lower pH, after successive generations appear to become more tolerant (Cornwall et al. 2020). These are hints (more work, as ever, needs to be done) that these organisms might play a part in whatever kinds of reef we begueath to our children⁶.

⁵ The sea urchin *Diadema antillarum*, the species that first hosted the pathogen causing the current urchin mass mortality referred to earlier, is one of his species, for instance.

⁶ We used to say grandchildren, but things are moving on.



For those of our children who are eccentric enough to take to palaeontology, then those coral-less (or, if we're lucky, simply very coral-depleted) reefs will mean that they will, among many other preoccupations, have to find new ways to approach that grand old concept of uniformitarianism. For their different present will be a key to a different kind of past as regards this kind of ecosystem, and the rock it builds⁷. There will, too, be more to consider than the coralline algae. Taking the present as a starting point, the likes of soft corals, sponges, ascidians and cyanobacteria have been suggested as among the reef-inheritors (Reverter *et al.* 2021). And past coral reef gaps have been filled by the likes of rudist bivalves in the Cretaceous and (famously, of future use to Egyptian pharaohs as pyramid-building material) large benthic foraminifera such as *Nummulites* as another of the ancient analogues of modern global warming, the Paleocene–Eocene Thermal Maximum, exacted its toll.

Still, we have another half-generation to wait until 2042 to see how the Bradbury prophecy pans out, so we can ponder the new trajectories it leads to, and what kind of new territories will unfold. Maybe it's best not to hold our breath.

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Does the Anthropocene matter for the biosphere?

One of the primary ways we make sense of geological time is through fossils and the chemical signatures in rocks that indicate the biosphere's modification of the atmosphere and oceans. That record has been painstakingly examined by palaeontologists for over 200 years from the time of pioneers such as Georges Cuvier and Mary Anning. Indeed, the names of many divisions of geological time express a deep relationship with the biosphere, from the Phanerozoic eon of 'revealed life', to the Palaeozoic, Mesozoic and Cenozoic eras of 'ancient', 'middle' and 'recent' life.

At present, we formally live in the Holocene Epoch of time, beginning ~11,700 years ago. Its beginning is marked by a change in climate from cold glacial to warm interglacial conditions, and its fauna and flora show the growing influence of humans, particularly when some species of animals and plants were domesticated and then transported beyond their native ranges. Extinction is also a part of the Holocene, continuing from the Pleistocene, with the loss of many large mammals, such as ground sloths in the Americas and mammoths worldwide. Later, as humans spread across ocean islands, came the demise of moas in New Zealand, much of the mammalian fauna in Madagascar, and vast numbers of Pacific Island bird species. All of these have left a record of human effects on the biosphere, in fossils, archaeological artefacts and oral traditions and, latterly, historical documentation.

So why is another proposed subdivision of geological time, the Anthropocene epoch – unofficially recognized as the time when humans remodelled Earth's operating system – so useful for thinking about the biosphere? Its beginning has been proposed for the year 1952 C.E. (Waters *et al.* 2024), meaning that 90 % of all humans alive were born during this new epoch. While it may seem odd that many people alive have lived through the Holocene–Anthropocene transition, especially given that geological time extends back thousands of millions of years, the mid-twentieth century is a time when scientists of many disciplines, including many geologists, recognize that Earth's processes were profoundly changed, marking an end to the relatively stable



Holocene conditions. Such recognition of a *de facto* Anthropocene time interval, even though the International Commission on Stratigraphy does not formally recognize it, is clearly marked in a sediment record captured from Crawford Lake in Ontario (McCarthy *et al.* 2023), and in many other kinds of geological deposits worldwide. At Crawford Lake, and at many other sites, annual layers can be traced back centuries. The 1952 layer is important because it records the prominent

uptick of radioactive fall-out from nuclear weapons tests; one of hundreds of proxies that record the accelerating pace of human activities from then on. Hence 1952 is reasonably viewed as when the *de facto* Anthropocene started.

Even though this view of the Anthropocene means it started only ~70 years ago, the impacts have been dramatic for the biosphere. Of course, patterns of human modification to landscapes and seas, and consequently the biosphere, began in the Pleistocene and continued through the Holocene, but over the past 70 years the living world has changed dramatically. This is clear when you walk along a



Himalayan Balsam growing along the banks of the River Soar in Leicester. Picture credit: Amy Wrisdale, University of Leicester, UK.

riverbank in the UK and are surrounded by the delicate pink flowers of Himalayan Balsam. It arrived in 1839 and has proliferated since the 1950s, overwhelming the native vegetation along many European rivers. Himalayan Balsam is just one of thousands of non-native species that are leaving a fossil record. In San Francisco Bay non-native species have been arriving at least since the American Gold Rush of the mid-nineteenth century, and in the twentieth century many new arrivals hitched lifts across the Pacific on international shipping that accelerated with global trade after 1950. Molluscs from East Asia, such as the Amur River clam, arrived to outcompete the local species. They were joined by smaller, less conspicuous organisms such as a foraminifer from the seas around Japan, which now dominates the microfauna (McCann *et al.* 2000). These and others are commonly collected from sediment cores extracted from the Bay, where they are part of the fossil record.

The biotic changes are significant because they occur everywhere, and they continue to accumulate. In Crawford Lake, the 1950s interval is marked by a pattern of reduced Elm pollen extracted from the core sediments, showing that Dutch elm disease, arriving from Europe, was now spreading through the Great Lakes region. Other patterns of recent biotic change are more difficult to pin-down in the fossil record, in part because the organisms involved do not fossilize easily: for example, the dramatic fall in the abundance of insects over the past few decades. Even so, this so-called Insect Apocalypse may be recognizable by new techniques that can identify the crash through environmental DNA extracted from sediment cores. Indeed, looking in Anthropocene sediments to understand how their nascent fossils differ from the Holocene is a brand-new area of science. While there have not been many studies, even in these early days it is evident that Anthropocene sediments have a distinct biological signature, and a demonstrable biostratigraphy that is emerging from the rapid intercontinental movement of many non-native species, which can be used to identify and correlate sedimentary deposits to sub-decadal level

around the world (Williams *et al.* 2022). What we already know highlights that, as under-studied as it still may be, the recent (sub)fossil record indicates a step change to the planet's life in the last 70 years, and impacts are continuing to accumulate.

The new assemblages of species being preserved in the nascent Anthropocene fossil record show the initial transformation of a biosphere that has departed from Holocene norms. If the past is any guide to the future, we may be in trouble: the Anthropocene biotic signature will likely become even more distinct as the massive translocation of non-native species is followed by increasingly widespread extinctions. This is already presaged by loss, for example, the extraordinary loss of non-human biomass, including more than two-thirds of non-human vertebrate animals in just the last 50 years, and enormous contraction of the Holocene geographic ranges of most of our planetary biota, at the expense of expansion of species we humans have introduced.

Recognizing that the degree of biological change is dramatic, and leaving a distinctive fossil record, is one more reason to acknowledge that the Anthropocene we are in, beginning in 1952, is different to any time that came before. Failure to recognize its palaeontological significance may deal a serious blow to strategies to protect the biosphere. Sadly, it would also fail to acknowledge the evidence of the geological record itself, illuminated by palaeontologists such as Georges Cuvier and Mary Anning, and the many thousands of others, whose diligent work over two centuries on the record of fossil life is the best comparison we have for what may happen to the biosphere soon.

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Spotlight on Diversity Palaeontological Association Council Diversity Report 2024

This report represents quantitative and qualitative data collected from the Council members of the Association between February and April 2024 via a JISC online survey that I ran in my capacity as Diversity Officer. The study aimed to determine the current diversity of the Association's Council. The intention was to highlight any under-represented groups and to explore factors that promote or impede the diversity of the Council.

Key findings: This study was warmly welcomed by the 2024 Association Council members. Benchmarking proved to be problematic, because although many comparable organizations are collecting diversity data, this is not generally publicly available. I believe that making this data publicly available will support the growth of the Association as an organization and will provide useful benchmarking information for future studies. Further, this will create a baseline of diversity information that will validate these types of statistical studies and the actions generated from them, hopefully even to the more sceptical groups in the population. Diversity data from the HESA, WISE campaign, England and Wales National Census 2021, and other sources have been quoted as assisting with benchmarking. These are some of the key findings of the Council diversity survey:

The Council is relatively diverse and seems to be improving in diversity compared with previous years. Our main lack of diversity is related to ethnicity and nationality: 93.4% of the Council members consider themselves to belong to a traditionally non-under-represented ethnic background and 64.2% of the Council members are British.

Introduction: Diversity studies are important tools to highlight discrimination and serve as wake-up calls for organizations to set counter-actions in place. Discrimination that arises because of people's individual characteristics and circumstances is not only unlawful, but also a denial of opportunity and a waste of talent. Higher diversity will only make scientific organizations thrive by allowing people to be more participative, welcoming new contributions and ideas, and attracting new talent. The Association has the responsibility to ensure that all their members have access to the available services and activities and that no members are excluded or marginalized.

"There never were in the world two opinions alike, no more than two hairs or two grains; the most universal quality is diversity."

Michel de Montaigne

The 2010 UK Equality Act¹ aims to eliminate discrimination against people with nine listed protected characteristics. These protected characteristics are: age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race/ethnicity, religion or belief, sex or gender, and sexual orientation. In order to be proactive in removing any potentially discriminating policies or practices, organizations in the UK are encouraged to monitor the protected characteristics of their stakeholders and to use this monitoring data to inform their planning and decision-making. The Council diversity survey therefore invited respondents to

disclose their protected characteristics but, being mindful of Council members' rights to withhold this personal information, the survey was conducted anonymously and a 'prefer not to say' option was provided in each case.

Due to the number of Council members who have taken part in this survey there is a limited number of responses. I am aware that some answers might be enough to identify an individual respondent, therefore the statistics below are not accompanied by detailed data in order to protect the anonymity of the Council members.

Participation: The Council diversity survey for 2024 was completed by 15 people, which accounts for 65% of the Council members. This is the same number of participants as for the Council diversity survey for 2023.

Age: In 2024 the majority of Council members (80 %) are 25–54 years old. Only 6.7 % and 13.4 % of Council members are younger than 25 or older than 55 respectively. In contrast, 33.3 % are between 45 and 54 years old. According to the Higher Education Statistics Agency (HESA)², 3 % of academic staff were aged 25 and under in the UK in 2021/22. At the opposite end of the age groupings, 20 % of academic staff were aged 56 and over.

Gender: The female proportion of the 2024 Council is the highest recorded since 2018 at 60 %. According to the Women in the STEM Workforce 2023 benchmarking data published by the WISE Campaign³, 25.2 % of the core STEM force and 43.7 % of science professionals across the STEM workforce in the UK were female.

Sexual orientation: Asking people to disclose their sexual orientation is thought to be good practice in the UK, USA and Europe where people's rights are protected, but can be problematic elsewhere. In 64 jurisdictions worldwide, private, consensual, same-sex activity is criminalized, according to the Human Dignity Trust⁴. In some jurisdictions it is punishable by death (six countries in the Middle East and Africa) or long prison sentences including life imprisonment (12 countries). In 2024, 33.3 % of Council members identify as being part of the LGBTQ+ community, which is the same percentage as in the previous year's survey. According to the National Census figures for England and Wales from 2021, published by the Office for National Statistics⁵, 89.37 % of the population identified as straight or heterosexual in England and Wales, whereas 3.18 % identified as having any other sexual orientation.

Disability: In 2024, 33.3 % of Council members disclosed having a disability, long-term illness, or health condition. According to HESA², 6 % of academic staff in the UK were known to have a disability in 2021/22.

Ethnicity: 93.4 % of Council members consider themselves to have a traditionally non-underrepresented ethnic background (86.7 % white European and 6.7 % other white background). Only 6.7 % of members belong to a traditionally under-represented ethnic background. In comparison, 81.7 % of residents in England and Wales identified as white, the next most common ethnic group was Asian, Asian British or Asian Welsh, accounting for 9.3 % of the population⁵. Additionally, 22 % of academic staff in the UK identified as belonging to ethnic minority backgrounds in 2021/22, which was an increase from 16 % in 2017/182.



Religion: 80 % of Council members reported no religion or beliefs, the same percentage as in the 2023 survey. The National Census found that 46.2 % of adults described themselves as Christian and 37.2 % as having no religion⁵.

Marriage/civil partnership: 53.3 % of the Council members are married or in a civil partnership, the same percentage as in the 2023 survey. In 2021, 49.7 % of the total population of England and Wales was married or in a civil partnership⁵.

Caring responsibilities: 40 % of Council members have caring responsibilities as co-carers of a child/children under 18, adult(s) with disability, learning needs or health issues, and/or elderly persons. 83 % of these carers are women. 41.5 % of families resident in England and Wales have dependent children (18 years or less) and 9 % are unpaid carers of adult(s) with disability, learning needs or health issues and/or elderly persons⁵.

Parental leave: 20 % of Council members have taken parental leave of three months or more, which is an increase from the 2023 survey when it was 6.7 %. According to the STEM Returners Index 2023⁶, 44 % of UK respondents cited family care responsibilities as the primary reason for a career break, which disproportionately affected women.

School history: 20 % of Council members attended a fee-paying school. According to the ISC Annual Census 2023, published by the Independent Schools Council⁷, 5.9 % of all school attendees in the UK enrolled in private schools.

Socio-economic status: 26.7 % of Council members considered themselves to be from a disadvantaged socio-economic group or were unsure about this, whereas in 2023 it was 33.4 % of Council members. Additionally, 46.7 % of Council members are the first person in their immediate family to go to university, the same percentage as in 2023. 23.5 % of usual residents in England and Wales occupied higher and intermediate managerial, administrative and professional occupations, whereas 32.8 % occupied supervisory, clerical and junior managerial, administrative and professional occupations⁵. According to HESA², 37.5 % of 18-year-olds in England entered full-time higher education in 2022, representing the second-highest figure on record.

Nationality: 64.2 % of Council members hold British nationality; in 2023 this was 60 % of Council members. For comparison purposes, according to HESA², 67 % of academic staff in the UK held British nationality in 2021/22.

Country of employment: 57.1 % of Council members are based in a UK institution, with Italy and Germany employing an additional 14.3 % of Council members each.

Sector of employment: 64.3 % of Council members are employed by a university, 21.4 % by a museum, and 14.3 % by another type of institution. In 2023, 76.9 % of Council members were employed by a university.

Type of contract: 35.7 % of Council members are employed on a fixed-term contract as a researcher or temporary worker, whereas 42.8 % have a permanent contract, and half of these as mid-level and half as senior-level employees. In 2023, 59.9 % of Council members were employed on permanent contracts. According to HESA², 33 % of academic staff in the UK were employed on fixed-term contracts in 2021/22, of which 51 % were hired on a part-time basis.

Languages: The three most spoken languages by Council members in 2024 are, in descending order, English, German and Spanish. According to the 2021 National Census figures for England
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and Wales published by the Office for National Statistics⁵, 91.1 % of usual UK residents aged three years and over had English as a main language and a further 7.1 % of the overall population were proficient in English but did not speak it as their main language. The most common main languages, other than English, were Polish (1.1 %) and Romanian (0.8 %).

We will continue to survey the Association's Council members annually. We would like to remind all members of the Association that they are welcome to apply to become Council members. To see more information about upcoming vacancies and the nomination process see page 25.

Nidia Alvarez Armada

Diversity Officer

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Spotlight on Diversity

New mothers in academia: breastfeeding on the go

Having a baby is one of the most life-changing events anyone could experience. The first months of the baby's life are challenging for parents, who usually must adjust their professional careers and personal lives to allow substantial extra time to assist with the baby's needs. Academic institutions and funding bodies have made a great deal of progress in accommodating new parents' needs; however, new mothers in particular are still suffering from difficulties when returning to work after having given birth, and often must secure additional assistance before planning any work trips or even office work. The experiences of five new mothers returning to academia are given below. They represent positive experiences overall, but there is clearly still room for improvement.

Time off to acclimatize to the major life changes is essential to parents. How academic institutions and funding bodies honour maternity rights is geographically biased. Paid maternity and paternity leaves are written into the laws of European countries and the UK. "Clearly the ideal solution is to give people at least six months off after having kids, in the UK we get nine months of paid maternity leave," Susannah Maidment commented. "When I returned to work, six months after giving birth to each of my children, my husband took a six-month period of shared



parental leave with each of them. We were fortunate to have this option available to us, and it very much facilitated my return to work and made some logistical issues around breastfeeding much easier to manage," Fiona Gill added. In contrast, in Spain maternity and paternity leave are only 16 uninterrupted weeks, though this is due to increase to 20 weeks in 2024. At the higher end of the scale are the northern countries in Europe: "Paid parental leave in Norway is about one calendar year with four months reserved for each parent and an extra two to three weeks of paid leave before the projected due date for the mother," Lee Hsiang Liow added. Mothers in other countries are under much more precarious conditions; for instance in the USA there is no federal paid maternity leave, and it is up to each state to create active policies. About 25% of new mothers in the USA are forced to come back to work only two weeks after giving birth.

Additionally for researchers, some funding bodies are more open to honour maternity rights than others. Susannah Maidment comments that the ideal solution is "... of course getting funders to honour maternity rights regardless of contract status" and Fiona Gill adds that "I think funders providing financial support so that the baby and a carer can accompany the parent, especially for extended trips, is a key means of support". Whilst many funding bodies are clear on their grants' policies about parental care, others may have more ambiguous policies. As a good example, the Royal Society states in their documentation "All directly employed staff on Royal Society funded grants are entitled to take full periods of paid leave in line with their host organisation's policies" and "The Society can provide financial support to Research Fellows for any additional childcare costs that arise when attending conferences, collaborative research visits or invited talks directly related to their fellowship or award. This policy is also applicable to meeting organisers, Chairs and invited speakers when attending a Royal Society organised meeting or event".

Work trips, such as conferences, museum visits and training sessions, are essential in academic careers but these carry additional planning, expenses and stress for new mothers. "When I had my son, I was close to the end of a Royal Society Dorothy Hodgkin Fellowship and funding from the Royal Society paid for my husband and son to travel with me to two international meetings and also covered a non-participant registration fee for my husband for one of the meetings, so that he could enter the conference centre and bring my son to me to feed in breaks between sessions. This was also the approach we took when I attended the Advance HE Aurora course. Advance HE made a room available in the hotel where the training sessions took place for my husband and son to use and for me to use to feed my son, although I also fed him on some occasions in the coffee area between sessions, so as not to miss out on networking opportunities. I have attended several Palaeontological Association events with a breastfeeding baby, including two Annual Meetings, the Lyme Regis Fossil Festival and a Council away day and in all cases, my husband was able to access the venue and bring my baby to me to feed in scheduled breaks, which was really helpful in allowing me to participate in these events," Fiona Gill commented. "I travelled to several conferences and analytical facilities when I was breastfeeding both of my children. Some with baby in tow, others, without baby. I brought my babies to conferences and synchrotron facilities only when they were young (less than 12 months old), and breastfeeding was more intensive, and the baby was less mobile. I do not think it is feasible to do this unless you have support. In my case, my husband travelled with me and looked after the baby while I attended the sessions/worked my shift at the beamline. This allowed me to soak up the science, but my coffee and lunch breaks were spent breastfeeding, so I felt that I missed out on

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networking and social opportunities. This was also expensive, as I was paying for my husband's flights," Maria McNamara added. Travelling with another carer is the only option for mothers breastfeeding newborn babies, but it is expensive and usually exhaustive planning is needed independent of the accommodations put in place by the organizing teams. "I did travel for international meetings and workshops during my breastfeeding period. Early on, I simply took both my partner and baby with me as my daughter never took breast milk in a plastic bottle. As the baby grew less dependent on breast milk for nutrition, I could take short work trips where I had a breast pump with me just to keep the milk production going. I pumped in hotel rooms, conference location toilets, colleague's offices and restaurants, some more pleasant than others," Lee Hsiang Liow adds. When open strategic and financial support are not offered by hosting institutions and/or organizing committees, the pre-travel planning might become unbearable, and mothers might feel compelled to wait until the baby has been weaned to attend work commitments requiring travel for long distances. "Not much to say, only that I felt that I was not able to attend a conference until I had finished breastfeeding. The deadline of the conference looming was the catalyst for weaning my son at about 11 months," Alice Clement stated. "Conference attendance without a baby is less expensive. It is also a little more relaxing, and gives a little more time to socialize, but I still found that I was dashing off to pump at least once a day while at the conference venue/beamline. This was somewhat stressful, and often meant pumping in rather undesirable locations, including many toilet cubicles," Maria McNamara added.

Treatment by peers is one of the most important factors in enabling new mothers to feel comfortable returning to work. Lee Hsiang Liow shared two completely opposing experiences on how she was treated by peers and how that made her feel in two different geographical locations. "When I was 7.5 months pregnant, I had a faculty position interview in the USA. For those unfamiliar with such interviews in the USA, these are usually two-day events including 1-2 seminars to be given by the candidate and many one-to-one meetings with faculty members, discussions with graduate students and formal meals where the interview with the hiring committee might continue. No one at that university was allowed (I discovered in retrospect) to glance or comment on my huge belly or to ask me how I felt. To their credit, I was secretly assigned a younger female faculty member who snuck me away between back-to-back meetings so I could take the frequent toilet breaks my pregnant body desperately needed. She also had a couch in her office but there was no time scheduled for a lie down, and she apologized for that. I think there are simple measures one could take to make job interviews more comfortable for anyone/everyone and I do not think I need to list them here. On the other hand, breastfeeding is encouraged and supported nationally in Norway, and I gladly followed the societal norm. The quitting was child-led: my daughter told me she did not want to be breastfed anymore when she was two years and three months old. I took a total of eight months of maternity leave. Dad, also an academic, took the rest of the four months, as a 50–50 split felt unnatural to us because of the breastfeeding, even though it was "unfair" career-wise. I tried to keep up with reading papers, answering work emails and going to the office for some work meetings during those eight months. None of that work was imposed on me, and I was occasionally chided by Norwegian colleagues for working during my 'time-off' but I felt I had to keep up, especially with my international network, who might not have been aware that I was on leave. I did not inform the international colleagues who were not close friends about my maternity leave, in fear of 'losing out' on opportunities. I regret that decision in part. However, comparing my early motherhood



and my daughter's first years with my peers and their kids in the USA, I realized deeply that Norway is a really supportive, conducive and kind environment for parents and kids".

It is common practice nowadays to design childcare and breastfeeding facilities when planning conferences and meetings, but these are not always advertised to prospective attendees and unfortunately sometimes do not meet appropriate requirements for the carers. "For conference organizers, allowing babies and carers on site and providing a space for feeding for those who want it is hopefully commonplace now, but making participants aware that this exists, ideally in advance of registration, is very useful for planning", Fiona Gill concludes. Maria McNamara suggests: "to anyone thinking of attending a conference while breastfeeding, just do it! It is really empowering and feels so invigorating to be 'back' in the community doing science. But be ready, make a plan, pump when possible in your hotel room, and bring a rechargeable battery pack for the pump", adding, "to organizers of future meetings: there are some simple things you can do to help: i) publicize breastfeeding/pumping rooms on the conference website, circulars and registration page; ii) clearly signpost the breastfeeding/pumping room and ensure your staff know where it is; iii) make sure the room includes: a lockable door with no window, a comfortable chair near a power outlet and beside a table, and a fridge; iv) ensure that the room is not used as a childcare room; v) ensure that the room is located in the same building as the conference". Organizers can also support those pumping by making sure they can leave heavy bags containing pumps, batteries and ice packs in a safe place and don't have to lug them around all day.

The Palaeontological Association has been working to make events more accessible to everyone, including new parents. The Carer's Bursary is open to support attendance at the Association's meetings by researchers with caring responsibilities. A maximum of £250 per individual bursary will be awarded and these are decided on a first-come first-served basis. The next deadline to apply for the bursary is **8th November**, in time for the Annual Meeting.

As the Palaeontological Association Diversity Officer, I would like to have an open communication with all members of the Association. Would you like your story to be featured in an upcoming *Spotlight on Diversity* column? Do not hesitate to contact me at **<diversity@palass.org**>. I am planning to write about immigration in academia for the next issue of the *Newsletter*; whether you have had a good or a bad experience, I am interested in sharing it with our membership.

Nidia Alvarez Armada Diversity Officer

>>Future Meetings of Other Bodies



13th International Symposium on Fossil AlgaeLe Castella, Italy2 – 6 September 2024

The 13th International Symposium on Fossil algae of the IFAA (International Fossil Algae Association) will be held in Le Castella (Calabria, southern Italy). The scientific topics will cover any aspects of calcareous algae and microbialites, including evolution, present-day and past biogeography, stratigraphic significance, palaeoecology and sedimentogenic roles. Because of the central role of calcareous algae in the global carbon budget, contributions concerning the identification and delimitation of marine habitats dominated by calcareous algae across latitudinal gradients and in different (palaeo)environmental settings are especially welcome. The Symposium is organized by the University of Milano-Bicocca, Department of Earth and Environmental Sciences, in collaboration with the Crotone Province, managing the Marine Protected Area of "Capo Rizzuto", the Museum Pélagos, and the Aragonese Fortress of Le Castella, where all scientific sessions will be held. Le Castella is located on the Ionian coast, within reach not only of Pleistocene marine terraces, but also of the Vrica GSSP for the Calabrian stage, the destinations of the post-symposium field-trip.

Register online: <https://cresciblureef.unimib.it/ifaa-2024/>.



19th International Nannoplankton Association Meeting (INA 19) Llandudno, UK 7 – 15 September 2024

The biennial INA conference is for nannofossil/nannoplankton professionals and students to exchange information and scientific research. INA 19 will be the first conference in over 35 years to be held in the UK and for the first time ever it will be hosted by an industrial firm. Calcareous nannofossils/nannoplankton are used in many diverse industries, including (but not limited to) biostratigraphy in the hydrocarbon industry, and are increasingly used in the low carbon energy transition (*e.g.* renewable energies and carbon capture, and prediction of future climatic trends), with research into living nannoplankton and environmental proxies relevant to the present global focus on climate change. A gala dinner and pre- and post-conference field-trips are planned.

Register online: <https://ina19.petrostrat.com/>.



The 175th anniversary of the Maastrichtian Stage – a celebratory conference Maastricht, the Netherlands 8 - 11 September 2024

In the Summer of 1849, Professor André Hubert Dumont of Liège, Belgium first used the phrase 'système maestrichtien', while doing geological mapping in the Belgium/Netherlands border area near Maastricht. In the three decades that followed, a wealth of stratigraphical and palaeontological data were published. In fact, the same may be said about recent progress in these fields. New information on the type Maastrichtian, including a chemostratigraphical analysis,



clearly shows that interest in this latest Cretaceous time slice is still very much alive and kicking. Therefore, this celebratory conference has been organized, commemorating the 175th anniversary of the stage, for participants to discuss recent progress and outline future research in an informal setting. A special issue of the periodical *Netherlands Journal of Geosciences*, covering various aspects of the Maastrichtian, will also be produced. Two days of oral and poster presentations, an icebreaker party and dinner, plus a full day field-trip are scheduled. Registration and abstract submission are now closed.

For more information see: <https://www.nhmmaastricht.nl/maastrichtian-anniversary/>.



Symposium of Vertebrate Palaeontology and Comparative Anatomy (SVPCA) University of Southampton, UK 11 – 14 September 2024

The 70th Symposium of Vertebrate Palaeontology and Comparative Anatomy (SVPCA) and the 29th meeting of the Symposium of Palaeontological Preparation and Conservation (SPPC) will take place at the University of Southampton on the south coast of England. The keynote will be delivered by Prof. Mike Benton, whose work has covered everything from pioneering methods to determine the colours of dinosaurs to delving into the aftermath of the end-Permian mass extinction, reshaping our understanding of ancient ecosystems and inspiring countless researchers to explore the wonders of the prehistoric world. The conference dinner will be held in a local brewery, and accommodation will be in the university halls of residence. The field-trip will be to the Isle of Wight, renowned for its abundant fossil deposits and rich geological history.

Register online here: <https://go.soton.ac.uk/g1o>.



7th Triennial Mosasaur Meeting – a global perspective on Mesozoic marine amniotes Maastricht, the Netherlands 12 – 15 September 2024

Early in May 2004, some 25 scholars of mosasaurid reptiles assembled for the first edition of what was then referred to as the 'Mosasaur Meeting' at the Natural History Museum of Maastricht – an aptly chosen venue as the first fossils of 'Meuse lizards' were unearthed there in the latter half of the eighteenth century. The 2004 meeting was the first in a series of triennial workshops in Europe and North America, for which it was later decided to also include talks on non-mosasaurid marine amniotes of Mesozoic age. The last meeting prior to the pandemic took place in Drumheller, Canada in May 2019 and, although not conforming to the three-year turnaround schedule, the next meeting in September 2024 is a special one as it coincides with the 175th anniversary of the Maastrichtian Stage. During the 7th Triennial Mosasaur Meeting, all aspects of taxonomy, systematics, phylogeny, palaeobiology and palaeobiogeography of mosasaurs (and other Mesozoic marine amniotes) will be considered. Two full days of oral and poster presentations, an icebreaker reception and conference dinner, plus a full-day field-trip at two localities in the Maastricht area are scheduled. Registration and abstract submission are now closed.

For information see the website: <https://www.nhmmaastricht.nl/mosasaur-meeting/>.





10th European Malacological Congress (Euromal2024)Cultural Conference Centre of Heraklion, Greece15 – 20 September 2024

Euromal is the most important meeting for the European malacological community, taking place once every three years. The motto of the 10th Euromal is "The slow side of life on a rapidly changing planet". The aim of the conference, among other things, is to highlight the importance of molluscs in our efforts to understand and address anthropogenic impacts on the environment. Therefore, at Euromal 2024 all aspects of research concerning diversity, function, ecology, evolution, behaviour, utility and conservation of extant and fossil molluscs are welcomed. The meeting will continue the successful tradition of the past Euromal congresses, and everyone with an interest in molluscs is welcome to join the Congress in Heraklion and to present and discuss their work. Abstract submission has now closed but registration is available online.

See the website for further information: <https://www.euromal2024.gr>.



Joint Meeting of the Polish Paleobiologists and the 95th annual meeting of the Paläontologische Gesellschaft (PalGes) Warsaw, Poland 16 – 21 September 2024

This joint meeting will be held in Warsaw, the capital, and the largest city, of Poland. The University of Warsaw will organize the meeting with assistance from co-organizers the Paläontologische Gesellschaft, the Institute of Paleobiology at the Polish Academy of Sciences (IP PAS), the Palaeontological Section of the Polish Geological Society (PS-PGS), and the Polish Geological Institute – National Research Institute (PGI-NRI). The main theme of the conference is 'More than extinct species: the importance of fossils for ecology, evolution, and conservation across borders?', which will emphasise the interdisciplinary direction that palaeobiological sciences are currently taking, and the key role of information from the geological past in addressing a variety of issues including ecology, evolution and biodiversity protection that concern us today. The official language of the meeting is English; however, associated outreach events are planned in German, English and Polish. Online registration is open until **31st August 2024**.

Meeting website: <https://www.palaeontologische-gesellschaft.de/tagungen/jahrestagung/>.



4th Annual Meeting IGCP 735 Córdoba, Argentina 14 – 21 October 2024

The goal of the meeting is to facilitate research about the Ordovician Period from a global, multidisciplinary perspective. The 2024 IGCP Annual Meeting provides a fresh opportunity to discuss recent advances and discoveries related to the most significant marine radiation in Earth's history. It aims to share ideas and insights, foster collaboration and stimulate cooperation. Oral and poster presentations, keynote talks, workshops, social activities, and a field excursion to the Argentine Precordillera are included in the programme. The meeting will be held over three days, with



two days of technical talks and a third day of workshops followed by afternoon social and tourist activities. The post-conference, four-day field-trip to the Argentine Precordillera will showcase spectacular outcrops and biotas of this celebrated basin, which has been the subject of intensive studies and debates for the last 30 years.

See more information: <https://sites.google.com/unc.edu.ar/igcp735annualmeeting>.



5th Palaeontological Virtual Congress Online meeting 10 – 24 March 2025

The increasing use of virtual platforms to communicate science inspired the creation of the 1st Palaeontological Virtual Congress in December 2018, the first exclusively virtual conference in our field, followed by three further editions. Following this success the fifth Virtual Congress will be held in early 2025. The purpose is to spread, worldwide, the most recent scientific advances in palaeontology in a fast, easy and economical way. In these challenging times, online platforms have gained greater relevance and are key to keeping up the drive for science communication among both academics and enthusiasts. Delegates can share their research with the world, via either oral communications or slide presentations.

Details to come at: <https://www.palaeovc.org/>



9th Symposium on Fossil Decapod Crustaceans Faxe, Denmark 9 – 13 June 2025

This conference in Faxe is co-organized by the Geomuseum Faxe and the University of Alabama (Department of Museum Research and Collections and Alabama Museum of Natural History). Although the conference is focused on decapod crustaceans, research on other crustaceans is also welcome. The conference consists of an icebreaker followed by two conference days full of talks and posters, followed by two field-trip days. The conference venue is very close to the Faxe Limestone quarry, which is the type locality for the Danian age, and has preserved the remains of a 63-million-year-old fossil cold-water coral reef. The quarry is famous for its high number of well-preserved fossils, including abundant decapod fossils that have been formally reported from Faxe since 1820. Geomuseum Faxe has an extensive collection of Maastrichtian and particularly Danian crustaceans from Denmark. The collection will be available for participants to study during the conference.

For more information see: <https://collections.museums.ua.edu/9th-fossil-decapod-symposium/>.



7th International Palaeontological Congress (IPC7)Cape Town, South Africa30 November – 3 December 2026

The 7th International Palaeontological Congress will be held in South Africa in 2026, only the second time that this meeting will be held in the global South and the first time in Africa. The meeting will be held during the height of the very pleasant summer season at the Cape Town International Convention Centre (CTICC), which has the capacity to host hundreds of delegates, both in large rooms and in smaller breakaway rooms. The CTICC is situated close to the vibrant heart of Cape Town's city centre and a short walk to the Victoria and Alfred Waterfront which hosts numerous restaurants and hotels to suit all pockets. The fossil heritage of South Africa is renowned globally for its importance in understanding the history of life on Earth and extends from the very beginnings of life to the world-famous hominin relatives that have been recovered there. Submissions for symposia topics will soon be invited, and the organizers expect to offer a wide range of symposia, as well as space for general talks. A series of field-trips will give delegates a feel for the rich fossiliferous rocks in South Africa that span significant periods of time. Furthermore, delegates attending IPC7 will have the opportunity to visit some of the most important museum collections of South Africa, including the Albany Museum featured in *Newsletter* **115**. Circulars are available online as well as preliminary registration.

Congress website: <https://ipc7.site/>.



Please help us to help you! Add your own meeting using the link on the Association's web page:

<https://www.palass.org/meetingsevents/future-meetings/add-future-meeting>.



Meeting REPORTS



18th International Nannoplankton Association Meeting (INA 18)Avignon, France28 August – 4 September 2022

The 18th INA meeting was held in Avignon at the Palais des Papes Conference Centre and was very well received by participants.



The INA 18 delegates in the cloister of the Palais des Papes. Photo by Luc Beaufort.

The meeting welcomed 114 delegates from 24 different countries (taking into account host institutions), including 11 videoconference participants from China and Japan, 37 PhD and master's students, and three accompanying persons. Unfortunately, eight people were unable to attend and had to withdraw at the last minute. We received 105 abstracts (55 oral presentations and 50 posters), which were divided into different sessions: 30 in biostratigraphy, 33 in palaeoceanography, 21 in evolution, 14 in taxonomy, biology or genetics, and seven in crystallography.

On Monday 29th August we awarded the first biennial van Heck Prize to Jeremy Young (2020) and Jackie Lees (2022) for their outstanding achievements in research and development. The INA Foundation awarded two research prizes based on research excellence. We helped organize an external event associated with the meeting on Wednesday 31st August with an 'art and science' perspective: a reception and painting exhibition on nannofossils by Isabelle Rochemars at the Musée Requien natural history museum. The INA business meeting also took place on 31st August. After five years as INA president, Giuliana Villa passed the torch to Emanuela Mattioli. The choice of venue for the next INA conference in 2024 was voted by 44.3 % in favour of Llandudno, North Wales (<https://ina19.petrostrat.com>). During the closing ceremony of the conference, several student prizes were awarded.

The pre-congress excursion to Mont Sainte-Victoire, organized by **Baptiste Suchéras-Marx** with a visit to the natural park, was attended by 26 people. The pre-congress tour of the Palais des Papes, organized by **Luc Beaufort**, was attended by ten people. Sixteen people took part in the two-day post-congress excursion to discover the geological and palaeontological attractions of the Luberon National Park.

Overall it was a very successful congress and we are grateful to the Palaeontological Association for the Grant-in-Aid that allowed three early-career researchers to attend (grant number PA-GA202001). We look forward to seeing everyone at INA 19 in Llandudno this September!



Simplified country statistics for participants' host institutions. As far as the nationalities of the participants were concerned, India and Iran were also represented.

INA 18 organizers:

Luc Beaufort, Baptiste Suchéras-Marx and Clara Bolton

Centre Européen de Recherches et d'Enseignement des Géosciences de l'Environnement (CEREGE), Aix-en-Provence, France



R for Palaeobiologists: Workshop and Hackathon

University College London, UK 7 – 8 September 2023

R is one of the most popular programming languages in data science and has been widely adopted by the palaeobiological community for cleaning, analysing and plotting data. General familiarity with R allows users to automate routine tasks and expands the potential of their research. Importantly, it also allows researchers to improve the reproducibility of their research and document their analyses. To foster the development of strong R programming skills in



palaeobiology, the 'R for Palaeobiologists: Workshop and Hackathon' two-day event was run at University College London (UCL) in September 2023. The event was organized and run by members of Palaeoverse (<https://palaeoverse.org/>), a team of early-career researchers aiming to bring the palaeobiological community together to share resources, reach agreed standards and improve reproducibility in palaeobiological research.

Day one kicked off with the workshop component of the event. All sections of the workshop included a short talk followed by a live code demonstration and practical. The day started out with some welcome tea and coffee, as well as an introduction to the Palaeoverse initiative.



Lewis A. Jones introducing the Palaeoverse R package to workshop attendees. Photo by Christopher Dean.

The opening tutorial was delivered by **Bethany Allen** (ETH Zürich, Switzerland), who introduced attendees to fossil occurrence databases, data acquisition, and cleaning. Following on from Bethany, **Lewis A. Jones** (Universidade de Vigo, Spain) introduced attendees to data preparation and exploration using the Palaeoverse R package. Attendees were then treated to a well-deserved lunch break, taking advantage of the international delicacies on offer at UCL's farmer's market (and surprisingly good weather for London!).

To help attendees recover from their self-inflicted food comas, **Sofía Galván** (Universidade de Vigo, Spain) and **Miranta Kouvari** (Science Graphic Design, UK) followed lunch with some expert tips and tricks for data visualization, including generating plots in base R and ggplot2. This session was followed up by UCL's very own **Christopher Dean** who delivered a presentation introducing a variety of resources relevant for palaeobiological analyses and palaeontologists more broadly. **Kilian Eichenseer** (Durham University, UK) led the next session of the day, with the difficult task of introducing how to write, document, test, debug and profile functions in R – fortunately plenty of coffee was on hand for attendees. The first day of the event was concluded with an introduction to the hackathon and the selection of hackathon briefs by each group.

The main hackathon component of the event ran on day two and provided the opportunity for attendees to work together in small focus groups, to develop functions to address various problems in computational palaeobiology. During this component of the event, attendees had the opportunity to work with different researchers and gain experience working collaboratively in R. Throughout the day, each group worked with dedication and intensity ... they had to be basically pulled away from their laptops for a pizza lunch and a top-up of vitamin D in UCL's main quad!





A much-needed refuelling break with pizza and drinks on the lawn. Photo by Lewis Jones.

At the end of the day, all hackathon groups had the opportunity to present the functions they had developed, with prizes awarded to the winning group. Whilst all groups had developed fantastic tools in such a short space of time, there could only be one winning group! And that was **Eileen Straube** (Universität Bayreuth, Germany), **Adam Woodhouse** (University of Bristol, UK), and **Thomas Wong Hearing** (University of Leicester, UK) with their function capable of generating equalarea latitudinal bins. Great job guys!



Hackathon winners (left to right): Thomas Wong Hearing, Adam Woodhouse, and Eileen Straube. Photo by Lewis Jones.

To wrap up, I would just like to say a personal thank you to all the attendees for their enthusiasm and to the organizing team for their tremendous efforts. This report would be amiss without a final special mention for UCL's **Cecily Nicholl** who provided incredible logistical support throughout the entire event and ensured everything ran smoothly and according to plan.

This first edition of 'R for Palaeobiologists: Workshop and Hackathon' was supported by a Grant-in-Aid (grant number PA-GA202203) from the Palaeontological Association (awarded to Lewis A. Jones) and a meeting support grant from the Paleontological Society (awarded to William Gearty, American Museum of Natural History, USA). Without this support, this event could not have gone ahead.



Prizes for hackathon winners and runners-up were generously provided by Transmitting Science, Jumping Rivers, PRStatistics and the Palaeontological Association. All workshop and hackathon materials are available at <https://hackathon.palaeoverse.org/>.

Lewis A. Jones

Universidade de Vigo, Spain



Group photo of attendees at the first edition of 'R for Palaeobiologists: Workshop and Hackathon'. Photo by Lewis Jones.



200 Years of Dinosaurs: New Perspectives on an Ancient World Natural History Museum, London, UK 11 – 12 January 2024

In 2024 we celebrated the 200th anniversary of the naming of the first dinosaur, Megalosaurus bucklandii, with an international conference showcasing the cutting-edge of dinosaur palaeontology. The conference was held in the Natural History Museum in London, UK, an appropriate venue

because it hosts one of the world's most important dinosaur collections. The conference was supported by a Grant-in-Aid from the Palaeontological Association (grant number PA-GA202301) and a grant from the Palaeontographical Society, which together allowed us to invite eight keynote speakers from around the world. Xu Xing came from China to tell us about his work reconstructing bird origins; Diego Pol came from Argentina to discuss the latest discoveries in Patagonia; Kimi Chappelle flew in from South Africa to demonstrate the cutting-edge approaches she is using to understand ontogeny and growth in sauropodomorphs, and Lindsay Zanno and Sterling Nesbitt came from the Kimi Chappelle presented on new approaches



to understanding ontogeny and growth in sauropodomorphs. Photo by Susannah Maidment.

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USA to tell us about faunal change through the Early Cretaceous and dinosaur origins, respectively. **Peter Falkingham**, **Laura Porro** and **Nizar Ibrahim** came from institutions across the UK to talk about dinosaur trackways, biomechanical approaches to understanding skull performance, and Moroccan dinosaurs.



The delegates at the 200 Years of Dinosaurs conference. Photo by Lucie Goodayle.

After an early-morning preview of the Natural History Museum's special exhibition *Titanosaur*, which showcased a cast of the largest dinosaur ever discovered, the conference started with an introduction from Museum Director **Doug Gurr**, and a surprise for the attendees: **Emma Nicholls** and **Duncan Murdoch** from the Oxford University Museum of Natural History had brought the holotype of *Megalosaurus bucklandii* to London, and the specimen was displayed on the stage alongside the speakers so everyone could take a selfie with it.

The programme included two days of excellent talks which showcased the diversity of techniques and approaches dinosaur researchers in the twenty-first century use to move beyond the bones to understand the palaeobiology of these long-extinct animals. For example, we heard about how drivers of radiation and extinction can be elucidated using ecological niche modelling from **Alessandro Chiarenza** (Universidade de Vigo, Spain), how new synchrotron beamlines are providing imaging at never-before-seen levels of resolution from **Kathleen Dollman** (European Synchrotron



Lindsay Zanno presented on faunal change through the Early Cretaceous. Photo by Susannah Maidment.

Radiation Facility, Grenoble, France), and how cutting-edge geochemical techniques are shedding new light on the formation mechanisms of bone beds found more than 150 years ago from **Pim Kaskes** (Vrije Universiteit Brussel, Belgium). Across the two days, we heard from dinosaur researchers from all around the world and from all career stages: Virginia Tech, USA undergraduate student **Simba Srivastava** gave a confident and engaging talk on his work on a new dinosaur from New Mexico while, at the other end of the



career spectrum, old hands like **Paul Upchurch** (University College London, UK) and **Matt Lamanna** (Carnegie Museum of Pittsburgh, USA) talked about new palaeobiogeographic methods and new discoveries of dinosaurs in Antarctica, respectively.

The conference dinner was held in the marine reptile gallery of the Natural History Museum, London, and delegates were served sharing platters of extremely tasty vegetarian Indian food while seated around a single long table, giving both an intimate and an awe-inspiring experience. Dessert was served beneath the feet of *Patagotitan*. The conference was a fantastic event, and we extend our special thanks to the Natural History Museum's Events team, particularly **Katy Payne**, for excellent organization and her attention to detail which made the two days run perfectly.

Susannah Maidment

Natural History Museum, London, UK



Delegates enjoying the conference dinner held in the marine reptile gallery of the Natural History Museum, London. Photo by Susannah Maidment.



OBITUARIES —

Christoph Bartels 1949 – 2024

Christoph Bartels, who died on 17th April 2024, spent a distinguished research career at the Deutsches Bergbau-Museum (German Mining Museum) in Bochum, Germany working on mining and metal production in mediaeval and early modern times, with a particular interest in the Harz region. Initially a teacher in Dortmund, he completed his PhD in 1985 at Carl von Ossietzky University in Oldenburg on the history of slate mining. He joined the Deutsches Bergbau-Museum the following year and became head of research on the History of Mining in 1999. He retired in 2012. In 2014 he received the Palaeontological Association's Mary Anning Award in recognition of outstanding contributions to palaeontology by someone not professionally employed in the discipline.

Christoph began collecting and preparing



Hunsrück Slate fossils as a high school student. As a young man he made regular trips to the Hunsrück region some 170 miles south of his home, becoming an expert in finding fossils on the guarry tips where material unsuitable for roof slate was discarded. The fossils are often only evident as subtle relief features on the surface of the slate. Christoph developed relationships with a number of the quarry workers who collected fossils as a byproduct of roof slate production. In those days research on the Hunsrück Slate was focused largely on the spectacular X-radiographs produced by Wilhelm Stürmer (1917–1986) of Erlangen, who developed his imaging expertise working at the Siemens Corporation. Stürmer's research was complemented by publications summarizing knowledge of different Hunsrück fossil groups by Fritz Kutscher (1907–1988) at Mainz. Following Stürmer's death, interest in the Hunsrück Slate waned in Germany, but Christoph kept promoting research on the biota although he had limited influence as someone outside academia. He and his collaborator Günther Brassel, a fossil collector and retired captain in the German navy, wrote a book-length account of the biota, Fossilien im Hunsrückschiefer – Dokumente des Meereslebens im Devon, which was published by the Museum Idar Oberstein in 1992. When I became interested in the pyritization of soft tissues, Jan Bergström, who had collaborated extensively with Stürmer on Hunsrück Slate arthropods, suggested I contact Christoph as a source of samples. That led to a long research collaboration which resulted, at an early stage, in a revised and



updated version of the 1992 book, published in 1998 by Cambridge University Press as *The Fossils of the Hunsrück Slate – Marine life in the Devonian*.



Christoph Bartels (left) examining part of a block of Hunsrück Slate in situ in the Eschenbach-Bocksberg Quarry in 1997 – sawn as part of Project Nahecaris. Photo by Derek Briggs.

In 1997 Christoph, together with Dr Michael Wuttke of the Referat Erdgeschichte der Direktion Landesarchäologie der Generaldirektion Kulturelles Erbe Rheinland-Pfalz (General Direction for Cultural Heritage of Rhineland-Palatinate - State Archaeology/ Earth History), took advantage of the end of commercial activity at the Eschenbach-Bocksberg quarry to organize the excavation of a massive column of Hunsrück Slate, the basis of a research project we called Project Nahecaris after the well-known Hunsrück Slate crustacean A block 7 3 x 2 x 1 metres was extracted using a giant hydraulic saw. Systematic splitting provided the basis for a bed-by-bed analysis of the fauna, allowing associations of taxa to be identified. which had not been possible based on the specimens collected by the guarry workers or on the discarded tips. The results were published in 2002 in Metalla, a journal of the Deutsches Bergbau-Museum. Research on the Hunsrück Slate finally returned to the mainstream in Germany in 2006, thanks in no small part to Christoph's efforts to increase awareness of the fossils, when a

major project was established at the University of Bonn under the direction of Jes Rust, funded by the Deutsche Forschungsgemeinschaft (DFG, *i.e.* German Research Foundation).

Hunsrück Slate fossils are largely concealed in matrix and traditional methods of preparing the pyritized fossils, with needles and blades, can damage the finest details even when great care is taken. X-radiography and scanning are now the norm, but surface details may be difficult to discern and clearly specimens imaged in this way are not exposed for study or display. Christoph pioneered a new method of preparing the fossils with an airbrasive machine using iron filings (which he recycled) in the basement of his home. This allowed him to expose remarkably delicate features with the aid of a binocular microscope. Many of his specimens, prepared in this way, provided spectacular photographs for a volume on the Hunsrück Slate fossils published as *Fossilien im Hunsrückschiefer: Einzigartige Fossilien aus einer einzigartigen Region* by Quelle and Meyer Verlag, and in English in 2012 as *Visions of a vanished world: the extraordinary fossils of the Hunsrück Slate Slate* by Yale University Press. These books included X-radiographs made by Wolfram Blind using Stürmer's X-ray equipment which Christoph helped to transfer to Blind's laboratory at the University of Giessen. As well as the books on the Hunsrück Slate, Christoph was an author on more than

20 scientific papers and articles on the fossils, including the results of research on pyritization, brachiopods, arthropods, annelids, ammonoids, machaeridians, crinoids and trace fossils.

Christoph was always generous in sharing his finds and in guiding colleagues and students in the field. His remarkable collection continues to yield exciting results. Future publications on his specimens of Hunsrück Slate blastoids by Jan Bohatý and colleagues, for example, will describe new taxa as well as the first evidence of mutable collagenous tissue, which has remarkable mechanical properties and is unique to echinoderms, in an extinct group. Christoph's fossils are destined for the palaeontological collections of the Goldfuss Museum at the University of Bonn, along with X-radiographs and other material he was given by Wilhelm Stürmer, whom he knew well from his early days of collecting. The Bartels collection in Bonn will no doubt be the source of other remarkable new discoveries by future researchers.

Derek Briggs

Yale University, USA

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Sven Laufeld 1939 - 2023

Sven Laufeld was an outstanding natural scientist who was deeply involved in research on Silurian microfossils from Gotland, Sweden. Furthermore, over a span of 35 years, he worked on a unique compilation of natural disasters that covered the period from the earliest historical documents up to recent times.

Sven was born in the city of Helsingborg in Sweden, where he spent his childhood and early school years. In 1960 he started university studies, first in zoology and geography at Lund University, before continuing his university studies with historical geology and palaeontology at the same university. For his Ph. Lic. degree, he presented a thesis on a group of organic microfossils (chitinozoans) from the Upper Ordovician of central Sweden. This pioneering work was followed by a



very comprehensive PhD dissertation on Silurian chitinozoans from the island of Gotland, which was published in 1974. He understood the importance of detailed descriptions and correctly given sample levels from the study sections. Using this information, the biostratigraphical value of chitinozoan species could be clarified. Sven was also one of the first in the world to illustrate his fossils by means of SEM, and one of the first to discuss their ecology based on a broad analysis of contemporary fossils and sediments. He interpreted a bathymetric control of the chitinozoans and considered them to have been zooplankton. He found no evidence for a protozoan affinity and felt it to be more likely that these fossils were egg cases of some group of marine organisms such as Gastropoda or Polychaeta.

During his years on Gotland he was director of the Allekvia Research Station, where he created the Anders Martinsson Library, the most complete collection of literature on Silurian geology and palaeontology in Sweden. During these years he was invited to become one of 20 members of Collegium Palynologicum Scandinavicum, and to be a voting member of the International Working Group on the Ordovician–Silurian boundary of the International Union of Geological Sciences. Also, in 1971–1975, he was a member of the International Subcommission of Chitinozoa of the Commission International des Microflores Paléozoïque (CIMP), and became its chairman in 1973.

After receiving his PhD degree. Sven accepted an invitation from The Ohio State University in the USA for a year-long post-doctoral fellowship. His stay at this very large university provided him with not only global geological education but also the opportunity to participate in extensive geological fieldwork in several parts of North America. He often expressed the desire to continue his career in

North America, but suitable job opportunities were scarce. He finally accepted a one-year position at the University of Alaska Fairbanks. Although he enjoyed his job and had the opportunity to stay longer, he felt the climatic conditions during much of the year were too harsh, and he returned to Sweden, where he was employed by the Geological Survey as Director of the Museum, first in Stockholm and later, after the transfer of the Survey, in Uppsala.

In 1981, he was elected member of the Faculty Evaluation Committee of the PhD dissertation by Florentin Paris at the Université de Rennes, France. In this dissertation a new chitinozoan genus, *Laufeldochitina*, was introduced, and a species of this genus is now used in the chitinozoan standard zone classification of the Ordovician system. In the same year, Sven was elected Fellow of the Explorers Club, one of the most exclusive clubs in the world. He also became a member of the Royal Physiographic Society in Lund in 1993, and received an award from the Geological Society of Sweden for his efforts to popularize geology to the Swedish public.

In 1986 he was offered a job at Swedish Geological International AB and accepted. The position was to serve as an advisor to the government of Indonesia and he spent four years in Bandung, on West Java. Indonesia is rich in volcanoes, some of which are located close to Bandung, and Sven increased his interest in and knowledge about volcanic gases and volcanism in general. This is shown by the fact that he became a member of the International Commission on crater lakes in 1999.

In June 1992 Sven was appointed to the position of Director of Malmö Museum. He was full of ideas of how to increase the public interest in museums and related fields. Unfortunately, his creative ideas were not accepted by the political board of the Malmö Museum, which wanted to make all the decisions. Sven felt that this was non-negotiable, and it resulted in his resigning and moving to his summer home at Brekille near Munka-Ljungby in southern Sweden. Sven's compilation of a huge amount of data on all types of natural events and disasters started in 1987, speeding up after his exit from the position at Malmö Museum. In May 2023 his data collection, called OVERKILL, occupied more than 12,700 pages (see <www.naturalhazardsgroup.com>).

A list of Sven's publications includes eight books and more than 225 other publications. About one hundred of these were popular articles in magazines and daily newspapers. Sven was an outstanding educator and both students and other readers were immediately captivated by what he had to say. Not surprisingly, he was a popular general science lecturer in his home region around Brekille.

On his pension, Sven spent many of his retirement winters in Thailand and Laos, where the climate eased his rheumatism. He continued his scientific interest in natural event activities there, based on studies in local libraries as well as using online information. He returned from Laos to his home in Brekille in late May 2023, where he tragically died on 24th May.

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Research Grant **REPORT**

Environmental change, evolution and extinction in the Triassic of northwest Pangaea

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The Triassic started unfavourably for life, with a protracted recovery from the greatest biotic crisis in Earth history, the Permian–Triassic mass extinction (PTME). The Early Triassic records numerous 'gaps' in the stratigraphic record of major groups, including in metazoan reefs, which did not reappear until the Middle Triassic (Pruss and Bottjer 2005). The environmental changes that first hindered and later resulted in the recovery of marine ecosystems after the PTME are poorly understood, but we know that life was hit by further crises across the Smithian–Spathian transition, during the Carnian, and at the Norian–Rhaetian boundary (Preto *et al.* 2010). Most knowledge of this dynamic period derives from low-palaeolatitude Palaeotethys, resulting in a palaeogeographic gap in our understanding of Triassic environmental change, extinction and recovery.

This field report summarizes our sampling around Williston Lake (British Columbia, Canada), a > 200 km-long hydroelectric reservoir with seasonally excellent exposures of latest Permian to earliest Jurassic strata deposited on the northwestern margin of Pangaea. These strata comprise seven formations (in ascending order: the Grayling, Toad, Liard, Charlie Lake, Baldonnel, Pardonet and Bocock formations that comprise shales, siltstones, sandstones, limestones and localized phosphorites; Gibson 1975). Our objectives are to generate i) a Triassic geochemical proxy record of environmental changes on the northwestern margin of Pangaea; ii) a record of biodiversity; and iii) a carbon isotope chemostratigraphy to constrain i) and ii) and facilitate global correlation.

A team comprising David Bond (University of Hull, UK), Omid Ardakani and Steve Grasby (Geological Survey of Canada, Calgary, Canada), Yadong Sun (China University of Geosciences (Wuhan), China) and Cameron Wood (University of Calgary, Canada) travelled to the southeastern tip of Williston Lake in May 2022 shortly after BC Hydro dropped the reservoir level to accommodate spring snowmelt, thus exposing very clean outcrop around the shores. We arrived in snow – indeed the delayed thaw rendered the water level too low for our planned boat launch at Portage Yacht Club. Instead, we used the Williston Lake Boat Launch near the W.A.C. Bennett Dam, resulting in significantly longer days on the water. Over the course of a week we sampled four sections:

Ursula Creek (55° 59' 36.5" N, 123° 10' 27.2" W; Figure 1). This is one of the better-known sections on the reservoir (*e.g.* Brookfield *et al.* 2022). We collected 225 samples from the Permian Fantasque Formation to the Carnian Baldonnel Formation. Our work focuses on the PTME and the Smithian–Spathian transition, and we hope to find an expression of the Carnian Pluvial Event through chemostratigraphic correlation with Tethyan records.



Figure 1. Our boat at the Ursula Creek section. The water levels are visibly low, creating seasonally extensive exposures of clean outcrop around the reservoir. Photo by Steve Grasby.

Brown Hill (56° 06' 00.1" N, 122° 52' 33.0" W; Figure 2). This is the outcrop reference section for the Baldonnel Formation (Colquhoun 1962). We collected 114 samples (plus additional conodont samples) from the Ladinian to Carnian Liard and Charlie Lake formations that include bioherms and bacterial laminae amongst shales along with numerous ammonites and *Halobia*-bearing levels.



Figure 2. Brown Hill, the outcrop reference section for the Baldonnel Formation. Photo by Steve Grasby.



Black Bear Ridge (56° 05' 08.7" N, 123° 02' 25.6" W). This section is a candidate Global Stratotype Section and Point (GSSP) for the Carnian–Norian boundary, and it extends up into the Jurassic. We collected 169 samples including limestones, shales and sandstones of the Carnian to Rhaetian Baldonnel and Pardonet formations and the Hettangian (Jurassic) Fernie Formation. The position of the Triassic–Jurassic boundary is uncertain. Of particular interest is the enigmatic demise of the spectacular *Monotis* bivalves that proliferate before disappearing around the Norian/Rhaetian boundary (Wignall *et al.* 2007). We sampled the same interval in New Zealand in 2019 and plan a comparison of the *Monotis* extinction in these distinct palaeogeographic settings.

Ne Parle Pas Point (56° 00' 59.0" N, 123° 05' 10.0" W). This section exposes the Norian/Rhaetian transition and a more complete Rhaetian through Jurassic succession than at Black Bear Ridge. When wet, as it was during our visit, this section is extremely slippery and difficult to sample so we took only 39 samples through 21 m of strata.

Ongoing work on 547 samples involves comprehensive geochemical analyses to support the facies and fossil observations made in the field and in ~100 thin sections. We are measuring trace metal concentrations by mass spectrometer as proxies for marine productivity (Ba, Ni and Cu), redox (Mo, V and U, plus Fe speciation), and volcanism (Hg). Total organic carbon measured by rock pyrolysis is used to normalize Hg concentrations. Carbon isotope values (measured by mass spectrometer) will provide the temporal framework for these data and facilitate correlations. A subset of thin sections has been prepared for pyrite framboid petrography under SEM, an independent redox proxy. These analyses are time consuming, but we plan to begin publishing this work in the next 12–24 months.

Acknowledgements

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Small Grant **REPORTS**

Comparative isotopic analysis of exceptional fossils preserved through calcite from two Palaeozoic Konservat-Lagerstätten

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Introduction

Three-dimensional fossils with preserved non-biomineralized tissues provide crucial information on the morphology and evolution of Palaeozoic arthropods (Briggs *et al.* 2004; Siveter *et al.* 2007, Losso *et al.* 2023a). Calcite cast fossils maintain the three-dimensional structure of gills and legs, but arthropods preserved this way are only known from two localities, the Herefordshire Biota from the Silurian of England (Siveter *et al.* 2019) and the Walcott-Rust Quarry form the Ordovician of Laurentia (Brett *et al.* 1999) (Figure 1). Although these two localities display the same pattern of a rim of fibrous calcite crystals, sparry calcite and pyrite framboids (Orr *et al.* 2000; Losso *et al.* 2023b), they occur in different geologic settings (concretions within a volcaniclastic sediment *versus* micritic limestone) and at different sizes (mm *versus* cm). The Herefordshire fossils have a halo with increased aluminum, silicon, iron and magnesium, as well as depleted calcium (Orr *et al.* 2000). The objectives of my project were to study the taphonomy of the Walcott-Rust fossils and conduct comparative stable isotope analysis on the multiple crystal phases from the Walcott-Rust and Herefordshire fossils to better understand the environmental conditions leading to their preservation.

Material and methods

Studied specimens are housed at the Museum of Comparative Zoology (MCZ), Harvard University, USA and the Oxford University Museum of Natural History (OUMNH), UK. Specimens were prepared as one-inch epoxy mounts. Gold- or palladium/platinum-coated specimens were imaged at Williams College, Massachusetts, USA using a ThermoScientific Quattro S scanning electron microscope (SEM) fitted with an Everhart-Thornley, concentric backscatter, and EDAX Octane Elect detectors. Secondary ion mass spectrometer (SIMS) analyses of δ^{18} O and δ^{13} C were conducted at Washington University in St. Louis, Missouri, USA using a Cameca IMS-7f-GEO secondary ion mass spectrometer.

Results and discussion

Fibrous and sparry crystals have overlapping ranges of magnesium, but compositions cluster based on specimens rather than crystal type. Sparry crystals have decreasing magnesium towards the centre of the calcite whereas most spots have non-detectable magnesium concentrations. The concentrations of calcium and carbon in the trilobite MCZ:IP:198048 and the vein MCZ:IP:199123 are similar and distinct from all other specimens (see Fig. 4c in Losso *et al.* 2023b). Iron



concentrations are also consistent within specimens but vary between specimens. Unlike the Herefordshire fossils, elemental halos are entirely absent from the Walcott-Rust fossils which, combined with the lack of concretions, points towards important differences in terms of the lithification of the fossil-bearing strata between these localities. We hypothesize that for the Rust Formation, decay through sulfate-reducing bacteria took place within the carcasses, matrix and veins as indicated by the presence of pyrite framboids, which may have aided in the precipitation of calcite, but that this process was not restricted to trilobite bodies (Losso *et al.* 2023b).



Figure 1. Walcott-Rust and Herefordshire specimens. A - D, Ceraurus pleurexanthemus (MCZ:IP:198047) modified from (Losso et al. 2023b). A) Photomicrograph of polished specimen. B) Backscattered electron micrograph of box 1 in A. C) Backscattered electron micrograph of box 2 in A. D) Backscattered electron micrograph of calcite vein (MCZ:IP:199123). E - J, Carduiospongia pedicula (OUMNH 36099).

SIMS analyses are still being conducted on the Walcott-Rust veins and Herefordshire specimens. Two trilobite specimens from the Walcott-Rust Quarry have been analyzed for δ^{13} C and δ^{18} O. MCZ:IP:198046 was likely hydrothermally altered, shifting δ^{18} O to more negative values, but maintaining their relative differences between crystal types (Figure 2). The Walcott-Rust specimens display a wide range of δ^{13} C values. MCZ:IP:198047 appears to retain the original isotopic values. The exoskeleton displays a broad range of δ^{13} C (-4.96 to 9.08‰) but restricted values of δ^{18} O (1.68 to 3.79‰) (Figure 2). Both specimens show a depletion of δ^{18} O and δ^{13} C in the sparry crystals compared to fibrous. This supports the interpretation that these formed later during diagenesis (Figure 2).



Figure 2. δ^{18} O and δ^{13} C of trilobites with non-biomineralized tissues preserved as calcite casts.

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Holocene growth time series for the black goby¹ in the Adriatic Sea

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Introduction

Otoliths, the functional biominerals in the inner ear of teleost fishes, provide a unique opportunity to study changes in growth parameters in past and present fish populations because they are well-preserved in large numbers in marine sediments (Campana 2005). These calcified biominerals grow continuously by daily accretion of calcium carbonate (CaCO₃) and protein-rich fractions around a core, following a circadian rhythm (Pannella 1971). The resulting bipartite microincrements and seasonal growth zones allow accurate estimations of age and growth. However, life history events or stress may cause secondary increments or shifts in periodicity (Mosegaard *et al.* 1988). The metabolic inertness of otoliths results in the permanent preservation of their growth structures and incorporated trace elements, which are thought to reflect (palaeo)environmental conditions (Campana 1999; Hüssy *et al.* 2021). Fossil otolith assemblages provide a unique long-term perspective of the processes controlling past and present growth changes (Leonhard and Agiadi 2023).

In this project I evaluate the potential of otoliths of the black goby (*Gobius niger* Linnaeus 1658) for sclerochronological analyses. The black goby is a common but non-commercial demersal fish species in the Mediterranean shelf regions today and in the past. I use otoliths from specimens caught alive, as well as radiocarbon-dated fossil (Holocene) otoliths derived from two 1.5 m-long sediment cores in the northern Adriatic Sea, off the coast of Piran, Slovenia (Figure 1). These cores capture the last 10,000 years since the Holocene marine transgression of the northern Adriatic shelf (Gallmetzer *et al.* 2019). I aim to test the hypothesis that growth rates and subsequently body sizes of these non-commercial fishes have changed during the late Holocene and Anthropocene in the northern Adriatic Sea due to climate-induced environmental perturbations. Herein, I employ a novel approach that combines sclerochronology and radiocarbon dating on the same specimen. Age-dating is crucial, because the fossil assemblages in the Adriatic sediments are highly time-averaged (Nawrot *et al.* 2022).

¹ The original title of this grant project was 'Holocene growth time series for the giant goby in the Adriatic Sea'; however, the species was misidentified at the proposal outset. It is not the giant goby (*Gobius cobitis*) but the black goby (*Gobius niger*). This will not affect the outcomes of the project.



Figure 1. A) The location of sampling in the Gulf of Trieste near Piran, Slovenia and B) the stratigraphy of the sediment cores used in this study (for sampling details and descriptions of the stratigraphic framework see Nawrot et al. 2022 and Tomašových et al. 2019).

The semi-enclosed, highly productive Adriatic Sea has one of the longest histories of human impact (*e.g.* bottom trawling) and climate change in the Mediterranean basin, that in combination have altered fish species distribution and abundances (Barausse *et al.* 2011; Lotze *et al.* 2011). The Gulf of Trieste (northern Adriatic Sea) has experienced overfishing, pollution, frequent hypoxia and eutrophication since the twentieth century (Gallmetzer *et al.* 2019; Tomašových *et al.* 2018).

Material and methods

In this study I incorporated 90 modern otoliths and 65 fossil otoliths from two 1.50 m-long piston sediment cores collected in 2013, 4 km off the coast of Piran at 22 m water depth (for detailed core descriptions see Nawrot *et al.* 2022). The Holocene goby otoliths were cut in half with a diamond wire saw. One half was embedded in epoxy resin and prepared for sclerochronological analyses, and the other half was radiocarbon-dated at the Northern Arizona University Amino Acid Geochronology Laboratory (AAGL) in the USA. Age-dating followed the procedures of Bush *et al.* (2013) using a precision instrument for ¹⁴C applications, a gas source carbonate system on the Mini Carbon Dating System MICADAS. I will perform sclerochronological analyses on selected otoliths using light microscopy and backscattered electron imaging to verify historical growth patterns and microstructures.



Preliminary results

Radiocarbon dating reveals median calibrated radiocarbon ages of the goby otoliths from 656 to 8,512 years BP (Figure 2A). Initial analyses revealed well-preserved incremental features in Holocene otoliths, allowing direct comparison with modern counterparts (Figure 2B, C).



Figure 2. A) Size distribution (otolith length) of Holocene (blue) and modern (grey) G. niger otoliths over the last 8,500 years. The two different shades of blue indicate the two different sediment cores from two close sampling stations. High-resolution light microscopy images of polished sections of B) a modern otolith, in direct comparison with C) one well-preserved fossil (Holocene) otolith, which was cut in half for age-dating with a calibrated age of 3,143 years BP (¹⁴C error: 68 years). Growth increments are well visible in both otoliths and annual rings are marked with stars. Scale bars equal 1 mm.

Conclusion and outlook

Radiocarbon-dated otoliths provide insights into fish growth and life histories over the past 8,500 years in the Northern Adriatic Sea up to the 'Anthropocene tipping point' (Marriner *et al.* 2022). The study bridges temporal gaps by directly comparing modern and fossil otoliths from the same species and area. This approach helps establish a growth baseline for fish in pre-industrial times. Sclerochronological examination of historical growth patterns will provide insights into the effects of climate change and other anthropogenic stressors on fish populations, providing valuable knowledge for fisheries management and conservation today.

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Pelagic deadfalls from Northern Italy: a comparative study on Mesozoic vertebrate taphonomy

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Background

In modern oceans, sunken carcasses of large pelagic vertebrates play an essential role in the flux of nutrients in deep oligotrophic settings (Smith *et al.* 2015). Thanks to the release of large amounts of nutrients, these vertebrate 'deadfalls' generate peculiar, highly specialized and ephemeral ecosystems around them. Four stages of these ecological successions where formalized in the past



for the specific case of cetacean carcasses (*i.e.* whale-falls, see Smith and Baco 2003):

- i) Mobile scavenger stage: the removal of soft tissue on the carcass by nektonic necrophages;
- ii) Enrichment-opportunist stage: colonization of the skeletonized carcass and surrounding enriched sediment by invertebrates and microbial mats;
- iii) Sulfophilic stage: sulfur metabolization by microbial activity during bone lipid decay;
- iv) Reef stage: encrustation of the nutrient-exhausted bones by filter-feeding organisms as a hard substrate on which to grow.

Since the very beginning of whale-fall studies researchers have speculated that Mesozoic marine reptiles could have played a similar role to that of cetaceans after death, possibly triggering the evolution of whale-fall specialist precursors (Hogler 1994). Ichthyosaurs, metriorhynchids, plesiosaurs and mosasaurs do share anatomical similarities with modern cetaceans, as well as an osteoporotic-like bone microstructure that could host high amounts of lipids (Houssaye *et al.* 2018). These analogies imply that pelagic reptiles might have also shared a similar biostratinomic pathway with cetaceans. Most previous taphonomic studies on marine reptiles from Europe were carried out on material from shallow-water Fossil-Lagerstätten like the Oxford Clay (Danise *et al.* 2014), the Slottsmøya member (Delsett *et al.* 2016) and the Posidonia Shale (Maxwell *et al.* 2022). As a consequence, very little is known about preservation patterns and deadfall ecology from deep water settings during the Mesozoic.

Since the late eighteenth century, the Rosso Ammonitico Veronese (RAV) from the Veneto region of northern Italy has yielded several marine reptile specimens (Bizzarini 1996; Cau and Fanti 2014; Cau 2019; Serafini *et al.* 2020). The RAV is a stratigraphic unit that extends from the upper Bajocian to the upper Tithonian; it is composed of a pelagic limestone deposited in a mesopelagic (upper bathyal) setting characterized by slow sedimentation rates and well-oxygenated waters (Martire *et al.* 2006). Despite some recent taxonomic interest in the RAV marine reptile record (*e.g.* Cau 2019), the taphonomy of these rare specimens has never been investigated. Here are summarily presented the results of a detailed, large-scale taphonomic survey of the RAV ichthyosaurs, pliosaurs and metriorhynchoids.

Results

A total of 23 marine reptile specimens were analyzed for this project. The taphonomic survey of RAV amniotes firstly revealed a common poor state of preservation consistent with the prolonged exposure of carcasses on a well-oxygenated seafloor. Evidence of chemical dissolution of hard tissues are reported in detail, particularly on the compact bone, but unexpectedly also on the tooth enamel of some specimens. Moreover, thanks to the analysis of the associated fossil fauna, deadfall stages analogous to modern whale-falls are recognized with confidence. Results show a mobile scavenger stage dominated by hexanchiform sharks (*Notidanodon* sp., *Pseudonotidanus* sp.) and nautiloid beak elements (rhyncholites). Only rarely, marine reptile teeth are also found as scavengers. For the first time the active trophic interaction of Mesozoic nautiloids with marine reptile carcasses during scavenging is unambiguously documented. The enrichment opportunist stage from the pelagic RAV features deep-water echinoids, macro-bioeroders compatible with sponges, fungal/microbial micro-borers, possibly ammonoid aptychi and occasionally large occurrences of belemnites believed to have died after a spawning congregation in the surroundings of a carcass. No evidence of the sulfophilic stage could be retrieved from the RAV specimens, most likely due to the oxic conditions of the basin that hampered the formation/preservation of pyrite

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framboids inside the spongiosa, a common proxy of microbial sulfur metabolization. Finally the reef stage is found almost exclusively dominated by crinoids (*cf.* Phyllocrinidae) encrusting the skeletal elements. It is hypothesized that the planktonic larvae could have landed in the already exposed cancellous bone by chemical erosion and then grown into the adult sessile form deeply embedded inside the bone itself. This peculiar encrustation with large numbers of individuals affecting tetrapod bones is reported for the first time.



Figure 1. Associated fauna of MCLSC T2 (Metriorhynchoidea indet). A) Overview of the RAV block with the specimen. B) Anatomical drawing of the specimen with detail of the associated fauna. C-E) Closeups of rhyncholites found in close association with the skeletal elements. F-H) Crinoidal elements embedded in MCLSC T2 vertebral cancellous bone. Abbreviations: cr, coracoid; f, femur; isc, ischium; p, pubis; r, rib. Scale bars are A, B) 20 cm; C) 2 cm; D, E) 1 cm; F-H) 0.5 cm. Reproduced from Serafini et al. 2024 (published under CC BY-SA 4.0 licence).

While some of these results deviate from other Mesozoic deadfalls set in shallow waters, they are consistent with Recent whale falls in pelagic-bathyal zones. This survey systematically characterized



the taphonomy and deadfall ecology of marine reptiles from a Mesozoic pelagic deposit for the very first time, shedding light on the complex ecology of the Jurassic open seas and reporting new biological interactions never described from the fossil record. The results of this study were recently published in Serafini *et al.* (2024).



Figure 2. Taphonomy of MPPPL 18797 (Anguanax zignoi). *A) Skull of* Anguanax zignoi *under UV-ABC light. B) Axial and appendicular elements severely affected by crinoid colonization under UV-ABC. C) Articulated caudal column under UV-ABC. D) Bone-chert interface at the border of the slab. E) Teeth under UV-ABC with detail of the enamel preservation. F) Isolated tooth under UV-ABC with detail of the silica infilling of the root. Scale bars: A) 20 cm; B) 10 cm; C) 5 cm; D) 3 cm; E, F) 1 cm. Reproduced from Serafini* et al. *2024 (published under CC BY-SA 4.0 licence).*

As thalattosuchians represent a conspicuous part of the RAV amniote record, a dedicated survey was conducted in parallel to better frame their biostratigraphic ordering, osteological characterization and taphonomic assessment. As a result, the most updated review of the Thalattosuchia record from northern Italy was produced, together with the description of three new specimens. The thalattosuchian record of the RAV is recognized to be too preservationally biased for any reliable taxonomic assignment below the family level. Regardless of such uncertainties, the RAV record offers major biogeographic insights for the open-ocean transition of Metriorhynchoidea during the Middle Jurassic (Serafini *et al.* 2023).

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Engagement Grant **REPORT**

Science on the Street YouTube channel

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Engaging the public, especially adults, in topics of science has become increasingly difficult in the USA. Ideological differences, racially-based underserving of communities and the rise of mis- and disinformation across social media platforms has deepened the divide between the public and scientists, and has decreased science literacy nation-wide. Simultaneously, more people are relying on non-traditional news sources (like social media and comedy news) to receive information on current events and other topics. In this context, I developed a YouTube channel called *Science on the Street* that presents broad science topics as comedy news. With the help of Suffolk University's campus broadcasting studio and the hard work of science-and-media-interested students, we launched the channel in Spring 2022 and filmed monthly. A team of undergraduate students picked topics, researched the topics using primary and secondary literature, and wrote the script including jokes and references to pop-culture. Undergraduate students also ran the cameras and teleprompter during filming. I then edited the episodes and posted them widely on social media. The episodes are hosted on the YouTube servers and will stay available as long as YouTube remains active. Unlike other social media platforms, YouTube has remained a successful venue since its inception, so the videos will continue attracting new views as these topics are searched in their servers.





A selection of videos available on the Science on the Street YouTube channel.

Each episode is between 15 and 30 minutes long and is typically broken into two segments: first, a narrative that gives background on the topic in a comedy-news style, followed by an interview with an expert in the field. The topics were chosen to be widely applicable to the public. For example: gene editing and CRISPR in relation to cancer treatments, climate change for Earth Day, environmental justice, earthquakes in relation to the earthquake in Turkey, toxic spills in conjunction with the train derailment in Ohio in 2023, nuclear bombs tied to the release of
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Oppenheimer, volcanic eruptions with the current events in Iceland, fungal infections with the release of *The Last of Us* series, and of course palaeontology, which we tied into the release of the *Jurassic World Extinction* film and the *Prehistoric Planet* series. Information on each of these topics is interspliced with one-liner jokes and references to popular culture to make the topics more approachable and keep the audience's attention through more intricate scientific details.

For the interviews with expert scientists in a relevant field, I took care to invite scientists across a multitude of fields to showcase the diversity of scientists and the topics they study, and to increase representation. These interviews served to provide greater detail about the topics of the episodes, gave direct information from experts in the field, and allowed scientists to speak directly to the public in a way that will demystify the science and humanize scientists – all things that are desperately needed in the context of increasing science literacy. I contacted and interviewed many professors at different institutions, two project scientists from NASA (one for climate change on Mars and one for the James Webb Space Telescope), a panel of diverse palaeontologists, *New York Times* Best Seller and palaeontologist Dr Stephen Brusatte, and many others across the topics we covered.









Lips of the Tyrant: Ethical Implications in T. rex... Inside a REAL Paleontology Conference

A Paleontologist's Perspective on Jurassic... A Jurassic Conversation 417 views • 1 year ago

Our palaeontology episodes outperformed our other topics and reached many more people than the other topics. This has led to the development of other palaeontology-dedicated channels by members of our team. In addition, the students involved requested larger roles in the production of this show, so in Spring 2024 they took the lead in the production of an episode from topic selection through to editing, with my guidance.

As we enter into a new academic year this Autumn, the student team will continue to produce episodes on a range of scientific topics tied to current events and/or popular culture. The undergraduate students who are involved in the show gain valuable experience in bridging course information with current events, gathering research for different audiences, writing in a novel tone, and developing their science communication and media production skills. This type of written and oral communication is not directly taught by our institution, so the training they receive by working on this show is an important addition to their professional skills. By posting the episodes on YouTube and on other social media platforms, the information becomes freely and widely accessible worldwide, allowing scientists to fight back against the tide of mis- and disinformation and producing freely accessible scientific content – are needed for increasing science literacy in the public and trust in the scientists who do the work. We hope to continue these efforts with a larger team of undergraduates in coming years.

Acknowledgements

I am grateful for Palaeontological Association Engagement Grant number PA-OE202203, which supported honoraria for invited scientists.

Science on the Street: <https://www.youtube.com/channel/UCIjyk2nXSbiXYgUFbJGPyYQ>.

Some of the palaeontology videos on the Science on the Street YouTube channel.



Career Development Grant REPORTS

In 2021 the Association's Council instigated a new Career Development Grant to assist talented earlycareer researchers who have recently completed their PhD during the difficult transition period as they navigate into postdoctoral or curation positions. The grant of up to £2,500 can allow them to strengthen their CVs, via completion of a measurable activity or output, helping them move on to the next step in achieving a career in palaeontology. The grantee is also automatically enrolled in the Association's mentoring scheme (see <https://palass.org/careers>) and is assigned a mentor by agreement. Some examples of things that the grant could be used for include (but are not limited to): help with living costs while turning a PhD chapter into a publication; help with living costs while writing a fellowship or grant application; further data collection that would allow a chapter to become publishable; a training course that would lead to skills enhancement; or a training or research internship in another research group. The deadline for applications is **7th October** each year. The following two accounts are from early-career researchers who were awarded among the first of these grants.

Alessio Capobianco writes: I applied for the Association's Career Development Grant to complete my research project on the evolution and biogeography of bonytongue fishes that I started during my PhD at the University of Michigan, USA. The grant allowed me to spend two months as a visiting researcher back at the University of Michigan in 2022, during the one-year hiatus after the end of my PhD. At that time, I was living at my parent's home in Italy, applying to postdoctoral positions without success and struggling to convert my dissertation's chapters into publishable manuscripts. During my visit to the University of Michigan, I was able to work on the description of a new genus and species of extinct bonytongue fish with unique ecomorphological features, which has been recently published (Capobianco et al. 2024). Moreover, I started reworking the last chapter of my dissertation as a manuscript on the biogeographic history of bonytongue fishes and on the impact of palaeontological data on model-based biogeographic inference. Currently this work is submitted and under review. Towards the end of my stay in Michigan and thanks also to the advice of my mentor, Dr Robert Sansom, I ended up accepting a postdoctoral researcher position at Ludwig-Maximilians-Universität München (LMU) in Germany working with Dr Sebastian Höhna, first on a Deutsche Forschungsgemeinschaft (DFG)-funded project and later transitioning to a four-year European Research Council (ERC)-funded project. My current position is allowing me to greatly expand my research skills towards state-of-the-art statistical and computational tools for macroevolutionary inference and phylogenetics. My ongoing work focuses on developing new models of morphological evolution for phylogenetic inference in a Bayesian framework, and on how tip-dating total-evidence phylogenetics can impact estimates of diversification dynamics in extant clades. The Palaeontological Association and the Career Development Grant funding have been fundamental in supporting my academic career at its most uncertain stage, and to give it a small but substantial push in the right direction. I can only be grateful to the Association for creating such a scheme for supporting early-career researchers during the critical transition period after their PhD.

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Jane Reeves writes: I am currently a postdoctoral research assistant at The University of Manchester, UK, and it is no stretch to say that this wouldn't have been possible without receiving the Career Development Grant. Driven by the goal of pursuing an academic career, I decided to move into palaeontology after a decade of working in private industry. I completed an MSc at the University of Bristol, UK in 2016, then embarked on a PhD at The University of Manchester in 2018. I managed to time this perfectly to ensure the COVID-19 pandemic hit during my second year. I'm forever grateful that I didn't suffer any personal loss, but the pandemic severely impacted my research. As my original plan involved working on fossil collections that quickly became inaccessible during lockdowns, I had to undertake a huge pivot in my work, which limited my output and drained my savings due to the non-funded extensions needed to catch up for the missing time. Although I received invaluable and constant support from my supervisor, Dr Robert Sansom, following my PhD, financial pressures meant I faced the possibility of returning to non-academic work. However, the Career Development Grant offered a lifeline for my career ambitions by covering my living costs for several months. The freedom the grant gave helped me in two main areas. First, I could focus on strengthening my CV by preparing and publishing my PhD chapters and completing abandoned projects; this has directly led to two publications and two that are close to submission. Second, I could stay connected to the academic world and concentrate on my future. I was able to write and submit a Leverhulme grant proposal, and although it wasn't successful, it has created a solid foundation for my next applications that I wouldn't have had without the Career Development Grant. With the safety net of the grant I also had the privilege of chasing after the academic roles I wanted without worrying about how to pay my rent. Critically, the grant provided the financial stability that allowed me to be in a position to take several short-term academic contracts that kept my momentum going until I was offered my current role. Without this grant, I have no doubt that I would have had to make the hard choice of leaving academia to pursue other employment that ultimately would have made returning so much more difficult. I am deeply grateful to the Palaeontological Association for the Career Development Grant and all the support I have received from this community. I cannot stress enough how much it has positively influenced my career and helped me overcome some of the pandemic's impact on my work. I strongly encourage anyone in a similar position to apply for this invaluable opportunity!





Reviews



Life Through the Ages II, Twenty-first Century Visions of Prehistory Mark Witton, 2020, 168 pp, Indiana University Press, ISBN 9780253048110.

Since the discovery of the first fossils, people have attempted to imagine and depict what the organisms looked like in life. In this way, palaeoart is deeply intertwined with the field of palaeontology: a symbiotic relationship of spreading research and inspiring new questions. In this regard, Mark Witton is a titan of the field of palaeoart (with whom I recently had the honour of dining at this year's SVPCA conference) so I was delighted when I had the opportunity to review his 2020 book Life Through the Ages II, Twenty-First Century



Visions of Prehistory (hereafter simply Life Through the Ages II).

The book derives its name from *Life Through the Ages* first released by Charles R. Knight towards the end of his life in 1946, compiling many of the artist's charcoal sketches and a smattering of his other artworks. In Knight's book, each of these striking illustration plates is accompanied by a page of descriptive text targeted at a general audience. Witton's companion piece/sequel follows a similar structure (both even share *Dimetrodon* as the cover taxon), but runs a much beefier 168 pages (compared to Knight's 96) and further distinguishes itself with lavishly coloured plates. As Witton notes, the other difference between the two works is that *Life Through the Ages II*, after 70+ years of scientific advancement, brings with it a much more vulnerable view of nature and the direct harm caused by humanity's own actions. These choices make *Life Through the Ages II* a great introduction to the history of life on Earth for those unfamiliar, as well as an excellent encapsulation of current understanding and practices for the more informed reader.

Beyond the cover, the book opens with an introduction explaining the book's relationship to Knight's *Life Through the Ages* with additional historical context, not only on Knight himself but also on the state of palaeoart in the twentieth century more generally, significantly preceding the term 'palaeoart'. The next six pages, despite appearing unassuming to someone with a strong background in biology, may just be the most academically ambitious in the book. Across six pages, Witton covers the geological history of the Earth, the evolutionary relationships of major groups on Earth, and the principles of palaeoart. Their inclusion and detail are a necessity for a book targeted at a general audience, and their brevity maintains the pacing of the book even for experts in the field. This is

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emblematic of nearly all the text in Life Through the Ages II; approachable for a wide reader base but delivering accurate and relevant information with authorial character felt on every page.

The next section makes up the vast majority of the book and is certainly the most eye-catching: the plates. Each of the 62 chronologically-arranged plates features a prehistoric organism in an accurately reconstructed vista and is accompanied by a page of text describing aspects of the scene. That sentence was incredibly vague, as the plates span from the formation of planet Earth to the modern day, covering a huge range of fossil taxa, not just dinosaurs. Healthy respect is given to fish¹, some of the earliest animals, lesser-known mammal groups, and even 'bacterial mats of slime' get a long-deserved spotlight. Each page of text is equally dynamic, various pages will cover the palaeoenvironment depicted, how the taxa were reconstructed, gaps in our understanding, or the hypothesized purpose of particularly striking body features. Importantly, in my opinion, for a book directed toward a general audience, it ends with an explicit discussion of the damage human activity is causing the biosphere without unnecessary fearmongering.

When reviewing a book subtitled '*Visions of Prehistory*', talking about the art is a must. Witton has continually refined his craft over the years, and the works displayed here exemplify his technical skill and his ethos toward reconstructing long-dead organisms. The most obvious point about each plate is the subject matter; beyond the range of subject matter, the behaviours shown by the species are diverse with great care taken to make even sedentary behaviour distinct in multiple taxa, for example, the anatomical differences between enteledonts and caseids are reflected in how Witton depicts them resting. A similar effort is made to differentiate individuals of the same species, and in the inclusion of juveniles. The benefits of this are two-fold, both emphasizing the role of parental care and play across time (not just in modern mammals), but also showing the ontogeny of species. There are many more small touches that epitomize the amount of consideration, both artistic and scientific that went into each plate.

I will try to discuss the technical merits of the art featured in *Life Through the Ages II* despite my lack of expertise in this area. It is obvious by browsing the portfolio displayed in the book that colour is used by Witton in a manner few other palaeoartists use. Whilst the colouration of subjects tends to be restricted to earthy tones, this makes display features such as soft tissue or bony crests stand out, with much of the overall colour of a piece coming from creative use of lighting and composition. This allows Witton to make artworks where even if black is the prominent colour, it still reads very clearly and no anatomical detail is lost (see the *Zuul* plate). This combines with softer lines (especially in backgrounds) in any scene featuring splashes of water, dust, dense foliage or rain to come alive with movement (*e.g.* crinoid barges and *Livyatan* plates). Such a sense of motion is enhanced in no small part by the ensemble of other animals scurrying or flapping around. Mix this all together with compositions that give a sense of depth and scale to make truly memorable and singularly atmospheric works of art. My personal favourites include the hydrothermal fields of the Archean and *Gastornis* plates; conversely, the least memorable plates (to me) were those missing one or more of these elements.

Despite running a sizeable 168 pages, any text can only cover so much (I would have liked a plate on snakes) and considering its image-heavy format, it is not an exceptionally long read, and by virtue of its layout once a topic is raised it is unlikely to resurface again. Furthermore, despite giving coverage to a much wider range of extinct taxa than most popular science media, if you are a

¹ We love to see it. Ed.



non-specialist and fascinated by an obscure group, you will struggle to find additional media about them. But that is not a point unique to this text, and if such groups find more interested persons via this book, then that is hardly a negative.

Taken as a whole, *Life Through the Ages II* is a triumph of the intersection between illustration and the written word, as well as artistic expression and scientific accuracy. It seems redundant to say in an age of so much high-quality palaeoart, but it was only a few decades ago that aspects as simple as posture or soft tissue were poorly portrayed and misled the general population. Witton has and continues to set a high benchmark for the reconstruction of extinct taxa and combines this with his personal artistic touches to create something with a real unique sense of identity. *Life Through the Ages II* is more than worthy to carry on the name of its highly influential precursor, whilst being a distinct entity.

Sean Smart

Sean Smart (he/him) is a master's student at the University of Lincoln, UK, specializing in macroevolutionary trends. Outside of his studies, Sean enjoys a variety of cooking, craft hobbies and tabletop games. He can be found on X: @SeanSmart14.

Mesozoic Sea Dragons – Triassic marine life from the ancient tropical lagoon of Monte San Giorgio

Oliver Rieppel, 2019, 256 pp, Indiana University Press, ISBN 9780253040114.

Mesozoic Sea Dragons by Olivier Rieppel is a highly informative and well-researched book that provides a comprehensive overview of Triassic marine vertebrate fauna found at Monte San Giorgio and other contemporaneous localities. The book is divided into eleven chapters, where the first covers the history and geology of Monte San Giorgio. Chapters two to ten cover different taxonomic groups of vertebrates from fish, marine reptiles and archosauromorphs. The final chapter puts all of this taxonomic detail into a broader Tethyan context, describing the complex palaeobiogeography of marine vertebrates to and from west-east Tethys.

Mesozoic Sea Dragons provides no doubt that Monte San Giorgio localities have been incredibly important for understanding the rich vertebrate fauna from the Triassic, and that there are still some unresolved questions in the nature and palaeoecology of the



often bizarre vertebrates found from these environments. Rieppel demonstrates his vast knowledge of Triassic marine reptiles in the book, as well as covering Triassic fish and sharks in detail. The book is richly illustrated with historical photos, maps, fossil specimens and their reconstructions. However, additional logs to allow for visual comparison with the numerous other Triassic localities

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that were compared with the Monte San Giorgio succession would have been helpful. In addition, a Triassic locality map of European localities would have helped place the many mentioned localities for non-European readers.

As a marine reptile worker, one of my favourite chapters was actually concerning the fish and sharks (chapter 2). With my limited knowledge on this group, the chapter helped clarify some of the confusing synonyms of the hybodontiforms, as well as explain the history behind them. The chapter also highlights the essential role that Monte San Giorgio articulated specimens have had in understanding the taxonomy of this group, with complete jaws and associated fin spines in contrast to isolated elements.

Despite some redundancy in the text and outdated geological and taxonomic information for some comparative localities, *Mesozoic Sea Dragons* is an excellent resource for students and researchers interested in Triassic marine reptiles. The taxonomically divided chapters provide a general introduction to each group, and Rieppel's summarizations aid comprehension of in-depth taxonomic debates.

The epilogue of the book highlights the newer findings from the Triassic of China, which shows that other more recently discovered localities should now be the focus for understanding the complex evolutionary and palaeobiogeographical history of marine vertebrates. Although there are still many undescribed and unprepared specimens located at various museums from the Monte San Giorgio Lagerstätten, Rieppel claims the large number of available specimens provide a good overview of the vertebrate ecosystem from this region.

Overall, *Mesozoic Sea Dragons* is an informative and well-written book that provides a comprehensive overview of Triassic marine vertebrate fauna found at Monte San Giorgio and other contemporaneous localities. Rieppel's vast knowledge of Triassic marine reptiles is evident in the book, as is his ability to explain complex taxonomic debates in a way that is easy to understand. The book is richly illustrated with historical photos, maps, fossil specimens and their reconstructions, making it a valuable resource for students and researchers interested in Triassic marine reptiles.

Aubrey Roberts

Aubrey Roberts is a post-doctoral researcher at the University of Oslo in Norway working on Mesozoic marine reptiles from Svalbard, with her current interest focused on the Triassic. She has a keen interest in the utilization of computed tomography on fossil vertebrates as well as phylogenetics. She can be found on X: @SeaMonsters2013.

Explorers of Deep Time

Roy Plotnick, 2022, 344 pp, Columbia University Press, ISBN 9780231195348.

Roy Plotnick's *Explorers of Deep Time* is, in my opinion, a must-read for anyone interested in the field of palaeontology and its inner machinations. Plotnick seeks (and succeeds) to break the stereotype that palaeontology is an old science, irrelevant to the modern world. It is both captivating and informative – highlighting many of the issues that palaeontologists and palaeontology as a discipline face. *Explorers of Deep Time* also provides much-needed context into the often arcane workings of academia, which is especially useful to up-and-coming palaeontologists!



Even before hopping into the book, you are greeted by a fun cover with a myriad of fossils, with almost every major group represented², which perfectly suits the target audience of non-specialists. Taking this cover off the hardback you are greeted with a tasteful plain black cover with embossed gold writing, a worthy addition to any bookshelf.

Plotnick starts by enchanting the reader with brief glimpses into the past environments that one would have seen if they were in Chicago in various time periods, before setting out his mission; to demonstrate that palaeontology is a modern science, essential not only in understanding past environments and the taxa that inhabited them, but also how the study of the past can provide us with information about the climate change crisis we find ourselves presently facing.

He then reveals some of the big questions that palaeontologists face today and the interdisciplinary

nature of palaeontology. Plotnick makes it clear to the reader from the start that palaeontology, often associated with dinosaurs, has the potential to be used as a bridge for other sciences to better communicate with the general public. He makes it clear that the questions and techniques that present-day palaeontologists implement are incredibly diverse, going a long way in highlighting and breaking the 'stamp collector' stereotype that plagues palaeontologists to this day.

A personal highlight of mine are the short, self-contained introductions for many of the palaeontologists mentioned in the book. This does wonders to humanize the people in palaeontology and is a perfect way to challenge the colonial era stereotypes that palaeontologists are often portrayed as. There seems to have been a concerted effort to highlight the not insignificant number of women currently active in the field, but Plotnick concedes that much more can and should be done to level the playing field for minorities.

Racism, sexism and the colonial legacy of palaeontology are major themes that persist throughout *Explorers of Deep Time*, with a thorough discussion of the challenges that minorities face in palaeontology. Of note is the extensive discussion of the latent sexism that is present in palaeontology and the prevalence of sexual assault of women while on fieldwork, plus what we can do to reduce and prevent such abuses of power. Plotnick also highlights the disproportionately low number of ethnic minorities currently operating in the field, before demonstrating to the reader that this is detrimental to both minorities and palaeontology more generally.

This discussion is refreshingly frank and is handled carefully, acknowledging Plotnick's personal privilege as a straight, white, cisgender man. While covering all minorities in academia is an entire topic in itself, it is surprising that neurodiversity and the struggles that working-class people face in academia are only mentioned in passing. This is only a minor quibble, however, in what is otherwise a comprehensive look at the present diversity in academia.

² For readers of the Life through the ages II review, this sadly does not extend to 'bacterial mats of slime'. Ed.

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Plotnick also gives sound advice to current palaeontology students, and although by his own admission in the book he predominantly draws from his experiences as a North American palaeontologist, there is plenty of advice that is universal to all looking to succeed in the field. Plotnick also demonstrates how palaeontologists are truly interdisciplinary, with a varied skillset that allows them to succeed in a wide range of positions. This was especially useful to me personally as a master's student and I am sure there are many others in my position.

Above all, I think this book is an incredibly important read for those in palaeontology and especially those who are in the early stages of their career. Much of the issues we face, as a collective, are exacerbated by the division that is rife in this discipline and, only together as a collective, can we move forward to address those issues that hamper palaeontology and those explorers of deep time who work within the discipline.

Shane Wheatley

Shane is a palaeontologist at the University of Lincoln, UK, and is obsessed with shape evolution, diversity and games, not necessarily in that order. He can be found periodically staring at claws. X: palaeotWheat.

Frozen in Time: Fossils of the United Kingdom and Where to Find Them

Rhys Charles, 2022, 250 pp., Trapeze (The Orion Publishing Group), ISBN: 9781409197966.

Frozen in Time sells itself as a guide to finding fossils in the UK. The book is particularly pitched at readers with little previous experience of fossil hunting, and explains a lot of palaeontological terminology and concepts along the way. Although much of this information is likely already familiar to the readership of this *Newsletter*, the book succeeds in being accessible to the non-

specialist whilst also providing useful, practical information about some of the best fossil localities in the UK. In my experience 'Where can I go to find fossils?' is one of the most commonly asked questions at palaeontological public engagement events, and I consider this book to be an excellent recommendation in response.

Aside from a brief introduction and conclusion, the book is split into geographic regions, and 'visits' individual localities one by one. Starting in Scotland, the book works gradually southward, resulting in an approximately chronological order to the past ecosystems evoked. For each locality, the most common and/or famous fossils are described, alongside brief anecdotes either geological, historical or palaeontological in theme. This is accompanied by practical advice on how to access the locality, and any particular points to note regarding safety and legality.





The structure of the book makes it perfect for dipping into as desired, but it also carries enough flow to be a charming cover-to-cover read.

Charles' expertise in communicating with the general public shines through in his conversational tone. In particular, his ability to express equally abundant enthusiasm for all of the localities and clades described is impressive; there are few who can muster as much excitement about a graptolite as a tyrannosaur, especially through the pages of a book. As well as telling stories about the history of fossil collecting at the localities, recent discoveries and advances in palaeontological knowledge are also highlighted, all with credit wherever possible. This narrative choice serves to centre the stories around the people involved in them, and really demonstrates the role of individuals in pushing palaeontology forward as a science. As a result, the book sells fossil hunting as an opportunity for the reader to engage in and contribute to the future of palaeontology, elevating it from a trivial hobby to a scientifically impactful pursuit.

The book is well-placed as a gateway to fossil hunting, but more experienced or involved readers may be left wanting more. For example, the book is furnished with simple line drawings, but only of a handful of the key fossils described. Thoughtful analysis of a newly-collected fossil haul is likely to require more comprehensive information and images than those provided here. Having said this, I hope it leads readers to make a trip to their nearest museum, or dig a little deeper into the literature, to find out more about their new favourite localities.

As a Brit abroad, and someone whose research is not field-based, I really enjoyed reading this book. It transported me to the geological past, but also to the beaches and quarries of my homeland. I can't wait to plan a fossil hunt during my next visit, and this book will be my go-to source of inspiration.

Bethany Allen

Bethany is a computational palaeobiologist, and is currently a postdoctoral researcher at ETH Zurich in Switzerland. She is merrily traipsing her way around the Tree of Life, having previously worked on terrestrial vertebrates and marine invertebrates, but now researches plants. You can find her on X: @bethany_j_allen.

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Here are some of the books we'd like to commission reviews for. This is just a sample, please drop Richard an e-mail if you'd like more options.

- Past Environments of Mexico: Unveiling the Past Environments of a Megadiverse Country Through its Fossil Record, edited by Rosalía Guerrero-Arenas and Eduardo Jiménez-Hidalgo. An academic book piecing together the palaeoenvironments of Mexico with chapters on a diverse range of methods and taxa.
- Macroevolutionaries: Reflections on Natural History Palaeontology, and Stephen Jay Gould, by Bruce S. Lieberman and Niles Eldredge This series of essays provides a Gould-en opportunity to ponder the mysteries of the natural world.
- Impossible Monsters: Dinosaurs, Darwin, and the War between Science and Religion, by Michael Taylor.
 A dramatic retelling of the intellectual impact of early palaeontology aimed at a general audience.

We don't just publish book reviews! If there is something else palaeontological that you would like to review we would love to include it in the *Newsletter*. This could be a film, a podcast, a video game, an exhibition, or something else that Richard is insufficiently imaginative to think of. As above, please just get in touch at **<bookreview@palass.org**> where he is very happy to discuss ideas.

Dr Richard Dearden

PalAss Reviews Editor c/o Naturalis Biodiversity Center Darwinweg 2 Leiden 2333 CR The Netherlands





Careers Q & A

Professional palaeontologists in the wider world

Dr Liz Martin-Silverstone grew up in Alberta, Canada where she was lucky enough to be surrounded by Late Cretaceous palaeontology and the outdoors. After a BSc in Palaeontology from the University of Alberta she moved to the UK to study pterosaurs and earn her MSc at the University of Bristol, followed by a PhD at the University of Southampton on pterosaur biomechanics. She has always been interested in using CT scans to understand extinct and extant animals, and after spending some time in an osteoarthritis research group learning how to CT scan she became a Technical Specialist in the University of Bristol Palaeobiology Group. Here she manages all of the palaeontology labs including the XTM Facility and CT scanner as well as wet and micropalaeontology labs.

When you were a child, what did you want to become when you grew up?

I was strange for a palaeontologist in that I wasn't interested in fossils that much. I wanted to be a flight attendant as I thought it would be great to get paid to travel the world! Or a famous football player...

How did you first get interested in palaeontology?

I still remember my high school biology class system and when we were learning about the circulatory system the teacher was talking about how it works in a giraffe, and then imagining how it would be in dinosaurs. That was when I started thinking about the biology of large extinct animals.

What is the biggest highlight of your work as a palaeontologist so far?

Earlier this year I named my first (and maybe last) new genus and species, Ceoptera evansae, a pterosaur from the Middle Jurassic of the Isle of Skye in Scotland. It was amazing to get to do that and to do it by combining the things I love - pterosaurs and CT scanning.



How did you make the transition from a PhD to your career outside academia?

I'm a bit unique as I'm still kind of in academia. I'm academia-adjacent. I was lucky in that our previous lab manager went on leave and they needed someone to take over. I had always shown keen interest in CT scanning and already knew how a lot of it worked, so I was ideally positioned. I was already involved in the Bristol Palaeobiology Group so it wasn't a hard transition to make

What does your job involve on a daily basis? I do a lot of problem solving and trying to help others as much as I can. On a CT day I'm in the dungeon lab with no windows quite a lot, trying different methods of mounting and scanning to get the best results possible. While we're scanning, if it's a long enough scan, I will pop upstairs to help out an MSc student who is having a problem with software, or sort out lab access, do some admin, or maybe order some consumables

Can you tell me more about your current role, and what its significance is?

As a Technical Specialist I oversee different aspects of the Palaeobiology labs at the University of Bristol. I have overarching responsibilities for the labs, making sure that they are stocked with general consumables. managing the budgets for the lab and the XTM Facility, and making sure Health and Safety policies are in place and followed. As the Facility is open to the entire University (and external users) I am responsible for making sure that users get the most for their money, the best results they can, and am constantly looking for ways to improve. Unlike more traditional lab managers I also get to be involved in research, not just by helping other people but also by doing my own research projects and supervising students where appropriate. I manage 11 labs across two buildings, which are also in two different faculties so there can be a lot of conversations about how these all work together.

What gives you the most satisfaction in your current work, and what do you enjoy?

For me the greatest satisfaction is when I feel I have truly helped someone do something they otherwise wouldn't have been able to. For example, someone CT scanning for the first time and being completely amazed by the results, or someone scanning something particularly difficult and being happy with the solution I've come up with, or a student really appreciating what I've done to help them. In terms of enjoyment I think the biggest thing for me is how varied it is. No one day is the same. Right now I'm writing this sitting on my couch at home while I'm having a work-fromhome day. This week I need to install some new fossil preparation tools, and I'm training a new user on the CT scanner who is looking at rocks for research into carbon capture storage. I'm rarely sat in front of a screen for longer than 30 minutes (unless it's an admin day) and I'm never bored. The other thing I enjoy is that I'm still involved in palaeontology, but the pressure for getting grants or publishing in high impact journals is off. I'm welcome to do this if I want to, but there's no expectation and to my employer that's a bonus. I also don't have to do

exam marking or that side of teaching which is not my favourite.

Do you have any opportunity to still work in research areas of interest to you, or if not, do you miss the 'hands on' aspect of being a palaeontologist?

Absolutely I can still do interesting things. I have the leeway to still get involved in research where I'm interested, but ideally there is some kind of relation to my job. For example if I can do something new involving CT scans then that's ideal, or some new lab technique. But as long as there's time and it doesn't interfere with my day-to-day things I can also get involved in more traditional research as well. I'm unlikely to lead it as I may have before, but I can still be involved. What I do miss though is being able to design the research questions I wanted to do before and didn't manage to. It's not as 'pure research' as previously and now has to be a bit more applicable to some aspect of the lab.

Do you have any tips for anyone wishing to transition into a role like yours?

Do as much training as you can. The reason I was able to move into this role so easily is that I pestered the previous lab manager to teach me things about the CT scanner. When I did scanning, I asked him how it worked and got him to explain the set-up rather than just giving him the sample and walking away. Learn as many techniques as you can, even if it's not directly related to your current project or role. And just be willing to learn new things.

Is there a skill you wish you had been taught at university that would be useful in industry? What turned out to not be useful at all? I wish I were better at coding. It doesn't come

up often in my current role, but there are some things that would be much easier if I could code.

What are your future ambitions?

Good question! For now I'm focusing on highlighting technical careers and showing people that they are a good way of still being involved in research and palaeontology, but no one cares if you've published in *Nature* or not. I don't know what the future holds for me, but I hope to make technical careers more appealing and show the amazing depth and knowledge that technicians have that is often overlooked.



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Cover: *Aldanella attleborensis* (Shaler & Foerste), lower Cambrian, Terreneuvian, Emyaksin Fm; Bol'shaya Kuonamka River, eastern Anabar Uplift, Siberian Platform, Republic of Sakha (Yakutia); inner mould with imprints of the platy shell layer on the surface, adapical side, diameter 15 mm. (Photo by kind permission of Artem Kouchinsky; see Kouchinsky *et al.* 2017, fig. 20A, doi: <10.4202/app.00289.2016>; CC BY 4.0).



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Cover: The echinoderm *Cambroblastus guolensis* from the Cambrian Sandu Formation of Guangxi, South China. Specimen is housed at the Nanjing Institute of Geology and Palaeontology (NIGPAS 156159). Theca approximately 10 mm wide.



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Miguel Díaz de León



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Devapriya Chattopadhyay



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Miky Lova Tantely Ravelson



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Jean Vannier



Region: **France**; Affiliation: Université Claude Bernard Lyon 1 Position: Senior Researcher Research/job focus: Early life, late Precambrian and lower Palaeozoic faunas and marine ecosystems (based of Fossil-Lagerstätten).

Rudy Lerosey Aubril



Region: **USA**; Affiliation: Harvard University Position: Research Associate Research/job focus: Cambrian exceptionally preserved biotas

TAXONOMY/NOMENCLATURE UPDATE

This publication is now registered on ZooBank and is thus deemed to be valid for taxonomic/nomenclatural purposes. However we request contributors (especially those contributing grant reports) not to include names of new taxa in their reports.

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