CIMP
COMMISSION INTERNATIONALE DE LA MICROFLORE DU PALÉOZOÏQUE

NEWSLETTER 94
FEBRUARY 2024

TABLE OF CONTENTS

COMMISSION INTERNATIONALE DE MICROFLORE DU PALÉOZOÏQUE

Thanks to all members who contributed to this newsletter!

Cover photo: Generated by AI
Credit: Filipe Barreira (LNEG)

CIMP

CIMP is an international federation of palynologists focused in Palaeozoic palynology, and membership is open to all individuals involved in this field of expertise. The commission aims to advance knowledge in Paleozoic palynology and related subjects by the promotion of international co-operation and meetings between scientists of all regions and countries.

To this end the CIMP arranges symposia and working groups which deal with various stratigraphical and taxonomic problems in Palaeozoic palynology. For more information on membership and activities, please see:

https://cimp.weebly.com/

PRESIDENT'S LETTER

Dear CIMP members,

Two important things have happened since the last Newsletter was produced. Firstly I would like you all to welcome Sonia Clara Camina to the Executive Committee. Sonia was voted in as the Student Representative of CIMP in May, 2023. She recently submitted her PhD thesis, and by the time that the Newsletter is distributed will hopefully have successfully defended it. To be the Student Representative you don't actually have to be a student for the whole of the term of office, but to be prepared to represent the interests of the student corpus within CIMP. I'm sure that Sonia will do that admirably over the next few years. Sonia has also taken on some of the responsibilities of CIMP's social media and online presence and you can see her report elsewhere in this Newsletter. CIMP now has a presence on Facebook and X.

Duncan McLean
mbstratigraphy@gmail.com

Gilda Lopes
cimp.palynology@gmail.com

This brings to mind a CIMP General Assembly in Pisa in September, 1998 when some of the "older" members decided that one of the "younger" members should establish a website for the commission. At the time this was seen as the height of new technology, but admittedly CIMP was late into the game. So, a certain "younger" member, sat down and learned how to write HTML code and produced the first CIMP Website. It was a product of its time: by today's standards clunky and very basic. Subsequently other, more capable members of CIMP took over the website and substantially revamped it, much to the benefit of CIMP. Unfortunately, at some time in 2018-19 we lost access to the server hosting the site and over the last four years it grew progressively out of date. So the second important thing is that we now have access to the CIMP website again. The Executive Committee have decided that rather than having a dedicated Webmaster, the site will be administered by the Committee, and we are set upon its redevelopment. Those of you who have visited the site recently may have noticed updates and the addition of new pages. So please keep you eyes open for developments. Bearing in mind that hosting of the website is free to CIMP, and that the things that we can do are limited in terms of uploaded file size and server space, it would be interesting to hear what you, the membership, think of the website, and how you think that it could be used and improved.

2023 has been a sad year for CIMP with the deaths of several of our earliest members, notably Basil Balme, Harold Smith and Herbert Sullivan, all pioneers in Palaeozoic palynology. Short obituaries relevant to their activities in CIMP appear in this newsletter and more extensive obituaries can be found elsewhere.

Finally, I should mention that in June, 2023 CIMP held an enjoyable meeting alongside the 55th Annual Meeting of The Palynological Society (AASP), in Kentucky, USA. This is the fourth time that CIMP have partnered up with TPS/AASP over the years and the combination of our two societies always works to mutual benefit. The next meeting of CIMP will be at the 16th International Palynological Congress/11th International Organization of Palaeobotany Conference in Prague, May 25th –31st, 2024, and I hope to see many of you there.

Duncan McLean

GENERAL SECRETARY'S LETTER

Dear CIMP Members,

I want to express my gratitude for your continued membership with CIMP. It gives me immense pleasure to present the 2024 newsletter to you. I hope this issue provides you with insightful and enjoyable readings.

I also want to take a moment to acknowledge all the members who took the time to contribute to the newsletter. The newsletter is created for and by the members, so please send us any news you have from the past year. Even if you don't have much time to write things down, sending us a list of the papers published throughout the year would be greatly appreciated. This small gesture will help us all!

In this newsletter, you will find important information about the activities of our members over the past year, as well as other news.

I also want to give a special shout-out to

Filipe Barreira, LNEG's designer, for all his support with the newsletter layout.

Best regards,

Gilda Lopes

Paulo Fernandes
pfernandes@ualg.pt

TRESURER LETTER

Dear CIMP Members,

We would like to remind you that your membership fees play a crucial role in supporting our community. Your contribution helps us fund various initiatives, including student travel grants for attending conferences and payment of IFPS membership. Moreover, CIMP members are eligible to join the board to participate in the commission's management.

Please note that your membership is valid from January 1st to December 31st. On behalf of the committee, we urge you to renew your membership with CIMP. You can pay for multiple years in advance.

We have enabled PayPal payments on our website to make the payment process easier for you. Click on the PayPal logo to access secure payment.
http://cimp.weebly.com/membership.html

Jiří Bek
bek@gli.cas.cz

Alternatively, please write to me at this address (pfernandes@ualg.pt) to discuss options.

Kind regards

Paulo Fernandes

DIRECTOR-AT-LARGE AND IFPS COUNCILLOR

Dear CIMP Members,

I am pleased to share with you that I have been actively promoting the interests of our organization, CIMP, within IFPS while also supporting the CIMP President in his endeavours. This year, we are privileged to be intensely involved with the 16th International Palynological Congress/11th International Organization of Palaeobotany Conference in Prague, which presents many exciting opportunities for our community.

It is my sincere hope that you will consider joining us and participating in the event. I would be delighted to see you there and engage with you on this occasion.

With warm regards,

Jiří Bek

CIMP NEWSLETTER GUIDELINES AND SOCIAL MEDIA

The CIMP Newsletter is released once a year by the Commission Internationale de Microflore du Paléozoïque, and welcomes contributions from both members and non-members. You are invited to submit items related to CIMP members' fields of study that might include technical notes, meeting reports and reviews, book reviews, and other news related to Paleozoic palynology. Articles are preferred in Microsoft Word or plain text formats, and high resolution photos and other illustrations are welcomed.

All contributions should be sent by email to the Newsletter Editor, Gilda Lopes, at:

cimp.palynology@gmail.com

We are also present on Facebook (**CIMP - The Power of Palaeozoic Palynology**) and on X (**@CIMPalaeozoic**), follow us and post your own news.
You can contribute to our society and to the dissemination of Palaeozoic palynology!

CIMP SUBSCRIPTION RATES

CIMP has an annual subscription regime. We encourage you to check your annual status and make your payment!

Subscriptions are set at:

Professionals

10€ per year (+ 0.50€ of charge whatever for how many years you pay your fees)

Students and retired members:

FREE

Information on methods of payment can be found at: **http://cimp.weebly.com/membership.html**

It is easy, but why pay?

Simple - you can help CIMP members (students) to participate in meetings and conferences. You also may help in offsetting the costs of organizing social events during meetings, and participate in discussions between CIMP members. Your annual CIMP member dues also provide the fees for the CIMP subscription to IFPS (International Federation of Palynological Societies).

Thank you!

INTRODUCING THE NEW CIMP STUDENT REPRESENTATIVE

Dear CIMP Members,

I wish to thank all of you for allowing me to be part of this organisation. I'm a geologist and palynologist. I'm finishing my PhD studies at San Luis University in Argentina and working at the IANIGLA Institute in Mendoza. Claudia Rubinstein (IANIGLA) and Anthony Butcher (University of Portsmouth, UK) are my supervisors.

My PhD is based on Devonian chitinozoans from South Bolivia and Northwestern Argentina. I'm using this microfossil group to complement the biostratigraphic information given by acritarchs and spores from the same basins. Devonian basins from Western Gondwana are believed to be interconnected, and therefore, the microfossil associations should bear strong similarities. However, some exciting results show new endemic species for these basins. This trend could be because the main studies come from Brazilian basins, and there is a lot to keep studying from other Western Gondwana Basins. Some of these results were presented online in the CIMP-sponsored session on Paleozoic Palynology from the 55th Annual Meeting of The Palynological Society in Kentucky, USA.

Claudia and I also have some fascinating material from the Silurian and Devonian of the Chacoparaná basin in Argentina, where hardly anything has been studied, and the preliminary results are promising. We look forward to analysing other new material from the Ordovician in the Puna and Precordillera Argentina regions where the graptolites are being studied. Therefore, it should be possible to obtain high-resolution biostratigraphy.

Last year, I was awarded the TMS Frances Parker grant, which allowed me to travel to the UK in June to work on a project with Anthony about exceptionally well-preserved chitinozoans from the lower Silurian of Measley Ridge (Ohio, USA). I also collaborated with another work on Silurian chitinozoans in the UK, headed by James Inman. Unfortunately, none of these works have been published, but we hope most of them will be early this year.

During the COVID-19 pandemic, I started creating my chitinozoan database to do my PhD systematics. This eventually led to an analysis of the current situation regarding chitinozoan systematics and databases, guided by Anthony and Olle Hints. I presented this work in my first in-person international meeting, the 14th International Symposium on the Ordovician System in Tallinn. Hopefully, in the near future, we will have a complete and easily accessible chitinozoan database for all scientists to use.

As stated in my Student Representative's proposal, I'm a passionate field hockey player. Since a very young age, I've been involved in this community, where I learned to collaborate, train and communicate with people from many different backgrounds. I've been a men's and women's

Sonia Camina, current Student Representative.

coach, umpire, and delegate in various committees. Helping people achieve their goals is something I'm very passionate about, and it is the reason why I decided to be involved with the CIMP student community.

Since I became a CIMP board member, I have felt welcome and supported by the entire community. We have a fantastic team, and I'm excited about all the upcoming events. I want all the students (and all the members) to know they can count on me for anything they need!

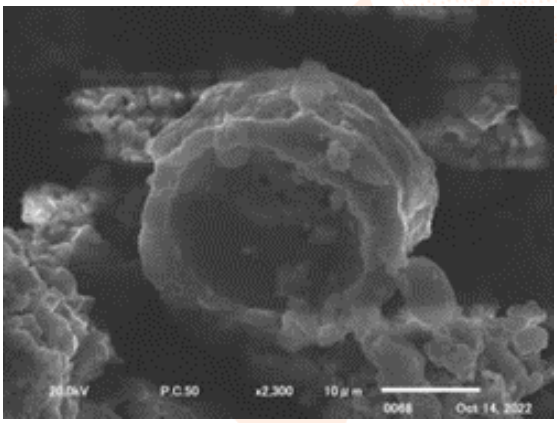
Sonia Camina

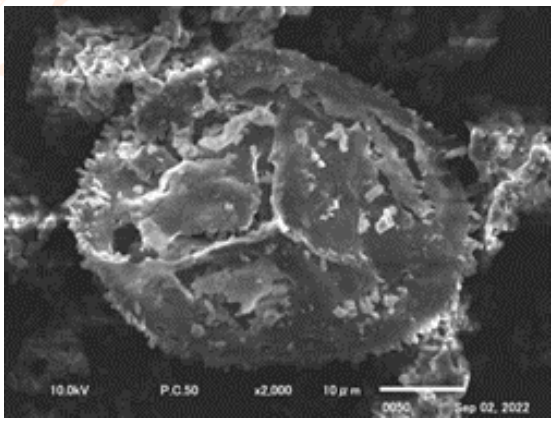
NEWS FROM THE MEMBERSHIP

Ahmed Maher
Graduate School of Science and Technology Shizuoka University
Shizuoka, Japan
ahmed.maher.21@shizuoka.ac.jp

I nearly finished my PhD thesis at Shizuoka University, entitled "Paleozoic palynostratigraphy and vegetational changes in the South Kitakami Belt of Northeast Japan", and the defense for graduation has been fixed to next February. It was a very hard mission to find and interpret the results obtained from the Paleozoic rocks of

Japan. This thesis represents the first comprehensive palynostratigraphical study on Paleozoic sediments in Japan. Part of the sporomorphs obtained were of a high thermal maturity and remained opaque even after oxidation, and I had to focus my study on SEM observation to identify most of taxa. The samples from the Silurian yielded tabular remains and some spore-like specimens, while samples from the Devonian yielded some cryptospores and a diversity of trilete spores, tabular remains and fragments of conducting structures, indicating the expansion into the hinterland of herbaceous plants including rhyniophytes, zosterophyllophytes, and lycophytes. The material from the Carboniferous and Permian





A. *Pseudodyadospora petasos* (Nakazato Fm., Devonian); B. *Aneurospora* sp. (Nakazato Fm., Devonian); Visit of Shirakawa Village, Gifu Prefecture, after my field trip to the Middle Devonian of central Japan.

was not very productive but revealed a composition agreeing with palynofloras previously reported from the Cathaysian realm. Among the studied sediments, richest assemblages were obtained from the Lower Devonian and permitted detailed discussion about the past location of the South Kitakami Belt, near the South China block. Above results were presented in poster session at the 2nd Asian Palaeontological Congress (APC2), held on August 2023 at the University of Tokyo. I will also present the results of my thesis during the 173rd Regular Meeting of the Palaeontological Society of Japan in January 2024 at Tohoku University. In addition, the manuscript about my Devonian results was accepted for publication in Paleontological Research, edited by the Palaeontological Society of Japan. I learnt the Japanese language for three years and can now read the characters and have discussions, which helped me a lot in my daily life and permitted to do many activities by myself. During the weekends, I enjoyed listening to piano performances in the downtown and could also participate in some culture festivals in Shizuoka City.

Charlie Wellman
University of Sheffield
Sheffield, UK

In 2023 work continued on a NERC-funded grant studying the Devonian sequences of Northern Spain. Our fourth field campaign took place in June with palynological and geochemical sampling by myself, David Bond, Gilda Lopes, John Marshall and Spanish colleagues from the University of Oviedo (Javier Sanz-López and Silvia Blanco-Ferrera). Other fieldwork took place in the Silurian-Devonian of the Midland Valley of Scotland (the Hagshaw Hills and Lesmahagow Silurian inliers and Silurian-Devonian sequence around Stonehaven) and the Ordovician-Silurian of the Cape Supergroup in South Africa.

Publications:

CLARKE, J. W., HETHERINGTON, A. J., MORRIS, J. L., PRESSEL, S., DUCKETT, J. G., PUTTICK, M. N., SCHNEIDER, H., KENRICK, P., WELLMAN, C. H. & DONOGHUE, P. C. J. 2023. Evolution of phenotypic disparity in the plant kingdom. Nature Plants: 10.1038/s41477-023-01513-x.

DUNLOP, J. A., WELLMAN, C. H., PRENDINI, L. & SHEAR, W. A. 2023. A pectinal tooth with peg sensilla from an Early Devonian scorpion. Journal of Arachnology 51, 255-257.

SLOTZNICK, S. P., SWANSON-HYSELL, N. L., ZHANG, Y., CLAYTON, K. E., WELLMAN, C. H., TOSCA, N. J. & STROTHER, P. K. 2023. Reconstructing the paleoenvironment of an oxygenated Mesoproterozoic shoreline and its record of life. Geological Society of America Bulletin 10.1130/B36634.1

WELLMAN, C. H., CASCALES-MINANA, B. & SERVAIS, T. 2023. Terrestrialisation in the Ordovician. In: HARPER, D. A. T, LEFEBVRE, B., PERCIVAL, I. G. and SERVAIS, T. (eds) A global synthesis of the Ordovician System: Part 1. Geological Society, London, Special Publications 532, 171-190.

WELLMAN, C. H., LOPES, G., MCKELLAR, Z. & HARTLEY, A. 2023. Age of the basal 'Lower Old Red Sandstone'Stonehave Group of Scotland: the oldest reported air-breathing land animal is Silurian (late Wenlock) in age. Journal of the Geological Society 181: 10.1144.jgs2023-138.

WELLMAN, C. H., STEEMANS, P. & LOPES, G. 2023.Dispersed spore assemblages from the Lower Devonian Reneces –La Vid groups of Northern Spain: Palaeogeo-

graphical implications. Review of Palaeobotany and Palynology 310:104825.

Duncan McLean
MB Stratigraphy Limited
Sheffield, UK

Following from my note in the previous CIMP Newsletter, I have co-authored two papers published this year as well as writing an obituary for my late PhD supervisor. I presented two papers at the Joint CIMP/Palynological Society (AASP) conference in Lexington, Kentucky, USA in June, for which see the report on that meeting elsewhere in this Newsletter.

Publications:

BAARS, T.F., HUIS IN T' VELD, R., ZHANG, L., KOOPMANS, M., McLEAN, D., MARTINUS, A.W. & ABELS, H.A., 2023. A cyclostratigraphic framework of the Upper Carboniferous Westoe and Cleaver formations in the southern North Sea Basin as a methodology for stratigraphic reservoir characterisation. Netherlands Journal of Geosciences, 102, e9. https://doi.org/10.1017/njg.2023.8

STEPHENSON, M.H. & McLEAN, D., 2023. Late Permian palynomorphs from the Cadeby Formation, Cadeby Quarry, Yorkshire, UK. Revista Italiana di Paleontologia e Stratigrafia, 129, 25-47. DOI: 10.54103/2039-4942/17850

McLEAN, D. & RIDING, J.B., 2023. Roger Neves (1932-2020). Palynology. DOI: 10.1080/01916122.2023.2277630.

Gilda Lopes
University of Sheffield
Sheffield, UK
g.m.lopes@sheffield.ac.uk

It has been an interesting year for us here in Sheffield. We are still analyzing the data from our Devonian project, and this year, we plan to submit several papers. Please stay tuned for further updates! Additionally, I have co-authored several articles and abstracts over the past year. Below is a list of them.

Publications:

WELLMAN, WELLMAN, C.H., LOPES, G., MCKELLAR, Z. & HARTLEY, A. 2023. Age of the basal 'Lower Old Red Sandstone' Stonehaven Group of Scotland: the oldest reported air-breathing land animal is Silurian (late Wenlock) in age. Journal of the Geological Society 181(1). DOI: https://doi.org/10.1144/jgs2023-138

FERNANDES, P., HANCOX, P.J., MENDES, M., PEREIRA, Z., LOPES, G., MARQUES, J., JORGE, R.C.G.S. & ALBARDEIRO, L. 2023. The age and depositional environments of the lower Karoo Moatize Coalfield of Mozambique: insights into the postglacial history of central Gondwana. Palaeoworld. DOI: https://doi.org/10.1016/j.palwor.2023.07.001

ROCHA, H.V., SANT'ANNA, L.G., RODRIGUES, C.F.A., MENDES, M., PEREIRA, Z., LOPES, G., FERNANDES, P., PEREIRA, E., TASSINARI, C.C.G. & LEMOS DE SOUSA, M.J. 2023. The paleoenvironmental and thermal histories of the Permian Irati Formation shale in the Paraná Basin, Brazil: An integrated approach based on mineralogical and organic imprints. Marine and Petroleum Geology 154, 106328. DOI: https://doi.org/10.1016/j.marpetgeo.2023.106328

MENDES, M., DESCAMPS, G., FERNANDES, P., LOPES, G., JORGE, R. & PEREIRA, Z. 2023. Lower Cretaceous palynology and palaeoenvironments of Algarve Basin: the Arrifes section. In Lopes, F. C., Dinis, P. A.,

Duarte, L. V. e Cunha, P. P. (Coords.). XI Congresso Nacional de Geologia: Geociências e Desafios Globais. Livro de Resumos. Coimbra, 16-20 julho de 2023, Departamento de Ciências da Terra da Universidade de Coimbra (eds.). Págs 97-98. ISBN: 978-989-98914-8-7.

PEREIRA, Z., FERNANDES, P., MENDES, M., LOPES, G., MARQUES, J., JORGE, R. & ALBARDEIRO, L. 2023. The Permo-Triassic Boundary in the N'Condédzi sub-basin, Moatize-Minjova Coal Basin, Mozambique: palynology, $d^{13}C_{org}$ variation and palaeoenvironments. In Lopes, F. C., Dinis, P. A., Duarte, L. V. e Cunha, P. P. (Coords.). XI Congresso Nacional de Geologia: Geociências e Desafios Globais. Livro de Resumos. Coimbra, 16-20 julho de 2023, Departamento de Ciências da Terra da Universidade de Coimbra (eds.). ISBN: 978-989-98914-8-7.

BOND, D., GREENE, S., HILTON, J., LOPES, G., LU, J., MARSHALL, J., WANG, Y., WELLMAN, C. & YIN, Y. 2023. Devonian mass extinctions: cumulative or cataclysmic? EGU General Assembly 2023. DOI: https://doi.org/10.5194/egusphere-egu23-13268

LOPES, G., BLANCO-FERRERA, S., BODMAN, D., BOND, D., GREENE, S., HILTON, J., MARSHALL, J.E.A., SANZ-LÓPEZ, J. & WELLMAN, C. 2023. The early-Middle Devonian transition in Northern Spain and the associated Chotec Event. Linnean Society Palaeobotany and Palynology Specialist Groups Joint Meeting, November 23, 2023. Linnean Society of London, 1p.

Jacques Verniers
Ghent University
Ghent, Belgium
Jacques.Verniers@UGent.be

The publication of Jan Mortier's Ph.D. (2014) for the Memoirs of the Geological Survey of Belgium, with an extensive study on the uppermost Ordovician and Silurian of many sections plus their chitinozoans in the Belgian Condroz Inlier, was reviewed and changed accordingly. We are waiting for the proofs.

He works on three manuscripts for the revue Geologica Belgica: A new biostratigraphy with chitinozoans for the Silurian of Belgium; a review on the Silurian of Belgium 20 years after the previous synthesis of Verniers et al (2002) and on the Silurian formations in Belgium anno 2024 (for the National Commission on Stratigraphy of Belgium).

All the best,
Jacques

Publications:
MORTIER, J., VANMEIRHAEGHE, J., HARPER, D., STORCH, P., ZALASIEWICZ, J., VAN DEN HAUTE, P., DECKERS, J., MESTDAGH, J., PILLE, T. & VERNIERS, J. 2023. Stratigraphy and biostratigraphy with chitinozoans of the uppermost Ordovician and Silurian of the Condroz Inlier. (in press January 2024).

John Marshall
University of Southampton
Southampton, UK

This last year has been busy as regards fieldwork. We have been to the Devonian sections in the Cantabrian Mountains and coastal sections in Asturias in Spain for a further visit. This is a NERC funded grant led by Charlie Wellman from Sheffield and includes David Bond (Hull) on the stable isotopes and geochemical indicators of extinction together with Gilda Lopes as the

post-doc focusing on the acritarchs and chitinozoans. Some of these sections are very well known having been studied by Cramer in the 1960s at the very beginning of palynology. We have been greatly assisted in our sample collection by our local Project Partners Javier Sanz-López and Silvia García-López.

In the late summer of 2023 we returned to the Devonian of Svalbard to collect more distant spore samples from under the Viséan section on Birger Johnsonfjellet. It was a long walk jumping off from the Czech base at Nostoc. I was accompanied by Ian Troth and 3 independent fish palaeontologists (Mike Newman, Roger Jones and John Armstrong). We got more than they did!

Conference attendance included STRATI23 in Lille where I presented in the CIMP-Saudi Aramco symposium, the Life and the Planet Earth System meeting in London together with PalAss in Cambridge.

Relevant Publications:

BEITH, S.J., FOX, C.P., MARSHALL, J.E.A. & WHITESIDE, J.H. 2023. Compound-specific carbon isotope evidence that the initial carbon isotope excursion in the end-Triassic strata in northwest Tethys is not the product of CAMP magmatism. Global and Planetary Change, 104044.

LIU, F., PENG, H., MARSHALL, J.E.A., LOMAX, B.H., BOMFLEUR, B., KENT, M.S., FRASER, W.T. & JARDINE, P.E. 2023. Dying in the Sun: Direct evidence for elevated UV-B radiation at the end-Permian mass extinction. Science Advances 9 (1), eabo6102.

LIU, F., PENG, H., MARSHALL, J.E.A., LOMAX, B.H., BOMFLEUR, B., KENT, M.S., FRASER, W.T. & JARDINE, P.E. 2023. Response to comment on Dying in the Sun: Direct evidence for elevated UV-B radiation at the end-Permian mass extinction. Science Advances 9 (1), eadj6309.

SMART, M.S., FILIPPELLI, G., GILHOOLY III, W.P., OZAKI, K., REINHARD, C.T., MARSHALL, J.E.A. & WHITESIDE, J.H. 2023. The expansion of land plants during the Late Devonian contributed to the marine mass extinction. Communications Earth & Environment 4 (1), 449.

Paul Strother
Boston College
Boston, USA
strother@bc.edu

It was a group effort with Bas van de Schootbrugge (Utrecht), Wilson Taylor (Wisconsin), Andreas Koutsodendros (Heidelberg) in a project started by Charles Wellman (Sheffield), but we have now published a paper demonstrating a possible link between a series of striate "problematic" genera and the cysts of euglenoids. The title is, *Recognition of an extended record of euglenoid cysts: Implications for the end-Triassic mass extinction* , and it is currently published open access online in Review of Paleobotany and Palynology: https://www.sciencedirect.com/science/article/pii/S0034666723002129.

We were joined in this effort by Fabian Weston, who is an award-winning naturalist expert in videography of living protists. His work can be found on youtube.com at *The Protist Lab Films*: https://www.youtube.com/@protistlabfilms/ featured. We think he is the only living person to have documented live euglenid encystment. If our hypothesis is correct, the striate (NPPs/acritarchs) *Chomotriletes* and related genera should be indicative of ponded, terrestrial settings throughout

geologic time. Our conclusions are built on the unique wall ultrastructure of Pliocene and Recent specimens of *Concentricystes* that are similar to Jurassic *Pseudoschizaea* published by Tekleva et al.(2021). Tekleva, M. V., Polevova, S. V., Gavrilova, O. A., Roghi, G. and Neri, M. 2021. Pseudoschizaea sp. from the Early Jurassic of Italy: Fine Structure and Comparison. Paleontological Journal, 55(2), 224–234.

Shouhan Wu

Nanjing Institute of Geology and Paleontology
Chinese Academy of Sciences
Nanjing, China
shwu@nigpas.ac.cn

I am a master student at the Nanjing Institute of Geology and Paleontology, Chinese Academy of Sciences. My master thesis will focus on the systematics and biostratigraphy of Devonian chitinozoans in South China, tutored by Professor Yan Liang. Although it has not been so long since I started learning chitinozoans, I hope to make some progress and discover some interesting results in the upcoming years. It's good to know we have such a wonderful association. I look forward to reading news from here and meeting you in the near future.

Sinem Tanrikulu

Stratigraphy Department
Turkish Petroleum Corporation
Turkey

As a new member of CIMP, I would like to introduce myself.
I have been working in the Stratigraphy Department of Turkish Petroleum Corporation (TPAO), Research and Development Center since 2015.

I completed my BSc in the Geological Engineering Department of Middle East Technical University (METU) in Ankara, Turkey in 2011. In 2012, I was awarded a full governmental scholarship from TPAO for my MSc degree. I studied mid-Cretaceous terrestrial palynoflora of the Glen Rose Formation, Texas under supervision of Prof. James A. Doyle and co-supervision of Dr. Irina Delusina in the Earth and Planetary Sciences Department in University of California, Davis. In 2015, I completed my MSc degree and turned back to Turkey. In 2016, I started my PhD in the Geological Engineering Department of METU on the uppermost Ordovician-Lower Devonian palynostratigraphy of the Central and Eastern Taurides in southern Turkey. In January 2024, I defended my PhD thesis under supervision of Prof. Sevinç Özkan Altıner and co-supervision of Charles H. Wellman.


Sinem Tanrikulu

In 2023, I presented palynological and paleobiogeographical findings from the Upper Ordovician successions in Central and Eastern Taurides, Turkey at 21st International Petroleum and Natural Gas (IPETGAS) Congress in Ankara, Turkey.
Currently, my main interest is on early

plant spores, and Early Devonian palynomorphs and their paleogeographical distributions.

G. SUSANA DE LA PUENTE
CITAAC, CONICET - CIGPat,
Universidad Nacional del Comahue
Neuquén, Argentina
sudelapuente@gmail.com
susana.delapuente@comahue-conicet.gob.ar

I continue to work on Ordovician, Silurian and Devonian chitinozoans from Argentina basins, including the Central Andean Basin and Precordillera. In this period, I have published Ordovician chitinozoans results from the Central Andean Basin. I continue also working on projects focusing on palynology and stratigraphy of Patagonia and Tandilia regions, in collaboration with paleontologists and sedimentologists. I have advised two undergraduate students during 2023 as well. I was in charge of organizing the Palinofacies postgraduate course for the Doctorate in Geosciences (Doctorado en Geociencias) at the university, which was taught by specialists Marcelo Martinez and Daniela Olivera (Argentine).

Publications:

DE LA PUENTE, G.S. & ASTINI, R.A., 2023. Ordovician chitinozoans and review on basin stratigraphy, biostratigraphy and paleobiogeography of northern Argentina along the Proto-Andean margin. Geobios, Special Issue, Ordovician of the World — Proceedings of the UNESCO/IGCP Project 653 – 735, 81: 199-226. https://doi.org/10.1016/j.geobios.2023.04.004

VOJTĚCH KOVÁŘ
Charles University
Prague, Czech Republic

During 2023, my research mainly focused on the Cambrian deposits of the Barrandian area (Czech Republic). I have been studying organic-walled microfossils (most notably acritarchs and SCFs) from the Paseky Shale and Jince Formation of the Příbram-Jince Basin and the Buchava Formation of the Skryje-Týřovice Basin. One of the main goals is to complement the biostratigraphy of the Skryje-Týřovice Basin, which is currently based on macrofossils. This research will continue into 2024.

Apart from that, I and my colleagues have finished an article on the chemical extraction of phyllocarid remains both from bulk rock samples and via targeted dissolution of macrofossils.

Publications:

KOVÁŘ, V., ŠILINGER, M., FATKA, O., BROCKE, R., 2023. Chemical processing of fossil phyllocarid cuticle: a comparison of micro- and macrofossil remains. Palynology, 1–8.

YAN LIANG
Nanjing Institute of Geology and Paleontology
Chinese Academy of Sciences
Nanjing, China
liangyan@nigpas.ac.cn

Yan Liang continues to focus on chitinozoan taxonomy, biostratigraphy, and morphological function.

This summer, I attended the 14th ISOS in Tallinn and had two more wonderful weeks discussing chitinozoans with Prof. Olle Hints and Jaak Nõlvak at Taltech. Meeting many old friends and getting to know

some new friends after four years is really cheerful.

With colleagues from China, Estonia and America, some works have been published during the past two years, mainly focusing on Ordovician chitinozoans of South China and Baltica. Eight chitinozoan species were erected, including *Lagenochitina megaesthonica* in Liang et al. (2022), *Bursachitina baldonia, Conochitina ulsti, Eremochitina*? *procera* and *Sphaerochitina*? *latviensis* in Nõlvak et al. (2022), *Spinachitina*? *coronifera*, *Lagenochitina yichangella* and *Pellichitina confragosa* in Liang et al. (2023).

Publications:

LIANG, Y., NÕLVAK, J. & HINTS, O., 2023. Ordovician chitinozoans of the Miaopo Formation at Zhenjin, Upper Yangtze Platform, South China. Palynology. https://doi.org/10.1080/01916122.2023.2271086

LIANG, Y., HINTS, O., NÕLVAK, J. & TANG, P., 2023. On future directions of Ordovician chitinozoan research. Estonian Journal of Earth Sciences, 72: 58–61. https://doi.org/10.3176/earth.2023.34

LIANG, Y., TANG, P., WANG, G.X., YAN, G.Z. & WANG, Q., 2023. Middle-Late Ordovician chitinozoans from Songliang of Qiaojia, western South China, and their biostratigraphic implications. Palaeoworld, 23: 287–302. https://doi.org/10.1016/j.palwor.2021.11.003

LIANG, Y., TANG, P., HINTS, O., NÕLVAK, J., ZHANG, L.N. & CHEN, Y.S. 2023. Chitinozoan study: review and prospect. Acta Palaeontologica Sinica, 62(3): 436–450. (in Chinese with English abstract). https://doi.org/10.19800/j.cnki.aps.2023003

LIANG, Y., NÕLVAK, J., XU, H., CHEN, Y. & HINTS, O., 2022. Revision of Ordovician chitinozoan *Lagenochitina esthonica* sensu lato: morphometrics, biostratigraphy and paleobiogeography. Journal of Paleontology, 96 (1): 46–60. doi: 10.1017/jpa.2021.79. https://doi.org/10.1017/jpa.2021.79

NÕLVAK, J., LIANG, Y. & HINTS, O., 2023. Latest Ordovician age of the *Spinachitina fragilis* Chitinozoan Biozone in Baltoscandia. Estonian Journal of Earth Sciences, 72: 82–85. https://doi.org/10.3176/earth.2023.51

WANG, G.X., CUI, Y.N., LIANG, Y., WU, R.C., WEI, X., GONG, F.Y., HUANG, B., LUAN, X.C., TANG, P., LI, L.X., ZHANG, X.L., ZHANG, Y.C., ZHANG, Z.T., WAN, Q. & ZHAN, R.B., 2023. Toward a unified and refined Ordovician stratigraphy for the western Yangtze region, South China. Palaeoworld, 32: 202-218. https://doi.org/10.1016/j.palwor.2022.04.003

LUAN, X.C., DESROCHERS, A., WU, R.C., LIU, J.B., WANG, G.X., LIANG, Y., ZHANG, Y.C., WEI, X., LI, L.X. & ZHAN, R.B. Reconstruction of the Yangtze Ramp during Floian to Darriwilian (Ordovician) in South China: Its Morphology, Controlling factors and Significances. Acta Geologica Sinica - English Edition. https://doi.org/10.1111/1755-6724.15101

NÕLVAK, J., LIANG, Y. & HINTS, O., 2022. Early and early Middle Ordovician chitinozoans from the Baldone drill core, central Latvia. Estonian Journal of Earth Sciences 71, 25–43. https://doi.org/10.3176/earth.2022.03

GOLDMAN, D., LESLIE, S., LIANG, Y. & BERGSTRÖM, S., 2023. Ordovician biostratigraphy: index fossils, biozones and correlation. In: Harper, D. A. T., Lefebvre, B., Percival, I. G. and Servais, T. (eds) A Global

Synthesis of the Ordovician System: Part 1. Geological Society, London, Special Publications, 532, 31–62.

ZHANG, Y.D., ZHAN, R.B., ZHEN, Y.Y., WANG, W.H., LIANG, Y., FANG, X., WU, R.C., YAN, K., ZHANG, J.P. & LI, W.J., 2023. Regional synthesis of the Ordovician geology and stratigraphy of China. In: Harper, D. A. T., Lefebvre, B., Percival, I. G. and Servais, T. (eds) A Global Synthesis of the Ordovician System: Part 1. Geological Society, London, Special Publications, 533, 421–478.

IN MEMORIAM

Arthur Harold Victor Smith (1923-2023)

By Duncan McLean

The distinguished palynologist Arthur Harold Victor Smith, universally known by his middle forename Harold, died on the 4th of January 2023 at the age of 99. Harold Smith was a pioneer in Carboniferous palynology, coal petrology, coal provenance, and thermal maturation. He spent almost his entire career, between 1952 and 1987, as a palynologist at the National Coal Board (NCB) where he helped with the evaluation of Britain's coal resources. He was also highly involved with the *International Committee for Coal Petrology* (ICCP) from the early 1950s to the 1980s, and the *Commission Internationale de la Microflore du Paléozoïque* (CIMP) from the early 1960s to the early 1970s. Without question, his career highlight was the publication of Smith and Butterworth (1967), the definitive account of Late Carboniferous miospores.

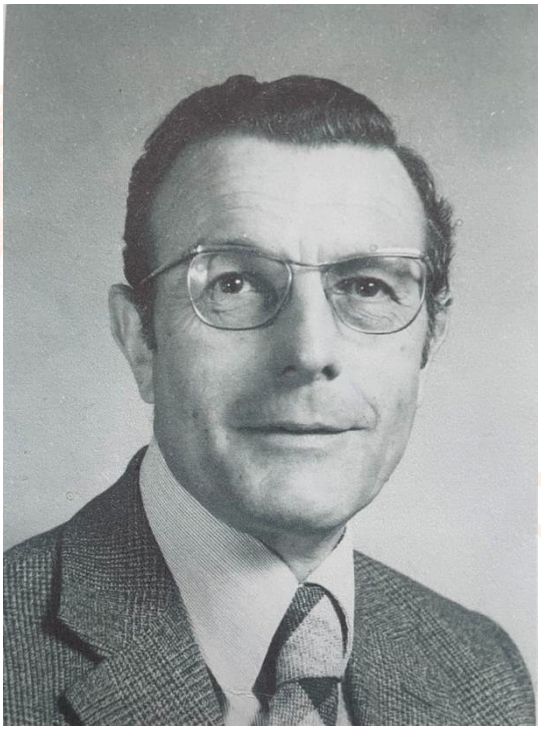
Harold Smith was born in North London in 1923. He enrolled for a bachelor's degree in Botany at Queen Mary University of London in 1942 during the Second World War. Harold was evacuated to Cambridge where he completed his academic studies along with military training in the Officer Training Corps, and graduated with honours in 1945. He became a member of the Army Operational Research Group where he attained the rank of Captain in 1951. Here he studied soil mechanics, specifically how tracked vehicles, such as armoured military vehicles and tanks, moved over soft substrates (Smith and Evans 1949). This work took him on fieldwork throughout the UK and Germany where Harold instructed various geologists on his work. One of these geologists was the palynologist Norman Hughes who was aware of Harold's interest in Harry Godwin's research on reconstructing the postglacial British vegetation using pollen records. Norman drew Harold's attention to a job advertisement for a post on miospore biostratigraphy and correlation of coal seams at the NCB. Harold applied, was offered the position, and accepted.

Following the nationalisation of the UK coal mining industry in January 1947 the newly established NCB undertook a strategic assessment of its coal reserves. This involved an extensive exploratory drilling campaign with boreholes sunk across all the known UK coalfields. With the rapid acquisition of so many new cored successions, the NCB needed manpower to study the coal seams recovered from these wells. In 1952, Harold was employed to study this material, initially at the NCB Scientific Laboratories in London before moving to the Sheffield Coal Survey Laboratory, on the site of Manvers Main Colliery,

at Wath upon Dearne, South Yorkshire. Harold joined a team of other NCB palynologists at Wath upon Dearne, namely Basil E. Balme (Backhouse and Playford 2023, 2024) and R.W. Williams, along with John O'Neale Millott and Mavis A. Butterworth who worked at the NCB laboratory in Chester.

Harold studied for a PhD as an external student at the University of London. He undertook this work at the NCB laboratory, who provided facilities and coal samples. His PhD was conferred in December 1960 for a thesis entitled *The Relationship Between the Spore Assemblages and the Petrography of the Coals from the Westphalian of Yorkshire*.

Throughout his long career in palynology at the NCB, Harold examined material from all the exposed UK coalfields and also studied coal samples from the concealed Kent Coalfield in southeast England, and, latterly, the unexploited subcropping Berkshire and Oxfordshire coalfields (Smith 1978a). He published on miospore biostratigraphy and taxonomy from the coal measures in the coalfields based on his work for the NCB (e.g. Smith and Williams 1957, Marshall and Smith 1965, Butterworth and Smith 1976, Cope et al. 1977; Smith 1983, 1987; Smith and Spriggs 1985; contributions in Poole 1969, 1978). Harold's early publications, demonstrating how the distributions of miospores and macerals in coals can be used to interpret the palaeoecological and palaeohydrological development of coal mires were of substantial impact (e.g. Smith 1961a, 1962). However, his *magnum opus* was the 1967 monograph *Miospores in the coal seams of the Carboniferous of Great Britain*, co-authored with Mavis A. Butterworth. This major paper was based on both authors' palynological work at the NCB, allied with



Artur Harold Victor Smith

previous work at the NCB by Basil E. Balme and R.W. Williams, and Harold's research for the various CIMP working groups. Smith and Butterworth (1967) was the inaugural number of *Special Papers in Palaeontology*. It remains a landmark taxonomic reference for Carboniferous miospore biostratigraphy and systematics and also covers palynological processing techniques, suprageneric classification, descriptive terminology, and coal seam correlation methods. Although not a CIMP publication, Smith and Butterworth (1967) brought together for the first time much that the CIMP Working Groups were intent on achieving.

The *Commission Internationale de la Microflore du Paléozoïque* (CIMP) was initiated in September 1958 at the Fourth International Congress on Carboniferous Stratigraphy in Heerlen, The Netherlands. By the time of the CIMP General Assembly in Paris during 1963, Harold had become a key member of several of the Working Groups.

He was involved in Working Group No. 1 on 'Recommended Terminology' which aimed to establish a standard morphological terminology for the description of Palaeozoic miospores. Harold contributed significantly to the final report of this Working Group which was published by Grebe (1971). He also contributed to Working Group No. 10 which aimed at standardising palynological preparation techniques (Hughes et al. 1964). Another branch of the CIMP Working Groups involved biostratigraphy. Harold was involved in CIMP Working Group No. 13C investigating Namurian and Westphalian (Serpukhovian to late Moscovian) miospore biostratigraphy (Butterworth et al. 1964a).

Several of the Working Groups in the early years of CIMP were established to provide taxonomic precision in some of the more common genera of Palaeozoic miospores. Harold's attention to detail, insistence on observational rigour, and standardisation of interpretations was ideally suited for this work. He was involved in Working Group No. 2 on *Densosporites* (Smith 1960, Butterworth et al. 1964b), Working Group No. 4 on *Lycospora* (Pierart et al. 1964, Grebe 1972), and Working Group No. 6 on *Verrucosisporites* (Smith et al. 1964, Smith 1971). It is noteworthy that all the CIMP Working Groups were highly collaborative, international efforts, and that the author listings did not necessarily reflect the contributions made by many other workers.

Between 1967 and 1973, a series of five volumes containing eight palynological monographs were published by CIMP through the *Éditions du Centre National de la Recherche Scientifique* in Paris. These were on acritarchs, chitinozoans, miospores, and prasinophytes. Harold sat on the CIMP Editorial Committee throughout this period, eventually becoming the Editorial Director. He held various other posts in CIMP, being the Secretary of the Subcommission on Microspores from 1967, and being elected to serve a term as Vice President of the Executive Committee of CIMP on the 20th of August 1971 at the Ninth CIMP General Assembly at Krefeld, central western Germany. The latter meeting was held the week prior to the Seventh Carboniferous Congress.

As well as working on palynology, Harold was charged with establishing the NCB's first coal petrological laboratory. He became interested in how miospore composition varies vertically through an individual coal seam, and how this relates to the distribution of coal macerals (Smith 1957). He recognised that both miospore and maceral assemblages reflected hydrological conditions at the time of peat formation, and recorded the changing ecological and environmental conditions of peat accumulation (Smith 1961a, 1962, 1968).

Harold was a founding member of the International Committee for Coal Petrology (ICCP) (now the International Committee for Coal and Organic Petrology – ICCOP) in 1953. Through this organisation he encouraged the development of standardisation in nomenclature and techniques and was active on the committee that produced the *International Handbook of Coal Petrology*, the standard text on coal petrology (International Committee for Coal Petrology 1963) and subsequent revisions (Murchison and Smith 1971). In 1990, Harold was awarded the Reinhardt Thiessen Medal by the ICCP. This is the highest award of the ICCP, and recognises significant achievements and outstanding contributions in the fields of coal and organic petrology. The citation for the medal states that it was awarded to Harold 'for his contribution to coal petrology and palynology, for his many contributions to indus-

trial applications of coal petrology and for his work on the International Handbook of Coal Petrography.' In 1993, Harold was elected as an honorary member of the ICCP.

Harold also published extensively on the application of palynology and petrography to the provenancing of archaeological materials, most commonly coal fragments recovered from Roman and medieval sites (Smith 1961b, 1964, 1965, 1975, 1977, 1978b, 1980, 1996, 1997, 2000; Green et al. 1980; Smith and Owens 1983; Prosser and Smith 1986). As well as determining the provenance of local archaeological materials Harold was able to relate samples to sources which may have been far removed from the site of the find. Such far-travelled artefacts included some from continental Europe (Smith 2000), or the wreck of the *HMS Bounty* off Pitcairn Island in the South Pacific (Erskine et al. 2008). The techniques employed in these archaeological applications were elegantly summarised by Smith (2005).

Harold maintained a very close association with the Department of Geology at the University of Sheffield from around 1953. He sporadically taught a short course in coal geology as part of the MSc course in Palynology at Sheffield. Following his retirement from the NCB in 1987, he was appointed as an Honorary Lecturer at the University where he taught on the MSc course for its final decade, and continued his research which by now was largely related to the application of coal geology to archaeological studies.

Outside of his career as a coal geologist, Harold was an avid natural historian, an ecologist and, above all, a passionate ornithologist. While in London in 1946, Harold joined the London Natural History Society. His knowledge of soils and botany was applied to understanding how vegetation recolonised bomb sites in the city. In the late 1990s Harold was awarded honorary member of that society. Later, he became heavily involved in the Sorby Natural History Society in Sheffield. Harold was President in 1989, and in 2003 he was elected an Honorary Life Member for services to the Society. Harold published widely on the birds of South Yorkshire and was involved in establishing a field station in Sheffield's Limb Valley. Amongst other publications, he edited the first comprehensive avifauna for the Sheffield area (Smith 1974).

Harold was honoured by the naming of the fossil pteridophyte spore *Deltoidospora smithii* Ravn 1986.

A more complete obituary for Harold Smith will appear in the journal *Palynolgy*. An account of his contributions to natural history and conservation will appear in *The Sorby Record*.

REFERENCES

BACKHOUSE J., PLAYFORD G. 2023. Basil Eric Balme 13th June 1923 – 10th July 2023 Doyen of Australian palynology. Journal of the Royal Society of Western Australia. 106:23–24.

BACKHOUSE J., PLAYFORD G. 2024. Basil Eric Balme (1923–2023: doyen of Australian palynology. Palynology. 48(2), 2305050.

BUTTERWORTH MA, SMITH AHV. 1976. The age of the British Upper Coal Measures with reference to their miospore content. Review of Palaeobotany and Palynology. 22:281–306.

BUTTERWORTH MA, ALPERN B, BARSS MS, GREBE H, KOSANKE RM, MÜLLER W, NOËL R, PIERART P, SMITH AHV, SULLIVAN HJ. 1964a. Report of C.I.M.P. Working Group No. 13C. Miospore distribution in the Namurian and Westphalian. Compte Rendu

Cinquième Congrès Internationale de Stratigraphie et de Géologie du Carbonifère, Paris, 1963. 3:1115–1118.

BUTTERWORTH MA, ALPERN B, ARTÜZ S, JANSONIUS J, KOSANKE RM, RICHARDSON JB, SMITH AHV, STAPLIN FL. 1964b. Report of C.I.M.P. Working Group No. 2. *Densosporites* (Berry) Potonié & Kremp and related genera. Compte Rendu Cinquième Congrès Internationale de Stratigraphie et de Géologie du Carbonifère, Paris, 1963. 3:1049–1057.

COPE KG, WATSON LKB, SMITH AHV. 1977. Coal seams of the Steeple Aston borehole. Bulletin of the Geological Survey of Great Britain. 57:23–28.

ERSKINE N, SMITH AHV, CROSDALE PJ. 2008. Provenance of coals recovered from the wreck of HMAV Bounty. International Journal of Nautical Archaeology. 37:171–176.

GREBE H. 1971A. A recommended terminology and descriptive method for spores. Commission Internationale de la Microflore du Paléozoïque, Éditions du Centre National de la Recherche Scientifique, Paris. 4:7–34.

GREBE H. 1972. Révision du genre *Lycospora* Schopf, Wilson et Bentall. Commission Internationale de la Microflore du Paléozoïque, Éditions du Centre National de la Recherche Scientifique, Paris. 5:1–110.

GREEN HS, SMITH AHV, YOUNG BR, HARRISON RK. 1980. The Caergwrle Bowl: its composition, geological source and archaeological significance. Report of the Institute of Geological Sciences. 80/1:26–30.

HUGHES NF, DE JEKHOWSKY B, SMITH AHV. 1964. Extraction of spores and other organic microfossils from Paleozoic clastic sediments and coals. Compte Rendu Cinquième Congrès Internationale de Stratigraphie et de Géologie du Carbonifère, Paris, 1963. 3:1095–1109.

INTERNATIONAL COMMITTEE FOR COAL PETROLOGY. 1963. International Handbook of Coal Petrology, Second edition. International Committee for Coal Petrology, Centre National de la Recherche Scientifique, Paris, 232 p.

MARSHALL AE, SMITH AHV. 1965. Assemblages of miospores from some Upper Carboniferous coals and their associated sediments in the Yorkshire coalfield. Palaeontology. 7:656–673.

MURCHISON DG, SMITH AHV (EDITORS). 1971. International Handbook of Coal Petrology, Supplement to the Second Edition. International Committee for Coal Petrology, University of Newcastle-upon-Tyne, UK, 308 p.

PIERART P, ALPERN B, GREBE H, NOËL R, PIERART P, SMITH AHV, STREEL M. 1964. Rapport du Groupe de Travail C.I.M.P. No. 4. *Lycospora* Schopf, Wilson & Bentall. Compte Rendu Cinquième Congrès Internationale de Stratigraphie et de Géologie du Carbonifère, Paris, 1963. 3:1059–1061.

POOLE EG. 1969. The stratigraphy of the Geological Survey Apley Barn borehole, Witney, Oxfordshire. Bulletin of the Geological Survey of Great Britain. 29:1–104.

POOLE EG. 1978. The stratigraphy of the Withycombe Farm borehole, Oxfordshire. Bulletin of the Geological Survey of Great Britain. 68:1–63.

PROSSER W, SMITH AHV. 1986. The examination of archaeological samples from excavations at Caerwent. British Coal South Wales Area Laboratory Report (unpublished).

SMITH AHV. 1957. The sequence of miospore assemblages associated with the oc-

currence of crassidurite in coal seams of Yorkshire. Geological Magazine. 94:345–363.

SMITH AHV. 1960. Structure of the spore wall in certain miospores belonging to the series Cingulati Pot. and Klaus 1954. Palaeontology. 3:82–85.

SMITH AHV. 1961a. Palaeoecology of Carboniferous peat bogs. Nature. 189:744–745.

SMITH AHV. 1961b. Miospore examination of coal from a Roman site at Gloucester. National Coal Board Coal Survey Laboratory Report. 3245 (unpublished).

SMITH AHV. 1962. The palaeoecology of Carboniferous peats based on the miospores and petrography of bituminous coals. Proceedings of the Yorkshire Geological Society. 33:423–474.

SMITH AHV. 1964. Microscopical examination of archaeological samples of coal. National Coal Board Coal Survey Laboratory Report. 3381 (unpublished).

SMITH AHV. 1965. Nature and possible origin of coal from a Roman site at Lufton near Yeovil. National Coal Board Coal Survey Laboratory Report (unpublished).

SMITH AHV. 1968. Seam profiles and seam characters. In: Murchison DG, Westoll TS (editors). Coal and coal-bearing strata, Oliver and Boyd, Edinburgh, 31–40.

SMITH AHV. 1971. Le genre *Verrucosisporites* Ibrahim 1933. emend. In: Microfossiles organiques du Paléozoique, 4 Les Spores. Commission Internationale de la Microflore du Paléozoïque, Éditions du Centre National de la Recherche Scientifique, Paris, 35–87.

SMITH AHV. 1974. Birds of the Sheffield area. Sorby Natural History Society and Sheffield City Museums, Sheffield, UK, 167 p.

SMITH AHV. 1975. Provenance of coals from the sites at Swine Sty and Totley. Transactions of the Hunter Archaeological Society. 10:207–211.

SMITH AHV. 1977. In: Clarke H, Clarke A (editors). Excavations in Kings Lynn 1963–1970. Society for Medieval Archaeology, Monograph Series. 7:347–349.

SMITH AHV. 1978a. Age of cores from the N.C.B. Foundry Bridge B.H. nr. Reading, Berks. National Coal Board Yorkshire Regional Laboratory Report. YRL9194:1–3.

SMITH AHV. 1978b. Coal from the excavation of 18th Century clay pipe kiln, Brentford. Museum of London.

SMITH AHV. 1980. Provenance of coals from New Fresh Wharf, City of London. In: Dyson T (editor). The Roman Quay at St Magnus House, London. Museum of London and the London and Middlesex Archaeological Society, Special Paper. 8, 271 p.

SMITH AHV. 1983. Stratigraphic position of coal seams in borehole HW3. In: Gallois RW, Worssam BC. Stratigraphy of the Harwell boreholes. Institute of Geological Sciences Report. FLPU 83/14, 77–79.

SMITH AHV. 1987. Stratigraphic ranges of selected miospores in coal seams of Upper Coal Measures age in Oxfordshire and SE Warwickshire. Journal of Micropalaeontology. 6:21–37.

SMITH AHV. 1996. Provenance of coals from Roman sites in U.K. counties bordering River Severn and its estuary and including Wiltshire. Journal of Archaeological Science. 23:373–389.

SMITH AHV. 1997. Provenance of coals from Roman sites in England and Wales. Britannia. 28:297–324.

SMITH AHV. 2000. Petrographic and palynological analysis of coals from the late medieval village of Walraversijde, Belgium, to confirm historical evidence of

provenance from Newcastle-upon-Tyne area. Report to the Archaeological Institute, Doornveld (unpublished).

SMITH AHV. 2005. Coal microscopy in the service of archaeology. International Journal of Coal Geology. 62:49–59.

SMITH AHV, BUTTERWORTH MA. 1967. Miospores in the coal seams of the Carboniferous of Great Britain. Special Papers in Palaeontology. 1, 324 p.

SMITH AHV, Evans I. 1949. Sensitivity of clays to remolding. Nature. 164:319.

SMITH AHV, OWENS B. 1983. The Caergwrle bowl: its composition, geological source and archaeological significance – an addendum. Report of the Institute of Geological Sciences. 83/71:24–27.

SMITH AHV, SPRIGGS P. 1985. BGS boreholes 1983. Report of the British Geological Survey. 16:1–15.

SMITH AHV, WILLIAMS RW. 1957. The occurrence of the Carboniferous 'microspores' C1 and C4 in the seams below the Clay Cross Marine Band in Yorkshire. Bulletin of the Geological Survey of Great Britain. 12:27–51.

SMITH AHV, BUTTERWORTH MA, KNOX EM, LOVE LG. 1964. Report of C.I.M.P. Working Group No. 6. *Verrucosisporites* (Ibrahim) emend. Compte Rendu Cinquième Congrès Internationale de Stratigraphie et de Géologie du Carbonifère, Paris, 1963. 3:1071–1078.

BASIL ERIC BALME (1923-2023)

By Duncan McLean

The eminent and pioneering australian palynologist Basil Balme died on 10th July, 2023. Basil worked for several years alongside Mavis Butterworth and Harold Smith at the National Coal Board's Coal Survey Laboratory at Wath-upon-Dearne, Sheffield, UK. Here he published on Carboniferous miospores from the British coalfields (Balme, 1952; Balme & Butterworth, 1952). At the time of the foundation of CIMP in 1958, Basil had returned to Australia to work, initially, at the Univeresity of Western Australia. He acted as CIMP regional secretary for Australia for several years and contributed to CIMP working groups (e.g. Alpern et al., 1964). Basil published widely on Palaeozoic and Mesozoic palynology over the years and many of his works, particularly on the Devonian, Permian and Triassic remain as standard references. An account of Basil's life has been produced by Backhouse & Playford (2023). You can access it at: https://www.rswa.org.au/publications/journal/106/RSWA%20106%20Backhouse%20and%20Playford%20p23-24.pdf

ALPERN, B., BALME, B., DOUBINGER, J., GOUBIN, N., GREBE, H., NABALE, G. & PIERART, P., 1964. Rapport du Groupe de Travail C.I.M.P. No. 13D. La stratigraphie palynologique de Stephanien et du Permien. 5ème Congrès International de Stratigraphie et de Géologie Carbonifère, Paris 1963, Compte Rendu, 2, 1119-1129.

BACKHOUSE, J. & PLAYFORD, G. (2023). Basil Eric Balme. 13th June 1923 – 10th July 2023. Doyen of Australian palynology. Journal of the Royal Society of Western Australia, 106, 23-24.

BALME, B.E., 1952. On some spore specimens from British Upper Carboniferous coals. Geological Magazine, 89, 175-184.

BALME, B.E. & BUTTERWORTH, M.A., 1952. The stratigraphical significance of certain fossil spores in the central group of British

coalfields. Transactions of the Institute of Mining Engineers, 111, 3-17.

HERBERT JAMES SULLIVAN (1933-2023)

By Duncan McLean

The palynologist Herbert James Sullivan died on 31st October, 2023 age 90 years. He was born in the coal mining town of Ebbw Vale, South Wales in 1933. He studied as an undergraduate at the University of Sheffield Depatment of Geology from 1951 to 1954 and was a demonstrator in the university between 1954 and 1960, spending a year as a temporary lecturer and time teaching Chemistry at Buxton Grammar School, He undertook research for a PhD under Professor Leslie Moore. After the defence of his PhD thesis (Sullivan, 1959) he was appointed as a lecturer in the Sheffield department, a position which he maintaind for several years. Here he published extensively on Carboniferous miospores (Neves & Sullivan, 1964; Sullivan 1958, 1962, 1964a; Sullivan & Hibbert 1964; Sullivan & Moore, 1956) and was active in CIMP. "Herb", as he was known by colleagues, attended the 2nd CIMP Meeting in Sheffield in April, 1960. Here he joined the Stratigraphic Working Group 13C looking at the biostratigraphic distribution of miospores in the Namurian and Westphalian of Britain. Along with Roger Neves and Bernard Owens he provided data on coals and clastic rocks which was added to the data exclusively from coal provided by Mavis Butterworth and Harold Smith at the National Coal Board. Preliminary results were presented to the CIMP meeting in Paris in 1963 prior to the 5th Internbational Carboniferous Congress (Butterworth et al., 1964). Also at the CIMP meeting in Sheffield, Herb undertook direction of the Taxonomic Working Group No. 7: Revision of the genera *Triquitrites* and *Tripartites*. Results were again presented at the CIMP meeting in Paris (Sullivan & Neves, 1963) where Herb also presented some independent research (Sullivan, 1964b).

Herb left Sheffield to take up a post at the Research Centre of the Pan American Oil Company (later Amoco) in Tulsa, Oklahoma in 1964. Thus he was not able to attend the next Carboniferous Congress in Sheffield in 1967, but had a paper published in the conference proceedings (Sullivan & Mishell, 1971). He continued to publish on Carboniferous miospores (Sullivan, 1965, 1967, 1968, Sullivan & Marshall, 1966). He eventually moved to Calgary, Alberta to become Amoco's Chief Geologist. Amongst many other achievements, Herb was instrumental in establishing the American Association of Stratigraphic Palynologists (AASP), now The Palynological Society (Traverse & Sullivan, 1983).

Herb was honored by the naming of two Carboniferous miospores: *Deltoidospora sullivanii* Ravn 1986, and *Discernisporites sullivanii* Higgs & Clayton 1984.

REFERENCES

SULLIVAN, H.J., 1959. The description and distribution of miospores and other microfloral remains in some sapropelic coals and their associated humic coals and their carbonaceous shales. Unpublished PhD thesis, University of Sheffield.

BUTTERWORTH, M.A., ALPERN, B., BARSS, M.S., GREBE, H., KOSANKE, R.M., MÜLLER, W., NOËL, R., PIERART, P., SMITH, A.H.V. & SULLIVAN, H.J. 1964. Report of C.I.M.P. Working Group No. 13C. Miospore distribution in the Namurian and Westphalian. 5ème Congrès International de Strati-

graphie et de Géologie Carbonifère, Paris 1963, Compte Rendu, 2, 1115-1118.

NEVES, R. & SULLIVAN, H.J., 1964. Modification of fossil spore exines associated with the presence of pyrite. Micropaleontology, 10, 443-452.

SULLIVAN, H.J., 1958. The microspore genus *Simozonotriletes*. Palaeontology, 1, 125-138.

SULLIVAN, H.J., 1962. Distribution of miospores through coals and shales of the Coal Measures sequence exposed in Wernddu Claypit, Caerphilly (South Wales). Quarterly Journal of the Geological Society of London, 118, 353-373.

SULLIVAN, H.J., 1964a. Miospores from the Drybrook Sandstone and associated measures in the Forest of Dean basin, Gloucestershire. Palaeontology, 7, 351-392.

SULLIVAN, H.J., 1964b. Miospores from the Lower Limestone Shales (Tournaisian) of the Forest of Dean Basin, Gloucestershire. Compte rendu 5ème Congrès Internationale de Stratigraphie et de Géologie du Carbonifère, Paris, 1963, 3, 1249-1259.

SULLIVAN, H.J., 1965. Palynological evidence concerning the regional differentiation of upper Mississippian floras. Pollen et Spores, 7, 539-563.

SULLIVAN, H.J., 1967. Regional differences in Mississippian spore assemblages. Review of Palaeobotany and Palynology, 1, 185-192.

SULLIVAN, H.J., 1968. A Tournaisian spore flora from the Cementstone Group of Ayreshire, Scotland. Palaeontology, 11, 116-131.

SULLIVAN, H.J. & HIBBERT, A.F., 1964. *Tetrapterites visensis* a new spore bearing structure from the Lower Carboniferous. Palaeontology, 7, 64-71.

SULLIVAN, H.J. & MARSHALL, A.E., 1966. Viséan spores from Scotland. Micropaleontology, 12, 265-285.

SULLIVAN, H.J. & MISHELL, D.R., 1971. The Mississippian-Pennsylvanian boundary and its correlation with Europe. Compte rendu 6ème Congrès Internationale de Stratigraphie et de Géologie du Carbonifère, Sheffield, 1963, 4, 1533-1540.

SULLIVAN, H.J. & MOORE, L.R., 1956. The horizon of the Tilery Vein in Monmouthshire. Geological Magazine, 93, 409-417.

SULLIVAN, H.J. & NEVES, R., 1963. *Triquitrites* and related genera. Compte rendu 5ème Congrès Internationale de Stratigraphie et de Géologie du Carbonifère, Paris, 1963, 1, 1079-1093.

TRAVERSE, A., SULLIVAN, H.J., 1983. The Background, origin, and early history of the American Association of Stratigraphic Palynologists. Palynology, 7, 7-18.

CIMP STUDENT TRAVEL GRANT AWARDEES

Introducing the CIMP Student Travel Grant Awardees. Each of the trhee students received a 500 EUR travel grant to participate in the next IOPC in Prague. They will be presenting their work within the CIMP Symposium.

CAROLINA KLOCK CAMPOS FERREIRA

Carolina K.C. Ferreira

Carolina is originally from Brazil, where she obtained her BSc degree in Geology at the Federal University of Minas Gerais, including a 1 year academic exchange at The University of Queensland (Australia) and a 1 year academic mobility to the Federal University of Paraná (Brazil). She concluded her MSc degree in Crustal Evolution and Natural Resources at the Federal University of Ouro Preto (Brazil). Currently, she is a PhD candidate at Ghent University (Belgium), studying chitinozoan populations during Silurian biogeochemical events. The focus of her most recent case study was on chitinozoan biostratigraphy during the Valgu Event in Anticosti Island, Canada, but she is also investigating chitinozoan communities (including the search for malformed taxa) through the Valgu and Mulde Events in the USA and Sweden.

EIVER MANZANO

Eiver Manzano

I am a Ph.D student from the Evolution, Ecologie et Paléontologie (Evo-Eco-Paléo) Laboratory of the Université de Lille in Villeneuve d'Ascq, France. My main research interest are organic walled microfossils. For my doctoral project I am currently working on acritarch diversity during the Silurian and Devonian, looking at differences in spatial distribution and how their diversity is affected by climate changes, particularly during the mass extinction event at the end of the Devonian. I am also interested in applications of biostratigraphy for energy or mineral resource exploration, having worked with TotalEnergies on the morphology of a Cretaceous dinoflagellate genus for my master's thesis.

JAQUELINE L. CALERO GORDON

My name is Jaqueline L. Calero Gordon from Ecuador, I am a Master student of the Erasmus Mundus Pangea program. In my academic years I have focused on envi-

ronmental sciences. I have a degree in Geosciences Engineering from an Ecuadorian Amazonian University called "Ikiam", where I have acquired the fundamentals to start my research career. I have worked in research related to paleontological reconstructions. In addition, I published my bachelor thesis related to an age model through isotopic interpretation from tropical glaciers in the Journal of South American Earth Sciences. Being a master student has allowed me to interact with different universities in Europe (Lille-France and Athens-Greece) and at the same time has contributed to strengthen my knowledge in the field of applied paleontology.

Jaqueline L. Calero Gordon

My research proposal to be presented at the XV IPC-XI IOP suggests that the record of acritarch assemblages from Ölan, Sweden should be interpreted as ecophenotypical signals to the changing palaeoenvironment and not as biostratigraphical signals. The morphological plasticity challenges the validity of biostratigraphically useful taxa.

TRIBUTES

By Jiří Bek

In this number we pay tribute to two palynologists who were key to develop this field. Enjoy it!

D.C. BHARADWAJ

This summary was taken from a more detailed work on the life of D.C. Bharadwaj. You can access the complete work at: TIWARI, R., 1994. Dr D.C. Bharadwaj (1923 -1995). Journal of Palaeosciences, 43(1-3), 114. https://doi.org/10.54991/jop.1994.1168

D.C. Bharadwaj, a famous Indian palynologist was born on December 13, 1923 and died on February 9, 1995 at Lucknow, India. His academic career reflects his talent and high calibre aptitude for scientific work. He was awarded a Ph.D. Degree in Botany (Bryophyta) in 1952.

While working as a Research Assistant the potential of Bharadwaj was recognised by Professor Birbal Sahni who chose him for an assignment at the newly sprouting Institute of Palaeobotany. He received the award of the German Academic Exchange Service (DAAD) Fellowship in 1953, to work with Prof. R. Potonie in Krefeld, Germany. Dr. Bharadwaj was admitted to the Degree of Dr rer. nat. in 1955 by the Bonn UniverSity. One of the results of his German stay were two important Pennsylvanian palynological papers about spores and pollen of the Ruhr and Saar coalfields (1957a,b). On his return to India a breakthrough was made for the Indian coal palynology; he established the school of Gondwana Palynology. Dr Bharadwaj was a pioneer who worked with the palynoflora from the Raniganj assemblage from India. His style of describing the fossil spores and pollen explaining their organization and reconstruction, and interpretation of observation by L-O analysis were original. During his active scientific career of about 35 years, Dr Bharadwaj guided 18 Ph.D. students, analysed geological sequences from Carboniferous to Tertiary from India, Europe, China, South America, North America, and Spitsbergen. Dr Bharadwaj was a good planner in science, an outstanding organiser, an editor and esteemed teacher. He occupied several positions in journals, being a member of Editorial Board, Editor, or Chief Editor, with the Palaeoboranist, Geophytology, Review of Palaeobotany and Palynology, CIMP Monographs, Biological Memoirs, Proceedings of IV International Palynological Conference, Palaeobotany and Cryptogamic Botany and several other periodicals and special publications.

R.M. KONSAKE

This summary was taken from a more detailed work on the life of R.M. Konsake. You can access the complete work at: CROSS, A.T., SIMON, J.A. & PHILLIPS, T.L., 1998. Memorial to Robert M. Kosanke, 1917–1996. Geological Society of America Memorials, 29, 59-63. https://rock.geosociety.org/net/documents/gsa/memorials/v29/kosanke.pdf

Robert M. Kosanke was one of the pioneers of palynological research in North America. He was born in Park Ridge, Illinois, September 4, 1917 and died April 17, 1996. Though he retired from his 30-year tenure in the Paleontology and Stratigraphy Branch of the

U.S. Geological Survey in Denver in 1993, he continued serious research and publications on several projects and was in his office daily until the end. He started graduate school at the University of Cincinnati in the Department of Botany under J. H. Hoskins in September 1940, and joined the Illinois State Geological Survey Coal Group in January 1943. He entered the doctorate program in botany at the University of Illinois and his dissertation, completed in 1955 under the direction of Wilson Stewart, reported on the morphology of a Pennsylvanian Calamites cone, Mazostachys, a classic in combining three branches of paleobotany-compressions, anatomy, and palynology. The treatise (1950) on the Pennsylvanian palynoflora of the Illinois Basin was the first monograph on a major basin-wide pollen/spore flora in North America including 100 new species and 19 genera, five of which were new. In 1963, he joined the Paleontology and Strati-

graphy Branch of the U.S. Geological Survey as a research geologist. Kosanke applied his broad experience in coal geology, palynology, and field experience with Pennsylvanian-age strata to several general service projects. Among his last major contributions were three chapters in the Geological Society of America Memoir 185, Historical Perspectives of Early Twentieth Century Carboniferous Paleobotany in North America. One of these, with Cross, on the history of Carboniferous palynology in North America provides an extensive overview of the early palynological research.

He was a member of the executive committee of the Commission Internationale de Microflorae du Paléozöique, and a member of the Subcommission on Carboniferous Stratigraphy and Chairman of Working Group E, 1975–1990. Robert Kosanke received many well-deserved honors and awards including the prestigious Geological Society of America Gilbert H. Cady Award, for contributions in coal geology, and the U.S. Geological Survey Meritorious Service Award in 1993. The Denver Botanical Gardens elected him to life membership and presented him two awards for more than 1000 hours of volunteer work.

UPDATE ON THE CIMP-ARAMCO SPECIAL PROJECT: PALAEOZOIC PALYNOLOGY OF THE ARABIAN PLATE AND ADJACENT AREAS

By Charles Wellman and Marco Vecoli

In July 2023 we held a symposium at the 4th International Congress on Stratigraphy (strati 2023) that was held in Lille France. Talks covered all aspects of the palynology of the Palaeozoic deposits of the Arabian

The CIMP-ARAMCO Group at Strati 2023.

Peninsula. The Special Project team are currently working on a 6th publication that will serve as a review of the work completed to date. A symposium is being organised for the 'International Palynological Congress/International Organisation of Palaeobotany Conference' to be held in Prague, Czech Republic in May 2024. The latter symposia (delayed from 2020 due to the Covid pandemic) will be in honour of Bernard Owens, one of the architects of the project, who sadly passed away in 2019.

Cortland Eble demonstrates his dedicated palynology laboratory at the Kentucky Geological Survey. Photograph: Martha Gibson.

MEETINGS REPORTS

55TH ANNUAL MEETING OF AASP-TPS JOINT WITH THE COMMISSION INTERNATIONALE MICROFLORE PALÉOZOIQUE (CIMP) – 6-10 JUNE 2023, STOCKHOLM, SWEDEN (JUNE 6 – 10TH, 2023)

By Duncan McLean

The first in-person meeting of CIMP since the Covid-19 pandemic was held jointly with The Palynological Society (AASP) at the University of Kentucky, Lexington, Kentucky, USA in June 2023.

The meeting began with a CIMP-sponsored overview of local Palaeozoic Palynology presented by Cortland Eble of the Kentucky Geological Survey (KGS). This was a review of the uses of miospores in biostratigraphy and coal geology, which, given the economic interests of the KGS centered on the Pennsylvanian (Late Carboniferous) of Kentucky. Cortland started by describing laboratory methods for coal maceration and clastic sample digest and oxidation (which resulted in some interesting discussions), and moved on to techniques for maturation analysis. Uses of miospore assemblages to reconstruct Pennsylvanian coal floras was described before moving on to biostratigraphy. This was demonstrated by the presentation of representative miospore assemblages from the Pennsylvanian biozones as they appear in Kentucky. Everything described was placed into an economic context relevant to the work of the KGS. After lunch we visited the laboratories of the KGS including Cortland's "I can digest anything" palynology lab.

Day two saw palynologists enthusiastically driving away from the rain of Lexington down towards the drier weather of the Appalachian mountains to the East. We drove "down" to the Appalchians which appear like mountains but represent a heavily dissected plateau: the highest

points being at about the same elevation as Lexington. On the way we passed outcrops of Ordovician carbonate rocks and the Devonian New Albany Shale. The latter is the equivalent to the Ohio Shale and represents a target for hydrocarbon exploration. Extensive road cuts in the Appalachians expose siltstones and shales of the Misssisippian Borden Formation which is overlain unconformably by the Pennsylvanian Corbin Sandstone. Above this are the coal measures of the Breathitt Group. The lower part of this group, the Pikeville Formation, exposed in spectacular road cuttings, provided the bulk of interest for the field trip. We examined numerous coal seams and associated mudstone and sandstone units with plant remains and rare marine invertebrate fossils. Identification of marine ichnofossils and many interesting sedimentological features initiated discussion on the recognition of shallow marine and tidal sediments. Large-scale submarine slump structures were demonstrated as were syn-sedimentary faults, channel fills, a cannel coal and an unusual coal draped over a surface with considerable relief. The presence of single, continuous outcrops encompassing the entirety of the equivalent of the European Duckmantian Substage was quite amazing to the non-native, and stimulated discussion on the nature and recognition of Pennsylvanian "cyclothems". It was disappointing but very instructive to learn that the historically named "limestones" in the Breathitt Group are calcareous mudstones rather than well-developed carbonates. What's in a name?

Roadcut exposing the Pikeville Formation and part of the overlying Hyden Formation. The whole of the equivalent of the Duckmantian substage is represented between the Betsie Shale Member (equivalent of the Vanderbeckei Marine Band at the base of the Duckmantian) and the Magoffin Shale Member (equivalent of the Aegiranum Marine Band at the base of the Bolsovian substage). David Bodman for scale. Photograph: Duncan McLean.

The technical sessions of the conference began with a CIMP-sponsored session on Palaeozoic Palynology, moderated by Duncan McLean and Erdoo Mongol. Talks for the session were arranged in stratigraphical sequence and included presentations on the Cambrian to the Permian. Abstracts are reproduced below. Vojtěch Kovář presented Organic-walled microfossils from the restricted marine environment of the Paskey Shale (Barrandian area, Czech Republic) by V. Kovář and O. Fatka; Geoff Clayton presented Assessing the thermal maturity of early Silurian rocks from Saudi Arabia using Palynomorph Darkness Index ('PDI'): progress and challenges by Geoff Clayton, Marco Vecoli, Pan Luo and Robbie Goodhue; Sonia Clara Camina presented Devonian chitinozoans from the Los Monos Formation in the Ramos borehole, northwestern Argentina by S.C. Camina, C.V. Rubinstein, G. Vergani and M. Pereira; Duncan McLean presented Palynology of the Horton Bluff Formation, Nova Scotia, Canada by O. King, D. McLean, R.A. MacRae, M. Stimson and S. Lucas; Maria Antonieta Lorente presented New Insights into the Age of the Strawn Group, Texas by M.A. Lorente, P. Flaig, F. Abuhmida, K. Hattori, S.T. Hasiotis, L.D. Boucher, A. Roberts and B. Ambrose; Martha Gibson presented It's a trap!: the preservation potential of ancient salt minerals by M.E. Gibson, S. Titta and K.C. Benison; and Duncan McLean presented Lopingian (Late Permian) palynomorphs from the Cadeby Formation, Cadeby Quarry, Yorkshire, UK by M.H. Stephenson and D. McLean.

The conference benefitted enormously from the usual icebreaker, social events, and conference dinner and AASP business lunch as well as several events for students and early career researchers. It was rounded off by a post-conference field trip again into Appalachia to look at the rock bridges of the Natural Bridge State Resort Park and the Red River Gorge National Geological Area. Here we again saw the Mississippian Borden Formation and carbonates of the Slade Formation. These are

Delegates to the joint AASP-CIMP Meeting in Lexington, Kentucky, USA, June 2023. Photograph: Cortland Eble.

unconformably overlain by the Pennsylvanian strata dominated by large cliffs of the Corbin Sandstone which is eroded into spectacular gorges and natural rock arches. As well as the geology we were introduced to the different modern vegetational communities that exist in the area, and how these vary depending upon position within the gorge systems.

MEETING ABSTRACTS FROM THE CIMP PALAEOZOIC SESSION

Devonian chitinozoans from the Los Monos Formation in the Ramos borehole, northwestern Argentina

Camina, S.C.[a], Rubinstein, C.V.[a], Vergani, G.[b] and M. Pereira, M.[b]

a. IANIGLA-CCT CONICET, Av. Ruiz Leal s/n, Parque General San Martín, 5500 Mendoza, Argentina
b. Pluspetrol S.A., Lima 339, C1073 CABA, Buenos Aires, Argentina

Keywords: Devonian; Chitinozoan; Taxonomy; Argentina; Tarija basin.

The Ramos R1011 borehole, located in the north-eastern Salta province of Argentina, was palynologically analysed. It comprises rocks from the Tarija basin in northwestern Argentina which is considered to be connected with the Silurian-Devonian sub-Andean basin from South Bolivia. Preliminary palynological results of Middle Devonian samples from this borehole suggest a marine platform paleoenvironment for the upper samples with some fluctuations to shallower deposits in the deepest samples. The organic-walled marine phytoplankton and miospores would also indicate a possible Emsian - Givetian age for this section.

Nineteen cutting samples were processed and a moderately well-preserved chitinozoan assemblage was recognized from the Los Monos Formation in the upper and middle parts of the studied section. Five genera and twenty-one chitinozoan species were recognised from the 323 chitinozoan specimens analysed with SEM.

Three new chitinozoan species were recognised. Two of them (*Ramochitina candelariaensis* and *Ramochitina durandi*) were previously recorded as a *nomen nudum* for Pérez-Leytón (2007). Furthermore, another two species that were previously recorded from the Tacobo borehole (*Ancyrochitina* aff. *morzadeci* and *Lagenochitina* cf. *pirum*) are well represented herein, which suggest that they could also be new species themselves. The assemblage yielded species that are restricted to Western Gondwana such as *Ancyrochitina biconstricta*, *Ancyrochitina parisi* and *Ramochitina boliviensis*. However, well-known species with worldwide distribution such as *Ancyrochitina cornigera*, *Ancyrochitina fragilis* and *Fungochitina pilosa*, were also recognised.

The Ramos and Tacobo borehole chitinozoan assemblages share 50% of the species and both resemble strongly to the typical middle Devonian chitinozoan fauna from Western Gondwana and Bolivia.

The topmost part of the Ramos assemblage can be assigned to the early Givetian *postdesmea-yeserae* biozone from South Bolivia (Pérez-Leytón, 2007) and the *Fungochitina microespinosa-Ancyrochitina taouratinensis* biozone from Western Gondwana (Grahn, 2005). Furthermore, the samples from the middle part of the section can be assigned to the late Eifelian – early Givetian *candelariaensis* informal biozone from South Bolivia, which correlates with the *Ramochitina stiphrospinata* biozone from Western Gondwana. The Middle Devonian *Ancyrochitina cornigera* global biozone (Paris et al., 2000) can be assigned to the entire assemblage.

Summarizing, the samples studied from the Ramos borehole yielded a typical Middle Devonian Western Gondwana assemblage that can be assigned to the late Eifelian – early Givetian.

Assessing the thermal maturity of early Silurian rocks from Saudi Arabia using Palynomorph Darkness Index ('PDI'): progress and challenges

Clayton, G.[a], Vecoli, M.[b], Luo, P.[b] and Goodhue, R.[c]

a School of Biosciences, University of Sheffield, UK
b Saudi Aramco, Dhahran, Saudi Arabia
c Department of Geology, Trinity College, University of Dublin, Ireland

Keywords: PDI; Silurian; acritarchs; Qalibah Formation; Saudi Arabia

Early Silurian (Llandovery to Aeronian) organic-rich shales ("hot shales") are widespread across large areas over the entire northern Gondwanan margin and particularly in North Africa and the Middle East, where they constitute the primary source rocks for Palaeozoic petroleum systems. In Saudi Arabia, these "hot shales" deposits occur within the Qusaiba Member of the Qalibah Formation. Accurately assessing the thermal maturity of these rocks is therefore important, but also challenging. Vitrinite Reflectance (VR) is the parameter most widely used for the assessment of thermal maturity and definition of boundaries of the various hydrocarbon generation 'windows', however, this method cannot be applied to pre-Mid Devonian rocks such as the Qusaiba Member due to the absence of vitrinite. In its place, several proxies for VR known as Vitrinite Reflectance Equivalents (VREs) are used. These include two VREs calculated from pyrolysis -based Tmax determination and one VRE calculated from measured graptolite reflectance but these methods often produce somewhat different results from the same sections.

Acritarch PDI (Palynomorph Darkness Index) is proving to be a useful method for estimating the relative maturity of Qusaiba Member sections and has the advantage of being rapid, inexpensive and easily deployed during routine palynostratigraphic investigations. The *Veryhachium – Neoveryhachium* morphological complex is the preferred group for PDI determination (PDIV), as it has a very long stratigraphic range and consistent structure and vesicle wall thickness. PDI can also be obtained from all acritarch taxa in an assemblage (PDIA) in samples containing too few specimens of the *Veryhachium – Neoveryhachium* Group for PDIV to be measured. PDIA is closely comparable to PDIV at lower levels of maturity but the correlation is poorer in more mature rocks.

At present, calibration of PDIV and PDIA against standard VR-based maturity scale can only be achieved indirectly via other VREs. To overcome this problem, PDIA and VR (Av. VRo) have been determined from a small number of latest Devonian and earliest Carboniferous samples from the eastern and Midwest USA that contain both vitrinite and acritarchs. The results from these samples tightly constrain the relationship between PDIA and VR around the base of the Oil Window but many more samples will need to be investigated to accurately establish the calibration of PDIV/PDIA against VR through the whole maturity range and thereby erect a robust, standalone, acritarch PDI-based maturity assessment.

It's a trap!: the preservation potential of ancient salt minerals

Gibson, M.E., Titta, S. and Benison, K.C.

Department of Geology and Geography, West Virginia University, 98 Beechurst Ave, Morgantown WV, 26501, USA

Keywords: palynology; paleoecology; taphonomy; evaporites

Chemical sediments, such as bedded halite (NaCl) and gypsum (CaSO4), are strongly influenced by environmental conditions during deposition and, if unaltered, may preserve microfossils and microorganisms for hundreds of millions of years. Recent studies have shown that halite and gypsum can be an excellent repository for palynomorphs, biosignatures, and environmental data. However, the preservation potential of salt minerals remains relatively untested. Salt minerals are the perfect trap. As they grow "step-like" cleavage-controlled irregularities rapidly enclose the surface brine and other matter from the environment as fluid or solid inclusions. These inclusions function as "snapshot" repositories of surface water, air, crystals, and the remains of life.

Here, we present highlights of preservation in halite and gypsum of varying ages to showcase the diversity of life that has been documented within it. In addition, we use Permian bedded halite from western equatorial Pangaea and modern halite from acid saline lakes in Western Australia, as case studies. Halite from the Nippewalla Group of Kansas (Amoco Rebecca K. Bounds, Andarko Davis, and AEC 5 cores) and Opeche Shale of North Dakota (Gulf Romanysyn core) reveals chevron and cumulate crystals with primary fluid inclusions, many containing microbes and primary fluid inclusions, many containing microbes and accidental daughter crystals. Solid inclusions trapped along growth bands were also trapped as the halite precipitated. Biological material in our study includes representatives of Archaea, bacteria, fungi, and green algae, as well as pollen grains, spore, coniferous plant cuticle, charophyte algae, and organic fibers. Whole insects and insect segments, as well as halite ostracod molds, have also been recognized as solid inclusions. Pennate diatoms have been found as solid inclusions and inside fluid inclusions. Organic compounds, including beta-carotene and chlorophyll, are also present. We supplement our findings with examples of exceptional preservation from the literature. Our systematic review reveals how the remains of multiple Kingdoms of life have been reported from salt minerals: Archaea, Bacteria, Chromista, Plantae, Fungi, and Animalia.

Life and taphonomic processes in continental environments in dry climates are relatively poorly understood. Salt minerals forming in shallow saline surface waters may represent the most important sink of terrestrial organic matter in arid environments, as it traps both organisms living in parents surface waters as well as transported materials. Detailed study of organic and fossil materials in salt minerals has implications for the better understanding of life in extreme terrestrial environments, as well as aid in the search for life on Mars.

Palynology of the Horton Bluff Formation, Nova Scotia, Canada

O. King, O.[ab], McLean, D.[c], MacRae, R.A.[a], M. Stimson, M.[ab] and Lucas, S.[d]

a Saint Mary's University, New Brunswick, Canada
b New Brunswick Museum, St John, New Brunswick, Canada
c MB Stratigraphy Ltd., Sheffield, UK
d New Mexico Museum of Natural History and Science, Albuquerque, New Mexico, USA

Keywords: Carboniferous; Tournaisian; Nova Scotia; miospores; tetrapods

The Late Devonian to Tournaisian Horton Bluff Formation is part of the widespread Horton Group in the Maritimes Basin of Atlantic Canada. It is exposed at several sites in the Blue Beach-Horton Bluff type area in Nova Scotia. These formations and locations have been known for their early, terrestrial tetrapod fauna since the pioneering work of Logan and Dawson. Ages of the Horton Bluff Formation are constrained by macrofloras and palynology (miospores). Questions about the existing palynological biostratigraphic zonation in this area arose when evaluating historical work. While a small number of samples have been analyed from high in the section, a systematic palynological study of the entire tetrapod-bearing interval has not been published. New samples were taken from Horton Bluff coastline in Nova Scotia, commonly referred to as Blue Beach. Sample coverage extends from the southernmost and stratigraphically deepest coastal exposure up to the axis of a syncline along the shore. It thus encompases all of the tetrapod-bearing strata in the section. These strata should preserve subdivisions within the *Vallatisporites vallatus* miospore Biozone: the *Claytonispora distincta* and *Spelaeotriletes cabotii* subzones (informally "spore zones 2 and 3"), but the exact position of the subzonal boundary cannot be identified from exisiting data. Preliminary results and taxonomy of these samples across the *Claytonispora distincta* and *Speleaotriletes cabotii* subzones will be discussed. This locality and stratigraphical interval are important because some of the oldest know tetrapod materials from within Romer's Gap come from this coastal section. Understanding the detailed biostratigraphy will allow correlation with tetrapod records from within Romer's Gap in the Horton Group in nearby New Brunswick. The study will also allow correlation with other euramerican tetrapod sites.

Organic-walled microfossils from the restricted marine environment of the Paseky Shale (Barrandian area, Czech Republic)

V. Kovář, V. and Fatka, O.
Institute of Geology and Paleontology, Faculty of Science, Charles University, Albertov 6 12800 Prague, Czech Republic

Keywords: Paseky Shale, restricted marine environment, small carbonaceous fossils, acritarchs

The Cambrian Paseky Shale (Příbram–Jince Basin, Barrandian area, Czech Republic) is represented by an approximately 10 meters thick unit of shale and siltstone embedded within coarser sediments (mainly sandstone and conglomerates) of the Holšiny-Hořice Formation. Unlike the overlying and underlying unfossiliferous continental sediments, the Paseky Shale yielded a highly endemic skeletal fauna (Chlupáč 1995), atypical ichnofossil assemblage (Mikuláš 1995) and an unusual microfossil assemblage (Fatka & Konzalová 1995). Based on these characteristics and other lithological and geochemical data, a restricted marine depositional environment has been proposed for the Paseky Shale (Chlupáč et al. 1995).

A new analysis of the microfossil assemblage of the Paseky Shale, involving the application of the 'low-manipulation HF extraction' method of Butterfield & Harvey (2012) has been conducted. The obtained fossils include a variety of filamentous remains, acritarchs, small carbonaceous fossils as well as putative ciliates. These findings expand our understanding of the extraordinary restricted marine environment in Cambrian.

References:

BUTTERFIELD, N.J. & HARVEY, T.H.P. 2012. Small carbonaceous fossils (SCFs): A new

measure of early Paleozoic paleobiology. Geology 40(1), 71–74. DOI: 10.1130/G32580.1

CHLUPÁČ, I. 1995. Lower Cambrian arthropods from the Paseky Shale (Barrandian area, Czech Republic). Journal of the Czech Geological Society 40(4), 9–36.

CHLUPÁČ, I., KRAFT, J. & KRAFT, P. 1995. Geology of fossil sites with the oldest Bohemian fauna (Lower Cambrian, Barrandian area). Journal of the Czech Geological Society 40(4), 1–8.

FATKA, O. & KONZALOVÁ, M. 1995. Microfossils of the Paseky Shale (Lower Cambrian, Czech Republic). Journal of the Czech Geological Society 40(4), 55–66.

MIKULÁŠ, R. 1995. Trace fossils from the Paseky Shale (Early Cambrian, Czech Republic). Journal of the Czech Geological Society 40(4), 37–54.

New Insights into the Age of the Strawn Group, Texas

Lorente, M.A.[a], Flaig, P.[b], Abuhmida, F.[a], Hattori, K.[b], Hasiotis, S.T.[c], Boucher, L.D.[d], Roberts, A.[e] and Ambrose, B.[b]

a Ellington Geological Services, LLC, Houston, Texas
b STARR-BEG, Austin, Texas
c University of Kansa, Lawrence, Kansas
d UT Austin Non-Vertebrate Paleo Lab, Austin, Texas
e Former UT MS Student

Keywords: Strawn; Atokan; Desmoinesian; Pennsylvanian; Paleozoic; Texas; palynology.

The Strawn Group is a lithostratigraphic unit of Pennsylvanian age deposited primarily within the Fort Worth and Permian basins of Texas. The Strawn contains complex stratigraphy and regional stratigraphic relationships because 1) it was deposited during a time of high amplitude, high frequency sea-level fluctuations, 2) clastic sources such as deltas developed intermittently along a complex tidal coastline, 3) carbonates formed on a tidal shelf near-to but off axis of clastic sources, and 4) basins were tectonically active during deposition. Age control that allows for regional correlations of Strawn clastics and carbonates is lacking.

A new palynological study of samples from three subsurface cores of the Strawn Group in Stonewall and King Counties, and outcrops in the Greater Texas Stone Quarry in San Saba County, TX provide new insights into the age of the unit. The chronostratigraphy of the Strawn Group in the north-central Texas outcrop belt is often taken for granted, to the point that it is commonly misused as synonyms for some Pennsylvanian chronostratigraphic stages, such as the Desmoinesian and Missourian. Still, there is controversy about the age of the unit in the subsurface. To clarify the age, fifteen dark shale samples were analyzed, most of them with positive palynological results.

From the subsurface, core samples of the Continental Oil Osborn #7 well (King Co, TX) contained a palynological assemblage characterized by *Savitrisporites nux, Densosporites annulatus, Knoxisporites triradiatus Punctatisporites minutus, Punctatisporites glaber, Triquitrites bransonii, Laevigatosporites globosus,* and *Endosporites globiformis*. This sporomorphs assemblage can be correlated with the spore Zone *Radiizonates difformis* (Zone RD, Phillips and Peppers, 1984).

The samples from the Phillip CB Long C-16 well (Stonewall Co., TX) contained a varied and rich assemblage that included 34 different species. The Assemblage Zone *Radiizonates difformis* (RD) was identified on the lower part of the section based on

key sporomorphs, e.g., *Torispora securis, Savitrisporites nux, Granaporites medius, Laevigatosporites globusus*, *Microreticulatisporites sulcatus* and an abundant and diverse *Lycospora* and *Densosporites* assemblage. The Zone OT was identified in the top studied sample based on well-diversified *Lycospora* and *Densosporites* assemblages, together with the occurrence of *Torispora securis* and *Laevigatosporites globusus*.

The Threshold Development Co #6A Fayette-Yates well (Jack Co., TX) assemblage was the richest analyzed, with 44 species that included, *Acanthotriletes echinatus, Cirratriradites annulatus, Cirratriradites annuliformis, Cirratriradites saturni, Crassispora kosankei, Deltoidospora levis, Deltoidospora subadnatoide, Densosporites irregularis, Endosporites zonalis, Granulatisporites granulatus, Knoxisporites stephanephorus, Laevigatosporites globusus, Laevigatosporites medius, Lophotriletes gibbosus, Lycospora granulate, Lycospora pellucida, Lycospora pusilla, Lycospora subtriquetra, Microreticulatisporites sulcatus, Punctatisporites glaber, Punctatisporites punctatus, Savitrisporites majus, Triquitrites exiguus*, and *Triquitrites tribullatus*. Based on the general assemblage in the section and the combined presence of *Microreticulatisporites sulcatus, Triquitrites scuptilis, Savitrisporites nux*, and *Laevigatosporites globusus*, it was possible to identify the palynological Zone SL (Clayton *et al*., 1977), equivalent to the upper part of the Assemblage Zone *Radiizonates difformis* RD.

The Greater Texas Stone Quarry samples were mainly barren, with single occurrences of *Savitrisporites* cf. *nux, Ahrensisporites* cf. *guerickei, Leiotriletes* sp., *Vallatisporites vallatus*, and a few broken specimens comparable to *Punctatisporites minutus*. Based on this it was impossible to identify a palynological zone.

The age of the Strawn Group from these samples, based on the species ranges by Eble *et al*. 2022, belong to Zone SL/ RD hence of "upper" Atokan age, except the shallowest sample of the Phillips CB Long core with the presence of the Zone OT indicating a Desmoinesian age. These results indicate a mainly Atokan age for the Strawn Group in the subsurface of Texas, with some intervals of Desmoinesian age. This is a slightly older age than the generally accepted Desmoinesian age for the Strawn.

Lopingian (Late Permian) palynomorphs from the Cadeby Formation, Cadeby Quarry, Yorkshire, UK

Stephenson, M.A.[a] and McLean, D.[b]

a Stephenson Geoscience Consulting Limited, 14 Thelda Avenue, Keyworth, Nottingham, NG12 5HU, UK. mikepalyno@me.com
b MB Stratigraphy Limited, Sheffield, S9 5EA, UK.

Keywords: Permian; Lopingian; bisaccate pollen; Yorkshire; palaeoenvironments

Seventeen samples from the Cadeby Formation (Lopingian, Permian, EZ1) of Cadeby Quarry near Doncaster, South Yorkshire, UK, yielded organic residues including phytoclasts, cuticle, unstructured tissue and generally well-preserved palynomorphs. The palynomorph assemblages are dominated by taeniate and non-taeniate bisaccate pollen including *Klausipollenites schaubergeri, Limitisporites rectus, Lueckisporites virkkiae* and *Taeniaesporites noviaulensis.* The assemblages are generally similar to those from the English Midlands described from Kimberley Railway Cutting and the Haughton Hall Borehole, Nottinghamshire and those from the Marl Slate Formation (lower EZ1) of the Durham Sub-basin at Claxheugh Rock

and Crime Rigg Quarry and to the mid EZ1 of the Salterford Farm Borehole and Woolsthorpe Bridge Borehole. The excellent preservation of the assemblages allows the recognition that *Dicappipollenites* Tiwari & Vijaya 1995 is a junior synonym of *Lueckisporites* Potonié & Klaus emend. Clarke 1965.

The presence of rare microphytoplankton and microforaminiferal test linings indicate a neashore marine environment. The clastic (and organic) content of the Cadeby Formation, part of a dominantly carbonate succession, may represent erosion and transport of material from the hinterland reflecting a wetter climatic period, though the alternation of clastic and carbonate sedimentation in the section at Cadeby suggests some wet/dry palaeoclimatic cyclicity.

67TH Annual Meeting of The Paleontological Association (PalAss) – 11-15 September 2023, Cambridge, UK

By Paul Strother

The first The Palæontological Association annual meeting was held this past year in Cambridge England, from September 12 through 14. While there are many good reasons to attend *PalAss*, enlightenment on Palaeozoic Paleopalynology is not usually one of them – this is simply a general Paleontology meeting, but one that strives to be inclusive by building a program that relies on early career researchers. Anyway, there were two talks and that included palynology, a pre-Palaeozoic one by Leigh Anne Riedman from Susannah Porter's group in Santa Barbara, *Organic-walled microfossils of the late Paleoproterozoic Limbunya Group and implications for early eukaryotic evolution*, and, on the younger side, a Paleogene talk by Vera Korasidis (with Scott L. Wing) on, *Palynofloral change through the Palaeocene-Eocene Thermal Maximum in the Bighorn Basin, Wyoming.*

On the poster side, however, there were actually a number of presentations that were of potential interest to those of us in the Paleozoic palynology world. A current topic of interest amongst some palynologists includes the study of teratologies, or malformations, of pollen grains and spores. Mathew Kent and colleagues presented a poster related to this topic, *From malformations to mass extinctions: what spore and pollen exines can tell us about*

CIMP delegates working group dinner at Darwin College.

Conference dinner at Girton College. CIMP members on the right hand side: Gilda Lopes, John Marshall and Charles Wellman in the photo. Photograph by Paul Strother.

Earth's past. A related poster from the Lomax group at Nottingham was presented by Hendrick Nowak, *Testing for a signal of solar irradiance in fern spores from the K-Pg boundary*. It's a work in progress. Palynologists from Belgium (Ghent) and elsewhere in Europe presented a poster with the word acritarch in the title, *Molecular characterization of acritarchs: applying infrared spectroscopy to better infer biological affinities with other organic-walled microfossils*. It's a noble idea, but I don't recall that the technique has yet been successful in re-classifying any one acritarch to a known biological protist group. Colleagues from Lithuania, Robertas Stankevič, Agnė Venckutė-Aleksienė, Sigitas Radzevičius and Andrej Spiridonov presented a poster on, *Coordination of acritarch and graptolite turnovers before and during the onset of Lau Event (Ludlow, Silurian).*

Precambrian palynological posters included, *Doushantuo–Pertatataka acritarchs from the lower Ediacaran of Ghana*, by Heda Agic, Andrey Bekker and Muhamuda Abu;. and *Organic-walled microfossils from the c. 766–730 Ma Moosehorn Lake formation, Uinta Mountain Group, Utah,* by Christina R. Woltz, Susannah M. Porter, Carol M. Dehler and Leigh Anne Riedman. Intriguingly, this is the first report to include recovery of the putative holozoan, *Bicellum Brasieri* outside the type area (the Torridonian of NW Scotland).

PalAss is traditionally held in the weeks right before Christmas, and it is known for kicking off the social calendar for the end of the year festivities. That said, the CIMP members present in September did their best to help create a festive atmosphere so early in the fall – John Marshall was able to gain access to one of the eating halls in Darwin College for a formal working group dinner, illustrated in the previous page. Here, the requirement for an after-dinner sherry was met with some degree of enthusiasm.

In the second photo Gilda Lopes, John Marshall and Charles Wellman portray joyous anticipation of the conference dinner at the high table at Girton College, after which, several Paleozoic palynologists do their best to acquire drink at the post conference dinner slow-bar. Alex Liu and his staff at Cambridge, along with Nick Butterfield, are to be congratulated on creating a flawless meeting, enjoyed by all.

The CIMP gang and other colleagues reaxing at Darwin College bar after the dinner. From left to right: Paul Strother, David Bond, Wilson Taylor, John Marshall, Charles Wellman, Barry Lomax, and Matthew Kent.

UPCOMING MEETINGS

XV International Palynological Congress & XI International Organization of Palaeobotany Conference

Prague, Czech Republic

May 27th–31st, 2024

Dear colleagues,

Since 2009, the world community of palynologists and palaeobotanists has been meeting every four years to discuss the latest research, and to share experience.

This time, however, the 15th International Palynological Congress (IPC-XV 2024) and the 11th International Organisation of Palaeobotany Conference (IOPC-XI 2024) will take place after an eight-year interval due to the world pandemic.

This upcoming joint congress will be held in Prague, hosted by Czech palynologists

and palaeobotanists, on 27–31 May 2024. Year 1820 is considered the starting point for palaeobotanical nomenclature. By then, Caspar Maria Sternberg published the first volume of his *Flora der Vorwelt*.

200 years of palaeobotany will be honoured by this year's conference. It will be an excellent opportunity for the Czech Republic (a country rich in plant fóssil finds, palynological sites, and palynological and palaeobotanical history) to host leading experts in various discipl nes, and to promote scientific innovations. Joint symposia are planned to foster interaction and integration between palynologists and palaeobotanists, also including plenary sessions of general interest. The meeting is promoted by the collective efforts of the International Federation of Palynological Societies (IFPS) and the International Organisation of Palaeobotany (IOP).

We look forward to seeing you,

The Organizing committee of XVth IPC/XIth IOPC Prague 2024