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COMMISSION INTERNATIONALE DE MICROFLORE DU PALÉOZOÏQUE

Thanks to all members who contributed to this newsletter!

Cover photo: 3D model of palynomorph deposition
Credit: Filipe Barreira (LNEG)

PRESIDENT'S LETTER

Greeting CIMP Members:

Although it is more than a month late, let me wish everyone a Happy New Year with hopes for success in both your personal and professional lives in 2017.

I have a number of issues to discuss in my column, the first of which is directed to our younger members as they embark upon their career, hopefully in palynology. I direct you to the notice in the newsletter titled "Advice for Early Career Scientists" by Dr. John Smol, which is available in open access. The link and synopsis of the paper appeared in the latest Newsletter of the Canadian Association of Palynologists (CAP) and I thought it was excellent in terms of the advice offered to those starting a career in science. I hope you read it and find his advice useful.

Secondly, I want to remind you of the upcoming joint AASP-CIMP meeting in Nottingham, England, September 3–7, 2017. The third circular with all the latest news and how to register is available at the end of this newsletter, as well as on the CIMP website (cimp.weebly.com). We expect to have an excellent turnout for this meeting, which is the 50th annual meeting of AASP. A number of keynote talks, special theme sessions and the usual 20-minute scientific talks are planned. I hope to see many of you at the meeting.

We are also planning to award up to five student travel grants to attend this meeting and present their research. Details on the amount of the travel grants and the application process will be sent to the membership at a later date.

The third item I'll discuss is the future of CIMP and where we want to go as a society. I presented a talk on this topic at the 2015 CIMP meeting in Bergen, Norway, and since then have been thinking about this issue and what the membership would like their organization to be moving forward. There has been much discussion about this topic among the Board members, and it is time to hear from the membership.

Before we can have that discussion, we need to look at our past as an organization, and I want to thank Dr. Maurice Strel for his fine overview of the origin and history of CIMP that appears in this Newsletter. You should all enjoy this article because it provides the opportunity to connect with our collective past as an organization.

The following are some of the issues that need to be considered, debated, and hopefully resolved. I realize we will never achieve unanimity on all of the following points, but, hopefully, we can at least come to some consensus on a number of these issues. Rather than make major overhauls all at once, I would like to resolve, and put in place, some of the topics discussed and agreed to by a vote of the membership.

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To facilitate discussion, our Webmaster, Christian Cesari, has provided a CIMP Forum on our website where members may share their thoughts on our future. For those who do not wish to use the Forum option, but want to share their ideas, feel free to send those to me.

Here are five initial issues that need discussion and resolution.

Do we still need the three subcommissions? Do they serve a useful purpose, and what is that purpose? The days of separate subcommission newsletters are past, and even today, most subcommission reports in the CIMP Newsletter are by the President. If we do dissolve the subcommissions, should we have group-specific (acritarchs, chitinozoans, spores) forums on our website where members can share information, without the structure of a subcommission?

Although taxonomy and biostratigraphy remain the foundation of our science, many of our members are branching in new directions and collaborating with other researchers in different fields. This certainly helps our science become better known outside our own organization. Perhaps we can have a dedicated section of our website where members can share their new ideas. Like the organisms we study, we need to mindful that organizations also evolve, and, in order to avoid extinction, we need to change as well.

We now have a major Spring Newsletter, and a minor Winter Newsletter. As anyone who has served as a newsletter editor can attest, it is difficult, if not impossible, to get contributions from the membership. A Spring Newsletter would cover what has gone on during the past year, including conferences reports, as well as the usual contributions from the Board and membership. And, instead of a minor Winter Newsletter, we could have a short end-of-the-year President's report, thus eliminating the need for numerous calls for contributions. What are your thoughts on having only a single Newsletter in the Spring, and a President's Report in the Fall?

We are increasing the number and amount of student travel grants we award each year, and, obviously need to maintain a healthy bank balance. Unfortunately, there has been a precipitous drop in the number of dues-paying membership since 2002. On the bright side though, our Treasure,

Paulo Fernandes has told me there has been an increase in dues-paying members in the past year. Our present dues are only 10€ a year, and dues can be paid forward for several years, and paid via our website. What are your thoughts on raising yearly dues to 15€ or even 20€ per year? Most of this money would go to support students as well as help defray CIMP costs for our meetings.

What are your views on increasing our presence on social media outlets, such as Facebook, etc.?

I hope to hear from many of you with your thoughts and ideas regarding the five points raised.

Lastly, to end on a positive note, we are seeing an increase in new members, especially students which is a good sign. Phillipe Steemans has been signing up new members, and we thank him for all his efforts.

Reed Wicander
President

GENERAL SECRETARY'S LETTER

Dear CIMP Members,

I am presenting to you the winter CIMP short newsletter! Unfortunately, once again, very few members responded to our calls for contributions to the newsletter.

In the present newsletter you will find members activities and research, and also new palynology publications. Read about the new members and students and future meeting announcements. Of particular interest to our membership is the upcoming 50th Annual Meeting of AASP - The Palynological Society/The Golden Anniversary Meeting held jointly with CIMP and the Micropalaeontological Society Palynology Group, to be held in Nottingham, UK in September 2017. The third circular with information and how to register can be found at the end of this newsletter, as well on the CIMP website.

We express our congratulations to Gilda Lopes, who is our new IFPS-CIMP councilor.

We need to reflect on the future of our organization, which is almost 60 years old (see the history of CIMP by Maurice StreeL). I ask you to read, reflect, and give your opinions to the five issues



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suggested by CIMP president Reed Wicander. These items need a serious discussion. Finally, I would like to show my gratitude to all of you who have contributed to the present newsletter and to Filipe Barreira (LNEG's designer) for all his support with the newsletter.

Please do not forget to pay your fees. There are numerous student activities dependent on them. Also, continue to send us information on your activities. And lastly, if you have any comments or suggestions to improve the newsletter please email us.

Best wishes,
Zélia Pereira



Paulo Fernandes

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TREASURER NOTE

A quick reminding from the treasurer.

Please continue support CIMP by paying your subscriptions. You can pay your subscription by using PayPal or ask me (pfernandes@ualg.pt) the details of CIMP bank account for bank transfer.

Paulo Fernandes
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WEBMASTER NOTE

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NEW MEMBERS

Ahmed Al-Shawareb

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I work in the Biostratigraphy Group in the Saudi Arabian Oil Company (Saudi Aramco). I have completed Bsc at the University of Western Australia in 2009 where my Honours thesis focused on Eocene spore-pollen assemblages of Western Australia, under the supervision of Dr. Lynne Milne. In 2014, I have completed Msc at the University of Tulsa where my thesis focused on Upper Ordovician chitinozoans of northwestern Saudi Arabia, under the supervision of Mr. Merrell Miller. My current work involves chitinozoans, acritarchs and miospores on the Ordovician-Devonian successions of the Arabian Plate. Recently, I have also started working on Cretaceous-Miocene dinoflagellates, algae, spore and pollen assemblages of the Red Sea area to assist drilling operations for oil and gas exploration.

Márcia Mendes

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I completed my master in geology last year and have been working on a research European 2020 project at LNEG (Geological Survey of Portugal). I had the support of Zelia Pereira, who has been a great help dealing with miospores and acritarchs of Devonian and Carboniferous ages of Iberian Pyrite Belt. We have been working in some publications, so I hope you see our work soon. Since I'm starting a new area of research (which is very exciting) I very much appreciate any papers or comforting words that you can send me.

MEMBER ACTIVITIES

Adnan M. Hassan Kermadji

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Current research project: Palynology, palynofacies analysis and palaeogeology of Mid-Upper Palaeozoic succession of Oued Saoura Trough southeastern Algerian Sahara.

Oued Saoura and Zulfane Valley has chosen for study as they form the classic exposed Silurian, Devonian and Carboniferous successions.

The stratigraphy of these periods been studied by many workers since 1906. Also these strata roughly sedimentologically been studied, palynologically there is no investigation except that of Hassan Kermadji for Lower Devonian and it is under preparation. Therefore, these sediments require detail study for its scientific and economic significance

The thick Siluro-Devonian sequence is unconformably lay on Cambro-Ordovician Strata (Faber 1976; Legrand 2002). It comprises many formations (Oued Ali Zeimlet, Saheb el Djir, Dkhissa, Teferguenite, Marhouma..... Formations). Consequently, the study project will shed light on: 1. Age and biostratigraphic value of the succession, 2. Sequence stratigraphy, 3. Organic variation and thermal maturation, 4. Organic facies and palynofacies, 5. Petroleum applicability and source rock evaluation, 6. Geologic and phytopalaeogeographic evolution, 7. Economic and scientific outcome.

The age of the sequence proposed to be study in detail, (previous age determination based on spot samples). Palynological samples of the studied sections of the above said formations prove to be well productive with significant stratigraphic value, also to review all palynoformes and to identify all fauns and fauna forms that will discovered,

Tectonic deformation of the region (detachment and normal faults, fragile and ductile folds and complicated sediments) described in Soura depression, Tidikelt Plateau and Steh Region. Palaeo-environment and hydrocarbon evaluation require to be analyze in detail, and the points of controversy needs to be discuss on the light of

new discoveries of thermal maturation, palynologic and palaeozoologic (put on sight for the first time) results. Furthermore, the sequences require detail facies and environmental investigation that specially based on sedimentologic and palynologic. In addition, to construct facies and phytopalaeogeographic maps. Pedagogically it is well-cited region for graduate and undergraduate student to view and study well exposed Palaeozoic sediments. In addition, To carry in detail sequence stratigraphy of propose area and, to name or relocate unnamed sedimentary successions of Tidikelt Plateau, Triassic Province and Steh region of Illisi Basin. Furthermore, the item cited this work will be based on detailed analysis of structures to implement mapping knowledge and dating.

The articles cited above need to be achieve have great economic value will provide a basic establishment and a ready documents and a guide for any future installation.

The project members intend to create a unit for Palaeozoic Palynologic, Palaeobotanic, Organic Maturation and Palaeoecologic studies. The unit can be regarde as an advanced and highly qualified researching center. In addition, the center will be use to train students to study and obtain postgraduate degrees in related sciences. Furthermore, they hope that they can prepare a track for many students whom are aiming to obtain Master or PhD degrees in palynology, palaeoecology, biostratigraphy and facial analysis of Oued Soura, Steh region-Illisi Basin and Tidikelt Plateau.

Presentations made: Miospore assemblages from Predolian to Early Eifelian sequences of the Oued Saoura Algerian Sahara. Presented by: Adnan M. Hassan Kermandji and Fatima Khelifi Touhami. At the Palaeozoic stratigraphy of Gondwana Conference.; Perugia-Italy from 16-18 April 2016.

Alexander Askew

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I am currently in the third year of a Ph.D. at the University of Sheffield studying the palynology of the Middle Devonian Huergas Formation (and equivalents) from northern Spain. I've found an, at times, excellently preserved assemblage, with which I am investigating the palaeoecology of the deposits and ecosystem response to the Kačák extinction event. Latest results indicate a somewhat younger age than expected for these sediments, with data collection ongoing.

Charles Wellman

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This year I will be undertaking fieldwork studying the Lower Devonian La Vid Group of northern Spain and Lower Old Red Sandstone of Scotland. I'm hoping to finish writing up monographs on the Lower Devonian spore assemblages from New Brunswick, Canada and on the Torridonian of Scotland (with Paul Strother). Preparations are well underway for the 5th volume of the CIMP/Saudi Aramco project of the Palaeozoic palynology of the Arabia Plate. This is due to be published in *Revue de Micropaleontologie* in June 2017.

RAEVSKAYA, E., DRONOV, A., SERVAIS, T. & WELLMAN, C. H. 2016 Cryptospores from the Katian (Upper Ordovician) of the Tungus basin: the first evidence for early land plants from the Siberian paleocontinent. *Review of Palaeobotany and Palynology* 224, 4-13.

STROTHER, P. K. & WELLMAN, C. H. 2016 Paleocology of a billion-year-old non-marine cyanobacterium from the Torridon Group and the Nonesuch Formation. *Palaeontology* 59, 89-108.

Claudia Rubinstein

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I continue to be involved in projects related to marine and terrestrial palynomorphs (acritarchs, cryptospores, trilete spores) of the Early to Middle Paleozoic in Argentina, as well as in other Gondwanan basins, especially of South America. I am currently working on Devonian deposits in Bolivia and Uruguay in collaboration with oil companies. Researchs are mainly focused on taxonomy, biostratigraphy, paleogeography and paleoenvironments, including the analysis of palynofacies. Together with Philippe Steemans (Liège) and Victoria García Muro (Mendoza) we are carrying out the project "Origin and evolution of the early land plants in Argentina (Middle Ordovician - Devonian), through the palynological record, and comparison with other Gondwanan palynological assemblages " within the framework of a scientific cooperation program between CONICET (Argentina) and FNRS (Belgium). I am also working on Ordovician acritarchs and miospores from Baltica (Sweden), in collaboration with Vivi Vajda (Stockholm). Results of some of these

lines of research have already been published or presented in congresses.

GARCÍA MURO, V. J., RUBINSTEIN, C. V., STEEMANS, P., 2016. Silurian palynomorphs from the Precordillera basin, western Argentina: biostratigraphy and diversity trends. XIV IOP, X IOPC (Salvador, Brazil). Symposium: New frontiers and classic studies in Palaeozoic palynology and palynostratigraphy. Boletín de la Asociación Latinoamericana de Paleobotánica y Palinología, n. 16, p. 107.

RUBINSTEIN, C. V., SOLANO RODRÍGUEZ, C. C., DE LA PUENTE, G. S., 2016. A new record of the messaoudensis-trifidum acritarch assemblage (Late Tremadocian-Floian) in the Cordillera Oriental, Central Andean Basin, northwestern Argentina. XIV IOP, X IOPC (Salvador, Brazil). Symposium: New frontiers and classic studies in Palaeozoic palynology and palynostratigraphy. Boletín de la Asociación Latinoamericana de Paleobotánica y Palinología, n. 16, pp. 108.

RUBINSTEIN, C. V., VAJDA, V., 2016. A biostratigraphic and paleoenvironmental approach to Late Ordovician (Sandbian) palynomorphs of Sweden: the oldest evidence of land plants in Baltica. XIV IOP, X IOPC (Salvador, Brazil). Symposium: New frontiers and classic studies in Palaeozoic palynology and palynostratigraphy. Boletín de la Asociación Latinoamericana de Paleobotánica y Palinología, n. 16, pp. 107-108.

RUBINSTEIN, C. V., GARCÍA MURO, V. J., PEREIRA, M., VERGANI, G., 2016. Palynology and organic geochemistry of an Early to Middle Devonian succession from borehole TCB X-1001 – Tacobo, Tarija Basin, southern Bolivia. XIV IOP, X IOPC (Salvador, Brazil). Symposium: New frontiers and classic studies in Palaeozoic palynology and palynostratigraphy. Boletín de la Asociación Latinoamericana de Paleobotánica y Palinología, n. 16, p. 106.

Duncan McLean

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It has been a tough two years in the biostratigraphy industry. Research has very much taken a back seat, but with UK government incentives I have managed to maintain a small research profile.

Work on revision of the miospore biozonation for

the Carboniferous of the British Isles is ongoing with David Bodman, Geoff Clayton, Ken Higgs, Bernard Owens and Janine Pendleton.

Several decades ago I undertook analyses of some late Visean sections in exploration wells in the Barents Sea. Data from these studies is now being incorporated into a regional study by Gilda Lopes with Geoff Clayton and Gunn Mangerud, with a view to publication soon.

In late 2015, in anticipation of a field visit by the IUGS Subcommittee on Carboniferous Stratigraphy I joined a team working to clean up and re-sample the European Namurian Substage stratotype sections in northern England. Other than the work by Bernard Owens on the Chokierian stratotype section (once proposed as a mid-Carboniferous boundary stratotype), there has been little published on the palynology of these sections. It therefore seemed timely to re-log and re-sample the sections. This is now complete, with the exception of the lower part of the Pendleian (basal Namurian) section which lies in the dark, dank and poorly-named Light Clough on the slopes of Pendle Hill. I now have a large number of samples to analyse. Some preliminary results were presented to a meeting of the Yorkshire Geological Society in October, 2016 and results from the Alportian and Yeadonian stratotypes will be presented at the forthcoming AASP/TMS/CIMP meeting in Nottingham in September 2017 in conjunction with a pre-conference field visit to these two sites.

McLEAN, D. & BODMAN, D., 2016. Progress on the palynology of the Pennine Carboniferous stratotype sections. Yorkshire Geological Society Meeting: Stratotypes of the Visean-Namurian substages in Northern England - an update from the visit of the IUGS SCCS. British Geological Survey, Keyworth, October 2016.

Gilda Lopes

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Dear colleagues, I continue to work with the Mississippian of the Barents Sea as part of my post-doctoral project. I am now focusing on Spitsbergen (Svalbard) and interesting new material is coming to light. The biozonal scheme for Finn-

mark Platform is being finished and I am confident that this second paper will be submitted within weeks.

This year I have also been a co-author in two other publications. In one of the papers the maturation data from several Carboniferous sections in Portugal are analysed and interpreted, and in the second paper the Permian-Triassic palynology of the Moatize-Minjova Basin in Mozambique, is described.

I am co-supervising a Master thesis together with Gunn Mangerud and Geoff Clayton where palynofacies analysis are completed by applying two different methods. 'Palynological' point counting results are being compared with results based on relative areas of OM types measured using an image analysis software.

For the next four years I am also the new CIMP appointed councillor at the International Federation of Palynological Societies (IFPS).

LOPES, G., MCLEAN, D., MANGERUD, G., CLAYTON, G. (2016). Palynostratigraphic study of the Finnmark Platform, Norway Establishing a palynozonation for the Mississippian successions of the Barents Sea. (Abstract) Boletín de la Asociación Latinoamericana de Paleobotánica y Palinología, 16, 100.

LOPES, G., MANGERUD, G., CLAYTON, G., MØRK, A. (2016). New insights on East Finnmark Platform palynostratigraphy and paleogeography - A study of three shallow cores from a Mississippian succession in the Barents Sea, Norway. Palaeogeography Palaeoclimatology Palaeoecology, 450, 60-76.

FERNANDES, P., LOPES, G., MACHADO, G., PEREIRA, Z., RODRIGUES, B. (2016). Superimposed thermal histories in the southern limit of the Ossa Morena Zone – Portugal. Geological Magazine, 1-18. doi: 10.1017/S0016756816000248.

PEREIRA, Z., FERNANDES, P., LOPES, G., MARQUES, J., LOPO VASCONCELOS (2016). The Permian-Triassic transition in the Moatize-Minjova Basin, Karoo Supergroup, Mozambique: A Palynological Perspective. Review of Palaeobotany and Palynology, 226, 1-19.

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I am working mainly in the palynostratigraphy of the Permo-Carboniferous of Saudi Arabia.

I just completed my master degree in Geoscience from University of Tulsa with thesis topic in the palynostratigraphy of the Permo-Carboniferous of Saudi Arabia

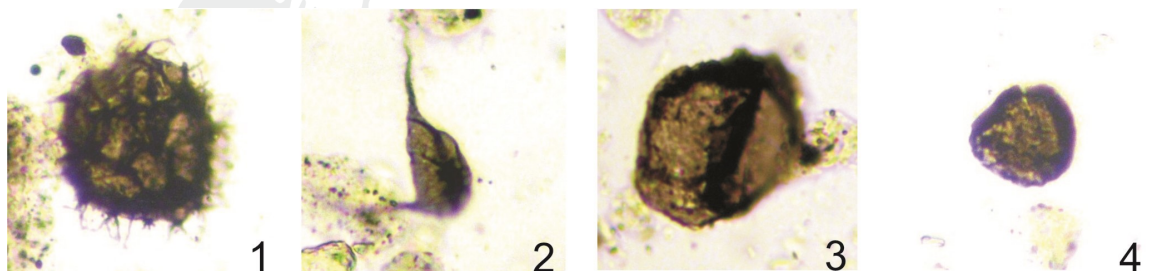
Iskra Lakova

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A continuous Ordovician to Lower Devonian subsurface section from the eastern Moesian Platform in Bulgaria: palynostratigraphy, palaeogeography, earliest land plants.

Recently, I was engaged with palynostratigraphy of a borehole that penetrated the deepest and oldest sedimentary rocks from the Moesian Platform in Bulgaria. It is located in the eastern part, close to the terrestrial Bulgarian/Romanian border where the Moesian Platform passes to the South Dobrogea. The borehole bottom is at depth of 5600 m where Tremadocian age has been firstly determined in Bulgaria on the basis of acritarchs.

The palynological association at the core bottom



Acritarchs and cryptospores from R-1 Rogozina, Moesian Platform, Bulgaria. All from depth of 5600 m, Tremadoc.

1. *Vulcanisphaera africana* Lister;
2. *Leiofusa somniculata* Pittau;
3. Cryptospore dyad *Dyadospora murusattenuata* (Strother & Traverse);
4. Pinate cryptospore monad *Laevolancis divellomedia* (Chibrikova).

consists of mainly acritarchs and probably cryptospores. The acritarchs *Leiofusa somniculata*, *Leiofusa simplex*, *Leiofusa crassiuscula*, *Verychachium antiquum*, *Vulcanisphaera nebulosa*, *Vulcanisphaera africana*, *Cymatiogalea velifera* and *Saharidia fragilis* has suggested a Tremadocian age (see Vecoli & Le Herisse 2004). Among these species, *Leiofusa somniculata* was reported only from the Tremadoc of Sardinia, Italy (Pittau 1985). Cryptospores assigned to *Laevolancis divellomedia*, *Tetraedraletes medinensis* and *Dyadospora murusattenuata* from the same stratigraphic level seem to be the oldest land plant witnesses from the northern periphery of Gondwana. Their age is ca. 20 Myr older from the previously known cryptospores of the Middle Ordovician in Argentina and Saudi Arabia (Rubinstein et al. 2010; Strother et al. 1996, 2015; Wellman 2010). It is to be reminded the simultaneous age of these three simple cryptospore species found preciously in NW Anatolia in Turkey (Lakova et al. 2006). There, at Karadere area, the age determination was based on graptolites, i.e. Late Tremadocian (see Goncuoglu et al. 2014). What concerns the paleobiogeographic signal of the acritarch association, it is of evident North Gondwanan affinities with high-latitude cool southern position and comparable with North Africa, Sardinia, Iberia, Armorica.

Upwards, in the thick monotonous fine siliciclastic sedimentary series, an acritarch association has been determined of Llandovery/Wenlock age including *Deunffia monospinosa*, along with longer-ranging species, such as *Elektoriskos willierae* and *Hellosphaeridium citrinum*.

Going further upward this subsurface section, a next stratigraphic level of interest is that of Ludlow/Pridoli where the chitinozoans *Sphaerochitina sphaerocephala*, *Eisenackitina philipi*, *Eisenackitina lagenomorpha* have been identified. *Eisenackitina philipi*, first found in Gotland (Laufeld, 1974), and later in other localities in Baltica, might indicate that during the late Silurian the Moesian Platform was already closer to Baltica. This confirms previously published hypothesis (Stemans & Lakova, 2004) based on miospore study that at late Silurian and Lochkovian times the Rheic Ocean narrowed enough so that the eastern part of Moesian Platform shared same microzooplankton and terrestrial spore palynological associations with Baltica.

Successive stratigraphic levels from bottom to top have been assigned to the following chitinozoan zones: *Cingulochitina cingulata* (Wenlock), *Margachitina elegans* (Pridoli), *Fun-gochitina lata* and *Cingulochitina plusquellecti*

(Lochkovian). The highest level of the siliciclastic series belongs to the Emsian *Bursachitina bursa* chitinozoan zone.

Thus, the R-1 Rogozina core has provided material for palynological study that resulted in documentation of more or less continuous Tremadoc to Emsian succession of siltstones, shales and minor sandstones in the eastern part of the Moesian Platform in Bulgaria.

The results will be published with special emphasis on their palaeobiogeographical implication and the occurrence of cryptospores in the Tremadoc.

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Gondwana margin in relation to palaeoclimatic and palaeogeographic changes. *Earth-Science Reviews* 67, 267-311.

Wellman, C.H. 2010. The invasion of the land by plants: when and where? *New Phytologist* 188, 306-309.



**Małgorzata Moczyłowska -Vidal
Sebastian Willman**

Uppsala University




Micropalaeontological studies at Uppsala University, Department of Earth Sciences, are carried out by Małgorzata Moczyłowska -Vidal and Sebastian Willman, and our Ph.D. student Emma Arvestål. Małgorzata supervises also research of PhD student Xiaodong Shang from Institute of Geology, Chinese Academy of Geological Sciences, Beijing, for one year of his visit to Uppsala, 2016–2017. This is a part of my collaboration with Prof. Pengju Liu, who is the principle supervisor of Xiaodong's project on the Ediacaran microfossils from China. Last year, 2016, I have supervised the research of PhD student Lanyun Miao from Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, Nanjing, who spent one year in Uppsala. Lanyun's project is on the Mesoproterozoic microfossils from China in cooperation with Prof. Maoyan Zhu.



The Master of Science project by Corentin Loron, Uppsala, entitled "The biodiversity of organic-walled eukaryotic microfossils from the Tonian Visingsö Group, Sweden" has been supervised by Małgorzata, and we continue our work although Corentin moved to University of Liege, Belgium, to work on his PhD project.

The major interest of our research is focused on the evolutionary history of unicellular, prokaryotic and eukaryotic microorganisms that are interpreted to be of cyanobacterial and algal origins and some of yet unresolved affinities, appearing in the fossil record throughout the Proterozoic and early Palaeozoic times. The current studies are carried out on microfossil assemblages from the Mesoproterozoic, Tonian, and Ediacaran successions from various regions in China, Australia, Sweden, and Estonia. We are using various microscopic and spectroscopic techniques to reveal phenotypic features and cell wall ultrastructure and biochemistry of microfossils that are extracted from the sediment by palynological methods.



The research by Małgorzata is funded by the Swedish Research Council, and it concerns biological affinities of marine phytoplankton and their phy-

logenetic relationships, timing of the diversification of photosynthesising eukaryotes and the origin of sexual reproduction. These events are among the most significant in the evolution of biosphere that had a profound influence on the oxygenation of hydro- and atmosphere. The research involves doctoral projects by Emma Arvestål, Lanyun Miao and Xiodong Shang, and a new Master of Science student Frida Hybertsen. Małgorzata is also the investigator in the multi-disciplinary project funded by The Research Council in Norway, entitled "The Digermul Peninsula – a window into the early diversification of animal life" and led by Dr. Anette Högström at Tromsø University Museum. Her contribution, involving former PhD student Heda Agić, studies, deals with the primary producers at the base of evolving trophic web at the Proterozoic-Cambrian transition that paved the way for the development of animals. Geochemical and ultrastructural studies of organic matter comprised in body walls of the early, organically preserved metazoans are methodologically similar to those used in studies of resistant biopolymers in unicellular microorganisms. The search of biochemical composition of organic materials synthesized by microbes and metazoans provide the insights into the biochemical evolution through time. It unravels the major changes in synthesis of refractory macromolecules that allowed evolution of multicellularity and biomineralization. This was a part of the evolutionary success of metazoans and later on the terrestrial plants. Understanding of this biochemical pathway of synthesis and in fact evolutionary major innovation is pointed out in the work conducted with the post-doc researcher Fanwei Meng of Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, Nanjing, who spent one year in Uppsala in 2014.

Scientific activity

Małgorzata attended the project meeting and workshop "The Digermul Peninsula – a window into the early diversification of animal life" at Tromsø University Museum, April 4-8, 2016. Later on, April 11–16, 2016, we worked at Uppsala University with the collaborators in the project Dr Wendy Taylor and her Ph.D. student Bianca Harrison, University of Cape Town, Department of Geological Sciences, on chemical processing of Proterozoic microfossils from South Africa successions.

Sebastian continues his research on the Ediacaran microbiota and biochronology with the purpose of establishing the zonation based on

microfossils and the potential Global Stratotype Section and Point of the Ediacaran System, which is the aim of the IUGS, ICS, Working Group on the Ediacaran Subdivision.

At our Department, Sebastian is responsible for scientific outreach and education in Earth Sciences, including geo-tourism in the Baltic countries and educational activity in schools and society.

2016 MOCZYDŁOWSKA, M. Algal affinities of the Ediacaran and Cambrian organic-walled microfossils with internal reproductive bodies: *Tanarium* and other morphotypes. *Palynology*, 40 (1), 83–121. Online 2015, doi.10.1080/01916122.2015.1006341.

2016 AGIĆ, H., MOCZYDŁOWSKA, M., CANFIELD, D.E. Reproductive cyst and operculum formation in the Cambrian-Ordovician galeateplexus microfossils. *GFF*, Geological Society of Sweden, 138:2, 278–294. Online 05 February, 2016. Doi: 10.1080/11035897.2015.1116603.

2016 BROCKS, J.J., JARRETT, A.J.M., SIRANTOINE, E., KENING, F., MOCZYDŁOWSKA, M., PORTER, S., HOPE, J. Early sponges and toxic protists: possible sources of cryostone, and age diagnostic biomarker antedating Sturtian Snowball Earth. *Geobiology*, 14, 129–149. Doi:10.1111/gbi.12165.

2016 MOCZYDŁOWSKA, M., MENG, F. The Ediacaran *Aspidella*-type impressions in the Jinxian successions of Liaoning Province, northeastern China. *Lethaia*, 49, 617–630.

2016 XIAO, S., NARBONNE, G.M., ZHOU, C., LAFLAMME, M., GRAZHDANKIN, D.V., MOCZYDŁOWSKA-VIDAL, M., CUI, H. Towards an Ediacaran Time Scale: Problems, Protocols, and Prospects. *Episodes*, 39 (4), 540–555. Doi:10.18814/epiiugs/2016/v39i4/103886.

Martha Gibson

University of Sheffield

I have just commenced a NERC funded Ph.D. research studentship at the University of Sheffield. The project is supervised by Charles Wellman and Geoff Warrington and will entail a palynological investigation of the Late Permian Zechstein deposits of northeast England. It is based on over 1600m of core from boreholes drilled during development of a new potash mine by Sirius Miner-

als. I am currently processing the first set of samples I collected.

Maurice Streef

Liège University, Belgium

My main interest in 2016 was on the Holocene of Hautes-Fagnes (Belgium) peat bogs trying to integrate detailed pollens, thecamoebians and chemical analyses from 2000 to 7000 BP. However I'm still interested in the stratigraphy of the Famennian Stage in the type area, hoping to get better correlation of miospores with conodont, ammonoid zones and lithostratigraphy (*Updating the correlation Miospores/Conodonts in upper and uppermost Famennian, in IUGS Subcommission on Devonian Stratigraphy – SDS- Newsletter, in press*). On another hand, recent controversy ("ResearchGate" August-September 2016) on the respective significance of palynology, palaeobotany and lithostratigraphy to date newly described Famennian Tetrapod-bearing localities, engage me to prepare now a well-documented paper to support these ideas.

Also, as a former (1974-1985) Secretary of the 1st IUGS Working Group on the Devonian-Carboniferous Boundary, I feel still concerned with the activity on the 2nd Working Group trying to identify a new DCB, after the recognition of the inefficacy of the former proposed conodont based limit: the *praesulcata-sulcata* limit. (*Streef Maurice, Korn Dieter ; Pleading for a new DCB in the historical German deep facies of Sauerland near Stockum, in IUGS Subcommission on Devonian Stratigraphy – SDS- Newsletter, in press*).

Marco Vecoli

Biostratigraphy Group

Geological Technical Services Division

Saudi Aramco

My main activity is concentrated on Early Paleozoic palynostratigraphy (acritarchs, chitinozoans, cryptospores/miospores) in Saudi Arabia in support of Hydrocarbon exploration. I am working together with my colleagues in Saudi Aramco on several projects all over the Arabian Plate in order to document the taxonomy, stratigraphic ranges and palaeoenvironmental distribution of palynomorphs to develop/refine a robust biozonation which can be used to validate key stratigraphic concepts in the various phases of hydrocarbon exploration (conventional and

unconventional). These studies also include the optical characterization of kerogen (i.e., palynofacies analysis) and organic maturity assessment especially in early Silurian source rocks.

I am the coordinator of the "Saudi Aramco – CIMP Joint Project" which gives me the possibility to interact with colleagues from the Academia and stay informed on the latest developments of Paleozoic palynology research.

I am still involved in the investigation of the "Terrestrialization Process", in an attempt to understand the evolution of earliest terrestrial ecosystem and the origin of land plants, as Ordovician cryptospore assemblages of Saudi Arabia are among the oldest and best preserved assemblages in the world.

Full papers:

VECOLI, M., BECK, J., STROTHER, P., 2015. Palynology of the Ordovician Kanosh Shale at Fossil Mountain, Utah. *Journal of Paleontology*, 89, 424-447.

STROTHER, P., TRAVERSE, A., VECOLI, M., 2015. Cryptospores from the Hanadir shale member of the Qasim Formation, Ordovician (Darriwilian) of Saudi Arabia: taxonomy and systematics. *Review of Palaeobotany and Palynology* 212, 97-110.

MEYER-BERTHAUD, B., SERVAIS, T., VECOLI, M., GERRIENNE, P., 2016 (Eds). *The Terrestrialization Process: a palaeobotanical and palynological perspective. Review of palaeobotany and Palynology*, Vol. 224 and 227.

GERRIENNE, P., SERVAIS, T., VECOLI, M., 2016. Plant evolution and terrestrialization during Palaeozoic times – the phylogenetic context. *Review of Palaeobotany and Palynology* 227, 4-18.

HAYTON, S., REES, A., VECOLI, M., 2016 (in press). A punctuated Late Ordovician and early Silurian deglaciation and transgression: evidence from the subsurface of northern Saudi Arabia. *AAPG Bulletin* (doi: 10.1306/08251616058)

Presentations to conferences:

VECOLI, M., AL-SHAWAREB, A., MILLER, M., CESARI, C., REES, A., 2016. Paleoenvironments, palynological events, and subsurface correlation of the Sarah Formation and Quwarah Member of Qasim Formation in NW Saudi Ara-

bia. GEO 2016, 12th Middle East Geosciences Conference and Exhibition, 7-10 March 2016, Manama, Kingdom of Bahrain.

REES, A., MACPHERSON, K., VECOLI, M., AL-DAKHEEL, M., AL-GHENAIM, H., HAYTON, S., PHILIPS, E., 2016. Depositional evolution and architecture of Late Ordovician pro-glacial outwash fans in the subsurface on northwest Saudi Arabia. William Smith Meeting 2016, Glaciated margins: the sedimentary and geophysical archive, The Geological Society of London, 2-3 June 2016.

STROTHER, P., TAYLOR, W., VECOLI, M., 2016. Cryptospores and the canalization of plant sporogenesis. XIV International Palynological Congress, X International Organisation of Palaeobotany Conference. *Boletín de la Asociación Latinoamericana de Paleobotánica y Palinología* 16, p. 99.

LE HERISSE, A., GUIDAT, C., NOT, F., VECOLI, M., BREUER, P., WELLMAN, C., STEEMANS, P., 2016. Occurrence and significance of minute palynomorphs of marine and non-marine origin in the Middle Ordovician from Saudi Arabia. XIV International Palynological Congress, X International Organisation of Palaeobotany Conference. *Boletín de la Asociación Latinoamericana de Paleobotánica y Palinología* 16, p. 103.

WELLMAN, C., STEEMANS, P., BREUER, P., VECOLI, M., 2016. A review of Silurian dispersed spore assemblages from the Arabian Plate: stratigraphy and palaeogeography. XIV International Palynological Congress, X International Organisation of Palaeobotany Conference. *Boletín de la Asociación Latinoamericana de Paleobotánica y Palinología* 16, p. 104-105.

GOODHUE, R., CLAYTON, G., ABDELBAGI, S.T., DUGGAN, C., VECOLI, M., 2016. Preliminary correlation of Palynomorph Darkness Index (PDI) with vitrinite reflectance and other indicators of organic maturity. XIV International Palynological Congress, X International Organisation of Palaeobotany Conference. *Boletín de la Asociación Latinoamericana de Paleobotánica y Palinología* 16, p. 105-106.

Mike Stephenson

British Geological Survey

This year and the last I was involved in an extensive review of the literature of Permian palynostratigraphy. A paper has just been published for an upcoming Geological Society of London Special Publication that summarises my findings (Stephenson 2016; available open access at <http://sp.lyellcollection.org/content/early/2016/12/07/SP450.2>).

In the Permian, palynostratigraphy has been used primarily to correlate coal- and hydrocarbon-bearing rocks within basins and between basins, sometimes at high levels of biostratigraphic resolution. Though these palynostratigraphic schemes related to resource extraction have been very successful, their main shortcoming has been a lack of correlation with schemes outside the basins, coalfields and hydrocarbon fields that they serve, and chiefly a lack of correlation with the international Permian scale. The benefits of a better integrated general palynostratigraphy are very great scientifically because there are numerous events of global scientific interest in the Permian, for example the timing and order of deglaciation events and the detailed characteristics and timing of mass extinction events within the Permian and at the Permian-Triassic boundary. Permian palynostratigraphy is strongly affected by phytogeographic provinciality particularly from the Middle Permian onwards, as predicted by palaeobotanical studies. This makes correlation between regional palynostratigraphic schemes difficult. For these reasons it is unlikely that a single comprehensive palynostratigraphic scheme for the Permian globally will ever be developed. However local high resolution palynostratigraphic schemes for regions are being linked either by precise assemblage-level quantitative taxonomic comparison or by the use of single well-characterised palynological taxa that occur across Permian phytogeographical provinces. Such taxa include: *Scutasporites* spp., *Vittatina* spp., *Weylandites* spp., *Lueckisporites virkkiae*, *Otynisporites eotriassicus* and *Converrucoisporites confluens*.

However there are problems with single taxon correlations. Take for example the bitaeniate bisaccate pollen *Lueckisporites virkkiae* which has long been considered useful for correlation in the Permian phytogeographical province of Euramerica (now represented by the areas west of the Ural Mountains, Europe, parts of North Africa, and North America). This is because it is widespread in the province (Warrington, 1996; Clarke, 1965; Visscher, 1971; Wilson, 1962; Clapham, 1970), and because the taxon is very distinctive with a diploxyelonoid outline, a thin corpus intexine and

a prominent cappa formed chiefly by two reniform exoexinal taeniae (see Klaus 1963; fig. 27).

The biostratigraphic value of *Lueckisporites virkkiae* also stems from its well-established first occurrence in the lower part of the Kazanian (Roadian) in its type area in the Russian Platform (e.g. Utting et al., 1997), and therefore was useful for correlating to the then international scale of the Upper Permian before the Guadalupian Epoch was established in the United States.

However since then *Lueckisporites virkkiae* has been recorded in a range of Gondwana locations with first appearances much earlier than its apparent first appearance in Euramerica (for example Mori et al. 2012; Stephenson 2015).

Part of the reason for this discrepant first appearance may be to do with conception of the taxon being too wide.

The original concept of *Lueckisporites virkkiae* Potonié and Klaus 1954 was of a diploxyelonoid bisaccate pollen grain with wide separation of sacci (see, for example, Potonié and Klaus, 1954; text-fig. 5, plate 10, fig. 3; Klaus 1963, fig. 27). Clarke (1965) allowed more haploxyelonoid specimens within *Lueckisporites virkkiae* in his emendation of the species, referring to these as 'variant B'. The specimen illustrated by Mori et al. (2012; fig. 3, j) is strongly haploxyelonoid and lacks evidence of a prominent cappa or exoexinal taeniae. It appears closer to *Corisaccites alutas*. Haploxyelonoid specimens of *Lueckisporites virkkiae* (using the conception of Clarke, 1965) are difficult to separate from *Corisaccites alutas*, though Venkatachala and Kar (1966) regarded *Corisaccites alutas* as 'subsaccate', and subsequent authors have described *Corisaccites alutas* as having poorly inflated, 'leathery' sacci whose exoexine is structurally indistinguishable from that of the corpus (see Stephenson, 2008).

To maintain the value of *Lueckisporites virkkiae* as a biostratigraphical marker may mean rejecting the emendation of Clarke (1965) and retaining the original concept of *Lueckisporites virkkiae* Potonié & Klaus 1954 as a diploxyelonoid bisaccate pollen grain with wide separation of sacci. It may also be valuable to start comparative studies between South American Gondwanan and Euramerican localities focusing on the genera *Lueckisporites* and *Corisaccites*.

In terms of international 'ICS official' correlation, none of the Permian GSSPs involve palynological definitions, which may be problematic given the importance of palynology in correlation in the commercial and academic worlds. However there appear to be taxa that occur at GSSPs or well-dated boundary sections that could be used to

correlate those boundaries. For example *Aratrisporites* and *Otynisporites eotriassicus* may be useful to correlate the Permian-Triassic boundary into non-marine sections or sections without radiometric dates. *Converrucosisporites confluens* may be useful in correlating the Carboniferous-Permian boundary. But we need to be very clear on the taxonomy of these correlating taxa!

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GHAVIDEL-SYOOKI, M., 2016, Biostratigraphy of acritarchs and chitinozoans in Ordovician strata from the Fazel Abad area, southeastern Caspian Sea, Alborz Mountains, northern Iran: Stratigraphic and paleogeographic implications, in Sorkhabi, R., ed., *Tectonic Evolution, Collision, and Seismicity of Southwest Asia: In Honor of Manuel Berberian's Forty-Five Years of Research Contributions: Geological Society of America Special Paper 525*, p. 1-32, doi:10.1130/2016.2525(11).© 2016 The Geological Society of America. All rights reserved. For permission to copy, contact editing@geosociety.org :

GHAVIDEL-SYOOKI, M., AND BURJI, S. 2017. Chronostratigraphy of acritarchs and chitinozoans from Upper Ordovician strata from the Robat-e Gharabil area, NE Alborz Mountain, northern Khorassan Province: Stratigraphic and paleogeographic implications. This paper has accepted to be published in <http://jscienc.es.ut.ac.ir>.

Paul Strother

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With W. A. Taylor, Marco Vecoli and John Beck, I have just completed a description of some interesting cryptospore "thalli" from the Dapingian-Darriwilian of Utah. The work, which

has been submitted to the volume commemorating Gordon Wood, is a follow up of material published recently by Vecoli et al. (2015). I continue a long-term project with Charles Wellman on the taxonomy of the Torridonian sequence of the NW Scottish Highlands. The microflora is dominated by sphaeromorph acritarchs, which are not always biologically informative; however, in combination with petrifications in phosphate, we are beginning to gain an understanding of the phylogenetic affinities of some of these billion-year-old, lacustrine microfossils (e.g. Strother and Wellman, 2016). In addition, I continue to work on the palynology of the coeval Nonesuch Shale.

This year has seen the publication of descriptions of middle Cambrian (Series 3) cryptospores (Strother, 2016), and I continue to work on putting together a more comprehensive picture of the fossil record of spores/cryptospores in relation to the algal-plant transition. This theme has been the topic of several talks at meetings this year.

Recent Publications:

- STROTHER, P., 2016. Systematics and evolutionary significance of some new cryptospores from the Cambrian of eastern Tennessee, USA. *Review of Palaeobotany and Palynology* 227, 28–41. doi:10.1016/j.revpalbo.2015.10.006
- STROTHER, P.K., WELLMAN, C.H., 2016. Palaeoecology of a billion-year-old non-marine cyanobacterium from the Torridon Group and Nonesuch Formation. *Palaeontology* 59, 89–108. doi:10.1111/pala.12212
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Recent Abstracts:

- STROTHER, P.K., W.A. TAYLOR & M. VECOLI. 2016. Cryptospores and the canalization of plant sporogenesis. XIV IPC / X IOPC. *Boletín de la Asociación Latinoamericana de Paleobotánica y Palinología*. Número 16: 99.
- STROTHER, P.K. 2016. Cryptospores from the Cambrian of Laurentia. XIV IPC / X IOPC. *Boletín de la Asociación Latinoamericana de Paleobotánica y Palinología*. Número 16: 140-141.
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- STROTHER, P.K. 2016. Cryptospores record the canali-

zation of meiosis in the evolving sporophyte. *Botanical Society of America. Annual Meeting Abstracts* (<http://2016.botanyconference.org/engine/search/index.php?func=detail&aid=438>)

P. Steemans

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I'm currently working on miospores from the QSIM borehole, Saudi Arabia, middle Ordovician in age. The samples have been taken in the Saq-Hanadir transitional beds. This research is done in collaboration with Charles Wellman, Philippe Gerrienne, Alain Le Hérisse and Marco Vecoli. Interestingly one of the sample contained sheet of cells identified as parenchymatous, most probably belonging to an undermined land plant, and would represent in this case the earliest evidence of a land plant. A second paper on the same samples but based on acritarchs has been submitted by Alain Le Hérisse.

In collaboration with Pierre Breuer, Saïd Al-Hajri, Florentin Paris, Jacques Verniers and Alain Le Hérisse we have submitted a paper entitled "A distinctive marginal marine palynological assemblage from the Pridoli of Northwestern Saudi Arabia», in *Revue de Micropaléontologie*.

I have identified an in situ megaspores, *Talchirella trivedii* Bharadwaj & Tiwari 1970, from a new lycopsid cone from the Late Devonian of Australia. A paper is in preparation by Brigitte Meyer-Berthaux and others.

Another paper is in preparation on a new genus and new species plant finds in the Late Devonian, a diminutive woody lycospid from China. In situ spores have been identified, in the sporangia. This paper is written in collaboration with Philippe Gerrienne, Li Cheng Sen, Borja Cascales-Miñana, Nicolas Momont, Cyrille Prestianni and Yang N.

Early land plants from Poland have been found. The palynological studies have been done to date those ones. A future paper in which I'm involved is in preparation. The authors are Mariusz A. Salamon, Philippe Gerrienne, Philippe Steemans, Przemysław Gorzelak, Paweł Filipiak, Alain Le Hérisse, Florentin Paris, Borja Cascales-Miñana, Tomasz Brachaniec and Magdalena Misz-Kenan

Close to the Ordovician/Silurian from Ethiopia, a rich assemblage of cryptospores have been observed. Two new species of trilete spores

have been identified. This research is done in collaboration with Rainer Broccke and R. Bussert.

We have worked on Frasnian/Famennian boundary samples from the Rodanas area in NE Spain. We had a small meeting with Zelia Pereira and Gonzalo Rial to discuss on the systematic.

We have obtained funds for an exchange between the CONICET of Argentina and the NFSR of Belgium. We will go on the field in Argentina next May to take samples in the Ordovician up to the Devonian. The composition of the team is Claudia Rubinstein, Victoria Garcia, Solano Rodriguez and myself.

I have submitted with Charlie Wellman a determination key of all cryptospores from the Ordovician to the Devonian. It contains all determined cryptospores published; this represents more or less 120 species. This paper, if accepted, will be published in the special volume for our friend Gordon Wood, in *Palynology*.

Reed Wicander

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Retirement still suits me as I continue to work mostly on Ordovician and Devonian organic-walled microphytoplankton. Following my visit with Geoff Playford last year, I was appointed an Adjunct Professor in the School of Earth and Environmental Sciences.

As mentioned in last year's newsletter, I spent two months working with Geoff and we completed a manuscript on the palynoflora of the Middle Devonian Arkona, Hungry Hollow and Widder formations of Ontario, Canada. The manuscript was accepted for publication later this year in the *Boletín Geológico y Minero*. We also completed a manuscript on the Middle Devonian Gravel Point Formation, Michigan, U.S.A., which was recently submitted for review.

This year I am spending three months with Geoff, and we are studying the palynoflora of the Lower Devonian Ross Formation, Tennessee. This was a study originated by Gordon Wood, who kindly provided me with all of his prepared slides and collecting data before he passed away.

Along with Merrell Miller (chief editor), Thomas Servais and myself (guest editors), we are in the final stages of completing the Gordon Wood

Memorial Volume, which is scheduled to be published as a special issue of *Palynology* later this year. All of the submitted manuscripts are currently out for review, and many of them have been returned to us, following suggested changes by the reviewers. This volume will commemorate Gordon's contributions to palynology.

Lastly, I continue my term as President of CIMP.

Thomas Servais

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Thomas Servais (Lille, France) is research director at the CNRS. He continues his research mainly focused on the Great Ordovician Biodiversification Event (GOBE) with a new IGCP project dedicated to the onset of this event (www.igcp653.org), and the evolution of the marine microphytoplankton in general. Publications in 2016 concerned the results of the French ANR projects "terrestrialisation" (partly with M. Vecoli, Dahrán) and "Cambrian-Ordovician radiation". While the first project resulted in the publication of the first cryptospores from Siberia (with Lena Raevskaya, St. Petersburg), the « phytoplankton blackout in the Late Palaeozoic », and the early evolution of land plants, the second project resulted in the publication of a database analyses of the Cambrian phytoplankton and of the palynology of the Fezouata Lagerstätte of the Ordovician of Morocco (several papers by Hendrik Nowak, who finished his PhD in December 2015 at Lille). Research continues in collaboration with several Chinese colleagues : Li Jun, Liang Yan, Yan Kui (all Nanjing Institute of Geology and Palaeontology) and Wang Wenhui (Central South University, Changsha) on both acritarch and chitinozoan research. In late 2016 a new PhD subject started on the analyses of the Palaeozoic phytoplankton diversity with David Kröck (Lille, France).

WANG, W.H., SERVAIS, T., YAN, K., VECOLI, M., LI, J. (2015). The Ordovician acritarch *Dactylofusa velifera* Cocchio 1982 : a biostratigraphical and palaeobiogeographical index species. *Palynology*, 39: 125-141. Dallas.

NOWAK, H., AKODAD, M., LEFEBVRE, B., SERVAIS, T ; (2015). Discovery of the messaoudensis-trifidum assemblage (upper Tremadocian –

lower Floian, Lower Ordovician) in the subsurface of Morocco. *Estonian Journal of Earth Sciences*, 64: 80-83. Tallinn.

VANDENBROUCKE, T.R.A., EMSBO, P., MUNNECKE, A., NUNS, N., DUPONCHEL, L., LE-POT, K., QUIJADA, M., PARIS, F., SERVAIS, T., KIESSLING, W. (2015). Metal induced malformations in early Palaeozoic plankton are harbingers of mass extinction. *Nature Communications*, 6, 7966. London.

NOWAK, H., SERVAIS, T., MONNET, M., MOLYNEUX, S.G., VANDENBROUCKE, T.R.A. (2015). Phytoplankton dynamics from the Cambrian Explosion to the onset of the Great Ordovician Biodiversification Event: A review of Cambrian acritarch diversity. *Earth-Science Reviews*, 151 : 117-131. Amsterdam.

RAEVSKAYA, E., DRONOV, A., SERVAIS, T., WELLMAN, C.W. (2016). Cryptospores from the Katian (Upper Ordovician) of the Tungus basin: The first evidence for early land plants from the Siberian paleocontinent. *Review of Palaeobotany and Palynology*, 224: 4-13. Amsterdam. SERVAIS, T., MARTIN, R.E., NÜTZEL, A. (2016). The impact of the 'terrestrialisation process' in the late Palaeozoic: pCO₂, pO₂, and the 'phytoplankton blackout.' *Review of Palaeobotany and Palynology*, 224: 26-37. Amsterdam.

GERRIENNE, P., SERVAIS, T., VECOLI, M. (2016). Plant evolution and terrestrialization during Palaeozoic times—The phylogenetic context. *Review of Palaeobotany and Palynology*, 227: 4-18. Amsterdam.

MARTIN, E.L.O., PITTET, B., GUTIERREZ-MARCO, J.C., VANNIER, J., EL HARIRI, K., LEROSEY-AUBRIL, R., MASROUR, M., NOWAK, H., SERVAIS, T., VANDENBROUCKE, T.R.A., VAN ROY, P., VAUCHER, R., LEFEBVRE, B. (2016). The Lower Ordovician Fezouata Konservat-Lagerstätte from Morocco : Age, environment and evolutionary perspectives. *Gondwana Research*, 34 : 274-283. Amsterdam

ERIKSSON, M.E., LINDSKOG, A., SERVAIS, T., HINTS, O., TONAROVA, P. (2016). Darrivilian (Middle Ordovician) worms of southern Sweden, GFF, DOI: 10.1080/11035897.2016.1181102. Stockholm.

SERVAIS, T., PERRIER, V., DANELIAN, T., KLUG,

C., MARTIN, R.E., MUNNECKE, A., NOWAK, H., NÜTZEL, A., VANDENBROUCKE, T.R.A., WILLIAMS, M., RASMUSSEN, C. M.Ø. (2016). The onset of the 'Ordovician Plankton Revolution' in the late Cambrian. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 458 : 12-28. Amsterdam.

YAN, K., LI, J., SERVAIS, T. (2016). An overview of Chinese Silurian acritarch research. *Canadian Journal of Earth Sciences* 53 : 808-814. Ottawa.

NOWAK, H., SERVAIS, T., PITTET, B., VAUCHER, R., AKODAD, M., GAINES, R.R., VANDENBROUCKE, T.R.A. (2016). Palynomorphs of the Fezouata Shale (Lower Ordovician, Morocco): Age and environmental constraints of the Fezouata Biota. *Palaeogeography, Palaeoclimatology, Palaeoecology* 460 : 62-74. Amsterdam.

Tania Dimitrova

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OKUYUCU, C., DIMITROVA, T., GÖNCÜOĞLU, M. C. & GEDIK, I. (2016). Late Permian (Tatarian) fluvio-lacustrine successions in NW Anatolia (Zonguldak Terrane, Turkey): palaeogeographic Implications. *Geol. Mag.*: page 1 of 15 Cambridge University Press 2016. doi:10.1017/S0016756816000674

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In the past 2016, Wenhui Wang finished her three years research work in Nanjing University and started her career as an associate professor in School of Geosciences and Info-Physics, Central South University, China. Most of her research activities concerning chitinozoans in 2016 had been involved in seeking out the biological affinity of chitinozoans. Abnormal individuals, which mean teratological specimens, well preserved specimens in chain or cocoon and specimens preserve internal structures were restudied and they provided important clues for the elucidation of chitinozoan biology. Anatomy, morphology and chemical composition studies on

"contemporaneity" fossils, such as graptolites and acritarchs and modern organisms such as copepod eggs were carried out. She gave a talk about this work in the start meeting of IGCP653. Her research interest also includes studies of Ordovician and Silurian graptolites. One paper was recently published about the stratigraphical distribution of early Silurian black shales from the Lower Yangtze Platform in South China with Dr. X. Chen. Another research interest of her is on studies of Ordovician palynology. She also tries to use Quantative methods in the classification of certain Ordovician acritarch taxa.

WENHUI WANG, WENXUAN HU, QING CHEN, DONG JIA, XU CHEN. Temporal and spatial distribution of Ordovician–Silurian boundary black graptolitic shales on the Lower Yangtze Platform. *Palaeoworld*, 2016, <http://dx.doi.org/10.1016/j.palwor.2016.11.002>.

Yan Liang

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Yan Liang continues Ordovician chitinozoan studies as an assistant researcher at NIGPAS, China.

In the middle of last year, I finished my PhD on the Early and Middle Ordovician chitinozoans of the Yangtze Region, South China, and luckily got a position at NIGPAS to continue my study. I have attended the 12th ISOS meeting at Harrisonburg, Virginia of USA and made oral presentation based on the preliminary results of my PhD program. In the second half of the year, together with Dr. Peng Tang and Prof. Florentin Paris, three papers have been prepared focusing on the Ordovician chitinozoan biostratigraphy and biodiversity of South China. Two papers have already been published out in Chinese and the other is waiting to be published in *Rev Palaeobot Palyn.*

In this year, together with Prof. Thomas Servais, Dr. Peng Tang, Dr. Wenhui Wang and Prof. Jianbo Liu, we made a review and update of the Tremadocian chitinozoan biostratigraphy of South China. In this work, we systematically restudied *Lagenochitina destombesi* recovered from South China, and the result shows that no typical *L. destombesi* appeared in South China and a new chitinozoan biozone was proposed for the earliest Ordovician. The geological range

of the index species *Euconochitina symmetrica* in South China have been discussed. This paper is submitted in *Rev Palaeobot Palyn.*

For the coming 2017, I plan to have a short visit at the University of Western Ontario, Canada, to make cooperation with Prof. Jisuo Jin based on the chitinozoan materials collected at Tongzi, South China. Besides, I'd like to participate in the IGCP 653 Annual meeting in Yichang and the joint AASP-CIMP meeting in Nottingham.

LIANG, Y., TANG, P., WU, R.C., LUAN, X.C., ZHAN, R.B., 2015. Chitinozoan Biostratigraphy of the Middle-Upper Ordovician Miaopo Formation in Yichang, Hubei Province. *Journal of Stratigraphy* 39, 17-30. (in Chinese, with English Abstr.)

TANG, P., WANG, J., WANG, C.Y., WU, R.C., YAN, K., LIANG, Y., WANG, X., 2015. Microfossils across the Llandovery–Wenlock boundary in Ziyang–Langao region, Shaanxi, NW China. *Palaeoworld* 24, 221-230.

LIANG, Y., TANG, P., 2016a. Early–Middle Ordovician Chitinozoan Biostratigraphy of the Upper Yangtze Region, South China. *Journal of Stratigraphy* 40, 136-150. (in Chinese, with English Abstr.)

LIANG, Y., TANG, P., 2016b. Early Ordovician to early Late Ordovician Chitinozoan biodiversity of the Upper Yangtze Region, South China. *Scientia Sinica Terrae* 46, 809–823. (in Chinese)

WU, R.C., STOUGE, S., ZHAN, R.B., LIU, J.B., LIANG, Y., 2016. Conodont faunal dynamics across the Middle and Upper Ordovician boundary in the Yichang area, western Hubei Province, South China. *Canadian Journal of Earth Sciences* 53(8), 856-864.

LIANG, Y., PARIS, F., TANG, P. Middle-Late Ordovician chitinozoans from the Yichang area, South China. *Review of Palaeobotany and Palynology*. (Accept)

LIANG, Y., SERVAIS, T., WANG, W.H., TANG, P. Tremadocian (Early Ordovician) chitinozoan biostratigraphy of South China: review and update. *Review of Palaeobotany and Palynology*. (under review)

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I continue to work on long term projects on the Devonian and Carboniferous palynostratigraphy of the Iberian Pyrite Belt and South Portuguese Zone. I am starting a new research European 2020 project—EXPLORA, that aims to characterize the geological, geochemical and geophysical models of the Neves-Corvo Mine region (Iberian Pyrite Belt), to depths of about 1 500 m and promote the discovery of new geological horizons favourable to the occurrence of massive sulphide mineralization.

I am still developing with Paulo Fernandes (UALG) a project focused in the high resolution palynostratigraphy of the Permian Karoo of Mozambique, Africa.

CORREIA, V., RIDING, J. B., FERNANDES, P., DUA RTE, L. V., PEREIRA, Z., 2017. The palynology of the Lower and Middle Toarcian (Lower Jurassic) in the northern Lusitanian Basin, Western Portugal. *Review of Palaeobotany and Palynology.*, 237 (2017) 75–95.

FERNANDES, P., LOPES, G., MACHADO, G., PEREIRA, Z., RODRIGUES, B., 2016. Superimposed thermal histories in the southern limit of the Ossa Morena Zone – Portugal. *Geological Magazine*, 1-18. doi: 10.1017/S0016756816000248.

PEREIRA, Z., FERNANDES, P., LOPES, G., MARQUES, J., VASCONCELOS, L., 2016. The Permian-Triassic transition in the Moatize-Minjova Basin, Karoo Supergroup, Mozambique: a Palynological Perspective. *Review of Palaeobotany and Palynology*, 226, 1-19.

THE SAUDI ARAMCO – CIMP JOINT STUDIES: ONGOING INVESTIGATIONS

Marco Vecoli, Biostratigraphy Group, Geological Technical Service Division, Saudi Aramco, Dhahran, Saudi Arabia.

In a previous newsletter (No 83), we presented an historical perspective and an account of the activities involved in the Saudi Aramco – CIMP (Commission International Microflore du Paléozoïque) collaborative project. This project started in the 1990s with the aim of documenting in detail the palynostratigraphy of Saudi Arabia and continued through various phases, each one concluding with a thematic issue published in scientific journals or thematic books, reporting on the results of the various investigations (see CIMP Newsletter 83, pp. 11-12 for a detailed list of publications). The project is still active and currently involves collaboration between Saudi Aramco and researchers (all members of CIMP) from several institutions, such as Charlie Wellman (The University of Sheffield, U.K.); Alain Le Hérissé (Université de Bretagne Occidentale/CNRS Brest, France); Philippe Steemans (Université de Liège, Belgium); John Marshall (University of Southampton, U.K.); Paul Strother (Boston College, USA); Geoff Clayton and Robbie Goodhue (Trinity College, Ireland); Merrell Miller (the IRF Group, USA); and Stewart Molyneux (British Geological Survey, U.K.). Some of the “founding fathers” of the project are now retired (e.g., Bernard Owens, Florentin Paris, Maurice Strel), but their pioneering work remains influential and at the very heart of all subsequent developments.

We are now in the fifth phase of the project: current investigations focus on a variety of subjects such as detailed analyses of the palynology and palaeoenvironmental interpretation of Cambro-Ordovician clastic sediments in southern Saudi Arabia; taxonomy, palaeobiology and stratigraphic significance of Ordovician-Silurian cryptospore and chitinozoan assemblages; the implementation and testing of a new method for assessing thermal maturity of organic matter in absence of vitrinite and the palynostratigraphy of the Permo-Carboniferous of Saudi Arabia. Results from the current phase of the project were presented at special sessions at the 45th Annual Meeting of the AASP in Lexington, Kentucky, USA (2012); the 46th Annual Meeting of the AASP in San Francisco, California, USA (2013); the 9th EPPC Meeting in Padova, Italy, (2014); the CIMP Meeting in Bergen, Norway (2015); and finally at the XIV International Palynological Congress in Salvador de Bahia last October, 2016.

At this latter meeting, talks based on investigations relating to the CIMP project were presented during the session SS11, “New frontiers and classic studies in Palaeozoic palynology and palynostratigraphy.” The following papers were presented:

Strother, P. and Vecoli, M., 2016. Cryptospores and the canalization of plant sporogenesis. *Boletín de la Asociación Latinoamericana de Paleobotánica y Palinología* 16, p. 99.

Steenmans, P., Breuer, P., Al-Hajri, S., le Hérissé, A., Paris, F., Verniers, J. and Wellman, C., 2016. Palynology and palaeogeography of the middle Pridoli from Saudi Arabia. *Boletín de la Asociación Latinoamericana de Paleobotánica y Palinología* 16, p. 100.

Clayton, G., Breuer, P. and Hooker, N., 2016. The palynostratigraphy of the Mississippian Berwath Formation in northern Saudi Arabia. *Boletín de la Asociación Latinoamericana de Paleobotánica y Palinología* 16, p. 101.

Marshall, J., Zhu, H., Wellman, C., Berry, C., Wang, Y., Xu, H., Troth, I. and Breuer, P., 2016. The significance of Verrucisporites megaspores in the Middle and Late Devonian of Saudi Arabia. *Boletín de la Asociación Latinoamericana de Paleobotánica y Palinología* 16, p. 101-102.

Le Hérissé, A., Guidat, C., Not, F., Vecoli, M., Breuer, P., Wellman, C. and Steemans, P., 2016. Occurrence and significance of minute palynomorphs of marine and nonmarine origin in the Middle Ordo-

vician of Saudi Arabia. Boletín de la Asociación Latinoamericana de Paleobotánica y Palinología 16, p. 103.

Wellman, C., Steemans, P., Breuer, P. and Vecoli, M., 2016. A review of Silurian dispersed spore assemblage from the Arabian Plate: biostratigraphy and palaeogeography. Boletín de la Asociación Latinoamericana de Paleobotánica y Palinología 16, p. 104-105.

Goodhue, R., Clayton, G., Abdelbagi, S., Duggan, C. and Vecoli, M., 2016. Preliminary correlation of Palynomorph Darkness Index (PDI) with vitrinite reflectance and other indicators of organic maturity. Boletín de la Asociación Latinoamericana de Paleobotánica y Palinología 16, p. 105-106.

A new thematic issue (the fifth in the Saudi Aramco – CIMP series) including, among others, full papers based on the above presentations, is now in progress in *Revue de Micropaléontologie* and we

NEWS

ADVICE FOR EARLY CAREER SCIENTISTS

Dr. John Smol published a valuable opinion paper addressed to early career scientists wishing to find a place in the complex research world we live in today. The paper, titled "Some advice to early career scientists: Personal perspectives on surviving in a complex world" was published in the journal "Ideas in Ecology and Evolution." The paper is open access and can be accessed at:

<http://ojs.library.queensu.ca/index.php/IEE/article/view/6346/5920>

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CIMP FEES

Please don't forget to pay your annual CIMP subscription. Information on methods of payment can be found at <http://cimp.weebly.com/membership.html>.

It is easy, but why pay? Simple - you may help CIMP members (mainly students) to participate in meetings and congresses. You also may help in offsetting the costs of organizing social events during meetings. You may also 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).

THE ORIGIN OF CIMP OR HOW TO INCREASE INTERNATIONAL CONTACTS BETWEEN PALEOZOIC PALYNOLOGISTS DURING THE SECOND PART OF LAST CENTURY

Maurice Streef, CIMP Secretary General (1971-1977)

The "Commission Internationale de Microflore du Paléozoïque" was established at the end of the Heerlen Carboniferous Congress, in September 1958. This commission had the purpose of studying and reviewing the terminology and the diverse methods (sampling, maceration, computing, and illustration) used in palynology (B. Alpern, R. Potonié, 23 March 1959, unformal meeting at Paris). Boris Alpern (1921-2014) was a Scientific Councilor (1952-1978) at the «Centre d'Etudes et Recherches des Charbonnages de France, CERCHAR. His PhD (1957) «Contribution aux méthodes et à la systématique palynologique et pétrographique des charbons: application au problème de la corrélation des couches; Université de Paris » convinced him that something should be made regarding the general confusion arising at that time in the spore-pollen nomenclature and taxonomy. Boris Alpern is the true founder of CIMP that he promotes as General Secretary during 10 years. Meetings succeeded in Paris and London (1959), Sheffield (1960), Krefeld (1961), Liège (1962), Paris (1963), Sheffield (1965) and Paris again (1967), all reports type-written, duplicated and sent by surface mail to participants (27 in 1959, 54 in 1962, 72 in 1963). In 1963, the list of Working groups amounts to 17 (Terminology, Densosporites, Torispora, Lycospora, Knoxisporites, Verrucosisporites, Triquitrites-Tripartites, Megaspores, Acritarchs (subdivided in 9 sub-groups), Maceration-Computing, Botany affinities, Stratigraphic palynology (subdivided later in several sub-groups), Cirratiradites, Chitinozoa, Cavate spores, Cuticules). The last non-printed report (Sheffield 1965) contained more than 100 pages. In the meantime, printed reports were published by the French CNRS as synthesis of some of the working-groups results. We refer to CIMP Newsletter 12 for the lists of these CNRS publications. Boris Alpern was also at the origin of a collection of more than 400 transparencies of types and co-types of Paleozoic spores and pollens (list to be found also in the CIMP Newsletter 12, digitalized copies of transparencies available on request to P. Steemans, University of Liège). In 1967, Boris asked to be replaced as CIMP Secretary General to be able to return to his first main interest, coal petrography. He became President of the International Committee for Coal Petrology (ICCP), another committee issued from the Carboniferous Congress. Nevertheless he still accepted the position of CIMP President after the death of Robert Potonié in 1974 (see CIMP Newsletter 7).

From the beginning, CIMP was opened to a participation as wide as possible and asked several palynologists of non-West European countries to be responsible as regional secretaries for palynologists unable to attend CIMP meetings (for political reasons for instance). XX Luber for USSR, XX Balme for Australia, XX Dybova for East European countries, successively J.M. Schopf, RX. Kosanke and XX. Kremp for North America were approached. Unexpectedly, USA members were the most reticent to follow. Often because they do not believe in joint works by correspondence. Also because some would have favored attachment to botanical rather than geological international bodies or because others would have preferred a stratigraphically wider organization, not restricted to Paleozoic. A paper by Traverse and Sullivan (Palynology 7: 7-18, 1983) explains that situation when relating the background of the foundation of the American Association of Stratigraphic Palynologists (AASP) in 1967. In that paper (1983), they just ignore the existence of the much older CIMP... However, ten years after AASP foundation, in 1976 CIMP Newsletter 14) at the first AASP/CIMP Meeting at Halifax (Nova Scotia), among the 125 registrants, 37 were North American CIMP members.

After Boris Alpern retirement at the Sheffield meeting of 1967, Roger Neves (Sheffield) took over the CIMP general secretary until the Krefeld meeting (1971). From then, the CIMP reports were printed with the Carboniferous Congress reports (Sheffield... Krefeld ... Moscow...). However, the stratigraphic working groups, oriented by Alpern on specific problems linked to the Carboniferous became then more diversified with the development of research notably in the Devonian.

To attract as many palynologists as possible, CIMP tried to align their general assembly with International Commissions and Congresses. The Carboniferous Congress first of all, from where CIMP was

issued, also the Devonian Congress (see CIMP Newsletter 13) but later, most often the International Geological Congresses and the International Palynological Congresses. At Sheffield 1967, CIMP had also its first joint meeting with the IUGS Subcommittee on Carboniferous Stratigraphy (SCCS), an experience renewed in Liège in 1969.

The second International Conference on Palynology was held in Utrecht in 1967, initiating a new journal of Elsevier Group: *Review of Palaeobotany and Palynology*. (The first International Conference on Palynology was held in Tucson in 1962). In the meantime the need for an International Commission for Palynology (ICP) develops, initiated by Norman Hughes (Cambridge). Discussions arise within CIMP concerning their relation with ICP (CIMP Newsletter 13 and 14). CIMP disapproved working groups organized by ICP when their themes closely overlap those of existing working-groups in specialist societies as proposed during the International Palynological Conference planned in Lucknow (1977). Another subject of discussion with ICP was to know if CIMP has to be closely restricted to the limit of the Paleozoic or could reasonably overlap with the adjacent stratigraphic units. In 1972 a list of 77 CIMP members (see CIMP Newsletter 3) were asked to give their interest in the different systems. It provided the following results: Precambrian 3, Cambrian 6, Ordovician 13, Silurian 16, Devonian 36, Mississippian 31, Pennsylvanian 31, Permian 21, Triassic 13, Post Triassic 22. It was evident that the Permian-Triassic constituted a single unit that could not be subdivided. On another hand the Precambrian was poorly considered by CIMP members. This engage Marjorie Muir (Cambridge) to propose a new IUGS Working Group on the Precambrian. This resulted in an impressive list of researchers and of formations being under study at that time (CIMP Newsletters 14 and 15). ICP is now only a Federation of many regional, national or specialized palynological societies and is a constituent body of both the International Union of Geological Sciences and the International Union of Biological Sciences.

When I took over the CIMP general secretary in 1971, the number of members has considerably increased with the result that providing any-ones with big working-group reports as distributed before with CERCHAR and CNRS support became impossible. We realize however that we needed some more or less permanent contact with the members. I initiated then the CIMP Newsletters (produced two or three times a year) which you can discover on the cimp.weebly.com. Of course the quality was fortunately increasing step by step and many thanks are due to Bernard Owens who transformed progressively the Newsletter into a real professional paper. At the beginning, my laboratory supports the mailing cost, but we had soon to start the process of asking members for a financial contribution. So we were at the origin of that fastidious task, still necessary, to collect money among our members....

Of course, internet allows now to distribute our data in full color all around the world and I engage you to go to the Newsletter 55 (1998) where Thomas Servais, then new secretary general, talks about the 40 years of CIMP.

Maurice Streeel

Note: A Complete bibliography on Boris Alpern was written by Lemos de Sousa in the ICCP Newsletter 61, April 2015.

NEW CIMP IFPS COUNCILLOR (2016-2020)

Gilda Lopes obtained her PhD degree in 2013 at the University of Algarve, Portugal, focusing on Paleozoic biostratigraphy (acritarchs and spores), stable isotopes and organic maturation. She continued her research in the Portuguese Geological Survey working with Permian palynology from Mozambique. In May 2014 she moved to Norway where she accepted a post-doctoral position at the University of Bergen. Her project main aim is to devise a palynostratigraphic framework for the Mississippian succession of the Barents Sea. She is also interested in the study of palynofaceis methodologies, co-supervising a master thesis in this field of expertise. Currently, she is also the Spore and Pollen sub-commission secretary for the International Commission of the Palaeozoic Microflora (CIMP).

*Gilda Lopes
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Azzedine Soufiane
(1959–2017)

IN MEMORIAM

Azzedine Soufiane
(1959–2017)

Azzedine Soufiane died on January 29, 2017 while trying to disarm the shooter at the Ste-Foy mosque massacre. He was 57 years old, having been born on October 10, 1959, at Khouribga, south-east of Casablanca, Morocco.

Azzedine came to Canada in 1998 thanks to an International Development Research Centre (IDRC) scholarship and the support of the Office National de Recherches et d'Exploitation Pétrolières (ONAREP) to attend the Université du Québec à Montréal. In 1991 he received a M.Sc. degree in geology on the basis on his work on Ordovician and Silurian chitinozoans from the Tadla basin in Morocco.

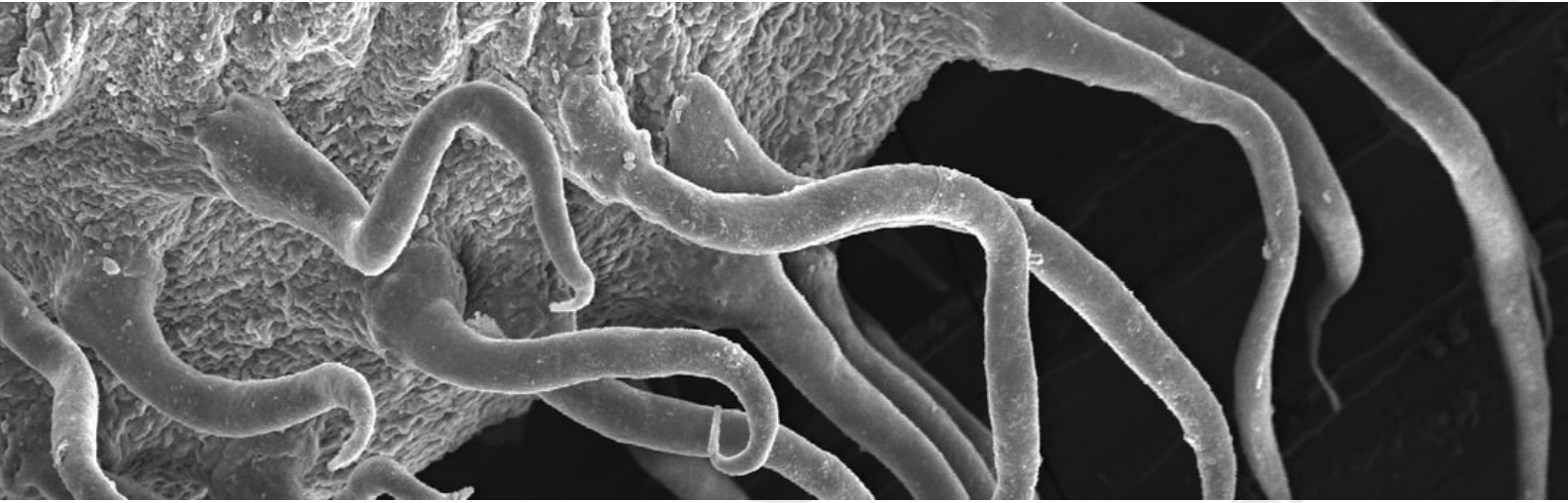
In 1992 he joined the Institut national de la recherche scientifique (INRS) in Quebec as a research assistant, and in the following ten years he undertook a number of projects on the Ordovician and Silurian chitinozoans of Anticosti Island, Arctic Canada, Nevada and Nova Scotia. This work produced more than fifteen papers and oral communications. In 1999 he enrolled at the INRS for a Ph.D. degree to better integrate the knowledge he had acquired in palynostratigraphy.

In 2004, because of family obligations and an unfavorable labor market, he left a promising scientific career to open a Mediterranean grocery and an halal butcher shop attuned to the needs of the local Moslem community.

Azzedine was appreciated by his colleagues. He was a rigorous and meticulous scientist, unpretentious and always helpful. The Quebec community unanimously acknowledged his generosity, open-mindedness and other human qualities.

Azzedine is survived by his wife and three children, 6, 13 and 15 years old.

Aicha Achab, Esther Asselin and John Riva



COMMISSION INTERNATIONALE DE MICROFLORE DU PALÉOZOÏQUE SUBCOMMISSION ON SPORES AND POLLEN

Thanks to all members who contributed to this newsletter!

Cover photo: Detailed of a megaspore ornamentation
Credit: F. de Ville de Goyet

PRESIDENT'S LETTER

Dear colleagues,
Another year has passed and Paleozoic spore and pollen knowledge has increased with new and interesting projects being developed and papers published on the results. Members of our sub-commission have participated in several national and international conferences (and not just palynological ones) around the world where they enriched the program with their presentations on Paleozoic palynology.

We particularly welcome the new student members which have joined us during the last year and wish all of you great success with your research activities. Don't hesitate to contact the members of our subcommission if you need support and advice on Paleozoic spores and pollen in your studies. There is a wide range of knowledge and experience concentrated in our subcommission, which is a valuable resource that you can use. We are glad to recognise that the scientific interest in our field of expertise still continues to endure, even though we struggle, while waiting for better days to come. During this past year several papers and conference abstracts on Paleozoic spores and pollen studies have been published in national and international peer-reviewed journals. We recommend that you go through the reference list in this newsletter and check on what has been done as it relates to your particular research. It

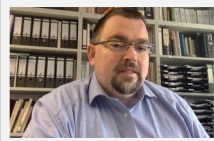
is also a good opportunity to see what other colleagues are working on and to develop new ideas for collaboration to enhance the power and impact of our discipline by new collaborative research projects.

Several international conferences were attended by members of our subcommission, but we would like to focus on the following two:

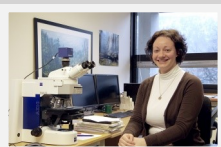
- The TSOP-AASP-ICCP Joint Meeting took place in Houston last September, bringing together all societies focused on organic matter research. The wide range of presentation topics showed how diverse and complex the analysis of organic matter – palynology in the widest sense – is. It also included several talks on Paleozoic spores and pollen, showing different applications from stratigraphy to facies and paleoenvironment interpretation. It was a stimulating meeting providing many new ideas that will help foster the development of new avenues for research in our discipline.

- The XIV IPC/X IOPC meeting was held in Brazil last October, and several sessions on Paleozoic palynology were part of the programme. Various posters and oral communications from our subcommission members were presented. All of the abstracts can be found in the "*Boletín de la Asociación Latinoamericana de Paleobotánica y Palinología*".

We also want to congratulate Geoff Clayton, a long-standing member of our sub-commission,



President
Hartmut Jager



Secretary
Gilda Lopes

who was awarded the AASP Medal for Excellence in Education. This medal is granted only to those with outstanding experience and accomplishment in all aspects of academic education involving palynology, including the training of new scientists.

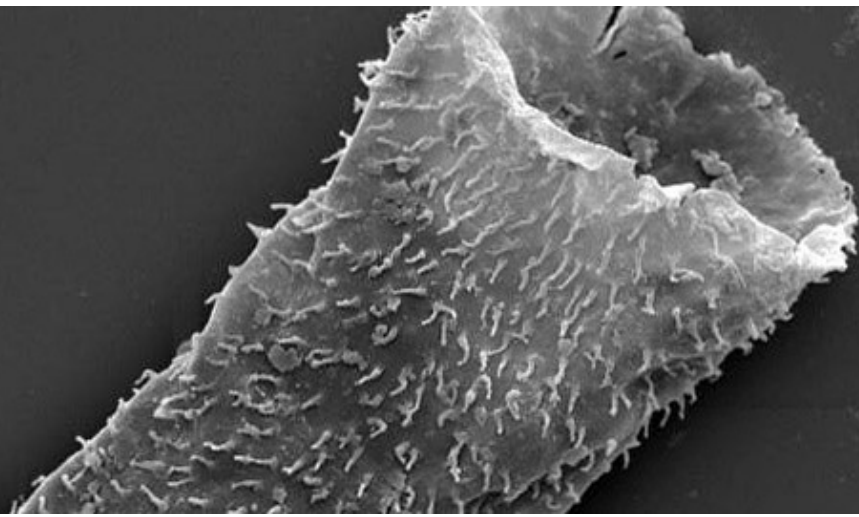
As in every newsletter in the last several years, we want to take this occasion to promote the Facebook page of our subcommission. It is a perfect place to exchange ideas, discuss open questions on taxonomy, stratigraphic and paleogeographic interpretations of Paleozoic spores and pollen, including photos that you can easily upload and make available to everyone in the group. Facebook can be a very strong tool, not only for social activities, but also for scientific communication – BUT IT NEEDS YOUR ACTIVE PARTICIPATION! We should not waste this great opportunity any longer, but start to use the enormous potential it provides to our research community. TAKE THE CHANCE NOW! This is something we would really like to see our members utilize this year.

Finally, we want to take the chance again to renew the call for your original descriptions and photos of new pollen and spore species. We still want to do a compilation of newly published spore and pollen species, which will be sent out to you once a year, **but it needs your support**.

Please send in your newly described, modified and emended species of the last five years, including the original descriptions and photo(s) of the type specimen to me (jaeger@georesources.de) or Gilda (Gilda.Lopes@geo.uib.no). Hopefully, we can send out the first compilation this summer.

We wish you all a good and successful 2017, and look forward to the new ideas coming from our subcommission and good published Paleozoic palynology data.

Best wishes
Hartmut Jäger & Gilda Lopes



COMMISSION INTERNATIONALE DE MICROFLORE DU PALÉOZOÏQUE SUBCOMMISSION ON CHITINOZOANS

Thanks to all members who contributed to this newsletter!

Cover photo: *Baltisphaeridium perclarum* Loeblich & Tappan, 1978
Credit: Reed Wicander (CIMP website)

PRESIDENT'S LETTER

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Dear Chitinozoa researchers,
Welcome from the president.

As announced in the previous CIMP newsletter 85 (July 2016) several Chitinozoa workers were present in Ghent, Belgium, between 5 and 9 July 2016 at the Closing Meeting of the International Geoscience Programme Project IGCP-591 organized by Thijs Vandenbroucke. The symposium was mainly centred on Palaeoclimatology and modelling, but there were also 8 talks or posters on Chitinozoa.

AMBERG, C. E. A., VANDENBROUCKE, T. R. A., NIELSEN, A. T., MUNNECKE, A. AND MCLAUGHLIN, P. I. Chitinozoan biostratigraphy and carbon isotope stratigraphy from the Upper Ordovician Skogerholmen Formation in the Oslo Region. A new perspective for the Hirnantian lower boundary in Baltica.

ANTONOVITŠ, L., NESTOR, V., NÖLVAK, J., HINTS, O., MARTMA, T. AND KIIPLI, T. Baltic Ordovician and Silurian chitinozoans: a quantitative stratigraphic synthesis.

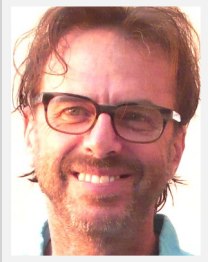
HOWARD, R. J., STEEMAN, T., VANDENBROUCKE, T. R. A. AND WILLIAMS, M. Late Wenlock chitinozoans from the Farley Lane section in the stratotype area of the Wenlock Series.

PENG TANG AND YAN LIANG. Chitinozoa *Eisenackitina ripae* Soufiane et Achab from Yangtze Region, China and its significance.

STEEMAN, T., VANDENBROUCKE, T. R. A., WILLIAMS, M., VERNIERS, J., PERRIER, V., SIVETER, D. J., WILKINSON, J., ZALASIEWICZ, J. AND EMSBO, P. Chitinozoan biostratigraphy through the Silurian Wenlock–Ludlow boundary succession of the Long Mountain (Powys, Wales).

TESSITORE, L., VANDENBROUCKE, T.R.A., GHIEPPE, J.-F., DABARD, M.-P., DIETRICH, P., LOI, A., PARIS, F. AND RAZIN, P. A biostratigraphic framework for the Hirnantian glaciations in the Central Anti-Atlas (southern Morocco).

VELLEMAN, J. F. M., VANDENBROUCKE, T. R. A. AND MCLAUGHLIN, P. Building a chitinozoan biostratigraphy to anchor Upper Ordovician chemostratigraphy in the Cincinnati Arch (USA).



President
Jacques Verniers



Secretary
Wenhui Wang

WENHUI WANG, VANDENBROUCKE, T. R. A. AND SERVAIS, T. Middle Ordovician (Darriwilian) chitinozoans from the Chaidam Palaeoplate, northwestern China.

During the different breaks and evenings amongst the chitinozoan-workers we discussed the value and significance of our subcommission. Several suggested ideas were appreciated: a.o.: the need for a forum for taxonomic discussions, but also the lack of time allowed in the normal work load for many of us; the need for a functional website for chitinozoan workers with also links to other Websites where Chitinozoans are mentioned or discussed, a database with all publications in pdf form, easy determination tools, ...

A data stick was handed out by me to several of us with a beginning of a database for our Chitinozoa Subcommission. It contained:

A pdf file with >1700 references of chitinozoan publications, in 4 groups as defined in the nineties by Florentin Paris, Aicha Achab, Esther Asselin, Geert Van Grootel and myself when building a chitinozoan database: CODA: scientific published articles discussing chitinozoans; CODB: conference abstracts; CODC: unpublished

PhD, M.Sc. theses; CODD: general articles, handbooks, etc. where the word chitinozoans is mentioned or illustrated.

A file with 503 pdfs of chitinozoan publications CODA, assembled by Peng Tang from Florentins reprints in Rennes, by Thijs Vandembroucke, by our student Leonard Dewaele and by myself.

A file with an alphabetic list of chitinozoan species made by F. Paris 2010.

A file with the list of all genera of chitinozoans selected as valid by Paris and Grahn (in Paris et al. 1999), with their discriminating characteristics and the genera not accepted as valid.

A list of 8 publications for a student starting to study chitinozoans.

The database still needs to be updated for 2015 and 2016 with the new references, species and genera, and pdfs. Peng Tang and Wang Wenhui volunteered to look how that database with pdfs can be enhanced, where it can be stored and how it can be accessible for all Chitinozoa-workers, taking into account the copyright on some of the articles. At least 600 pdfs of CODA type are yet not included in the database. If you have many pdfs of chitinozoans, please contact us.

Jacques Verniers