

# International Organisation of Palaeobotany



## IOP NEWSLETTER 124

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### CONTENTS

Letter from the president

News from palaeobotanists

Announcement: new book on fossilization

In memoriam: Michael Akhmetiev

A changing of the guard in Münster

Collection Spotlight: Queensland Museum Network, Australia

Upcoming meetings

## Letter from the president

Greetings colleagues!

As spring approaches in the Northern Hemisphere and autumn in the South, let us be optimistic that the plague of Covid 19 may soon be behind us. Although we are eager for the resumption of in-person conferences we continue to be cautious as we await widespread vaccination and reliable testing procedures to improve the possibilities for international travels. Meanwhile, for the safety of all participants, our IOPC-XI conference has been rescheduled for 2024. Our next international conference is planned to be virtual via teleconference hosted in Sweden in early 2022. As details for these conferences become available, we will update our home page at [Palaeobotany.org](http://Palaeobotany.org).

With sadness I report that our colleagues Mikhail Akhmetiev and Zlatko Kvaček died in 2020. An obituary for Zlatko Kvaček, written by Lilla Hably, Johanna Eder and me, was published in Fossil Imprint: [http://fi.nm.cz/wp-content/uploads/2020/12/1\\_obituary.pdf](http://fi.nm.cz/wp-content/uploads/2020/12/1_obituary.pdf) A dedicated volume is in preparation for the same journal. An obituary for Mikhail Akhmetiev follows in this newsletter, prepared by Alexei Herman and Tatiana Kodrul, followed by condolence notes from some of his many international colleagues.

This issue highlights the paleobotanical programs and facilities at two major institutions in Münster Germany, and Brisbane, Australia. The legacy of paleobotanical programs and research activity at the University in Münster is reviewed by retiring Professor Hans Kerp, and his successor, Benjamin Bomfleur. The spectacular Queensland Museum—its facilities and collections and personnel—are summarized in the article by Andrew Rozefelds. The latter contribution continues our series of IOP newsletter articles on Institutions with significant paleobotanical programs and collections. We would like to extend this series to cover other institutions, large and small, from various parts of the world. We welcome contributions on your own institution—its history, stratigraphic/taxonomic strengths of the collections and current facilities.

The website “Links for Palaeobotanists,” maintained by Klaus-Peter Kelber, continues to be a useful directory of various kinds of articles and resources of interest to students and colleagues in paleobotany. I recommend it highly. This site, and many others we consider useful to our members, are featured on our website:

<https://palaeobotany.org/index.php/featured-palaeobotanical-links/>

Let us know if you have additional links for blogs, websites, or other relevant information that you wish to add.

With best regards,

Steve

Steven Manchester (Gainesville, FL, USA), IOP President

## News from palaeobotanists

### Welcome to IOP – our new and returning members in November 2020 – February 2021:

**Camila Martínez** – New position: Biology Dept., School of Sciences, Universidad EAFIT, Medellín, Colombia [PhD Cornell, University 2018]

### New appointments

**Benjamin Bomfleur** – Professor of palaeobotany; University of Münster, Germany ([see article below!](#))

**Fridgeir Grímsson** – Senior Scientist; University of Vienna, Department of Botany and Biodiversity Research, Division of Structural and Functional Botany (head Jürg Schönenberger). „I will be running the SEM-TEM lab, teaching, and doing my pollen/paleo research.“

**Ludwig Luthardt** – Curator of palaeobotany; Museum für Naturkunde (Museum of Natural History) Berlin, Leibniz Institute for Evolution and Biodiversity Science

**Christopher West** – recently accepted a postdoctoral fellowship at the University of Alberta to work on early Paleogene fossil plant localities in the Yukon, as well as revisit some of the historical Late Cretaceous and Paleocene plant fossil collections at the University of Alberta.

## Announcement: new book on fossilization

Research Unit 2685 in Bonn, funded by the Deutsche Forschungsgemeinschaft, has been working on The Limits of the Fossil Record: Analytical and Experimental Approaches to Fossilization since 2018. As a result of our collaborative work in the last three years, we have put together a book called *Fossilization: Understanding the Material Nature of Ancient Plants and Animals*, which will be published by Johns Hopkins University Press in March 2021. The book consists of 10 chapters on various topics in fossilization contributed by 16 paleontologists, geochemists, and mineralogists. Although the book includes topics such as soft-tissue preservation in dinosaur bones, organics in fossil eggshell, and the application of Raman spectrometry to paleontological questions, over half of the book features fossil plants. The paleobotanical chapters discuss soft-tissue preservation in amber, experimental silicification of wood, silica structure and chemistry in fossil wood, plant defenses against herbivory in the fossil record, and searching for color in fossil plants.

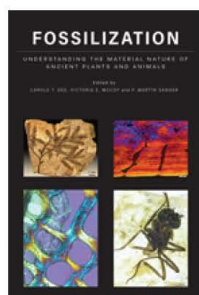
With permission from Johns Hopkins University Press, I am passing on this special offer of a 30% discount on the book to the international paleobotanical community (see next page in the newsletter). You can order the *Fossilization* book online at [jhupbooks.press.jhu.edu](http://jhupbooks.press.jhu.edu) and receive the discount by entering the promotional code HTWN when checking out. I hope that this generous discount on the part of JHUP will help to offset the cost of postage to wherever you may be sheltering in place in the world.

Happy fossilization! Keep safe and stay healthy!

Carole Gee, Bonn

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**Carole T. Gee** is an associate professor of paleontology at the University of Bonn. She is the editor of *Plants in Mesozoic Time: Morphological Innovations, Phylogeny, Ecosystems*. **Victoria E. McCoy** is a visiting assistant professor of paleontology at the University of Wisconsin–Milwaukee. **P. Martin Sander** is a professor of vertebrate paleontology at the University of Bonn. He is the coeditor of *The Microstructure of Reptilian Tooth Enamel: Terminology, Function, and Phylogeny* and, with Gee, *Biology of the Sauropod Dinosaurs: Understanding the Life of Giants*.

Be sure to mention the code **HTWN** to receive your 30% discount.

## Fossilization

Understanding the Material Nature of Ancient Plants and Animals

edited by **Carole T. Gee, Victoria E. McCoy, and P. Martin Sander**

**An in-depth look at the latest breakthroughs in our understanding of the material record that deep time leaves behind.**

Understanding the complex interplay of physical and chemical processes leading to fossilization is crucial to elucidating the 3800 million years of life on earth. And yet, the process of fossilization also leads to the loss of pivotal biological information, placing constraints on the very same understanding of ancient life it preserves. Over the last decade, however, remarkable advances in approaches, techniques, tools, and instrumentation have helped scientists to transcend these constraints by enabling high-resolution analysis of fossil material—even down to the nanoscale.

*Fossilization* provides a critical look at these cutting-edge innovations in the science of fossil preservation and provides a road map for future research. A true interdisciplinary undertaking, the book is authored by paleontologists, mineralogists, geochemists, organic chemists, microbiologists, and materials scientists who have worked together to investigate questions around substance fossilization and the limits of the fossil record. A special color section contains SEM, Raman, and other striking images of vertebrates, invertebrates, and plants. *Fossilization* is a trailblazing reference book for research scientists and specialists in related fields, as well as for advanced undergraduates and graduate students interested in fossilization, emerging research techniques, and fresh approaches in the analysis of plant and animal fossils.

Contributors: H. Jonas Barthel, Aurore Canoville, Carole T. Gee, Thorsten Geisler, Jens Götze, Conrad C. Labandeira, Sashima Läbe, Moritz Liesegang, Victoria E. McCoy, Martina Menneken, Jes Rust, P. Martin Sander, Frank Tomaschek, Torsten Wappler, Kayleigh Wiersma, Tzu-Ruei Yang

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## **In memoriam: Mikhail Akhmetiev**

*January 23, 1935 – October 17, 2020*

On October 17<sup>th</sup>, 2020 Professor Mikhail A. Akhmetiev passed away in Moscow, Russia at the age of 85.

Mikhail Akhmetiev was a distinguished geologist, stratigrapher, and palaeobotanist with a career spanning over five decades. We knew him as a professional scientist and, at the same time, a kind and friendly person possessing a wonderful sense of humour. Palaeobotany and stratigraphy were the fields of his professional expertise; apart from that he was keen on philately, collected postage stamps from different countries and possessed a substantial knowledge of this subject.

Mikhail Akhmetiev was born in Moscow on January 23<sup>d</sup>, 1935. In 1958 he was awarded a degree from the Sergo Ordzhonikidze Moscow Institute for Geological Prospecting. After the graduation he started his research career in the geological mapping expedition of the USSR Ministry for Geology in Khabarovsk (Soviet Far East). His first post was a field geologist, then, in 1960, he was promoted to a head of a geological party and finally, in 1965-68, became a chief geologist of the expedition. At that time, his major research interests were geological mapping, stratigraphy and tectonics of the Khabarovsk Region and Primorie, Soviet Far East. The geological composition of the latter was very poorly known at that time.



Mikhail Akhmetiev (left) during fieldwork in Khabarovsk Region, 1960s (with permission of the widow).

In 1961 Akhmetiev enrolled into the postgraduate school of the Historical Geology Department of the Moscow Institute for Geological Prospecting as a distant learner. Simultaneously, he began his studies of plant morphology, anatomy, systematics and geography at the Biological Department of the Lomonosov Moscow State University. A famous geologist professor Muratov was his PhD supervisor. Mikhail's PhD thesis was focused on the Neogene stratigraphy and fossil flora of volcanogenic deposits in East Sikhote-Alin'. It was successfully defended in 1964, after four years of hard work both in the field and in the laboratory.

A new stage in Akhmetiev's life started in 1968 when he, his wife Nina Petrovna and their two sons, Pyotr and Vladimir, moved to Moscow. Mikhail continued his palaeobotanical research at the Laboratory of Palaeofloristics, Geological Institute, USSR Academy of Sciences. Numerous field expeditions in the Soviet Far East provided Akhmetiev with abundant material for studies of the Paleogene and Neogene floras and nonmarine stratigraphy of this region and adjacent territories.



Mikhail Akhmetiev and his wife Nina, 1970s (with permission of the widow).

A remarkable event in Mikhail's life and work was his participation in expedition on the research vessel 'Vityaz' (1970-71) in the Pacific Ocean. During this expedition, organised by the USSR Academy of Sciences, he studied local geology and collected a vast herbarium of local plants.

In 1973-81 Mikhail Akhmetiev participated in the Soviet geological expeditions to Iceland. At that time, he provided significant scientific input into knowledge of regional stratigraphy of the Cenozoic volcanogenic deposits (basaltoids) of the island based on study of fossil plants. His book "Stratigraphy and flora of the late Cenozoic of Iceland" was published in 1978 in Russia and in 1981 in Iceland. In 1980 he was awarded a Doctor of Science degree for the outstanding results of this research. In 1985-87 Akhmetiev took part in the fieldwork on the Cabo Verde islands, studying geological structure and modern vegetation of the islands.



Mikhail Akhmetiev, 2005 (with permission of the widow).

In 1987 Mikhail Akhmetiev was appointed a head of the Laboratory of Palaeofloristics in the Geological Institute of the Russian Academy of Sciences and in 1997 he became a head of the Department of Stratigraphy of this Institute. He continued studying Paleogene and Neogene geology, stratigraphy, plant fossils, plant migrations, palaeophytogeography and palaeoclimate of different regions of the Earth, including Russian Far East, North-eastern Russia, Western Siberia, south of European Russia, the Caucasus, Kazakhstan, northern China. In 2000–2008

Professor Akhmetiev was one of the principal investigators of the international project focused on establishment of the Cretaceous/Paleogene boundary in the nonmarine sequences of Far East, both in Russian and Chinese parts of this region.

Mikhail Akhmetiev had a unique ability to see problems from a large-scale perspective. Early in his career, he realised the significance of studying organic-walled microphytoplankton for Mesozoic and Cenozoic stratigraphy and palaeoceanology. In the 1980s he initiated an intensive study of dinoflagellate cysts, first at the Geological Institute in Moscow and then at several other research centres in Russia, inviting many young biologists and geologists to this research program. It would not be an exaggeration to say that he was a founder of dinocyst biostratigraphy in Russia.

In his research, Mikhail Akhmetiev cooperated with colleagues (who always became his friends) from different countries: Czech Republic, England, France, Germany, Austria, Sweden, USA, China, Japan, etc. Mikhail was a member of the editorial boards of international and Russian journals such as “Global geology”, “Paleobotanist” and “Stratigraphy and Geological Correlation”. He published more than 180 research works including 12 books.

We shall miss his kindness, originality, depth of thought and companionship.

On behalf of Laboratory of Palaeofloristics,  
Geological Institute of the Russian Academy of Sciences,  
Alexei Herman and Tatiana Kodrul

\* \* \*

*He was a great scientist with very solid character – Abdul Rahman Ashraf.*

*I was hugely impressed with his depth and breadth of knowledge and was very proud to have the chance to support the opportunity to have more of that knowledge and understanding published in the English language – Margaret Collinson.*

*Prof. Akhmetiev was a leading figure who made major contributions to our field – Peter Crane.*

*Professor Akhmeitev, was a good friend and we shared many meetings and field trips together, most of them in China. I learned a lot from him and was always happy to travel with him. We shared an interest in using the past record of plants to understand many questions of Evolution of Life. He and his research will live long in our memory – David Dilcher.*

*I appreciated Mischa's friendliness, cooperation and helpfulness. He was always so active and agile. I also keep in good memory the meetings with him and his wife – Johanna Eder.*

*I am very sad to hear that he passed away – Else-Marie Friis.*



*Prof. Akhmetiev is a distinguished professor. So far I still remember his two visits to Guangzhou for the Sino-Russian symposium. In addition, when we visited Moscow, he received us very warmly every time. He will live long in our memory – Jin Jianhua.*

*I have such fond memories of Mikhail and I celebrate his legacy – Kirk Johnson.*

*I enjoyed the opportunity to join him in field work and research projects and learn from his breadth of knowledge – Steve Manchester.*

*I miss his friendly smile but the memory of joyful days with Mikhail and his excellent contributions last forever – Harufumi Nishida.*

*He knew so much and was so easy going in the same time, even with a young guy as I was then. In 1991 I visited Moskow, and he very kindly invited me at home and arranged a nice stay – Marc Philippe.*

*Professor Akhmetiev was one of the most outstanding paleobotanists ever. His academic legacy is always with us – Cheng Quan.*

*...he gave such a lot to our subject and was always friendly and welcoming to me. We shall miss him – Bob Spicer.*

*Prof. Akhmetiev is an outstanding paleobotanist and geoscientist in the world. He has made great contributions to the study of paleobotany and stratigraphy, particularly to the successful cooperation in geosciences among Russia, China, US, Japan, Germany, UK, France and other relative countries. He has been the Honorary Professors of Jilin University and Shenyang Normal University of China since 2002, making his great contributions also to the two Chinese institutions in development of the disciplines of Paleontology and Stratigraphy. His noble moral character and persistent spirit to scientific cause will always be our model to learn from.*

*Prof. Akhmetiev will always live in our hearts! – Sun Ge, Sun Chunlin, and Sun Yuewu.*

## A changing of the guard in Münster

On August 1<sup>st</sup> 2020 I formally retired as professor for palaeobotany at the University of Münster after having held this position for 29 years. It is a nice opportunity to look back. After I finished my MSc and PhD in Utrecht under the supervision of Henk Visscher, I spent nearly 1½ years in Philadelphia in Hermann Pfefferkorn's lab. In 1991 I moved to Münster. It was not easy to follow in the footsteps of Winfried Remy (1928–1995) who published – mostly together with his wife Renate – many papers and three very popular books on late Paleozoic floras. Despite Remy's fame, his laboratory was pretty outdated. Most of the equipment was acquired in the early 1960s; the fume hoods even dated back to the late 1940s and were part of the first post-WW II chemistry lab in Münster. The institute was modernized and in 2014 we moved to a new building with state-of-the-art facilities. Over the years many bachelor, master and PhD students, postdocs and visiting scientists from all over the world found their way to our lab.

My field- and specimen-based research focuses on late Paleozoic and early Mesozoic floras, preferably with well-preserved cuticles. Projects were carried out in various parts of the world, such as France, China and Jordan. I am primarily interested in characterizing whole-plant taxa, understanding their morphology and ecology, and in the interactions between vegetation and floral development and geological processes over time. Nearly 25 years I served as editor of one of the leading journals in our field. Editing is a time-consuming job and many authors see editors as a necessary evil. Nevertheless, I really liked it and I resigned with pain in my heart. When Remy invited me in the early 1990s to join his Rhynie chert research team I was reluctant, because many people were already working on early land plants. Tom Taylor, who spent one year in Münster, finally persuaded me. I never regretted it.



In 2008, Thomas Litt and I hosted the first joint IPC/IOPC conference in Bonn. Although initially criticized by those who feared that palaeobotany would be over-whelmed by palynology, we had good reasons to organize a joint meeting. Some previous meetings were held far apart, geographically and timewise. A joint meeting would bring palaeobotanists and palynologists closer together. Moreover, the German hosting society includes both palaeobotanists and palynologists. Last but not least, the German Science Foundation would support only one single meeting. The Bonn model turned out to be successful as all later meetings were joint ones.

Like in many countries, in Germany disciplines like palaeobotany are under fire. During the last couple of years there was a continuous threat that I would be replaced by a “modern” geo-scientist rather than by an “old-fashioned” palaeobotanist. I am very pleased they eventually decided to fill my position with a palaeobotanist. With Benjamin Bomfleur they hired an excellent successor and I am confident that our discipline will flourish in Münster in the next decades.

Looking back, I feel privileged that I could develop my passion for fossil plants into my profession. Formally retired, I now have the status of senior-professor, which allows me to continue my research. Unfortunately, all large conferences have been cancelled for this year due to Covid-19, but I hope to meet colleagues and friends again as soon as the situation permits.

Hans Kerp

It is a unique privilege to take over the palaeobotany professorship in Münster. Adjusting to the place won't take much at least, because Münster really is my home turf. I grew up in Bad Bentheim, a beautiful small town nearby, and it were my brother's finds of small bivalves and ammonites from the Münsterland Cretaceous basin that spawned my love for fossils when I was a kid. Palaeobotany got a hold of me only decades later during Hans' introductory class in my first semester studying geology/palaeontology in Münster. I stayed in Münster (much of the time in “Hans' palaeobotany shack”) for my entire diploma curriculum and my following PhD study. Hans' great support and encouragement throughout allowed me to join the palaeobotanical community early on—I enjoyed my first IOPC in 2004 in Bariloche, Argentina. His network also paved the way for my first Antarctic expedition in 2005/2006 and my resulting PhD thesis, which I defended in 2010. I continued studying Antarctic plant fossils during my first post-doc phase in Edie and Tom Taylor's lab in Lawrence, Kansas.

In 2013, I moved on to work with Steve McLoughlin at the Swedish Museum of Natural History in Stockholm. Eventually, the Emmy Noether Programme of the Deutsche Forschungsgemeinschaft enabled me to come back to Münster in 2016 to build a junior research group “Latitudinal Patterns in Plant Evolution”. Within this framework Patrick Blumenkemper defended his PhD thesis on Permian plant fossils from Jordan last summer, and another PhD thesis on Triassic–Jurassic plant fossils from Australia and Antarctica is about to be completed by Jan Unverfärth. Fortunately, our former research assistant Phil Jardine continues his work in Münster with a three-year project to study sporomorph chemistry and morphometrics. The latest addition to the Münster team is Nadine Pickarski, a Quaternary palynologist who was recently hired as research assistant. On top, Hans’ passion for plant fossils never seems to wear off, and we are grateful to have him stay as senior professor.

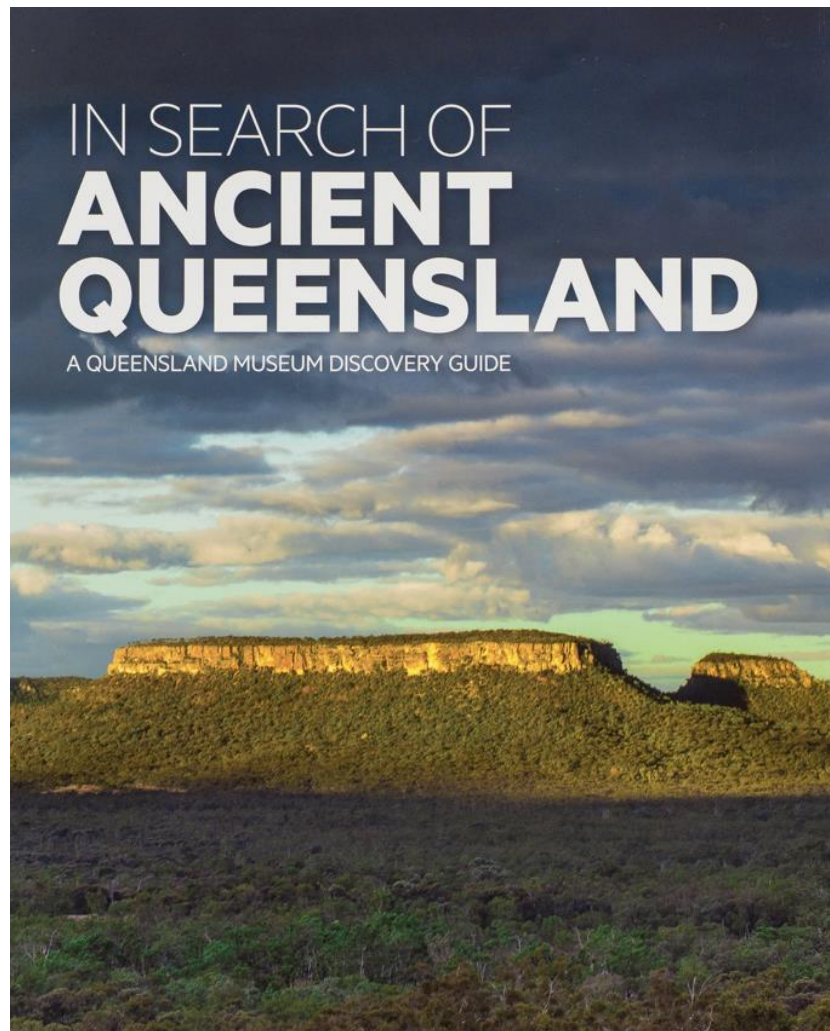


Hans handed over an exceptionally well-equipped palaeobotany lab, with extraordinary lab and microscope facilities, an extensive reprint library, and fossil collections. In his own words above, it will not be easy to follow in the footsteps of my predecessor, yet I am fortunate to be granted the best possible start in many respects. Thank you, Hans. I look forward to the times ahead.

Benjamin Bomfleur

## Collection Spotlight: Queensland Museum Network, Australia

The Geosciences section at the Queensland Museum (QM) is part of the Biodiversity and Geosciences Collection and Research Division. The main QM campus is in the centre of Brisbane at South Bank and the geology collections are stored at the Collection, Research and Loan Centre at Hendra, a suburb in the inner northern part of the city. The Queensland Museum also has regional campuses in Toowoomba, Ipswich and the Museum of Tropical Queensland in Townsville. The Townsville campus has a strong focus on research on the Great Barrier Reef and palaeontology. The primary support for the Queensland Museum comes from the State government of Queensland.



While the collection includes mineralogy, geology and palaeontology, the focus of this review is on the palaeobotanical record and the several important collections of some key institutions and researchers that are held at the Museum. The Queensland Museum collections include those of the University of Queensland and Geological Survey of Queensland. Significant fossil plant type material held in the Queensland Museum includes material described by Arthur



B. Walkom, Owen A. Jones, Noel De Jersey and John Rigby, but this is just a small subset of the many researchers who have contributed to the Museum over many years. Palaeobotanical research in Queensland has been actively progressed by Mary Dettmann and the late Trevor Clifford, both Queensland Museum honorary researchers, who have in recent years added significantly to our knowledge of the fossil floras of Queensland, including descriptions of Cretaceous and Cenozoic conifers and flowering plants of Australia.

The state of Queensland is 2.5 times the size of Texas and seven times the size of the UK. It is the most biodiverse state in Australia and the vegetation includes tropical, subtropical and temperate rainforests, open forest dominated by eucalypt woodlands, monsoon forests in the north and arid zone vegetation in the west of the State. In the same way that the state is highly biodiverse, it is also palaeofloristically diverse with fossil floras of various ages.

The oldest fossils (stromatolites) come from Precambrian sediments near Mount Isa in north western Queensland. Devonian-Carboniferous floras from northern Queensland include arborescent lycopods, ferns and coniferophytes. The extensive Permian basins uncovered in the Bowen Basin of central Queensland have a Gondwanic character, being dominated by *Glossopteris*. There are also extensive Triassic and Jurassic floras in eastern Queensland, and while some preliminary work has been done on some, others remain inadequately collected and many have not been studied in any detail.



*Palissya tillackiorum* cone

In the Early Cretaceous a large sea extended into the inland of the State and much of the sedimentary geology of Western Queensland is dominated by these marine sequences. Plant remains are known from various stages, with the most significant recent research focussing on the floras coming from the lacustrine/ fluviatile sediments of the Winton Formation, centred on the town of Winton. Additional floras have also been described by Walkom from small sedimentary basins in eastern Queensland, such as the Maryborough Basin and Burrum Coal Measures near Maryborough and the Styx and Stanwell Basins near Rockhampton. Late Cretaceous sequences from 85-65 ma are not currently recognised from the State.

The Cenozoic floras remain little studied although there is significant potential for fieldwork and collecting due to the large number of small sedimentary basins along the eastern margin of the Australian Plate. An additional challenge is that while a robust biostratigraphic framework, based upon pollen, exists for southern Australia a comprehensive understanding of the pollen floras of northern Australia is still lacking. At the same time, there is significant potential for radiometric dating of volcanics and intrusions associated with some of these sedimentary units.

One of the key questions involving the Australian flora is its origins. The modern Australian flora is largely dominated by southern elements although Northern Hemisphere incursions occurring through either long distance dispersal and/or through more recent land-based dispersal following collision of the Australian Plate with the Asian Plate. The New Guinean flora described in the older literature is often included as part of the South East Asian flora, although it has long been recognised as having both northern and southern elements, despite being part of the Australian plate and Gondwanic in origin.

### **Early Palaeobotanical Research in Queensland (pre-20th Century)**

One of the earliest papers published on the palaeobotany of Queensland was written by Constantin von Ettingshausen (Ettingshausen 1895). He described fossil plants from the Oxley Basin in the southern suburbs of Brisbane, which he inferred were Cretaceous in age, although the flora is now accepted as being Cenozoic. The Palaeozoic and Mesozoic fossils of Queensland, including palaeobotanical material were documented by Robert Etheridge Jnr in Jack and Etheridge (1892) in *The Geology and Palaeontology of Queensland and New Guinea*, and while they did describe the older floras, Cenozoic floras were noticeably absent. John Shirley, an educationist with an interest in palaeobotany and botany, published papers primarily on Mesozoic floras but did include some Tertiary material from Queensland (Shirley 1898). These early collections from Jack and Etheridge, and Shirley, which became part of the Geological Survey of Queensland collections, are now held by the Queensland Museum. Unfortunately, the whereabouts of the fossils described by von Ettingshausen in 1895 remain unknown.



## Queensland Museum

The Queensland Philosophical Society founded the Queensland Museum in Brisbane in 1862 with a small display in the city's colonial windmill, which still stands to this day. The Queensland Museum collections have had a strong focus on vertebrate palaeontology: palaeontologists who have worked at the Museum in the past include Charles De Vis, Heber Longman, Jack Woods, Alan Bartholomai, Michael Archer, Mary Wade, Ralph Molnar and many honoraries who specialised in various extant and fossil vertebrate groups. Currently two Senior Curators of Vertebrate Palaeontology are employed at the Queensland Museum Network, Scott Hocknull based in Brisbane, and Espen Knutsen in Townsville at the Museum of Tropical Queensland.



Moraceae fruit from Capella locality

While curators and directors have accepted palaeobotanical collections into the museum, it has been largely opportunistic and or spasmodic in nature due to incoming donations. The Museum has had honoraries and visiting researchers who have worked on parts of the palaeobotanical collection. Arthur Walkom, who undertook the first comprehensive studies of the Mesozoic floras of Queensland, was an honorary palaeobotanist at the Museum from 1915 to 1917. In more recent decades, the late Trevor Clifford and Mary Dettmann collaborated on projects on ferns, conifers and flowering plants of Queensland. Andrew

Rozefelds, current Head of Geosciences since 2011 and the first palaeobotanist to be employed at the Museum has worked closely with Mary and Trevor to progress this research.

### **Geological Survey of Queensland**

The collections from the Geological Survey of Queensland were brought together during the extensive geological surveying of the State from the late 19<sup>th</sup> century, and were used to better understand the biostratigraphy and exploit the geological resources of Queensland. The Geological Survey of Queensland has had active researchers involved in both palaeobotanical and palaeo invertebrate research in the State which complemented the vertebrate zoology focus of the Museum.

Arthur Walkom, from 1915-1944, published a series of benchmark papers on Palaeozoic and Mesozoic Floras of Queensland that formed the basis for taxonomic revisions and the foundations of a stratigraphic framework for the State (Walkom 1915-1917). He had the opportunity to study with Professor (Sir) Albert Seward at Cambridge for a year in 1926 while on a Rockefeller Foundation scholarship. He was later a director of the Australian Museum from 1940-1954.

Benjamin Dunstan, Chief Geologist in the Survey from 1908 to 1931, facilitated the collecting of Mesozoic and Cenozoic fossil woods from south eastern Queensland. The aim of the study, which was undertaken by the Indian Palaeobotanist Birbal Sahni was to assess the potential of wood anatomy to assist in biostratigraphic studies. These studies led to one of the few systematic papers on the fossil wood of Australia being published (Sahni 1920).

John Rigby published a series of papers primarily on late Palaeozoic Floras of Queensland and, while retired, is still actively involved in research, and currently affiliated with the Queensland University of Technology. Jim Beeston's studies were involved in supporting the development of the coal industry and he also published papers on palaeobotany on mainly Palaeozoic floras.

The Geological Survey of Queensland also undertook detailed stratigraphic palynological investigations from the 1940s onwards across Queensland to document the Mesozoic and Palaeozoic biostratigraphy of the State as exemplified by the research of Noel de Jersey, John McKellar and others.

In 2003 the Geological Survey of Queensland macrofossil collections, including type material, bulk collections and some slide material were transferred to the Queensland Museum, although the palynological slide collections are retained by the Geological Survey. The Survey's type collections were catalogued by GSQ palaeontologist, Susan Parfrey.

### **University of Queensland**

In 1999, the University of Queensland geology collection including all type material, registered and bulk collections were donated to the Queensland Museum. The University of Queensland traditionally had a strong focus on invertebrate palaeontology and sedimentology

through the leadership of Dorothy Hill. These collections were acquired over many years of fieldwork and through the active involvement of honours and graduate students at the university. Walkom was a lecturer at the University from 1913-1918. Significant research was undertaken by Owen Jones and Noel de Jersey on the Triassic and Jurassic floras of the State (Jones and de Jersey, 1947). The palynologist, Geoff Playford, undertook extensive research across the State on different aged floras focussing on their stratigraphic resolution, and also supervised PhD students working on macrofossil plant record including Rodney Gould, who undertook palaeobotanical studies on Jurassic and Permian plants, John Webb on Triassic plants, and Steven McLoughlin on the Permian floras of the Bowen Basin. Geoff Playford and John Rigby (QUT) also supervised Gary Pattemore on a recent PhD on Triassic-Jurassic floras of south eastern Queensland. The collections acquired during these respective PhDs are lodged with the Queensland Museum. Other significant locality collections (including by private collectors) were also transferred to the Queensland Museum and some of these sites are no longer accessible due to urbanisation, these collections represent the only record we have of these classic sites in south eastern Queensland.

### **Key researchers who have studied the combined Queensland Museum Collection**

The collections at the Queensland Museum therefore now include the palaeobotanical collections of the Geological Survey of Queensland, University of Queensland and core Queensland Museum collection. The combined collections strongly reflect the focus of study undertaken by these different organisations, and also the research interests of staff in these institutions. The Queensland Museum therefore holds the primary types (holotypes, neotypes, lectotypes and syntypes) and associated material described from the University of Queensland and Geological Survey of Queensland collections. While we are actively recalling QM collections that have been on long-term loan, we are also requesting of institutions and individual researchers that all such material from the University of Queensland and Geological Survey of Queensland collections be now returned to the Queensland Museum.

Collected material from Queensland has also been donated by Macquarie University (Sydney, New South Wales), James Cook University (Townsville, Australia) and the Australian National University (Canberra, Australian Capital Territory) and may include some limited palaeobotanical material. The combined Queensland Museum collections have a largely State and national focus, although some overseas material is also present.

Significant research has been completed by Australian-based researchers on these collections. David Cantrill and John Webb described early Triassic lycophyte floras of the Arcadia Formation in Queensland. Steve McLoughlin continues his active research on the Mesozoic and Palaeozoic floras of Australia while based in Stockholm. Gary Pattemore is continuing his research on the Mesozoic floras of Queensland. David Churchill described fossil *Lygodium* from a site near Brisbane and the late David Christophel undertook field work in Queensland on Cenozoic floras. Overseas researchers who have published on the Queensland flora include



Mahendra Bose, William Challoner, Rafael Herbst, Francis Huber, Harufumi Nishida, Kathleen Pigg, Mike Pole, Birbal Sahni, Olof Selling, Don Tidwell and many others. Most of the type specimens described from the QM collection come from the Triassic floras of Queensland, although there are a significant number of Cenozoic and Cretaceous plants described as well.

### **Queensland Museum Geosciences Staff (2020)**

The collection management software program, Vernon, is used to manage Queensland Museum collection data. Broad oversight of Vernon, and collection management generally, is overseen by the Collection Services unit in the Museum. While the Geology collection is quite broad in its coverage, many legacy issues still await addressing from when the Geological Survey of Queensland and University of Queensland materials were transferred to the Museum. Our staff are dealing with these systematically. Kristen Spring has the challenge, as the Senior Collection Manager in Geosciences, to bring order to these collections. The Museum holds over 85 primary palaeobotanical types from these various collections and a key focus is ensuring digitisation of all type material to ensure greater public access.

Volunteers have played a pivotal role across the section in the preparation, sorting and curation of collections. Joanne Wilkinson, Senior Technician, who has facilitated our honorarys and volunteer program, is a preparator and is also involved in collection management, but with Covid-19 our volunteer programs, as of December 2020, are on hold for the time being.

The palaeontologist position at the Museum of Tropical Queensland is a joint appointment with the regional James Cook University and Espen Knutsen is actively progressing work on the Mesozoic vertebrate faunas of northern Australia, including marine reptiles and Early Triassic faunas, and has also undertaken field work and research on fossil plant bearing sites in north Queensland.

Scott Hocknull maintains his research interest in the Cretaceous and Cenozoic faunas of the State, and is keen to understand how these ecosystems and the faunas responded to climate and environmental change. He is working to ensure better access to the collections through digitisation with a broad goal of on-line access to the collection.

### **Future Vision and Outreach**

The Queensland Museum has a large and diverse collection that records the geology and palaeontology of Queensland. Providing access to collections through exhibitions, research and public outreach is a key goal and is represented on the display floor at our South Brisbane main campus with our *Lost Creatures* exhibition and there are fossil displays at the Museum of Tropical Queensland. The *Memoirs of the Queensland Museum - Nature* originally a printed journal is now available as an on-line journal which publishes papers on the natural sciences including palaeobotany. In 2015 the Museum published *In Search of Ancient Queensland*, which documents the geological history of the State and includes some information on the fossil floras.

Fossil plants were curated in the Museum over its history and were mostly collected by local palaeontologists, geologists, and fossil enthusiasts. In the absence of a palaeobotanist for most of the time the core Queensland Museum collections remained largely unstudied and their significance is often poorly understood. Additionally, the existing palaeobotanical collections are often fairly limited in their coverage, many key sites remain inadequately collected and the existing collections are often poorly focussed and therefore have a limited value for future research. More strategic collection development is a key goal to help record the Green History of northern Australia. Nowhere is that more evident than in respect to the Cenozoic collections, where there has been essentially little systematic collecting. Only recently was an overview of the Paleogene Dinmore floras published even though this site has been known for over 100 years (Pole 2019) and is now inaccessible.

The current Head of Geosciences, Andrew Rozefelds, is a palaeobotanist and botanist and was appointed in 2011. His interests include Cenozoic and Mesozoic floras. A key focus is on the Oligocene Capella silicified fruit site that is interpreted as a complex rainforest with Anacardiaceae, Euphorbiaceae, Proteaceae and Elaeocarpaceae present along with emergent conifers and lianas (Menispermaceae, Vitaceae). The preservation is reminiscent of that seen in the Clarno flora in the USA. Current projects are focussed on these silicified floras from Capella to fully document the flora of this site and work is progressing on the study and description of Moraceae fruits from that site.

The Late Eocene – early Oligocene Lowmead flora is an impression flora in Central Queensland and has had some intensive collecting in recent years through philanthropic support from Shell Australia, and some preliminary research has been published including description of the first Cenozoic horsetails from Australia. Further research is planned to better document the flora and fauna and overview evidence of insect-plant interactions. New research is also focussed on an oil shale site in the hinterland behind Mackay. This relatively high-altitude site is yielding the first macrofossil evidence of *Nothofagus* (Southern beeches) from northern Australia and further field work is planned. Also further fieldwork is planned in the Mackay/Rockhampton area on other Cenozoic and Mesozoic fossil sites. Underpinning all field work are two key goals to build and enhance existing collections that have a high research value and also collect specimens with the potential for displays and exhibitions.

The Geosciences section uses the fossil plant collection for research, exhibitions, and outreach and education programs. In 2017 we had a multimedia exhibition, [Deep Time](#) on fossil plants that had been imaged at the Australian Synchrotron. This innovative project was initiated and developed by Anita Milroy, Central Queensland University, and as part of her PhD thesis - *Epistêmê, Technê & Poïesis Visualisations of Evolution and Extinction in Queensland Flora* (Milroy 2017), she developed three-dimensional imaging and animations of rainforest fruits from the Capella locality. This is one of the very few palaeobotanical displays using multimedia developed in Australia, and was on display for nearly twelve months at the Museum. Anita also presented the research findings at the 10<sup>th</sup> European Palaeobotany & Palynology Conference

(EPPC) in Dublin 2018 on the collaboration, and [Deep Time](#) was included in the closing ceremony of the conference

The Queensland Museum has one of the largest fossil collections in the southern Hemisphere, houses the Geological Survey of Queensland and University of Queensland Geological collections, and like most museums faces significant challenges in managing these vast and diverse collections. The palaeobotanical collections are generally a small and largely underdeveloped part of this collection, but the potential for future collecting and research in the State is great. While there exist opportunities to study new floras of almost any age, a key area of research remains the Cenozoic floras of the State – a largely unstudied resource for delving into the Green History of the continent and the evolution of the modern flora of Australia.

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25 November 2020

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## 2021 NECLIME Online Conference

Dear colleagues and members of Neclime,  
it's our pleasure to forward to you the second circular of our online conference, on April 19–21, 2021. **Please register before March 15 by sending the included registration form to [angela.bruch@senckenberg.de](mailto:angela.bruch@senckenberg.de) and/or [claudia.groth@senckenberg.de](mailto:claudia.groth@senckenberg.de).** The deadline for submission of abstracts is April 1, please find more details in the circular.

Best wishes,

Neclime coordination team

**The second circular is distributed together with this newsletter!**

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Newsletters are regularly issued in February, June and October every year.

Please send us your contributions for the next edition of our newsletter (125) until end of May 2021.

Contributions should be sent to Lutz.Kunzmann(at)senckenberg.de.



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