Dear Colleagues,

I would like to nominate Professor Else Marie Friis for election as a Corresponding Member of the Botanical Society of America. I first met Professor Friis in September 1992 at a symposium organized by the Royal Danish Academy of Sciences, at a time when she had already moved to the Department of Palaeobotany of the Swedish Museum of Natural History in Stockholm. We have then met a few more times at meetings, but have never been coauthors. I became familiar with her work on (mostly) Cretaceous fossils representing the Annonaceae, Araceae, Betulaceae, Chloranthaceae, Cunoniaceae, Illiciaceae, Lauraceae, Magnoliaceae, Nymphaeaceae and the gymnosperms Cupressaceae and Ephedra. Because of molecular-clock studies in which fossils are crucial for calibration, so as to estimate absolute time. I have also often used Professor Friis’s 1987 edited volume, with William Chaloner and Peter Crane, on *The origins of angiosperms and their biological consequences* (Cambridge University Press).

Professor Friis is perhaps best known for her use of the sieving method to fossil-rich Cretaceous soils, an approach that led to her discovery of some of the earliest remains of flowers yet known, some of them exquisitely preserved. The structural information that she and her colleagues have obtained from these remains, was something that she not been imagined prior to her work. The fundamental importance of Professor Friis’s discoveries recently were explained for the public in Ben Crair’s piece about her in the New Yorker (2 January 2023), entitled “The Fossil Flowers That Rewrote the History of Life -- Some of the world’s first flowers burned in wildfires more than a hundred million years ago. Else Marie Friis rediscovered them.”

Another new technique for which Professor Friis was an early adopter is synchrotron radiation X-ray tomographic microscopy, which she and her colleagues began applying around 2014. Among other insights, this approach led to new insights on the Gnetales and Bennettitales (Friis, E. M., Crane, P.R., Pedersen, K.R., Bengtson, S., Donoghue, P.C.J., Grimm, G.W., and Stampanoni, M. 2007. Phase-contrast X-ray microtomography links Cretaceous seeds with Gnetales and Bennettitales. Nature 450.)

Professor Friis’s many contributions have led to numerous awards and distinctions, among them her membership in the Royal Danish Academy of Sciences and Letters, the Royal Swedish Academy of Science, the Norwegian Academy of Science and Letters, the Chinese Academy of Sciences (CAS), the American Academy of Arts and Sciences, and the Royal Society of London.
I want to finish this nomination with a personal anecdote that sheds light on Professor Friis’s ethical work ethic. In April 2020, she alerted me to a request for a moratorium on the publication of any fossil specimens purchased from sources in Myanmar after June 2017, when the Myanmar military began its campaign to seize control of the amber mining. She had signed this and was alerting others, such as myself, who indeed had been approached about (beautiful) Lauraceae fossils in Burmese amber. Else Marie’s alert in fact caused me to desist from collaborating on the material.

In short, Professor Friis is a distinguished scientist who has made outstanding contributions to the plant sciences. She now lives in Aarhus, Denmark, but also often spends time at the Oak Spring Garden Foundation and in Chicago working with her American paleobotanical colleagues.

Sincerely,

Susanne Renner

Honorary Professor in Biology
Washington University in Saint Louis
Dear Colleagues:

Re: Nomination of Professor Else Marie Friis
as Corresponding Member of the Botanical Society of America

It is a pleasure to write in support of the nomination of Professor Else Marie Friis for election as a Corresponding Member of the Botanical Society of America. Trained in botany and geology at the University of Aarhus, Denmark, Professor Friis’ research focuses on her discoveries of well-preserved fossil flowers, fruits, seeds, stamens, and pollen to elucidate the earliest phases of angiosperm (flowering plants) evolutionary history. Her pioneering research on ancient flowers has revealed the paleontological history of flowering plants at a level of detail that was simply unimaginable fifty years ago.

In the early 1970s there was little prospect of ever having a meaningful understanding of the paleontological and phylogenetic history of flowering plants, the most speciose and ecologically important group of terrestrial autotrophs. Phylogenetic methods were in their infancy, and most of what was known about the angiosperm fossil record, especially during the Cretaceous (145-65 million years ago), was based on leaves and pollen. Efforts to collect and study ancient angiosperm flowers focused on flower macrofossils, which were rare, usually poorly preserved, and difficult to interpret.

The key breakthrough, made by Professor Friis in the late 1970s was to discover that numerous small fossil flowers, not visible to collectors in the field, are abundant, can be extracted from Cretaceous sediments using bulk-sieving techniques, and are often preserved in superb detail. Professor Friis primary research contribution has been to pioneer the careful study of these fossils, first with scanning electron microscopy and then with synchrotron X-ray microtomography, and to apply the knowledge gained to developing a more detailed understanding of the early evolutionary history of flowering plants.

Central in all of Professor Friis’ research, is her masterful integration of information from living and fossil plants. The discovery of well-preserved ancient flowers enabled point-by-point comparisons with the flowers of living angiosperms, which is crucial to interpreting the phylogenetic relationships of fossil material. Professor Friis’ discoveries also made possible inferences on pollination, dispersal, and other aspects of early angiosperm biology. For example, documentation of the size and structure of embryos in the seeds of early angiosperms allowed her to infer ecology and germination behavior, while her recognition of unusual endothelial tissues in the seeds of early angiosperms suggests maternal control over embryo development. Documentation of pollen grains in situ within fossil flowers also provides an improved basis for interpreting the record of dispersed fossil pollen.
Professor Friis’ discoveries of rich assemblages of fossil flowers from the Early Cretaceous of eastern North America and Portugal have helped catalyse an explosion of high-quality research on the early angiosperm fossil record over the past four decades. Her work has been emulated by many others, leading to the discovery of spectacularly preserved fossil flowers from Lower and Upper Cretaceous strata in Europe, North America, Asia and Antarctica. Professor Friis has also shown that many previously enigmatic non-angiosperm fossils that occur in the same fossil assemblages as early angiosperms were extinct relatives of extant Gnetales, thereby expanding dramatically knowledge of the fossil history of this isolated but important group of living seed plants.

Together with the development of explicit, computer-facilitated, phylogenetic models based on molecular data, which came to the fore during the 1990s, Professor Friis’ discoveries have revolutionized our understanding of the history of flowering plants. She has demonstrated remarkable consistency between the unexpected patterns of early flowering plant evolution now inferred from modern phylogenetic studies and the fossil record. Her discoveries are also the primary means by which molecular clock studies of deeper divergences in the history of flowering plants can be calibrated. Without the ground-breaking work of Professor Friis the direct fossil evidence of the structure biology and relationships of the earliest angiosperms would be insignificant compared to what we know today.

Now retired from her position as Professor of Palaeobotany at the Swedish Museum of Natural History Professor Friis sustains the same high quality and productivity of research that has characterized her entire career. Her accomplishments have been recognized by her election to the Royal Danish Academy of Sciences and Letters (1990), the Royal Swedish Academy of Science (1996), Norwegian Academy of Science and Letters (1998), American Academy of Arts and Sciences (2017) and the Royal Society in the United Kingdom (2020). Professor Friis is also a recipient of the Royal Order of the Polar Star, First Class, from the Government of Sweden. Within the last few weeks she has received the Lapworth Medal from the Palaeontological Association in the UK.

Professor Friis is the undisputed international leader in revealing the deep evolutionary of flowering plants (angiosperms) based on fossil flowers, especially from the critical early phases of their initial diversification during the Cretaceous period. Her research is the best of its kind in the world, both in terms of technical ability and sophistication of outlook. I support the nomination of Professor Else Marie Friis for election as a Corresponding member of the Botanical Society of America without reservation and with great enthusiasm. Please text or call me (203-500-6462) if you would like to discuss any aspect of this assessment.

Sincerely

Sir Peter Crane FRS
President
January 28, 2024

Dear members of the evaluation committee for Corresponding Members of the BSA:

I am pleased to strongly advocate for the election of Else Marie Friis to be a Corresponding Member of the Botanical Society of America. By every metric, Else Marie is one of the most important paleobotanists of our generation and she has been recognized for her work by the American Academy of Arts and Sciences (U.S.), the Royal Society (U.K.), and many other eminent scholarly societies around the world.

Else Marie Friis fundamentally changed our understanding of the earliest phases of the evolution of flowering plants and their reproductive structures. For well over a century, Darwin’s “abominable mystery” - which spoke to the absence of an angiosperm fossil record prior to the mid-Cretaceous and the seemingly instantaneous appearance of diverse angiosperm lineages in the fossil record in the mid-Cretaceous - confounded plant evolutionary biologists. But, two things were lacking: a correct search image for what the oldest flowers might look like (not large and magnolia-like) and a key insight into the simplest of techniques, finding and putting old mud through a sieve to discover a previously unseen world of small flowers beautifully preserved and looking like they were picked yesterday when seen under the scanning electron microscope. Else Marie figured out that charcoalified fossils (toasted by wildfire, but not burned) might well survive in the fossil record and be three-dimensionally preserved. And she knew exactly where to look for these Lower Cretaceous fossils. The result, decades later, is an amazing record of some of the earliest angiosperms and a complete rewrite of plant evolutionary history. Simply put, Else Marie Friis is an amazing biologist, with total command of floral morphology and the keen eye and intellectual insights that were needed to solve Darwin’s “abominable mystery.”

I will not belabor this nomination with anything other than the following: how many paleobotanists end up having their story told in the New Yorker Magazine? If you have not read the piece from the January 2, 2023 issue, have a look. It will put a smile on your face!


Sincerely,

William (Ned) Friedman
Arnold Professor of Organismic and Evolutionary Biology
Director of the Arnold Arboretum
CV Else Marie Friis
Professor emerita, Department of Palaeobiology, Swedish Museum of Natural History, Stockholm
From Dec 2019 also Department of Geoscience, Aarhus University, Aarhus, Denmark

Female, Born: 18 June 1947, Holstebro, Denmark

Education:
1975 Master of Science (mag. scient.) in geology (major) and botany (minor),
Aarhus University (AU), Denmark
1980 Ph. D. (lic. scient.) in geology (AU) (supervisor B.E. Koch, Århus). Title: Microcarpological
studies of Middle Miocene floras of Western Denmark.

1971-75 Teaching Assistant, Departments of Botany and Geology, University of Aarhus (AU)
1975-80 Research Assistant, Research fellow, Teaching Assistant, Depart. Geol., AU
1980-81 Research Fellow (British Council) Botany Department, Bedford College, London
1981-83 Research Fellow (Danish Natural Science Research Council), Depart. Geol., AU
1982 Visiting Research Scholar, Depart. Biol., Univ.Indiana, Bloomington (summer 82)
1983-87 Niels Bohr Fellow (Royal Danish Acad. Sci. and Letters), Depart. Geology, AU.
1987- Professor of Palaeobotany, Swedish Museum of Natural History
1987-2013 Head of Department of Palaeobotany, Swedish Museum of Natural History
1995 Guest-professor, Inst. Syst. Botany, Univ. Zurich, Switzerland (summer term)
2006-2008 Deputy Director of Science, Swedish Museum of Natural History
2008 Acting Director of Science, Swedish Museum of Natural History
2013-April 2015 Head of Department of Palaeobiology, Swedish Museum of Natural History
2015-August-Dec – Visiting Professor, Yale School of Forestry & Environmental Studies

Other academic assignments:
1989-90, 94-2000 Dean of Palaeontology, Swedish Museum of Natural History
1989-90 Board of directors of Swedish Museum of Natural History
1990-96 Danish Natural Science Research Council
1991-96 Nordic Board of Publication (vice-chairman from 1994)
1992-96 Committee for Biodiversity (chairman) (Danish Research Councils)
1994-96 Committee for Polar Research (chairman) (Danish Research Councils)
1994-95 Committee for Scientific Research in Greenland, Denmark
1994-95 Board of Governors, Geological Survey of Denmark
1995-2000 Board of Governors, Geological Survey of Denmark and Greenland
1996 Committee for The Agricultural Landscape (chairman) (Danish Research Councils)
1999-2004 Committee for Scientific Dishonesty (substitute) (Danish Research Agency).
2001-present Academic Committee for Laboratory of Palaeobiology and Stratigraphy, Nanjing
Institute of Geology and Palaeontology, Nanjing, China
2001 Strategic-expert committee for larger interdisciplinary research programmes (Danish Research
Agency)
2002-2004 Board of Museum of Evolution, University of Uppsala
2002-2004 Board of the Swedish Link Programme, Swedish Research Council and SIDA
2006 Science Audit committee, Kew Gardens, UK
2012-2015 Beam Time Allocation Panel, European Synchrotron Radiation Facility, Grenoble, France
2013-April 2015 Member of board of directors of science, Swedish Museum of Natural History
2014 Committee for international postdocs, Swedish research Council
2019-2020 Panel member for the Evaluation of Charles University, Prague

Co-organiser of several international meetings and symposia

Member of editorial boards of journals:
1997-present Member of Editorial Board, Review of Palaeobotany and Palynology
1999-2009 Associate editor, Plant Systematics and Evolution
2000-2011 Member of the International Advisory Board, Acta Palaeobotanica Polonica
2001-present Editor, from 2003 Chief Editor, Grana
2005 Member of Editorial Board, Palaeoworld

Invited speaker (including plenary and keynote) at many international meetings

Member of several scientific associations

Member of boards of scientific associations:
1972, 82-83 Board (chairman 1982-83), Geological Society of Denmark (Aarhus Group)
1993-95 Board, Geological Society of Sweden
2000-2004 President, International Organisation of Palaeobotany, Chairman of Executive Committee
2002-2006 Vice President, International Paleontological Association, Executive Committee

Membership of academies:
1990 Royal Danish Academy of Sciences and Letters
1996 Royal Swedish Academy of Science
1998 The Norwegian Academy of Science and Letters
1998 Royal Physiographic Society, Lund, Sweden
2002 The Chinese Academy of Sciences (CAS)
2017 America Academy of Arts and Sciences
2020 The Royal Society of London

Other academic distinctions:
1985 Hans Gram Medal, Royal Danish Academy of Sciences and Letters
1992 Nils Rosén Linné Prize in Botany, Royal Physiographic Society, Sweden
1999 Honorary Vice President for the XVI Intern. Bot. Congr., St. Louis, USA
1999 Honorary doctor (filosofie doktor honoris causa), University of Uppsala, Sweden.
2003 Honorary foreign member of the Linnean Society of London
2003 “Excellent researcher 2003” award from the Swedish Research Council
2005 Rolf Dahlgren Prize in Botany, Royal Physiographic Society, Sweden
2007 “Geologist of the year” appointed by the Swedish Association of Scientists
2009 Corresponding Member, Paläontologische Gesellschaft, Germany
2012 Denmarks Geology Prize 2011 from the Geological Survey of Denmark and Greenland
(with Kaj Raunsgaard Pedersen)
2014 Stora Linnémédaljen i Guld – Linneus gold medal from the Royal Swedish Academy of Sciences
("för hennes epokgörande forskning rörande blomväxternas uppkomst och tidiga evolution” – “for her groundbreaking research on flowering plants origin and early evolution”)
2023 Honorary Member, Portuguese Paleontological Society
2023 Lapworth Medal, The Palaeontological association

Other distinctions
2015 Ledamot av Nordstjärneorden 1. Klass (Knight 1st Class of the Order of the Polar Star)

Teaching: General palaeontology, universities of Århus and Stockholm; seed plant phylogeny and angiosperm evolution, universities of Stockholm, Uppsala, and Zurich, Kunming Botanical Institute (one course); Nanjing Institute of Geology and palaeontology (one course)

Publications

Popular science and conference proceedings not included


Friis, E.M., Crane, P.R., Pedersen, K.R., Marone, F., 2022. Synchrotron radiation X-ray tomographic microscopy datasets for multipartite and cupulate flowers from Early
Cretaceous mesofossil floras of Virginia, USA. PSI Public Data Repository, https://doi.org/10.16907/721beb60-0db2-4875-93bb-5329d52f68ac


**Introductory chapters to special issues**


Botanical Society of America Professional Conduct Disclosure Form

Completed by (your name) Susanne S. Renner
In reference to (nominee’s name or speaker’s name) Else Marie Friis
Your relationship to nominee Admirer from a distance

Circle one answer for each statement)

To the best of my knowledge,

1. Yes       No     Abstain  I attest that the nominee has strong scientific integrity.
2. Yes       No     Abstain  I attest that the nominee treats students, mentees, staff, and colleagues
   with professional behavior, both within and outside the discipline of Botany.
3. Yes       No     Abstain  I attest the nominee does not practice nor allow discrimination or
   harassment in any form, and when they perceive it in the action of others, they take appropriate
   corrective steps.
4. Yes       No     Abstain  I attest the nominee has not been the subject of a filed allegation,
   complaint, investigation, sanction or other legal, civil or institutional proceeding, where there
   was a finding of misconduct, nor are they currently the subject of such an allegation, complaint,
   or investigation in which their professional conduct is at issue.

By completing this form, I consent to being contacted for follow up questions.

SIGNATURE_______________________ Susanne Renner ___________ DATE 25 Jan 2024 _____________

Preferred contact information (phone or email): srenner@wustl.edu

___________ I request to be contacted soon by a member of the search committee to further discuss any
of my answers or any concerns about the nominee.

(For Award Self Nominations Only)
I affirm that I have read, understand, and agree to abide by the Botanical Society of America Guidelines
for Professional Ethics https://botany.org/home/governance/guidelines-for-professional-ethics.html. By
signing this document, I certify that, to the best of my knowledge, the above response and all
information provided by me related to this Professional Conduct Disclosure Form are truthful, accurate,
and complete, and I agree to notify BSA promptly of any material changes required in my responses to
the above question. I acknowledge that failure to comply with BSA’s policies may result in my ineligibility
to receive, or revocation of, any BSA award, honor, other type of BSA recognition, or governance
position, and is grounds for potential sanctions against me.

SIGNATURE_______________________ Susanne Renner ___________ DATE 25 Jan 2024 _____________