

IOP NEWSLETTER 18

INTERNATIONAL ORGANIZATION OF PALAEOBOTANY

INTERNATIONAL UNION OF BIOLOGICAL SCIENCES
-SECTION FOR PALAEOBOTANY
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PLEASE MAIL NEWS AND CORRESPONDENCE TO YOUR REGIONAL REPRESENTATIVE OR TO THE SECRETARY FOR THE NEXT NEWSLETTER 19. The views expressed in the newsletter are those of its correspondents and do not necessarily reflect the policy of IOP.

IOP NEWS

IOP CONSTITUTION

Our Leningrad constitution has recently been revised by the Executive Committee and is available for inspection on request to the secretary. The final revision will be presented to the next IOP General Assembly for acceptance.

PAYMENT OF DUES

The list of members, addresses and payments was revised in the computer during May 1982. Print-outs of this are, as usual, available free of charge on request to the secretary. If your address label shows the wrong payment date in the lower right hand corner this may be due to delays in receiving the information. If you know that you have not paid for this year please send US\$6 to your regional representative immediately.

IOP is a Section of the International Union of Biological Sciences, which publishes a news magazine called Biology International. Number 5 was published in June 1982 and includes an article by J.R. Vallentyne: "A New Approach to Membership Dues' Schedules for Use by International Organizations". The implication is that IOP should consider adopting Vallentyne's proposals. They are based on a formula:

where x_i is dues of an individual member nation, X is the sum of the dues of member nations, P_i is physiological energy consumption of member nations in D-units,

$$x_i = a + \frac{(bP_i + cT_i)(X-ka)}{\sum bP_i + \sum cT_i}$$

- T_i is technological energy consumption of an individual member nation in D-units,
 a is the basic component of the dues schedule applicable to each member nation, expressed in a standard currency,
 b is a population modifier,
 c is a technology modifier, and
 k is the number of member nations.

Copies of the full article can be obtained from the IOP secretary, which, together with the print-out of our membership, will enable members to make the necessary calculation. Meanwhile, the IOP Executive has approved the suggestion to increase dues to US\$8.00 from 1983.

REPORTS OF RECENT MEETINGS

ASSOCIATION POUR L'ÉTUDE TAXONOMIQUE DE LA FLORA D'AFRIQUE TROPICALE
 The 10th Congress of AETFAT was held in South Africa in January 1982 and included a two day symposium on the origin, evolution and migration of African floras. Invited speakers presented an overview of the present state of knowledge of the evolution of African floras and vegetation, particularly as a result of continental drift and climatic change.

In the keynote address, Dr P. Raven (USA) reconciled the theory of past continental movements and plate tectonics with present day flora distributions particularly of the southern hemisphere. By this means trans-oceanic affinities and discontinuities between Africa and Australia and South America can be explained. The unicellular organisms of the Precambrian fossil flora were discussed by Dr H. Knoll (USA), the pteridophytes and gymnosperms of the Silurian to Cretaceous periods by Drs J.M. and H.M. Anderson (RSA) and the angiosperms of the Tertiary by Dr J.A. Coetzee (RSA) and Prof E. Boureau (France). The angiosperms of the Quaternary in southern Africa were dealt with by Prof E.M. van Zinderen-Bakker (RSA) and north tropical Africa by Dr J. Maley (France). Dr J. Vogel (RSA) dealt with isotope methods for obtaining evidence for past climates and vegetation in South Africa.

SYMPOSIUM ON PALEOBOTANY & PALYNOLOGY, Romania, 1980.

This was organised by the department of Geology at the University of Cluj-Napoca, and attracted more than 80 participants. The abstracts have recently been published in a 119 page volume, price 13.00 lei. Write to Dr O. Dragastan, at the university.

FORTHCOMING MEETINGS

PALAEOBOTANICAL CONFERENCE, Montpellier, France, July 1983.

IOP is sponsoring this international meeting, and all members should by now have received copies of the first circular and the registration form. The accomodation and meals are really cheap and are being provided in the university halls of residence. The intention is not to organise a luxurious meeting, Versailles-style, but rather to bring together as many palaeobotanists as possible with a maximum of young people. For further details write to: Dr J. Galtier, Laboratoire de Paleobotanique, Université des Sciences et Techniques du Languedoc, Place E. Bataillon, 34060 Montpellier.

PALYNOLOGY OF TERTIARY FLORAS OF WESTERN N. AMERICA, San Francisco, October 25th, 1983.

This symposium is to honour Dr Harry D. MacGinitie and will take place at the Airport Hilton Hotel as part of the 16th annual meeting

of the American Association of Stratigraphic Palynologists. Papers are now being invited from palynologists who have recently investigated the pollen and spore floras of western Tertiary formations which have also produced described megaflores. The one-day symposium is being organised to honour and recognize the work of 'Mac', who has contributed so much to western Tertiary palaeobotany and palynology. It will specifically emphasise palynology of the floras which have been monographed by Dr MacGinitie, but papers describing other Tertiary palynoflores are also invited and welcome. Currently scheduled are papers on the following palaeoflores: Green River, Chalk Bluffs, Chuckanut, Kilgore, Weaverville, Bridge Creek, Succor Creek, Clarkia, Latah, Yellowstone, Florissant and Elsinore. "Mac" himself will also be giving a paper on his continuing work on the Eocene Wind River Flora.

Authors should submit a title and brief abstract before June 15th 1983, in order to be included in the final programme. Consideration will be given to all papers and those most appropriate to the theme of the symposium will be given preference. Remaining titles submitted will be considered for inclusion on the general AASP programme. Write to one of the convenors: Dr L.H. Fisk, Department of Geological Sciences, Loma Linda University, Riverside, California 92515, or Dr E.B. Leopold, Department of Botany, University of Washington, Seattle, Washington 98195, USA.

INTERNATIONAL PALEOBOTANICAL CONFERENCE, Edmonton, August 1984. IOP is sponsoring this second international conference that is tentatively scheduled for August 18-24 1984. The first circular has recently been issued to all IOP members. Write to Dr R.A. Stockey, Department of Botany, University of Alberta, Edmonton, Alberta, Canada T6G 2E9.

27th INTERNATIONAL GEOLOGICAL CONGRESS, Moscow, August 1984. The first circular of this conference has recently been published and is available from the Organising Committee of the 27IGC, Institute of the Lithosphere, 22 Staromonetny, Moscow 109180, USSR. Two of the Sections are of particular interest to IOP members:
C.01. Stratigraphy includes topics on the correlation of sediments belonging to different facies zones and biogeographical provinces, the Precambrian/Phanerozoic boundary, the Permian system and palynostratigraphy.
C.02. Palaeontology includes topics on early stages of organic life, palaeoecology and the evolution of ecological systems, florogenesis and continental history.

RECENT AWARDS

(This new section of IOP Newsletter hopes to attract details of new funding for palaeobotany projects. Please send details from your region to be included in the next edition. For a start, here is an extract from the recently published UK Natural Environment Research Council list of Studentship awards for 1982.)

The Lower Carboniferous flora of the Drybrook Sandstone, Forest of Dean, Gloucestershire. Dr K.C. Allen, Bristol.
 Palaeolatitude study of pollen evidence for Cretaceous angiosperm origins (CASE award with Robertson Research International Ltd). Dr N.F. Hughes & Mr J.F. Laing.
 Megaspores, coal facies and palaeoecology for correlation of Upper Carboniferous coal seams. A.C. Scott, London.
 Revision of Lower Cretaceous Bennettitalean plants from England, Germany and USA (CASE award with British Museum). J. Watson & C. Hill.

Sedimentology and floral palaeoecology of an Upper Carboniferous lake fill in central Spain. R. Wagner & E. Spinner, Sheffield.

WHAT IS THE SINGULAR OF RHACHEIS?

Scientific terminology often is derived, or borrowed, from classical Greek and Latin. The phonetic value of the letters of the Greek alphabet differed from those in the Latin, and this is why the Greek rho is transliterated as "rh", the phi as "ph", etc. If in a text Holmes writes about phyllophores (and not fillofores), he properly should write rhachis; "rachis" looks more like it was written by 'Olmes.

In order to determine what declension must be applied to find a plural of a Greek word, one must know the genitive of a word (from which the stem can be found). Thus Holmes found in his Greek dictionary "rhachis, gen. -ios Att. -eos"; this indicates that one deals with a vowel stem of the third declension, according to which the plural is "rhacheis" (following the sample of polis, which means city). However, raphis (needle) has a genitive raphidos, and thus has a consonantal stem of the third declension; the plural is raphides (following the sample of patris which means father-land). Of course, English dictionaries don't give genitives, but plurals of each entry.

Holmes' one scholar knew Greek; the other scholar? assumed a consonantal stem for rhachis. Good guess, but no cigar.

One reasonably could latinize rhachis; assuming that it would follow civis in its declension, one could defend a plural of (latinized) "rhaches". However, if one wants to remain puristically Greek, the plural is "rhacheis". If one cares little about languages, I guess rhachis looks similar enough to radish, to make a barbarian plural rhachises.

J. JANSONIUS, Calgary, Alberta, Canada.

Trichopitys, Medullopteris & Autunia REVISITED

During my stay in France in May 1982 I had an opportunity to scrutinize the originals of Trichopitys heteromorpha Sap. and Medullopteris pluckenettii (Sterz.) Krysht. et Nov. in the Université Claude-Bernard at Lyon and Autunia (formerly Cycadospadix) milleryensis (Ren.) Krasser in the Museum National d'Histoire Naturelle at Paris. Trichopitys is represented by "specimen A" described by Florin (1949, Acta Horti Bergiani, 15: 79-109, Pls. I, II, III, Fig. 4). "Specimen B" of Florin is missing. Florin held that the three-dimensional axillary seed-bearing organs are homologous to seed-bearing stalks of Ginkgo. Previously I suspected that Florin's description and reconstruction of Trichopitys is erroneous, because its fertile organs are externally similar to those of Biarmopteris (associated with Mauerites leaves) having planated nature and seeds attached abaxially and subapically. Leaves of Mauerites combine pinnate (as in Callipteris and Rhaphidopteris) and palmate (as in Trichopitys and Sphenbaiera) segmentation. My suspicions have proved to be justified. Fertile axillary shoots of the specimen A are clearly planated. Their lateral seed-bearing outgrowths bear longitudinal ribs suggesting acute lateral edges.

The outgrowths are not decurrent and do not overlap their bearing axis as they should in three dimensional organs. The terminal widenings cannot be treated as inverted seeds. The lateral outgrowth grades into the widening on both compression (faced to the observer) and imprint (on the matrix). A distinct boundary between the widening and its bearing outgrowth cannot be seen on either side. This means that the widenings do not overlap the outgrowths and cannot be treated as inverted seeds. I do not think, however, that they are atropous seeds, because in one case I observed a faint, but distinct, seed contour obliquely overlapping the widening. I am convinced that the widenings are seed-bearing organs and that the fertile organ of Trichopitys is basically similar to fertile fronds of Biarmopteris differing only in a lesser degree of segmentation (in Biarmopteris the frond has a forked rachis and its fertile appendage may be forked). The seed bearing organs of Trichopitys and their subtending leaves are arranged along the margins of the main axis of the shoot. The latter is striated longitudinally and bears no traces of axillary complexes attached between marginal ones. In other words, the two-ranked arrangement of axillary complexes is suggested. The planated nature of sterile Trichopitys shoots having longitudinally striated rhachis is well seen in a specimen at the exhibition of the Museum in Paris. It is true that another specimen at the exhibition bears clearly spirally attached dichotomising leaves. The generic affinity of the latter specimen should be checked, though. Thus, I hold that that fertile shoot of Trichopitys consists of a main axis with two-ranked(?) arrangements of the axillary complexes consisting of planated pinnate seed-bearing organs (cladosperms) with sub-apical and abaxial (by analogy with Biarmopteris) seed attachment, and dichotomously segmented subtending leaves. The fertile portion of the axillary complex is nearly the same as the reduced fertile frond associating the Supaia (Mamay, Watt, 1971). The latter genus was convincingly affiliated with Callipteris (Haubold, 1981). On the other hand, Mauerites also shows similarity to Callipteris. The combination of pinnate and palmate segmentation characteristics for Mauerites is observed in Dichophyllum-moorei Elias, which was placed into Callipteris by W. & R. Remy. I am inclined to regard Trichopitys, Callipteris and Mauerites as closely related plants.

Probable female fructifications of the Autunian Callipteris, according to Barthel (in Haubold et al., 1982), belong to the genus Autunia. I saw only one original of Autunia. Renault's drawing of it is accurate. Unfortunately it is difficult to understand the mode of seed attachment. The seeds associating with Autunia were depicted by Renault erroneously. He took a fissure to be the apical notch. Careful uncovering of some seeds has shown that their apex bears two rather long horns which are often torn. The seeds are platyspermic and resemble those associating with Eremopteris (Delevoryas, Taylor, 1969). I believe that Eremopteris (together with Pteridozamites) can be ancestral to Callipteris. At the same time, I agree with Barthel that Callipteris can also be affiliated with those Callistophytales, the female fronds of which belong to Medullopteris pluckenettii. Grand'Eury's drawing of such a frond was repeatedly reproduced in the literature. Inspection of his specimens convinced me, however, that he presented

a reconstruction instead of a real specimen. In none of his specimens can one recognise the outline of seed-bearing pinnules because they are overlapped by seeds. The latter are platyspermic and resemble Callospermarion as figured by Stidd, Hall and Rothwell. Small swelling in some seeds suggests that secretory organs were usually present in the callistophytans. The contour of the seed-bearing pinnules is seen only in two small fragments where seeds have been shed and have left accurate oval scars near the apex. The fertile pinnules are reduced and are linear in outline. Thus the fertile pinna of the last order is basically similar to Biarmopteris, Trichopitys and the fertile fronds associating with Supaia. The present study, albeit preliminary, allows the following hypotheses to be maintained: (1) seed-bearing fronds of Stephanian callistophytans have already undergone certain reduction, (2) Middle Carboniferous Eremopteris and Pteridozamites may belong to the Callistophytales, (3) Autunian Callipteris together with Mauerites and Biarmopteris, Trichopitys and Supaia, are closely related to Callistophytales and form a natural plexus of genera, (4) this plexus comprises plants producing either pinnate (fern-like) or digitate (ginkgoalean-like) leaves. This provides additional support for the view advocated by me elsewhere (IOP Newsletter 15, 1981, 9: Zhurnal Obshchei Biologii, 42(3), 1982, 303-323) that the Ginkgoales originated from the Peltaspermales or their allies.
S.V. MEYEN, Moscow.

NOMENCLATURE

Those contemplating the outstanding issue of palaeobotanical nomenclature - Storch's proposal to change the starting point for fossil plants back to Schlotheim's Petrefaktenkunde of 1820 - may have realised that this is the 150th anniversary of his death. This is celebrated with a four page illustrated biography in the latest edition of Natur und Museum, March 1982, Band 112, Heft 3, published by the Senckenberg Museum: W. Langer, Ernst Friedrich von Schlotheim (1764-1832) Zur Erinnerung an seinen 150. Todestag.

Some palaeobotanists are frustrated by the operations of the Committee for Fossil Plants of the IAPT. But zoological nomenclature is organised through an International Commission on Zoological Nomenclature. The IOP secretary has recently received a glossy circular asking for a contribution to the funds of the Trust which is associated with the Commission. It includes a draft budget for 1981 which quotes salaries for a "Scientific Controller £22,870, Assistant Zoologist £13,070, Secretary £8,160" and £26,400 for other expenses.

Copies of the circular, with a Deed of Covenant attached, can be obtained from the International Commission on Zoological Nomenclature, c/o British Museum (Natural History), Cromwell Road, London SW7.

OBITUARIES

PROFESSOR CHARLES HEBANT As a previous student of Louis Grambast, Charles was a researcher in the field of Plant Evolution and an outstanding specialist of Bryophytes. He was the author of a book: "The Conducting Tissues of Bryophytes" which is the first and only comprehensive review of this subject.
J. Galtier, Montpellier.

PROFESSOR ERIC HULTEN was head of the Department of Botany at the Stockholm Riksmuseum from 1945 - 1961 and died on February 1st 1981 at the age of 86. Being for some decades the leading expert of circumboreal floras, Hulten always worked under the perspective of historical plant geography. In his doctor's thesis: "Outline of the history of Arctic and Boreal biota during the Quaternary period" (1937), he put forward the theory of the equiformal progressive areas of present plant species, at the time of its appearance characterised by L. von Post as an egg of Columbus. Several publications by Hulten contain discussions of phytogeographic connections in the past, and the presence or absence of land bridges between the northern coasts of the Pacific and the Atlantic during Quaternary or Late Tertiary times. Thus, the conception of "Beringia" goes back to Hulten's thesis, and the INQUA-volume on "The Bering land bridge" (1967) was dedicated by its editor, D.M. Hopkins, to the Swedish botanist (and an American colleague).

Eric Hulten brought together a large archive of phytogeographic maps in the Riksmuseum. Presenting this in an article in Svensk Botanisk Tidskrift in 1954, he wrote as follows: "We have 'Index Londinensis' as a registration of the botanical illustrations, but there is no work in existence listing the distributional maps of plants."

Fifteen years later such an index was initiated by Hulten's pupil and former assistant, Hans Tralau, on the basis of his map archive, and named "Index Holm(i)ensis". After the deaths of Hulten and Tralau the Index is still being continued on a wider basis under the leadership of Professors Magnus Fries and Bertil Nordenstam. The 5th volume (Dicotyledoneae C) appeared in 1981, edited by the Swedish Natural Science Research Council.

B. Lundblad, Stockholm.

TORE LINNELL died on March 22nd 1979, aged 76. His active period of research fell in the late twenties and in the thirties, when he published papers on the genera Sphenozamites and Scytophyllum ("Zur Morphologie und Systematik triassischer Cycadophyten", Svensk Bot. Tidskr. 26-7, 1932, 1933) and studied Tertiary wood of the Taxodioxyton type from southern Sweden (Sveriges Geol. Unders., C, 406, 1936, and Svensk Bot. Tidskr. 30, 1936). Linnell carried out these studies in the Palaeobotanical Department of the Stockholm Riksmuseum, where he occasionally acted as a substitute for Dr R. Florin. Linnell obtained a PhD at the University of Stockholm in 1933, and was for decades a beloved teacher of biology of some of Stockholm's schools. He did much for the popularisation of biology in our country, and was particularly known for his activities in the Swedish Association of Teachers of Biology. Linnell leaves the memory of a bright and jovial personality.

B. Lundblad, Stockholm.

ERIK NORIN died on January 16th 1982. Between 1945 and 1961 he held one of the chairs of Geology at the University of Uppsala, Sweden. He is best known for his outstanding contributions to the knowledge of the geological structure of Central Asia. Norin came to China in 1920, and was first connected with the Sino-Swedish Institute at Taiyuanfu, Shansi. Later on he was invited by the famous explorer Sven Hedin to join his expeditions in Asia, acting as chief geologist to the Scientific Expedition to the north western Provinces of China 1927-1935. By supervising the collecting of fossil plants, in particular from the Permian Shihhotse Formation, Norin played an important part in Chinese palaeobotany. He thus provided part of the material described by Thore G. Halle in the monograph "Palaeozoic plants from Central Shansi" (1927), in all 184 packing cases, studying

himself for the plant bearing section from a lithological-stratigraphical point of view. As a result of these activities, Norin's name has become attached to the genus Norinia Halle, and to several species, for instance the pteridosperm Alethopteris norinii (Halle 1927, 1929). A critical summary of the work of the Swedes on the Taiyuan stratotype was given by Xingxue Li & Zhaoqi Yao in "An outline of recent researches on the Cathaysia flora in Asia", published for the first conference of IOP at Reading in 1980. B. Lundblat, Stockholm.

NEWS OF OTHER ORGANIZATIONS

INTERNATIONAL ASSOCIATION OF ANGIOSPERM PALEOBOTANY

An IAAP newsletter, volume 7, number 1, was published in June 1982 and includes a long history of the association. There is also a questionnaire asking if members feel that IAAP should or should not be disbanded.

Copies are available from Bruce Tiffney, IAAP Treasurer, Department of Biology, Yale University, PO Box 6666, New Haven, Connecticut 06511, USA.

COMMISSION INTERNATIONALE DE MICROFLORE DU PALEOZOIQUE

Newsletter 28 was published in May 1982. The Secretary General is Dr B. Owens, Institute of Geological Sciences, Ring Road Halton, Leeds LS15 8TQ, England.

NEWS OF INDIVIDUALS

JACK DOUGLAS of the Geological Survey of Victoria has recently moved to a new building: 140 Bourke Street, Floor 4, Melbourne 3000, Australia.

LEO HICKEY has moved from the Smithsonian Institution to: The Peabody Museum of Natural History, Yale University, 170 Whitney Avenue, P.O. Box 6666, New Haven, Connecticut 06511, USA.

SERGIO ARCHANGELSKY can be contacted c/o Luis Ballester, Conde Altea 2, 24 - Valencia - 5, Spain, as well as at his normal address in Argentina.

ANNIE SKARBY has been working with the well-known photographer Lennard Nilsson to make a photo-reportage of the Late Cretaceous flowers and other fossils from Scania. Some pictures have been published in Stern, Paris Match, the Sunday Telegraph Magazine and other newspapers. Last Christmas Day they worked at the scanning electron microscope from 9.00hrs until 21.00hrs.

SERGIUS MAMAY will be retiring shortly. His address is 8001 Carita Court, Bethesda, Maryland 20817, USA.

YRJO VASARI has moved to the Department of Botany, University of Helsinki, Fabianink. 24, SF-00100, Helsinki 10, Finland.

TOM HARRIS takes up the newly created Birbal Sahni Professorship at the Institute in Lucknow, from October 1982 to March 1983. He gives the Sahni Memorial Lecture in November.

BIBLIOGRAPHY

BIBLIOGRAPHY AND INDEX TO PALEOBOTANY AND PALYNOLOGY

1971 - 1975 375pp to be published at the end of 1982

This second part consists of one volume with about 15,000 references. Send 250 Swedish kroner or US\$46 to: The Publishing House of the Swedish Research Councils, FRN, Box 6710, S-113 85 Stockholm, Sweden.

The first part of this work is still available. It covers the world literature from 1950 - 1970 and was compiled and edited by the late Hans Tralau at the Swedish Museum of Natural History; there are approximately 25,000 references. The price of the first part is 350 Swedish kroner or US\$64.

As a special offer the Publishing House is selling both bibliographies, 1950-1970 and 1971-1975, at a special price of 500 Swedish kroner or US\$91.

INTERNATIONAL BIBLIOGRAPHY OF PALEOBOTANY & PALYNOLOGY FOR 1981

This was compiled by H.W. Pfefferkorn & W.H. Gillespie in March 1982, with special assistance from the West Virginia Department of Agriculture. There are 66 pages, and the references are arranged stratigraphically.

Write to: Dr H.W. Pfefferkorn, Department of Geology D4, University of Pennsylvania, Philadelphia, PA 19104, USA.

BIBLIOGRAPHY OF AMERICAN PALEOBOTANY 1981 with international appendix. This is compiled under the auspices of the Paleobotanical Section of the Botanical Society of America by A.D. Watt, Geo Ref, American Geological Institute, Falls Church, Virginia, USA.

It includes a retyped appendix of the international bibliography mentioned above. There is a total of 141 pages.

This is the last such bibliography to be compiled by Art Watt. Future editions will undoubtedly be simplified to accommodate the extra information of the international appendix.

BIBLIOGRAPHY OF JAPANESE PALAEOBOTANY 1877 - 1980

This is compiled by T. Kimura (Department of Astronomy and Earth Sciences) in the Bulletin of Tokyo Gakugei University, Section IV, Mathematics and Natural Sciences, Volume 33, August 1981.

The references are arranged alphabetically by the authors' names. There are 43 pages.

REPORT ON BRITISH PALAEOBOTANY & PALYNOLOGY 1980-1981

The latest edition of this work is compiled by W.G. Chaloner & G.T. Creber, and was printed in May 1982. The 41 pages have the references arranged in the usual stratigraphic order. Send £2, negotiable at a London Bank, and payable to "Bedford College", to Botany Department, Bedford College, Regent's Park, London NW1.

BOOK REVIEW

THE CORRELATION OF HETEROFACIAL UPPER PERMIAN SECTIONS OF THE NORTH EUROPEAN PART OF THE USSR. L.M. Varyukhina, G.P. Kanev, N.A. Koloda, V.A. Molin & L.A. Fefilova. 1981. Leningrad, Publ. Office "Nauka", 160 pp., 24 pls., 2 roubles, 90 kopeks.

On the basis of plant megafossils (studied by Fefilova), miospores (studied by Varyukhina and Koloda) and bivalves, the Permian

sections of the Fore-Uralian foredeep, Pechora and Mezen syncline are correlated. The stratigraphic part of the book contains descriptions of key sections with detailed data on their fauna and flora. A separate chapter is devoted to the history of the fauna and flora development in the area. There are 5 plates of plant megafossils and 14 of miospores. The most important are two plates depicting plant megafossils from the Ufimian stage in the stratotype area. Most of the plants from there are figured in the literature for the first time (Intia, Sylvopteris, Permotheca, Rufloria etc).

S.V. MEYEN, Moscow.