INTERNATIONAL UNION OF BIOLOGICAL SCIENCES SECTION FOR PALAEOBOTANY

IOP NEWSLETTER 66

MAY 1999

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PLEASE MAIL NEWS AND CORRESPONDENCE TO YOUR REGIONAL REPRESENTATIVE OR TO THE SECRETARY FOR THE NEXT NEWSLETTER 67.

The views expressed in the newsletter are those of its correspondents and do not necessarily reflect the policy of IOP.

EDITORIAL

There has been a lot of talk and writing in the British media recently about evolutionary biology, and with modern methods of communication the same messages must have been picked up elsewhere. It's been stimulated by the publication over the last few months of lots of popular books on the subject: Gould, Dawkins, Eldredge, Pinker, Fortey, Ward, and so many others are doing good work to popularise our interests. The climax to it all must have been last week when a book was published reviewing the other books of the Darwin Wars.

There is talk of global changes in atmosphere, sea level, temperature, and of the response to these by animals and plants. Because each of these variables is changing, time-series are central sources of evidence. Palaeontology has become sexy. But hold on before you get too excited about our importance. Where is all the palaeobotany in this?

Good work was done last weekend at the Linnean Society, with a conference about climate change. Evidence from fossil plants occupied the whole of the Saturday morning when there was much talk of cores through wood, ice and lake sediments. They showed changes since 1950, let alone from the K-T boundary. There's more being described from other sources.

More recent breakthroughs are basic texts on the same kind of application of multidisciplinary palaeobiology. They're not palaeobotany as most understand that, and they're nothing else traditional either. Moore and Chaloner's Climate Change was one of the first with evidence from pollen diagrams, atmosphere changes and the like. But I wonder how many of you have known about it. I didn't until last week, the newsletter wasn't sent a review copy: no review, no palaeobotanical push.

Now we have a contribution which strikes me as a pinnacle of palaeobotanical application (though I had to ask for a review copy): Peter Skelton, Bob Spicer and Allister Rees have modestly put together a brilliant display of how our subject can interest and serve others. They are modest because this Open University second level course text, for the course S269 Earth and Life is entitled Evolving Life and the Earth. ISBN 0 7492 8185 5. That's all, no price, no supplier, and I tell you it's hard to get, let alone buy, from bookshops.

All of us should be sent on a course in Public Relations. Dilcher and Sun get on the front cover of *Science*, itself hardly populist, but most of us are obscure, secretive, hidden. Let's join the twentieth century before it's too late, or if you think we're there already, show it to this newsletter.

M.C. BOULTER, London

FORTHCOMING MEETINGS

THE SECOND ROMANIAN SYMPOSIUM ON PALAEONTOLOGY Cluj Napoca in Transylvania, Romania, 1–3 October 1999.

The first Circular of the scientific session comparises 9 sections, one of Palaeobotany & Palynology all colleagues and friends of Palaeobotany will be warmly invited and appreciated. For more information please contact Professor. Dr. Ioan Bucur, the Secretary of the Organising Committee, University Babes – Bolyai, Cluj Napoca, Str. M. Kog

THIRD INTERNATIONAL SYMPOSIUM ON EXTANCT AND FOSSIL CHAROPHYTES Nanjing, P. R. China, October 16 - 20, 2000

The Symposium is open to any aspect of Charophyte research. Provisional themes :

1. Classification and position of Charophytes in the plant kingdom;
2. Evolution and global events;
3. Fossil assemblages and their international correlation;
4. Ecology and Palaeoecology;
5. Molecular and Reproductive biology & population genetics;
6. Ultrastructural studies;
7. Origin of living genera;
8. Identification of fossil genera;
9. Suggestion on international cooperative studies;
10. Free themes.

Organizer:

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14TH INTERNATIONAL CONGRESS ON THE CARBONIFEROUS AND PERMIAN

I have been asked by the organizing committee of the 14th International Congress on the Carboniferous and Permian to organize a paleobotanical program for Carboniferous macrofloras. Ben LePage (University of Pennsylvania) is organizing the program for Permian floras.

I suggest and encourage colleagues to additionally consider presenting papers on Carboniferous plant systematics *(thoughts, state-of-the-art, promising methods, caveats...) on:

- methods of chemotaxonomy, (2) cuticles, (3)fractal taxonomy, and (4) on tracking
- atmospheric CO2 changes during the Carboniferous, using methods of stomatal density/index.

I would also like to extend my cordial invitation to graduate students to present their latest research results!

The conference is to be held at the University of Calgary, Alberta, Canada T2M 4S7 (e-mail: **Henderson@geo.ucalgary.ca** or Fax: 403-284-0074

INTERNATIONAL BOTANICAL CONGRESS - PALEOBOTANICAL FIELD TRIP. FT 18 Southwest/Petrified Forest, New Mexico/Arizona, USA. August 1999.

Trip begins Sunday, August 8, 1999 at Sheraton Old Town Hotel, Albuquerque, New Mexico at 4:00 p.m., returns Friday, August 13, 1999 at 8:00 a.m.

Limited to 29 participants Cost $820 double; $1,020. single; includes ground transportation, lunch for five days, beverages, accommodations for Saturday, Sunday, Monday, Tuesday and Wednesday, a guidebook and park entrance fee.

PermoTriassic Floras of New Mexico and Arizona. This trip will present an unparalleled opportunity for the participants to examine several Late Carboniferous/Permian and Upper Triassic fossil plant localities in the scenic southwestern United States. The party will visit two localities containing non-peat forming Carboniferous/Permian floras in central New Mexico near Albuquerque. After the Paleozoic collecting is completed, the party will travel to Gallup, the Indian Capital of New Mexico. Participants will also visit several localities in the Upper Triassic Chinle Formation, plus an old cowtown in east-central Arizona. The Petrified Forest National Park will be explored and a visit to the capitol of the Navajo Indian Nation will be included. The trip will conclude with a banquet at the New Mexico Botanic Garden. Participants must be in good physical condition as there will be moderate hikes in rough terrain with some climbing at an elevation of about 1600 m. Hot weather (35-40C/90-105F) is to be expected, along with brief thundershowers. There will be adequate opportunities to collect at most localities and to view cultural attractions, as well as discussions of the local high desert floras and the geology of the area.

Trip leader: Sid Ash, 1708 Quail Run Court NE, Albuquerque, New Mexico 87122 USA; Ph: 505/856-5852; e-mail: sidash@aol.com

S. ASH, New Mexico, USA

NEWS OF A NEW PROJECT

Kate Gregory (Lamont Doherty) and Jack Wolfe (U. Arizona) embarked on a project funded by NSF to analyze late Paleocene-early Eocene floras from southern British Columbia and adjacent Washington. These analyses are to provide paleoaltitudinal estimates for the interior region through this time interval to constrain geophysical models. In the last two decades, the development of new geophysical theory suggests that a terrain such as interior southern British Columbia, because of pressure built up by the North American Plate pushing westward, underwent (1) crustal thickening with concomitant altitudinal increase, (2) melting of the lower part of the crust and consequent movement upward of intrusives, some of which also reached the surface as extrusive volcanics, (3) with increased crustal thickening, the "root" of the pile totally melts and drops downward, thus releasing the upper part of the crust to "bounce" to an even higher altitude and even greater extrusions, and (4) the initiation of crustal extension (shown by many normal faults that tend to create grabens) and consequent decrease in altitude. Gregory and Wolfe collected fossil floras that appear to represent stages 1 through 3, and the stage 4 floras represent such well known floras as the Republic of northeastern Washington and the Princeton of British Columbia. Preliminary analyses also suggest that the flora of these uplands witnessed a very rapid diversification of temperate ("arcto-tertiary") lineages; the older stage 1 flora largely contains archaic lineages of Taxodiaceae and trochodendroids, while the stage 4 flora, which has diversity a magnitude greater, contains a flora of much more modern aspect (e.g., Pinaceae, Fagaceae, Ulmaceae, Rosaceae, Tiliaceae). This change occurred in perhaps only 3-4 Ma.

J. A. WOLFE, University of Arizona, US

WHAT DO YOU WANT TO HEAR FROM IOPC-VI AND THE NEW CENTURY?

As IOPC-VI in 2000 is drawing near, I am often reminded that the Second International Mathematicians Congress (IMC) held in Paris in 1900 is surely an important event of mathematical history. It is Professor David Hilbert (1862 - 1943) who presented a total of 23 notorious topics at the IMC, which is not only included all the research areas of his time but also had influential effect on the historical process of mathematics in the whole 20th century.

We belong to this century. And also, we will belong to the next century. I think we are very lucky to have a change to attend IOPC-VI in 2000, which serves as a special forum to retrospect the long passage of palaeobotanical studies in the world and prospect the research directions before us. Those from all over the world who are concerned about the fate of palaeobotanical causes both in global sense and in regional sense, will get together to discuss interdisciplinary subjects, initiate feasible collaborative programs and confront increasingly worsening financial challenges. The most important is that IOPC-VI is avidly expected to have a lot of attendance of young students and beginning palaeobatanists, who will, hopefully, become cream of palaeobotanical circle in the coming century.

Hilbert's voice at the IMC in 1900 often echoes in mathematics realm, "THE AUTHORS OF MATHEMATICS ARTICLES WILL OUTNUMBER THEIR READERS. NEW CENTURY WILL BESTOW TALENT INDIVIDUALS AND GURUS ON MATHEMATICS", which might be conveyed to pray for the future of palaeobotany.

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Nov.14, 1998 Beijing

PAGE INDICES AVAILABLE FOR PALEOBOTANICAL MONOGRAPHS

Some classic, commonly cited, monographs on Tertiary floras in the northern hemisphere were originally published without index to pages. Taxonomic indexes are now available for the volumes listed below, through the courtesy of clerical help at the Florida Museum of Natural History.

Friis, E.M., 1985 Angiosperm Fruits and Seeds from the Middle Miocene of Jutland (Denmark). Biologiske Skrifter 24.

Hickey, L.J. 1977. Stratigraphy of the Paleobotany of the Golden Valley Formation (Early Tertiary) of Western North Dakota. Geol. Soc. Amer. Memoir. 150.

MacGinitie, H.D. 1969. The Eocene Green River flora of northwestern Colorado and northeastern Utah. Univ. Calif. Pub. Geol. Sci. 83

MacGinitie, H.D. 1974. An early Middle Eocene flora from the Yellowstone-Absaroka Volcanic Province, Northwestern Wind River Basin, Wyoming. Univ. Calif. Pub. Geol. Sci. 108

Tanai, 1961. Neogene Floral Change in Japan. J. Fac. Sci. Hokkaido Univ. Ser 4 Geol. and Min. 11 (2).

If you desire a free copy of the taxonomic index for any of the above listed references, contact Steve Manchester at:

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E-mail: **steven@flmnh.ufl.edu**

NEWS OF INDIVIDUALS

PETER CRANE, who was elected to the Fellowship of the Royal Society last year will be returning to the U.K. in mid-August immediately following the International Botanical Congress in St. Louis, to take up the position of Director of the Royal Botanic Gardens, Kew.

His joint interests in systematic botany and palaeobotany make his appointment particularly timely now that nucleotide base sequencing is enabling new proposals about angiosperm phylogeny.

JASON HILTON has just returned from Beijing where he focused on the origin and early evolution of the spermatophytes under guidance and co-operation of professor Dr Cheng-Sen Li at Institute of Botany, the Chinese Academy of Sciences during his post-doctoral research from May 1997 to November 1998.

Our Chinese correspondent writes: "Dr Hilton's research has involved the following:

1) Conifers and related groups from the Early Permian Shanxi Formation;
2) Late Permian spermatophytes from the Upper Shihhotze Formation of Shanxi Province;
3) Phylogenetic significance of coal ball Cordaitales;
4) The novel Late Devonian plant Polypetalophyton wufengensis Geng;
5) Fossil evidence for spermatophyte origin and early evolution;
6) Lower Devonian aged spermatophyte-like structures.

"Because there is not any pub at my Institute, Dr Hilton had to play with his fossils both in weekdays and on weekends. His untiring research has produced a lot of exciting results and publications, which makes my Academy very happy.

"China greatly differs from Britain. Moreover, Dr Hilton is a vegetarian. Although he was accustomed to Chinese foods with all sorts of meat, he was often missing western foods and British pubs. I am feeling so sorry as to take Jason to Hard Rock Café and John Bull Pub (British pub) in Beijing only for twice and once respectively.

"Jason Hilton will resume to work on the NERC project in the University of Wales, Cardiff, UK."

JOAN WATSON's dispute with Manchester University has been resolved and she would like to thank most warmly those colleagues who felt able to write to the Vice-Chancellor on her behalf. These supporting letters made a strong impression and played a considerable part in the final settlement. This involves complete restitution of status, career rehabilitation, sabbatical leave and 'fringe benefits'.

They celebrated in the lab. with a champagne and sandwich 'Victory Party' for 30 special guests, who are now probably on a hit list. They also installed new Web pages where you can get all their latest news on: http://www.man.ac.uk/Geology/research/pb_web/

OBITUARIES

HARLAN BANKS

I first became aware of Harlan Banks as a personality, rather than just as a name at the top of research papers, through meeting one of his postgraduate students, Wayne Fry. Wayne was holding a post-doc with John Walton in Glasgow in the early 1950s when I visited there to study Walton's plant collection. Of course he spoke warmly and enthusiastically about Harlan and the young people working with him, so that when I went to Ann Arbor in 1953 I made a point of arranging to visit Harlan's lab. In Cornell. Typical of Harlan's encouragement of the younger generation, he arranged for me to give a seminar to his research group, and made me feel that I was some distinguished foreign visitor rather than the reality of a stumbling, newly-won PhD. To a young Brit. from Reading, Harlan appeared as an archetypal American Professor – enthusiastic, ebullient, outgoing and often outspoken, complete with a bow tie and crew-cut (or perhaps the crew-cut came a few years later?) The following day we went into the field to do the traditional round of New York State Devonian palaeobotany, with two of his research students. The exposures, mostly natural, stream cuts, and river cliffs, often in impressive steep-sided gorges, made a wonderful change from the rather low-key low-topography of the undulating drift of southern Michigan. Most of the outcrops exposed only rather barren black shales revealing some equally uninspiring black streaks. Flecks of pyrite, with promise of structure to be revealed back in the lab. Were the height of excitement. But with Harlan enthusing at my elbow over what we should have found, I really didn't feel the need to find any fossils! It was a fascinating contrast for me after a few months with Chester Arnold – also an inspired teacher and supervisor, but reserved, taciturn, careful, rarely making a negative criticism of anyone or anything. Harlan restored my faith in the Englishman's caricature of what Americans should really be like.

Later that year I saw him again at the Paris International Botanical Congress, going great guns on what was right – and wrong – with our understanding of Devonian plants. It was at that Congress that Ed. Boureau launched the IOP, some twenty years later, at the Leningrad Congress of 1975, when Harlan had become President of the IOP.

W.G. CHALONER, London

These are just some very personal thoughts, I hope not too egocentric, which do no justice to his influence on global palaeobotany. I feel his loss very keenly and hope that in such reminiscences and our tributes, Kit Banks will find some comfort.

In February 1964 while an undergraduate student at Cambridge I was trying to decide on a PhD area. Harlan Banks on sabbatical in Liege visited the Botany School and gave a lecture on Psilophyton and early vascular plants. I no longer had a problem, like generations of Cornell undergraduates and postgraduates I became enchanted by the shear enthusiasm of a phenomenal teacher. There and then I determined to work with him.

Harlan and his old friend Henry Andrews rejuvenated Devonian palaeobotany in the sixties at a time when things cellular and molecular were gaining ascendency. Harlan in particular was the great preacher, although his popularity, being in equal proportions to his workload, made it sometimes frustratingly difficult to pin him down on the research front. His numerous achievements and honours were celebrated in the volumes edited by Karl Niklas for his retirement. By most he will be remembered for his seminal papers on the reclassification of the psilophytes, by his research students for his inspiration and support, and his insistence on meticulous morphological and anatomical observations on some very often scrappy fossils. He also used his brilliant lecturing skills to communicate all aspects of botany to the general public and continued to spread the gospel way into his retirement. On visiting him recently in New Hampshire, I knew I had reached the right place because in the foyer was a table adorned by various local species of Lycopodium all annotated in his very neat hand. I regard myself as being exceedingly privileged to have been his pupil and his friend. I can still hear that distinctive voice: "darn it" whenever I look at a Devonian fossil and I rejoice that he has left us an appropriate legacy in his writings and in a myriad of happy recollections of a truly colossal personality.

D. EDWARDS, Cardiff.

ALBERT GEORGE LONG, DSc, LLD, FRSE (1915-1999)

Albert Long died on March 13th, 1999 at Tweedmouth House in Berwick-on-Tweed. An unusually well rounded natural historian, he will be best remembered by the palaeobotanical community for his large body of empirical publications on the Lower Carboniferous plants of the Scottish Borders.

Although Albert's later years were compromised by infirmity, he took the opportunity to write his own life story in 'Hitherto' (1996: Pentland Press, Edinburgh - see review in IOP Newsletter 59). In this idiosyncratic and highly personal autobiography, Albert relates how he entered palaeobotany in 1937 to work on British coal-ball ovules with W. H. Lang at Manchester University. By 1939 times were difficult and Albert was obliged to leave research (with the consolation prize of an MSc) for secondary school teaching, having failed his medical for military service as a result of being shot accidentally in the left foot when he was 14. On moving to Duns in Berwickshire in 1944 entomology became an abiding passion. Fortunately for our discipline, he eventually returned to his palaeobotanical roots.

Albert's many remarkable palaeobotanical discoveries, the fruit of diligent fieldwork, nonetheless bore a strong serendipitous element that he was not slow to acknowledge. A life-changing letter from London-based Peter Barnard in 1957 prompted intensive searches for petrified plants in the Lower Carboniferous Calciferous Sandstone Series. The fossils were virtually on his doorstep, and as he wrote in 'Hitherto,' "As soon as I saw the first specimens of *Calymmatotheca kidstoni* Calder the penny dropped." The penny certainly had dropped, because in 1966 Albert and one of us (BAT) both arrived in Newcastle-upon-Tyne to pursue palaeobotanical research (Albert as Deputy Curator in the Hancock Museum and BAT as lecturer in the University Botany Department). I remember him telling me (BAT) how, when he first found publishable anatomically-preserved plant fossils, he could visualise a panoply of papers stretching out before him. Characteristically, he was not slow to realise this vision.

Initially operating from the customised outhouse of his home evocatively described by Henry Andrews in 'The Fossil Hunters', 1980 (Cornell University Press), Albert described many painstakingly researched plants from the Calciferous Sandstones, almost all published between 1960 and 1987 in the 'Transactions of the Royal Society of Edinburgh.' He first tried piecing together the dissociated parts of the enigmatic but widespread *Pitus* tree, eventually demonstrating that its true affinity lies with the pteridosperms. Then came an unparalleled series of empirical studies of a wide range of his beloved ovules and fructifications, which ultimately led to his one major theoretical contribution to evolutionary palaeobotany - his well-argued (if radical) cupule/carpel theory, suggesting the direct evolutionary transition from pteridosperm to angiosperm. There followed a rapid flush of well-deserved academic rewards: Fellowship of the Royal Society of Edinburgh in 1962, significant involvement in the Edinburgh Botanical Congress in 1964, a DSc from Manchester University in 1966 (finally laying to rest the spectre of his abortive pre-war attempt to gain a PhD), an honorary LLD from Glasgow University in 1967, and lastly the Linnean Society of London's Silver Medal for amateur research.

In character, although Albert struck many people as unusually serious and reserved, his quiet, rather dry and wistful humour often emerged, and his faith in "providence," amply detailed in 'Hitherto,' provided an important life-long framework. He remained steadfastly proud of his wife Gladys, daughter Jean and son David (also a systematic botanist). In his later years he also ensured continuity of his research interests by encouraging involvement from other research groups, most notably those of Jean Galtier, Andrew Scott and Gar Rothwell. Indeed, palaeobotanists exploring his extensive collecting preserves on the Scottish Borders (including RMB from the mid-1980s onward) were invariably shown the greatest kindness and courtesy, and any brave souls who exceeded established protocols were offered

what Albert himself would describe as "Christian charity." Transgressors were, needless to say, few in number.

We both found it a pleasure and a privilege to have known this remarkably modest human being, and happily leave the last word to him: "Kindnesses do not always cost much but they make a great difference in life . . . all the certificates in the world cannot therefore be compared to a kind spirit."

B.A. THOMAS & R.M. BATEMAN

My first encounter with Albert Long was at the Edinburgh International Botanical Congress in 1964. As most of the readers of this Newsletter will know, Albert was no average "professional palaeobotanist", but had really had to fight his way into the subject. He had started in research with W.H. Lang, after graduating in Manchester. But by the outset of the 2nd. World War, having run out of financial support after two years postgraduate work, he took a teacher's certificate and embarked on a series of school-teaching jobs. He finally settled down at the High School in Duns, Berwickshire, Scotland. At the time of that Congress, he had just embarked on his series of publications on Scottish Lower Carboniferous seeds, and had published significant papers on the anatomy of the stem geunus, Pitys. This was the field for which he was to rightly gain world renown over the next thirty years, in the course of which he described a series of permineralised seeds; these gave a picture of the evolution of the cupule, integument and micropyle of the earliest gymnosperms. His reconstructions and the evolutionary steps in seed evolution based on them have been an essential element in any textbook treatment of the subject, and made a most impressive story. Some more stratigraphically-minded palaeobotanists have suggested that the uncertainty of the relative ages of his several seeds maded the time dimension of his phylogeny less secure than his meticulousanatomical observations. But the standing of his work goes unchallenged, and he was undoubtedly one of the great figures of British palaeobotany. A good brief account of his work and standing are given in Henry Andrews's 1980 The Fossil Hunters and a much fuller picture is given in his autobiographical reminiscences Hithertoo (Pentland Press 1996).

Two years after the Edinburgh Congress Albert became Deputy Curator at the Hancock Museum in Newcastle. This gave him the chance to become a full-time palaeo-botanist, with great effect over the next two decades. I met him many times subsequently, both in Newcastle and in various international meetings at which his forthright style and special sense of humour always contributed to the enjoyment of his audience, as much as did his scientific observations and insight. My one prevailing memory of Albert at that Edinburgh meeting was a field trip that he led to Oxroad Bay, one of his Lower Carboniferous localities on the Scottish coast. This was part of a one-day field trip out of Edinburgh during the course of the Congress. He treated the group (which included such great names of palaeobotany as Hoeg, Henry Andrews, John Walton and others) as a party of rather naughty school children, admonishing not to stray off the path, and to let him see anything palaeobotanically exciting that might turn up. He was in his element as a schoolmaster - scalding but encouraging, and doing it all with such good humour that the party accepted it all in good heart.

W.G. CHALONER, London

KATHY BARTUSKA

Kathy Bartuska, a member of IOP and the Paleobotanical Section of the Botanical Society of America, died on June 20, 1998. She taught at the Agnes Irwin School and the following obituary is from a school publication:

Kathleen T. Bartuska, 43, a member of Irwin's science department, died of cardiac arrest on June 20 at the East Falls home of her parents, Anthony J. and Dr. Doris S. Bartuska. She is survived by sisters Ann, Lisa Ann, Karen, Christina and Mia. Holding a B.A. from the University of Pennsylvania and an M.S. from Rutgers University, Kathy was a member of Irwin's science department from 1980-1998. She taught Middle School science and, in the Upper School, Advanced Placement biology. She chaired the department from 1987-1996.

During her tenure, Kathy was one of eight semi-finalists (out of 578 applicants) from the state of Pennsylvania for the NASA Teacher in Space Project in 1985. She was also named Biology Teacher of the Year for Pennsylvania in 1991-1992. The Class of 1992 dedicated its yearbook to her, writing: "Whatever the form of her contact with students, it is certain that she has helped to teach them and has shared with them her own love of learning."

More recently, she was the faculty representative to Irwin's Board of Trustees and served on both the Finance and Education Committees.

Memorial contributions may be made to The Agnes Irwin School, P.O. Box 407, Rosemont, PA 19010-0407.

E.L. TAYLOR, USA

BOOK REVIEWS

Late Cretaceous and Cenozoic History of North American Vegetation (north of Mexico) A. GRAHAM 1998. 384 pp; 171 illustrations / 511342-X, Oxford U. Press, 198 Madison Ave., NY,NY10016 Prepublication price is $68 (reg. $85) with $3.50 shipping on the first copy and $1.50 for each additional.

This book is a unique and integrated account of the history of North American vegetation and paleoenvironmentals over the past 70 million years. It includes discussions of the modern plant communities, causal factors for environmental change, biotic response, and methodologies. The history reveals a North American vegetation that is vast, immensely complex, and dynamic.

Contents:

- Setting the goal - the modern vegetation of North America
- Cause and effect - factors influencing the composition and Distribution of North American plant formations through the late Cretaceous and Cenozoic time
- Context
- Methods, principles, strengths and limitations
- Late Cretaceous through Early Eocene North American Vegetational history
- Middle Eocene through Early Miocene North American vegetational history
- Middle Eocene through Pliocene North American vegetational history
- Quaternary North American vegetational history

Evolving Life and the Earth P. Skelton, R. Spicer and A. Rees, 1997. Open University, 199pp. ISBN 0 7492 8185 5.

This very unusual book was "prepared" for the second level Open University course called "Earth and Life" and is normally available only to students enrolled on the course. Because it's so good I think it deserves a wider audience so the purpose of this review is to meet that end within the international palaeobotanical community. The book is so good because it includes sexy stories about topical aspects of evolution from all manner of disciplines, and these have never been in the same bed before. What emerges is a convincing case for the importance of palaeobotany in helping to understand how life developed on this planet. What could be more productive? Well, the real thing I suppose.

Among the wide variety of topics discussed are altruism in insects, Gaia, solar flux and the carbon cycle. There's detail on mass extinctions, climate modelling, greenhouse and icehouse effects etc. and from mainstream palaeobotany there's Carboniferous ecology, growth rings, leaf assemblages, etc. and lots of lovely colour pictures and drawings. The content is very much what you'd expect from these authors and their well rehearsed presentation skills are still of the very highest quality. Each familiar palaeobotanical cameo is set in a real context (such as natural selection, climate change), analysed in some detail and shown to lead to constructive solutions. It really is good applied stuff where only high theory has tended to rule before.

Being a course text there is ample help for the learner; lots of questions; even more answers; good references; excellent diagrams. If you show your students this book they will want to study palaeobotany, no matter what you say to them. But of course, I have a serious criticism. It's all presented in the same professional style that modern governments' spin doctors do for our leaders and give us citizens. There's no debate, no balanced argument about controversies, as though it's all true. I don't believe that. After a bit, life would become dull.

There is one uncertainty about it: I think you can obtain a copy from Open University Educational Enterprises Ltd, 12 Cofferidge Close, Stony Stratford, Milton Keynes MK1 11BY, UK. And an unknown: I don't know how much it costs because they won't tell me and I got my review copy free, a perk of being IOP secretary. If you have trouble, borrow mine, but I want it back.

M.C. BOULTER, London.