



# THE Systematics ASSOCIATION

# Newsletter

Number 18

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## From the Editor

Happy New Year! This is my first stab at editing the Newsletter. If I can keep it half as informative and entertaining as Neale Monks did during his editorship, I'm sure I will be doing very well. I would like to thank Neale on behalf of all SA members for his hard work over nine issues and five years of editorship and to send him good wishes for the future. I also have the onerous task of living up to his simple yet bright and attractive layout of the Newsletter; all I can say is my skills ought to improve over time!

This newsletter has changed substantially in appearance over its 17 issues, but it remains as true now as at any time that what appears in it is driven by the Systematics Association membership. Therefore please send articles, reviews or any other form of prose on any systematic subject or activity of the association which you feel needs publicity or discussion. Electronic copy is, of course, preferable.

We certainly have a mixed bag of material in this issue, with the main focus being the highly successful Third Biennial Meeting, which was held in September at Imperial College in London.

*Paul Wilkin (p.wilkin@rbgkew.org.uk)*

## Biennial Meeting – A Presidential Review

Our third Biennial meeting was held at the Department of Engineering in Imperial College London between the 3-7 September and was attended by 174 delegates. It was a great pleasure to see so many faces, old and new, particularly the many younger scientists and research students making their first appearance and presentations. We continued in the spirit of the first and second Biennial conferences and fulfilled the main objects of these meetings – namely, to bring young researchers together without being exposed to the dead hand of those needing Grecian 2000 (or is it 3000 now?). There was, of course, quite a number of the older contingent (including myself) playing to the galleries especially in the thematic sessions. As with the first and second Biennial conferences there were many more botanists in both the presentations and on the delegates list. As Peter Forey noted in his report of the second Biennial it is difficult to know why this should be so, since we both believe that zoology is no less represented in the systematic community. In future, I hope that more zoologists will be encouraged to register and take part. Despite the subject imbalance it was encouraging to see at least 18 nationalities represented from countries in all of the major continents. The Biennial has genuinely become a truly international event, and the number of offered talks and delegates grows each time.

The talks reflected the interests of the registered participants, and of the 93 contributed papers and 25 posters, 56 were botanical (overwhelmingly angiosperm in nature, although diatoms and bryophytes got honourable mention) and 20 zoological. The other papers were all invited talks as part of the thematic sessions: *Milestones in systematics in the 20<sup>th</sup> century*, *Telling the evolutionary time: molecular clocks and the fossil record*, *Macro- to Micro-: the challenge of soil biodiversity* and *Organelles, genomes and eukaryote phylogeny*. Amazingly, all but one of the talks offered or promised were read and since the programme and the abstracts are posted on our web site (<http://www.systass.org>). I have no need to discuss each one but simply draw together some general themes.

### **Milestones in Systematics**

*Milestones in systematics*, organised by David Williams and Peter Forey kicked off the proceedings. The purpose of this one-day symposium was to "to document key advances in systematics, including both theoretical and technical breakthroughs, and to chart their histories and impacts on systematic studies." The speakers were asked to address particular subjects most of which remain contentious. The most important thing to emerge was that systematists tended to be poor historians and somewhat revisionist in their outlook. Undoubtedly the main breakthroughs during the 20<sup>th</sup> century had come from the insights of Willi Hennig and cladistics becoming the main language of systematics. The subsequent impact of cladistics on palaeontology, biogeography, homology assessment and molecular biology has been far-reaching. However, the world is not a happy place, as the several brands of cladistics now emerging, largely as implementations of new principles by molecular systematists, is found to be wanting by those interested in homology, historical biogeography, and classification.

### **Molecular Clocks & Soil Organisms**

The second one-day symposium was another plenary session organised jointly between the Palaeontological Association and the Systematics Association. Philip Donoghue and Paul Smith designed the symposium to discuss the importance of molecular clocks as assessed by palaeontologists. Aspects such as the mechanics of molecular clocks, the quality of the fossil record, and the use and abuse of palaeontological data all came into focus during the day. The symposium included a series of case studies describing the match and mismatch between palaeontological and molecular estimates of the timing and tempo of major evolutionary radiations, within animals and plants. The tone of the day was struck by the very first paper by Francisco Ayala, who said that in his view there was no case for clocks and precious evidence for them as seen by comparison of rates of change in different molecules. According to him, the neutral theory predicts that the rate of (neutral) molecular evolution is constant over time, and thus that there is a molecular clock for timing evolutionary events. However, a variety of experiments have shown that the variance of rates of evolution is generally larger than expected according to the neutral theory, which raises the question of how reliable the molecular clock is or, indeed, whether there is a molecular clock at all. The theme of discordance between the molecular clock and palaeontological divergence continued throughout the day with an overwhelming number of speakers bearing out the fact that that clocks were at best clunky and at worst did not exist.

### **From Macro to Micro**

The third plenary symposium, organised by Paul Eggleton, provided a panoramic view of a wide range of soil organisms as seen from a systematic context. Each of the speakers covered background details on particular groups of organisms, emphasising their diversity and importance in soils. Secondly, they provided a summary of the present state of systematics in the group and emphasised the immense amount of work that was still to be undertaken. It was interesting to hear about different methods required to capitalise on the modern technology. The symposium was a parallel session with the clocks symposium and sadly for much of the time was very poorly attended. This was a pity because it has become obvious that soil-borne organisms are critical for the economy of nature and that there is still a tremendous amount to be done especially when trying to visualise systematic needs for ecological work.



### **Contributed Papers**

The whole of Thursday was devoted to three parallel contributed paper sessions, and involved the student competition for best speaker and best poster presentation. It was a great pleasure that out of 28 original applications for student bursaries we managed in the end to fund eleven students and young scientists. The quality of their presentations was remarkably good and I was pleased to be able to meet with so many new and able people. Unlike the 2<sup>nd</sup> Biennial meeting where the predominance of botanical papers were molecular the spread in the contributed paper session thankfully covered a wider range of interests. Nevertheless, there was still a lot of molecular work discussed. Of the botanical papers, 21% were solely molecular, 38% molecular and morphological, 25% on morphology (particularly floral anatomy), and a couple of others focussed on historical biogeography and ecology. This contrasted with 50% molecular papers, 10% molecular and morphology papers, 3% morphology and 10% theory amongst the smaller zoological clique. The question I asked myself was do these ratios actually mean anything? I think the main effect that we are seeing today is that the band-wagon effect is beginning to break down. In some ways it is comforting to know that a mature view is emerging and the idea might be that we need to understand all aspects of the life cycle and not just base sequences. It might be that recent emphasis on evolutionary development might be the saviour of morphological systematics, a counter-view of the molecular systematists who think that morphology is trivial. Possibly the drive by botanists over the last 15 years to accumulate and examine huge molecular databases across of the whole of plant diversity have given way to more thought provoking questions. There is a lot of molecular data for angiosperms, yet some of it is still hard to explain. No doubt the molecular analyses will go on increasing until the stage is reached of comparing whole genomes. However, I do think that there is a new arena of morphological studies that should go towards rethinking novel groups suggested by the molecular studies. It seems from several of the presentations provided by the younger scientists that there is a new impetus for finding the actual context as to what it all means.

What was of great interest to me was the range of presentations in terms of choices of study groups. Although some of the papers were largely theoretical in content, most were extremely interesting new empirical investigations. Amongst the plants at least 24 families of flowering plants were considered (from Acanthaceae to Solanaceae), ranging from systematic studies of genera (e.g. *Amorphophallus*, *Moringa*, *Nepeta* and *Solanum*) to wholesale consideration of flowering plants (species richness at a global scale and evolution of microsporogenesis). The application of molecular

data although significantly used for generating phylogenies, showed some novel applications. These included dating radiations in *Protea* (Proteaceae) and *Phyllica* (Rhamnaceae), to historical biogeography in Australasian Myrtaceae. The morphological studies were extremely varied, encompassing wood anatomy of caesalpinoids, the floral morphology of lilioid monocots and the evolution of nuts in Restionales. In some cases, the molecular signal confirmed the morphological phylogeny, but in others, there was conflict. It was comforting to see that there were four contributed papers two each on diatoms, and two bryophytes. Too little is known of the lower land plants and the many groups of the previous ragbag of "algae". I was especially pleased to hear the work of H. C. den Bakker and colleagues as this I believe is the first contributed paper on basidiomycetes to appear in three biennial conferences. Amongst the zoological papers within the open session there were those dealing with systematics of amphibians, gastropods, fishes, mammals, sea spiders and beetles.



### **Plurality of Methods**

As all the talks showed, whether botanical or zoological, systematics has become synonymous with cladistics. But what was demonstrated quite forcefully at this meeting, as I noted earlier, was the plurality of methods. The idea that cladistics has become a plethora of methods, with definite differences of opinion as to which is the most authentic approach among maximum likelihood, maximum parsimony, Hennigian systematics and pattern cladistics (to mention just four divisions) puts it into the same trap that befell phenetics thirty years ago. For example, I found that some of the analyses were undertaken using the black box of PAUP without a great amount of thought going into why particular options had been used.

### **Organelles, Genomes and Eukaryotes**

The final thematic session, held on the last morning of the conference, was a fascinating insight to the work, going on in the study of "organelles, genomes and eukaryotes". The opening papers outlined the cellular and molecular perspectives of eukaryote phylogeny and showed that there is still considerable disagreement amongst the *cognoscenti*. Other papers addressed the problems of methodology and genomics. Particularly alarming to me was that it transpired that many of the large data bases used in genomics are merely deposited gene sequences, without any kind of voucher specimen or reference collection. The veracity of these collections - used routinely by eukaryote researchers - can be brought seriously into question, but ascertaining the size of the problem is also daunting. It seems that the emphasis in systematics still embraces the big picture - the origins of organelles such as mitochondria and other plastids in eukaryotes.

The standard of presentation of nearly all of the talks was truly outstanding. This is at one level was due to the fact that people have learned what it takes to make a presentation through the use of Powerpoint and sophisticated graphics. However, it was remarkably clear that an immense amount of thought had gone into material content. It was obvious that there had been many hours of practice with respect to the presentations so as to capitalise on the relatively short amount of time that each talk was given. The messages and how effectively we convey them is the ultimate measure of any contribution.

Presentation was just one of the criteria used to decide the student prizes. These included the breadth, depth and relevance of the science beyond the immediate area of investigation, the take home messages, and the way in which the talks were structured and kept to time. This provided the criteria for judging both the talks and the posters. Many congratulations to all of you for the high standard of presentation. The judges (Eileen Cox, David Horner, Paul Kenrick, Peter Olson, Angie Newton, Paula Rudall, Russel Stothard and Paul Wilkin) under the chairmanship of Tim Littlewood finally agreed that the student presentation prize should be awarded to Alexandra Wortley (Department of Plant Sciences, University of Oxford, UK.) for her talk on the "Systematics of *Thomandersia* Baill." There were six papers that made the final cut, and indeed were very hard to separate in the final analysis. James A Cotton (& Roderic D M Page) at the Division of Environmental and Evolutionary Biology, Institute of Biomedical and Life Sciences, University of Glasgow won the poster prize with "Going nuclear: gene family evolution and vertebrate phylogeny reconciled"

### **Thanks**

Imperial College provided an excellent venue for the conference and I extend my thanks to Michael Cheung and Bridget Bell for their help and organisation. The lecture theatres were modern, close to one another for parallel sessions, comfortable and well-equipped with Powerpoint presentation facilities and all the older forms of technology. Accommodation was adequate and within a stones throw of the lecture theatres. I would also like to give many thanks to the Linnean Society for sponsorship and for their excellent reception on the Tuesday Evening. I would also like to thank the Council of the Palaeontological Association for their sponsorship and for organising the "clocks" symposium and, last but not least, thanks to Taylor and Francis for their reception at Imperial College on the Wednesday evening and for the student prizes. Thursday evening was a fine Banquet at the Rembrandt Hotel in South Kensington, and I thank the after dinner speaker, Mary Micevich for her interesting and quirky insights into being once a young researcher herself.

In all, I very much enjoyed the meeting and hope that this feeling was shared by everyone. The size of the meeting, plus the range of taxonomic expertise, meant there were many opportunities to make new contacts and share common systematic problems. In the end the organisation went remarkably smoothly, at least from the participants' point of view, and for this I must thank my student Vilma Bharatan for all of her excellent efforts in organising the database and for helping me produce the conference materials. I should also mention Gordon Curry, as treasurer, who smoothed troubled waters especially those of the financial kind.

Chris Humphries (cjh@nhm.ac.uk)

## **Biennial Meeting – A Delegate's View**

Thirty or more hours of travel from remote tropical Australia to the heart of London was something I was not sure if I was looking forward to...and for just a four-day conference, some people said it had to be a very important and special one. Well, it was indeed special, and for various reasons; the eagerness to meet the glorious and famous ('greyheads and shavedheads' as Dr. Humphries called them), the enticing chance to hear about the Cambrian Explosion, molecular clocks and the evolution of Angiosperms, or even that recommendation from more experienced ones saying "go and make contacts for future jobs and post-docs".

The Systematics Association Biennial meeting last September was a first encounter with the pure systematics world. Having attended an extremely fruitful conference by the Society of Australian Systematic Biologists (SASB) in Perth, Australia in December 1999; for which all I had was enthusiasm and preliminary data to present, the SA meeting was my first 'international' opportunity to reinforce a timid but deep fondness for systematic biology.

Due to my tropical marine biology background and the fact of being surrounded by coral reef scientists (ecologists in particular) here in Townsville, TSA meeting was such a different and challenging conference to attend. Once there, I not only met interesting people but also had the chance to hear about the history of systematics, the development of cladistics and the integration of systematics and palaeontology. I have to say (in a good way of course), I did not miss the coral reef scientists.

As a recipient of one of the student bursary awards, I had the opportunity to present my work on phylogenetics of sea spiders or pycnogonids, an incredible and sometimes called 'aberrant' group of arthropods. They can be so particular and obscure that arthropod systematists either love them or run away from them! I was so glad to be able to show my work on sea spiders and share it with people from a broad range of disciplines. Actually, It felt especially good the last day of the conference when I was announced as a finalist of the best student presentation. It was a great feeling to receive support and encouragement not only from renowned scientists but also from other young scientists, all extremely good and deeply committed to their work in systematics and evolution.

I take this opportunity to sincerely thank the President, Dr. Chris Humphries, and the committee members of the SA for continuing a strong belief in supporting young researchers in the field of systematics. Despite the commonly mentioned need for taxonomic training of the up and coming generations of life scientists, there is still a general lack of support or even acknowledgement of the problem. The SA, through the research grant scheme, offers a very attractive opportunity for young systematists around the world to find encouragement and recognition for their work.

*Claudia P. Arango, Department of Zoology and Tropical Ecology, James Cook University, 4811 Qld Australia  
(claudia.arango@jcu.edu.au)*

## **Quick Notices**

The young systematists forum 2001 took place on December 6 at the Natural History Museum, in the Demonstration Room of the Department of paleontology. See the website (<http://www.systass.org/youngsys01.html>) for more information.

There is a revised version of the research grant application form available this year; see the website again (<http://www.systass.org/awards/AppForm2001.pdf>). The main change is that it is strongly recommended that objectives and methodology are described in 1 A4 page (or less) which can be stapled to the application. Completed applications have to reach Tim Littlewood at the NHM by December 31 so get writing.

Now's the time to start thinking about topics for symposia at the 2003 biennial. The Angiosperm group Rosids and the importance of databases have already been suggested as possibilities. Workshops could also play an important part in the meeting. Please send all ideas to Chris Humphries at [C.J.Humphries@nhm.ac.uk](mailto:C.J.Humphries@nhm.ac.uk) or via the webpage.

At the time of writing, volunteers for council are still being sought. Again, nominations should be sent to Chris Humphries.

## **Affiliated Societies Forum Meeting**

### **23 October 2001, IOB, London**

*"BIOLOGY IN EUROPE"*

#### **Meeting of IOB with Lord Sainsbury, Minister for Science (02.08.01)**

Three main issues were discussed at the meeting.

- Short term university contracts (1). The 3 year model was not long in keeping a research team cohesive. Lord Sainsbury believed that universities preferred flexibility and therefore kept their staff on short-term contracts. The IOB's view is that scientists are expected to do research and bring in funding whilst teaching staff were seen as a lower status.

- Short term contracts (2). Whole organismal biology was particularly disadvantaged where much of the work was seasonal. Molecular biology does not have such restrictions.
- The balance between a science base and government funding. Whilst it was true to say that the “R” of R&D in the UK was well done, the “D” part or developing science into commerce and industry was not. Funding for this type of research both by Government and its agencies had been in real-term decline.

#### **How France liaises with UK science**

*Professor Gilbert Balavoine, Counsellor for Science & Technology at the French Embassy gave a talk on funding opportunities for collaborative Anglo-French projects. These are mainly aimed at young scientists and represent “seed” money enabling young scientists to visit and develop projects/collaborations.*

- ALLIANCE – France provides the funding and British Council the administration/management. This represents £1-2K only. It is meant to start new bilateral cooperation between young teams (up to 35 years old). It gives support for 1–2 years and aims to give the basis for a larger project from some other funding source.
- PICS – (Program International Cooperation Scientifique). This is the next level up.
- LEA (Laboratoire Association de Europe). This is the twinning of two research Labs
- GDR (Groupe de Recherche Europeenne) A network of laboratories
- UMR (Union Mixte de Recherche) the next level up.

#### **Biotechnology Funding**

*Ian Shaw of the DTI gave an excellent talk on UK and European Biotechnology.*

- The UK has 281 Biotechnology SME’s, plus 450 companies involved in Biotechnology both in Agriculture and the Pharmaceutical industry and yet the UK seems to be unable to commercialise the potential.
- The EU brought out a Consultative Document on Biotechnology in September 2001.
- European culture is not the same as in the USA, and this may have something to do with our tardiness in developing the commercial arm of Biotechnology.

## *Offer to Systematics Association Members from Cambridge University Press* **The Freshwater Algal Flora of the British Isles**

*An Identification Guide to Freshwater and Terrestrial Algae*

By D. M. John, B. A. Whitton and A. J. Brook

The first modern account of the freshwater algae of the British Isles (excluding diatoms), covering over 2200 species, many of which also have a world-wide-distribution. Profusely illustrated with line diagrams and photographs, plus an accompanying CD-ROM photo catalogue with more than 500 spectacular colour images of freshwater algae and their habitats.

Publication February 2002

2002 297 x 210 mm 720pp 150 line diagrams 11 half-tones

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#### **EU 6th Framework**

*This talk was given by Dr Martin Penny, Director, UK Research Office (UKRO) in Brussels.*

- The Research Office represents the various councils (BBSRC, EPSRC, MRC, ESRC, NERC, PPARC). Its role is to promote UK participation in EU funded research and to alert its subscribers to opportunities available.
- The European Parliament will discuss Framework 6 in June 2002.
- A total of 13,685 million euros will be available for funding research.
- The structuring of the priority areas (programmes) are different. But the most relevant to biology will be: “Food Safety & Health Risk”, and “Genomics and Biotechnology for Health”.

- The 8<sup>th</sup> programme: “Immediate new emerging demands” is a “black box”. It will cover natural resources such as water quality, and sustainable management of natural resources.
- The “Marie Curie Fellowships” were heavily undersubscribed in Framework 5. They had a 40% success rate, and were a good way to obtain extra funding for young researchers.
- In Framework 6 the EU will be funding “big” projects. In the 5<sup>th</sup> Framework, projects were of the value of 1.7 million euros. For the 6<sup>th</sup>, this will rise to 10 million euros. Whilst one can understand that it is easier for the EU to administrate a few large projects rather than several small ones, such large projects will be a nightmare to coordinate. It is hoped that the EU will provide adequate funding for a full-time Project Manager.
- A good way to understand the workings of the EU is to become a project evaluator. Volunteers are always sought.
- In order to influence the programme, researchers should target the key players namely, representatives of the national councils, commissioners, MEPs, Cabinet Officers.
- UKRO can help with proposals, identify key contacts, and provide expert interpretation of EU issues.
- [www.ukro.ac.uk](http://www.ukro.ac.uk)

### **Conclusions**

*This was an interesting day, in that it allowed an insight into the workings of the various departments in Brussels. What came over very strongly was the need to have “our man (or woman) in Brussels”. It is clear that in order to be successful (project funding) it is definitely a case of “who you know, not what you know”.*

*Zofia Lawrence, S.A. Affiliated Societies Liaison Officer*

### **Systematics Association Support for meetings**

One of the ways in which the Systematics Association seeks to fulfil its aim to promote systematics is by providing financial support towards scientific meetings with some systematic focus. These may be concept-based (Homology and systematics; Species: the units of biodiversity) or organism-centred (The flagellates: unity, diversity and evolution; Arthropod relationships) meetings, workshops or training courses, bringing together “experts” and other interested participants. Thus the programme is usually built around invited speakers and particular topics, but may also allow contributions from registered participants. Meetings can be of any length: a single day, a few days or even a couple of weeks. Organisers of a meeting supported by the SA also have the option of producing a meeting volume, subject to a successful book proposal.

Any successful meeting requires careful planning and therefore potential organisers need to allow plenty of time for preparation, and to consider all aspects of the meeting, scientific value, timeliness, practical arrangements and dates. Thus, planning needs to begin well in advance (probably 12-18 months) and careful budgeting is imperative. The Systematics Association regards the money it provides more as a grant or “seed-money” than essential funding, and encourages organisers to use the support to help less-advantaged participants to attend. Nevertheless the association does not impose hard and fast rules for eligibility, but assesses each case on its own merits. Nevertheless it is expected that Systematics Association support is clearly acknowledged in any meeting flier or literature. If the meeting makes sufficient profit, it is usual to return the original amount to the society.

Potential organisers are invited to submit proposals to the Programme sub-committee on the form provided on p. 7 & 8, including any other pertinent information they wish. The proposal will then be reviewed by the sub-committee before being put before Council for approval. Council will also decide the level of support it wishes to provide. The maximum support given is £2000, usually dependent upon the production of a volume from the meeting. If no volume is planned, support will usually be less. Submission dates are shown at the end of the proposal form, and decisions are usually made within a month of these dates. Any informal queries can be addressed to the chair of the sub-committee, Eileen J. Cox.

### **Topics of meetings supported in recent years include:**

- Milestones in systematics in the 20<sup>th</sup> century (3<sup>rd</sup> Biennial Meeting, September 2001)
- Telling the evolutionary time: molecular clocks and the fossil record (3<sup>rd</sup> Biennial Meeting, September 2001)
- Macro to micro: the challenge of soil biodiversity (3<sup>rd</sup> Biennial Meeting, September 2001)
- Organelles, genomes and eukaryote phylogeny (3<sup>rd</sup> Biennial Meeting, September 2001)
- International meeting on trilobites (April 2001)
- Insect information: from Linnaeus to the internet (October 2000)
- Developmental genetics and plant evolution (September 2000)
- The millenium brachiopod congress (April 2000)
- Ethiopia: a biodiversity challenge (February 2000)
- Under the microscope: plant anatomy and systematics (September 1999)
- Morphology, phylogenetics and morphometrics (2<sup>nd</sup> Biennial Meeting, August 1999)
- Phylogeny and co-evolution (2<sup>nd</sup> Biennial Meeting, August 1999)
- Interrelationships of Platyhelminthes (July 1999)
- Major events in early vertebrate evolution (April 1999)

**PROPOSAL TO ORGANISE A MEETING ON BEHALF OF THE SYSTEMATICS ASSOCIATION**

TITLE OF MEETING:

MAJOR THEMES:

NAMES & ADDRESSES OF ORGANISERS:

PRINCIPAL CONTACT:

PROPOSED VENUE, DURATION & DATE OF THE MEETING:

VENUE:

DURATION:

DATE:

ANTICIPATED ATTENDANCE:

OPEN / BY INVITATION ONLY?

ANTICIPATED SPEAKERS:

WILL THE MEETING BE ORGANISED JOINTLY WITH ANOTHER SOCIETY OR ORGANISATION?

WHICH SOCIETY OR ORGANISATION?

WHAT IS THEIR INTENDED INVOLVEMENT IN THE ORGANISATION, FINANCE AND PUBLICATION?

HOW MUCH SUPPORT IS REQUESTED?

HOW WILL THE SUPPORT BE USED?

WHY IS THIS MEETING TIMELY AND DESERVING OF SUPPORT?

NAMES & ADDRESSES OF 3 SUPPORTERS:

**When completed this form should be sent to:**

Dr E.J. Cox. Department of Botany, The Natural History Museum, Cromwell Road, London, SW7 5BD.

**Closing dates for submissions:** 1st February; 1st May; 1st September; 1st December.