IUSSI, North-west European Section
(International Union for the Study of Social Insects)
Autumn/Winter Newsletter 2008

Officers of the British Section of the IUSSI

President Prof. Andrew Bourke, Professor in Evolutionary Biology, School of Biological Sciences, University of East Anglia, Norwich, NR4 7TJ U.K. Tel. +44 (0)1603 591868. Fax +44 (0)1603 592250. E-mail: a.bourke@uea.ac.uk.
Webpage: http://bioweb2.bio.uea.ac.uk/faculty/BourkeA.aspx
Contact him about: inspiration, leadership, anything too challenging for Rob or Seirian to deal with.

Secretary Dr Seirian Sumner, Research Fellow, Institute of Zoology, Zoological Society of London, Regent's Park, London, NW1 4RY. Tel: +44 (0) 207 449 6617. Fax: +44 (0) 207 586 2870. Email: Seirian.Sumner@ioz.ac.uk.
Webpage: http://www.zoo.cam.ac.uk/ioz/people/sumner.htm
Contact her about: newsletter, meetings, general information.

Treasurer Dr Rob Hammond, Lecturer in Evolutionary Biology, Department of Biological Sciences, University of Hull, Cottingham Road, Kingston upon Hull, HU6 7RX. Tel: +44 (0)1482 465506. Fax: +44 (0)1482 465458. Email: R.Hammond@hull.ac.uk
Webpage:http://www.hull.ac.uk/biosci/staff/academic/MolecularEcologyandEvolution/RobHammond.html
Contact him about: membership, subscriptions to *Insectes Sociaux*

Webmaster Dr. David Nash, Department of Population Biology, Institute of Biology, Universitetsparken 15, DK-2100 Copenhagen East, Denmark. Tel: ++45 3532 1328; Fax: ++45 3532 1250; E-mail: DRNash@bi.ku.dk
Contact him with: information and suggestions for the web site
Meetings site: http://www.zi.ku.dk/iussi/meetings.html
Who's who site: http://www.zi.ku.dk/iussi/newsletter.html

Upcoming Meetings

David Nash keeps a comprehensive and regularly updated webpage of upcoming meetings at http://www.zi.ku.dk/iussi/meetings.html#iussiuk. The highlights are listed below:

Winter Section Meeting

IUSSI North-west European Annual Meeting, Friday 28th November 2008. Paul Eggleton has kindly agreed to host our Winter Meeting this year again at the Natural History Museum. The talk schedule is currently being put together and will be sent out to all members as soon as possible. There will also be a poster session which is open to everyone, so please bring along any poster you wish to display. Following the success of last year's drinks reception at the end of the meeting, we plan to hold a similar event this year. This gives people the opportunity to mingle together rather than getting lost in the pub-network of South Kensington. It is also be a good time to view posters and to applaud the winner of the Student Talk Competition. We anticipate the reception to end around 6.30pm (tbc), after which people may wish to adjourn to a local pub or restaurant to continue discussions and gossip with the usual intellectual fervour. Please bear this in mind when making your travel plans.

Other up-coming meetings

First Central European Meeting of the IUSSI, 7-10th September 2009. A*bbey Frauenwörth, Fraueninsel Chiemsee, Germany*

XVI International IUSSI Congress, 8-14th August 2010. Copenhagen Denmark. The organizing committee has now been selected. Details are given on the meeting's website, http://www.iussi.org/iussi2010/. If you would like to be kept informed of developments, please send an e-mail to the conference e-mail address: IUSSI2010@bio.ku.dk

Conference Reports

PhD student Anton Chernenko from Helsinki received IUSSI funds to attend the EMPSEB in Switzerland this year……

"In September 2008 I attended the 14th European Meeting of PhD students in Evolutionary Biology, held in Einsiedeln, Switzerland. Actually, it was my first PhD students meeting on such a high level and I expected a lot. All my expectation were absolutely satisfied, even more, the impressions exceeded my expectations! The level of the talks, place and invited speakers - all of this was on a perfect level! I must say big "THANK YOU" to Ralph Dobler and all members of organizing committee. The meeting consisted of students from all-over Europe, and some more distant ones, from New Zealand and Argentina. So, this meeting is extending its sphere of influence. Plenary speakers included David Queller, talking about cooperation and conflict in *Dictyostelium discodeum*, Angela Hay, talking about the plant *Cardamine hirsuta* and the genetic basis of diversity, David Hosken on sexual selection in *Drosophila*, Hanna Kokko on sexual selection, Alain Jacot on evolution of phenotypic variation, Sebastian Bonhoeffer on the red queen, Daniel Rankin on selection, Ashleigh Griffin on sociality in microorganisms, and Tom Wenseleers on altruism. All the student talks were divided in 6 sections: evolutionary ecology, sexual selection, life history evolution, evolution of sociality, population genetics and phylogeny and speciation. Unfortunately, there was a huge mess in the program, so all the sections were completely mixed up and the only way to choose a talk was to read an abstract. Student talks covered many species from different classes and orders. It was very exciting to see what is going on in evolutionary biology in Europe, taking into account that students are usually the ones doing something new (sic!). Surprisingly, there was almost nothing about plants (excluding presentations on outbreeding depression and heterosis in *Triticum aestivum,* and gene flow in *Picea asperata*), only animals. the meeting lasted 4 full days with 2 parallel sessions. The interesting and new idea was to have a plenary speaker after dinner, at about 8 p.m. One may expect that everyone was tired, however, interesting talks woke us up! On the third day we had a choice where to go: walk in the Einsiedeln area to see the beautiful Swiss Alps or visit an old monastery. I chose the first option and did not regret it. Swiss cows live better that people in some countries (at least, for a while)!

Going back to the conference, I must say that it provided an opportunity not only to show others what kind of research one is doing, but also to learn how to present research, because there were quite a few extremely good talks. Everyone had a chance to be an evaluator (and fill in an evaluation form) or be evaluated and get a feedback from other participants and invited speakers. A party followed the last day of the meeting. The one thing I was pleasantly impressed by is that communication at a party may play a much more important role than discussion in coffee breaks. One becomes familiar not only with the scientific life of others, but also finds new friends, colleagues and future collaborators. As David Hosken said in the last speech before the party: "You [students] are a new generation of evolutionary biology." So, why not seed new ideas in new friends, even if we would only be collaborators many years from now? So, I look forward to the next EMPSEB meeting, which will be held in Groningen, Netherlands next year!"

PhD student Olivia Scholtz from the Natural History Museum was awarded IUSSI funds to attend The International Congress of Entomology this summer…..

"The International Congress of Entomology was hosted by the city of Durban, South Africa (6-12th July 2008). A constant stream of Social Insect Symposia were held throughout the five and a half days. With some financial help from the IUSSI, I was able to attend the ICE, presenting findings from my PhD that examines community ecology processes in rainforest termites. Here is a brief, admittedly termite dominated, overview of a select number of Social Insect Symposia.

Indeed termites kick started the Social Insects section on Monday morning. This covered the recent evidence for the position of Isoptera within the Blattaria, from a molecular (Paul Eggleton, Natural History Museum, London) and morphological (Klass Klaus-Dieter, Museum of Zoology, Dresden) perspective. So the Isoptera order it seems is well and truly dead, and termites are eusocial cockroaches with fancy guts and soldiers. Apart from being annoying pests, termites are probably most renowned for their fancy architecture, and several talks covered mound design and their ecological significance. Understanding the biological significance of the magnificent magnetic mounds of northern Australia, has largely focused on their uniform N-S orientation for thermo-regulation. Judith Korb's group (University of Regensburg) have included the influence of seasonal flooding to understand the ecological function of the thin-walled wedge-shape. They have been manipulating the mounds to determine their function with respect to flooding events, such as accelerated drying to provide greater mound stability, and drying of grass food reserves.

The biology and impact of the Argentine ant filled an afternoon. We heard about their super-colony structure in several introduced countries, a trait attributed for its success as an ecologically dominating invasive species. Across a remarkable distance of 2800 km from Perth to Melbourne, the Australian populations show widespread genetic homogeneity forming essentially one expansive super-colony (Elissa Suhr, Monash University). While in South Africa a staggering 58% of the country's surface is estimated to be inhabited by the Argentine ant, a range that was reached fairly rapidly following its introduction prior to the 1900's (Melodie McGeoch, University of Stellenbosch).

Talks in the "social systems and symbionts" session, illustrated just how complex these communities and relationships are. Kenji Matsuura (Okayama University) entertainingly introduced the "termite ball" fungus that mimics the shape and chemistry of Reticulitermes termite eggs, thereby conning the termites into safely harbouring the fungus within their nest. Yet further layers of complexity have been unearthed in the host–symbiont system of leaf-cutting ants, in addition to their associated parasitic fungi and bacteria that inhibits the garden parasite. Cameron Currie (University of Wisconsin) presented evidence of more ant microbial symbionts, including nitrogen-fixing bacteria that fertilize the ants' fungus garden. Through a process of gene sequencing, Morten Schiøtt (University of Copenhagen) has been identifying the fungi-derived proteins in the faecal droplets of fungus-growing ants. They have identified proteins that are promoters of new fungal growth, while others act as a defence against alien fungal strains the ants may have introduced. Sean Brady (Smithsonian Institution) discussed the co-evolutionary history between fungus growing ants (tribe Attini) and their fungal cultivars. The fossil calibrated phylogeny of Attine ants, confirms the ~50 million year old origin of the symbiotic relationship between ant and fungus in the Neotropics. Nested within this is the separate evolution of several ant-fungal symbiotic systems, while the higher agriculture of leaf-cutting ants arose only 8-12 millions years ago.

The "Termites as beneficial organisms" session was held on late Friday afternoon. Theodore Evans and Tracy Dawes-Gromadzki (CSIRO, Australia) have been quantifying the role of termites in ecosystem services e.g. soil fertility, infiltration, soil conservation and crop production, of the wheat belt of far Western Australia, and coastal New South Wales. They presented data on the effect of land-use practices on macro-invertebrate communities, soil properties and processes. The New South Wales project was instigated by observations of high sediment run-off into the Great Barrier Reef Lagoon. Intensive agriculture and cattle grazing is the major culprit, which has caused compaction of the soil, reducing the macro-invertebrate communities, and therefore the water retention capacity of the soil.

Although presented in a separate symposium, Alison Brody's (University of Vermont) work in East African savannas, provided another surprisingly rare example of research quantifying the role of termites in ecosystem processes. The fungus-growing termite, *Odontotermes* sp. directly affects plant communities by improving soil quality. She also showed how this has an indirect effect on the density and foraging patterns of vertebrate communities. I presented results on my research on termite community interactions in tropical rainforests. This included preliminary results from Gabon in Central Africa, from which I had only a week earlier stepped out of a long stint of fieldwork in a very remote place indeed. Perhaps as a consequence of the extreme diversity and abundance of termites to be found in African rainforests, a strong correlation was found between the trophic groups, which feed on material at different stages of decomposition. This suggests that certain

groups of termites are effectively producing the food material consumed by other termites, and at each stage the organic material is further decomposed.

The bee-ventriloquist sadly did not quite make it into the Social Insects Symposia, presumably due to opting for a solitary existence among humans. A talk on insects in art gave some fascinating examples of insect symbolism in the art-work of many greats including Vincent van Gogh and Salvador Dalí. The end of the ICE saw some very pleased looking Koreans, as it was announced that South Korea will be hosting the XXIV ICE in 2012.

Section Gossip Column

University of East Anglia - The Bourke Lab: We recently welcomed **Edd Almond** to the group, where he will work on a NERC-funded project to measure the heritability of sex ratio and other life-history traits in bumble bees. Edd previously worked at the Institute of Zoology, London, on a project, cosupervised with **Bill Jordan** (IoZ), on applying genetic census techniques to evaluate the success of agri-environment schemes for bumble bees. Before that, he carried out a PhD on *Polistes* with Jeremy Field at University College London. **Nehal Saleh** has come to the end of her British Ecological Society Early Career Project Grant and, having decided to leave research, obtained a job as a Business Development Associate at Abcam plc, a company that supplies antibodies based in Cambridge, UK. We wish her every success in her new career. Meanwhile, current group members **Lucy Friend**, **Lorenzo Zanette** and **Sophie Miller** are continuing with their projects on, respectively, testing aspects of kin selection theory in *Leptothorax acervorum* (Lucy) and investigating reproductive conflicts and internest drifting in the bumble bee *Bombus terrestris* (Lorenzo and Sophie).

Andrew Bourke

University of Copenhagen - The Boomsma, d'Ettorre, Pedersen, Eilenberg and Nash Labs. **Stephanie Dreier** successfully defended her PhD thesis, "Recognition systems in ants: from the individual to the colony level", in September and **Jelle van Zweden** just submitted his PhD thesis, "The smell of cooperation and conflict in insect societies". **Nick Bos** handed in his Master thesis, "Does my enemy smell like food?", and will continue playing with ant chemicals during his PhD thesis. **Volker Nehring** is progressing well with his project on leaf-cutter social parasites and has been awarded a German PhD stipend. Three new people joined the d'Ettorre Lab group: post-doc **Luke Holman**, who is discovering the secret recipe of *Lasius niger* queen perfume and investigating sperm traits; Master student **Lena Grinsted**, who is interested in chemical communication in social spiders and **Elisa Bresciani**, who studies lizard pheromones.

The year 2008 started successfully for the Maculinea group with a Science publication by **David Nash**. Although busy with conferences ("The future of butterflies" in Wageningen and the ICE in Durban) and fieldwork, David still managed to organize his wedding and the purchase of a house near Copenhagen. On the 20th of September he married his Jane in Islip, his home village, close to Oxford. **Line Ugelvig** and **Matthias Fürst** spent their summer dispersed over the Northern Hemisphere (Estonia, Finland, Northern Germany, and Denmark) digging for caterpillars and chasing adult butterflies. They also attended conferences in Wageningen and the IUSSI in La Roche. This summer the group recruited a new master student **Erica Juel Ahrenfeldt** working on behaviour patterns of *Maculinea* caterpillars.

Leaf-cutting ant research activities included **Henrik de Fine Licht** leaving for a 5 months stay with **Ulrich Mueller** in Texas as part of his PhD work and **Sandra B. Andersen** successfully defending her MSc thesis on Cordyceps fungal parasites in August and receiving a PhD grant to continue. **Marlene Stürup** joined as MSc student to study trade-offs between sperm length and sperm number and egg development rates in attine ants. **Tim Linksvayer** recently started a Marie Curie Fellow using an evolutionary genetic approach to study social evolution in ants. **David Hughes** is leaving CSE and heading west to Harvard on an Outgoing Marie Curie Fellowship. He will come eastwards again in March 2010 to join the faculty at Exeter.

Tim Linksvayer

University of Sussex – The Field Lab. It's been an exciting year since our move from UCL to Sussex in November 2007, with three new members joining us. Dr **Elli Leadbeater** and **Jonathan Green** are both studying Spanish populations of *Polistes.* Elli is exploring direct benefits of helping for her post-doc, while Jonathan has started his PhD, examining the relationship between facial marks and dominance. Meanwhile, Sheffield graduate **Jon Carruthers** has joined the team to provide technical assistance. Team Field went in the field this year, with Jeremy, Elli and Jonathan between them spending six months in Cadiz, Spain, with field assistant **Neil Rosser**. They are sad to be back, and Jeremy still does not speak any Spanish. **Eric Lucas** is entering the fourth year of his PhD investigating the Neo-tropical apoid wasp *Microstigmus*. He has recently returned from six months' field work in Brazil and is preparing himself for a stint in the lab. Dr **Catherine Bridge** is approaching the end of her post-doc investigating genetic influences on social behaviour in collaboration with Rob Paxton's group. She will sadly be leaving the group in January. Many congratulations to Dr **Lorenzo Zanette** and Dr **Edd Almond**, both of whom successfully completed their PhDs last year.

Jon Carruthers

Trinity College Dublin – The Brown Lab. **Mike Kelly** - who has been working for 3 years on the interaction between bumble bee queens and the extremely cool nematode *Sphaerularia bombi* - is now in the process of writing up. We hope he'll be finished by March, small child and moving countries allowing! **Caitriona Cunningham** - co-supervised by **Jane Stout** - is in her 2nd year of her MSc looking at pollinators in fragmented landscapes. A new student - **Thomas "Joe" Colgan** - has just started in the group, and he is going to be conducting a collaborative project (co-supervised by **Seirian Sumner** and **Mark Blaxter**) looking at gene expression in bees and worms (the same system Mike spent the last 3 years developing). Finally, Mark is moving! After 6.5 years at Trinity College Dublin, Mark is moving to a Senior Lectureship in the School of Biological Sciences at Royal Holloway, University of London. It's exciting, and a challenge, and he's looking forward (I think...) to discovering how the UK funding system works....

Mark Brown

University of Gloucester – The Hart Lab. The summer has been a productive period for me, with a number of papers being accepted, including some theory-based work with Sheffield's **Duncan Jackson** on the link between sanitation and sociality (in press, Animal Behaviour), which will likely lead to further work in this area. My summer research work has also involved Duncan. We have been investigating various aspects of trail laying and division of labour using my Atta colonies and this work will continue over the next few months.

My media involvement has continued, with a monthly science slot on BBC Radio Gloucestershire as well as a number of other appearances, including, most recently, a morning program on the Large Hadron Collider and related physics – not quite social insects but I still managed to get an ant plug in! The station seems happy to increase my involvement with them, which could be an exciting opportunity. I have also developed links with River Cottage in Devon, placing some students there for a biodiversity study in the summer. They have a good selection of social insects on-site there and it's a great place to get some field work done, so I am working on some projects for next summer.

In October I have another PhD student starting, working with me and a previous Ph.D student of mine, **Anne Goodneough**, on phenology. Initially this will involve migratory birds but the plan is to branch into insects after the first year's work. I also have a keen group of undergrads waiting to start on Atta projects examining some finer details of waste management, disease control and trail building. A busy year lies ahead…

Adam Hart

University of Helsinki – The Sundström Lab. *New group events.* The social insect research in Helsinki currently has not undergone so many changes as last year. **Heikki Helanterä**, who got money from Academy last year, is still travelling in-between UK and Finland. **Emma Vitikainen** has finished her last field season and is going to write up her thesis pretty soon. **Anton Chernenko** has successfully stayed in Helsinki and started his PhD project on social parasitism and recognition in *Formica* ants. The group seems to be attractive for people from Eastern Europe and there is a volunteer from Slovakia, **Martina Ozan** (who used to live in the UK). She works on questions related to a preference of closer kin value brood in Formica ants.

The Nordic network on social evolution entered its second year. . It has provided opportunities for research exchange between the network labs. **Snaebjörn Pálsson** spent a week in Helsinki working on the effect of social structure on estimators of population subdivision. **Jelle van Zweden** also spent a couple of days in Helsinki to discuss some ideas and write up part of his thesis. **Anton Chernenko, Hannele Luhtasela, Lea Heikkinen, Terhi Evakoski** and **Ulla Vatulainen** took part in a course on social insect biology, organized by the Copenhagen crew. **Jonna Saapunki** has also visited Helsinki several times. The network also organized workshop on grant writing, held in Tvärminne, April 8th-11th.The teachers were **Lotta Sundström, Koos Boomsma, Patrizia D'Ettorre, Heikki Helanterä** and **Sanna-Maija Miettinen** from the University of Helsinki. There will also be a course on insect pathogens, organized by **Ingermar Fries**, Uppsala, Oct 29-31st.

The network will end its second year with a symposium on "Social insect biology" in Oulanka, Dec 8th – Dec 11th. The symposium is organized by Oulu people, the main organizers are PhD students **Jonna Saapunki** and **Kukka Haapaniemi**, and we look forward to a crew of about 25 network members. As well as last year, the symposium is especially designed for PhD-students, to provide them an opportunity to practice scientific communication. The participants will be students from Copenhagen and Helsinki, and possibly from Estonia as well. There are several extra-scientific activities that may be possible, such as deer and dog team driving, sledging, cross-country skiing and some extreme ones (swimming under ice?). The confirmed invited speakers are **Eamonn Mallon** and **Ashleigh Griffin**.

Anton Chernenko

University *of* Sheffield – The Martin Lab Social insect research at Sheffield remains in a healthy state despite the departure of Francis Ratnieks for Sussex in early 2008. During the summer of 2008 **Stephen Martin**, along with **Roger Butlin, Mike Boots, Duncan Jackson** and **Falko Drijfhout** at Keele University were awarded around £1.2 million in grants from the UK's Natural Environment Research Council (NERC) for social insect research. Two projects are to investigate the evolution of virulence using the honeybee-mite-virus model and to investigate the source and maintenance of chemical recognition cues in ant societies. The ant research is a large collaborative project that involves the chemical ecology team at Keele University, who along with Sheffield have recently successfully decoded the nest-mate recognition mechanism in the ant *F. exsecta,* the Finnish ant group headed by **Lotta Sundström**, who have one of the most complete datasets on any ant population, and the expertise of **Johan Billen** in Leuven. By bringing together a truly multidisciplinary team that includes experts in chemistry (Falko), genetics (Roger), histology (Johan), information processing (Duncan), behavioural and field biology (Stephen, Lotta, Emma) we intend to make real progress into a understanding key evolutionary questions of how chemical variation between colonies is maintained. This is project will generate vast amounts of chemical and genetic data that will be made available to the wider research community to help them further their own studies.

The bee grant allows me to return to the topic of bee diseases which is timely with all the media surrounding colony collapse disorder. Mike is a world expert on diseases both in insects and animals and brings a new dimension to the world of diseases dynamics in social insects. The aim is to develop the honeybee-mite-virus associations into a model system to test a raft of theoretical ideas, which cannot be tested in other animal systems due to ethical issues. All the work on both grants to be carried out over the next 3-4 years will be conducted in the new purpose-built environment research centre. This will open in autumn at a cost of £4 million and has been in part designed specifically for social insect research. A small number of honeybee colonies will be maintained in the adjoining woodland and a bee observation room, CT room and chemical lab are

all present in the new state-of-the-art research facility. It will be sad to leave Tapton were I have been based for the past eight years but I am looking forward to moving into the new facilities where a new and dynamic team of people will be established. As key discoveries in insect chemical ecology and recognition are now coming thick and fast, we hope to continue our success in grant capture and establish the new facility at Sheffield as a place at the forefront of social and non-social insect research. So, to paraphrase Mark Twain, "The rumours of the death of social insect research at Sheffield have been greatly exaggerated".

Steve Martin

Job Vacancies

Web-wonder David Nash is keeping an excellent record of vacancies in the social insect world on the IUSSI British Section webpage http://www.zi.ku.dk/iussi/vacancies.html. Please check it for jobs you might be interested in, and also keep him informed about any jobs coming up in your labs.
