IUSSI, BRITISH SECTION

(International Union for the Study of Social Insects)

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Election of New Officers of the British Section of the IUSSI

After a call for candidates to take up the reins of the Section in the 2007-2009 period, the following nominations were received:
For Section President – Andrew Bourke
For Section Secretary – Nigel Raine and Seirian Sumner
For Section Treasurer – Rob Hammond

In the absence of competing nominations, Andrew Bourke and Rob Hammond are duly elected as the new President and Treasurer of the British Section, respectively. They will take over from the current officers after the 2006 Winter Meeting.

In a sign of a healthy democracy, we will now run an election for the post of British Section IUSSI Secretary. Votes must be sent to the current Secretary, Mark Brown (mabrown@tcd.ie) before October 15th. I will announce the result of the election by email prior to the Winter Meeting.

Important Information for the Winter Meeting 2006

This year's Winter Meeting will take place on **Friday 8th December**, at the **Natural History Museum**, London. Our kind host is Paul Eggleton.

The meeting will start, as normal, at 10am, with members and non-members welcome to arrive from 9:00 onwards. Please go to the reception desk of the museum, where local hosts will direct you to the lecture theatre. There will be the normal breaks for coffee/tea/lunch, and the meeting will end around 5pm and then move onwards to a local hostelry. Costs for the meeting are unchanged from last year (Members: £10, £5 students; Non-members: £15, £7.50) and prior registration is not required.

This year our guest speaker will be Dr Doug Yu, of the University of East Anglia, who will be talking to us about his work on ant-plant symbioses.

If you wish to give a talk or a poster at the meeting, please contact Mark Brown (mabrown@tcd.ie) with a title as soon as possible. There will be the usual student competition, so if you are an undergraduate, MSc or PhD student, please state so in your submission. We do not require an abstract.

Directions to the Natural History Museum are as follows:

Bus (routes 9, 10, 49, 70, 207) and tube (Picadilly, District, Circle lines; get out at Gloucester Road or South Kensington). From Heathrow Airport take the Heathrow Express or tube. From Gatwick Airport take the direct train to Victoria railway station and then the tube.

For further information on the venue, please contact Paul Eggleton (p.eggleton@nhm.ac.uk)

Report from the Spring Field Meeting in Ireland, hosted by John Breen

Stephen Martin

We all probably agree that as biologists we now spend far too much time in front of our computers rather than out in the field. So John Breen provided the opportunity to redress the balance by offering to organise a field trip to the Burren, an area of outstanding natural beauty on the west coast of Ireland. After a brief exchange of e-mails a compact group of entomologists gathered in the Burren for what turned out to be an excellent experience. The weather could not have been better and John introduced us to some of the best field sites the Burren had to offer. We were all particular impressed by John's ability to arrange a Dolphin escort for our boat trip to the Aran isles (of Jumper fame). There were many highlights, which included the Cliffs of Moher, the highest sea-cliffs in Europe, various Turlough's (tarns whose water levels rise and fall with the water table), a wide range of orchids including bee, butterfly and frog, Father Ted's house on Craggy island and the excellent food, drink and, of course, company. John's students did a brilliant job, often behind the scenes, moving people around making sandwiches and generally ensuring everything ran smoothly. Everyone went home with a great suntan, collection vials full of specimens and great memories. Many thanks go to John and his team.

News from Washingon – IUSSI Congress 2006

The British Section of the Society was well-represented at the XV Congress of the IUSSI, with one Plenary Talk (our past president, Nigel Franks), 6 Symposia (organised or co-organised), and numerous talks and posters. Reports below from those members given grants by the Section to aid their attendance give a real flavour for what an exciting meeting it was.

A number of important events occurred and decisions were taken at this year's congress.

1) the British Section bid for the XVI Congress (2010) organised by Koos Boomsma and David Nash (Copenhagen) was successful and so the next Congress will be hosted in Copenhagen. I'm sure that Koos

will welcome help in the organisation of this major event in the ensuing years. Congratulations from the Section to them for putting together a superb bid!

2) the new officers of the International IUSSI are as follows: President, our own Koos Boomsma; Secretary General, Joan Herbers. Johan Billen remains Journal Editor, Chris Starr remains Archivist, and our own David Nash remains Webmaster.

3) the International Society has agreed to revisit its structures and organisation, in order to formalise its status and prevent future problems with respect to Congress organisation, as well as to increase its scientific and international profile. [This decision requires agreement from each section, so this will be an agenda item at our Winter Meeting]

4) the first Hamilton Award was given to Professor Ross Crozier, for his lifetime work on the genetics of social insects

5) members with journal subscriptions can now get online content. A pdf file describing how to achieve this is attached along with the newsletter.

Reports from the Washington Meeting

Margaret Couvillon

Over 600 scientists (self) assembled for the 15th IUSSI Congress in Washington D.C. The conference began with a welcome reception in the airy rotunda of the Smithsonian Natural History Museum and concluded with a banquet at the Omni Royal.

Throughout the week, I found myself thinking about several themes that ran through the conference. In his opening remarks, President Walter Tschinkel (University of Flordia) stated that two things brought us together: passion and beauty. I heard echoes of his sentiment throughout the numerous symposia, posters, and lectures. We are passionate about our species, awed by their beauty, and inspired to learn about them. Another strong theme, stated on the first morning by E.O. Wilson (Harvard University), is that the foundation of the study of social insects will always be natural history. He delivered this idea in his Keynote Address through the retelling of his own successful journey in the field. Natural history is our common language: from observations arise questions, and this synergy drives our field.

I found the symposium Social Recognition to be extremely interesting, not only because of the overlap with my own studies, but because I appreciated how the coordinators organized the talks to parallel the field. Recognition, of which there is a context in all areas of organismal life, is divided into three components: expression, perception, and action. Speakers, using proximate examples of their work and study organism, dealt with each of these ultimate components.

In social recognition, an individual expresses a specific label to be assessed in encounters. Studies on the invasive Argentine ant (*Linepithema humile*), as compared to the native Argentine ant in South America, demonstrate that a genetic bottleneck occurs when a small, invasive population moves into new territory. Analysis on the resulting supercolony demonstrates how genetic and chemical processes involved in recognition are integrated to produce behaviour.

During the perception component of recognition, an evaluator matches the expressed cues against a template. Most studies previously dealt with a phenotypic matching that did not include individual recognition. However, studies on the ponerine ant (*Pachycondyla villosa*) show that, in the interest of stable dominance hierarchies and subsequent reduction of conflict, queens are able to remember another individual for more than 24 hours.

The action component depends on the degree of dissimilarity between the cues and the template. If the template and the acceptance threshold are static, then recognition should proceed in a consistent, predictable pattern. However, flexibility introduces complexity. Studies in *Polistes dominulus* show a context-dependent nature in their recognition, providing us with understanding on how an updatable template or a flexible acceptance threshold could result in higher accuracy in recognition.

And so in this way, the studies on recognition, approached with an appreciation of beauty and a passion for what we might learn, echoed the importance of natural history. Only through a deeper understanding of our organism might we edge closer to answers.

Henrik Hjarvard de Fine Licht

The British section of the IUSSI very kindly donated £100 towards my travel expenses from Copenhagen, Denmark, to attend the XV International Congress of IUSSI in Washington, DC. This was my first IUSSI conference, and apart from the impressive Omni Shoreham Hotel in Washington, DC I found the program for the conference extremely interesting. Around 600 researchers ranging from students as myself to the 'PI's' in the field attended the conference. The symposia subjects were very diverse and covered the entire range of subjects within the IUSSI.

I especially found the symposium 'Conflict resolution in insect societies' very interesting. This topic was close to my own studies during my master's thesis and the symposium was very well organized by the coordinators. Conflict resolution is important as potential conflicts over reproduction may otherwise destabilise insect societies. Especially queen-worker conflicts over the production of males are a well known example of conflicts in insect societies. The symposium highlighted several central themes such as relatedness or kinship and policing as explanations for reducing potential conflicts. Not only were a wide variety of study organisms respresented in this session, but it also included diversity in terms of methodological and theoretical approaches.

It was a great experience to take part in the Conference and I'm already looking forward to the XVI IUSSI Congress in Copenhagen 2010.

Liz Evesham

Thank you for your contribution that enabled me to attend and present my paper at the Congress. My paper was included in Symposium 8 "Building Behaviour and the Control of Climate in social Insects" which was organised by Flavio Roces from the University of Wurzburg, Germany.

The Symposium started with a talk from Mike Hansell on the origins and consequences of building nests. He considered whether selection pressure to provide nests with greater protection from predation, had an effect on nest design such that a colony would make compromises, particularly with regard to the control of climate within the nest.

Walter Tschinkel talked about his methodology of creating cast nests using dental plaster or molten metal. I was able to learn of this when I visited Walter in his lab earlier this year. He then talked about the vertical arrangement of *Pogonomyrmex badius* workers according to their age and task performed within the nest. For example, older workers that dig more and provide a defensive zone are found at the top of the nest while the young callows dig less and care for brood are found deeper in the nest. In between, is a food processing and transport maintenance area. Carbon dioxide concentration and temperature may be a factor influencing such arrangement.

I was interested in Robert Jeanne's talk on the effect of relative humidity on the rate of nest construction in the social wasp *Polybia occidentalis*. They complete their nest in two weeks, which I originally found to be the case in laboratory colonies of *Myrmica rubra*. However, in more recent experiments I have found that these ants continue to excavate and appear to have resting phases. In the social wasp, the rate of building was shown to be high in the first week and then slowed down. Most activity was in the early mornings when there was high humidity. High humidity had a direct effect on this in that the pulp collected required less water to process and so the ants could spend their energies in nest construction. As humidity declined later in the day, foraging for water and food became the prime tasks.

I was fascinated to learn of the occurrence of glycerol in the nest material of fire ants in a talk by Jian Chen. He was able to study this in the lab using wetted pure silica gel as a building material, thus avoiding the interference of other compounds found in the soil. Glycerol preserves moisture and may act as a regulator for moisture in a fire ant colony.

Anna Schmidt looked at the "Magnetic Termite" *Amitermes meridionalis* which occurs in Northern Australia. It builds wedge-shaped mounds with an elongated axis that is orientated in a North-South direction. The

biological significance of this is discussed. For example, it was suggested that the shape was important to dry out the grass storage which termites depend upon during the floods. After heavy rains the mounds are dried out quickly and so maintaining stability. When damp, the shape also facilitates gaseous exchange. Julia Jones looked at the honeybee *Apis florea* which maintains the temperature inside its nest by fanning. Workers that are genetically different are stimulated to fan at different temperature thresholds and this may be a widespread phenomenon in the genus *Apis*.

There were many more fascinating talks and it was a wonderful opportunity to be able to meet and discuss research ideas with colleagues.

Sophie Evison

Since discovering the marvel of the chemical ecology of insects, and hence heading towards this area of research, I have frequently encountered the name of the pheromone expert, pioneer in pheromone research in the social insects, and past winner of the Lamar Dodd award for excellence in research, Murray Blum. With more than three decades as a research professor at the University of Georgia, there is little surprise that a symposium on the semiochemicals of social insects would be dedicated to Murray Blum. His name appeared throughout the references of each of the talks in the symposium.

As a new PhD student interested in this area, it was very rewarding to hear about the huge variety of functions of semiochemicals in the social insects. Interesting subjects ranged from the link between genetic variation and hydrocarbon variation in termites, through venom chemistries, and the stench of stink ants being caused by bacterial chemicals in their head space, rather than the ants chemicals. Learning about how an ant queen recognition primer pheromone, that acts on workers to maintain high levels of octopamine, increases worker sensitivity to the subtle changes in intraspecific nestmate recognition cues, and all about the role of semiochemicals and synergism in pest control, particularly the eastern yellow jacket, was also enlightening.

I found the talk on the ant species *Amblyopone reclinata* fascinating, where the unusual dorsal position of the footprint gland leads to the curving of hind legs into a peculiar upside-down position in order to lay a trail to recruit workers to large prey. I was also particularly interested in the talk titled “The multifaceted role of cuticular hydrocarbons in social insects”. Nestmate recognition being a recognised function, but to also function as fertility signals where fertile individuals project specific hydrocarbon blends different from infertiles is curious as the two contradict each other. Maybe responses are context dependent and it may link back to the role that octopamine plays in increasing worker sensitivity. Talks that really get you thinking, particularly about the parsimonious nature of semiochemicals, stand out furthest in the mind.

I'm sure, listening to all the presentations throughout the day, Murray felt proud to be a major player in this area of research, just as I felt keen to learn more of such an interesting subject. Finally listening to Hank Fales recall notable events in Blum’s career was quite inspiring, but to be treated to a talk from the man himself really made this symposium a joy to attend.

Elva Robinson

My talk was slotted in to one of the very mixed open sessions. I stayed for all the talks, initially out of a sense of solidarity with other presenters giving their talks during the evening of the penultimate day of the conference. This meant that I found myself attending talks which I would not otherwise have picked out, but through this I learnt about several areas quite new to me.

The session began with a talk about a social insect one hears very little about: the thrips. Both solitary and social species of thrips co-exist on many different acacia species. This overlap seems to have persisted for millions of years, and raises interesting questions concerning competition and niche overlap, with still much to learn on the subject. Termites, although quite well-represented at the conference, are another group about which I don’t know a great deal. The next talk discussed the role of wood mulches in the spread of pest termites throughout the US, and showed that the source of wood and the amount of weathering have dramatic effects on the ability of the termites to survive in these mulches.

The remaining three talks concerned my own study group, the ants. First we were introduced to some strange ants in which gynes are produced by parthenogenesis, but workers by sexual reproduction. The experiments reported produced an interesting result: mean worker size increased with the colony level of

genetic diversity, and thermal tolerance was size related, with larger workers able to forage at a wider range of temperatures. I then gave my talk about the negative pheromone in the Pharaoh's ant, and discussed our hypotheses about its role within the organisation of the foraging system, where it provides information to enable correct trail choice at bifurcations. The final talk discussed how a third species of ant controls its local environment. These ants can survive local floods when the soil composition is right, and their survival can be used as a bioindicator of the state of its riverine habitat.

This amalgam of unrelated talks represented a small snapshot of many of the themes developed in depth in their own symposia. Within this open session we touched on the evolution of sociality, pest control, caste specialisation, organisation of foraging and manipulation of the physical environment.
Thank-you to everyone who made it to our session despite the competing attraction of the poster session complete with cheese, biscuits and a bar.

Anna Mosegaard Schmidt

Come socialize! Was the message sent out many months ago with the first announcements of the IUSSI 2006 conference in Washington, D.C.. Many answered the call and turned up to share their passion for the social insects.

Although late Friday afternoon on the last day of this five day conference, most remained seated to include the last talk in the Invasive ants symposium. This was a very interesting full-day symposium, which included talks on a number of different ant species, as well as a built-in poster-session, that contributed new, interesting data and insight to the area of ant invasions.

Applied perspectives made clear that the economic costs of keeping down the red imported fire ants (*Solenopsis invicta*) can be substantial, but that their presence is actually also sometimes appreciated, e.g. when they reduce the occurrence of other, unwanted insects or rodents. Application of boiling water in vast quantities as a means of killing unwanted invaders was illustrated through elaborate descriptions and photographs, and important perspectives regarding some of the species' current geographical distributions and their expected potential for spread to climatically similar regions were included through, among others, the one-man, no-functional-power-point-show provided by Jim Wetterer.

The success of invasive ant species is attributed to a number of different factors that are currently being investigated. The release from natural enemies otherwise occurring in the ants' native range is likely important, and the different possibilities of introducing these enemies, such as host-specific decapitating flies, as a means of biological control are currently being tested by Sanford Porter and others. Another factor considered important for invasive ant species is their unicolonial social structure; a form of social structure where the colony boundaries are indistinct and worker ants from vastly separated nests can be exchanged freely without any signs of animosity. The resources released by the lack of intraspecific aggression can potentially provide the invaders with a competitive edge. Thus in species such as the Argentine ant (*Linepithema humile*) and the imported fire ant (*Solenopsis invicta*) the levels of intercolony aggression were found to correlate with levels of intercolony genetic differentiation, and within supercolonies observed in California the genetic differentiation was low and aggression absent.
However, a very interesting talk on *Myrmica rubra* showed that extremely high nest densities apparently can be achieved by an invasive species that is not unicolonial, thereby showing that even though the unicolonial social structure may in many cases seem an extremely important trait, the lack of unicoloniality may not prevent an ant species from becoming a very successful invader.

On this last night of the conference many joined the banquet at the Omni Royal, but numerous chose alternative paths too, and the streets surrounding the Omni Hotel resounded with enthusiastic insect chats until late in the evening; as the aim of the conference stated, so it was: people were socializing.

Line Vej Ugelvig

Having just recently started working in the field of immune systems of social insects, it was with great interest I followed the symposium 11 on this topic at the 15th IUSSI Congress in Washington D.C…and despite high expectations I was not disappointed.

The symposium gave a good insight into how living together in social groups, as the colonies of social insects, is connected with both costs and benefits, not least when it comes to diseases.

iseases have great impact on colony fitness, leading to the evolution of many different defence systems, each suited for a specific need. Studies presented gave an overview over a wide array of colony level defences: Attine ants which have an ancient association with a bacteria grown on their cuticle that produce antibiotics for use in the fungus garden, wood ants of the species *Formica paralugubris* which actively collect resin to inhibit growth of microorganisms in their nest, and “social transfer of immunocompetence” after pathogen infection in the termite *Zootermopsis angusticollis*, an effect similar to vaccination.

The maintenance of immune systems is costly which was shown in studies on the queenless ant *Diacamma sp*. where immunocompetence decreased in colonies where reproductive conflicts were induced; likewise was the immune response of *Atta colombica* queens affected by high number of matings, possibly due to increased metabolic costs of sperm storage.

Thanks to molecular studies in this field we start to understand some of the underlying mechanisms involved in the evolution and maintenance of these complex systems.