

Views from Bangor, North Wales – the FSBI summer symposium

Eleni Petrou, a University of Washington graduate student and winner of the best student paper award gives her perspective



We arrived in Bangor, Wales in the middle of an unusual heat wave. The clothes that we had packed for the Annual Symposium of the Fisheries Society of the British Isles were too warm and so we came to the conference under-dressed, wearing whatever short-sleeved and filmy thing we might have brought in our luggage.

During the day, we gathered in the cool, spacious halls of Bangor University to hear colleagues from

around the world present their latest research. Some had traveled thousands of miles, from as far as Australia, Malaysia, and Russia, to attend the symposium. The talks were interesting and well-crafted, covering a variety of topics. We learned about the potential effects of sampling bias on estimates of effective population size for marine organisms, and then heard about how genetic estimates of population size can be used

in fishery stock assessments. Presenters dazzled us with enormous data sets investigating the basis of reproductive isolation in pelagic fish and speciation in reef fish and cichlids. Other scientists discussed elegant microsatellite data that uncovered the sneaky love lives of Mediterranean damselfish or the connectivity of fish in the polar seas. We heard some excellent talks on the polygenic nature of phenotypic traits in salmonids and the development of methods in environmental DNA to monitor populations or species assemblages. It was inspiring to see colleagues poring over genomes that they had sequenced themselves, or passionately dedicating themselves to a research question on a shoestring budget.

After the day's work was done, we congregated in shady university courtyards to socialize in the long twilight hours. Our gracious host, Professor Gary Carvalho, had arranged for ample and delicious supplies of food and drink, and the conversations flowed easily. One adventurous scientist tried to convince me to sequence the whole genome of my study organism [the Pacific herring, ►

◀ Ed.], and I traded ideas with super-sharp graduate students, who had taught themselves how to deal with the thorny quirks of bioinformatic analyses.

Later at night, as a fat moon shone above the gentle Snowdonia Mountains, we wandered Bangor's streets in search of pubs. We

treated each other to pleasantly drinkable English ales and planted the seeds of friendships and collaborations. These gatherings lasted late into the warm night. More than once, I was woken up by groups of merry scientists who loitered under the dormitory windows chatting excitedly. And of

course, after the banquet, at least half the conference attendees lingered on the lawn into the small hours of the night, sounding so cheery and fraternal in their tipsiness. It was a pleasure to have attended the symposium and to have met so many convivial and creative people.

Sweltering in Bangor – the Society's annual symposium was one of the biggest yet



Mention Bangor in North Wales and the tendency will be to think of rain and wind. The weather in North Wales is typically Atlantic and can be very variable. For the Annual Society's Symposium this year which took place between 18th– 22nd July the weather was out of character. For the first two days it was swelteringly hot for the area, then, on Tuesday night there was a thunderstorm and rain which brought temperatures down to a more normal, but still pleasant level. Despite this variability in the weather the quality of the papers given at the conference was consistently high and provided material suitable for a wide range of participants.

The conference title was *Fish, genes and genomes: contributions to ecology, evolution and management* and was organized

principally by Professor Gary Carvalho (the Society's Vice President) although with a large number of local and international volunteers. The attention to detail was amazing and insured that delegates were able to focus on the talks and on the opportunities for interaction without distraction. An excellent lunch was provided each day as part of the package obviating the need to go foraging in the lunch hour, there was a barbeque for which the weather remained dry, and an excellent conference dinner at the Bangor Management Centre at which the Beverton, Le Cren and FSBI medals were awarded to Lennart Persson (Umeå University), Julian Metcalf (Cefas) and Steve Simpson (Exeter University). Presentations were made by the Society's President Iain Barber.

Social events began with a welcome reception on Tuesday evening at which the Bangor City mayor officiated. The evening was very warm so people spilled out of the room and sat on a grassy bank where they could eat and chat at the same time in a less stuffy environment.

The main activities were in the new Pontio building which is cut into the hillside connecting the old part of the University to the town below. Despite some minor teething problems with the new building, the location was excellent with plenty of room for posters, for talking and for listening to papers in the large auditorium.

The JW Jones lecture, was first given in 1992 during the Liverpool based conference celebrating the 25th Anniversary of the founding ▶



◀ of the Society. Jones (at right) was founding President of the Society and worked on salmon ecology being one of the first, if not the first, to record male salmon smolts fertilizing large females. The life history element of this work decided the content of the 1992 conference and Geoff Parker, a one time colleague of Jones gave the first lecture in the founding president's honour, analysing reproductive strategies in fish. Since then we have had a distinguished sequence of speakers giving the Jones lecture including in 2001, Robin Waples at a meeting in Leicester on biodiversity and conservation. At the Bangor meeting, Robin became the first person to give the Jones lecture twice and his paper on *Tiny estimates of the Ne/N ratio in marine fish—are they real?* set the scene for the rest of the meeting. I did not arrive at the conference until Tuesday afternoon so cannot comment on the detail of this paper but those I spoke to were full of admiration.

Keynote papers were also given by Jennifer Ovenden (Australia), Louis Bernatchez (Canada), Craig Primmer (Finland, pictured right), John Casey (UK/Italy) and Dorte Bekkevold (Denmark). All these papers were full of interesting observations and wise conclusions but Craig Primmer's paper was the one that caught my attention, mostly because it dealt with life history strategies which happen



to be preoccupying me at present. Craig, who is originally Australian started by drawing attention to his appearance at the conference in contrast to his picture in the



conference handbook. In this his photograph shows him with a full beard which had gone by the time he got to Bangor, apparently as a result of a vote in the family!

The main thrust of Craig's talk was the genetic architecture underlying the size and age at first reproduction in Atlantic salmon. The paper was an interesting blend of practical issues, such as that big salmon, which are declining in Finish rivers attract tourists, with more biological issues such as the different reproductive strategies that give males and females maximum fitness. For females it is unequivocally the case that large size increases fitness as egg number is a positive function of size. For males there is a dilemma. If they go to sea and achieve a big size they have to do this in the face of a significantly higher risk of mortality. Alternatively a male can stay in the river and remain small. In this case the risk of mortality is much less but the fitness gain is less. Craig's work has discovered a gene that is associated with age at maturity in salmon and when homozygous for one allele is associated with an early age at maturity and the other homozygote is associated with high age at maturity with the heterozygote being intermediate.

As with so much of this type of genetic research, this gene has also been found in mice and humans. In us the gene is expressed in people who can keep their weight down whilst in mice the gene is also associated with weight issues. Such is the sparing property of the evolutionary process.

The meat of the symposium was made up from all the contributed papers most of which were well presented and full of interesting findings, even as judged by a non-molecular whole organism biologist such as myself. An innovation was the holding at the end of the day of so-called flash talks in which presenters ▶

◀ had 3 minutes to present their main ideas. On Tuesday evening before the mayoral reception there was a poster session with presenters in attendance. The one complaint I had about this session was the noise level which made conversation very difficult. The conference was attended by Taylor Wilcox (University of Montana and the US Fish and Wildlife Service) who was an *American Fisheries Society Genetics Section Fellow* and the *American Fisheries Society International Fisheries Section*

Fellow Charles Waters (University of Washington, Seattle). Both gave paper as did the eighteen early career scientists who received travel awards from the Society. Best poster went to John Hargrove from the University of Florida and best student talk was given by Eleni Petrou from the University of Washington, Seattle (she gives her view of the conference elsewhere).

This conference was large in relation to many other summer symposia held by the Society with almost 200 participants. As usual the delegates came from a

wide range of countries, 26 in all. Unlike many of its predecessors the topic of the Bangor meeting was inclusive and this might be the future trend. In particular next year's symposium at the University of Exeter, which will celebrate the 50th Anniversary of the founding of the Society, will we hope be even larger than the Bangor and with a much wider range of subject matter (see the poster in the Notices section).

Paul Hart
University of Leicester

Iain Barber, President of the Society gives his view from the conference

One of the great pleasures of serving as FSBI President is attending our Society's International Symposia, which are held each year on a wide variety of subjects in the fields of fish biology and fisheries. Because the meetings are on focused topics, this inevitably means that the President attends meetings outside of his or her normal purview, which nowadays is something that few of us are normally able to do. This is regrettable of course, because very often attending meetings outside one's own immediate research area can give far greater insights – and stimulate more genuinely interesting avenues for novel research ideas and collaborations – than attending the same 'comfortable' meetings each year. I am writing this piece in the afterglow of another fantastically successful FSBI Symposium, this time held at Bangor University in Wales, on the subject of Fish Genes

and Genomes. As you will read elsewhere in this issue, the meeting was a resounding success, both academically and socially. Why was the meeting so successful? In my opinion there were four key elements. The first – unquestionably – was the level of organization, hospitality and general spirit given to the meeting by the organizing team, led by the irrepressible Gary Carvalho (at right). From the first moment, the delegates felt welcomed and valued, and every element of the meeting – from the constant and early availability of coffee, to the final sing-along at the close of the meeting – had been meticulously planned (well, maybe not the sing-along, but everything else...!). Second, the timeliness and suitably-broad nature of the topic of the meeting encouraged very high quality scientific submissions tackling a wide variety of extremely pertinent questions; as a result, the programme



was packed full of interest, and – almost uniquely in my experience – there was no drop-off whatsoever in attendance or the level of questioning throughout the meeting. Third, the careful selection of keynote speakers meant that each session began with a real 'bang' as delegates were treated to incisive contributions from ▶



◀ world-renowned fish and fishery scientists (e.g. Robin Waples above). And fourth, but certainly not least, were the conference delegates themselves, who appeared as one very happy, welcoming

and collaborative family. I was present throughout the meeting and heard many delegates state that this has been the best conference they've ever attended. I would have to agree with them – this one will live long in the memory. As a non-specialist attendee, I left the conference with a number of ideas for my own research that I know I would not have had, if I had not been there.

Next year the Society celebrates its 50th Anniversary, and we hope to take some of the Bangor 'magic' with us to mark this occasion by holding a special meeting at the University of Exeter on 'Understanding Fish Populations', the first announcement of which is included in this newsletter. The idea behind this rather more broad topic than usual is to encourage participation by a

large proportion of Society's membership – as indicated by the list of proposed conference themes, we are taking a very broad approach to fish populations, and we hope to encourage wide participation in the event. The conference will also include a number of FSBI celebratory events, to include reflections on our Society's history, its role in shaping the fields of fish biology and fisheries science, and commemorating some of the figures that have played key roles over the past 50 years. The meeting is being co-convened by Steve Simpson and myself, and we will soon be contacting you with further information about the meeting. For the moment, please 'hold the date' of 3rd-7th July 2017!

With very best wishes

Iain Barber

Editorial

Given that I have already written too much on my impressions of the Bangor symposium there is not much to say here. The item on Port Jackson sharks awakes my interest in that it is part of a growing trend of involving the wider population in scientific research. An organization I am involved with and which taps

into this crowd-sourcing trend is the Secchi Disk project started by Richard Kirby. Realising that there was a dispute as to whether phytoplankton populations in the world's oceans was declining or not, Richard had the brilliant idea of getting yachting people and other seafarers to use a secchi disk to measure the point of extinction

around the world. This is now producing a magnificent data set and you can see more at <http://www.secchidisk.org>.

Paul Hart
Leicester, August 2016

Next deadline for copy:
1st November 2016

Culum Brown reports on a project using crowd funding of shark research

A shark research group based at Macquarie University have been studying the behaviour of Port Jackson sharks (*Heterodontus portusjacksoni*) for the past 5 years. The team is comprised of 5 PhD students, a masters student and a Post-doc all under the guidance of A/Prof Culum Brown. The team use a range of

network analysis shows they have preferred social partners and each shark has its own personality.

But conducting fieldwork is an expensive process and a single acoustic tag costs around \$500 to deploy. So the team has looked for funding in an unconventional place, the general public. “Our research attracts a lot of media

information packs for schools so we can slot into their biology curriculum” said Sherrie Chambers, one of the PhD students working on PJs. “We think this is the kind of thing high school teachers will embrace and the price tag is pretty reasonable given the time the tags remain active.” As the word spreads, largely through social media, more people are taking advantage of ‘the adopt a shark’ program and are making solid contributions to shark research.

Follow thefishlab through the website (thefishlab.com), on facebook (@PJsharktags) and twitter (@FishLab_MQ)



techniques to understand the behaviour of the sharks including passive and active acoustic tracking, accelerometers, genetics, metabolic chambers, stable isotopes and lab based cognition and social preference tests. The data to date has shown that these sharks show very high site fidelity and return to the same reef for the breeding season every year. This is even more impressive given that they seem to migrate to Bass Strait and back every year, a round trip of about 2000kms. There is a high degree of relatedness at breeding aggregation sites, particularly among females and there is strong population structuring with significant differences in genetic diversity between bays. Social

attention and the public has a fascination for sharks” explained Culum, “So we thought we could make the most of that by asking the public to help fund our research”. The team set up a website “thefishlab.com” where punters can log in and make a tax deductible donation. The site is linked to the university accounts system and the university is a listed charity. Donations over \$500 enable an individual or company to adopt a shark. They get the naming rights and are given access to a webpage where they can track the movement of their adopted shark over time. The acoustic tags last up to 10 years, so it’s a solid investment.

“We are now preparing

Notices



First announcement

FSBI 50th Anniversary Symposium

Understanding Fish Populations

3rd–7th July 2017

Forum, Streatham Campus, University of Exeter, UK

Conference themes include:

- Population structure, dynamics and demography
- Fish populations as sentinels for environmental health
- Behaviour and social networks within fish populations
- Population-level impacts of environmental stressors
- Effects of climate change on fish populations
- Importance of fish populations for global biogeochemical cycles
- Exploitation and recovery of harvested fish populations
- Feeding a growing human population (fisheries + aquaculture)
- Celebrating 50 years of the FSBI

Lead organisers: Dr Steve Simpson (S.Simpson@exeter.ac.uk) & Dr Iain Barber (FSBI; ib50@le.ac.uk)



further details available soon at www.fsbi.org.uk

Research report

Shaun Robertson, Janette Bradley and Andrew MacColl at the School of Life Sciences, University of Nottingham, UK received an FSBI research grant to study *The immune response of three-spined stickleback (Gasterosteus aculeatus) exposed to natural conditions in a field experiment.*

Here is the abstract they wrote for the paper reporting their results.

Placing our understanding of the function of the immune system into a more natural context, particularly identifying factors which shape immune function, is a fundamental challenge in understanding the evolutionary relevance of immune system variation. Whilst patterns of immune system variation can be observed when sampling individuals from wild populations, they are potentially confounded

by the unmeasurable past experiences of each individual. To control for this variation, we exposed F2 hybrid fish, between two parental populations which vary in parasite resistance, to semi-natural conditions for 8 weeks in enclosures in a lake on North Uist, Scotland. We measured individual immune gene expression profiles using a previously published set of markers, and examined which factors contribute to shaping immune function. As each fish was individually tagged, we could also examine variation in growth rate and changes in condition over the course of the experiment. Exposure to natural conditions resulted in a change in immune gene expression levels relative to a control set of fish kept in the lab, with variation associated with sex, reproductive condition, growth rate, and infection with the

common parasite *Gyrodactylus arcuatus*. Growth rate varied with *Eda* genotype, the gene underlying a major adaptive phenotypic polymorphism, whilst change in condition differed with reproductive investment. This study demonstrates that patterns of immune system function in the wild are not just determined by variation in individual experience, and adds to our growing understanding of the function of the immune response in a natural setting.

Information Desk

For all membership enquires (except subscription payments), including grant application submissions, please contact the FSBI office at:

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See <http://www.fsbi.org.uk/membership/joining-the-fsbi/> for further information.

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