

Perspectives on “Nest Construction and Function 2015”

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Back in September 2012 I organised the first conference on nest construction and function, which was held at the University of Lincoln (Deeming, 2012). Even before the meeting was over I was being asked when the next meeting would be held. Whilst I thought another meeting would be a great idea I felt that there needed to be some time delay to ensure that there was sufficient new research to be reported upon. Research carried out at Lincoln during 2013 and 2014 meant that novel data about nests were available, there were many new reports about a wide range of topics regarding nest biology in the literature, and interest in avian reproduction was increasing (Deeming and Reynolds, 2015). In this environment, I decided in early 2015 to organise the second nest meeting at a time three years after the first event. Initial enquires of various colleagues was positive so “Nest Construction and Function 2015” was born.

The second meeting was held in September 2015 at the University of Lincoln (UK) and was attended by delegates from the UK, from four different countries across Europe, and the USA. Most of the delegates at the meeting had not attended the first meeting in 2012. Over the course of two full days there were excellent presentations and discussions on a range of different topics. My sincerest thanks go to each of the delegates for attending the meeting and helping make it such a success. I was really pleased to see so many young researchers attending the meeting, presenting their work and learning from the collected wisdom (whatever that may be) present within the room. I am very grateful to those delegates who have contributed to the written proceedings of full papers (which together with the abstracts of talks presented at the meeting will again be published by Avian Biology Research) for their prompt responses to reviewers’ or editorial changes. Many thanks go to the reviewers of manuscripts who helped so much in the preparation of the proceedings.

Nest research has been continuing apace since 2012 (see reviews by Deeming and Mainwaring, 2015; Healy *et al.*, 2015; Mainwaring *et al.*, 2015; Smith *et al.*, 2015) and novel areas of research have emerged in just a few years. Various broad themes also seem to be developing as strands of research interest. One such example is research that seeks to allow us to understand the cognitive basis for nest building by linking it with neurophysiology. Much of this work is carried out on captive Zebra Finches (*Taeniopygia guttata*), which are provided with artificial

nest materials. Whilst this important work undoubtedly provides insight into behaviour it would be interesting to test this species with more natural nesting materials, particularly in the context of its decision making given a choice of natural and artificial nesting materials. Zebra Finch nests also build rather simplistic nests and perhaps future research will identify another model species that builds a more complex nest structure?

Another key theme is the investigation of the composition and physical properties of nests built by a variety of wild species. Much of this work uses nests removed from their nesting location but has the advantage of the nests being built by wild birds. It is increasingly clear that nest construction is a plastic behaviour, common in many species. Much research effort is directed towards an understanding of the thermal properties of the nest using a variety of techniques. However, during the meeting it became clear during questions and discussions that the way that nest materials interact with liquid water (typically as precipitation) and humidity may well be very important in their function in some species. The rather ambiguous role for feathers in the nests of many small birds may not reflect thermal, insecticidal or antimicrobial roles after all, but could be related to their hydrophobic properties. Further research is needed but well-designed studies could be most enlightening in this respect. It was remarkable that birds are so selective in their choice of nesting materials – one talk showed that despite a very diverse choice of bryophytes in the natural environment, three tit species (Paridae) are highly selective in choosing only 2–3 species of mosses to include in their nests. Other research is directed towards investigation of how nest materials with different properties are positioned within the nest and what that can tell us about decision making during nest construction.

Another key element of study is how nests fit within the breeding ecology of the species. This can be the natural nesting of colonial weaverbirds in Africa, one talk was given by the invited speaker Gavin Leighton (from the USA), or the interaction of nest choice selection with habitat selection in a North American warbler. There is certainly an increasing awareness of how nest construction can impact on the fitness of the adult birds and their offspring. It was reassuring that the impact of the study of nests *in situ* in studies examining brood parasitism or predation has been recognised as a potential problem and

tested empirically. The broader implications of a better understanding of nest biology were also put into context of anthropogenic changes to the environment, particularly urbanisation.

At the previous meeting there was a predominance of studies dealing with tit species nesting in artificial boxes. Whilst this remains an important model system for many studies, there is an increasing move towards the study of cavity-nesting species in natural holes and of species that breed in more open environments. This can only be a positive move given the paucity of quantitative data on nest materials (Deeming and Mainwaring, 2015). In 2012, there was a talk on nest construction in fish and so it was great to have an invited talk by Jeanine Refsneider from the USA on nesting in reptiles to provide a timely contrast with nest construction in bird species.

Nest Construction and Function 2015 was certainly a success at all levels – as in 2012 I was being asked when the next meeting would be even before the meeting had ended. Although remaining noncommittal as to when it might be, I do believe that interest in the nests of birds is steadily increasing because of an increasing realisation of the fascinating biology of these structures and the various roles that they play in avian reproduction. I suspect that in a few years' time there will be another meeting to update us all on how we are getting along in understanding nest construction and function.

1. REFERENCES

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Nest Construction and Function 2015 Participants

(left to right) **Front row:** Ángel Cruz Miralles, Kevin Briggs, Douglas Russell, Tomasz Wesołowski, Charles Deeming, Laurene Guillette, Sophie Edwards, Alexis Breen, Eira Ihalainen. **Second row:** Cezary Mitrus, Michał Gładalski, Sue Healy, Daniel Hanley, Gavin Leighton. **Third row:** Joanna Rosenberger, Lucia Biddle, Liberty Gray, Iga Gózdź, Caitlin Higgott, Jeanine Refsneider, Henry Streby (with Sora), Liliana D'Alba, Tom Pike, Adrian Goodman, Jim Reynolds. **Back row:** Rene van Dijk, Ben Hatchwell, Stuart Humphries, Thomas Martin, Adam Kaliński, Mark Mainwaring, Riccardo Ton, Nat Warning.