



ZSL Scientific Awards

The citations for the following awards were read at the Scientific Awards Presentation Ceremony on 17 June 2014

ZSL Prince Philip Award and Marsh Prize

Is awarded to an A-Level (or Higher) student for the best zoological project involving some aspect of animal biology. This year's winner is **Carly Brown**, of Taunton School, for her project 'Can the common garden snail see in colour?' In her novel and well-executed study, Carly constructed apparatus made out of PVC cut in a cross-shape, which allowed four different colours of light (red, blue, green and purple) to be streamed through acetate filters at four independent points within a chamber. Upon collection of fifty snails the experiment began, as one snail at a time was placed into the apparatus and its movement towards the different coloured lights recorded. Carly presented a sound hypothesis, supported by appropriate biological arguments and background research. Repetitions of the experiment ensured that a robust data set was produced, which Carly analysed with the use of statistical tests. The results indicate that *Helix aspera* move towards red light more frequently than other colours, and that the purple light was rarely preferential. In addition to her extensive data collection, Carly provided an impressive critical evaluation of the project and was able to identify priorities for future research. We are delighted to award this prize to Carly, who receives a cheque for £600 generously sponsored by the Marsh Christian Trust, and Taunton School is presented with a medal.

ZSL Charles Darwin Award and Marsh Prize

Is awarded for the best zoological project by an undergraduate student attending university in the UK. This year's winner is **Mark Scherz**, for his project 'The paraphyly of ratites just doesn't fly'. Mark is currently completing his MSc at Munich University, and we are sorry that he cannot join us tonight. In his exceptional study, Mark addresses the controversy surrounding the evolution of flightlessness in ratite birds. Until recently, the accepted opinion was that ratites comprise a monophyletic group with a sister clade in the tinamous. However, with the recent flood of molecular sequence data, several studies have placed the tinamous within the ratite clade, with the implication that flightlessness has been lost independently amongst the ratites. Mark succinctly pulls this latter hypothesis apart, demonstrating that it arises from conflicting and error-prone phylogenetic signals amongst different genes. This highly inconclusive picture may not easily be resolved because there are few extant species in this group. In

the space of a few weeks Mark managed to shed more light on the difficulty of recovering a deep phylogeny of birds than numerous professionals in the field. The work is impressive in many ways: the ambition of the question it addresses, the sophistication of the analyses used, the mature interpretation of the results and the truly excellent standard of the scientific writing. For this outstanding work Mark receives a cheque for £800, sponsored by the Marsh Christian Trust.

ZSL Thomas Henry Huxley Award and Marsh Prize

Is presented for the best zoological doctoral thesis. This year's winner is **Helen Leggett**, University of Oxford, for her thesis 'Developments in social evolution and virulence in parasites'. In this accomplished study Helen examines how parasite virulence is influenced by population demography, multiplicity of infection, and the nature of interactions with the immune system. The thesis includes a published review article examining the importance of generalism versus specialism on virulence evolution, a published comparative study on the relationship between infective dose and virulence, and a published experimental study on the evolution of phenotypic plasticity in parasites. It also includes a comparative study of the relationship between immune-system subversion and pathogen virulence, and an experimental study looking at the evolution of virulence in a spatially distributed population. A key finding was that, contrary to standard theory on virulence evolution, pathogens with higher virulence do not tend to have higher within-host growth rates. Given the centrality of this assumption in standard theory on virulence evolution, this finding is of enormous significance, and it has the potential to change the way people think about the subject. We are delighted to present Helen with the award in recognition of this exceptional thesis. Helen will receive a medal and a cheque for £1000, kindly sponsored by the Marsh Christian Trust.

ZSL Scientific Medal

Is awarded to research scientists with no more than 15 years postdoctoral experience for distinguished work in zoology. This year we are awarding three medals:

Iain Couzin, Princeton University

Iain's research focuses on the collective behaviour of animals and, in particular, understanding how the actions of individuals in swarms or flocks generate the complex and coordinated behaviours shown by the group as a whole. He uses a variety of study systems (tumour cells, ants, fish, birds, humans) and his approach is highly original and interdisciplinary, involving mathematical modelling, and computational and experimental analyses. Iain's early work on the structural dynamics of animal groups, hysteresis effects, behavioural transitions and collective memory, have significantly advanced our understanding of collective behaviour in animals. In recent years Iain's major achievement has been to combine theoretical approaches with empirical work, systematically testing his early theories with elegantly designed experiments. Iain has an unfailing instinct for the big-picture questions, and his vision and

commitment explain the huge influence that he has had on his discipline. Much of his work has transcended the field of animal behaviour and his studies are widely known as modern classics in organismal biology. Iain has been a Royal Society University Research Fellow at the University of Oxford, and he joined Princeton University in 2007. We are delighted to present him with the Scientific Medal.

David Hosken, University of Exeter

David is an evolutionary biologist who has worked extensively in the areas of post-copulatory sexual adaptations relating to sperm competition and sexual conflict. Much of David's early research was concerned with sperm economics: the evolution of sperm and testis size, and how males allocate their limited sperm reserves to females. He has shown that sperm size need not be influenced by sperm competition risk but that sperm–female co-evolution occurs and that maternal effects can influence sperm size. David was also the first to conduct an experimental evolution study to directly show that sperm competition selects for increased testis size. David's detailed anatomical work has shown that sperm transfer to the female sperm stores is indirect: sperm are ejaculated into the female's bursa by the male and later moved by the female to the spermathecae. More recently he has shown that males with sperm that are more competitive have offspring that develop faster, suggesting a reason for polyandry from the female perspective. David uses a wide range of techniques from field to molecular biology to establish the nature of adaptation. He has recently co-edited the first book devoted to sperm evolution, and co-edited the first book dedicated to genotype by environment interactions and sexual selection. His work shows excellence, flair and originality, and he richly deserves the Society's Scientific Medal.

Judith Mank, University College London

Judith is unquestionably a tremendously talented evolutionary geneticist. Her achievements are truly impressive, given that she completed her PhD just 8 years ago. Judith and already has more than 50 peer-reviewed publications in the best journals from her field, and her international standing is recognised by the many awards she has received, including the Dobzhansky Prize from the Society for the Study of Evolution and a Young Investigator Award from the American Society of Naturalists. Judith uses a variety of novel techniques and analytical tools to challenge our views about how genes function and are expressed. How genes are regulated and interact to build an organism lies at the heart of evolutionary biology and Judith tackles this question by focusing on organisms with different sex-determination systems. Her work on birds and butterflies has challenged the dogma that gene dosage needs to be globally regulated and has provided important insight into how sexual dimorphism can be achieved via differential gene expression. Her research elegantly demonstrates the importance of the sex chromosomes and differential gene expression for the evolution of sexual differences. Highly focused and fully independent, Judith has the ability to conduct research and leadership of the highest calibre. It is our absolute pleasure to award her the Society's Scientific Medal.

ZSL Stamford Raffles Award

Is presented for distinguished contributions to zoology, either amateur or outside normal professional activities. This year it is awarded to **David Mallon**. As well as his job as an ecological consultant and lecturer in the UK, David is an unsung hero of international conservation. He is co-chair of the IUCN Antelope Specialist Group, and he carries out a huge range of conservation activities for organisations such as IUCN, and Fauna and Flora International, amongst others. The focus of David's conservation work lies in Central and Eastern Asia, the Indian subcontinent and the Middle East. He has worked on Red List assessments of antelopes since 1989 and has co-compiled the IUCN Antelope Action Plan, covering North Africa, the Middle East and Asia. David's extensive field experience and knowledge, and his remarkable language skills, have facilitated truly significant conservation successes. In particular, David facilitates on behalf of antelope specialists to engage the international community in conservation and development issues, such as: improving the knowledge of poorly known antelopes, initiating field operations for the conservation of threatened antelopes, promoting capacity building in range countries, supporting reintroductions of antelopes where extinct and making regular status assessments for *The IUCN Red List of Threatened Species*. All of this work is carried out on a shoestring, on a cost-only or voluntary basis. We are extremely grateful for his generosity, his dedication and his commitment, and we are delighted to present him with the Society's Stamford Raffles Award.

ZSL Silver Medal

Is awarded for contributions to the understanding and appreciation of zoology, including such activities as higher and public education in natural history and wildlife conservation. It is hard for me to imagine a better-qualified candidate for this award than **Tim Birkhead**. Tim is, without doubt, one of the most respected behavioural ecologists worldwide. Scientifically, Tim has made major contributions to our understanding of sperm competition, which arises from the observation that individual males and females will copulate with more than one partner for the same reproductive attempt. This finding opened up a whole new subject area in evolutionary biology: an aspect of sexual selection whose importance was wholly unknown to Darwin and his successors. Tim led the development of this subject area by careful observation and analysis of bird behaviour in the field, and study of the anatomical and physiological adaptations involved in copulation and sperm storage. But Tim stands out in other ways: the extent of his contributions to the public understanding and appreciation of zoology is extraordinary. He is one of our best science writers, having written and edited textbooks on bird ecology, and many popular science books including *The Wisdom of Birds*, and *Bird Sense*, which was short-listed for the 2013 Winton Royal Society award. Tim is an inspiring speaker, as many of you will know from his 2012 Stamford Raffles Lecture. Tim engages his audience with public lecture, radio and TV discussions and print media, including regular articles in *New Scientist*, *BBC Wildlife*, *The Independent*, *Biological Sciences Review* and the *Times Education Supplement*. It is our pleasure to present Tim with the Society's Silver Medal.

ZSL Frink Award

Is given to a professional zoologist for substantial and original contributions to the advancement of the science. This year's award goes to **Michael Akam**, Head of the Department of Zoology, University of Cambridge. Michael took his first degree in Zoology at Cambridge, where his interest in developmental genetics and pattern formation was first kindled. As a graduate student in Oxford he identified and mapped genes encoding the larval blood proteins of the fruit fly *Drosophila*. In 1979 he moved to Stanford University, where he participated in the first isolation of the developmental control genes known as Hox genes. Returning to the Genetics Department in Cambridge in 1982, Michael was able to show for the first time that Hox genes were expressed at specific positions along the body axis of animals. He has since worked on many aspects of the functional organisation of Hox genes in fruit flies and other species. His work is characterized by an impressive combination of experimental technique and instinct for what it is interesting from the evolutionary point of view. Michael is a Fellow of the Royal Society in recognition of his significant contributions to zoology, and he received the Linnean Medal for Zoology in 2009, the Kowalevsky Medal in 2007 from the St Petersburg Society of Naturalists, and the Waddington Medal in 2005 from the British Society of Developmental Biology. He is considered as one of the founders of modern evolutionary developmental biology, and we are delighted to present him with the Frink Award.

Marsh Award for Conservation Biology

Is presented for contributions of fundamental science and its application to the conservation of animal species and habitats. This year's award is presented to **Debbie Pain**. Debbie has a passion for conserving rare and threatened species, and has undertaken seminal scientific research to do so. Debbie joined the RSPB as a Research Biologist in 1992 and within a few years she had successfully argued the case for an international research biologist and, eventually, an entire team of international scientists within the RSPB. Debbie managed this team for a decade, developing the Society's international research programme beyond all recognition. Her specialism is in ecotoxicology, and particularly the effects of lead poisoning in wildlife, including important research on the effects of lead derived from ammunition, angling weights, and pollution from mining operations and other industrial sources. Debbie has led scientific investigations into the collapse of vulture populations in southern Asia, the impacts of agriculture on birds, prioritising islands for predator eradication, climate-change adaptation and the impacts of the bird trade on threatened species. In search of new challenges, Debbie became Director of Conservation at the Wildfowl and Wetlands Trust in 2008, where she has boosted the Trust's investment in international conservation and two critically endangered species, the spoon-billed sandpiper and Madagascan pochard, are now more secure because of the interventions of Debbie and her teams. Her dedication to ensuring the application of science to practical conservation has been outstanding. We are delighted to present Debbie with a cheque for £1000, kindly sponsored by the Marsh Christian trust.

Marsh Award for Marine and Freshwater Conservation

Is presented for contributions of fundamental science and its application to conservation in marine and/or freshwater ecosystems. This year's winner is **David Bilton**, of Plymouth University. David has a wide range of research interests covering many groups of animals, including seabirds, aquatic bugs, woodlice, marine invertebrates and small mammals, plus excursions into coastal vegetation. However, it is his expertise and specialism in water beetles that really marks him out as a significant figure in biological conservation. David uniquely uses water beetles as systems for obtaining broader insights and has gained an international reputation in the ecology, conservation biology and biogeography of aquatic organisms. David has developed a comprehensive and multidisciplinary research programme that addresses molecular ecology, ecophysiology, community structure, macroecology, population genetics and climate change. A particular strength is the way in which David combines his expertise in the natural history and taxonomy of water beetles with identifying the ecological and evolutionary drivers of organismal diversity and distribution, and by extension, conservation biology. I must add that appreciation of David's research contributions is proven by the fact that six species of aquatic beetles have been named after him! His new definitive guide to aquatic-beetle identification will be welcomed by policy makers and amateur enthusiasts, as well as fellow scientists. He fully deserves this award. We are delighted to present David with a cheque for £1000, kindly sponsored by the Marsh Christian Trust.

Thomson Reuters/Zoological Record Award for Communicating Zoology

Is awarded for a communication of a zoological nature that has an outstanding impact on a general audience. This year's winner is *Feral: searching for enchantment on the frontiers of rewilding* by **George Monbiot**. This is an exciting and stimulating book to read. It has great potential to influence important policies if it is read as it should be by politicians, conservationists, land-owners, farmers, fishermen and civil servants, as well as the general public. The book is exemplified by broad, critical thinking and well-researched ideas and possibilities for rewilding. George discusses meetings with a wide range of people from diverse backgrounds, not all of whom are fans of rewilding. He also does an outstanding job of outlining the many challenges for rewilding, and why it is worth addressing and overcoming these in order to achieve considerable potential benefits. A test of whether a book can be considered great is if it makes one look at the world around us in a different way, with our eyes opened to a new perspective. This book certainly qualifies by these criteria. For this achievement, we are delighted to present George with £1000, kindly sponsored by Thomson Reuters.

ZSL Award for Outstanding Contributions to the Zoo Community

Is this year presented to **Kristin Vehrs**. Kristin has been a leader in the global zoo and aquarium community for over thirty years, all at the Association of Zoos and Aquariums (AZA) in North America.

As the AZA's Executive Director, Kristin is responsible for driving the mission of the Association, as well as being the primary liaison to the global zoo community. Kristin has helped the AZA grow into a modern, mature organization, one that is respected within both zoological and conservation communities, and by governmental entities. Much of that respect is due in no small part to Kristin's credibility, and to her role as the public face of the Association within the international zoo and aquarium world. Kristin was key to the development of the AZA's accreditation program, which is widely considered as one of the 'gold standard' accreditation programs. She also has been a core driver throughout the history of the AZA's animal sustainability programs – from the original development to a current intensive assessment of this effort. Her legal background and lobbying experience have also been critical to the Association's success as Kristin has been instrumental in shaping many of the regulations that impact our animal community, including guidelines and protection for zoo animals and professionals alike. Kristin believes passionately in the role of zoos and aquariums as organizations critical to both saving species and engaging people. She also believes strongly in the importance of zoos and aquariums working cooperatively – both regionally and internationally – and her remarkable leadership skills, personality and enthusiasm, have empowered the zoological organisations that AZA represents to achieve tremendous success. We are delighted to present Kristin with this award.

ZSL Honorary Fellowship

is awarded to a person who, by their association with ZSL, has promoted the objectives of the Society. This year we are presenting an Honorary Fellowship to **Ken Sims**. Throughout his career Ken has played a leading role in zoological gardens and aquariums. After returning from Malaya where he had been a rubber planter, poisonous-snake farmer and a crocodile keeper, Ken built and opened Thrigby Hall Wildlife Gardens in 1979. Thrigby Hall is a relatively small collection, which has always punched well above its weight: it houses many important species, is an active member of several European breeding programmes and is a generous supporter of field-conservation projects. Ken has been an important mentor and guide to the zoo industry: he has selflessly given his time and expertise to a range of zoos and zoo associations. He was Vice-Chair of the British and Irish Association of Zoos and Aquariums (BIAZA) from 1998 to 2002 and again from 2005 until 2011. Ken was Chair of BIAZA from 2002 until 2005, during a period of rapid change and modernisation in zoos and aquariums. Ken has also been a UK representative on the European Association of Zoos and Aquariums Council. Ken's contributions to ZSL have been immense: he first served on Council in 1994, and has been our Vice-President three times. He was a member of the London Zoo Board, and has served on ZSL's Finance and General Purposes Committee and the Zoo Advisory Committee. During this time, ZSL has benefited enormously from Ken's knowledge, experience and sound judgement. We are delighted award him an Honorary Fellowship of the Zoological Society of London.

ZSL Staff Medal

The ZSL Staff Medal is presented to **Andrew Cunningham**. Andrew completed his BVMS at the University of Glasgow in 1987 and joined ZSL in 1988 as Veterinary Pathologist, within the Department of Veterinary Science. He was awarded his PhD in Veterinary Medicine in 2001, and in the same year was appointed Head of Wildlife Epidemiology at the Institute of Zoology. In 2010 Andrew was awarded a Royal Society Wolfson Research Merit Award and he is currently Professor of Wildlife Epidemiology at the Institute of Zoology. At ZSL, Andrew leads a team of researchers working on wildlife diseases, with particular reference to biodiversity conservation. His own research has included important and influential work on catastrophic vulture declines in India; zoonotic pathogens in African fruit bats and ground-breaking research on global amphibian population declines. In 1995 Andrew was appointed Chair of the pathology and disease working group of IUCN's Declining Amphibian Populations Task Force, and in 1996 he led an international team that co-discovered a novel chytrid fungus causing amphibian disease associated with population declines. In 2000 he was co-awarded a CSIRO medal for this work. Andrew has since been pivotal in coordinating research into chytridiomycosis and global amphibian population declines. Closer to home, Andrew discovered ranavirus disease in amphibians in the UK and demonstrated that this was likely an incursion from North America. Andrew has contributed significantly to wildlife conservation and to placing wildlife disease firmly on the ecology and public-health research agendas. In addition to publishing over 300 research articles, of which almost 200 have been in international journals, Andrew is an inspiring research leader and his skills as a diplomat have led to some real advances in conservation science. We are delighted to present him with the Society's Staff Medal.