

## U3AC Norah Boyce Lectures 2011-2012

Professor Nick Davies. FRS

18th October 2011

“Cuckoos versus hosts; an evolutionary arms race”

Nick Davies is Professor of Behavioural Ecology in the Zoology Department of the University of Cambridge. The common cuckoo is one of Nature's most famous cheats. The sight of a little warbler feeding a monstrous cuckoo chick has astonished human observers for thousands of years. Why are the hosts apparently being so stupid? In this talk, illustrated by video clips from the fens, Nick will describe field experiments which have unravelled the remarkable host defences and cuckoo trickery involved in this evolutionary arms race. He will also compare the common cuckoo's trickery with other “cuckoos” from around the world, where hosts and their parasites have been co-evolving for even longer.

Professor George Salmond

15<sup>th</sup> November 2011

“Antibiotics, virulence, faith, phages and flotation: the wonderful world of bacterial sociology.”

George Salmond is Professor of Molecular Microbiology in the Department of Biochemistry and a Fellow of Wolfson College. He has wide research interests in the fundamental nature of microbes and their ecological, industrial, agricultural and medical impacts. His research activities include studies of antibiotic biosynthesis, regulation and resistance mechanisms, bacterial virulence in plant and animal pathogens, intercellular chemical communication (“quorum sensing”) in microbes, the nature and exploitation of bacterial viruses (bacteriophages), anti-viral defence mechanisms in bacteria, and the phenomenon of microbial buoyancy. In this talk he will cover aspects of most of these diverse topics that, remarkably, are linked through some common themes seen in a fascinating microbial world.

Professor Sir John Meurig Thomas, FRS

29<sup>th</sup> November 2011

Sir Humphry Davy: Natural Philosopher, Discoverer, Inventor, Poet, Man of Action

Professor Sir John Meurig Thomas has a long and distinguished *curriculum vitae* [<http://www-hrem.msm.cam.ac.uk/people/thomas/CV5.pdf>]. Highlights include Honorary Professor of Materials Science, University of Cambridge; Emeritus Professor of Chemistry, Davy Faraday Research Laboratory, Royal Institution of Great Britain, London; Director of the Royal Institution (in which post he was preceded by Sir Humphry Davy); Master of Peterhouse (1993-2002); Davy Medal of the Royal Society; countless honorary degrees; over forty honorary fellowships in universities and colleges in the UK and elsewhere, Fellowship of the Royal Society since 1977. In 1999 he was

elected Honorary Fellow of the Royal Academy of Engineering for work that *“has profoundly added to the science base of heterogeneous catalysis leading to the commercial exploitation of zeolites through engineering processes”*. He is the author of over a thousand research papers on the materials and surface chemistry of solids, and over 100 review articles on science, education and cultural issues. Like Davy, he has a mineral (“meurigite”) named after him.

Professor Martin Rees, FRS (Lord Rees of Ludlow)  
17th January 2012  
“Life's future in the universe”

Martin Rees

[http://en.wikipedia.org/wiki/Martin\\_Rees,\\_Baron\\_Rees\\_of\\_Ludlow](http://en.wikipedia.org/wiki/Martin_Rees,_Baron_Rees_of_Ludlow) has been Astronomer Royal since 1995 and Master of Trinity College, Cambridge since 2004. He was President of the Royal Society between 2005 and 2010; is a member of the Order of Merit; and Emeritus Professor of Professor of Cosmology and Astrophysics in the University of Cambridge. From 1973 to 1991 he was Plumian Professor of Astronomy and Director of the Institute of Astronomy. He is the author of more than 500 research papers, and he has made important contributions to the origin of cosmic microwave background radiation, as well as to galaxy clustering and formation, and black holes. He is also the author of several general books -- most recently “From Here to Infinity: Scientific Horizons”, an expanded version of his 2010 BBC Reith Lectures. An asteroid (“4587 Rees”) has been named in his honour.

Professor Morris Brown, MD, FRCP  
7<sup>th</sup> February 2012  
"Letting off pressure - as simple as ABC"

Morris Brown is Professor of Clinical Pharmacology in the University of Cambridge and an Honorary Consultant Physician at Addenbrooke's. He is a Fellow of Gonville & Caius College. He leads several research projects on the causes and management of hypertension. He was awarded the Lilly Gold Medal of the British Pharmacological Society (2002), and the Walter Somerville Medal of the British Cardiac Society (2006). In this lecture he will explain why the treatment of high blood pressure has transformed life for the elderly, and how the garden hose helps doctors to choose the right drugs.

Dr Richard McMahon  
6<sup>th</sup> March, 2012  
“All power is theft”

Dr McMahon is a University Senior Lecturer in the Cambridge University Engineering Department. He is in the Electrical Group in the Electrical Engineering Division. He is also President and a Fellow of Corpus Christi College. He is interested in renewable energy generation and energy

efficiency of electrical appliances. Current research focuses on low maintenance generators for wind turbines; linear generators for wave power and energy efficient power conversion for power supplies and electric appliances such as compact fluorescent lights. In the lecture he will argue that whilst there have been impressive improvements in the energy efficiency of appliances, this has been counterbalanced by the growth in the number of appliances in use. How are we going to square our dependency on electricity for our contemporary way of life with the associated need to generate the electricity, especially against a background of concern about the adverse effects of large-scale emissions of carbon dioxide?

Professor Martin Johnson, PhD, FRCOG

24<sup>th</sup> April, 2012

“Can study of the history of science explode myths?”

Martin Johnson is Professor of Reproductive Sciences in the University of Cambridge and a Fellow of Christ's College. Other offices have included: Visiting Professor in the Department of Physiology at the University of Sydney Australia (1999-2004); Distinguished Visiting Scholar at the Institute for Advanced Study at La Trobe University Melbourne (2005-2006); member of the Human Fertilisation and Embryology Authority (1993-1999); Chairman of the British Society for Developmental Biology (1984-1989), and Head of the Anatomy Department, University of Cambridge (1995-1999). In 1989 he was awarded the Albert Brachet Prize and the Diploma of Laureate of the Belgian Royal Academy of Sciences, Letters and Fine Arts, and was elected to the Society of Scholars of Johns Hopkins University. He is author of *Essential Reproduction* (seventh edition, Wiley-Blackwell 2012) and has authored over 260 papers on reproductive science, ethics, law, history and medical education. He has been a tireless advocate for adequate recognition of the work of his PhD supervisor, Bob Edwards, pioneer of *in vitro* fertilization, who was awarded the 2010 Nobel Prize for Physiology or Medicine, and received a knighthood in the Queen's Birthday Honours list of 2011. In his lecture Martin will use material from his recent historical research to expose some of the myths that have developed around the science underlying Assisted Reproduction and explore how and why they came to exist.

Dr Chris Burgoyne

15<sup>th</sup> May 2012

“The wonder of wheels”

Chris Burgoyne is Reader in Concrete Structures in the University Engineering Department. Unusually for an engineer, he has published a paper in the *Lancet* – on a topic of interest to U3AC members: “*Relation between age, femoral neck cortical stability, and hip fracture risk*”. He is a Fellow of Emmanuel College where he is a strikingly effective Director of Studies in Engineering. Most people in Cambridge cycle, and bicycle wheels are remarkably complex structures; there is an extensive literature about the way loads get transmitted from the frame to the ground, most of it wrong! He

will show that the three major inventions in wheel development all relied on the principle of prestressing, which is most commonly seen in concrete bridges.