THE UNIVERSITY OF BRISTOL MAGAZINE // SUMMER 2012

nonesuch

ALZHEIMER'S: NO SMOKE WITHOUT FIRE

HUMAN RIGHTS ADVOCACY IN ACTION

LIVES WELL LIVED: A NEW AGE OF ANIMAL WELFARE

Welcome

Welcome to *Nonesuch*. First, I would like to say a personal 'thank you' to all the alumni volunteers around the world, working with the Campaigns and Alumni Relations Office, who have a done a truly fantastic job of organising events and bringing alumni together.

The Alumni Weekend 2012 from 6 to 8 July will showcase the 'Best of Bristol', both from the perspective of the University and the city, with a variety of lectures, lunches, dinners and tours. I am particularly looking forward to the Valedictory Lectures by Stephen Lisney (BSc 1972, BDS 1975, PhD 1978, MA 2005) and Bob Evans (PhD 1970) – both acclaimed teachers over many years who are now Emeritus professors. For a full weekend programme and booking details, visit bristol.ac.uk/alumni/events/reunion.

Second, as Bristol alumni and members of Convocation, this is the time of year for you to select who you want as a Convocation representative on Court, and to stand for membership of the Convocation Committee, or as Chair of Convocation. Details of how to stand and vote are enclosed.

I sincerely look forward to seeing you at the Alumni Weekend and hope you will join Bristol's rapidly growing LinkedIn alumni group – now well past the 10,000 mark!

Bill Ray (BSc 1975)
Chairman of Convocation,
Bristol's alumni association

alumni@bristol.ac.uk

Is Bristol the same university that it was when you were a student here?

In one particular aspect, the answer is surely both 'no' and 'yes'. Earlier this year, we decided to increase UK/EU undergraduate student numbers in 2012 (see pages 13-16). Our current plans will take us to around 21,000 students by 2015/16. Overall, the expansion is modest and Bristol will retain its relatively small size compared with other Russell Group universities.

Of course, the University has expanded in every decade of its life. In 1960, there were around 3,400 Bristol students; by 1980, there were 7,100; and by 2000, there were 15,700. Growth is, in fact, 'business as usual' for Bristol University.

To support our growth plans now, we are expanding teaching capacity in various subject areas, and investing in learning and living spaces. This is because of our commitment to retaining the quality of the student experience, and our belief that groundbreaking research must underpin our teaching.

Such objectives are fundamental to what Bristol stands for, and we deviate from them at our peril. While the University may not, on the surface, be exactly the same now as when you studied here, its core value of excellence is, and always will, remain the same.

Professor Eric Thomas (Hon LLD 2004)
Vice-Chancellor

bristol.ac.uk/alumni

Greencoat 80 Silk is carbon balanced – where the carbon intensity has been measured through the production process and an equivalent carbon credit (offset) has been purchased.

Carbon balancing by the World Land Trust tackles climate change through projects that both offset carbon dioxide (CO_2) emissions and conserve biodiversity.

Nonesuch magazine //
Summer 2012
Carbon saved 10,590 kg
Land preserved 890 m²

recycle
When you have finished with this document please recycle it.

80% recycled
This document is printed on 80% recycled paper

WORLD LAND TRUST™
www.carbonbalancedpaper.com
CBP0050818041154 18

Contents

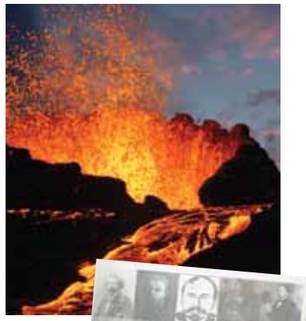
Features

6 New solutions to old-age problems

18 Their lives in our hands

11 Blooming brilliance

22 Together against torture



2

Regulars

Listings

29

In pictures

nonesuch
Summer 2012

Editors
Hilary Brown
Nick Riddle

Contact
nonesuch@bristol.ac.uk

Contributing Editor
Freya Sterling

Advisory Group
David Alder //
Director of Communications and Marketing
Jill Cartwright //
Head of Public Relations Office
Dr Lorna Colquhoun //
Head of Research Development
Hannah Johnson //
Press Officer
Dr Maggie Leggett //
Head of the Centre for Public Engagement
Dr John McWilliams //
Publicity and Recruitment Officer
Dick Penny //
Managing Director, Watershed
Tania Jane Rawlinson //
Director of Campaigns and Alumni Relations
Professor Judith Squires //
Dean of Social Sciences and Law

Design
pelotondesign.co.uk

Produced by
Public Relations Office
Senate House
Tyndall Avenue
Bristol BS8 1TH
T: +44 (0)117 928 8895

Cover illustration
Gary Neill

Printed by
Belmont Press

Nonesuch, May 2012

If you need part or all of this publication in an alternative format, please telephone +44 (0)117 928 8895.

Regulars

The plug New books

'Ubusing' Culture: Alfred Jarry's Subversive Poetics in the Almanachs du Père Ubu by Marieke Dubbelboer (Legenda)
Paradox and provocation were essential features of the work of Alfred Jarry, not least in the experimental and satirical Almanachs du Père Ubu. Dr Marieke Dubbelboer, Postdoctoral Research Fellow in the Department of French, examines key characteristics of Jarry's poetics through an analysis of the Almanachs and addresses their role within European avant-garde.

Examining the Visual in Sport edited by Mike Huggins and Mike O'Mahony (Routledge)
This volume, jointly edited by Dr Mike O'Mahony of Bristol's History of Art Department and Professor Mike Huggins from the University of Cumbria, brings together an international array of art historians, visual culture specialists and sport historians and examines the importance of visual culture as a vital research resource for understanding sport as a cultural phenomenon in the modern era.

Rosebud
Everyday objects with a special meaning

Dr Andrew Kennedy,
School of Biological Sciences

The lichens that I saw as a boy in the Himalayas helped to trigger my career in polar ecology. I grew up in Nepal; my parents worked for the Save the Children Fund, and I often accompanied the Nepalese doctors on health visits to remote villages high in the Himalayas. During these visits, I was fascinated by the small clusters of lichens that I saw growing at the snow line. As an 11-year-old boy, this started me wondering: can lichens grow beneath snow cover? If not, how long has the ground where they grow been free of snow? And is the altitude of the Himalayan snow line fixed, or is it increasing or decreasing?

We now know that Himalayan glaciers are retreating, and that the diversity and growth patterns of lichen and moss communities indicate the rate of glacial retreat, and hence of regional climate warming; the more mature the communities, the longer the period since the ground became exposed.

As for my boyhood question: yes, lichens can grow beneath snow cover, in a habitat known as the subnivean zone. In fact, my research as a polar ecologist has shown that it is one of the best places for plants and invertebrates to live.

In the city
The University in Bristol

The School of Earth Sciences is rolling out a new programme of workshops to schools to enable young people to learn more about volcanoes and earthquakes. The workshops are run by postgraduates, who in turn learn how to engage with the public and make their subject more accessible.

Funded by the HE STEM (Science, Technology, Engineering and Maths) programme, the initiative follows on from the success of the School's Bristol Dinosaur Project, which enables local people to learn more about *Thecodontosaurus*, Bristol's own dinosaur.

The workshops combine theory and practice, and activities are geared towards specific age groups. 'The younger pupils love the interpretive dance sequences where they can simulate the energy of a volcano,' says former Palaeontology student Nicky Stone (MSci 2012). 'Older students act like geologists to work out which rock is the odd one out, or get to decide how to manage volcanic hazards on "Danger Island".'

In the earthquake workshops, pupils use kits to design and make their own seismometers, build earthquake-proof buildings, generate seismic waves using slinkies and use a brick-and-pulley model to gain an understanding of tectonic plate movements.

Regulars

Hammer brought back from the dead
Film

Simon Oakes (BA 1980), Vice-Chairman of Exclusive Media, and President and CEO of Hammer production company, has brought Hammer films back on to our screens with *The Woman in Black*.

The film, starring Daniel Radcliffe, is based on a 1983 horror fiction novel by Susan Hill and held the number-one spot at the UK box office for several weeks. It follows a lawyer who travels to a remote village to sort out a deceased client's papers. As he works alone in the client's isolated house, he begins to uncover tragic secrets, his unease growing when he glimpses a mysterious woman dressed in black.

Interviewed by *The Independent*, Oakes said: 'We never in our heart of hearts thought we'd have that phenomenal opening, it just caught fire. I hope this means Hammer is back. There is something in the gothic horror theme that really speaks to the heart of Hammer. It's somehow pricked people's imagination.'

Hammer has announced that its next supernatural thriller, *The Quiet Ones*, is moving into production and will be presented at the upcoming European Film Market.

Marathon in honour of Registrar's cancer battle
Sport

Dr Jonathan Nicholls (BA 1978) ran the London Marathon in honour of Dr Tony Rich, the University of Bristol's recently retired Registrar, who is battling cancer.

Dr Jonathan Nicholls (BA 1978), who is Cambridge University's Registrary, has raised over £15,000 in sponsorship for the University's Cancer Research Fund, which supports vital research into cancer prevention and treatment. His efforts were prompted by the heartbreaking diagnosis that his close friend Dr Tony Rich has incurable cancer.

Dr Rich started work as Registrar and Chief Operating Officer at the University of Bristol at the end of the 2010/11 academic year but had to retire due to ill health. Nicholls said: 'I completed the marathon in four hours and 49 minutes. My friendship with Tony (whom I was able to greet on Tower Bridge where he was watching with members of his family) definitely inspired me, as did my debt to the University of Bristol. We are all truly grateful for the large sum that has been raised already.'

If you would like to support the Cancer Research Fund, please visit our Centenary Campaign website.
bristol.ac.uk/centenarycampaign

News illustration © Alberto Antoniazzi

The new graze.com craze
Enterprise

Edd Read (MEng 2007) is co-founder of the company graze.com, a new snackbox delivery company that is becoming a huge success in offices across the county.

Graze delivers healthy, natural food by post. Only three years old, the company has been going from strength to strength. *Marketing Week* magazine reported: 'Graze.com plans to ramp up its advertising and expand its marketing department this year.'

Read said: 'We've created a world-class innovation in web-ordering and delivery. By combining state-of-the-art technology and bespoke web-based systems, custom building our own robotic food posting facility and sourcing the best ingredients in the world, we're working hard towards our goal of becoming the most innovative food company in the world.'

Regulars

The leaders of today

- **Ben Emmerson QC** (LLB 1985) has been selected as the United Nation's special rapporteur on counter-terrorism and human rights. Quoted in *The Guardian*, Emmerson said: 'Far too often international law and human rights standards are seen as incompatible with effective counter-terrorism. The reverse is true.'
- **Sarah Glennie** (BA 1992) has been appointed Director of the Irish Museum of Modern Art (IMMA). Glennie said: 'IMMA makes a vibrant and valuable contribution to contemporary Irish society and I am truly honoured to be given the opportunity to lead this great institution into the next important phase of its development.'
- **Alastair Paterson** (MEng 2004) is CEO of Digital Shadows Ltd, a cyber security innovator, which announced its partnership with leading information security provider, Activity. The partnership will provide groundbreaking service to Digital Shadows' clients, keeping organisations safe from cyber attacks.
- **Christian Rütz** (LLM 2003) has been appointed a Civil Court Judge by the Land Nordrhein-Westfalen, working at the higher regional court of Krefeld (Lower Rhine).

Chris Salmon's autograph goes national

Finance

Chris Salmon (BSc 1990), Executive Director, Banking and Chief Cashier for the Bank of England, has had his signature featured on the new £50 note, without which the bank-note would not be legal tender.

Before Salmon was appointed to his current role in April 2011, he ran the Bank's Sterling Markets Division for two years with responsibility for the implementation of the Bank's monetary and financial stability market operations, including the Quantitative Easing programme.

In *The Telegraph*, Salmon said that he wanted the bank-notes to be 'instantly recognisable and hard to copy'. Since being appointed Executive Director, Banking and Chief Cashier, he has overseen operations of the new £50 note, which has been phased in across the country. It carries eight significant updates in security features for cash users, compared with the five of its predecessor.

Salmon said to *Nonesuch*: 'A huge amount of work goes into the launch of a new bank-note, so it was a testament to all involved that the launch of the new £50 in November went so smoothly.'

Bringing *War Horse* to life

Film

The Oscar winning film *War Horse* relied heavily on the computer-generated visual effects expertise of **Ben Morris** (BEng 1993). Interviewed by the *Evening Post*, Morris said: 'Where special effects were unavoidable I was determined to make it so life-like that nobody would know it was CGI.'

Will Dean gets tough

Business

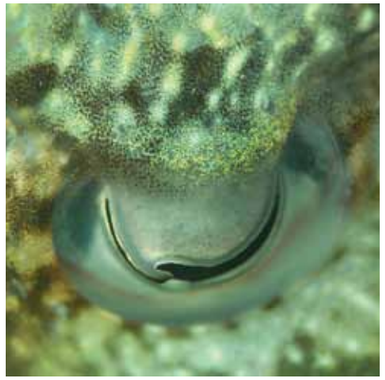
Will Dean (BSc 2003), Chief Executive of Tough Mudder, is one of Crain's New York Business.com '40 under 40'.

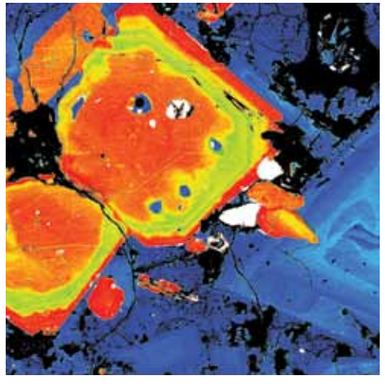
From a list of over 500 nominees worldwide, Will Dean has been selected as one of the '40 under 40' for 2012 to have achieved success in business before turning 40. Tough Mudder is an adventure challenge series which includes 12 mile-long obstacle courses designed by the Special Forces to test all-round strength, stamina, mental grit and camaraderie.

These events can include crawling under barbed wire, plunging into icy water, darting through flames and getting shocked by 10,000 volts of electricity. Tough Mudder made more than $2 million in revenues in its first year and about $25 million in its second. Now in its third year, it is expanding into Europe, South Africa, Japan, Australia and New Zealand.

In an interview with Crain's New York Business.com, Dean said: 'It's not like saying, "Can I run a hundred miles?" It's, "Do I have it mentally?".'

Dean worked in counter-terrorism for the British government for five years and had to complete United Kingdom Special Forces training. It was used to measure his 'mental grit' as opposed to pure physical fitness and later became the inspiration for Tough Mudder.





Cuttlefish eye © Shelby Temple and Justin Marshall // Alphasphere © Benjie Croce // Year of the Dragon © Tom Durrant // St Helens © Ben Buse // Slaveskeletons © Pearson Archaeology Ltd / OFID

In pictures

Snapshots
Life and work at Bristol

Clockwise from top left.

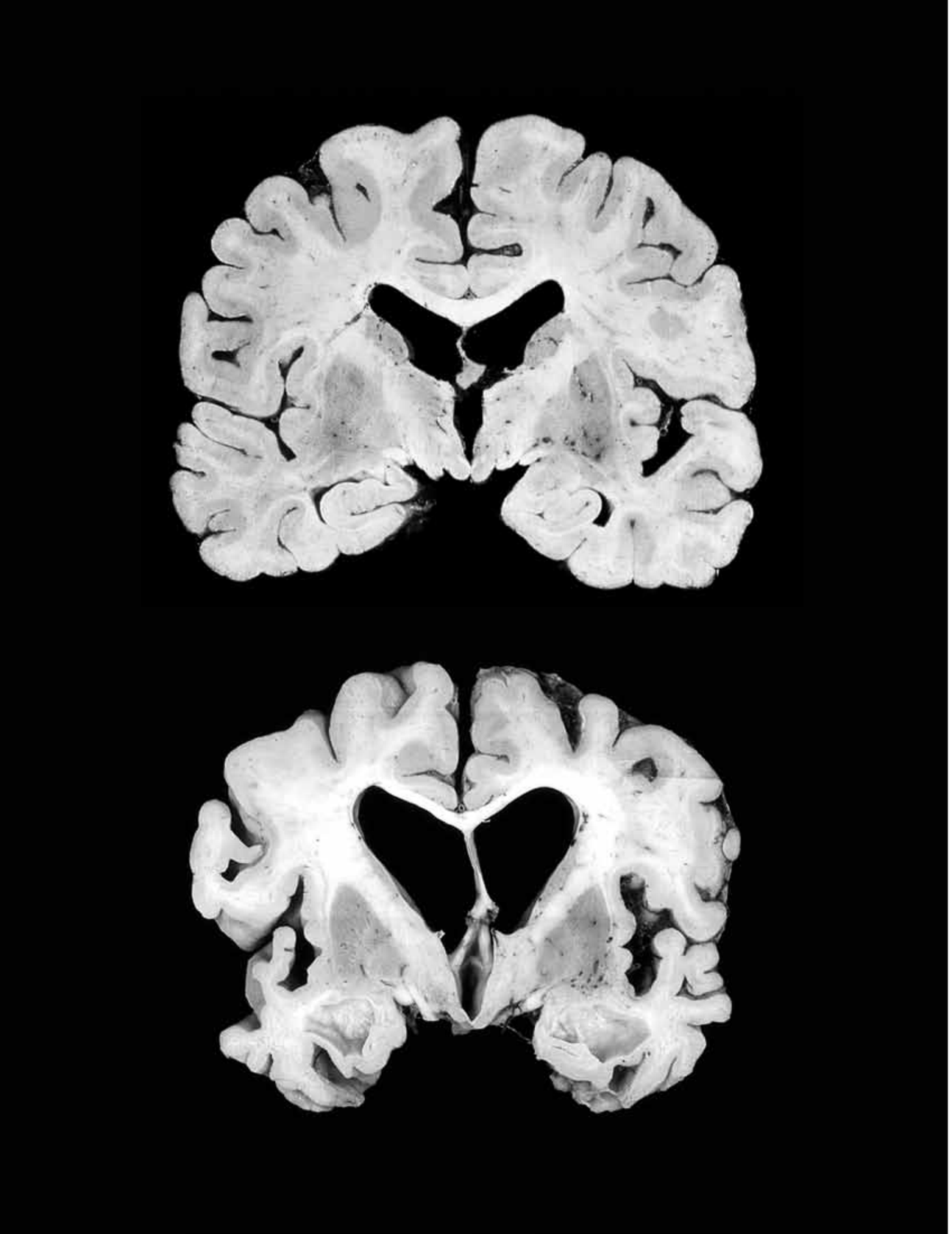
CUTTLEFISH EYE // The most acute polarisation vision found in any animal.
bristol.ac.uk/news/2012/8228.html

ALPHASPHERE // Futuristic football or electronic music-maker?
bristol.ac.uk/news/2012/8320.html

YEAR OF THE DRAGON //
Chinese Lion Dance Troupe in action.
bristol.ac.uk/news/2012/8199.html

BENEATH ST HELENS //
Microscopic, sub-volcanic visions.
bristol.ac.uk/news/2012/8375.html

SLAVE SKELETONS //
St Helena burial ground unearthed.
bristol.ac.uk/news/2012/8294.html



grey matters

Cover feature

Dementia affects one in 14 people over the age of 65. As the population ages, this number is likely to increase. Professor Seth Love and Dr Pat Kehoe, co-directors of the Dementia Research Group in the School of Clinical Sciences, are among those in the forefront of research into the abnormalities of the brain in this disease, and new options for its treatment and prevention.

Cover feature

By **Hilary Brown**

For every dementia scientist, there are more than six cancer researchers. And yet more than 465,000 people in the UK have Alzheimer's disease, costing the economy more than £23 billion and causing considerable human suffering. There is currently no cure for Alzheimer's. The treatments available only alleviate some symptoms for a limited period – they target memory loss by attempting to correct chemical imbalances in the brain, but don't tackle the underlying causes of the disease. There is huge pressure on scientists to deliver new drugs, but dementia is still poorly understood and research remains shockingly underfunded.

So argues Alzheimer's Research UK, the country's leading dementia research charity, in its recent report, *Defeating Dementia.* It states that despite recent initiatives from government and other research funders, the field is dwarfed by research into cancer and heart disease, neither of which poses the same degree of risk to society and the economy as Alzheimer's.

The enemy within

Lack of funding *is* an issue, says Seth Love, Professor of Neuropathology, but that's not the only reason why dementia research is trailing the field. It was over a century ago that German neurologist Dr Alois Alzheimer first described the symptoms of the disease that bears his name, but for many years clinicians didn't regard dementia as a disease – it was just part of getting old. 'It wasn't until the 1950s and 1960s that scientists began to realise that the changes in the brains of people with dementia were not an inevitable consequence of ageing: that some people got to 100 without becoming demented, and that those who did develop dementia had a disease,' explains Love.

There's also the problem of accessibility to tissue for research purposes. 'Cancer research has progressed so quickly because in general it's relatively easy to remove tumours from living patients and extract fresh cells to study. That's just not the case with brain diseases like dementia,' says Love. 'The Human Tissue Act quite rightly regulates the use of post-mortem human tissue, but this means that organ donation is more complicated than it used to be and samples are at least 24 hours old by the time we receive them.'

Dr Pat Kehoe, Reader in Translational Dementia Research, believes that dementia is less 'visible' than many other illnesses because the overwhelming majority of people affected are elderly – over 65. Most are retired and to a large extent out of the public eye. And in many cases, says Kehoe, there are few outward manifestations of the disease, especially in the early stages, which makes it easier to ignore.

While it's not entirely clear what causes Alzheimer's, there are likely to be several contributing factors. 'In Alzheimer's there's a kind of domino effect at work,' says Kehoe. 'The chemical and structural transformations that occur in the brain trigger further complications even as the body strives to minimise the damage arising from these changes.' There is much evidence to suggest that Alzheimer's starts to develop during middle age, so that by the time the symptoms show – perhaps as much as 20 years later – 'several rooms are ablaze', to use Kehoe's analogy of the dementia brain as a house on fire.

DEMENTIA IS STILL POORLY UNDERSTOOD AND SHOCKINGLY UNDERFUNDED

A different take

Bristol's Dementia Research Group brings together scientists with varied but complementary skill sets to investigate some of these contributory factors from different angles. Its research programme focuses on a number of interwoven themes using molecular, genetic, biochemical and neuropathological approaches to study the underlying mechanisms that cause dementia.

The group has brought fresh perspectives to dementia research in two areas in particular. The first, and the focus of Love's research, relates to the role of plaques – large clumps of a protein known as Abeta (Aß) that kill off brain cells. There is much evidence to support the view that the accumulation of Aß and the secondary damage this causes to brain tissue is central to the development of Alzheimer's. But while most research has targeted the reasons for Aß production, Love's focus is on the enzymes that attempt to break it down – and the complications that can ensue.

'Aß accumulation coincides with an increase in the activity of enzymes that act to remove the protein and protect the brain from its harmful effects,' says Love. 'One of the things we've shown is that this activity adversely affects other systems, such as the renin-angiotensin and endothelin pathways that regulate blood pressure, and the opening up and closing down of blood vessels in the brain.'

Above Dr Pat Kehoe (left) and Professor Seth Love

What is … Alzheimer's?

Alzheimer's disease is the most common form of dementia. During the course of the disease the chemistry and structure of the brain change, leading to the death of brain cells.

As with most forms of dementia, Alzheimer's involves progressive memory loss, mood changes, and problems with communication and reasoning. It is likely that a combination of factors, including age, genetic inheritance, environment, lifestyle and overall general health, are responsible.

Lead image The effects of dementia on the brain are highlighted by comparison of slices through the brain of a normal elderly person (above) and a person with Alzheimer's disease (below). In the brain from the Alzheimer's patient there is obvious loss of brain tissue: the surface convolutions (gyri) of the brain are smaller and the spaces between them larger. The cavities (ventricles) deep within the brain have dilated as the surrounding brain tissue has shrunk.

Abnormal signals produced by this pathway contribute to a number of other damaging effects often seen in the brains of people with Alzheimer's. These include lowered blood circulation in the brain, damage to blood vessels, higher levels of brain inflammation and increased brain cell death due to reduced oxygen supply. 'You then have the potential for a vicious cycle, because Aß production increases when the brain cells are deprived of oxygen,' says Love.

Fire-fighting

Looking at ways to repair damage caused to the vascular system in dementia, and improve blood supply to the brain, is where Kehoe comes in. One of his main areas of research is investigating the relationship between high blood pressure and the development of dementia in later life, and, in particular, the links between the renin-angiotensin system and Alzheimer's.

His research has led him to experts Professors Richard Martin (PhD 2005) and Yoav Ben-Shlomo in the School of Social and Community Medicine, who study risk factors for disease in large populations and datasets. Together they have been looking at whether drugs already being used to treat high blood pressure, particularly ones that reduce the activity of the renin-angiotensin pathway, might reduce the occurrence of Alzheimer's.

In a recent study, the team found that people over 60 who had ever taken certain groups of drugs that target the pathway in the previous ten years had as much as a 50 per cent lower risk of developing Alzheimer's compared with patients on any other type of hypertension drug. These findings corroborate new pre-clinical evidence that the drugs are tapping into specific biomedical alterations resulting from the angiotensin pathway.

'Improving blood flow and reducing the action of angiotensins in the brains of dementia patients by administering hypertension drugs may help delay the onset of the disease,' says Kehoe. 'If such treatments were found to be successful, they could be adopted in Alzheimer's care relatively quickly as they are already used for other conditions, are relatively cheap and have few side effects.'

More funding is needed to do the clinical trials necessary to test these findings, but Kehoe, who is always looking for ways to translate laboratory findings to the real world, is optimistic. 'It's not a cure for Alzheimer's, but it could offer additional improvements when combined with current treatments and would have a substantial benefit on the lives of sufferers,' he says. 'And if we could more selectively administer certain drugs when patients first exhibited the symptoms of hypertension, there may be longer-term benefits in significantly delaying the onset of the disease. We'd certainly be closer to putting out the fire before the flames take hold.' ●

bristol.ac.uk/clinicalsciencenorth/dementia

Statistics The rise and rise of dementia

1 in 3
people aged over 65 will die with a form of dementia

168,000
new cases of dementia occur in England and Wales each year

42%
of the UK population, know a close friend or family member with dementia

Every 7 seconds
there is a new case of dementia worldwide

alzheimersresearchuk.org

Brain bank A wealth of information

Pat Kehoe and Seth Love portrait © Nick Smith // Illustration Gary Neill

The Dementia Research Group has access to a unique resource: a collection of more than 850 brains, accumulated over nearly 30 years.

The South West Dementia Brain Bank (SWDBB) was established by Gordon Wilcock, former Professor of Care of the Elderly and founder of the Dementia Research Group. The resource was set up as a means to collect whole brains from dementia sufferers and non-demented elderly donors to provide material for dementia-related research. SWDBB is part of the Brains for Dementia Research network, a formal network of five brain banks. It aims to monitor people both with and without memory impairment until they die and donate their brain. This enables researchers to look much more specifically at brain changes in relation to particular manifestations of dementia. SWDBB is funded by grants from a number of sources including Alzheimer's Research UK, Alzheimer's Society, the Dementias and Neurodegenerative Diseases Research Network, Western Comprehensive Local Research Network and BRACE (which also currently funds a consultant senior lecturership, a clinical research fellow and a PhD studentship within the Dementia Research Group).

Regulars

From Bristol to the 2012 Olympic Games

Freya Sterling interviews **Jayne Pearce-McMenamin** (BA 1986), Head of Press Operations for the Olympic Games 2012

I discovered my enjoyment for the organising aspect of sport during my time at Bristol University. Right from the get-go I had the honour of being captain of a variety of teams: basketball, tennis and netball. I also relished roping friends into intra-mural sport. I particularly enjoyed team sports because they bring down barriers and encourage people to work together.

I went on to become President of the Athletics Union; I wanted some practical experience and to give something back to Bristol. Organising minibuses and kit, managing budgets, chairing meetings and so forth was essentially a microcosm of the jobs I was to do later in my career, and a language degree at Bristol gave me a unique competitive edge when applying for jobs.

My BA Honours degree in French and German was a major contributing factor in securing future roles, including my role as Press Manager of the Bordeaux Venue of the FIFA World Cup '98 and as Press Director of the IAAF World Athletics Championships in Paris. In fact, my first major role at the International Association of Athletics Federations (IAAF) was translating press clippings.

As Head of Press Operations for the Olympic Games 2012, I aim to provide great working facilities for the press. In the next couple of months, we will be providing the 5,800 press and photographers coming to the Games with 33 venue media centres, a huge central Main Press Centre, 1,500 biographies of athletes and horses, 6,000-plus work spaces and 12,600-plus seats.

The internet has changed the face of media; everything is instant and we've evolved our strategy to reflect this. In London, there will always be someone on a deadline. All around the world, the Olympic Games will be watched 24/7 on Twitter, Facebook, blogs and news websites. Now that reporting is so much quicker, we have to ensure that the press can do their job successfully. If we do our job well, we won't be noticed.

Our biggest challenge for the Olympics will be going from a core team of 36 to 3,000, who will be implementing press operations on the ground. We have been training our staff at over 40 test events in various venues across the country, as well as holding classroom exercises ready for the opening of the Main Press Centre in June and the Games themselves in July. Staff and volunteers will be there to assist the press: answering questions, managing photographer positions, running Venue Media Centres and much more. Most of the team are volunteers, and I want to make sure that everybody has a fulfilling, worthwhile experience.

This is the seventh Olympic Games I've been part of, but the London Games are on a scale like no other. The 2012 Olympics will be the experience of a lifetime and will be great for our country. There is so much going on, whether you're interested in sport or not. It's a fabulous opportunity and a wonderful thing to happen in our backyard, in our lifetime. I'm thrilled and honoured to be part of it.

THE 2012 OLYMPICS WILL BE GREAT FOR OUR COUNTRY AND I'M THRILLED TO BE PART OF IT

Jayne Pearce-McMenamin © Stephen Shepherd

Feature

Change in the air

Life on earth has always had a fight on its hands, as species struggle to adapt to change. The scientists who study evolution, like the rest of us, have to cope with developments in their own lives. Some, like **Dr Patricia Sanchez-Baracaldo**, manage to combine family and career. But not without a battle – and not without support.

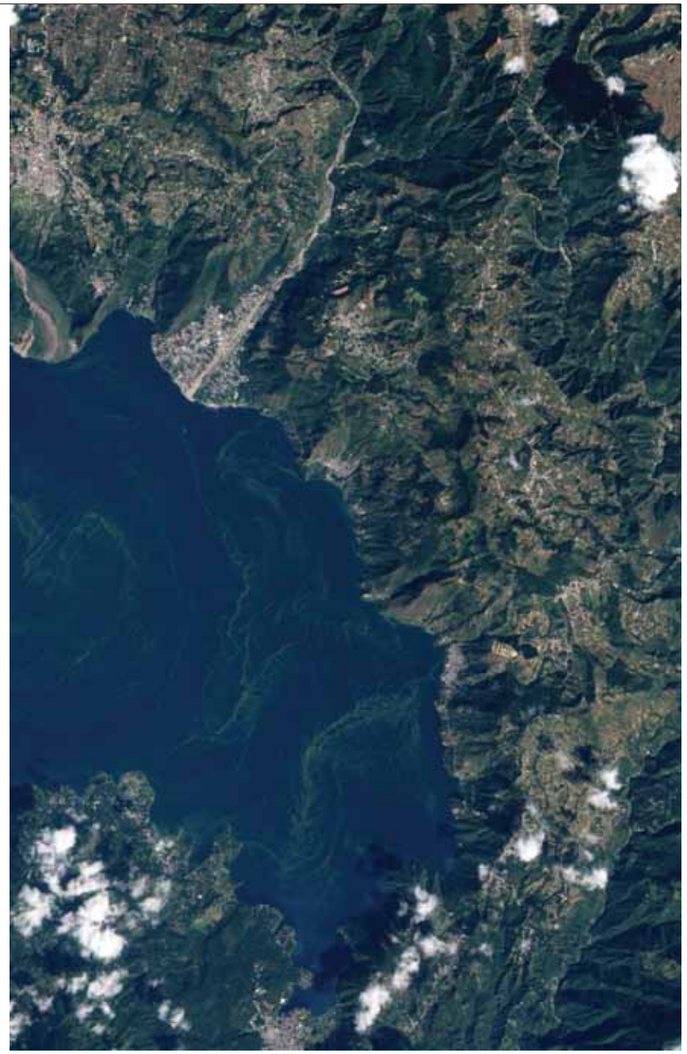
By **Nick Riddle**

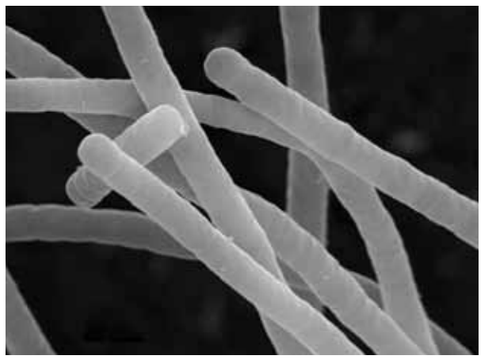
Under a microscope, they look like thin, translucent filaments of hair. From space, thermal imaging shows them as great swirls of green spreading across oceans and freshwater lakes. They're known as cyanobacteria, or blue-green algae. Not only are they probably the most successful micro-organisms on the planet, but without them, life as we've come to know it would never have evolved.

'Cyanobacteria transformed the atmosphere during the early Earth,' says Dr Patricia Sanchez-Baracaldo. 'They were the first micro-organisms on the planet to perform oxygenic photosynthesis, and in doing so they released huge amounts of oxygen into the air.' This large-scale release – known as the Great Oxygenation Event, and estimated as having happened some 2.3 billion years ago – caused the mass extinction of most anaerobic organisms, which had been the predominant life forms on the planet.

Sanchez-Baracaldo, who trained as a plant evolutionary biologist at Berkeley, California, first looked at cyanobacteria in depth when she moved to Bristol with her husband and began working on molecular ecology as a postdoctoral researcher in the School of Biological Sciences. As a side-project she developed her own ideas on evolutionary biology. 'I was wondering where they sit in the evolutionary scheme of things, and when oxygenic photosynthesis first evolved,' she says.

It was long thought that cyanobacteria first appeared in the world's oceans. But as more and more microbial genomes are sequenced, researchers have been able to begin mapping more accurately the evolution of certain species and their relationships with each other. Sanchez-Baracaldo and a colleague in the States used these new techniques to establish that the first cyanobacteria actually appeared in freshwater rather than marine environments.





Above A large bloom of cyanobacteria seen from space
Right Filamentous cyanobacteria (*Planktothrix agardhii*) as seen under an electron microscope

Feature

There are still many questions to be answered about the first cyanobacteria to colonise the oceans. Since they would have used carbon dioxide to photosynthesise, this would have had major effects on global nutrient cycles and the climate of the early Earth. Indeed, the geological record shows major climatic events such as global Earth glaciations following the rise in atmospheric oxygen. So how are these events linked? And what role do micro-organisms play in regulating the global environment?

The parental era

Some chains of cause and effect are much easier to trace. Sanchez-Baracaldo had already changed research fields after moving to Bristol from Berkeley; then, having gained a foothold in phylogenetics, she entered another period of change with the birth of her first child.

That brings an environment all its own: round-the-clock duties, sleep deprivation, sickness, baby talk … hardly conditions in which academic-level work can thrive. 'I wanted to take a year off with each baby, and I don't regret it for a moment,' she says. But it came at a cost. After her second child, born 18 months after the first, she left science to concentrate on parenthood.

'After so long away from science, you lose confidence,' she says. 'Your field moves on, your peers move up, new techniques come along. The statistics show how many women leave science after having a baby. And I wonder if some of them regret having left.'

Strictly speaking, she never left science entirely. 'During maternity leave I explored different ideas,' she says. 'I wanted to do something worthwhile for society.' In 2007-08, she advised the Ministry of Environment in her native Colombia on the effects of climate change on high-altitude ecosystems in the Andes: 'The higher temperatures put those ecosystems at greater risk, and they'll eventually disappear. That work sparked my interest in climate change.' She also collaborated on a paper with a colleague in the States, an experience she recalls with mixed feelings. 'That was hard – she would email me drafts, but I was totally sleep-deprived; it felt like an achievement if I managed anything beyond keeping my children happy, clean and fed.'

At the end of her second maternity leave she worked part-time in Biology, running a training programme for PhD students. 'But then several people told me there were funding opportunities for women who had left science for caring responsibilities, and I decided to look into it. I was convinced there was no chance – I'd packed away all my notebooks …'

THE FELLOWSHIP BRINGS HIGH EXPECTATIONS AND I WANT TO FULFIL THEM

It may be easy to say now, but the chances are that the scientist who, as a child in Colombia, loved 'watching all the nerdy nature documentaries and reading science encyclopedias' would probably have found a way of getting back to something that is clearly her passion.

The turning point came when she heard about the Daphne Jackson Trust, a charity that helps scientists, engineers and technologists to re-enter their field after a career break for family, caring or health reasons. She sent them her CV and a personal statement, was invited to apply, and was accepted. And thus began her own Great Oxygenation Event.

Deep breaths

'It was great to have the Trust tell me that I had a great CV and great publications,' says Sanchez-Baracaldo. 'They were saying "We believe in you", and that's all it takes to spur you on.' She started contacting people at Bristol, beginning with Professor Andy Ridgwell in the School of Geographical Sciences, who studies climate change. 'He liked the work I'd done, and agreed to be my mentor. He was so enthusiastic, I really felt I was on to something good.' Professor Alastair Hetherington in Biological Sciences agreed to be a second mentor.

She then wrote a proposal for a project – studying how events such as the evolution of cyanobacteria influenced the global environment and past climatic events – and applied to the Royal Society for a Dorothy Hodgkin Fellowship, which is designed 'for excellent scientists in the UK at an early stage of their career who require a flexible working pattern due to personal circumstances such as parenting or caring responsibilities or health issues'.

'Applications to the Royal Society have a tiny success rate,' she says. 'I worked so hard on it; as soon as my baby was asleep, I was at the computer.' But it paid off: in 2011 she was awarded a prestigious Dorothy Hodgkin Fellowship, with five years' funding.

Labs and laundry

'It's still a challenge,' says Sanchez-Baracaldo. 'The Dorothy Hodgkin Fellowship brings with it high expectations, and of course I want to fulfil them. But if I didn't love challenges, I probably wouldn't have got the Fellowship in the first place. When I was doing my PhD at Berkeley, we worked such long hours in the lab that doing laundry felt like a holiday. Laundry is still one of my favourite chores.'

But, as with the early Earth's atmosphere, it's all about finding the right balance. She had given up a postdoctoral fellowship at Yale to follow her husband to Bristol, a decision that caused some of her peers to raise their eyebrows; and at times, she admits, 'I regretted changing research fields, which I had to do when I came to Bristol. But now, I have support from the Royal Society and the University, I'm doing interesting work, and I have two beautiful kids.

'It's amazing how things have worked out,' she concludes. She's referring to her own career, of course, but the same goes for the evolution of life on Earth; life that she and others have devoted their careers to studying. ●

growth as usual

Feature

Nick Lieven, Pro Vice-Chancellor of Education and Students, discusses the implications of the partial deregulation of student numbers.

Patrícia Sanchez-Baracaldo portrait © Nick Smith

Feature

By **Nick Lieven**

In June last year, the government announced a partial deregulation of home (UK and EU) student numbers. Historically, home and EU student numbers were strictly controlled by government but from the 2012 intake, the cap on the number of students that universities can enrol that achieve A-level grades of AAB and above has been lifted. This is a significant milestone in terms of a deregulation, albeit partial, of what has been historically a highly regulated environment.

Of course, UK higher education was already in the midst of a dynamic structural change; the new coalition government had already announced a significant increase in the tuition fee cap to £9,000. In response to that change, universities found themselves in the spotlight as students across the country – including those in Bristol – took to the streets in protest.

The news about the deregulation of AAB+ student numbers has not dominated education headlines in the same way, yet we believe that it is likely to have an even more pronounced impact on the sector than the fee increase. Universities with lower proportions of AAB+ students may face challenges in recruiting sufficient students, whereas universities like Bristol, where demand for places from outstanding candidates outstrips availability, have a new opportunity to consider increasing educational provision for some of the UK's brightest students.

Bristol is taking that opportunity. We plan to increase our current undergraduate intake from around 3,300 per annum, to around 3,900. The fundamental questions are, of course: Why grow? And what does growth mean for Bristol?

Why grow?

Growth is not a new concept for universities, or for Bristol. Since the 1960s the number of UK universities has grown, and student numbers have risen at almost every university in the country. In 1991 there were around 990,000 undergraduates in UK universities; in 2011 there were 1.9 million undergraduates.

IN 2011 THERE WERE 1.9 MILLION UNDERGRADUATES

Bristol University itself grew dramatically in the 1960s and 1990s, with slower but still constant growth in the 70s and 00s (see panel on right). In fact, growth has been integral to Bristol's success and achievement throughout its life. From the addition of a Drama Department (the UK's first in the 1950s), to the very recent example of accreditation of the BSc in Biochemistry with a Year in Industry course, Bristol's undergraduate degree offerings have expanded and developed as the world has evolved. Growth enables us to embrace new and emerging disciplines with rigour.

Biography

Professor Nick Lieven, PhD, FRAeS

Job title
Pro Vice-Chancellor (Education and students)

Other roles
Fellow of the Royal Aeronautical Society

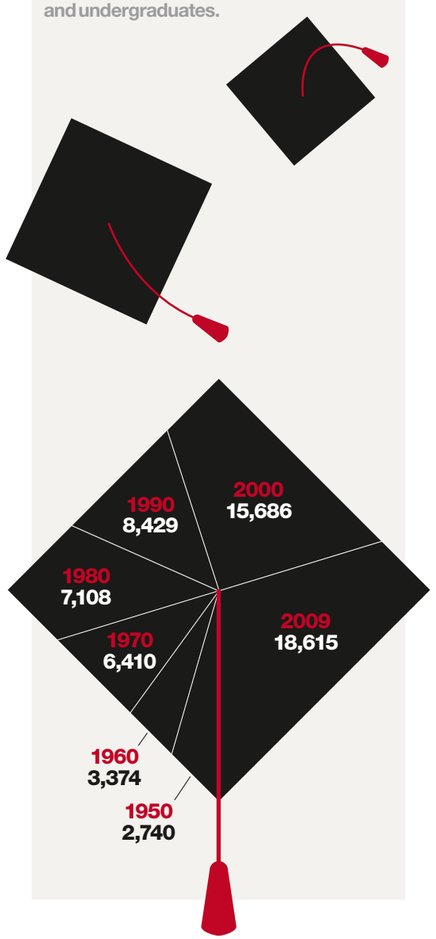
Professor of Aerospace Dynamics

Research
His particular area of expertise is the link between the inherent stress in structures and their dynamic response

Student growth 1950-2010

Graphical representation of the growth of student numbers over the past few decades beginning with the 1950s.

The number of students includes home and overseas students, postgraduates and undergraduates.



Now, an increase will enable us to expand departments where there is overwhelming demand for places, and to add key academic staff to others. For instance, in English – one of our most intellectually diverse disciplines – we have the opportunity to provide a broader range of intellectual challenges. Our planned growth now will provide sufficient resource to enable us to recruit into new areas such as Contemporary Literature, a topic in the discipline where there is strong student interest. It's a tight balancing act, but we feel that Bristol will succeed as long as we ensure that our growth is driven by our strategic imperatives to provide a positive – and improved – student experience, underpinned by our commitment to provide a rigorous scholarly education.

GROWTH ENABLES US TO EMBRACE NEW AND EMERGING DISCIPLINES

Growth provides another important opportunity for Bristol, in terms of perception. Undergraduate places at Bristol are among the most highly sought after in the country. In recent years, restricted course numbers mean we've had to turn down many well-qualified applicants; this has often led to accusations of bias on our part towards one particular student type or another. Nothing is further from the truth, but perception is everything; with tens of thousands of AAB or better applicants seeking Bristol places, many talented students heard 'no' when they applied to Bristol in the past. We believe that by expanding student numbers in high-demand subjects, we now have an opportunity to say 'yes' to some more of the best students in the country and EU.

The university landscape

Importantly, we are not the only university to be increasing its home undergraduate student intake. The education platform has shifted quickly and we can be sure that other universities will be competing aggressively for the same small pool of highly talented students. In this new environment, we have to ensure that students know about Bristol and its reputation, and come to us first.

With this in mind, last autumn Bristol developed a campaign of targeted advertisements in newspapers, magazines and train stations. The ads (see below) used iconic Bristol images (Brunel's Clifton Suspension Bridge, hot-air balloons), and, with an eye on the mobile-phone-using student audience, incorporated QR codes so readers could instantly access web content about the University.

As I write this piece, our 2012 undergraduate student numbers are pretty much where they should be, but we are not complacent. The world of undergraduate student recruitment has changed radically. Anecdotal evidence suggests that students who are predicted three As at A-level are receiving record numbers of offers from competitive universities; top-notch 2012 candidates may find themselves more spoilt for choice than their 2011 peers. Our hope is that Bristol's great attractions, its research excellence, its commitment to high-quality teaching and scholarship, its friendly student environment and its fantastic city will inspire those who have many options to choose Bristol.

Our Vice-Chancellor has said, in his capacity as Chairman of Universities UK, that changes in student number regulation will 'mean different things to each individual institution and those differences are not yet necessarily predictable. It is inevitable that there will be unintended consequences, there always are in the midst of such change.' We believe that Bristol is well positioned to make the most out of the opportunities before us.

Building our future

I have been delighted by Bristol's capacity to embrace this opportunity for growth. The University's decision to respond by growing student numbers was made quickly, mindful of the opportunities laid out above, but also with capacity questions in mind for us and for the city of Bristol as a whole.

Discover more campaign

'The QR code campaign set out to raise awareness of Bristol in such a way as to reflect the excellence of our students and academics – it had to be clever and effortlessly excellent simultaneously. The response to the campaign, both in terms of increased web traffic to key University web pages, and wide acclaim from the advertising and marketing media, underlined that we had hit the mark. Now we must continue to raise the bar, which is a wholly exciting challenge.'

David Alder
Director of Communications and Marketing

Feature

Introducing more students to the city, even phased over several years, is a significant undertaking. We have also had to ensure that our facilities can cope with the increase. Our commitment to house all UK first-years who come from outside Bristol is one we are keen to preserve. The student residential experience is part of our history and character. In partnership with private providers, we have the capacity to meet our commitment for the next few years, as we plan and build new facilities on the Stoke Bishop site.

Our lecture theatres and study spaces will also grow, and we will improve the effectiveness of usage to maximise every lecture space we have in the most effective way for our students. The complexity of timetabling university teaching across our different undergraduate courses (many of which contain common elements) is quite astonishing, but our review of our current use gave us confidence that we can be more efficient with our existing assets. Within four years, as the numbers bed in, we will need to provide some additional space, and we are planning for that now.

INTRODUCING MORE STUDENTS IS A SIGNIFICANT UNDERTAKING

Core values

As Pro Vice-Chancellor, one of the catch phrases I hear around the University today and indeed across the sector is a focus on the quality of the student experience. What does that mean? I think too many people try to use easily measurable things to provide an answer: contact hours, numbers of academics per student, size of student bedrooms, cost of breakfast in a hall. Instead, I believe that it is far wiser to measure the student experience and level of scholarship, particularly at a great research institution like Bristol, by asking whether we have inspired our students to be the very best at what they choose to do.

To inspire students, we need research staff that will bring leading-edge, world-class thinking and teaching into the classroom. We need excellent facilities: modern labs for our scientists, medics and engineers; well-stocked and attractive libraries for all of our students. We need students to be able to access a broad range of extracurricular opportunities through halls, the Students' Union and sports clubs, and, of course, we need the students to inspire each other through their own excellence and willingness to explore and push at the frontiers of knowledge.

Our Vice-Chancellor summarises that 'Bristol University will continue to thrive and develop and we will do so by remaining true to our vision'. Growth now enables us to take that vision forward into our second century with real confidence and enthusiasm. ●

Interview
Generations

An interview with Clare Timms (BA 1981), Managing Director of Bare Films, and her daughter Millie Tett (BSc 2010), who is currently studying Social Policy and Politics at Bristol.

Clare: I wanted to go to Bristol University because of its international reputation and I loved my time there. Bristol gave me so many close friends.

Millie: I chose to study at Bristol, because both my parents spoke so highly of their time there. It's a leader in terms of research and standards of teaching, and that has been reflected in all my experiences so far. When I tell other people that I go to Bristol University they always respond positively.

Clare: Millie got a place in Badock Hall, the same hall of residence I was in! Going back reminded me of my first term there; it's very friendly and small enough to get to know most of the other students.

Millie: It has a great atmosphere; everyone was unbelievably friendly and helpful and it was very easy to settle in.

Clare: Some of my best memories are of certain lecturers who really brought their subject to life. Professor Kenneth Ingham was Head of the Department of Historical Studies and he developed my passion in Africa. I was amazed by how he lectured with no notes.

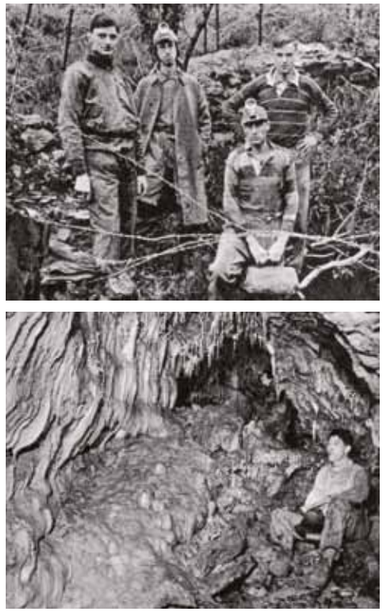
Millie: Like Mum, I've found all the lecturers passionate about their teaching and always willing to help if you have any concerns. The teaching has allowed me to use my initiative and think on my feet. I hope that going to such a prestigious university will open doors for me in the future.

Lead image © RyanMcVay/Getty Images // Clare Timms and Millie Tett portrait © Stephen Shepherd

Regulars

What happened when …

Bristol cavers struck it big



Top The team about to descend the entrance shaft
Bottom Francis Goddard looking into the first grotto

'Romantic discovery of a vast and unknown cavern on Mendip,' said the headline of an article in the *Illustrated London News* (*ILN*) in August 1941. The subhead went on: 'An immense system of limestone caves and stalactites at Charterhouse-on-Mendip, 450 feet below surface, discovered by Bristol University students.'

The students concerned – Francis Goddard and Charles Barker – were members of the University's Spelaeological Society, which had been investigating the subterranean formations beneath Black Down since the 1920s.

Early in 1939, a group from the Society returned to the site of an earlier dig and began to excavate beneath a slab of rock where a stream had once disappeared underground. A draught from a fissure 20 feet below the surface suggested the existence of a cave, so the team used explosives to enlarge the crack until the two smallest members – Goddard and Barker – could fit through.

'This … opened out into a series of chambers leading … some 300 ft, and amongst them were two grottoes of extraordinary beauty,' continues the article, which goes on to describe stalactites in wildly varying forms – some with tree-like branches, others fused together into trunks.

Work was slowed by the team's wartime duties, and by more pressing excavations after the Society's museum was destroyed in the first heavy bombing raid on Bristol. But they returned the following spring to explore deeper into a complicated system of passages and chambers. They discovered 'a cavern of dimensions exceeding anything else in the whole of Mendip … a roofed gorge [which] expands in its loftiest part into a chamber approximately 120 ft high and 100 ft wide, the walls of which are draped with pure white curtains of stalactites'.

Further discoveries were made: deep red stalagmites; stalactites that rang like chimes when tapped; and an area of ground with a resonant crust on which water dripping from above created a distinctive rhythm that prompted the explorers to name the section Rumba Alley.

Access to the GB Cave (named after Goddard and Barker) is controlled by the Charterhouse Caving Company Ltd.

THE WALLS ARE DRAPED WITH PURE WHITE CURTAINS OF STALACTITES

GB Cave photos © University of Bristol Spelaeological Society

Numbers
Botanic Garden

The 1.77-hectare **Botanic Garden** has been at its current site since 2005. It is the first university botanic garden to be created in the UK for nearly 40 years.

bristol.ac.uk/botanic-garden

looking for the good life

Feature

Philosophers have debated the mental abilities of animals for centuries; today, animal welfare science is a burgeoning field. Studies by researchers such as Dr Becky Whay (PhD 1999) and Dr Claire Weeks (PhD 1981) in the Animal Welfare and Behaviour Group provide fundamental information about animals' perceptions, awareness and experiences in order to develop better welfare assessment methods and improve the conditions of livestock.

Feature

Left
Dr Becky Whay (top) and Dr Claire Weeks

By **Chris Wraight**

What, if anything, do animals think about? Do they have an emotional life, one that might include happiness, stress or depression?

Descartes thought that animals were little more than machines; Aristotle thought that they were non-rational and created entirely for the use of humans. The 17th-century French theologian Nicolas Malebranche wrote that they 'eat without pleasure, cry without pain, grow without knowing it; they desire nothing, fear nothing, know nothing'.

The more we learn about the inner lives of animals, though, the more the supposedly clear boundaries between us and them have become blurred. Researchers at Bristol's School of Veterinary Sciences are at the forefront of work into understanding how farm animals experience the world around them. Their research is giving us a clearer picture of what the emotional life of animals is, and how we can ensure that their environment suitably protects their welfare.

Cow psychology

Dr Becky Whay, Senior Lecturer in Animal Welfare and Behaviour, has a passion for cattle. With a background in farming and a PhD in Animal Sciences, much of her working life has been devoted to understanding how cows think. 'They're quite enigmatic animals,' she says. 'It's fascinating trying to understand how the world appears to them.'

Whay is particularly interested in the extent to which cattle feel pain. The idea that animals might experience pain in a roughly similar way to us is still controversial: Whay records responses from farmers ranging from 'What can we do about it?' to 'Honey, are you seriously telling me that cows feel pain? That's ridiculous!' The question isn't purely abstract, though – it has both moral and commercial consequences.

Take the problem of lameness. This is a major issue for farmers: as many as a third of cattle are lame on any one day in the UK. Lameness is bad for the economy of farms – affected cows produce less milk – as well as causing practical difficulties in moving herds around. What is less well understood is the extent to which lameness affects animals' psychological wellbeing. As Whay explains, 'Pain has to have a sensory component – the feeling part – but it also has to have an emotional part, because it has to matter to you.'

Understanding the emotional life of a cow is difficult, but even simple experiments can provide clues. The nociceptive threshold test, for example, can be used to gauge the extent of an animal's sensory response. Nociceptors are sensory receptors in the skin that respond to damage, and their operation is a key indicator of how pain is experienced. A small rod is pressed against a part of an animal – the metatarsus, say. After a while, the pressure becomes unpleasant, and the animal moves away. This point is the animal's nociceptive threshold.

> PAIN HAS TO HAVE A SENSORY COMPONENT … BUT IT ALSO HAS TO HAVE AN EMOTIONAL PART

If the animal has similar sensory pain mechanisms to people, then damaged tissue should have a lower nociceptor threshold, and the response to the stimulus should take place earlier. Whay's research shows that this is indeed the case: 'There's evidence that at least locally to the site of the injury cows have increased responsiveness, which is classically indicative that the sensory mechanisms associated with pain and signal transmission are working in the way that we would expect them to.'

If lameness is genuinely painful to the affected animals, there's a moral imperative to reduce its prevalence, in addition to the economic case for eradication. Sadly, eliminating lameness in cattle is far from straightforward – there are at least 15 different common causes, from the state of the farm's physical environment to the presence of infectious diseases.

Whay's work with farmers has helped identify which interventions are likely to be successful. Her team's research has led to the introduction of a national lameness strategy, something that's helping to reduce incidences of lameness nationwide. As a result of this, the Veterinary School secured an award from the Vice-Chancellor for research impact.

Chickenopolis

Dairy cattle aren't the only animals whose behaviour has come under scrutiny by researchers. Dr Claire Weeks, Senior Research Fellow in Animal Welfare, has had a varied career since reading Agricultural Science as an undergraduate: after specialising in Animal Sciences, she's since worked on pigs, sheep, horses, veal calves and poultry. She's currently particularly interested in the welfare of laying hens and broiler chickens. Broilers can spend their time in houses of up to 30,000 birds, making it very challenging to get a sense of how individual animals are faring at any given time.

'We have a very structured approach to measuring the way that animals are partitioning their time during the day,' says Weeks. 'We look at the time they spend doing different things, the way they interact with one another, the objects they make use of, and so on. You can't possibly look at 30,000 birds, you have to just look at an area of the house that's well defined, and try to tease out the relevant features.'

Hens, it turns out, are just as tricky to understand as cows, and they can respond unpredictably to changes in their environment. Getting it wrong can be costly, resulting in birds losing weight, becoming injured or pecking one another. 'The mortality levels can be really frightening,' says Weeks. 'It can be more than 20 per cent of the birds dying during production, whereas on the very best farms, you'd be talking about one or two per cent.'

Weeks' team has developed a whole range of management strategies aimed at improving chicken welfare. Where these are adopted by farmers, the results can be impressive. As Weeks says, 'We've become successful at getting farmers to put our ideas into practice. This has a big impact on mortality, the birds have better quality plumage, better feather cover, and peck each other a lot less.'

Down on the farm

Work on animal welfare has a strong practical element. Researchers co-operate closely with commercial farms, both in terms of obtaining data for their work and in advising on best practice. The Veterinary School has played an active part in many welfare changes over recent years, resulting in vastly improved conditions for farm animals.

Changing established practices isn't always easy, even when supported by rigorous research. As Whay points out, farming is a very difficult business to be in, with long, antisocial hours and challenging margins. Farmers can feel very disempowered, despite the fact that they often have huge expertise. 'One of the aims of our project work is to try to redress some of that empowerment balance,' says Whay. 'We try to work by facilitating farmers to think about what they want to do on their farm. Rather than telling them what to do, we use their knowledge about their own farm. You have to trust that knowledge.'

This approach has led to a mutually beneficial relationship between academics and practitioners with plenty of practical benefits. 'We've moved from the fundamental questions that we started with,' says Whay. 'From "Is cattle lameness painful?" to "What are we going to do about it?" and then to "How do we work with farmers in order to make that happen?".' It's a prime example of abstract enquiry leading to practical changes; something of which Descartes, for all his mechanistic views on animals, would surely have approved. ●

Influencing policy and practice

The Animal Welfare and Behaviour (AWB) group aims to build lasting and mutually beneficial relationships with other organisations that have interests in the welfare of animals, including governmental and industry bodies, and animal welfare charities.

One such organisation is the Farm Animal Welfare Committee (formerly Farm Animal Welfare Council (FAWC)), which was set up over 30 years ago in response to consumer concerns over the welfare of factory farmed animals. FAWC provides independent advice to government on welfare issues relevant to legislation and Codes of Practice. Several scientists from Bristol's Vet School have served on FAWC over the years. Steve Wotton MBE (MSc 2001), Senior Lecturer in Farm Animal Science, is currently a member.

The EC outlawed the prevalent barren battery cage at the beginning of the year. 'Enriched' cages must provide perches, a nest, a scratching area and at least 600 cm^2 usable area per hen to allow hens to express their predominant needs. The AWB group performed much of the original scientific work that demonstrated these behavioural needs, and Professor Christine Nicol was the UK representative on the European committees that wrote the reports on which the legislation was based.

The worth of the AWB group also feeds into the Cabot Institute's food security programme, in the area of animal welfare for a new agricultural age.

brave new world

Feature

The way international organisations approach human rights is changing. Malcolm Evans OBE, Professor of Public International Law, is helping to steer states towards a more proactive approach to the prevention of torture and ill treatment.

By **Hilary Brown**

Prevention has never been the kind of thing that makes headlines. Few know this better than Professor Malcolm Evans, a member of the United Nations Subcommittee on Prevention of Torture (SPT) and its Chair since 2011. 'Mention the word torture and people fixate on the extremes – the type of intentional, systematic cruelty you'll never eliminate,' he says. 'Torture is prohibited under international law, but that doesn't stop it happening.'

The work of the SPT is much more long term and involves changing perceptions about what constitutes humane behaviour. 'There's another side to torture – the kind of unthinking violence meted out daily in detention centres, prisons and police stations around the world,' says Evans. 'That's something you *can* tackle, by helping states establish robust criminal justice systems that rule out such casual ill treatment.' It's not glamorous, but it makes a real difference to many people's lives.

In it for the long haul

Evans' involvement in torture prevention stretches back to the early 1990s, when the European Committee for the Prevention of Torture sought the help of Rod Morgan, Professor of Criminology at Bristol, to set up training courses on visiting places of detention. Evans provided the international legal expertise.

He then developed links with the Association for the Prevention of Torture, a Geneva-based non-governmental organisation that was one of the drivers behind the United Nations Optional Protocol to the Convention against Torture (OPCAT; see panel on right). Following on from his work around the European system, Evans fed into the protocol's drafting process. When the OPCAT came into being in 2006, Evans collaborated with colleague Professor Rachel Murray (LLM 1995) on a project funded by the Arts and Humanities Research Council to monitor its progress. So began a long association with the UN.

Compliance and co-operation

The SPT takes its mandate from OPCAT. States parties choose to ratify OPCAT to demonstrate their commitment to the promotion of human rights and the prevention of torture and ill treatment. It's a completely new way of approaching human rights, says Evans.

'Traditional approaches are based on accountability and punishment,' he explains. 'There are laws that stipulate the right to life, to freedom from torture, to freedom of expression and so on; these are the standards against which states' behaviour is assessed. If your rights are violated, you should be provided with a remedy.'

This is essential, of course, but it doesn't stop a breach from occurring – or from recurring. While recognising the need for accountability, the SPT seeks to establish mechanisms to prevent torture and ill treatment in the first place; as Evans says, 'it's better if human rights violations don't happen at all'.

The SPT is also distinctive in that it operates at both international and national levels. It has the capacity to conduct visits to places of detention in the jurisdiction of party states but OPCAT also requires states parties to put in place national preventive mechanisms (NPMs). One of the jobs of the SPT is to help states do this, and to advise and assist the NPMs themselves in their work of reducing – or eliminating – the risk of torture. 'Our visits may be unannounced, but they're not designed to catch people out,' says Evans. 'The idea is to make practical recommendations to improve conditions of detainees and in the long run to safeguard against ill treatment.'

> YOU HAVE TO BE DIPLOMATIC WHEN YOU'RE NEGOTIATING WITH SOMEONE HOLDING A MACHINE GUN

Diplomacy and detachment

Visits can be demanding, both physically and emotionally. 'Every country has its challenges,' says Evans. 'Some of the detention centres are very remote – it took a two-hour helicopter ride followed by a two-hour trip in a jeep on unpaved roads to get one place we wanted to look at in Liberia.'

Although states agree to the principle of inspections, SPT members are sometimes treated with suspicion. 'To be fair, if you're running a prison in an isolated location and some foreigners turn up waving papers and demanding access to interview the inmates on behalf of the UN, you might want to check their credentials,' says Evans. 'You have to be diplomatic when you're negotiating with

SPT
Mission and mandate

The SPT began its work in 2007. It is a new kind of body within the United Nations human rights treaty system with a purely preventive mandate focused on a sustained, proactive approach to the prevention of torture and ill treatment. It comprises 25 independent experts from different backgrounds and parts of the world.

SPT operates in accordance with the provisions of the OPCAT, implemented in 2006. Under OPCAT, it also has the right to conduct unannounced visits to places of detention in party states. As well as conducting its own visits, it co-operates with other international, regional and national bodies engaged in activities related to torture prevention, and advises party states on setting up independent national preventive mechanisms.

Feature

someone holding a machine gun. But we have local liaison officers who can verify our mandate – and we're very persistent.'

Once inside a facility, the challenge is to remain focused on the purpose of the visit. 'We can't intervene in individual cases,' says Evans. 'That's extremely difficult, especially when you've been talking to someone who's been locked up in appalling conditions, and you know exactly what they'll be going back to when you leave. Half of you wants to prolong the conversation to delay that inevitability, and the other half is aware that the longer you spend with this person, who may not have been allowed out of his cell for months, the less time you have for seeing others.'

Quid pro quo

In return for unprecedented access to places of detention, the SPT keeps its reports confidential unless states agree to make them public. Around half the committee's reports have been published so far – and not just those that are beyond criticism. 'This is hugely commendable,' says Evans. 'It shows a remarkable degree of honesty and a willingness to improve things.'

It comes as a surprise that some democratic countries have not yet ratified OPCAT, while others with historically poor human rights records, such as the Democratic Republic of Congo and Cambodia, have done so. Evans believes that the example these countries set encourages others to ratify; Tunisia, for example, is the first of the Arab Spring countries to come on board, and there are signs that others will follow suit.

How much can the SPT realistically achieve? Not all that much in terms of inspections, concedes Evans. A visit may lead to many recommendations, such as, for example, moving detainees to alternative accommodation in a case of chronic overcrowding, improving conditions, or even to close a facility down. But there's a limit to how many visits teams drawn from its 25 committee members can make in a year – currently only about six. The committee is, however, making greater strides in the area of helping states establish national structures with a similar mandate to its own. 'In the UK, we're used to the idea of having independent inspectorates, but it's new territory for many countries,' says Evans. 'The STP spends a lot of time working with states to ensure that they have their own mechanisms in place to create effective monitoring bodies.'

Entente mondiale

So far, 62 states have ratified OPCAT. That may not sound like many, but it's nearly a third of the world's countries. Evans believes its success is due to its forward-looking nature. 'We're not out to prosecute for past misdemeanours; we're interested in the future,' he says. 'The more that states understand that, the more willing they are to engage with us. It can be difficult to get that message across, especially when other international mechanisms work differently, but we keep plugging away.'

> WE'RE NOT OUT TO PROSECUTE FOR PAST MISDEMEANOURS; WE'RE INTERESTED IN THE FUTURE

Familiar as he is with the slow-turning wheels of international diplomacy, Evans is heartened by how much OPCAT has achieved in the short time since its implementation. While the lawyer in him takes nothing for granted – once states establish preventive mechanisms, they still have to maintain them – he is cautiously optimistic. A new era of universal understanding? Time will tell. ●

United we stand
Who has ratified OPCAT?

Albania, Argentina, Armenia, Azerbaijan, Benin, Bolivia, Bosnia and Herzegovina, Brazil, Bulgaria, Burkina Faso, Cambodia, Chile, Costa Rica, Croatia, Cyprus, Czech Republic, Democratic Republic of the Congo, Denmark, Ecuador, Estonia, France, Gabon, Georgia, Germany, Guatemala, Honduras, Hungary, Kazakhstan, Kyrgyzstan, Lebanon, Liberia, Liechtenstein, Luxembourg, Macedonia, Maldives, Mali, Malta, Mauritius, Mexico, Montenegro, Netherlands, New Zealand, Nicaragua, Nigeria, Panama, Paraguay, Peru, Poland, Republic of Moldova, Romania, Senegal, Serbia, Slovenia, Spain, Sweden, Switzerland, Togo, Tunisia, Turkey, Ukraine, United Kingdom, Uruguay

Albania
First to ratify in 2003

UK Third to ratify, also in 2003

Hungary
Most recent state to ratify, earlier this year

Tunisia
First of the Arab Spring countries to ratify

Benin, Honduras, Maldives, Mexico, Paraguay, Sweden
All have made SPT's visit report public

Malcolm Evans portrait © Rob Vanderplank

Listings

Calendar June 2012 – November 2012

Unless otherwise stated, more information and booking details are available from bristol.ac.uk/alumni/events or by calling +44 (0)117 331 8204. The events programme is always being updated, so keep an eye on the website for the latest event news.

If you're organising an event for alumni and would like our help publicising it, please email alumni@bristol.ac.uk

Calendar illustration © Alberto Antoniazzi

June

Saturday 9 June
Tracing human ancestry using DNA // Cambridge

The Cambridge Branch invites you to hear Dr Peter Forster, Director of Research at the Institute for Forensic Genetics in Müenster (Germany), talk about how DNA can be used to trace family histories over thousands of years.

Wednesday 20 June
Victorian London walk

Join the London Branch of the University of Bristol Alumni on the 'Darkest Victorian London Walk' led by an experienced Blue Badge guide and followed by light buffet supper. (Repeated 12 July.)

July

Friday 6 July – Sunday 8 July
Alumni Weekend 2012: Best of Bristol

Come back to Bristol and enjoy a packed weekend of lectures, lunches, friends and tours. There will be special anniversary celebrations for those who graduated in 2002, 1992, 1982, 1972, 1962 and earlier.

Saturday 7 July
Valedictory Lecture: Emeritus Professor Bob Evans // Bristol

Professor Evans (PhD 1970) on 'Understanding the states of matter: 45 years and still trying'. Popular professors who have moved on to 'Emeritus' status are invited to give a Valedictory Lecture to former students, alumni and friends.

Saturday 7 July
Valedictory Lecture: Emeritus Professor Stephen Lisney // Bristol

Professor Lisney (BSc 1972, BDS 1975, PhD 1978, MA 2005) on 'Marshall Hall and the concept of spinal reflex action (1832)'. Popular professors who have moved on to 'Emeritus' status are invited to give a Valedictory Lecture to former students, alumni and friends.

Saturday 7 July
Convocation (Bristol University's alumni association) AGM // Bristol

See details and absentee ballot paper, enclosed.

Saturday 7 July
Wills Hall and Churchill Hall Associations' reunion dinners // Bristol

All alumni and guests are welcome to attend. Guest speaker at Churchill: The Right Honourable the Baroness Hale of Richmond DBE (Hon LLD 2002), University Chancellor. Guest speaker at Wills: Professor Bruce Hood, Director of the Bristol Cognitive Development Centre at the University and 2011 Royal Institution Christmas Lecturer.

September

Saturday 8 September
Cambridge Branch annual dinner, Pembroke College // Cambridge

Guest speaker: The Right Honourable the Baroness Hale of Richmond DBE (Hon LLD 2002), University Chancellor.

Friday 21 – Sunday 23 September
The 10th annual Eastern Canada alumni reunion 2012 // Canada

This reunion will centre on the Stratford Shakespeare Festival in Ontario and combines theatre with a reunion dinner.

Thursday 27 September
Alumni forum: Understanding admissions and student funding // London

Especially for parents and friends of current and soon-to-be university applicants: a university view on undergraduate admissions and student life.

Saturday 29 September
Midlands Branch visit to Winterbourne House and Garden // Birmingham

The University of Bristol Midlands Branch of Convocation invite alumni to join them for a visit followed by lunch at Winterbourne House.

October

Wednesday 10 October
Pioneers' reception // London

This is an invitation-only event: please see bristol.ac.uk/centenarycampaign/recognising-support/pioneers.

Monday 15 October
Wills Hall Association reception // London

Enjoy canapés and good company at this annual reception, which will be held at the Oxford and Cambridge Club.

November

Thursday 8 November
London Branch of the University of Bristol alumni annual lecture // London

Guest speaker, Tony Juniper (BSc 1983), campaigner, writer, sustainability adviser and well-known British environmentalist, will speak at the London Branch's keynote event.

Saturday 17 November
Centenary of Bristol's School of Oral and Dental Sciences, Bristol

You are warmly invited to help celebrate the centenary of the School of Oral and Dental Sciences with a variety of tours, lectures and lunches. Come see how the school has changed.

Listings

The University extends its sincere condolences to the friends and families of those listed below for who the University has received notification of death.

In order of degree date

William Ancrum
(BA 1936, Diploma 1940)
died December 2011, aged 97

Douglas Thomas
(BSc 1936)
died February 2012, aged 97

Margaret Bartlett (née Poole)
(BA 1937, Diploma 1938)
died October 2011, aged 96

Dr Alfred Nowell Peach FRCS
(MB ChB 1937)
died January 2012, aged 98

Philip Nethercott
(LLB 1938)
died August 2011, aged 93

Dr William Heaton-Ward
(MB ChB 1944, Diploma 1948)
died June 2011, aged 91

Dr Gawin Herdman
(MB ChB 1947)
died January 2012, aged 88

Peter Yates
(BSc 1947)
died 2011, aged 85

Molly Cairns
(BA 1948, Cert Ed 1949)
died November 2011, aged 84

Dr Charles Crowne
(BSc 1948, PhD 1951)
died 2011, aged 84

Wyndham Paige
(BSc 1948)
died November 2011, aged 84

Louise Roberts
(BA 1948)
died November 2011, aged 84

Jean Daniels (née Hutchings)
(BSc 1950)
died January 2012, aged 81

Richard Hope
(BSc 1950, Cert Ed 1951)
died 2011, aged 90

Sheila McGrath (née Yeats)
(BA 1950)
died 2012

Justice Nnaemezie Aniagolu
(LLB 1951)
died 2011, aged 89

Charles Boldero
(BSc 1951)
died October 2011, aged 87

Mary Hayes (née Daley)
(Cert Ed 1951, BA 1950)
died February 2012

Dr Anthony Rowland
(MB ChB 1951, Diploma 1961)
died February 2012, aged 84

Ernest Brook
(BA 1952)
died January 2012, aged 80

Herbert Harvey
(BSc 1952)
died 2011, aged 80

Arthur Rust
(BA 1952, Cert Ed 1953)
died June 2011, aged 82

Dr Sydney Spragg
(BSc 1952, PhD 1955)
died September 2011, aged 84

John Vowles
(BDS 1952)
died 2011, aged 88

Anthony Bennett
(BSc 1953)
died November 2011, aged 82

Philip Bishop
(BA 1953)
died October 2011, aged 78

Dr Ranchor Lalloo
(MB ChB 1953)
died February 2011, aged 85

Judith Blair-Brown (née Price)
(BA 1954, Cert Ed 1955)
died August 2011, aged 79

Margaret Dennison (née Morrison)
(BA 1954)
died March 2011

Christopher Lapworth
(BSc 1955, Cert Ed 1956, Adv Cert Ed 1980)
died February 2012, aged 77

Dr Philip Barry
(MB ChB 1955)
died October 2011, aged 88

Margaret Bunyan (née Pollard)
(BA 1955)
died 2011, aged 78

Alan Gard
(BSc 1955)
died October 2011, aged 77

Dr Kenneth Parry
(MB ChB 1955)
died 2011, aged 82

William Wood
(BSc 1955)
died November 2011, aged 79

Christopher Bowes
(BA 1956)
died February 2012, aged 76

Dr John Hardy
(BSc 1956, PhD 1959)
died July 2011, aged 76

Robert Eccles
(BA 1957)
died 2011, aged 76

John Green
(BVSc 1957)
died 2012, aged 78

The Rev Canon Eric Grimshaw
(BA 1957)
died September 2011, aged 77

Professor Richard Redwood
(BSc 1957, PhD 1964)
died October 2011, aged 75

Brian Totterdill
(BSc 1957)
died July 2011, aged 77

Peter Cushing
(BVSc 1959)
died 2011, aged 77

Alan Davis
(BSc 1959)
died August 2011, aged 75

Thomas Whymark
(BVSc 1961)
died October 2011, aged 73

Gillian Bedingfield (née Thunder)
(BSc 1962, MA 1997)
died August 2011, aged 70

Dr Geoffrey Burston
(MB ChB 1962)
died February 2012, aged 72

Alison Baxter
(BA 1963, Cert Ed 1966)
died February 2012, aged 70

Christopher Powell
(BArch 1963)
died December 2011, aged 70

Roderick Fox
(BDS 1964)
died June 2011, aged 79

Susan Mira (née Ison)
(BA 1965)
died August 2011, aged 68

Michael Pearce
(BA 1965)
died August 2011, aged 72

Derek Walkerdine
(BA 1965)
died July 2011, aged 75

Dr David Howard
(BSc 1966, MB ChB 1969)
died January 2012, aged 67

Jonathan Latham
(LLB 1966)
died May 2010, aged 65

Dr Veronica Tatton-Brown (née Wilson)
(BA 1966)
died March 2012, aged 67

Dr Richard France
(PhD 1967)
died February 2012, aged 73

Marcia Wilson (née Leavey)
(BA 1969)
died May 2011, aged 63

The Rev Mr Malcolm Grills
(BA 1974)
died July 2011, aged 62

Professor John Turner
(PhD 1974)
died 2011, aged 64

Richard Fisher
(BSc 1977)
died October 2011, aged 55

Dr Robert Newton
(MSc 1978, PhD 1984)
died August 2011, aged 56

Peter Edholm
(BSc 1979)
died October 2011, aged 53

Raymond Mardle
(BSc 1980)
died 2011, aged 53

Brian Liversage
(Certificate 1983)
died October 2011, aged 67

Sister Amelia Ip Cheng
(BEd 1984)
died November 2011

Roberta Dikeman (née Davis)
(JYA 1988)
died February 2012, aged 45

Paul Hawksworth
(BA 1988)
died November 2010, aged 44

Alastair MacGilp
(MPPS 1989)
died 2011, aged 71

Rebecca Cook (née Smith)
(BVSc 1992)
died 2011, aged 45

Pamela Brown
(MEd 1993)
died June 2011, aged 68

Helen Holder
(BSc 1993)
died August 2011, aged 38

Dawn Warner
(BA 1994)
died November 2011, aged 41

Etham Vimes
(MA 1996)
died July 2011, aged 39

Andreas Milakovic
(Certificate 1998)
died 2011, aged 43

Claire Cordon
(MSc 2006)
died June 2008, aged 25

Octavia Morris
(BA 2006)
died August 2010, aged 27

Clemens Reutter
(BSc 2011)
died 2011, aged 23

Please email any notifications of death to **alumni@bristol.ac.uk**

Feature

Thought that counts

Those neat diagrams in the textbooks make science look so … well, settled. And yet we still have trouble defining what a species actually is. Philosophers like Professor Samir Okasha try to shed light on the ambiguities that modern science still can't crack.

By **Nick Riddle**

Science is big on data. Philosophy … not so much. 'We tend to be looking for something a little more nebulous,' says Samir Okasha, Professor of Philosophy of Science. 'Philosophy doesn't have a catalogue of definite conclusions or discoveries. Some people think of that as a mark against it, but philosophical investigations can illuminate a subject in a different way.'

Philosophy of science as an organised sub-discipline is no more than 80 years old, but the questions and debates that it addresses go back much further, to an era when the notion of a sharp distinction between philosophy and science would have puzzled your average scholar; René Descartes, the father of modern philosophy, was one of many philosophers who were also practising scientists.

'Philosophy of science really got going in the 1930s, after relativity theory and quantum mechanics rewrote the laws of physics,' says Okasha. 'That threw up some profound questions to do with objectivity, causality and the nature of time.'

Speaking of species

So how can philosophers come to the aid of scientists? True to philosophy's reputation, the example that Okasha gives is a little involved.

'In evolutionary biology, there has been an age-long controversy about what exactly a species is,' he explains. 'The basic idea is that a species is a group of organisms that can interbreed with each other but not with anything outside the group. As a rough guide, that works fairly well – as long as you're dealing with sexually reproducing animals, though they're a tiny fraction of life on Earth.'

But biologists know that this leaves some loose ends. Are species real units in nature, or are they arbitrary divisions that we have superimposed on to nature? 'There's also the more practical question of how exactly you can extend the species notion to organisms that don't reproduce sexually,' says Okasha. 'Dividing all plants rigidly into species, with no grey areas in between, is a bit of a fiction.'

Philosophers have entered this fray many times – most recently in the 1970s, when they proposed a new approach: rather than define a species as a category, one should think

Feature

of it as an individual thing, born when an older lineage splits and then becomes extinct.

'The relation between a species and the organisms that belong to it is akin to that between a multicellular organism like you or me, and the cells in our body,' says Okasha; 'they're parts of the whole. So if you find an organism on Mars that resembles a domestic dog but has no connection with the dog lineage here on Earth, then you'd have to conclude that it's not a dog.' That might seem a hair-splitting distinction, but many biologists believe that it offers a possible guide to applying the species concept in practice – for instance, when measuring biodiversity.

Questions of degree

Okasha and colleagues in the Department of Philosophy run postgraduate courses that bring philosophy to bear on science, mathematics, psychology, cognitive science and biology. 'These are aimed at students with a science degree who have found that it doesn't quite scratch an itch,' he says. 'They might be curious about the history of the ideas behind the theories, or about how their basic principles tie in with other areas of enquiry. And there are broader questions: How confident can we be about scientific ideas? How should we understand the relationship between evidence and theory?'

That's not to say that science is badly taught, he adds: 'In some ways, it's good to have a separation between learning something and reflecting philosophically on it. But I do think that the more we can get people to see that profound philosophical issues are raised by science, the better.'

Doubt and Darwinism

Philosophy does seem to attract people with nagging doubts about some other field. 'We tend to have a rather chaotic intellectual trajectory,' says Okasha. 'Philosophy often attracts people who have studied other things but become a little disillusioned. It can be a kind of refuge for malcontents from other subjects.'

Okasha's undergraduate work was in philosophy and economics, but he was drawn to a new sub-discipline called philosophy of biology. 'I'm particularly intrigued by the way that many issues in political and social philosophy also crop up in evolutionary biology,' he says. 'One of my research projects involved studying the tension between individual self-interest and the welfare of the group, and how both evolutionary biology and philosophy address this trade-off. Both have versions of the theory that individuals acting in a self-interested way can produce outcomes that are not beneficial for their group, community or species. And both try to explain why animals sometimes sacrifice themselves for the welfare of others, even those not their genetic relatives.'

Head to head

In academia, scientists and philosophers have interacted in positive and often fruitful ways: the flourishing of cognitive science in the 1970s, for example, was the result of work by philosophers as well as psychologists. Okasha, who spends half his professional life with philosophers and half with scientists, has observed the differences between these species at close quarters.

'Your typical philosophy talk goes on for an hour,' he says, 'plus another hour of discussion, thrashing out some tiny point, everyone pitching in.' A science talk generally lasts half as long, with fewer questions.

> IT'S ABOUT PITTING ONE POSITION AGAINST ANOTHER

'But argument is intrinsic to philosophy,' he points out; 'it's all about pitting one position against another. So I always have to remember which company I'm in when I'm talking.' Not that scientists are unfailingly polite, but the kinds of questions at a philosophy talk would, he thinks, 'probably be seen as an attack on someone's competence if you were to ask similar questions after a science lecture'.

Both approaches have their merits, he emphasises, but the adversarial approach tends to favour combative, even aggressive, people. 'That might help to explain the rather embarrassing gender imbalance in philosophy,' adds Okasha. 'At the top of the profession only about five per cent of philosophy professors are women. I do think we could learn something from science's model of presenting and discussing ideas.'

Right to roam

But as for science's model of working towards concrete conclusions … 'We don't really do conclusions,' he laughs. But that's why philosophy complements science so well; without the pressure to produce definitive results, philosophers can explore the ambiguities of science more thoroughly. As Okasha says, 'These are important and interesting ideas for anyone who's interested in the bigger picture, and in what science can – and can't – reveal about the world.' ●

Key pioneers
Philosophy of science

David Hume (1711-76)
author of *A Treatise of Human Nature* (above) whose ideas about causation, in particular, have strongly influenced modern philosophy of science.

Karl Popper (1902-94)
whose books *The Logic of Scientific Discovery* and *The Open Society and its Enemies* still influence British philosophy of science.

Thomas Kuhn (1922-96)
influential author of *The Structure of Scientific Revolutions*, which introduced the concept of the paradigm shift – a wholesale overturning of received scientific wisdom by a radical new idea.

Samir Okasha portrait ©Nick Smith // Illustration © Joel Holland

In pictures

'Patryk and his cats' is one of a series of images from a project entitled People and Animals. The photographer, Charlie Clift (BSc 2010), honed his skills while studying at the University.

'I decided to study Psychology at Bristol because I've always been fascinated by the variation in people's personalities. During a year out from my studies, I discovered the joy of photographing people. Once back at university, I spent loads of time experimenting with the Photography Society's equipment, gaining the confidence to dive into a freelance career as a photographer straight after graduating. Since 2010, I've been taking portraits for editorial and advertising clients and pursuing my own projects.

For the People and Animals venture, I've been photographing interesting individuals who choose to live closely with animals. Patryk travels around the world showing the amazing ragdoll cats he breeds with his mother. All the kittens are from the same litter. I shot the cats individually and stitched the photos together later. We had to spend a good couple of hours playing with the cats, offering toys and other distractions to get things to look just right. Fortunately, ragdolls have a docile, placid temperament, otherwise they'd never have hung around long enough to get the shoot done.'

charliecliftphotography.com

Everyone can leave a legacy. Please think about it.

The Department of Music has been able to buy a suite of new instruments, thanks to a legacy from a mature student, who had wanted to help others enjoy his passion for music.

Contact:
Ella Searle (MA 2002), Planned Giving Manager
T: +44 (0)117 331 7971
E: ella.searle@bristol.ac.uk

bristol.ac.uk/centenarycampaign/how/legacies

University of BRISTOL