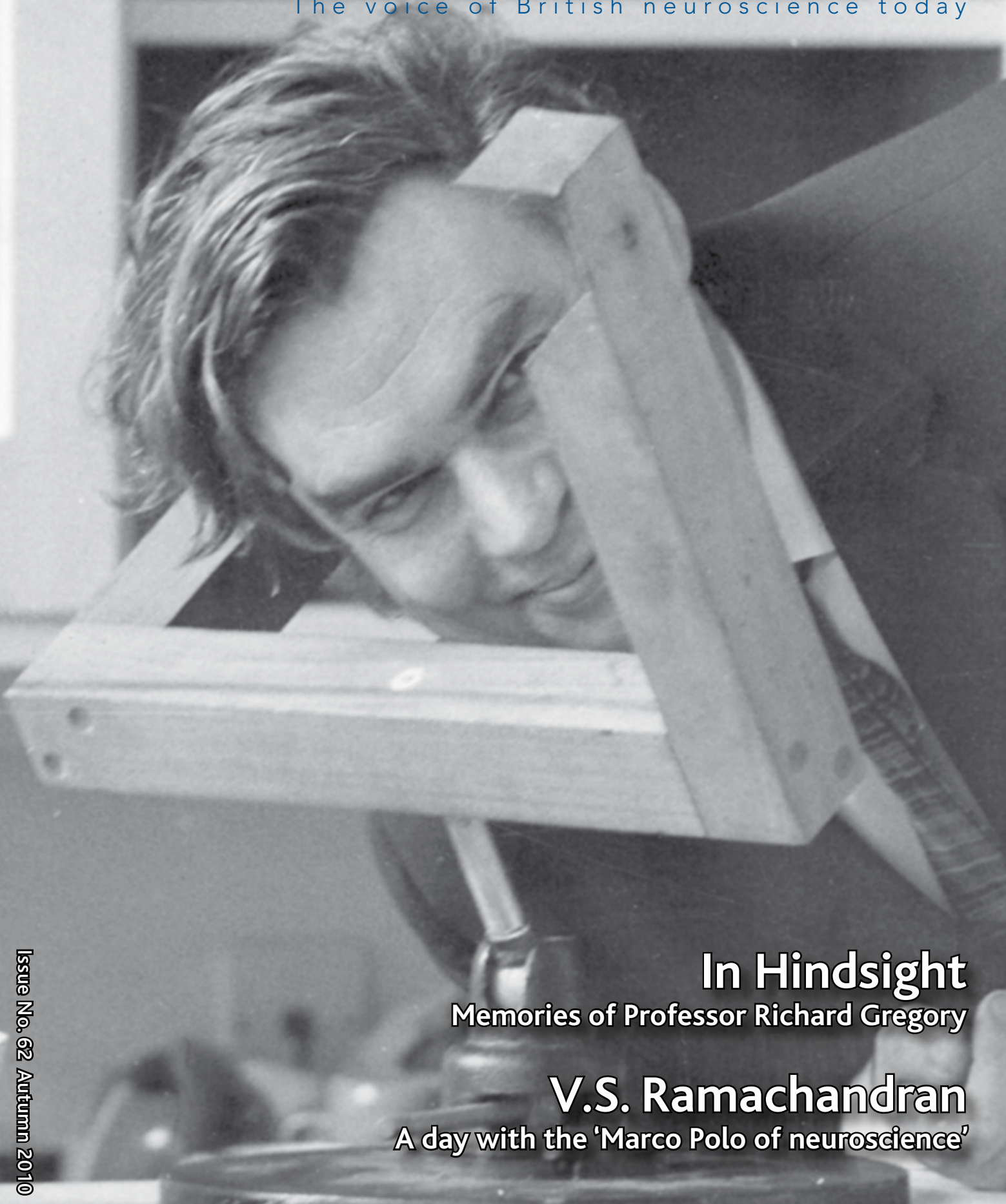




bulletin

The voice of British neuroscience today



In Hindsight

Memories of Professor Richard Gregory

V.S. Ramachandran

A day with the 'Marco Polo of neuroscience'



*The chances are
we will already
know what you
want to do...*

Blood Pressure

Stereotaxics

Electrophysiology

Anaesthesia

Analgesia

Behaviour

*...and what you
will need*

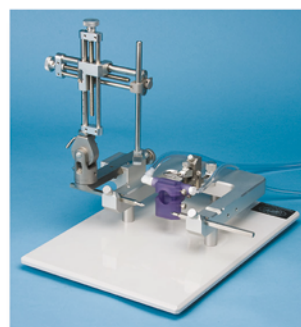
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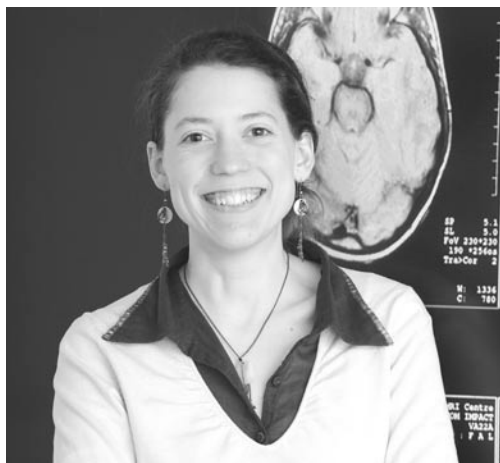
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Certificate No. 4015/03

Welcome



And I thought that doing the first edition of the re-launched Bulletin would be the hardest; it's not a patch on meeting expectations for the second! Thank you so much for your warm and enthusiastic welcome for the new Bulletin. I hope this edition proves up to standard and another enjoyable read for you too.

Since your feedback indicated you particularly liked articles about people (who are the neuroscientists in the UK? What do they do? What do they like?) I have made an extended 'People' section this time, with favourites such as 20 Tweets (p12) and A Day in the Life (p14).

It was joy tinged with sadness to create the feature on Professor Richard Gregory (p22) - a joy to work with the many leading scientists who contributed to the piece, but sadness this was brought about by the death of Richard, still active in research more than twenty years after 'retirement'. A true giant of vision research, one of his greatest legacies must be in revealing the sheer fun to be found in science.

Of course there's science in the Bulletin too; an assessment of amyloid in Alzheimer's (p28), a double bluff (p30 and p32), and thoughts on the neuroethics of brain imaging (p34 and 36).

Another joy in becoming Editor has been the chance to get to know more BNA members. I look forward to meeting many more of you at the Christmas symposium (p5) and the 2011 BNA national meeting (p7).

In the meantime, do send me your thoughts on this second re-launched Bulletin - and contributions for the third!

Anne Cooke
BNA-editor@bristol.ac.uk

Spring issue: COPY DEADLINE = 11th February 2011

Are you interested in submitting items for the Spring edition?
Are you interested in writing, drawing, doing photography, poetry...
or anything else for BNA? Email BNA-editor@bristol.ac.uk - to find out how. All enquiries very welcome

Advertising in the Bulletin: please contact BNA-editor@bristol.ac.uk for advertising rates and submission criteria. Printed adverts and insert distribution both available; special rates for various packages.

Events and notices: email BNAoffice@neuroscience.cam.ac.uk

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On the cover: Professor Richard Gregory, whose life is celebrated in the article on p22, was the first to recreate Penrose's famous drawing of an impossible triangle as a 3-dimensional model.

Acknowledgements: Tremendous thanks go to the friends and family of Prof Richard Gregory for their willing and generous help for the article on p22. And thank you to all the many contributors - see p 47.

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ISSN No: 1475-8679

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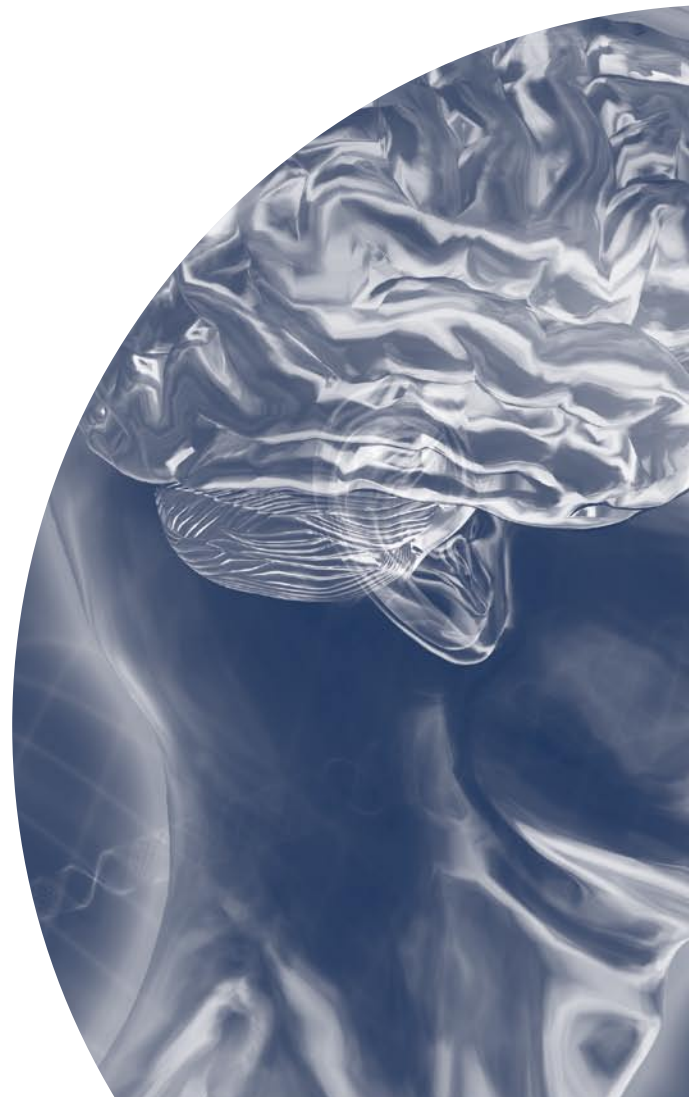
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A Day in the Life of ... Professor V.S. Ramachandran

Referred to as the 'Marco Polo of neuroscience' (Richard Dawkins), 'modern Paul Broca' (Eric Kandel) - and simply 'Rama' by his friends - the Bulletin asks how V.S. Ramachandran fits all his roles into each day

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A visionary maverick (cover article)

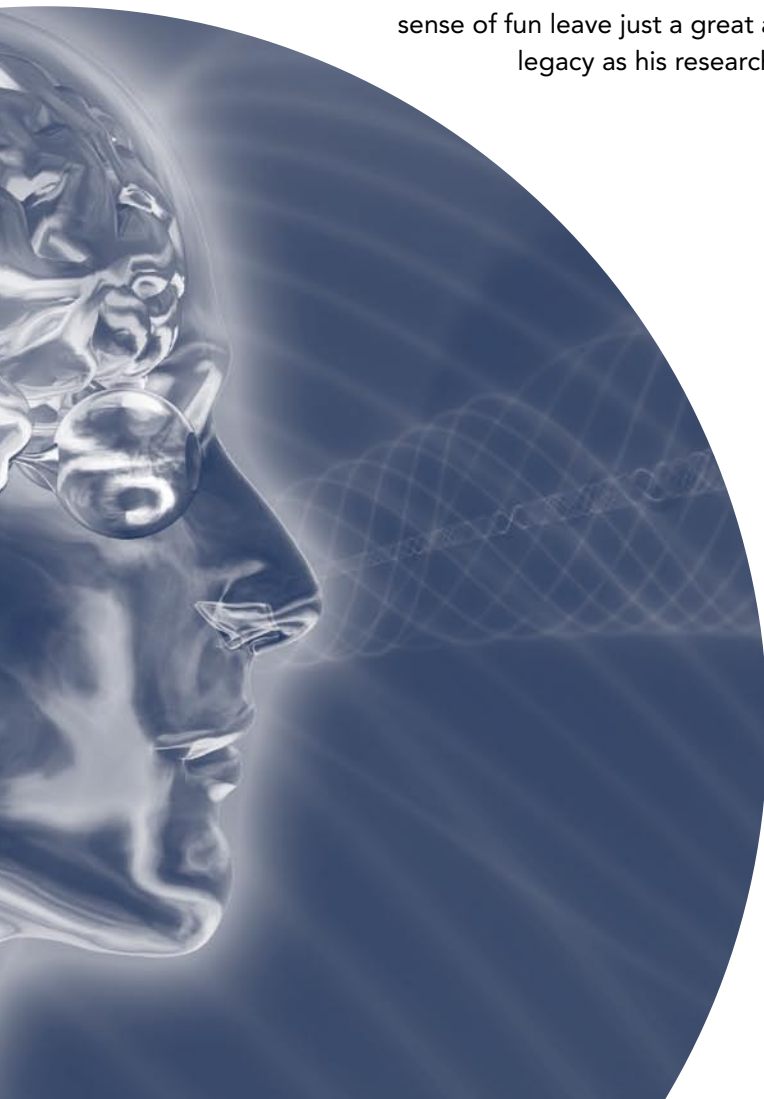
The death of Professor Richard Gregory marked the end of a distinguished, six-decade career, but his infectious enthusiasm and sense of fun leave just a great a legacy as his research



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The neuroethics of brain imaging

As modern technology advances apace, two BNA members consider the moral, ethical, and legal implications of what it might mean to literally 'read the mind'.



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• BNA NEWS & UPDATES

FROM THE PRESIDENT Trevor Robbins



Reflections on the year so far: the full report's online, but here are some ruminations on key themes that emerged...

ADVOCACY AND BNA
RELATIONSHIPS WITH
OTHER SOCIETIES
Meeting with Society for
Neuroscience officials at FENS:
what an impressive, successful

organization! I'm sure we can learn a lot from them. It brought home to me how comfortable they are with advocacy via direct lobbying to politicians in Washington

- whereas in the UK the routes are far less clear, and often devolve to making general noise in the media, or hopeful letters to local MPs.

BIENNIAL MEETING AT HARROGATE (17-20 APRIL 2011)
It gave the BNA office (Arciris and Hannah) and myself a great boost to see all our assiduous planning finally taking shape, with confirmations from nearly all our first choice Symposia and Plenary speakers. Thanks to the Scientific Advisory Board, Local Group reps, and members for their creative input. We also have exciting surprises in store for evening social events. Watch out for posters! Please put the date in your diary - this meeting, a notable milestone for the BNA, is not to be missed.

FROM THE SECRETARY Colin Ingram

- In this uncertain world in which we live, the BNA is keeping a positive outlook on life; following 2009's Christmas symposium on 'The neuroscience of pleasure, happiness and reward' our event at this year's Cheltenham Science Festival was entitled 'Your decadent human brain'. Is our abnormally large brain pure indulgence? Or does its largess allow us the decadence of emotions, like misery and joy?
- Feelings and emotions - and the drugs which alter them - again featured in the BNA symposium 'Bliss or Blues; Rapture or Rage' at the 2010 British Science Festival.
- And with this year's Christmas symposium 'The neuroscience behind partying' the BNA is certainly enjoying all life has to offer.
- Whilst on meetings; we encourage members to take up the offer of support from BNA to hold co-hosted symposia. Please email us your ideas.
- The big event of the summer was FENS in Amsterdam - the Federation of European Neuroscience Societies' biennial meeting. Alongside the excellent programme, delegates enjoyed a city pulsating with world cup fever (orange style).
- FENS business also took place: Two new countries (Iceland and Serbia) were welcomed, new membership fees approved, new committee members elected

- including President-Elect, Marian Joëls - and plans made to work more closely in future. To develop our role in FENS we are looking for people keen to get directly involved. Interested? email BNAoffice@neuroscience.cam.ac.uk

- We are also working with the US Society for Neuroscience about ways the two administration offices can share successful practice.
- Meanwhile the BNA's Board of Directors welcomes Bruno Frenguelli and Mike Rigby, and gives great thanks to Ian Varndell and Stefan Przyborski, now standing down after years of dedication.
- What strategic aims should the Board pursue? Please do let us know your views via the members' survey (announced in recent emails).
- Finally, please ensure all your colleagues and students are members; they need at least 6 months membership to benefit from reduced fees and bursaries for the BNA National Conference (see p7). A must for all neuroscientists!



FROM THE OFFICE Hannah Critchlow

What a busy, but enjoyable, 2010 to date!

Of particular note: it is with great pleasure that we can now reveal the programme for our British Neuroscience Association Biennial Meeting, 17th – 20th April 2011, hosted in the elegant spa town of Harrogate.

The suggestions of the BNA Scientific Advisory Board, together with those from the BNA membership and Committee, have resulted in a cutting-edge programme which will showcase recent advances and cover broad themes of neuroscience.

For a quick, whistle-stop, tour of the meeting (full details at bna.org.uk) :

- Twenty symposia on a wide variety of topics - e.g. optogenetics, the brain-machine interface, ncRNAs in the brain, channelopathies, neural oscillations, and Connectomics - with each symposium featuring both an international speaker and a 'rising star' in neuroscience.
- Plenary Lectures - Lighting up the Brain by Gero Miesenboeck (University of Oxford); Spontaneous Activity: a Key toward Understanding the Mind? by Maurizio Corbetta MD, (Washington University School of Medicine); The Life and Death of Synapses by Morgan Sheng, (Howard Hughes Medical Institute), Computational Psychiatry by Peter Dayan (UCL), Neural Circuit Dynamics in Mice Navigating in Virtual Reality by David W. Tank (Princeton University) and Novel treatments for drug addiction; prospects and problems by BNA President Elect, David Nutt (Imperial).
- In addition to satellite symposia, Emerging Hot Topics, participatory workshops exploring Neuroscience and Policy and Current Funding Opportunities, extended poster sessions, AND entertaining (we hope!) evening activities.

We extend a warm invitation to what promises to be a high profile meeting!

The BNA Office have also been busy re-developing the BNA website and email system, and is happy to now offer the following service to our members: if you have any news, jobs or events you'd like to announce to the UK neuroscience community, please do get in touch.

Looking ahead, the BNA Office - along with the Committee and Directors - is appraising our relationships with other learned Societies, investigating effective routes to inform policy and education, and working in the realm of public engagement.

Finally, please save the date of our Christmas Symposium, 15th December, at London's Royal Society. The topic? T'is the season to be sociable: The neuroscience behind partying, a timely exploration of the evolutionary origins and neural mechanisms behind our pursuit for social interaction.

If you have any comments or suggestions regarding the BNA please do get in touch.

Dr. Hannah Critchlow, British Neuroscience Association Coordinator
bnaoffice@neuroscience.cam.ac.uk

Details of all events: bna.org.uk



Hannah Critchlow, on the right, with Arciris Garay-Arevalo

CHRISTMAS SYMPOSIUM

T'IS THE SEASON TO BE SOCIABLE:

THE NEUROSCIENCE BEHIND PARTYING!

1-6:30pm,
15 December 2010

The Royal Society,
London

Wine reception

A timely (and seasonal) exploration of the evolutionary origins and neural mechanisms behind our pursuit for social interaction.

SOCIALISING BY CORVIDS AND CHILDREN: ARE THEY AS DIFFERENT AS YOU THINK?

Nicola S Clayton FRS,
Cambridge University

THE SOCIAL BRAIN
Robin Dunbar FBA, Oxford University

THE BRAINS BEHIND A COOPERATIVE AND ALTRUISTIC CHRISTMAS
Ben Seymour, UCL

SOCIAL COMPLEXITY IN THE TEENAGE YEARS
Sarah-Jayne Blakemore, UCL

A SOCIAL ROLE FOR ROBOTICS?
Chris Melhuish FBCS FIET, University of Bristol and UWE

FREE for members!
Register at tinyurl.com/bna-christmas10

BNA LOCAL GROUPS

From Bruno Frenguelli, Committee Member responsible for Local Groups:

BNA's network of 30 Local Groups is how the Directorate stays in touch with what's going on, members are kept informed about BNA, and regional news can be circulated to everyone via website, emails and Bulletin. BNA supports Local Groups by funding seminars, and by co-hosting workshops or symposia that showcase local strengths. Send your news and ideas to your local rep; they'd love to hear from you!

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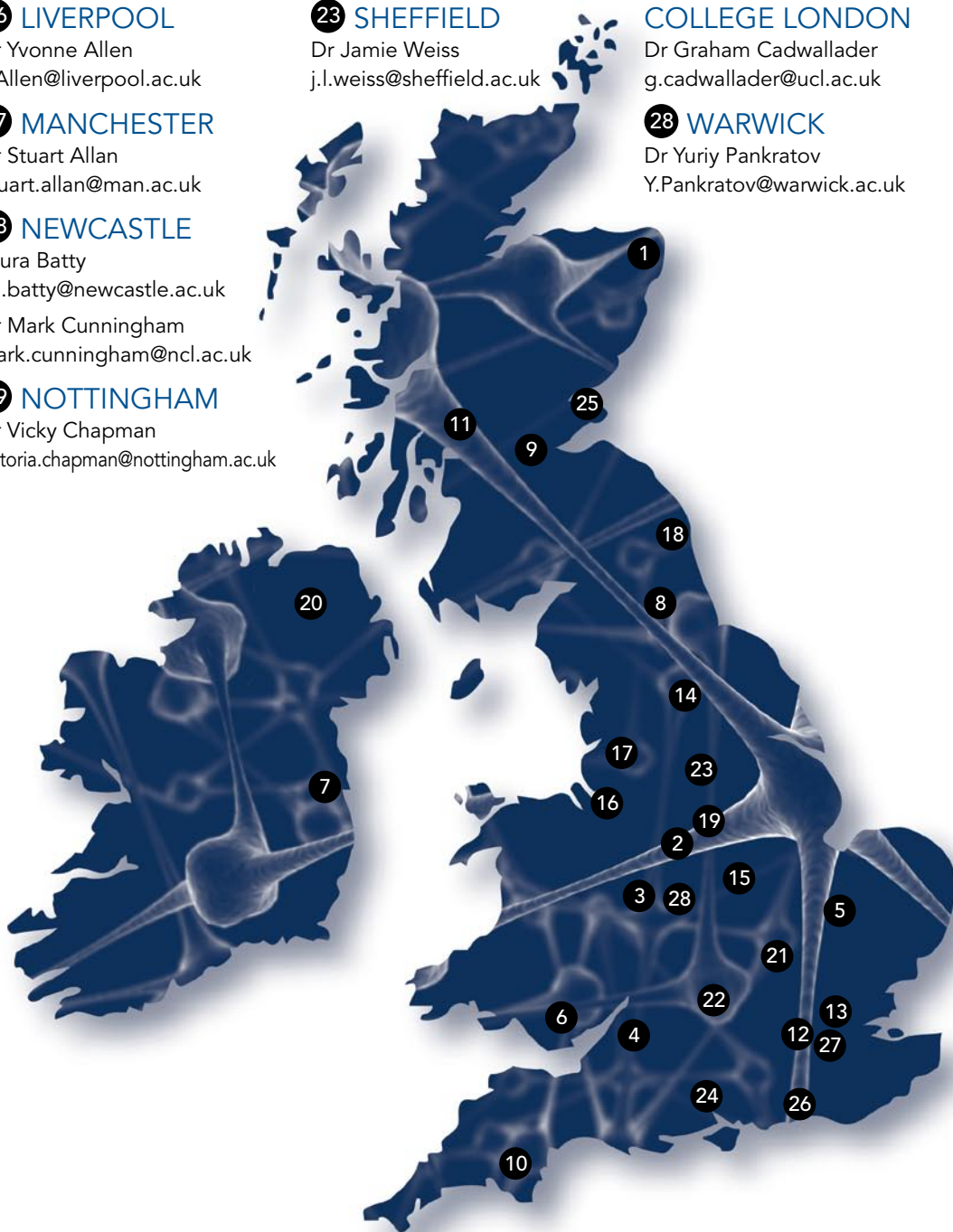
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British Neuroscience Association 21st National Biennial Meeting 17th -20th April 2011

Harrogate International Centre, Harrogate, UK

www.bna.org.uk

Plenary:

'Lighting up the Brain' by Gero Miesenboeck, Waynflete Professor of Physiology, Associate Head of Department – Department of Physiology, Anatomy, and Genetics, University of Oxford

'Spontaneous activity: a key toward understanding the mind?' by Maurizio Corbetta MD, Norman J. Stupp Professor of Neurology, Head of the Stroke and Brain Injury Rehabilitation Section, Washington University School of Medicine

'The Life and Death of Synapses' by Morgan Sheng, Menicon Professor of Neuroscience, Departments of Brain and Cognitive Sciences and Biology, MIT, Associate Investigator, Howard Hughes Medical Institute

'Computational Psychiatry' by Peter Dayan, Director of Gatsby Computational Neuroscience Unit, University College London

Neural Circuit Dynamics in Mice Navigating in Virtual Reality' by David W. Tank, Co-Director, Princeton Neuroscience Institute and Henry H. Hillman Professor of Biology, Princeton University

TBA, Li-Huei Tsai, Picower Professor of Neuroscience, Department of Brain and Cognitive Sciences, Director, The Picower Institute for Learning and Memory, MIT, Investigator, Howard Hughes Medical Institute

'Novel treatments for drug addiction; prospects and problems' by David Nutt, Fellow of the Royal College of Physicians, Royal College of Psychiatrists and the Academy of Medical Sciences, Imperial College London



Symposia:

Neurogenetics of clinical disorders Optogenetic Neuroscience Connectomics/High Resolution Microscopy
Redefining CNS disorders Epigenetics Neural basis of attention Channelopathies
Neural basis of obesity Glutamate - plasticity to pathology mRNAs and the brain Cortical connectomics
Neurobiology of hearing Building neural circuits Neural basis of language comprehension
Neural basis of psychosis Sleep and Circadian Rhythms Brain-machine interface
Brain rhythms in the clinic Memory and Imagination Neural basis of Perception and Action
Accumbens and Reward Role of neural oscillations Recent Advance in Neurodegeneration

Plus Satellite Symposia on:

Animal models of Schizophrenia Histamine and Pain Neuroinformatics

For queries please contact the BNA Office

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Background image by Maurizio De Angelis / Wellcome Images

Cancer risk of mobile phones

The largest study yet into possible links between mobile phone use and incidence of brain cancer recently reported its findings in the *International Journal of Epidemiology*. The INTERPHONE study gathered data from 5000 participants in 13 countries who had been diagnosed with either one of two types of brain tumour: glioma and meningioma. Comparing participants' phone use patterns with case-matched controls, the study found no overall evidence for an increased risk of either type of cancer - although more longitudinal research, especially on those with high cumulative call times, is required. *CM*

Edinburgh makes friends

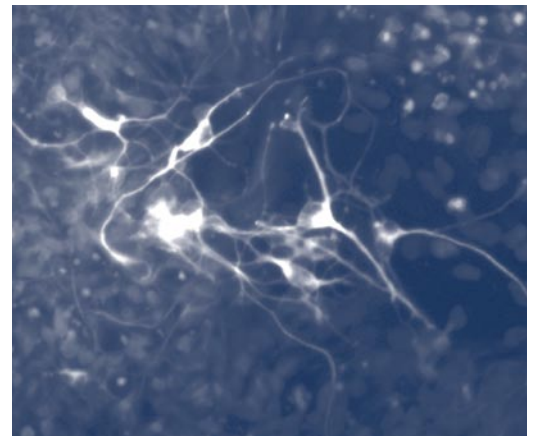


Edinburgh Neuroscience has established a new online community with the creation of its own Facebook page. Launched in October 2009, it already has 319 subscribers from 19 different countries and gets about 300 page views a week - and with only 31% of fans coming from Edinburgh, it really is reaching out to the world. The page highlights neuroscience research from Edinburgh, upcoming events for the public and neuroscience-related news from the University. Why not visit yourself? <http://tinyurl.com/edneuro-facebook>. *JH*

Parkinson's on a plate

Neuroscientists in Oxford are using stem cells derived from patients' skin to isolate the basis of Parkinson's disease. The cells, known as induced pluripotent stem cells (iPS cells), were first created in 2007 with stem-cell based therapies in mind - but they also offer a unique opportunity to study the cells of individual human subjects, in a dish.

Speaking at the UK National Stem Cell Network meeting in Nottingham, Dr Richard Wade-Martins, head of Oxford's Parkinson's Disease Centre, described how his team is able to convert iPS cells into the dopaminergic neurons that die in Parkinson's disease. He now plans to do this with >1,000 patients with early-stage Parkinson's disease and compare them with healthy, age-matched controls, in order to, "better understand how dopaminergic neurons from a PD patient handle dopamine." In particular, the team will investigate whether transmission at dopamine synapses fails prior to the development of protein aggregates and subsequent neurodegeneration.



Human dopaminergic neurons generated from stem

Dr Wade-Martins' presentation in Nottingham was covered by the BBC, among others. "I was delighted by the press attention" said Dr Wade-Martins, "it raises the profile of Parkinson's research in the UK and helps to highlight the importance of understanding neurodegenerative diseases in our ageing population."

The work is being funded by a £5 million grant awarded by Parkinson's UK to Dr Wade-Martins and the OPDC. *JW*

Cardiff heralds new research institute

As part of a £40M investment by Cardiff University, the new Neuroscience and Mental Health Research Institute will draw together diverse expertise - from medicine, psychology, biosciences and optometry - and develop new programmes of research to take discoveries and translate to greater understanding, diagnosis and treatment of brain disease.



Neuroscience & Mental Health Research Institute

Cardiff is already a world-leader in neuroscience and mental health research; 22% of the University's research income is in neuroscience. Under the Directorship of Professor Michael Owen the new institute represents a major development for UK neuroscience.

cardiff.ac.uk/research/neuroscience. *VD*

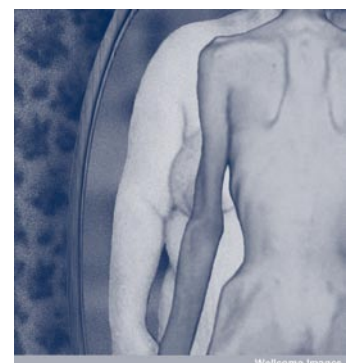
Views on brain imaging

Two online surveys and a series of workshops discussing the potential impact of brain imaging on society took place in Glasgow's Institute for Advanced Studies during June. Hosted by SINAPSE (Scottish Imaging Network: A Platform for Scientific Excellence), Edinburgh Neuroscience, the Joseph Bell Centre for Legal Reasoning, SCRIPT, and the Scottish Parliament Futures Forum, they sought opinions of the public and those already involved in imaging in order to guide new policies and regulations. See feature article pages 36-7. *GO*



A brain's view of the world

Matthew Longo, lead researcher at UCL, recruited 18 volunteers to hide their left hand under a board before asking them to locate their hidden knuckles and fingertips with a pointer. His results revealed that volunteers tended to overestimate the width of their hands while underestimating the length of their fingers. These findings might have implications on conditions such as anorexia nervosa that involve the perception of body image. In a separate study, creative people – those who typically do well on tests of divergent thought - were found to have a lowered density of dopamine (D2) receptors in the thalamus, a reduction that's also seen in schizophrenia. Fredrik Ullen, who led the study at Sweden's Karolinska Institute, reasons that this might cause less signal filtering into cortical areas that are involved in cognition and reasoning. However, it is still unclear why some people cope with such psychotic traits better than others. *FA*



Society for Neuroscience Chapter for Wales

Society for Neuroscience (SfN) members from Cardiff, Swansea and Bangor Universities have formed the UK's second SfN Chapter: SfN Wales. Headed by Chapter Representative Professor Frank Sengpiel, this provides a forum for neuroscientists across Wales to forge links, exchange information, and engage public interest in neuroscience. Already the Chapter has run a public lecture by Colin Blakemore FRS, events for Brain Awareness Week 2010,



and, on 14 March 2011, will host Simon Baron-Cohen for his talk *Do hormones affect how your mind develops? The foetal testosterone theory of autism*. (Details: Vanessa or Catherine, neuroscience@cardiff.ac.uk). *VD*

New animal experiment directive

After agreeing on the text of a new EU directive on animal research in late 2009, the European Parliament, the European Commission and the European Council still had technical issues to resolve before it could be published. This has now been completed, with only small changes made describing how amendments can be made. Following a legal and linguistic review the document should, finally, become publicly available this autumn. *JW*

Magnetic resonance relief

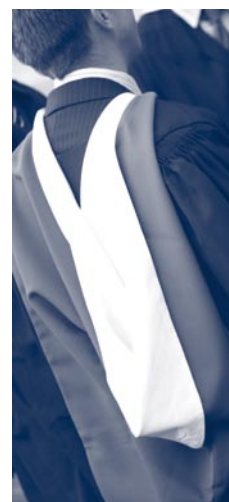
A troublesome EU directive that would have outlawed routine brain scans in laboratories and clinics is likely to be replaced by new, more carefully drafted legislation. The directive was deferred in 2007 when researchers raised their concerns, but is still due to be implemented by national governments before May 2012. The European Commission now says a new draft, exempting magnetic resonance imaging (MRI) from what are inappropriately restrictive safety measures - having been written with electrical and telecommunications industries in mind - will be proposed by December 2010. *JW*

Education linked to brain's compensatory mechanism against dementia

Neuroscientists from Cambridge have collaborated with researchers from Finland in one of the largest studies in the world to discover why education lowers the risk of dementia. Examining 872 brains from the EClipSE collaboration (three European population-based longitudinal studies, assessing people for up to 20 years), alongside questionnaires on education, yielded results with sufficient statistical power to conclude that - although there was similar brain pathology amongst people at post-mortem regardless of education - people who had higher education levels were less likely to show symptoms during life. This finding indicates that education in early life can have a compensatory effect in later life,

rather than actually protecting against neural degeneration. Moreover, the study reported that there was an 11% decrease in the risk of developing dementia for every additional year spent in education. Faced with a growing ageing population, this study has shed much needed light on a complicated and debilitating disease. *FA*

Original article: Brayne C. et. al. (2010) *Brain* 133(8): 2210-2216



UCL launches new centre



On 12 July 2010, a symposium at the UCL Institute of Child Health marked the launch of the Centre for Developmental Cognitive Neuroscience (CDCN). This will not only foster collaboration and increase translational research, but also create a critical mass within the research community to secure major funding. Students will also benefit from high quality training in what is a highly interdisciplinary field.

Prof. Faraneh Vargha-Khadem, director of UCL CDCN, opened the day. Without her vision and leadership, plus the help of the steering committee, this idea - two years

in the making - would have never become reality. UCL Vice Provost for Health, Prof. Sir John Tooke, and Dr. Jane Collins, Chief Executive of Great Ormond Street Hospital NHS Trust, fully endorsed the centre in their opening remarks.

Prof. Annette Karmiloff-Smith (Birbeck Centre for Brain and Cognitive Development), Prof. Kevin Pelphrey (Yale University), Dr. Nicola Robertson (UCL Institute of Women's Health), Dr. Francesca Cacucci (UCL Institute of Behavioural Neuroscience) and Prof. Nicola Clayton (University of Cambridge) all delivered fascinating talks, covering everything from autism to a Phase II clinical trial of xenon neuroprotection, and from hippocampal spatial representation to corvids.

Despite the daunting breadth and nature of the field, in his closing remarks Prof. Malcom Grant, Provost and President of UCL, aptly concluded that this centre will not only span world class research but also invest in the future. *FA*

Young Researcher at UCL Institute of Neurology Awarded Michael J. Fox Foundation (MJFF) Grant

The MJFF for Parkinson's Research announced \$3.5 million in funding nine research studies aiming to advance understanding of the LRRK2 gene, a potential new treatment approach for Parkinson's disease. Dr. Patrick Lewis was the only person from the U.K. to be awarded this grant. Dr. Lewis said: "Our research is focused on understanding how mutations in this gene alter protein signalling in cells and brain tissue from patients. Our hope is that...we will be able to narrow down how to target this protein in disease." FA



Patrick Lewis hard at work in the lab

On a high when feeling low

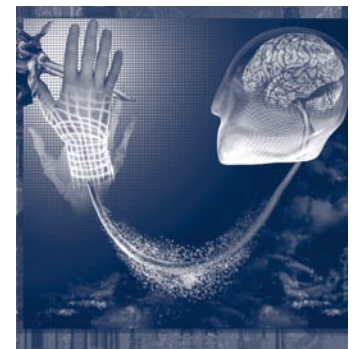


Depression has long been associated with low serotonin but new research indicates the opposite. How can this be? The low serotonin (5-HT) hypothesis rests largely on knowing that SSRIs (Selective Serotonin Reuptake Inhibitors) raise 5-HT at the synapse and alleviate depression. But more global measurements, taken from blood leaving the brain, revealed depressed patients had higher 5-HT than controls. Moreover, 12 weeks of SSRIs brought it to baseline. Revisiting SSRI action in this way brings a sea-change in our understanding and opens new ways to treat depression. AC

Impact of technology on the brain

In U.S.A., internet usage has increased by 30% and high speed home connections by 60% in the last decade, with it not uncommon for some people to spend 12-16 hours a day online. Such data prompts questions on the social and biological impact technology has on our brains. Neurologist Richard Restak (author of *The New Brain: How the Modern Age is Rewiring Your Mind*) asserts that technology has a major sculpting influence on the brain. However Patricia Greenfield, developmental psychologist from UCLA, is more sceptical. She thinks that the internet merely, "magnifies the influence of unrelated peers and reduces the influence of family". With plans to roll out high-speed broadband here in the U.K., what effect will the technology, and concomitant increased need to multi-task and integrate different streams of information, have on the brain? FA

Mind over machine



Ian Spreadbury, Wellcome Images

A wireless headset that can interpret brain signals to manipulate virtual actions attracted much attention during the TED (Technology Entertainment and Design) Global conference in Oxford. The headset records brain activity using 14 sensors and electroencephalography (EEG), converting signals to virtual movements via a series of algorithms. The kit is made by Emotiv Systems, a company founded by neuroscientist Professor Allan Snyder, a graduate of UCL, working with chip-designer Neil Weste and entrepreneurs Tan Le and Nam Do. Although on the market since 2009, much of the interest has been from research institutes focusing on refining and integrating the technology into applications that consumers find easy to use. FA

TWENTY TWEETS



Meet four more fellow members of BNA by reading their twittered replies to ten question tweets, plus this edition's topical double-tweet Blogbox: 'If brain scanners could literally read people's minds and find out their innermost thoughts, do you think this would be a good thing?'



With interests in ageing and neurodegenerative disease, Bunmi Ojo is doing a PhD at the Open University to study NCAMs in the aged hippocampus.

What's your favourite bit of the brain, and why? *The hippocampus because we all need it to perform everyday cognitive tasks. Without it one will be in a constant state of dementia.*

Whose brain do you most admire? *I would say Solomon because of his beautifully crafted proverbs and immense wisdom which has never been matched by any wise-mind till today.*

What is the key thing that first inspired or influenced your decision to go into neuroscience? *The first time I held a brain in my hand during a practical neuroanatomy class. It fascinated me!*

Describe a typical day at work *Check email and BBC news headline, chat to supervisor, off to the lab. Lunch break, off to the lab again! Retire to office, 15mins walk home.*

What one thing do you value or enjoy most about what you do? And the least? *Understanding how the brain ages, its implications in pathological diseases. It's a laborious process obtaining meaningful data from EM studies.*

What do you think will be the next big thing in neuroscience, in research, medicine, technology, or any other context? *I predict adult stem cell research will move on in translational medicine.*

If you could discover a miracle cure for one neurological or psychiatric disorder, what would it be? Why? *Parkinson's disease, my father was diagnosed with it some years ago.*

Name one piece of art (visual, aural, literary, anything) that really tickles your synapses. *Interesting, I love hymns so John Newtons 'amazing grace' by Jimmy swaggart*

What do you think you might be doing if not neuroscience research? *Most probably a sporting career (or maybe an architectural designer)*

Do you have an amazing, little known fact about the brain or nervous system, human or animal? *Why can't you tickle yourself? The cerebellum sends signals to other parts of the brain to inform you that 'your about to tickle yourself'*

BLOGBOX: *My first thought was 'good idea to convict criminals' however it is morally controversial because it will mean no more privacy, civil rights, intellectual ownership. Lets be honest those with evil schemes will abuse it! (The issue is need vs. design, so what do we need it for?)*



As newly appointed Professor at Liverpool John Moores University, Francis McGlone is busy building a strong research base in cognitive neuroscience to underpin the psychology curriculum.

Whose brain do you most admire? *Ayrton Senna – showed what a well-tuned brain can do; focused attention, speeded RTs, goal seeking behaviour, action planning, commitment...*

What is the key thing that first inspired or influenced your decision to go into neuroscience? *Hearing a neuron fire! I needed to understand what it was saying – somehow, anyhow... and still perplexed...*

Describe a typical day at work *Started a new job so new challenges, new opportunities, setting up another new lab, meeting a lot of new people, new parking challenges....*

What question would you most like to find the answer to in neuroscience? *I don't want to know what someone else is thinking, but I would like to know how thoughts emerge from the noise.*

What else do you wish the human brain could do? *Mend itself.*

What do you think will be the next big thing in neuroscience, in research, medicine, technology, or any other context? *Epigenetics. If only to put an end to the nature/nurture debates. And I want to know how a pup denied maternal touch ends up such a mess!*

If you could discover a miracle cure for one neurological or psychiatric disorder, what would it be? Why? *The body is, for the first time, beginning to outlive the brain – what's the point, unless we can find a cure for all forms of dementia.*

What one memory would you most like to erase? *Seeing Senna hit that wall.*

Name one piece of art (visual, aural, literary, anything) that really tickles your synapses. *The Wind in the Willows – what a beautiful little book.*

What do you think you might be doing if not neuroscience research? *Almost unimaginable, but maybe rally driving – for the vestibular buzz....*

BLOGBOX: *If it were possible, it would lead to the same moral debate as that over splitting the atom – there is good path, and there is a bad path. Thought is not action, but how would you know which thoughts would lead to actions and which would not? I'd say it would be a bad thing.*



Research Fellow Dr Chris Martin is a neuroimaging neuroscientist at Oxford University, investigating how we can better use non-invasive imaging tools to understand brain function and disease.

What's your favourite bit of the brain, and why? *White matter - it is the connectivity between structures, as much as the structures themselves that allow our brains to do amazing things.*

Whose brain do you most admire? *Without wishing to sound vain, my own. It has kept me fed and watered so far in life, and I'd be lost without it.*

Describe a typical day at work (yes, it is possible in 140 characters!) *Arrive around 7. Respond to emails. Set up lab if needed, otherwise data analysis. Lose the plot around 1pm... lunch....regain plot. Write papers/grants. Home!*

What one thing do you value or enjoy most about what you do? And the least? *Enjoy: Developing ideas for new projects. Dislike: when nothing works, for no good reason.*

What question would you most like to find the answer to in neuroscience? *How does the brain make completing hugely complex information processing tasks look so simple?*

What else do you wish the human brain could do? *Worry less. Relax more. Find missing car keys.*

What do you think will be the next big thing in neuroscience, in research, medicine, technology, or any other context? *I think that both optogenetics and neuroinformatics will be significant in how neuroscience develops over the next 10 years.*

If you could discover a miracle cure for one neurological or psychiatric disorder, what would it be? Why? *Depression - just because of the sheer number of people whose lives it affects.*

What one memory would you most like to erase? *Falling off a climbing wall at 16, breaking both wrists. Equally painful and embarrassing, as it was only a 4ft drop!*

Name one piece of art (visual, aural, literary, anything) that really tickles your synapses. *Literature: The Count of Monte Cristo*

BLOGBOX: *A pretty bad thing really. Surely having our own thoughts, which no-one else is privy to, is about having a right to own your own consciousness?*



Rie Sige is a behavioural neuroscientist working on learning and memory at Saitama Medical University, Japan.

What's your favourite bit of the brain, and why? *IMM (intermediate and medial mesopallium), a memory region in the domestic chick. Avian (not bird!) brain is an attractive mystery for me.*

Whose brain do you most admire?

Prince Shotoku, an early seventh century Japanese ruler who could talk with 10 people at the same time.

What is the key thing that first inspired or influenced your decision to go into neuroscience? *Several books about brain I read in my high school days; "The broken brain", "Toscanini's fumble"*

Describe a typical day at work *Coffee - Behavioural Experiment - Late Lunch - Lab work (immunochemistry) - Coffee - Data Analysis*

What one thing do you value or enjoy most about what you do? And the least? *Plan and perform the experiments (enjoy) Calculate the expense for that (least)*

What question would you most like to find the answer to in neuroscience? *How memory is represented in the brain and how neurological alteration is reflected to the memory.*

What else do you wish the human brain could do? *Automatic language translation system for all non-native language.*

What one memory would you most like to erase? *I think I forgot it already. Don't remind me!*

Name one piece of art (visual, aural, literary, anything) that really tickles your synapses. *R. Straus, Duett-Concertino for clarinet and bassoon with string orchestra, my favourite for listening and playing*

What do you think you might be doing if not neuroscience research? *Librarian or curator in museum*

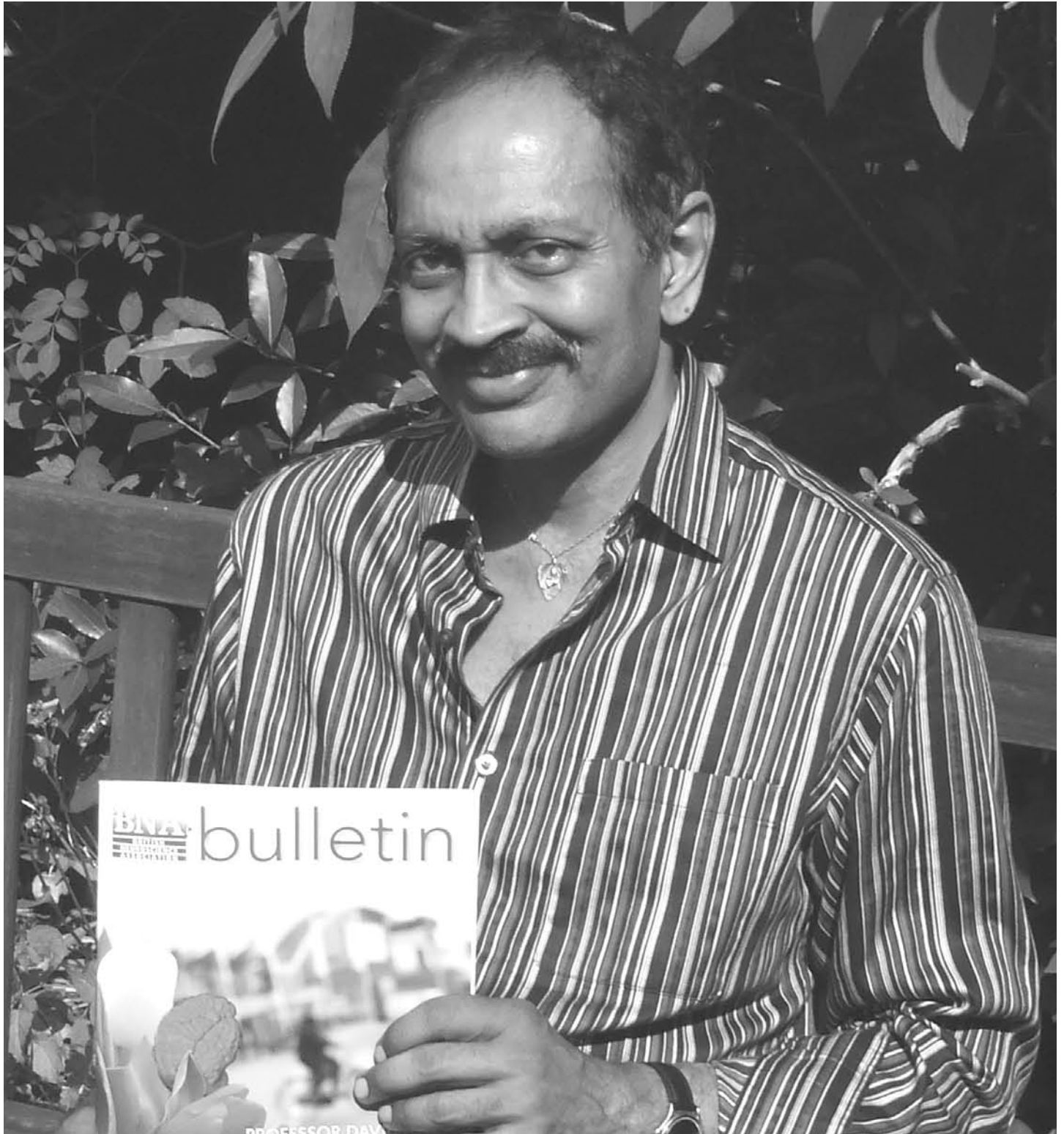
BLOGBOX: *Possibly, there are some cases that the scanner helps physically or mentally disabled people who have no way to express their will. Otherwise, what is it for? Or the scanner would read every time "Is there any end in sight to this strange inspection?"*

A DAY IN THE LIFE OF...

PROFESSOR V.S. RAMACHANDRAN

Kaz Pasiiecznik

Professor Vilayanur Subramanian 'Rama' Ramachandran, 59, says that he lives in two worlds – The West (U.S. and England), and his native India. The Bulletin caught up with him on a recent visit to The West: giving a lecture, at Bristol University, dedicated to his friend and colleague the late Richard Gregory (see p22).



It is said that Richard and you could devise, conduct, and write up a Nature paper in a single day. So; what is a single day like for you?

For breakfast I'll just have cereal. In the morning, when my mind is clear, I do tasks which require more concentration

"I like to be a detective and discover what's going on"

- for writing the sequel to *Phantoms in the Brain* I set aside three hours per morning, every day,

for several months. Called *The Tell-Tale Brain: A neuroscientist's quest for what makes us human*, it has chapters on art, consciousness, and pathology of self.

After lunch - I prefer to go to the local café rather than sit in my office - I catch up with my students. I have several undergraduates in my lab, some grad students, and two post-docs. By today's standards it's not big, but I prefer it that way because otherwise you're just a lab manager.

I take my students on long walks around campus. I tell them it's like Darwin's 'sand walk', where he did all his thinking. I visited Down House [Darwin's Kentish residence] the other day, and walked his circular sand walk in the garden. I warn my students against getting into a cul-de-sac of specialisation, telling them to instead read widely and discuss things at length - I take lots of tea breaks to chat about ideas. Walking with the students is about giving them the right, playful attitude towards science.

V.S.Ramachandran (with his favourite publication!) on his visit to Bristol in summer 2010.

Then there's a lot of administrative work. I direct the Brain and Cognition Research Centre at UCSD [University of California in San Diego], and I have an appointment at the Salk Institute.

I don't practice medicine anymore, but once every two weeks I go to

the hospital to scout around. My physician colleagues will contact me if there's an intriguing or unexplained neurological case. Sometimes there's something really fascinating, like a phantom limb, and I like to be a detective and discover what's going on.

My favourite topic in medical school was neurology. But I enjoyed basic research more than clinical work; as an undergraduate I started reading about vision, wrote to researchers at Cambridge, and they flew me over for a visit. I spent a month working with Oliver Braddick. He said, "Why don't you come back and do a PhD?" - and that was the turning point.

For dinner, sometimes I cook, sometimes we eat out, or we just do TV dinners. My favourite program is *Fawlty Towers*. My wife Dianne is also an academic, studying vision. We like to walk the dog together - a cockapoodle called Ella. As a teenager I loved gardening, but I don't do much now.

We have two boys, sixteen and twenty-one. The eldest is studying English Literature at Berkeley [University of California] and wants to be a professor. The younger one's still in high school. He's more of a party boy at the moment, but I think he'll make a good engineer or surgeon.

"My favourite is Fawlty Towers"

RAMA'S JOURNEY

In ancient Indian culture the epic 'Rama's Journey' describes the travels of Hindu god Vishnu's seventh avatar, Ramachandra. Where would our own Rama go in his own 'Journey'?

I travel a lot: Too much. Every summer my whole family goes to India together, usually Madras, where my mother lived. I'll continue to travel there; it's where my roots are.

But where I'd really like to go is back in time. I'd go to the Victorian age, before science had professionalized and become just another 9-5 job, with power-brokering and grants nightmares. Back then scientists just had fun. People like Darwin and Huxley; the whole world was their playground.

One of my heroes is Wallace. He had a great time travelling the world, collecting things, and he came up with the theory of natural selection independently of Darwin. Huxley is another role model. As well as an outstanding scientist, he was also interested in public education.

I'd love to get in a time-machine and go back to meet my heroes.

A DAY IN THE LIFE OF...

PROFESSOR V.S. RAMACHANDRAN *CONTINUED*



I'm very fond of my children, and now wish that I had spent more time with them over the years. When my eldest was nine I

"Something really fascinating, like a phantom limb"

asked him what he wanted to be when he grew up, and he said matter-of-factly, "Renaissance man". Now he's a serious 21-year-old interested in literature, and I miss the little boy.



At night I do a lot of reading. I like areas of science unrelated to my own - palaeontology, evolutionary theory, cosmology.

"I'd love to get in a time-machine and meet my heroes"

At the moment I'm reading Steve Jones' *Darwin's Garden*. Most people know Darwin for the theory of natural

selection, but he wrote many other books on biology: orchids, barnacles, climbing plants and more. Jones takes each of his major books, summarises them, then makes them more fun and interesting to read. For example he describes how, when Darwin was sent an orchid with a 12-inch flower, he stated there must be moth with a correspondingly long proboscis. A few years later the moth was discovered. Predicting a species: Science doesn't get better than that!



Giving lecture in honour of his great friend Richard Gregory. The bottom two photos show what happens if you forget to switch off your mobile whilst giving a talk...



RENAISSANCE MAN

In my spare time I like to sketch, although I haven't done any for a while. I've never tried creating art using my universal laws of aesthetics. I'm not sure, if you consciously tried to construct aesthetic art, whether the magic and beauty would happen. One of my points in *The Artful Brain* was how you tell kitsch art from the real thing. A lot of my laws apply to kitsch too, but the laws are not in harmonious resonance with each other.

I also write poems and short stories. I'd love to write a science-fiction novel. I have an idea where a temporal lobe epilepsy patient has intense mystical experiences, and comes to believe these bequeath him with telepathic and supernatural abilities. In the story, the scientists turn out to be wrong; the patient really does have such powers.

TALK ABOUT GETTING DRUNK: THE EXTRACURRICULAR ACTIVITIES OF A POST-DOC

James Dillon

James Dillon enjoyed a busy time when extending his day job as a research scientist into the arena of informing school children, the general public and MPs about the value of his research.

James is currently funded by a BBSRC project, led by Vincent O'Connor and Lindy Holden-Dye at the University of Southampton, to study the biological basis of alcoholism. James takes advantage of the model organism *C.elegans* to test the effects of ethanol, the major pharmaco-active component of beer, whisky and wine. This simple microscopic worm is actually capable of showing many features associated with human alcoholism.



Ordinarily, James is a shy sort; he's the first to admit his efforts to communicate science depend on working with others.

In the case of communicating with MPs, help was provided by the Science Engineering and Technology (SET) competition. SET arranged for James to visit the Houses of Parliament and 'speed-date' MPs and other dignitaries. Apparently security guards were just as intrigued, wondering how his poster would go down in a place renowned for late night drinking.

Having served the 'great and good', James returned to Southampton and took part in *Science Day*, the cornerstone of Southampton's award-winning science week. More than 4000 visitors flocked to see displays showcasing key research themes of the University. James' research on alcohol was but one of the topics tackled by members of the Southampton Neuroscience Group

(SoNG). Their exhibit also included 'remote control' worms which respond to blue light having been made to possess a light-sensitive nervous system.



The final part of James' triumvirate involved taking the alcohol message to schools. Thanks to the *Aim Higher* scheme over 200 of the brightest children, selected from fifteen local schools, were able to visit during science week, where they saw the display *Alcohol: A simple molecule with a complicated problem*. Prepared by the School of Medicine, Biological Sciences, Wessex Alcohol Research Consortium (WARC) and SoNG, it highlighted the range of expertise required to understand the action of alcohol and its impact on society.

An equally important aspect of the visit was that it gave the year 9-10 pupils the chance to talk about science and careers with professional researchers; biophysicist Dr Phil Williamson, biochemist Richard Mould, neurochemist Dr Vincent O'Connor, medical students Anne Bowyer and Tom Woods, bioinformatics expert Ben lent, and of course James, the expert in drunk worms.

However, nothing quite surpassed seeing microscopic worms rolling around under a microscope looking 'drunk and disorderly'. That was Richard and James' job - and is still their job, having returned to the lab to continue research on the biological effects of alcohol.

Due to the efforts of James, his colleagues, and organisations such as SET and *Aim Higher*, MPs, the public, and students (and future scientists) now have a better grasp of the significance of SoNG's alcohol-infused research. JD/AC

SLICE OF LIFE

Jon Stamford

When diagnosed with Parkinson's disease BNA member Jon Stamford found himself in the curious, and unwelcome, situation of becoming the subject of his own research. So what's life like when the tables are turned?

Bradykinesia, rigidity and tremor - the unholy trinity of Parkinsonian symptomatology. I had spent most of my research career looking at dopamine in the basal ganglia, and for years I had drilled these cardinal symptoms into the medical students. So it shouldn't have been difficult to identify the same symptoms in myself, right? But somehow I missed them.

Bradykinesia; you never really notice yourself slowing down. It's just part of getting older, you tell yourself. Rigidity; just a little bit of rheumatism or arthritis, surely. No big deal. And tremor? Well, it was probably no worse than the morning after a BNA dinner! It all seems obvious now but, like so many people with Parkinson's, I did not recognise the early symptoms for what they were.

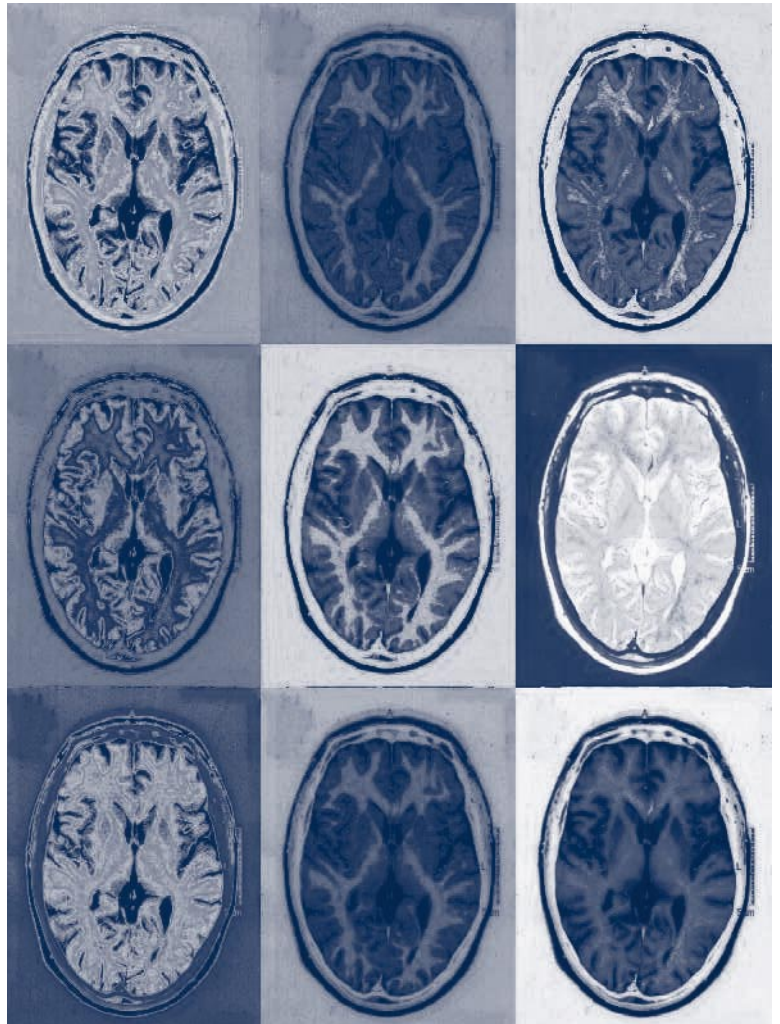
So what drove me to the doctor? Initially it was a stiff shoulder, a surprisingly common presenting symptom, but mainly it was my handwriting. I had been marking scripts for the Open University in September 2006 (good old-fashioned pen and paper, none of this digital malarkey). Struggling to find the right words, and keen to avoid repetition, I checked what I'd written in my March report. In six months my handwriting had changed from elegant copperplate to micrographic GP prescriptionese! It was a lightbulb moment and although neither my doctor nor I said the words, we were both thinking PD. The neurologist flirted briefly with other differential diagnoses before a DATscan (see glossary, p19) removed all doubt and had me peeing radioactivity for a week. My kids called me 'Chernobyl Dad'. I am sure I fogged film.

Having studied the basal ganglia for many years (one of my last papers* was on a murine model PD), I am only too aware of the irony of being diagnosed with PD. And in a particularly wry twist, I find myself being treated with drugs that I worked on some 20 years ago.

But what is it like being a patient and a neuroscientist?

Whilst Jon the patient understandably resents the increasing disability and erosion of function, Jon the neuroscientist can't help but be fascinated by the tremor, dystonias and rigidity of the PD, and the impulsivity and creativity induced by the drugs. You can take the scientist out of science but you can't take the science out of the scientist!

So while Jon the patient shakes so much that most of his spaghetti lands on his shirt, Jon the scientist is fascinated by how the rhythm and amplitude of the tremors changes throughout the day as the thalamus and internal pallidum



Jon's painting 'Slice of Life'.

vie for the motor cortex's attention like squabbling siblings. Heading to the kitchen for a cloth, Jon the patient almost breaks into a run. Jon the scientist instantly recognises festination, and adds another tick to the symptoms' list.

Exercise is increasingly recognised as a valuable means of delaying progression. But even there, the scientist does not switch off. While Jon the patient stiffly plays cricket, mentally calculating his runs total, Jon the scientist is totting up his UPDRS score. Hoehn and Yahr are to the scientist what Duckworth and Lewis are to the cricketer.

Diagnosed late 2006, I started treatment at Easter 2007. Currently I take rotigotine for symptomatic relief and, for neuroprotection, Rasagiline. No levodopa yet. This regime seems to work well against rigidity. The tremors are remarkably recalcitrant little blighters.

Stupid though it may sound, I believe there has never been a better time to have Parkinson's. 40 years on from the first use of levodopa, we have a battery of drug strategies. Moreover, the pipeline of potential new drug targets has never been richer. And then of course there are stem cells. Already talk is less about treatment and more about cure. These are optimistic times.

Nothing encapsulated that optimism more than the recent World Parkinson's Congress which, for the first time, came to Glasgow. Another first was that both scientists and patients were present at the same conference.

Do I still work? Yes I do. Full-time and then some. Although I left academic neuroscience in 2003, when my lab closed, I have maintained a degree of involvement through teaching for the Open University, and my ex-students here and abroad. I also work as a consultant for the Cure Parkinson's Trust.

For my research life, I chose Parkinson's. For my real life, Parkinson's chose me. And I'd better make the best of it.

Footnote: * Patel J et al, 2003, J Neurochem 85:898-910



Jon continues as a keen cricketer, not least as exercise can delay the movement problems of PD.

Bradykinesia	Slowed initiation and continuation of movements, or adjustment of body position
Basal ganglia	Group of interconnected nuclei (striatum, pallidum, substantia nigra, and subthalamic nucleus) involved in motor control and learning.
Micrographia	Small, cramped handwriting
DATscan	Gamma camera-based scan of ioflupane binding to the brain dopamine transporters, used to diagnose PD
Dystonia	Involuntary often painful muscle contractions
Festination	Involuntary shortening of stride and quickening of gait
UPDRS (Unified Parkinson's Disease Rating Scale)	Scale used to assess the longitudinal course of PD
Hoehn and Yahr	A system for describing PD progression (Melvin Yahr and Margaret Hoehn, 1967)
Rotigotine	Transdermal dopamine agonist
Rasagiline	Selective monoamine oxidase B (MAO-B) blocker

• BRAIN AWARENESS WEEK 2010

This annual celebration of the brain invites members of the public to hear about latest findings, engage in debate, and share the excitement of neuroscience with people actually doing the research. Here are a few examples of what BNA members did for BAW2010.



In Aberdeen, Union Square Shopping Centre got to meet brains thanks to Ken Skeldon and team, including student Jemma Ransom (holding dish in photos above). Photos courtesy of the University of Aberdeen



Edinburgh Neuroscience ran workshops on 'How we see the brain and what the brains sees': 180 pupils got to find out about brain imaging, what brains are made of, visual processing and why optical illusions occur. Led by Jane Hayley



Cardiff Neurosciences Centre events included: Neuroscience Open Afternoon; Science Café with neuroscientist Dr Paul Keedwell and philosopher Prof Chris Norris; interactive workshops for 9-11 year olds, at schools and local science centre Techniquist. Run by Sheila Dargan, Vanessa Davies, Cath Hortop, and Fiona Wyllie and team



Bristol Neuroscience ran interactive brain exhibits for 2 days in a city shopping centre, then 5 days at science centre At-Bristol, where they also encouraged brain-based conversations with the help of their giant brain. Run by Charlie George, Steve Fitzjohn, Anne Cooke, Andy Doherty, Chris Kent and many more

KNIT A NEURON

Anne Cooke

This collaborative craft project - brainchild of Anne Cooke (Bristol Neuroscience) and Helen Featherstone (University of West of England) - has seen hundreds of people creating woolly brain cells to make a giant neuronal network, which will then be displayed in Bristol's new MRI centre CRIC (Clinical Research Imaging Centre), whilst also raising money for Bristol's Head Injury Therapy Unit. Whether at home, a science café, in knitting groups, or one of the KaN workshops held at music festivals and elsewhere, this project has brought neuroscientists and crafters together in a unique and highly enjoyable way. Thanks to the blog, there are even neurons from Canada, Australia and the USA! Want to join in? See knitaneuron.blogspot.com



PROFESSOR EMERITUS RIC

CBE, D.SC., FRSE, FRS 1923 - 2010

A VISIONARY MAVERICK

Brian Rogers

Neuroscience suffered a great loss with the death, in May, of Richard Gregory. Truly one of a kind, here his friends remember the man who was a forefather of vision research, pioneer in public engagement, inspirational teacher, generous friend, and raconteur who, above all, found in everything sheer enjoyment and fun.

Richard Gregory's extraordinary career spanned six decades, during which time he rose from being a humble Demonstrator at Cambridge, through to Professor of Bionics, Professor of Neuropsychology and, after he formally retired, to Emeritus Professor at the University of Bristol.

As only fitting, he was awarded a CBE for his services to science. He was a Fellow of the Royal Society, and, shortly before he died, heard he was to become a Fellow of the British Academy. He also received honorary doctorates from some twelve universities.

But such description does not do justice to someone who had a profound influence on so many different people.

On his sixty-fifth birthday, we organized a 'retirement' Fest for Richard. What a misnomer. Richard was probably more active in the subsequent twenty-two years than at any time in his life. If he was not giving a lecture, he would be writing yet another Editorial for his journal *Perception*, or simply reading. He rarely stopped, except for 'a quick half' or a malt whisky late at night - and even then conversation would turn to the relationship between art and science, or the relevance of quantum mechanics to behaviour.

But he wasn't preoccupied with his own thoughts - his favourite question was, "Well; what do you think?" Life with Richard was like a continuous tutorial in which you couldn't take a back seat.

He was a passionate believer in communicating the excitement of science through practical, hands-on demonstrations, founding the model for all today's interactive science centres with *The Exploratory* in Bristol.

Richard was rightly proud of his many honours and his distinguished friends in science, politics and royalty, but he always had time to listen and answer questions from anyone who was interested. Quite simply, he was an inspiration to me and countless others and that, to my mind, will be his legacy.



When Richard was a Fellow of Corpus Christi College, Cambridge, he was invited to dinner in the Master's Lodge with Sir George and Lady Thompson. When Richard arrived, he saw the living room had been half repainted, and he expressed his delight that they were replacing the original dingy brown with a heavenly new blue. Lady Thompson smiled, then pointed out to Richard; they were repainting the blue room, brown....

Professor Stuart Anstis, University of California, San Diego (USA) Richard's first graduate student



In Cambridge, the US Air Force sponsored Richard to study size and distance judgments for space flight. His railway [described on p24 - Ed] ran the whole length of the lab corridor: I often emerged from my room to encounter a complete blackout, with an invisible truck trundling menacingly past while its 'astronaut' peered at an expanding circle on the far wall.

Also in the workshop at this time was Steve Salter, translating Richard's inventions into concrete engineering. I recall the 3D microscope which projected its image onto a whirling helix, and the moon camera, which automatically selected the instants when the image had least atmospheric distortion.

Professor Oliver Braddick FMedSci, Head of Experimental Psychology, University of Oxford Richard's PhD student 1965-68

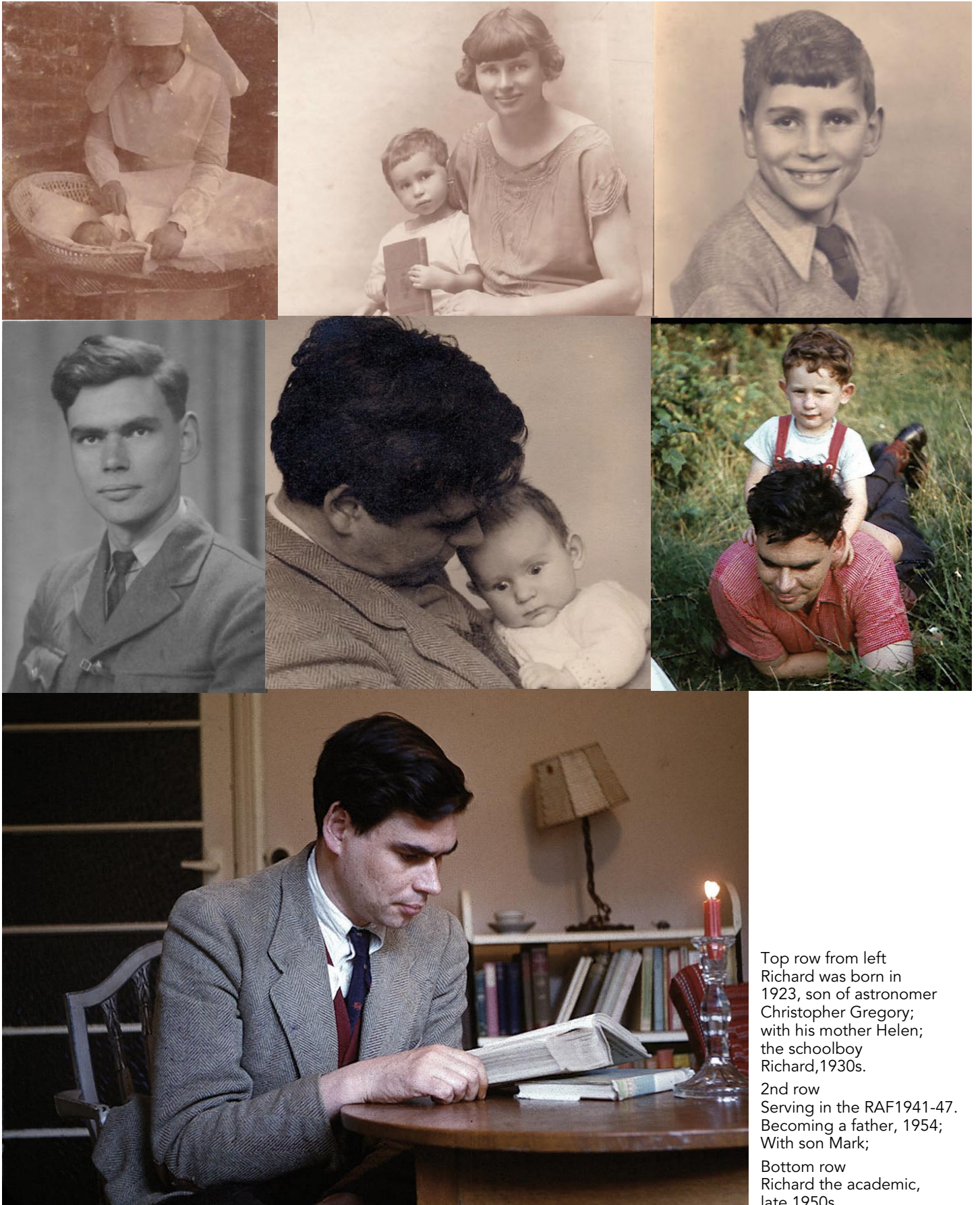


In 1988 I was privileged to attend the first of several retirement celebrations held for Richard Gregory: a banquet in a great hall at the University of Bristol. The Grand Old Man was introduced by Stuart Anstis,

Richard's best-known and most flamboyant student. Vision scientists know Stuart to be a colourful and witty character, whose talks feature eye-popping illusions more than deep analysis. His favourites are illusions of apparent motion created by sequential presentation of static dot patterns. Professor Gregory, taking the podium, instantly quipped that, for the best example of an apparent motion illusion, one need look no further than Stuart's own career!

Professor Alan Gilchrist, Rutgers University, (USA) Friend and colleague

HARD GREGORY



Top row from left
 Richard was born in
 1923, son of astronomer
 Christopher Gregory;
 with his mother Helen;
 the schoolboy
 Richard, 1930s.

2nd row
 Serving in the RAF 1941-47.
 Becoming a father, 1954;
 With son Mark;

Bottom row
 Richard the academic,
 late 1950s.

PROFESSOR EMERITUS RIC

CBE, D.SC., FRSE, FRS 1923 - 2010

One evening a group of us were chatting, and someone (not I) stated that the bra was invented in the first decade of the 20th century, becoming available in shops just before the First World War. A classical scholar present remarked that, strictly, it was a re-invention, since it was first used in the ancient world, adding: "*The Latin name was strophium.*" "Ah," said Richard, "*but with strophium there is a grave danger of fall-out.*" I cannot ever recall a swifter or more dreadful pun.

Max Hammerton, Emeritus Professor at the University of Newcastle. First met Richard at his public exhibition explaining radar, London 1946



Richard was not only a distinguished experimental psychologist, but also an ingenious inventor and infectiously enthusiastic communicator. All of these qualities came together at a party he held in his laboratory to mark the opening of the new Experimental Psychology building in Cambridge. Come the party, come the children, and whilst the adults enjoyed bounteous refreshments, Richard excited the children with experiments.

His laboratory was superbly equipped. To study space constancy he had installed a large screen, with a railway line extending away from it and down the whole length of the building. By sitting on a chair mounted on the line you could then view the screen from various distances - a sort of Pullman carriage. Richard, wearing a top hat, acted as driver and children clung on wherever they could.

It is no surprise that his Christmas Lectures at the Royal Institution were such a great success: he could reach out to people of all ages, and excite them all with science.

Sir Gabriel Horn FRS, Emeritus Professor of Zoology, University of Cambridge, Colleague and friend



Of all the people who have altered my thinking, Richard was one of the most important.

What first struck me was his curiously inventive playfulness. One had to put up with the constant barrage of puns - but then his interest in both linguistic and visual puns reflected his tangential inventiveness; instead of pursuing a straightforward line of research, Richard would go off on a tangent, disclosing things about vision the linear approach might have never revealed.

Alongside Wittgenstein, Richard Gregory had the most profound effect on my thinking about looking and seeing - initiating what turned into a lifelong interest in vision.

Sir Jonathan Miller, theatre and opera director, author, television presenter, humorist and sculptor
One of Richard's undergraduate pupils at Cambridge



HARD GREGORY *CONTINUED*



With a career spanning six decades, this shortened CV can only touch on Richard's activities and achievements.

1941-47: R.A.F.

1947-1967: UNIVERSITY OF CAMBRIDGE

MA (Cantab) Philosophy and Experimental Psychology
Researcher, M.R.C. Applied Psychology Unit,
Includes 1-year Navy secondment studying
submarine escape techniques

Lecturer, Department of Experimental Psychology
Fellow, Corpus Christi College

Directs the Special Senses Laboratory; studies perceptual problems of space travel; investigates adult recovery from blindness (the well-known case of S.B.); invents numerous instruments; devises the *Inappropriate Constancy Scaling* theory of distortion illusions; discovers the scanning visual system of *Copilia Quadrat*; presents BBC Royal Institution Christmas Lectures

1967-70: UNIVERSITY OF EDINBURGH

Professor of Bionics; Founds Dept of Machine Intelligence and Perception

1970-2010: UNIVERSITY OF BRISTOL

Professor of Neuropsychology (1970-88) and
Professor Emeritus (1988-2010)

Researches cognitive neural processes of perception; founds international journal *Perception*; founds the forerunner of all science centres, the EXPLORATORY; teaches; publishes numerous books and papers; holds many positions, memberships and roles in the University

PUBLICATIONS

Publications include *Eye and Brain*, *The Intelligent Eye*, *The Oxford Companion to the Mind*, *Even Odder Perceptions* and *Mirrors in Mind*

RADIO

Radio includes *Science Now*, *Round Britain Quiz*, *Desert Island Discs* (April 1993), and *Start the Week*

TELEVISION

TV includes *Horizon*, *Royal Institution Christmas Lectures*, *Thinking Aloud*; and *States of Mind*

PRESIDENCIES AND VICE-PRESIDENCIES

Experimental Psychological Society; Royal Institution of London

SOCIETY FELLOWSHIPS

Royal Society of Edinburgh; Royal Society of Arts; British Psychological Society; Institute of Physics.

PRIZES

Prizes include C.B.E., the Michael Faraday Medal (Royal Society); and numerous awards and honorary degrees

Clockwise from top left: Giving the BBC Royal Institution Christmas Lectures, 1967; Collecting his CBE in 1989; With fellow vision scientist Colin Blakemore; Richard with V.S. Ramachandran (far right) and son; Richard reacts in horror on hearing the single malt has run out; With long-time partner Priscilla Heard. Demonstrating his famous Café Wall illusion

PROFESSOR EMERITUS RICHARD GREGORY, *CONTINUED*

CBE, D.SC., FRSE, FRS 1923 - 2010



Richard had just suffered a stroke that, fortunately, left him largely intact except for a scotoma (blind spot) in his peripheral vision. Concerned, I Skyped him, so that we could have a live conversation with me here in California. Although a bit shaken up he seemed fine overall, and asked me what I was up to. I said I'd been reading Benjamin Libet's book on free will. Quick as flash, he came out with a pun - *"Well Rama, it depends on whether you believe in action potentials or potential actions"* - followed by hearty chortles down the line. Vintage Richard.

Professor V.S. Ramachandran, University of California San Diego (USA). Former pupil, and long-time friend and collaborator.



A few years ago, I was with Richard on his first (and only) visit to Japan where he gave a keynote address to the Japanese Psychology Society. We had a marvellous time, visiting temples and gardens as well as giving talks at different universities.

After one talk, we were enjoying a very formal dinner with some of the top officials in the University, when Richard declared, very loudly, that, *"chopsticks were the most stupid invention he had ever come across"*. Our hosts - undoubtedly aware that chopsticks were actually a Chinese invention - politely smiled.

*Professor Brian Rogers, University of Oxford
Former student, fellow perceptionist, and friend.*

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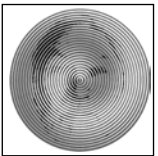
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My primary memory of Richard Gregory is of his irrepressible spirit and endless enthusiasm for all aspects of philosophy and perception, not to mention his proclivity for serving pigeon pie in a Dali-esque tureen set. One enduring image is my first visit to his lab in Bristol, where he was investigating the idiosyncrasies of perception at the colour isoluminance point. He was hovering over a giant assemblage consisting of an epidiascope mounted on top of an overhead projector attached to a vacuum cleaner, which seemed the logical way to eliminate luminance cues in the days before calibrated computer screens.

*Professor Christopher Tyler, Head of the Brain Imaging Center, Smith-Kettlewell Institute (USA)
Colleague and friend*



Richard joined Scotch Perspectives in the History of Perception many years ago. Membership requires a bottle of malt whisky. Richard's submission was selected because the name of his whisky (which, rules state, cannot be divulged) offered so much potential for puns!

Meetings can be anywhere in the world - within 50 miles of a Scotch distillery. One meeting, Richard wished to demonstrate his new video camera. Bets were made that it wouldn't work on the hotel's TV and, of course, it didn't. Richard was unaware that losing the bet involved buying a dram for all present. This he did without demure, reflecting both his humour and his humility.

*Nicholas Wade, Emeritus Professor at Dundee University
Colleague and friend*

The Bulletin is very grateful to all who gave their time, memories, and photos in order to put together this article.

Any who wish to acknowledge Richard's memory and further his legacy to science can do so by making a donation to the Royal Institution fund set up in his name. See justgiving.com/RichardGregorydonation



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Dr Simon Parson, BMT0, Old Medical School, Teviot Place, Edinburgh, EH8 9AG, or emailed to: s.h.parson@ed.ac.uk not later than **31st October 2010**.

AMYLOID DEPOSITION: SMOKING GUN OR INNOCENT BYSTANDER?

Karen Gunanayagam

You can't create new memories, you can't recognise colleagues or loved ones, you can't understand what is being said and you can't even button your shirt now. You're progressively becoming 'out-of-character'; aggressive, agitated and depressed. Sometimes you think 'they're out to get you'. The most frightening thing is, you may not even be aware of any of this.

Given that Alzheimer's disease (AD) affects more than 15 million people worldwide and accounts for 50-70% of late-onset dementia¹ the rat-race of researchers to decipher this neurodegenerative disease is not surprising.

Extracellular neuritic plaques, composed mainly of aggregated amyloid- peptide (abeta), are one of two key histopathological hallmarks of AD. For nearly 20 years research has accordingly focused on plaques.

But are we prosecuting the guilty party? Is abeta guilty of the crime, or merely a witness? What about alternative suspects, such as the second key marker, intracellular neurofibrillary tangles made of tau? Are there others we have missed?

SUSPECT A: ABETA

Abeta peptide is derived from amyloid precursor protein (APP) as part of normal cellular metabolism². Different isoforms of abeta are created. Abeta42 has particularly high fibrillogenic and neurotoxic properties, and is the main constituent of neuritic plaques.³

SUSPECT B: TAU

Tau protein, a microtubule-associated protein (MAP), interacts with tubulin to stabilise microtubules through phosphorylation⁴. In AD tau is hyperphosphorylated, disassembling microtubules and sequestering normal tau - plus MAP1, MAP2 and ubiquitin - into insoluble neurofibrillary tangles (NFTs). Cytoplasmic function is disrupted and dendritic and axonal degeneration occur⁵.



THE AMYLOID CASCADE HYPOTHESIS

This hypothesis suggests that dysregulation of APP processing, by genetic and environmental factors, occurs early in disease. Overproduction and accumulation of soluble abeta42 leads to its deposition as diffuse plaques. These 'mature' by reorganising abeta into fibrilising β -pleated sheets. Plaque formation is accompanied by microglial and astrocyte activation, oxidative damage, tau aggregation and phosphorylation and, finally the neuronal and synaptic loss of dementia⁶.

However, which form of abeta causes toxicity?

LOBBY FOR SOLUBLE ABETA OLIGOMERS

- Abeta42 production and cognitive deficits can become apparent before substantial deposition⁶.
- Soluble abeta correlates with AD plaque numbers, synaptic loss and cognitive decline more closely than insoluble abeta^{7, 8}.
- Fibrillar plaques can be present without dementia⁷.

LOBBY FOR DEPOSITION OF INSOLUBLE FIBRILLAR ABETA

- In early-onset familial AD, point mutations in APP increase the abeta42: abeta40 ratio and hence the proportion of the more fibrillogenic abeta42, accelerating onset of disease to affect people from their forties.⁹
- High fibrillogenesis is thought to underlie the predisposition of individuals to late-onset sporadic AD if they carry the apolipoprotein E allele, ApoE4¹⁰.

Despite the court moot, recent research highlights toxicity of both oligomeric and fibrillar abeta¹¹. However drugs tested on dementia patients that reduce both soluble and insoluble forms, such as the vaccine tarenflubril, have been largely disappointing¹². Nevertheless, some researchers - patriotic to the traditional amyloid cascade hypothesis - maintain that by the time patients are diagnosed, plaques have already triggered pathological processes, and subsequent abeta reduction fails to stop progression of the disease.

THE ALTERNATE HYPOTHESIS

Here, controversially, abeta is a protective response to neurotoxicity!

The 'biofloculant hypothesis' suggests that abeta binds potentially neurotoxic solutes, such as iron, and precipitates them into plaques to allow efficient phagocytic removal¹³. Plaques persist simply if the rate of deposition exceeds clearance. Also evidence that plaque deposition can protect against soluble abeta toxicity is most convincing¹⁴.

THE TAU AND TANGLE HYPOTHESIS

This hypothesis states that tau is the major pathogenic agent.

There is evidence that abeta is only toxic in the presence of tau. By reducing levels of tau whilst keeping abeta the same in mouse models, it was found that abeta lost its neurotoxic effects¹⁵.

A DUAL PATHWAY HYPOTHESIS

Some researchers believe that tau and abeta are henchmen operating under a master criminal; it has been seen that increased abeta and hyperphosphorylated tau occurs through independent but parallel pathways, suggesting both are driven by a common upstream driver. Is this anonymous suspect the one to blame for the amyloid cascade?¹⁶

Recent drug failures have strengthened such suspicions. Abeta-reducing drugs should benefit those with primary defects in APP processing; the dual pathway models would explain why this does not occur.

VERDICT?

The sheer complexity that surrounds AD pathogenesis is apparent - indeed a plethora of other theorems also exist. Whilst the amyloid cascade hypothesis might be evolving away from abeta deposition towards soluble oligomer toxicity, other hypotheses, such as that where tau is equally to blame, also seem biologically plausible.

And so, as the jury stands undecided, "*Abeta deposition: henchman or bystander?*" the judge orders, "*Court adjourned: further evidence required*". KG/AC

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A BLUFFER'S GUIDE (1)

STUDENT PLACEMENTS: INCREASING THE ODDS OF A SUCCESSFUL INTERNSHIP

Rhiannon Meredith

Every August sees a transient rise in hospital death rates across the UK as a fresh batch of keen, green, newly-qualified doctors are unleashed on to the wards¹. To researchers in the lab, the prospect of undergraduate and high school students are sometimes viewed in the same manner: a naïve pair of hands at the bench with the potential to contaminate and disturb laboratory equilibrium.

The consequences of student internships are rarely, in fact, life-threatening. But there are some simple guidelines to incorporate a new student and maximise the potential benefits the placement can bring - to both parties

TOP TIPS FOR SUCCESSFUL STUDENTSHIPS

A golden rule for short projects is to make them interesting and enjoyable! This not only encourages the student with their first tentative steps into research, but will have a positive effect on their productivity in your lab.

Don't assume any prior knowledge of lab skills on the student's part. This creates an ideal opportunity to instil your methods of best practice from the word go.

Reinforce the message that they can and should ask if unsure about what to do. Old-school style is to let the student learn by experience, good or bad. Whilst having its merits, the 'sink-or-swim' approach is sub-optimal for nervous novices and carries the risk of disrupting research of other students and colleagues. Furthermore, lack of guidance can kill the beginnings of investigative curiosity in even the keenest of students.

A good supervisor learns to balance hands-on close supervision, with intervals during which the student decides their own timetable for the day. Obviously, an undergraduate with a few more years' life- and lab-experience will tend to make the transition to semi-independent laboratory fledgling faster than school students.

Design part of the project to be fail-safe. Aim for a balance between tedious repetition, cutting-edge technical difficulty, and an interesting research question; the best projects contain a tried-and-tested experiment combined with a higher risk element.

Don't overestimate the amount that can be covered in a student internship! On the other hand, don't underestimate the potential benefits of a fresh and eager face. Today's generation of students grew up with computers and IT; they may bring abilities that enhance the skill-set of your lab.

Encourage interaction of the student with other researchers. Whilst not placing supervising responsibilities in someone else's hands, most fellow researchers can spare half an hour to demonstrate a key technique. Involve your intern in daily routine wherever possible, including meetings and journal clubs, to give them a taste of life in the lab.

During the project, set dates for regular appraisals. Commend and encourage. Seems obvious to state, but a more senior researcher easily forgets the apprehension felt by some when in the lab for the first time. End meetings by setting a target for the student to work on for next time, whether in the form of lab data or a topic to investigate for discussion.

On both sides, embarking on a studentship can be an uncertain and seemingly risky undertaking. However, the potential benefits are worth the gamble, and the scientific odds are likely to fall in everybody's favour.

1. Jen MH, et al., 2009 PLoS ONE 4(9): e7103. doi:10.1371/journal.pone.0007103

FUNDING OPPORTUNITIES FOR STUDENT PLACEMENTS

Nuffield Foundation Science Bursaries
nuffieldfoundation.org

Wellcome Trust Biomedical Vacation studentships
wellcome.ac.uk

Physiological Society Undergraduate Vacation Studentship Awards
physoc.org

Local University funds e.g. Summer Studentships in Cancer Research at London Research Institute
london-research-institute.co.uk



Worth a gamble? Student placements benefit from preparation and planning, enthusiasm and a little bit of luck. Image by Johannes Hjorth

What about the student experience? Laura Murray, recently graduated in physiology, spent some of her summer in Professor David Lodge's lab at the University of Bristol. Here's her diary from week one.



Day 1: My first day starts with a discussion on the experiments we are hoping to run.

Despite being nervous and a little overwhelmed, I am immediately treated as part of the team and manage to keep up with most of the science. I have a condensed, personal lecture from my supervisor, David, who explains about glutamate receptors and shows me a few papers to read. Everyone seems really friendly!

Day 2: Mask fitting, then an induction to the Animal Services Unit, where I'll be spending most of my time. A large part of my role here is to analyse the behaviour and learning ability of different strains of rats, before and after giving them agonists and antagonists for glutamate receptors. I start by analysing some previously recorded video footage before I start new experiments next week. Still trying to find my way around but thankfully found the tea room!

Day 3: Spent today with Zuner, observing his electrophysiology experiment. This starts with a brain dissection of a 4 day old rat. Luckily I hadn't eaten breakfast! I have a go at taking a brain slice which was more difficult than it looked. Unfortunately the experiment didn't work first time, but I hear that's just the way it goes sometimes! Hopefully I'll get to try some slice experiments for myself.

Day 4: Spent most of today analysing rat behaviour in an open field test. I also have a catch up session with David and am reading lots of papers and textbooks to do with learning, schizophrenia and glutamate receptors.

Day 5: I meet 8 of our new rats. They are being habituated so I need to get them (and me!) used to handling. Despite being a complete wimp to start with (!) I managed to transfer all the rats to a carry bucket and back again.

It's been a great first week - just 7 more to go!

A BLUFFER'S GUIDE (2)

'SMALL TALK': THE ULTRASONIC VOCALIZATIONS OF RATS

Beth Tunstall

One of the first to discover that rodents emit ultrasonic vocalizations (USVs) was Wolfgang Schleidt in 1948. It wasn't until around the 1980's, however, that the importance of the relationship between rodent USVs and rodent behaviour gained true momentum in the neuroscience field.

It is now well documented that rats emit ultrasound in a variety of behavioural situations. Combined with advances in PC performance, and software to record and analyse such calls, USVs are fast becoming a widely accepted predictive marker of rodent behaviour.

Rats are physically able to produce USVs as early as two days after birth, with a full range of vocalisations acquired between 6 and 10 days. Adult rats emit two subtypes of USV; the '22 kHz' and the '50 kHz' call (see boxes below). In contrast to adults, the ~40-50 kHz USVs emitted by pups are considered a marker of anxiety. The appearance of USVs before meaningful locomotor responses makes such calls ideal to assess anxiety levels in pups,

Before this piece gets a little too soft and fuzzy, it has been argued that rat pup calls are merely by-products of a physiological response to hypothermia. Regardless of the reasons behind their production, it certainly seems mothers are compelled to retrieve pups that emit these calls. It is therefore possible that, even if the pup USV were simply a result of physiological movement, it has attained functional qualities beneficial to the survival of the pup. (See Blumberg, M. S., & Sokoloff, G. (2001) *Psych Rev*, 108, 83-95).

Establishing that USVs are associated with different overt pup and adult behaviours has offered researchers the means to assess the emotional state of rats, a valuable tool for biomedical research into disorders such as depression and addiction. When it comes to rats, it seems, making 'small talk' is no small matter.

Two good reviews for those wishing to venture beyond bluff:

Scattoni ML, et al..*Neurosci Biobehav Rev*. (2009) Apr;33(4):508-15.

Blumberg, M. S., & Sokoloff, G. (2001) *Psych Rev* 108, 83-95.

22 kHz call

Actual range: 18 - 32 kHz

Bandwidth: ~1-6 kHz

Duration: 300-3400 ms

Associated with aversive stimuli

Cholinergic system heavily implicated; calls induced by ACh agonists

Measure of negative affective state

50 kHz call

Actual range: ~35 - 75 kHz (which includes a range of subtypes)

Bandwidth: Extremely variable.

Duration: < 100 ms

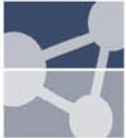
Associated with non-aggressive social contact, and as precursor to mating

Dopamine system implicated: calls induced by administration of drugs that increase dopamine level (also -delightfully - by tickling)

Measure of positive affective state



The Bristol Cardiff Neuroscience Collaboration

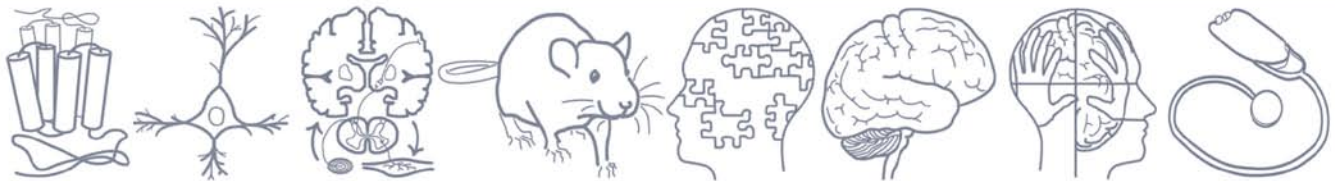


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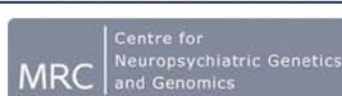
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READING THE MIND

Hanno Koppel

Hanno Koppel, a psychotherapeutic counsellor for the Sussex Partnership Foundation NHS Trust, turns his mind to the use of brain scanners, particularly in the field of mental health.

When introduced as a psychotherapist to strangers at a social event - a dinner party, say - a common response runs along the lines of, "Oh, I'd better be careful what I say; I hope you won't read my mind." A cliché perhaps - but even well-educated, rational people retain a superstitious fear that their secrets can be exposed by a therapist.

Of course, this is sheer nonsense, isn't it? Well, no. We all reveal more of ourselves than we are aware or intend, and therapists are trained to pick up on that unintentionally exposed information; to 'read' people. However, most psychotherapists do not do this at dinner parties: They are generally reluctant to work without pay.

An elegant grid, the Johari Window¹, sets out the relationship between the different kinds of knowledge:

	Known to self	Not known to self
Known to others	Public	Blind
Not known to others	Private	Unconscious

Donald Rumsfeld famously expressed it as: *There are known knowns. These are things we know that we know. There are known unknowns. That is to say, there are things that we now know we don't know. But there are also unknown unknowns. These are things we do not know we don't know. And each year we discover a few more of those unknown unknowns.*²

There has always been interest in penetrating the secrets of the mind. Phrenology, developed by Gall in 1796, associated psychological attributes with bumps of the skull. Phrenology was applied well into the 1900s, used, for example, to assess if someone was capable of murder³.

We may be amused by our forebears' naivety. But who knows? 200 years hence, will someone be writing exactly the same about current attempts to correlate brain activity, measured with 21st century technology, with our innermost thoughts?

This brings us back to the issues of brain scanning; concerns and ethical issues generated by this developing field need to be addressed by neuroscientists and by society at large. Are thoughts private? Do we have a right to secret thoughts?

There are two separate aspects to consider.

The first is clinical diagnosis. Could neuroimaging offer a way to objectively measure mental disturbance or psychiatric disease?

At present the field of mental health lacks objective diagnostic tools. Measurable criteria only weakly correlate with psychological change; even relatively discrete lesions have unpredictable effects. Indeed, when I asked the eminent psychiatrist behind a well-known test for schizophrenia how much she relied on its results, she confessed that what she most depended on was "gut instinct".

So, if a scan could reveal psychological pathology at an earlier stage - or less intrusively, more reliably, or more quickly - than current tests, well, chapeau! Of course there will be problems; diagnosis of anything is fraught. However, the accuracy of brain scans in diagnosing psychological problems is likely to improve. Applied in appropriate context, with proper consent, and as part of a range of investigations, the ethics of brain scanning as a diagnostic tool does not appear to give much to puzzle over.

It is the second aspect that seems more problematic - the use of brain scanners to 'read the mind', and detect private, blind or unconscious thought.

There are precedents for this with which we can compare our moral response. Closed circuit television cameras monitor people's behaviour. If deemed to be of criminal intent, the observing security guard may intervene - a judgement of someone's private thoughts that is almost wholly subjective. This may be a breach of privacy, but it does seem that most people feel the inconvenience of a few is a reasonable price to pay for safety of the many.

Another example is the use of whole body heat scanners, installed at some airports during the SARS and swine flu scares⁴. If you were a traveller, somewhat under the weather but otherwise fit to travel, you might be aggrieved to be stopped by some machine deciding you were running a temperature. However, if you were one of the healthy passengers or crew, you would be grateful to be saved from exposure to a potentially lethal virus.

So to those concerned with the ethics of neuroimaging consider, please, how the inconvenience of a few might be more than counterbalanced by the safety of many.



Finally, consider one particular kind of privacy that few could put forward arguments to uphold – the secrecy employed by physical, mental and sexual abusers, who can go undetected for years. Such abusers destroy lives. Ironically their victims, whether they are a partner, patient, resident, or child, are often those for whom they are supposed to be responsible.

Abusers get away with it because usually the only evidence is locked away in the minds of perpetrator and victim. Anything that brings these crimes to light (and if neuroimaging might do that, it is still a long way off) must be a good thing.

And by the way, if you really do not want your mind to be read, do not have dinner with a psychotherapist.

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4. Airports scan for SARS victims' flushed faces: Shaoni Bhattacharya: New Scientist, 24 April 2003; China adopts stringent measures to contain spread of swine flu: Jane Macartney: The Times, July 20, 2009

BRAIN IMAGING IN THE DOCK?

Garret O'Connell

More moral issues around the legalities of neuroimaging data are considered by Garret O'Connell following recent public debates in Edinburgh (see News p9).



The rise of functional brain imaging technology as a powerful tool in research is being mirrored by a rapid increase in its use in non-clinical settings. This has led to newly created fields such as 'neuromarketing', where companies use brain imaging to determine customer preferences and plan product launches, and 'neurolaw', where lawyers and neuroscientists discuss its use in the legal system.

In the USA, there is an increasing trend of brain imaging data being presented in law courts, generating much debate there about its reliability as evidence. There are two main legal arguments to which lawyers apply brain imaging data:

1. Sentence mitigation
– In one high profile capital punishment case, the discovery of brain abnormalities in the defendant was used to plea for reduced criminal culpability, even though experts agree it is too premature to use our current understanding as basis for mitigation.

"scientists [...] have an absolute obligation to shepherd this technology"

(Neuroscientist, Emory University)

2. As lie-detector – Demand for the use of fMRI-based data as lie-detection evidence is met by two commercial companies in the USA: No Lie MRI and Cephos. The most recent instance of involved a defendant, Lorne Semrau, accused of defrauding the government of \$3 million in over-claimed benefits. The defendant solicited the services of Cephos, and their report was submitted as evidence in the trial. In

"Some researchers feel that such plans are of only limited cause for concern."

(Anonymous)

this case the United States Magistrate recommended that, while there have been breakthroughs in understanding the neural substrate of deception, further research is required to improve reliability to real life situations.

"Most people who do brain imaging think this is far too soon"

(Neuroscientist Sheffield University).

In fMRI-based lie-detection, subjects are studied under conditions of deception and truth-telling and regional brain activity associated with lying is determined by comparison of data. The most consistent results indicate greater activation of

certain prefrontal and anterior cingulate regions during deception. It has been hypothesized that these regions are recruited to inhibit a truthful answer.

One potential advantage of the fMRI test over conventional polygraph methods is that it is less dependent on autonomic arousal, e.g. nervousness in an innocent subject would be less likely to falsely indicate lying. However, it is unknown what effects of countermeasures (e.g. extensive rehearsal of the lie) or psychiatric symptoms such as delusions would have on results.

So, should brain imaging be used in the law courts? In the USA, scientific evidence must meet the Daubert standard to be admissible.

This determines whether the proposed evidence is relevant to the issue and also assesses its reliability by meeting the approval of

a panel of experts in that technology field. In England and Scotland, which have separate legal systems, there is currently no equivalent to the Daubert standard.

"We really want to get the science right. We don't want to get to court and be killed."

(CEO, CEPHOS)

Many argue that the high standards used to evaluate the reliability of fMRI used for any scientific purpose are at odds with the circumstances under which fMRI would be used in court and therefore unreliable. In this sense, some aspects of fMRI or other imaging evidence might be acceptable as part of a larger body of evidence, but not for lie detection. A concern raised by those opposing the legal use of neuroimaging, in addition to questions about reliability, is that images have inherently more seductive appeal than verbal forms of evidence and their seeming ability to peer into the mind will unfairly prejudice jurors.

HOW TO SURVIVE (AND RATHER ENJOY) SfN

Rochelle Ackerley

SfN fan and veteran shares her tips on how to make the most of the annual American extravaganza that is SfN's Neuroscience meeting

TRAVEL TIPS...

- Make sure you can get in to America! Get your Electronic System for Travel Authorisation documentation (ESTA: <https://esta.cbp.dhs.gov/esta>) and get travel insurance via your employer
- Americans are very friendly and love non-American accents. For example:
Me: Can you tell me how to get to the other terminal?
Airport guard: Oh my, you're English!! (This is an airport; surely I'm not the only one?!). Speak some more!
Me: I'm in a rush (sadly, he didn't quite grasp British humour...)
- Money matters. Tax is added at the till (8.75%). Be ready to tip: in a bar, \$1 a drink or 10% of the bill; for food, around 15% (although no need to tip for fast food!)
- The Gas Lamp Quarter: history, great restaurants and bars, and a lively, vibrant atmosphere
- Go to the beach. Visit the naval bay. Do some shopping (Christmas presents...?)
- Don't jaywalk! If you are caught crossing on the red man, you will get yelled at.

Well I remember my first SfN (Society for Neuroscience) conference. What an eye-opener! It was in San Diego in 2004 and I could have never been prepared for its sheer scale; catering for up to 35,000 people, SfN's annual meeting - Neuroscience - is the largest forum on brain science worldwide.

Neuroscience claims to be, "*the premier venue for neuroscientists [...] to debut cutting-edge research*". I wholeheartedly agree. The conference also has numerous satellite symposia, social meetings, and

a huge trade fair. Each time I go to SfN I enjoy it more, and rediscover what a wealth of information it holds.

November sees the city of San Diego in California, on America's west coast, hosting the 40th Neuroscience meeting. As a 'seasoned SfN-er' I've put together some thoughts on how to make the most of your SfN 2010.

As scientists, we have an immense privilege in being able to travel across the globe to present our work; above all else, enjoy the meeting, and your time in America.



SELECTED SfN HIGHLIGHTS:

- Dialogues between Neuroscience and Society Lecture - informative and fun. Being given this year (13th Nov) by Glen Close, previous events have featured magicians and even the Dalai Lama.
- Presidential Special Lectures. Given by eminent scientists, these attract around a third of delegates and cater for wideranging expertise
- Barbara Sahakian (University of Cambridge) at the Celebration of Women in Neuroscience meeting. Lunch, lively discussion, open to all (RSVP)
- Exhibits; from equipment to public engagement resources, it is all there.

SMALL ISLAND, BIG ON NEUROSCIENCE

- We pack a punch: there are more than 1,300 members of SfN from the UK, which constitutes the largest membership per country in Europe.
- The UK contributes the second largest number of non-North American annual meeting attendees.
- The UK has two Chapters: the British Chapter, based in London, was established in 2003, and a new Welsh Chapter in Cardiff (see news p9)



PRESENTING YOUR WORK

Posters represent an excellent opportunity for feedback and ideas. Sessions are long and tiring, but worth it.

- Dress (relatively) smartly
- Know the background to your work
- Anticipate who will visit (look at who's presenting in your session and similar ones). Read around their work, too.
- Take hand-outs of your poster
- Pin up a sheet of paper for e-mail addresses of people who'd prefer an electronic version.

TIPS FOR THE MEETING...

- Plan! Before you go, make an itinerary of everything you want to see. There's a huge choice, and the vast building means you cover miles every day just finding the right room.
- Attend social receptions. The graduate/postdoc one is fun (16th Nov), and the BNA social - plus any in your field - are great for networking.
- Get a mentor... be a mentor. SfN's Professional Development Committee runs a mentoring event where 'mentees' can raise whatever worries they have - be it applying for grants or managing family life - with someone who's, "been there, done that". Mentors get to share experience and advice. (see 'Professional Development' at sfn.org)

SOCIETY FOR NEUROSCIENCE (SfN) 2010

40th Annual Meeting
13-17 November 2010 San Diego

As in the past Lotus Conferences are offering flexible travel arrangements for delegates attending the SfN Annual Meeting.

Bedrooms are available at the Best Western Bayside Inn (3* hotel) approximately a 15 minute walk to the convention centre. We also have rooms available at the Indigo Hotel (4* hotel), located in the Gaslamp Quarter of San Diego a short walk to the convention centre.

Flights will be tailored to delegates specific requirements. As an IATA and ATOL bonded agent, we have access to favourable airline fares and your booking is secure.

For further details and a personal quotation please contact:

Graziano Fontanini (Congress & Tours Director)
020 7962 9030 or graz@lotusgroup.co.uk

LOTUS CONFERENCES Hobbs Court, 2 Jacob Street, London SE1 2BG

MEETING REPORTS

The BNA Spring Symposium:

TOWARDS A
REGENERATIVE
MEDICINE
OF THE BRAIN

14th April 2010
Institute of Psychiatry,
London

SPEAKERS

Andrea Brand,
University of Cambridge
Maeve Caldwell,
University of Bristol
Patrizia Ferretti,
University College London
Charles ffrench-Constant,
University of Edinburgh
Robin Franklin,
University of Cambridge

ORGANISER

Michel Modo,
Institute of Psychiatry
Keith Muir,
University of Glasgow
Paola Piccini,
Imperial College
Rodney Rietze,
Pfizer Regenerative
Medicine
Anne Rosser,
University of Cardiff

PLENARY

Andras Simon,
Karolinska Institutet
John Sinden,
ReNeuron Ltd
Steven Wainwright,
Kings College London

BNA SPRING SYMPOSIUM: Towards a Regenerative Medicine of the Brain

Anne Cooke

Frogs do it, salamanders do it, even educated snails do it, but - despite decades of research - it remains to be seen if humans will ever really be able to do it, to any significant degree. Regeneration in the central nervous system: Newts and other urodeles beat us limbs down every time.

With so many neurological disorders in desperate need of a cure, finding the key to regeneration would unlock ways to reduce suffering and costs on a vast scale. BNA's spring symposium brought together researchers and clinicians all united in the search.

The day's speakers (see left) covered many different approaches and aspects of this quest.

Studying early development of neurons from stem cells, and how the process is regulated, is informing how we might stimulate transplanted stem cells to replace lost tissue. Moreover MRI technology now allows us to visualise transplanted cells and correlate with behavioural recovery. Such achievements justify excitement - but with important provisos; tabloid headlines might herald cures but stem cells aren't a silver bullet, and the source of stem cells raises many ethical concerns.

Promoting recovery of endogenous tissue is a promising alternative. Evidence that there is at least some intrinsic potential for recovery - e.g. as seen in spontaneous remyelination in multiple sclerosis - indicates that removal of inhibitory factors and/or provision of growth factors might facilitate full repair.

Recapitulating the slightly fishy feel of the day, the final talk was suitably titled 'How salamanders mend the gap in the brain'. Is development reactivated? Is it ever properly shut down? Or are newt and human nervous systems entirely different?

At the moment we have more speculations than conclusions. One thing of which we can be sure; when research finally solves the mystery, frogs will have played an important part.

Why did you come today? To give the plenary! The field's tremendously exciting - now we are able to study how the astoundingly complex nervous system is built, we might find how it can be rebuilt. And I love London; it's as complex as the brain!

Andras Simon
(Karolinska Institute)

Best exhibitor freebie?

Squishy brains from Millipore
Jolanta Juffry,
(Roehampton),
Keri Hildick (Bristol),
Sebastian Hadjiontioniou
The chocolates
Alyma Samani and
Antigoni Ekonomou
(KCL)



Why organise today's meeting? To bring together those working on brain repair and highlight the UK's strengths in this field.

Biggest breakthrough so far? Discovering, in the 70s, that foetal tissue allowed functional repair.

What will bring the next big step towards clinical efficacy? An alternative, robust and plentiful source of stem cells; 16 fetuses are needed for 1 human brain.

Mike Modo (KCL)

Best thing about the meeting?

Talk on biomaterials and stem cells; having done bioengineering I was excited to hear it can be applied in neurology
Jennifer Okorie (Roehampton)

Variety of sessions
Keri Hildick (Bristol)

Meeting new people Lucy Annett, (Hertfordshire) on meeting Becky Truman (Cardiff)

Keeping in touch with the field
Maeve Caldwell (Bristol)

Learning there are high hopes for successful remyelination in MS
Zanna Voysey (Oxford)

ONE TALL, SKINNY MODAFFICINO PLEASE

Anne Cooke



Should morning Modafinil be as acceptable as caffeine? Why not? Given that Modafinil has the same – if not better – cognitive-enhancing effects?

Whether cognitive enhancers such as Modafinil should be freely available is one of the many questions tackled by neuroethics, the subject under discussion at the symposium hosted by EDAB (the European Dana Alliance for the Brain) at FENS 2010.

Colin Blakemore first asked what we meant by neuroethics. In some ways neuroethical issues have always been around; long before the use of brain scanners, mothers could read the mind of their two-year old next to a box of biscuits. But, out of the plethora of 'neuro-' terms proliferating in recent years, neuroethics seems one likely to persist.

Why? Neuroscience has a unique place because the brain is unique; it taps directly into what it means to be human. Therefore, as neuroscientists, we have a special responsibility that is distinct amongst our scientific peers.

Discussing both the issues and the responsibility was a panel of experts from the neuroethical field.

Much of the session centred on the need to engage with the press. Neuroscientists tend to shy away from the media, but this leads to bad reporting, sensationalism, and headlines that convey little or misleading information, carrying public opinion in their wake. This is dangerous. Public views are immensely powerful when it comes to setting policies, with direct impact on health and research.

Instead of staying aloof, seemed to be the message, neuroscientists need to engage with the public by learning to work with the popular press. Neuroscience already has a direct line to the public's attention; the brain is a readymade soundbite that carries inherent human interest. Indeed journalists, instead of being frustrated by neuroscientists' reticence, are increasingly working alongside researchers to bring more responsible reporting and benefits both ways.

Neuroethics, it was concluded, is something that is integral to neuroscience rather than a stand-alone topic. However you term it, the issues are here to stay. Technology and science gallops ever faster, and the increase in ethical issues keeps pace. As those in the frontline of neuroscience research, we just can't afford to ignore it.



MEETING REPORTS

CHELTENHAM SCIENCE FESTIVAL

- fielding questions in the
frontline of the Discovery Zone

Chris Martin



What is the cleverest thing your brain does? A good question, and perhaps my favourite from visitors to the 2010 Cheltenham Science Festival in June.

The MRC mounted a brain-themed exhibition in the 'Discovery Zone' at this year's event and, as a newcomer to both the festival and to communicating neuroscience to the general public, I found it an exhilarating and rewarding experience.

My answer? That the cleverest thing the brain tries to do is understand itself. The excitement and interest in neuroscience amongst all-comers to the Festival reminded me that this is a feature common to all brains, not just those of neuroscientists.



THE INAUGURAL UNIVERSITY COLLEGE LONDON NEUROSCIENCE SYMPOSIUM

Fidel Anaya



Held at Senate House in London, 29th April 2010, the inaugural UCL Neuroscience Symposium set out to bring UCL's neuroscience community together. With all 500 tickets snapped up within 48 hours, the auditorium at full capacity, and the walls buzzing with discussion, the desire for such a meeting was evident and the aim more than achieved.

The UCL Neuroscience family unites about 450 Principal Investigators working across 7 themes and spanning more than 20 departments, centres and institutes. With such a critical mass of research being undertaken, there's a wealth of potential for neuroscientists to exchange ideas, collaborate and provide the means to translate fundamental research.

Neuroscience at UCL has a long and proud history of seminal discoveries. Otto Loewi, AV Hill, Bernard Katz, Andrew Huxley, Bert Sakmann, and JZ Young are but a few names in the UCL neuroscience fraternity. Their discoveries changed the face of neuroscience - and paved the way for the day's featured research.

Talks were given by some of UCL's top neuroscientists and 150 posters were presented, providing snapshots of the diverse work of UCL Neuroscience. Speakers did an excellent job of making their presentation accessible to what was therefore an equally diverse audience.

Subjects ranged from the role of microRNAs on the interplay between sodium channels and pain, to visual and auditory spatial information processing, developmental psychopathology, cognitive development and brain asymmetry. Other topics



Meeting organisers Alison Brindle and Graham Cadwallader

included memory, synaptic strength, pre-symptomatic Huntington's disease, the relationship between neurotransmitters and myelination, and translational research in the treatment of muscular dystrophy.

The UCL Neuroscience Symposium was successful not only in bringing UCL neuroscientists together, but also providing an appetizing taste of neuroscience at UCL, energising the community, and fostering a greater sense of integration and identity. I enjoyed it immensely and I am looking forward to the next one already.



BOOK REVIEWS

ISLANDS OF GENIUS Darold A. Treffert

ISBN-10: 9781846058100

Reviewed by Kaz Pasiecznik

Islands of Genius follows in the very successful vein of books containing collections of unusual neuropsychological case studies, including Oliver Sacks' *The Man who Mistook his Wife for a Hat* and V.S. Ramachandran's *Phantoms in the Brain*.

Whereas Sacks writes from a medical point of view, recounting unusual cases with humour and incredulity, Ramachandran is more science-focused, describing brain areas and functions, and technological advances like neuroimaging techniques. In terms of detail for the academic neuroscientist, *Islands of Genius* sits on a scale somewhere between the two.

The book's first quarter is a comprehensive review of the last 120 or so years of the savant syndrome literature. Treffert himself has been in the field for 50 of those years, but uses his experience as a popular science writer to cherry pick his substantial knowledge, and keep the text a reasonably light read. Indeed, in places *Islands of Genius* veers towards a Channel 4 documentary, with 'Coming up next...' reminders and apparent sensationalism. And, although there is enough meat to satisfy the appetite once whetted, there isn't enough modern science to make this a textbook, medical or scientific, so the above-average hardback price-tag (RRP £20) feels a little unwarranted.

Considering Treffert started writing about savant syndrome before modern PCs or the internet were invented, his new book is remarkably forward thinking. He shows keen awareness of modern behaviour and lifestyle, discussing savants whom he first saw decades ago and giving updates on their activities by referring to TV shows, books, DVDs and websites.

I highly recommend reading this book whilst connected to the internet, as you'll want to go to the savants' webpages and watch clips on *YouTube*. Including these references really brings *Islands of Genius* alive, and drives home its messages; first that these astonishingly able savants are real and out there, and second, that you'll want to find out about them.

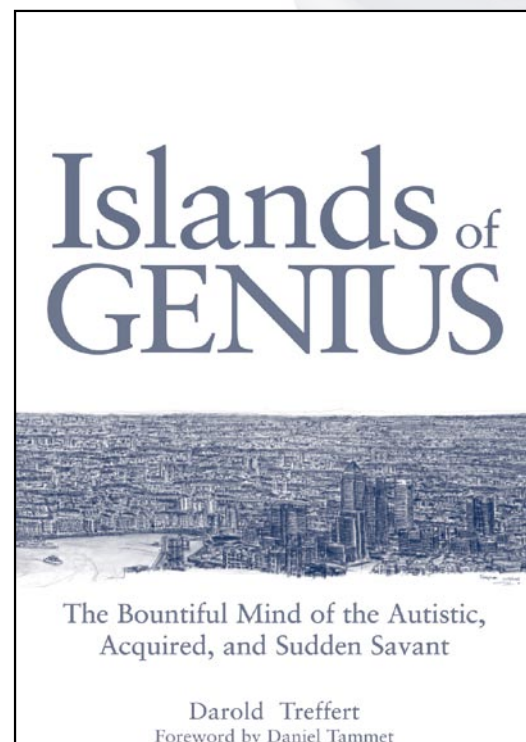
The savants' abilities will leave you incredulous, and some of their life stories will bring readers to tears. One supposes that it is impossible to be so involved with such individuals without becoming emotionally attached, and Treffert's heartfelt descriptions of savants belie an

almost familial pride. The strength of his relationships is epitomized by the foreword, written by autistic savant Daniel Tammet, for whose own autobiography Treffert wrote the introduction.

But Treffert skilfully leaves the best until last, discussing in his closing chapters his theory of 'genetic memory'. This describes the tantalizing notion that we all innately possess savant skills such as rapid mathematical calculations, flawless autobiographical memory and artistic prowess. Several case studies and a brief discussion of brain mechanics add enough weight to the theory to make it academically sincere, and this reader, for one, was left excitedly fantasizing about their own, untapped, cognitive capabilities.

EXCLUSIVE OFFER FOR BNA MEMBERS

To order a copy of *Islands of Genius* at the special offer price of £17.99 and FREE P+P, visit www.jkp.com and enter the following promotional code - BNAGEN



BOOK REVIEWS

THE IMPRINTED BRAIN: HOW GENES SET THE BALANCE OF THE MIND BETWEEN AUTISM AND PSYCHOSIS

Christopher Badcock ISBN-10: 1849050236

Reviewed by Anthony Isles

Can autism and psychotic disorders be explained by the battle for supremacy between genes within our brain? Christopher Badcock certainly thinks so and outlines his ideas in *The imprinted brain*.

First, Badcock argues that autistic and psychotic disorders are at opposite ends of a functional spectrum. Specifically, autism is characterised by what the author terms *hypo-mentalism* ('people thinking') whereas psychoses, such as schizophrenia, may be categorised by *hyper-mentalism*.

The section is engagingly written and peppered with fascinating quotes and anecdotes but, to some extent, the idea that autism is characterised by hypo-mentalism is not new; I am not convinced this is distinct from theory of mind and indeed the author admits they can be regarded as one and the same. Moreover, the extent to which psychoses can be described as hyper-mentalist leans heavily on anecdotes relating to, "the most frequently quoted patient in psychiatry", Daniel Paul Schreber.

This over-reliance on one case gives the argument an air of special pleading. However, it is an interesting theory that will certainly encourage debate.

After setting out his stall regarding psychiatric illness, Badcock then addresses how these deficits in mentalistic ability arise.

He focuses on genomic imprinting, a developmentally determined epigenetic process influencing a subset of genes within our genome. Genomic imprinting leads to silencing of one of the copies (alleles) of a gene that we inherit from our parents. For some genes the maternal allele is silenced; for others the paternal allele is silenced.

Imprinted genes are certainly important for brain function and raise some intriguing evolutionary questions. One idea is that they have evolved as a consequence of selfish *intragenomic* conflict between the parental genomes. Thus the maternal genome acts in the interest of other maternally-related genes, and the paternal genome acts in the interest of other paternally-related genes.

Badcock latches onto imprinting as a means to explain his autism-psychosis dichotomy. In particular, he seizes on pioneering embryology experiments showing differences in the contribution of maternally and paternally expressed genes to key brain areas. The author suggests that these

maternal (striatum, hippocampus and neo-cortex) and paternal (hypothalamus) brain regions are strongly linked to the development of psychosis and autism respectively.

There can be no doubt that the link between brain regions and mental illness is far more complex than imprinting effects. Moreover, recent work has shown that both maternally and paternally imprinted genes may be found throughout the brain, in contrast to the clear-cut case of uniparental brain regions that Badcock implies.

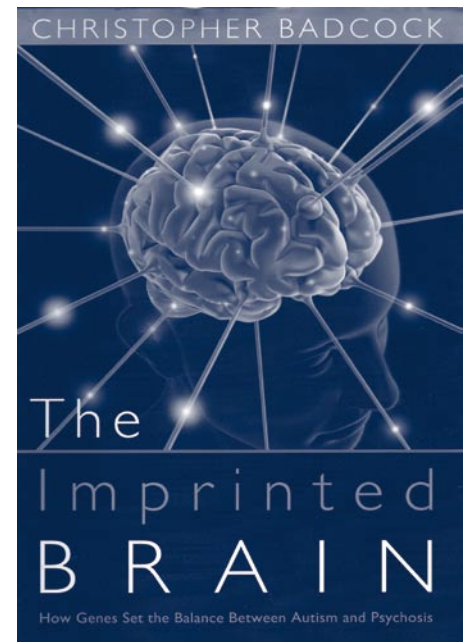
Further over-simplifications are made in relation to the role imprinted genes play in psychiatric illness. For instance, individuals with the imprinted gene disorder Angelmans syndrome show some features of autism but cannot be simply defined as autistic-like (e.g. autism is associated with reduced eye contact, whereas the opposite is true of Angelmans); maternal duplication of the imprinted chromosome 15q11-q13 interval has been associated with the development of both psychosis and autism.

These are not just technical inaccuracies. The causal underpinning of Badcock's theory is that the maternal genome reduces, whereas the paternal genome promotes, mentalism. In reality the action of imprinted genes is not as simple as this.

Whilst I am willing to keep an open mind with regards to the dichotomy between autism and psychosis, the evidence for a direct effect of this genetic component on mentalistic ability is at present weak, or at least inconsistent. Consequently, whilst stimulating debate and further study, *The Imprinted Brain* falls far short of being the groundbreaking theory of how we view mental illness that the author proposes.

EXCLUSIVE OFFER FOR BNA MEMBERS

To order a copy of *The Imprinted Brain* at the special offer price of £14.99 and FREE P+P, visit www.jkp.com and enter the following promotional code - BNABRAIN.



DIARY

4 NOVEMBER 2010

The BCNC Young Neuroscientists' Day

1-day meeting hosted by the Bristol-Cardiff Neuroscience Collaboration that is run by and for early-career scientists - postgraduate students, post docs, and all others at an equivalent stage in either lab-based or clinical career

www.youngneuroscientistsday.com (see p 33)

4 - 5 NOVEMBER 2010

3rd Practical Cognition Course

Great North Museum, Newcastle upon Tyne

A course for consultants and trainees who want to develop their practical expertise in cognitive assessment and relate this to clinically relevant neuroscience.

www.practicalcognition.com

Contact: Laura Batty, Institute of Neuroscience,
Newcastle University
+44 (0)191 222 6648,
Email: l.e.batty@ncl.ac.uk or ion@ncl.ac.uk

13 - 17 NOVEMBER 2010

Society for Neuroscience 40th Annual Meeting San Deigo, USA

Neuroscience 2010 is the event for neuroscientists from around the world to debut cutting-edge research on the brain and nervous system. (See p38 for more)

www.sfn.org/AM2010

29 NOVEMBER 2010, 13.30 - 18.30

Encephalitis Professional Seminar Wellcome Centre, Euston, London

The Seminar presents current studies that contribute to a fuller understanding of the pathogenesis, epidemiology and outcomes of the encephalitis.

www.encephalitis.info

Contact: alina@encephalitis.info or 01653 69258

15 DECEMBER 2010, 13.00 - 18.30

The BNA Christmas Symposium, 2010

T'is the season to be sociable:-

The neuroscience behind partying!

The Royal Society, London

A timely (and seasonal) exploration of the evolutionary origins and neural mechanisms behind our pursuit for social interaction. Free for BNA members

www.bna.org.uk and see p5



15 - 17 DECEMBER, 2010

Models of dementia; the good, the bad and the future

Robinson College, Cambridge

We believe that the time is right for a focused debate to establish the good, the bad and the future of this important aspect of the fight to reduce dementia in the human population. A Biochemical Society Focused Meeting.

www.biochemistry.org/MeetingNo/SA120/view/Conference

Contact: The Conference Office,
The Biochemical Society, London WC1N 2JU
Email: conferences@biochemistry.org

12 FEBRUARY 2011

NEUROANATOMY for PSYCHIATRY

London WC1

Functional brain anatomy course (1-day). Includes the neuroanatomy of memory, cognition and emotion; the cerebral cortex, basal ganglia and limbic system; and functional anatomy of the amygdala and hippocampus. Suitable for graduate students in neuroscience and psychology!

www.neurocourses.com/psych

17 - 20 APRIL, 2011

British Neuroscience Association

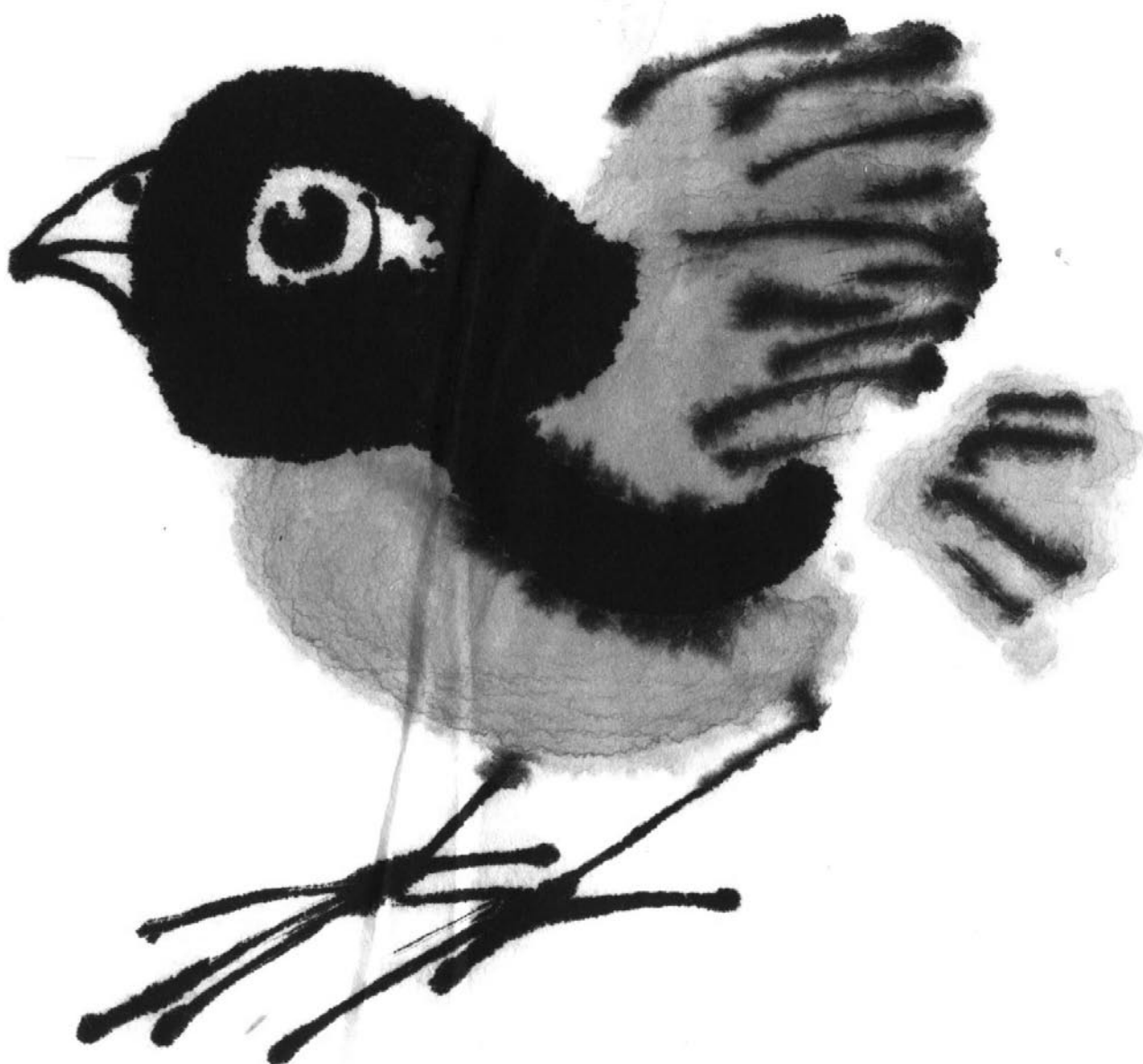
Biennial Meeting 2011

Harrogate International Conference Centre

Cutting-edge programme of recent advances spanning the breadth and depth of neuroscience, with seven outstanding Plenary Lectures, special Satellite Symposia, participatory interactive Workshops, and evening activities.

www.bna.org.uk and see p7





THE GALLERY:

SHARING AND ENJOYING THE WIDE AND VARIED TALENTS OF BRITISH NEUROSCIENCE.

This edition's featured artwork is by BNA member Beth Tunstall, who created this beautiful painting of bird in the style of Chinese artist Han Mei Lin.

Calling all closet artists, designers, poets, and any other BNA members with any sort of talent for a 2D-medium hidden in the creativity centres of their brain; The Gallery awaits your submissions. Any topic email BNA-editor@bristol.ac.uk

Answers to Brain Teasers on p48.
1. Cochlea, 2. CAT scan, 3. On centre sensory neuron, 4. The Notochord becomes part of the vertebral column.
Anatomical Antics: The Pons

THIS ISSUE'S CONTRIBUTORS



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Stuart Anstis teaches and studies visual perception, such as motion after-effect and coloured after-images, at University California San Diego. sanstis@ucsd.edu



Oliver Braddick is Head of Experimental Psychology at Oxford University, and co-directs the Visual Development Unit (Oxford and UCL) with Janette Atkinson. Oliver.Braddick@psy.ox.ac.uk



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Alan Gilchrist is a vision scientist at Rutgers University who studies visual perception of surface black, white, and gray shades. alan@psychology.rutgers.edu



Karen Gunanayagam is a medical student at Imperial College, with an intercalated neurosciences and mental health BSc. She's previously lived in Saudi Arabia - a country forbidden to tourism! karen.gunanayagam06@imperial.ac.uk



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Retired Professor of Psychology (Newcastle), sometime weapons designer; poetry, military history and sci-fi buff; generally considered of doubtful sanity. Max.Hammerton@newcastle.ac.uk



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Gabriel Horn FRS, Emeritus Professor of Zoology University of Cambridge, researches the neurophysiological basis of sensory interactions, and neural mechanisms of learning and memory using imprinting in the domestic chick as a model system. gh105@cam.ac.uk



Anthony Isles is a Senior Lecturer investigating epigenetic influences on brain and behaviour at the Neuroscience and Mental Health Research Institute, Cardiff University islesar1@Cardiff.ac.uk



Previously a neuroscientist and anatomy lecturer, Hanno Koppel switched to become an NHS psychotherapeutic counsellor working with asylum seekers and ethnic minorities. hannokoppel@googlemail.com



Research Fellow Dr Chris Martin is a neuroimaging neuroscientist at Oxford University, investigating how we can better use non-invasive imaging to understand brain function and disease. chris.martin@rob.ox.ac.uk



As newly appointed Professor at Liverpool John Moores University, Francis McGlone is busy building a strong cognitive neuroscience research base to underpin the core psychology curriculum. F.P.McGlone@ljmu.ac.uk



Rhiannon is a neurobiologist interested in neurophysiology and imaging at the VU University Amsterdam. rhisearch.com, rmred@falw.vu.nl



Sir Jonathan Miller CBE, amongst other activities and interests, is a theatre and opera director, author, television presenter, humorist and sculptor



Laura Murray graduated from Newcastle University with a 2:1 in Physiological Science. She is hoping to start a PhD in Neuroscience in the near future.



Originally from Ireland, Garret O'Connell is currently studying for a PhD on the neuroscience of autism at the University of Reading. g.o'connell-2@sms.ed.ac.uk



Kaz Pasiecznik is a neuroscience and a neuropsychology graduate researching short-term memory in Bristol University's Psychology department. Kaz.Pasiecznik@bristol.ac.uk



V.S. Ramachandran, studies psychophysics and behavioural neurology at University California San Diego, and is well-known for his popular science books and for giving the BBC Reith's lectures.



Professor of Psychology at the University of Oxford, Brian Rogers conducts research on 3-D vision with particular interests in binocular stereopsis and structure from motion. brian.rogers@psy.ox.ac.uk



Ken Skeldon is head of public engagement with science at the University of Aberdeen with research expertise in medical physics and detection of trace gas biomarkers. k.skeldon@abdn.ac.uk



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Beth Tunstall is enthusiastic about doing science and art if not both at the same time, and is currently taking time out to improve herself. beth.tunstall@hotmail.co.uk



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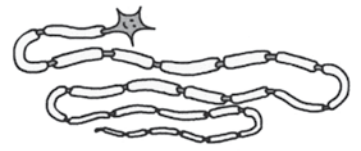


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Closet neuroscientists of history: Vincent Van Gogh

Van Gogh's achievements in neuroscience go largely unrecognised. Although most are aware of his work in the field of audition (namely, the role of external pinnae to direct sound into the ear) he was also years ahead of his time in being the first to measure calcium at the synapse.

He was able to perform such measurements by developing dyes that changed colour according to calcium concentration. Results he obtained (see Fig 1) rival the best calcium-sensitive dyes in use today.

Sadly, Vincent never achieved fame or fortune. Because his only income was through his second career as an artist, he could only afford cheap pigments; these made for rapidly disintegrating dyes of which none survived after his premature death.

Vincent recorded his observations in paintings, using standard oils to replicate dye colour (see Fig 1).

Of course, there is a lesson to this sad story. If Vincent had maintained proper written records, physical loss of the dyes need not have set back the imaging field for decades, and he'd be known as great scientist as well as artist. Something to remember when tempted to give your lab book a miss. AC



Calcium 'hot-spots' around voltage-gated ion channels in the pre-synaptic terminal.

Dendritic Wonder: a poem

Beth Tunstall

Dendrite, oh Dendrite,
you make me so happy,
Whether tree, lungs or
limestone, your structure
is snappy,
With you, neurones
talk, and surface area
increases,
Dendrite, oh dendrite,
your work never ceases.

Brain teasers

Beth Tunstall

(SEE P46. FOR ANSWERS)

1. From a delicate raindrop to the foghorns of ships, I'm stiff at my base, but not at my tips.
2. I'm a type of PET, who's also a scan, I'll give you the answers if you guess what I am.
3. I'm on in the centre, and off at the edge, I'll increase your contrast and improve your res.
4. Notochord, Notochord, where do you go, In lattermost stages of chick embryo?

Christmas neuro-crackers...

Schwann cell walks into a restaurant.

Waiter: What'll it be?

Schwann cell: I'll just have a wrap.

What works even after it's fired?

A neuron

Why did the neuron want the top bunk?

To reach a high resting potential

He's not dead. He's

electroencephalographically challenged.

What did one eye say to the other eye?

Between you and me, there's something that smells

Why don't neurons like baths?

They don't want to be brainwashed

AC/BT



Anatomical Antics:
What bit of the brain does this figure allude to? p46
AC

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