



CIRENCESTER SCIENCE AND TECHNOLOGY SOCIETY

2005 Autumn - edition Number 2

Notes from the Editors desk

At this time of year the quality of television programmes seems to take a sharp down turn. Perhaps it is that the populist audience have all gone away on a late holiday. However there are some pearls amongst the swine and I hope maybe you will have seen these excellent broadcasts.

One in particular told about Robert Hooke who was one of the most neglected natural philosophers of all time. The inventor of, amongst other things, the iris diaphragm in cameras, the universal joint used in motor vehicles, the balance wheel in a watch, the originator of the word 'cell' in biology, he was the Surveyor of the City of London after the Great Fire of 1666, architect, experimenter, worked in astronomy - yet is known mostly for Hooke's Law. He was appointed Curator of Experiments at the Royal Society a post he held for many years. He was a hard working man whose experiments ranged over the entire field of science but he had a difficult temperament. Sir Isaac Newton saw him as a rival and as Sir Isaac grew more influential he saw to it that Hookes work was erased from history. We now know that he deserves more from History than he received in his lifetime.

Last month I bemoaned the fact that the common man rarely acknowledges the service that science and technology gives him. Those that have followed the sad events in New Orleans will have heard that warnings were given by eminent scientists and engineers to the authorities well beforehand. But as very often happens the warnings were ignored. Now it has happened – should I expect politicians to remember and take notice next time. I suspect not and the USA is not unique!

I would like to thank our contributors to this issue and also all of those who kindly sent encouraging messages to the editor re our first edition.

Editor

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Happenings

Looking skywards –

3rd October – Eclipse of the sun starting at 8.48am - finishing 11.17am. In the west we should see around 50% of the sun obscured. Please take all the usual warnings with regard to your eyes.

In the spring the committee are hoping to arrange another visit to the Bristol Sewerage works. So if you are interested look out for notices.

Time to spare in London – visit the Imax Theatre at the Science Museum to see ‘Magnificent Desolation : Walking on the Moon 3D’ from 27th September.

Meeting dates and times

October 12 **‘Beagle 2 and Beyond’ –**
Professor Colin Pillinger CBE FRS. (see a short note on the
speaker later in the newsletter)

To be held at the Sundial Theatre, Cirencester College, 7.30pm

Note this is admission by ticket only , £3 (members and full time students free).

Ring the box office 01285 654224 or www.boxoffice@cirencester.ac.uk/sundial

November 23 **‘Dating the past’ -**
Professor Frank Oldfield

To be held at the Garner Lecture Theatre block – room 1 of the Royal Agricultural College, 7.30pm

December 14 **Annual General Meeting and a talk**
‘Jurassic Water Park’
Dr. Neville Hollingworth

To be held at the Cirencester Parish Centre, off Gosditch Street, Cirencester.
7.30pm

Meeting report 14th September 2005 – report by John Plevin

THE VIEW FROM THE REAR END OF A COW – RESEARCH INTO THE PRODUCTION OF MILK

Speaker - Prof David Leaver - Royal Agricultural College, Cirencester

Milk – something we cheerfully add to our cornflakes and tea in the morning, buy as fancy cheeses and yogurts at our local supermarket - is for most of us a key and familiar part of our diet. But put aside thoughts of milk-maids and small family farms. Milk production is big business. This was the message that came across in Prof David Leaver’s talk to the Society in September. And like all big businesses linked to agriculture, politics, economics, environmental impact, animal welfare, selective breeding and feeding regimes all play their part.

Milk production is controlled by quotas set by the EEC. Improvements in nutrition and the application of better breeding methods have resulted in higher milk yields/cow. As a result, because of the quota system, the number of cows and dairy farms in the UK has reduced whilst maintaining milk production levels. In addition, to retain profitability, the remaining farms are bigger, relying on energy efficient products such as maize for winter feeding and new technologies that enable large numbers of cows to be milked quickly and safely. Dairy farming today is high-tech and complicated. The farmer has to juggle with low milk prices paid by the supermarkets, high expenditure in technology and winter housing for his animals as well as a raft of environmental and welfare related legislation. Life down on the farm it seems is not all milk and honey.

Balloon Debate

The Society will be holding a Balloon Debate on March 8th, 2006. It will be chaired by Marcus Moore who has considerable experience of such events. A balloon debate is where occupants of the balloon are progressively jettisoned (to keep the balloon airborne) by audience vote until only one occupant remains. The proposition for this debate is “Who made the greatest contribution to the progress of science or engineering?”

Probably the balloon can accommodate a maximum of six scientists or engineers at the start, and the proponents for each can have five minutes to make the case for his/her survival. Possible candidates might include Galileo, Leonardo, Newton, Linnaeus, Darwin, Brunel, Mendel, Madam Curie, Einstein, Rutherford and the Cavendish Laboratory*, Whittle, Crick and Watson*, or anyone else members wish to propose. In the event we are over-subscribed, the Committee and Marcus Moore will have to make a selection and it would help if the proponents would write three lines as to why his/her candidate is the greatest. In the event we are under-subscribed, arms will be twisted.

*in such cases it is acceptable for a scientist to represent the work of a team.

Volunteers please email Palmer Newbould (palmer.newbould@btopenworld.com) or write to him at 26 Morestall Drive, Cirencester, GL7 1TF.

Lecture Report - Palmer Newbould

In Orbit! - Cassini explores the Saturn System The Charles Simonyi Lecture. Dr Carolyn Porco Oxford Playhouse Theatre 09/09/05

It was a brilliant lecture accompanied by stunning images of Saturn, its rings and its moons, especially Titan, but also Janus, Pandora and Prometheus. I cannot begin to cover the content of the lecture. You could get a flavour of the Cassini Project and Dr Porco's role from <http://ciclops.org> . I add a few comments.

Cassini was launched in 1997 and took seven years to reach Saturn. It is about the size of a London bus. It is a cooperative venture between many organisations and agencies including NASA. The partners negotiate for time, positioning, use of probes, data transmission and retrieval. I wonder what it is all costing. Methane, solid, liquid and gaseous, is one of the main components. It is very cold (-300°F, why do the Americans still use Fahrenheit?). Saturn, Titan and other moons are shrouded by cloud, fog, etc and difficult to see. The radar scanner works well. The Huygens probe landed safely on Titan and is sending back useful information. Titan shows dendritic surface patterns, evidence of flowing liquid at some time, probably liquid methane. And more, and more. Follow this ongoing saga on the internet and marvel, as Dr Porco and the other scientists do!

CSTS External Events

BA and ESRC Science in Society Seminars: Linking scicomm practitioners and the social science community.

Seminars held at the Dana Centre in London

- Thursday 3rd November 18:30 – 20:00** How do we communicate uncertainty and risk?
- Thursday 10th November 18:30 – 20:00** How do we communicate nanotechnology through the media?
- Thursday 17th November 18:30 – 20:30** How does industry access and use public knowledge?

Places are FREE but must be pre-booked - visit www.the-ba.net/scicomm or email events@the-ba.net

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University of Bristol Public Lectures

Thursday 27th October 5.15 From dinosaurs to disasters: a brief history of climate
Paul Valdes, Professor of Physical Geography

Climate is always changing and in the distant past, the dinosaurs experienced a period of natural global warming. Why did this occur? Why did it change? What lessons can we learn from the past about human-made future climate change?

Peel Lecture Theatre, School of Geographical Sciences, University Road,
This inaugural lecture is free and open to the general public. No prior booking necessary. Contact Yvonne Olver on 0117-331 7040 or Yvonne.olver@bristol.ac.uk

Monday 31st October 5.15 Caffeine: our favourite drug from womb to tomb
Professor Peter Rogers

Caffeine is the most widely consumed 'drug' in history. Why is caffeine so popular, and how does it affect our well-being? There are many claims, for example, that caffeine can help us think faster and combat sleepiness while driving, but do we really gain anything from consuming this substance?

Lecture Theatre 2D1, Social Sciences Complex, 8 Woodland Road,
This inaugural lecture is free and open to the general public, no prior booking necessary. Contact Yvonne Olver on 0117-331 7040 or yvonne.olver@bristol.ac.uk

Thursday 17th November 5.15 Hydraulic modelling in a data rich world
Paul Bates, Professor of Hydrology

Over the last 5 years data from aircraft and satellite sensors have transformed our ability to predict flooding, particularly in urban areas. This talk will examine the transformation of flood modelling from a data-poor to a data-rich science and show how Bristol researchers are capitalising on the opportunities offered.

Peel Lecture Theatre, School of Geographical Sciences, University Road, 5:15pm
This inaugural lecture is free and open to the general public, no prior booking necessary. Contact Yvonne Olver on 0117-331 7040 or yvonne.olver@bristol.ac.uk

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Oxford Playhouse

Friday 11th November 4.30 The Science Forum: Stem Cell Research

What is stem cell research? Why does it attract so much attention?

Anne Diamond, broadcaster, journalist and figurehead of BBC Oxford Breakfast Show, brings together eminent speakers from the field to talk about their work. An illuminating discussion examining both sides of this highly topical issue – the advantages stem cell technology offers mankind and the challenging ethical issues it raises. Come along to contribute your view and pose questions to the expert panel.

Ticket prices: Adults £6 Children £4 www.oxfordplayhouse.com 01865 305305

Visit report – by Roy Postlewaite

ROYAL SOCIETY SUMMER SCIENCE EXHIBITION 2005

Members of our Society, along with five staff members from Cirencester College, set off early on 6th July in an air-conditioned, 16-seater mini-coach for London. Arriving at Carlton House Terrace about mid morning, they spent four hours at the exhibition before returning home late afternoon.

The aim was to inform about cutting-edge science and technology research in the UK and to have an opportunity to meet the research scientists involved. Amongst 24 exhibits were aspects of cosmology, astrophysics and spacecraft; physiology in man and diving mammals; palaeontology, climatic change models and single ion optical clocks; genes, fruit flies, engineering and materials science in aspects of heart, brain, bone and joint disease; “robotics” in surgery; applications with super-molecules, nanotechnology, hollow-core photonic crystal fibres and imprinted plastics; mathematics, mechanics, psychology, artificial intelligence and human-computer interactions; and, by courtesy of the students themselves, the association of school and university in the teaching of microbiology.

The exhibits, competitively selected from universities, research institutes and industry throughout the UK, were of excellent quality and presentation, many with hands-on, interactive components; and all with enthusiastic, informed and articulate demonstrators and research workers. There was something for everyone and more than enough for anyone. At peak periods space was at a premium.

The atmosphere was welcoming, friendly and exciting. The expertise offered was adjusted to varying levels of consumer awareness but with a distinct edge to the scientifically literate. Thanks are due to our Society for supporting this trial run of a prestigious annual event.

As often in such arrangements, there were elements of unplanned humour/disaster. One enterprising member got on the wrong coach at the beginning and found himself in Swindon rather than London. On the other hand, and having earlier emphasised the need to turn up on time for the start of the return journey, the organiser, deeply engrossed in the minutiae of single ion optical clocks, was alone amongst the fifteen visitors to turn up ten minutes late at the waiting coach. Colleagues were generous in forgiveness!

Thursday 24th November – 7 for 7.30pm

BATH ROYAL, LITERARY AND SCIENTIFIC INSTITUTION

Einstein Year Lecture

EINSTEIN AND THE STORY OF HIS 3 REVOLUTIONARY PAPERS OF 1905

Speakers:

Dr Peter Ford, University of Bath

Dr Vincent Smith, University of Bristol

16 - 18 Queen Square, BATH, BA1 2HN email: admin@brlsi.org for details.

Scientists and non-Scientists. – by Roy Postlewaite

More than forty years ago two eminent professors of medicine, one from Oxford, the other from Manchester, conducted a discussion in the “British Medical Journal” on the then controversial subject of hypertension. Opposing views, cogently argued, stimulated much comment. In the hope that our own “Newsletter” might similarly espouse the cause of controversy, critique and debate, I comment here on scientists and non-scientists, communication and attitudes to science, drawing briefly and not entirely on publications of the British Association, the Wellcome Trust and the Office of Science and Technology. The subject is germane to the aims of our Society and might set the ball rolling in a deliberately provocative way.

How unaware is the man-in-the-street? How important is it that he be informed? How well do scientists perform in this regard? It might seem reasonable, if only for the economic health of the nation, that the public be encouraged to evaluate evidence and, to this end, that science comprises a significant part of a balanced education.

Schools have a pivotal role. Problems have arisen from bureaucracy, a shortage of good teachers, curriculum and examination structures, social inequities, perceptions of career prospects and sub-optimal career guidance. Whilst the UK does reasonably well at primary and early secondary levels, with more students taking science at GCSE, it is worrying that “A” level science candidates are fewer, raising questions about breadth and depth of study. On the other hand, the later the choice as to arts or science, the more students take science and the more scientifically literate are those who eventually choose the arts.

After school, it becomes even clearer that we are not all equal; and tertiary education for science has to recognise the diversity of likely attainment as well as the diversity of the national need for “scientists”. Although times change, the old style “Technical College” was as important as the old style “University”. They were different. One was not better than the other. They had different end products for different purposes. Especially are there long-standing misconceptions about “Engineering” which, in all its manifold guises, is not dirty, poorly paid or poor as to job prospects. We neglect its relevance and importance at our peril.

In communicating science to the public, we ourselves are often less than gifted. Seeming apathy can stem from our very professionalism in terms of jargon, dogmatism, detail rather than principle and a failure to listen as well as impart. We tend to convey facts rather than ethical and policy issues and how the scientific process works. A reluctance to forego autonomy means that material is provider rather than consumer driven. The “Media”, in all their modern applications, can be very good, especially where they exploit natural curiosity such as David Attenborough, Patrick Moore and some “Horizon” programmes. However much is poor, emphasising the “good story” for the quick buck, irrespective of accuracy, content or expert opinion. Ill-conceived coverage of vaccines for whooping cough and for measles, mumps and rubella illustrate only too well the sad consequences.

Public attitudes to science vary according to education, social class, household income, gender, age, political beliefs and geography, resulting in varying levels of confidence in government, regulation and scientists. Science is said to be “difficult”, to damage the environment, to be absolute. Scientists don’t always know best. Greenpeace, Friends of the Earth and animal lovers have their place. Trust must be earned. Even scientists poorly understand risk, and fear can be exploited by antagonistic pressure groups.

People are not intrinsically hostile to science. They contribute hugely to medical charities but, along with opinion-makers, they should be educated about the value of research and involved early in policy decisions about its direction. They should learn how to evaluate evidence and understand the value of a

knowledge-based society and about the need for life-long learning. Scientists themselves should consider the social, ethical, economic, political and public policy consequences of scientific advances.

Scientists are also whole citizens and are as interested in the humanities and the arts as those espousing the latter can be in science. Humility and an all-embracing vision seem important in linking different sections of our communities.

The Public Lecture for 2005.

Professor Colin Pillinger, lead scientist of the Beagle 2 Mars lander programme, will talk about the project and look to the future for Mars exploration "

We have been given the following profile of Professor Pillinger.

Professor Pillinger as Head of Planetary and Space Sciences, at the Open University, has led a group with considerable expertise in designing and building high sensitivity instruments for analysing extraterrestrial samples, both in the laboratory and remotely on spacecraft. His interest in samples from other solar system bodies started with analysis of the Apollo lunar samples in the 1970s.

Professor Pillinger was the instigator and lead scientist of the Beagle 2 project, which launched from the Baikonur Cosmodrome aboard the European Space Agency's Mars Express orbiter mission, to Mars. The instruments on board Beagle 2 would analyse samples of soil, rock and the atmosphere, to address the question "Is there, or was there, life on Mars?"

He holds a BSc and PhD in Chemistry from the University of Wales, a DSc from the University of Bristol and was elected to the Fellowship of the Royal Society in 1993. He and his wife live in Cambridgeshire, and have a son and a daughter.

Peter Tanswell