

THE SCIENCE OF BETTER AT THE HEART OF ANALYTICS

INSIDE O.R.

FEBRUARY 2013 NO 506



DATA FARMING

:: INSIDE THIS MONTH :: :: :: ::

MATHEMATICS OF THE POP-UP TENT

WINTER IN BERLIN

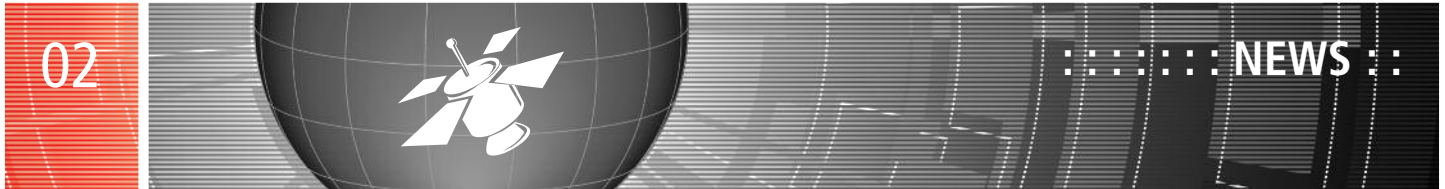
CAREERS OPEN DAY

ARTIFICIAL INTELLIGENCE KNOWS WHEN PEOPLE TWEET



THE OR SOCIETY

www.theorsociety.com



ADVANCE YOUR CAREER PROSPECTS

Accreditation: What it is and why you should apply

The OR Society's accreditation scheme enables members to enhance their career prospects by providing credible certification of their achievements in the field of Operational Research.

There are three categories of accredited membership:

Fellow (FORS) - for high achievers with at least ten years' experience

Associate Fellow (AFORS) - for those with a successful track record over at least five years

Associate (AORS) - for suitably qualified recent entrants

Candidate Associate (CandORS) - for those either completing a degree with a substantial O.R. content or starting their first employment in O.R. Candidate Associates are appointed a mentor to help guide them through the first couple of years in their O.R. career.

The substantial benefits of this recognised professional achievement include:

- an enhanced CV and post-nominal letters
- help in securing a job by demonstrating experience
- career progression through category upgrades

For full details of the Accreditation scheme, including criteria for each category and procedures, visit

www.theorsociety.com

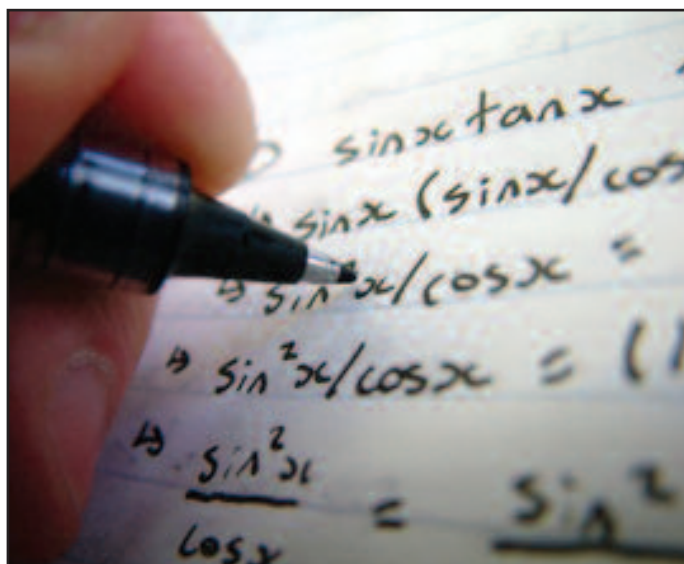
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YOUNG MATHEMATICIANS ARE BEING LET DOWN IN ENGLAND

NIGEL CUMMINGS

According to the Advisory Committee on Mathematics Education (ACME), England is failing to develop able maths students and the situation is reaching a critical point.



Young mathematicians are being let down by an education system that does not allow them to gain a thorough knowledge of the subject and ACME says it is vital that young people who have the potential to study maths at A-level gain a deep understanding of the subject.

But the current system rushes these students through the curriculum, leaving them with only a 'shallow mastery' of maths and insecure in their own abilities. It says: 'At present, England is significantly underachieving in terms of developing able mathematicians, and this situation is now critical. It is necessary to increase systematically the number of young mathematicians with a robust and deep grasp of the range of mathematical ways of thinking and working.'

ACME also says that the use of Level 6 tests in primary schools can mean that pupils may be entering secondary schools with an inadequate understanding of primary mathematics. Level 6 tests require an understanding of concepts that are in the secondary curriculum which could mean that these pupils are not spending sufficient time on understanding the more elementary concepts.

To try to get higher rankings in the league tables, schools are tending to enter pupils for their maths GCSE early so they can bank good results. ACME suggests that this is often not in the best interests of students. Young mathematicians should be given the

chance to study the subject in depth to gain a good understanding of it rather than rushing ahead.

ACME chair Professor Steve Sparks said: 'Just because a pupil can charge through the curriculum at top speed through procedural learning does not mean that he or she has developed a clear grasp of the subject matter or could apply the fundamental principles more broadly. The 'acceleration' approach is driven by league tables, and puts us at odds with many of the world's highest performers in terms of mathematics education. It is inconsistent with the government's stated aim to encourage more students to study maths to 19.'

He added: 'The government should act now to create an enhanced interpretation of the national curriculum, and should develop school accountability measures that prioritise deep learning over rapid progress through extra content.'

There is a wide consensus amongst politicians, employers, higher education tutors and others that students in England should, like their counterparts in many other countries, continue to study mathematics to the age of 18. ACME has spent the past year considering how this can be achieved for those students ready to progress beyond GCSE Mathematics.

ACME has published two papers of interest regarding this issue. The first, 'Post-16 Mathematics: increasing provision and participation', provides an overview to the fundamental changes to the structure and type of mathematics qualifications beyond GCSE. The second paper, 'Planning for success', describes the steps that will need to be taken to make this work.

The new ACME paper, 'Raising the bar: developing able young mathematicians' can be located at this web address. <http://www.acme-uk.org/news/news-items-repository/2012/12/acme-launches-raising-the-bar-developing-able-young-mathematicians> More general information about ACME's goals and objectives can be located at: www.acme-uk.org/

MATHEMATICS OF THE POP-UP TENT

NIGEL CUMMINGS

Have you ever struggled with a spring loop laden pop-up tent or pop-up gazebo, trying to flatten it to fit it back into its bag after use? Help is at hand, read on and avoid 'tent rage'!



The authors created a creased origami sculpture that illustrates the most efficient way of buckling a ring-shaped object

You've had a great weekend, the sun has shone and the company was great. But then it's time to go home and you have to get that pop-up tent or gazebo back into its bag. Help is at hand though, in the form of a mathematical theory to describe the shapes adopted by the types of flexible ring from which these structures are made. Alain Jonas, a materials scientist, University of Leuven, Belgium, led the research and he thinks he has found the best way to fold rings.

It might have only taken 30 seconds to pitch but if you don't get it right first time you could be wrestling with those flexible rings for hours. Jonas's solution has far reaching ramifications because buckled loops or rings crop up in many everyday contexts, not just collapsible garden and leisure structures. Jonas and his colleagues have worked on solutions for tents, laundry baskets, pop-up football goals and sculptures made of wood or paper. The rings are too curved to lie flat in a normal circle, so they either buckle into a three-dimensional 'saddle' shape or save space by coiling up to form what looks like a stack of interlinked loops.

The researchers have discovered that in nature these shapes can be predicted accurately using a theory that invokes a single key mathematical concept: 'overcurvature', or the amount by which a ring is made more curved than a perfect, unfolded circle of the same length.

The results of the research undertaken by Jonas's team can be used to work out the easiest folding pathways to collapse a single overcurved ring into a small coil — the problem of folding a pop-up

tent. According to Jonas. 'It's not trivial to find this pathway empirically. You naturally start by deforming the ring in two lobes, since this is easiest. But then you have to deform the ring further into shapes that require a lot of energy. If you take the pathway we propose, you have to use more energy at the start, but then have to cross lower energy barriers to reach the energy valley of the ring coiled in three' - meaning that you don't get trapped by starting off following the path of least resistance.

Their research also shows that such rings can be made even more compact, folded into five loops instead of three. 'This is more difficult, because the energy barriers are higher,' says Jonas, adding that for a tent, it would be best to have three people on the job. He sees no reason why his group's proposed folding route should not work for real tents, provided that the material is sufficiently strong and flexible. The biggest problem is avoiding getting a kink in the tube.



The mathematics of the pop-up tent

Jonas also thinks that the results of the research might be applied on the molecular scale for understanding the shapes of some relatively stiff molecular rings, such as plasmids - circles of DNA found inside organisms such as bacteria - and other ring-shaped polymers.

According to Basile Audoly, a mathematician at the Jean le Rond d'Alembert Institute at the Pierre and Marie Curie University in Paris. 'There is a lot of interest currently in this kind of fundamental mechanical problem'. He also says that collapsible tents aside, the same questions have been asked of the buckled fringes at the edges of some plant leaves.



Professional development opportunities for 2013

Approved courses in O.R. and Analytics

SUPPORTING STRATEGY

6-7 March, Birmingham
£1,040 + VAT for OR Society members
Hands on course

Course provider:
 Frances O'Brien and John Morecroft

This is a practical course aimed at developing expertise in deploying frameworks, methods and models to support strategy development. The course looks at the use of manual and computerised techniques for conducting various strategy development activities such as setting direction, creating strategic initiatives, making sense of internal and external environments.

Roles for O.R. Supporting strategy: Current practice; Frameworks for setting direction and measuring performance; Get an introduction to system dynamics; Learn about formulation and simulation; Undertake modelling for strategic development

IMPROVING QUALITY AND PERFORMANCE WITH THE PUBLIC SECTOR SCORECARD

12 March, Birmingham
£500 + VAT for OR Society members

Course provider:
 Sheffield Hallam University

Gain a greater understanding of the topics of quality, excellence and performance measurement and the need for performance measurement to be based on stakeholder needs, the organisation's strategy and process; appreciate the debate on targets in the public sector and the eight essentials of measurement.

Find out about the latest developments in performance measurement; Keep up-to-date with developments in quality management and developing quality user-focussed public services; Learn how to use the balanced scorecard and strategy mapping

BUSINESS INTELLIGENCE WORKSHOP

13 March, Birmingham
£585 + VAT for OR Society members

Course provider:
 Dweomer Consultants Limited

Understand the basic capabilities and limitations of OLAP tools, how they differ from other reporting and analysis tools and the change management issues raised when they are introduced; how and why the design of a data warehouse needs to be different from other data processing systems; learn how to use dimensional modelling techniques and understand the key challenges and trade-offs faced in managing a successful business intelligence / data warehousing initiative.

Understand the technical, political and change management issues that need to be addressed to benefit from investing in business intelligence and data warehousing; Get an opportunity to discuss the issues facing your organisation and exchange ideas with other delegates and the course tutor

FACILITATION SKILLS

14 March, Birmingham
£440 + VAT for OR Society members

Course provider:
 Rachel Bodle

A course where both beginners and those with some experience can review and practice the skills needed to add value at the interface with clients and other project stakeholders. Frameworks for structuring a group process; practical insights to some of the tools available to support group interaction; hexagon mapping techniques; enhanced awareness of own skills and activities to address development needs.

Valuable opportunity for delegates to practise specific skills and learn from supportive peers; Professional development: facilitation skills are a key component of the interpersonal skills needed for more influential, strategic roles; These skills are at the heart of managing client relationships

SIMULATION: A PRACTICAL GUIDE TO DEVELOPING AND USING MODELS

19-21 March, Birmingham
£1,680 + VAT for OR Society members
Hands on course

Course provider:
 Loughborough University

If you develop and use discrete-event simulation models in your work, this course will enable you to top up on the skills required for successful simulation modelling and analysis. You'll learn how to build valid and credible simulation models and perform experiments with models to compare the results of different scenarios appropriately and efficiently.

Learn how to determine what to model and what not to model; Find out how to collect and analyse the data needed for a model; Gain an understanding of the approaches for verifying and validating a model; Learn how to carry out experiments to obtain accurate estimates of performance; Methods of running and comparing multiple scenarios

INTRODUCTION TO O.R. I

15-19 April, Birmingham
£2,850 + VAT for OR Society members
Hands on course

Course provider:
 Frances O'Brien, Stewart Robinson et al

Understand the role of Operational Research in management; understand the requirements for successful Operational Research interventions; have knowledge of a range of Operational Research techniques; be able to identify the suitability of a technique for a problem situation and be able to apply those techniques.

O.R. and the O.R. process; Statistical methods in O.R.: sampling and regression; Simulation; Optimisation and (Meta-) heuristics; Statistical methods in O.R.: forecasting

**To book online, visit www.theorsociety.com
 or call Jennie Phelps on 0121 234 7818**

UNDERSTANDING THE HIDDEN COSTS

CHARLIE MAYES, MANAGING DIRECTOR, DAV

TWO OF SIX – DECEMBER 2012

UK Export Week (12-16 November 2012) was designed to inspire and provide practical advice for new and experienced exporters and is part of a campaign led by Trade and Investment Minister Lord Green to increase the number of British exporters by roughly a quarter.



Charlie Mayes

If this is achieved it is estimated that about £36 billion could be added to the UK economy. Lord Green was impressed by the way that many firms have seized on the export opportunity since the launch of UK Export Week in 2011.

Clearly there are many benefits to doing business overseas. A recent research report unveiled by the UK Trade and Investment (UKTI) shows that many UK firms are increasingly venturing into high growth markets in Asia and Latin America. Nearly 60% of entrepreneurs said exporting led to a 'level of growth not otherwise possible'.

There is every indication that the economic centre of gravity will move to high-growth markets such as China, India, Russia and Brazil. Companies of all ages and sizes are increasingly finding success in these markets. Some 40% of small exporters already do business in at least one high-growth market. Many

internationalised firms experience a 'virtuous circle' where exporting leads to new innovation, and where those innovations then lead to further exporting.

Exporting is not an automatic passage to growth and success for everyone. In today's economic environment it can be a costly mistake for a business to forge ahead with an export strategy simply because growth in its traditional home markets is slowing down, something that UKTI is keen to emphasise. It must conduct a full and realistic assessment of its business model in the context of the new export markets it wishes to enter encompassing its products, services and commercial propositions. It is unrealistic to assume that a model that has worked in a traditional, home market can simply be lifted into an overseas one that is likely to be driven by significantly different commercial and cultural characteristics.

Such consideration is particularly true if you are a people based business providing professional services. The European market has a largely consistent and mature view of professional services. But, Asian or Middle Eastern markets have a very different view of the commercial rates they are prepared to pay. To achieve these rates, it may be necessary to employ local staff.

So, whilst the UKTI research indicates that exporting offers substantial benefits there are clearly downsides that must be considered. The fundamental principle is that any business thinking of exporting must undertake a thorough due diligence before setting out down this path. Your export business plan needs to consider a multitude of scenarios specific to your business model and, most importantly, companies need to understand what it is that they are trying to achieve and why, and how well suited their business is to exporting. It is very easy to get carried away with the promise that exporting appears to offer, particularly for firms who are experiencing slower growth rates in their traditional home markets due to the current economic environment.

THE FUTURE OF DECISION MATHS

LOUISE ORPIN, EDUCATION OFFICER

Modelling in the A Level Mathematics curriculum under threat

Decision Maths is a module offered as part of the A Level Mathematics curriculum that deals with discrete mathematics. Decision Mathematics covers branches of mathematics, whose development has mainly been in the 20th century, meaning it has strong links with O.R. and computer science.

Branches covered include Algorithms, Graph Theory, Networks, Linear Programming and Critical Path Analysis. This maths should be familiar to anyone working in or studying O.R. The aim of the module is to develop modelling skills which is something that students wouldn't have met previously.

Decision Maths was introduced into the curriculum in the 1980's, unfortunately uptake was low and some viewed it as not real maths due to the lack of algebraic content. Uptake has increased over recent years due to the success of the Further Maths Support Programme in giving people the opportunity to study Further Maths. This means they need to study additional modules and as they will usually have already taken Mechanics and Statistics, they turn to Decision Maths.

It could be at risk in the current A Level review and it is important to have as much support, especially from HE, to fight for keeping this module. It is hoped that the Government will not want to lose the modular structure and risk a decline in Further Maths take up, not when encouraging more people to study maths and to a higher level is one of their goals.

Are you aware of this module? If you are, would you like it to stay in the maths curriculum? Could it be developed to ensure students have maths skills relevant for tomorrow's businesses and organisations?

The A Level review has also provided the chance for those who champion Decision Maths to get together and look at the future of the module. This is an ideal opportunity for the O.R. community to be involved with the development of a new Decision Maths curriculum. I have been working with Maths in Education and Industry (MEI), an independent curriculum development organisation, who are keen to work with HE and employers to ensure that Decision Maths is a valued part of the curriculum.

If you had the chance to influence the curriculum at A Level, what skills would you want students to develop? What is important for students to be able to do when they go on to HE? Could this qualification give students an advantage in applying for a job?

Contact Louise for more information or with comments and suggestions, louise.orpin@theorsociety.com

<OR>

ANALYTICS NETWORK TO BE LAUNCHED

GAVIN BLACKETT, SECRETARY & GENERAL MANAGER

Over the last couple of years, *Inside O.R.* has carried news of our burgeoning interest and activity in the field of analytics. I'm pleased to announce new developments in the Society's offering in this area.

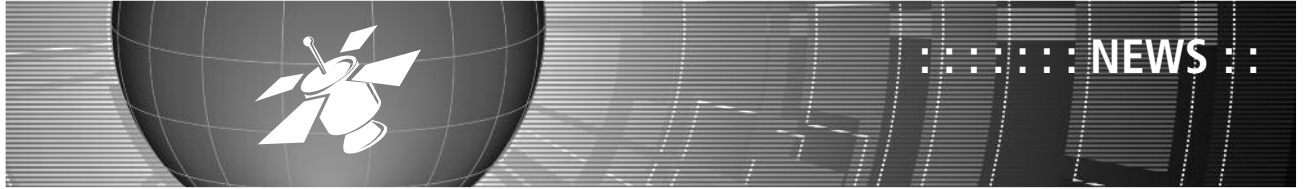
The Society will repeat its one-day analytics event on Wednesday 1 May, at the same excellent venue, the IET at Savoy Place in London. Work on the programme of speakers is ongoing, but please note the date in your diary, and let's ensure this year's event is even bigger and better than the last.

The Analytics Working Party has long been of the opinion that the OR Society can be the ideal professional home for a great many of those working in analytics, especially those using techniques in the potentially huge cross-over with O.R. tools, and that O.R. can add significant value to analytics for those not familiar with the field. To cater for these individuals, as well as the significant number of existing members who describe themselves as working in analytics, the Society has created the Analytics Network.

The network is set to be run along the lines of a Special Interest Group, with an enthusiastic group of volunteers willing to put on meetings and seminars, and contribute material to create a vibrant area of the website with articles, reports and comment. The same website functionality will be made available to the other SIGs and Regional Societies (once any niggles have been ironed out).

The Analytics Network will be launched with an event in London, hopefully on Wednesday 6 March, with an evening talk on how the fields of O.R. and Analytics can work together for mutual advantage. We haven't got final confirmation of the date or venue just yet – but pencil it in, ready!

<OR>



GET INVOLVED WITH YOUNGOR 18 – HERE’S HOW:

The YoungOR18 Conference is being held on 9-11 April 2013 at the University of Exeter, which was selected as University of the year by *The Sunday Times*. There are lots of great ways that you can get involved: don’t miss out!

BE A KEYNOTE SPEAKER!

IBRAHIM KUCUKKOC, UNIVERSITY OF EXETER



Ibrahim Kucukkoc

YoungOR18 Biennial conference in Exeter is getting closer and the organising committee members are occupied with making arrangements with the cooperation of stream leaders.

The list and definitions of confirmed streams for YoungOR18 so far were published in the December issue of *Inside O.R.* Here’s a brief description for those who are unfamiliar

with the format of the conference: each stream consists of a number of papers related to a particular topic (i.e. manufacturing, optimisation, soft methods etc.) and usually a keynote.

The focus of a keynote at YoungOR typically falls into (but not limited to) three main categories:

- papers presenting an overview of a research area and its practical applications
- review papers discussing the history of a subject through to the state of the art
- keynotes demonstrating how to maximise the benefits of O.R. and modelling in decision making.

Keynotes are an intelligent and effective way of either ‘sharing your own expertise and views on operational research’ or ‘giving a holistic idea to attendees’ to an enthusiastic audience. It is not compulsory to prepare a keynote paper for keynote speakers. However **we strongly encourage** speakers to prepare a short keynote paper (3,000 to 5,000 words) as an additional bonus for you to get a short paper detailing the main points that delegates can take away and review at their leisure. Additionally, keynote papers ensure that new researchers on your topic will have a chance to acquire your knowledge permanently!

If you are interested in giving a Keynote presentation at YOR18, please go online at www.theorsociety.com/YOR18 and check the list of confirmed streams to see which match your subject of expertise. You may also visit the websites of previous YoungOR conference speakers (just Google ‘YoungOR17’) to get inspiration about keynote papers.

Submit your title and a short summary of your keynote (no more than 300 words). Please let your stream leader know you would like your talk to be a keynote as an hour slot will be reserved for you. If you have any questions about the keynote papers (i.e. format of the keynote papers) please contact me, the YoungOR18 Keynote Editor, Ibrahim Kucukkoc – University of Exeter, via i.kucukkoc@exeter.ac.uk.

Full Keynote papers should be submitted to me by email please, no later than **7 February 2013**. Please note that keynote papers will be edited but not refereed.

To find out more, please visit YoungOR18 Conference website www.theorsociety.com/YOR18.

BE A SPONSOR OR EXHIBITOR

KUANGYI LIU, PWC



Kuangyi Liu

In addition to the plenary sessions and stream presentations, we provide exhibition places and sponsorship opportunities for organisations to get involved at this exciting gathering of O.R. people from the UK and beyond.

It is a good opportunity to promote your organisation and services to the O.R. community and to make face-to-face contact with the young researchers and practitioners who could be the future business partners, employees or clients of your organisation. Meanwhile, your details will appear on the O.R. website, in general conference information and in *Inside O.R.*, the Society’s monthly magazine.

Exhibitors

You can choose to hold an exhibition space for one day or for the whole conference duration (at a discount rate). You are also welcome to have your posters/leaflets at the venue or together with the conference materials to each attendee.

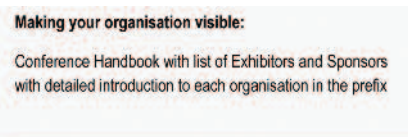
Sponsors

You can choose to sponsor the conference materials listed, for example conference handbook, memory stick, drink receptions, conference bags/gifts, at different rates applied. If you prefer, we are also happy to arrange joint sponsorships where possible.

Interested? Please find out more on the conference website

<http://www.theorsociety.com/Pages/Conferences/YOR18/YOR18Exhibition.aspx>

Or simply contact Kuangyi Liu (kuangyi.liu@uk.pwc.com) for details and/or further discussion.



We look forward to meeting you in Exeter.





THE BENEFITS OF MEMBERSHIP - A VIRTUOUS CIRCLE

RUTH KAUFMAN



‘many of us will recognise the OR Society’s aims as being worthwhile in helping shape the world we want to live in: a world where decisions are well-made, where systems are well-designed, where organisations are well-run.’

If you’re reading this, there is a very good chance that you are a member of the OR Society.

No doubt you stop to ask yourself ‘why?’ from time to time – especially when renewal notices appear on your doormat. Why do I belong to the OR Society? Maybe you even ask yourself: Why should *anybody* belong to the OR Society?

As somebody who spent much of a long career as a non-member of the OR Society, but who now chairs the Publicity, Membership and Website sub-committee with all the evangelism of the convert, I’ve been thinking long and hard about this.

The classic place to start when persuading somebody to do something is with answers to their question ‘What’s in it for me?’ I will get on to membership benefits in a moment. But there is another angle to this. The OR Society is a charity. Like all charities, it must demonstrate that its aims – the advancement of knowledge and interest in O.R; and the advancement of education in O.R – are for the *public* benefit.

Now, there are many charities, such as Mind, or the Fawcett Society, whose members join not because they get any direct personal benefit, but because they want to promote the *public* benefit pursued by that charity. It is true that O.R. promulgation may not arouse the same passions as fair treatment for women; and ‘Every A-Level maths student knows about O.R.’ may not be a benefit that tugs at the heartstrings in the same way as ‘no-one has to face a mental health problem alone’. Nonetheless, many of us will recognise the OR Society’s aims as being worthwhile in helping shape the world we want to live in: a world where decisions are well-made, where systems are well-designed, where organisations are well-run.

Taking a specific example: the OR Society’s academic publications do not bring much by way of direct benefit to members. The contents are often too abstruse for practitioners; and academics do not need to be members either to get free access or to publish. But they bring enormous public benefit by ensuring that good O.R. work will be disseminated, that up-and-coming O.R. researchers will have a forum, that potential O.R. users will have a repository to which they can turn, and that the OR Society has a credible, authoritative voice amongst fellow learned societies. And that is before considering the considerable income that its publications (currently) bring to the OR Society to enable it to pursue its wider activities.

Looking more broadly, the OR Society’s representation on various UK and global bodies give O.R. a real standing in national and international debates around the mathematical, system and decision sciences. Its conferences, training, networking activities and on-line resources provide support, and inspire development and cross-fertilisation amongst practitioners, students, teachers, researchers, and even users, enabling the profession to flourish. Its

initiatives including O.R. in Schools, analytics, research projects and O.R. Pro Bono all help promulgate O.R. amongst new generations and new sectors. These are all public benefits, and we don't need to directly benefit from them personally to feel that they are worth supporting.

However – there is no denying that gaining personal benefit from something does wonders for one's willingness to keep paying the subs. And there's a whole raft of personal benefits to be derived from OR Society membership, though exactly what that is will be different for each of us.

For somebody like me – an independent consultant, semi-retired – membership keeps me up-to-date with new ideas, maintains links with interesting people, adds to my personal credibility with potential clients, and gives me access to useful cheap-rate conferences, O.R. pro bono, and a host of other learning and networking opportunities.

By contrast, for an O.R. person currently doing 'not-O.R.', there is the opportunity to keep in touch with a world that you may wish to tap into for inspiration, for consultancy, or for future work. For an academic, in addition, there is the chance to work with practitioners, and the potential to develop research partnerships.

For those at the other end of the career ladder, students or new graduates, there may be more value in access to mentoring through the CandORS scheme; in finding out what is going on within the profession-as-practised rather than the profession-as-taught; in making connections which might help find a new role.

For an isolated practitioner or academic, there is the opportunity to keep in touch and learn from people who share your professional outlook, the access to on-line resources, the community of special interest groups. For people in large groups, there is the opportunity to get external perspectives, to attend different training courses, to differentiate yourself and your CV through accreditation or through taking on a position in the OR Society.

There is a lot here. But for both types of benefit, personal and public, the OR Society is ambitious to do more. And this brings me to the virtuous circle of the title. To do more we need more members. More members will result in more, stronger, broader networks; more, and more varied, promotion of the profession across a wider audience; more case studies to teach and to inspire: all resulting in more personal benefit and more public benefit. And of course, the more we can generate benefit, the more likely it is that people will think it worth paying the subscription (NOTE: unchanged in 2013). A positive feedback loop to be proud of!

This is one reason why we shall be embarking upon a membership drive in 2013. In the meantime, what do you think? Have I missed anything? Can we do more to foster links between members, and to realise the benefits I have been extolling? What are the membership benefits that you value the most? Are there any additional benefits you would like to see the OR Society provide? And is there anything more that we can collectively do to help advance knowledge and understanding of O.R. in pursuit of a better world?

<OR>

COULD YOU BE THE NEXT JORS BOOK REVIEW EDITOR?

GAVIN BLACKETT, SECRETARY & GENERAL MANAGER

The Society is looking for a new Book Reviews editor for its flagship journal, JORS.

The remit for this unpaid, voluntary position is quite simple – organise, edit and collate the book reviews to be published in JORS. Specifically, the tasks cover:

1. Maintaining the list of books to be reviewed;
2. Co-ordinating reviewers;
3. Reviewing/editing submissions;
4. Dealing with copyright forms; and
5. Submitting copy to Palgrave for publication.

If you are interested in this position, please get in touch at gavin.blackett@theorsociety.com

<OR>



WINTER IN BERLIN

JOHN CROCKER, FOREIGN CORRESPONDENT

Berlin is probably not at the top of your list of places to visit in the winter and yet some 860 people from all over the world made it their priority destination for the four days from Sunday 9 through to Wednesday 12 December.



After 43 years, 'WinterSim' took the plunge and headed out of the US and into Europe although, to be fair, the Berlin Intercontinental Hotel would have been very much at home in any US city. By coincidence it was around the time of the first 'WinterSim' that I first came across 'simulation' when Professor Tocher gave a talk to the Sheffield University Mathematics Society (SUMS) at which he said that he doubted simulation would last another five years believing it would be replaced by analytical methods.

Arriving into Schoenefeld (SFX) airport at 9pm Sunday evening is probably not the best introduction to this rather magnificent city. The fairest description of the airport is 'basic'. It was the old East Berlin airport and has for many years been scheduled to be replaced so has suffered from minimal investment. However, unlike Bristol (BRS), Schoenefeld has an excellent rail link into the city. The RB14 runs to the Zoological Gardens at the western end of the Tiergarten.

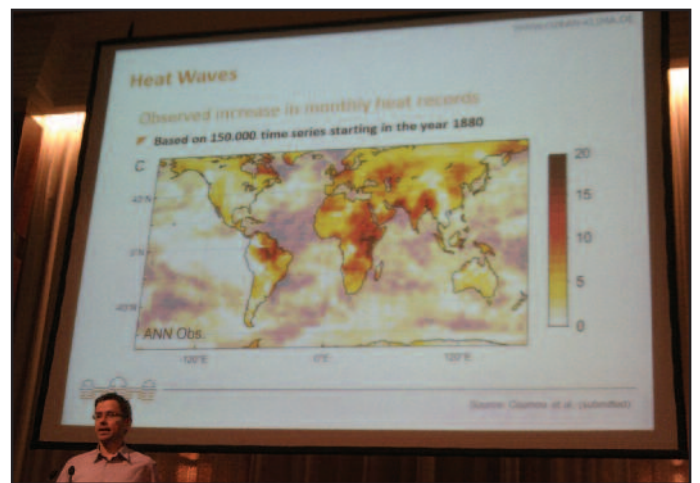
Unfortunately, I missed the tutorials on the Sunday but caught the opening sessions on Monday. These started with an appreciation of the life of Jerry Banks who, after over 35 years of service to simulation, died in September at the age of 63. This was followed by the presentation of awards for best paper, best student paper, best case study, best publication, life time achievement, distinguished contributions and distinguished service and bar.

WSC follows a very similar format to many other conferences with keynote papers, plenary sessions and a whole load of parallel sessions. There are also several poster sessions available where one can discuss the research work that students are doing and, of course, there are sponsors/vendors stands of which there was a very healthy number and without whom the conference would have cost an extra \$150 per person.

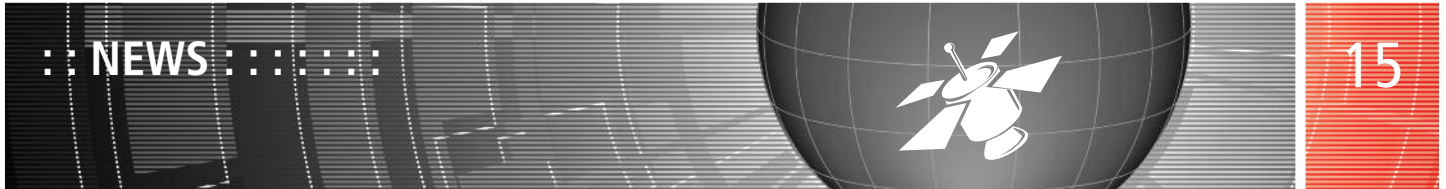
Probably the biggest difference between this WSC and the previous 43 was the high numbers of non-US delegates (nearly 80%). Indeed, the US was beaten into second place behind Germany for the number of attendees (191 v 241) with the UK a long way behind in 3rd place with just 51. In total some 53 countries were represented. Apparently there were 154 sessions over 23 streams representing the work of around 1200 authors.

Unlike our conferences, all of the 340 papers presented had to be submitted in full to undergo peer review requiring three editors and over 100 external reviewers. All papers are also published in full. Looking at the lists of WSC board, conference committee, chairs and program committee members clearly there is a vast army of people working behind the scenes.

Most of the people that I knew were academics or sponsors. I have no idea what percentage of the attendees were practitioners but I got the impression that there were not that many of us. Although the pouches containing the badges were large, the affiliation required one to have exceptionally good eyesight or risk being accused of spending too much time navel gazing!



The opening keynote address *Climate Change – State of the Science* given by Professor Stefan Rahmstorf was almost a case of *déjà vu* all over again. It was particularly interesting as it was very closely related to this year's Blackett Memorial Lecture (see January's issue) and Chris Dent's plenary at OR54 (see December's issue). Stefan's paper dealt with issues primarily concerned with the effects of climate change on the oceans and how these might also affect the rest of the world. It unfortunately gave a very depressing story: the



decade 2001-2010 was the hottest on record with several of the hottest summers ever recorded and somewhere near the 6 region of the normal distribution. This is almost certainly due to the very high CO₂ levels which are some 30% higher than they have been at any time during the past one million years. As a result the oceans are also around 30% more acidic than at any time in the same period and this is already having a serious effect on plankton levels, coral reefs and crustaceans.

There were several papers on sustainable energy, particularly wind and photovoltaic (PV). These ranged from how to maintain wind turbines particularly those off-shore in the freezing waters of the Arctic and north Atlantic oceans around northern Norway to how to cope with sudden surges in supply (to the grid) when the sun comes out or the wind picks up. With something like 12 million (and growing) PV panels in Germany, balancing supply and demand is becoming a serious problem. Walking through the Tiergarten covered in snow on a still, cold, overcast day there was very little chance of such an overload happening either from PV or wind, indeed, the exact opposite was most probably occurring with gas turbine powered stations being fired up to meet the deficit.

As far as I could tell, the experiment of taking WinterSim out of the US was a success but, alas, it will be at least 5 years before it is repeated. Having not attended one previously, I am unable to compare it with those held in the States but I can truthfully say that none of the people I talked to had anything but praise for the experiment and may I say a big 'thank you' to all those people who helped to make it so enjoyable.

<OR>

TWG NEEDS YOU!

GAVIN BLACKETT, SECRETARY & GENERAL MANAGER

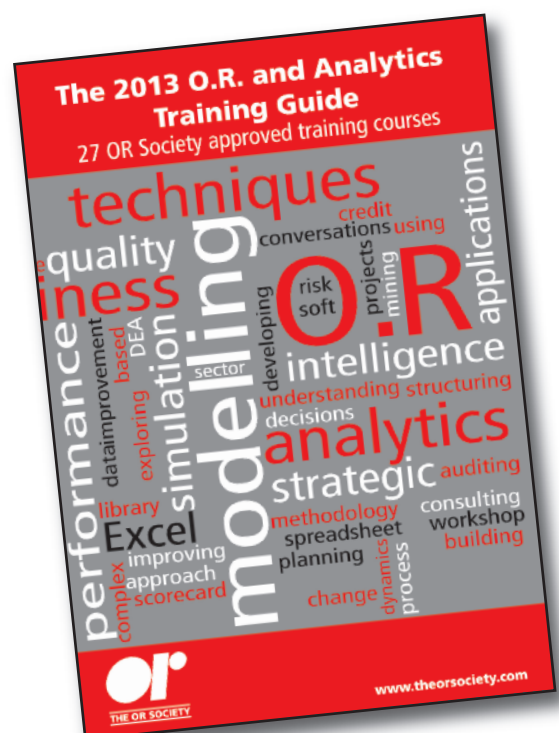
As far as The O.R. Society goes, TWG is the Training Working Group.

TWG is one of the less publicised of the Society's working bodies, and it's also one of the smaller ones. Martin Keys of Dstl and Alison Read of the Ministry of Justice make up the volunteer section of the Group, along with the press-ganged duo of Jennie Phelps and myself.

TWG's remit is pretty straightforward; decide which training courses should be offered as part of the programme from year to year. We consider the feedback from delegates on the courses that have run, the track-record of courses we've offered in the past and potential new areas of O.R. where new courses might be offered to extend the skills and awareness of the Society members. I'm sure you'll have seen the red and grey A5 booklet setting out the 2013 programme.

TWG is looking to increase its size. Would you like to give your time to help run and develop our training programme? We're specifically looking for a practitioner working in the private sector, and possibly someone who is relatively new to the profession. A new volunteer would need to commit to two meetings a year – generally in February and June. If you think you can help, please get in touch with me at gavin.blackett@theorsociety.com

<OR>





A TRIP AROUND THE BASEMENT - THE 2012 GOVERNMENT OPERATIONAL RESEARCH SERVICE (GORS) CONFERENCE

IAN MITCHELL, O.R. UNIT, DEPARTMENT FOR BUSINESS INNOVATION AND SKILLS.

GORS Conferences at BIS may now be a tradition.



Viv Raven starts the GORS Conference

GORS is the professional organisation for all those in O.R. posts in Government, except for the Ministry of Defence and its agencies. GORS facilitates the management and development of some 450 Government O.R. analysts across 25 Government Departments and agencies.

After the innovation of 2011 it seemed natural to descend the seven floors from the O.R. Unit roost in 1 Victoria Street to the basement, where the crowd gathered in the Westminster Conference Centre. GORS format 'postcards' using a standard PowerPoint template outlined projects across government from multiscreen displays behind the O.R. Practitioners who had carried them out.

It is encouraging to find familiar problems being addressed by similar means in different settings. Outside the day job at BIS I have been the Treasurer of the OR Society so it was good to see the O.R. community within Government sharing a common interest in raising the profile of O.R. in academia, industry and government.

The mix of plenaries and streams gave many potential routes around the basement. My trip started with Richard Allison's summary of a week in the Department of Environment Private Office. Alastair Brown explained how dinosaurs still walk the earth, with O.R. practitioners as the Velociraptors, the practical thinkers of Jurassic Park, amongst Triceratops, Brontosaurus and Barney in his description of O.R. in the Cabinet Office Implementation Unit. Geoff Royston, recently of GORS, and now the President of the OR

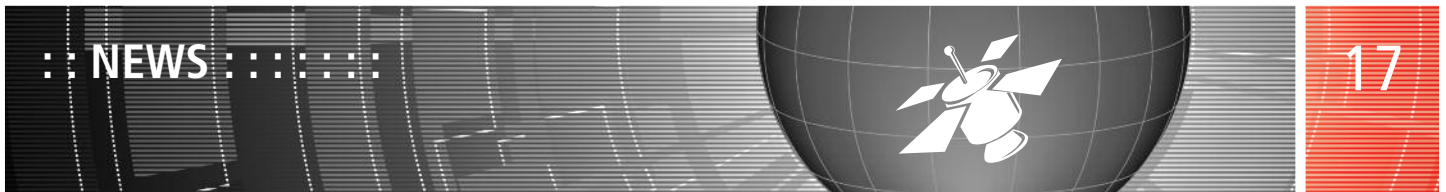
Society drew on many visual references to consider the place of O.R. in the Real World, raising the questions he had put to the OR54 OR Society conference in Edinburgh. Tony O'Connor considered how Operational Research threads its way through many areas.



Tony O'Connor provides some answers

I listened to Kirsty Bosley describe the use of process maps to determine Police and Fire Reform in Scotland. John Williams described simulation of the claims journey for Tax Credits with Simul8, the software featured at the 2011 GORS conference. I then moved from audience to stage to describe the growing use of Causal Loop Diagrams to develop concepts and communication amongst O.R. clients and their stakeholders. This included BIS work and cases gathered from West Point to Vilnius. The discussion following the presentation is a great form of peer review.

On Day Two the success of Transport for London O.R. enabling the Olympics as briefed by Sandra Weddell was a splendid example of analysis and communication with thousands of people, whose travel choices were of such concern during the Games. Back in the streams DWP's Tanya Powell described analysis on the forecasting of Working Age Benefits and Universal Credits. Professor David Oxenham introduced frameworks for Systems Thinking and Shakeel Khan described predictive analysis in HMRC. The winners of the 2012 OR Society President's Medal, Dr Patrick Rose and Colin



Geoff Royston poses questions to GORS

Marston, described a game of war and peace - the Peace Support Operation Model (PSOM). As the Secretary of the Cornwallis Group, which hosted a demonstration game in April 2006, it was

heartening to see PSOM's success and the recognition of O.R. practitioners in the complex field of Peace Support Operations.

Richard Goulsbra reflected on applications of Multi Criteria Decision Analysis to Universal Credit whilst Steve Dempsey described painting with numbers, comparing data visualisation with infographics. The final sessions centred on the quality of O.R.

GORS has a smaller population than the OR Society but both share common interests in the strength of O.R. and knowledge about O.R. The overlaps in 2012 were particularly striking. For Service and Society presentations, questions, interactions and discussions assure the descriptive, predictive and prescriptive analytics in use across and beyond Government.

For more information about GORS, the website is www.operational-research.gov.uk.

<OR>

HACKING STORY ENDS IN SUICIDE

GAVIN BLACKETT, SECRETARY & GENERAL MANAGER

Back in September 2011, *Inside O.R.* reported on a hacking incident where over four million academic papers, possibly including those published in JORS, were downloaded. The case, due to go to court in April, took a tragic turn with the suicide of the main protagonist, Aaron Swartz.

Swartz, 26, was found dead in his New York apartment on 11 January. He was accused of downloading millions of documents from JSTOR through the MIT network with the intent to distribute them. Both JSTOR and MIT had decided to drop the charges, but the U.S. Attorney's Office decided to pursue the case which was due to go to court on 1 April 2013. Swartz' family suggests the blame rests with the authorities: 'Decisions made by officials in the Massachusetts U.S. Attorney's office and at MIT contributed to his death,' Swartz' family and partner wrote in an official statement. 'Meanwhile, unlike JSTOR, MIT refused to stand up for Aaron and its own community's most cherished principles.'

Swartz co-authored the now widely-used RSS 1.0 specification aged 14, founded *Infogami* which later merged with the popular social news site *reddit*, and completed a fellowship at Harvard's Ethics Center Lab on Institutional Corruption. In 2010, he founded *DemandProgress.org*, a campaign against US internet censorship bills.

His death has prompted much in the way of both tributes and protests; a hacking group took credit for taking down MIT's network for three hours and signatures on an online petition had passed the minimum threshold required for to prompt an official review and response from the White House.

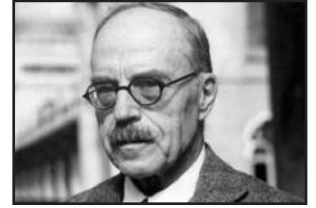
<OR>

'Decisions made by officials in the Massachusetts U.S. Attorney's office and at MIT contributed to his death,'

SIR HENRY TIZARD PART 7

JOHN CROCKER

Sir Henry accompanied by three senior officers representing the forces took the flying boat to North America in August 1940 on what became known as the Tizard Mission.



As always, he made a great impression wherever he went with his willingness and ability to talk to one and all in their own language displaying both a broad and an in-depth knowledge on ever subject as well as recognising the difficulties each was facing.

The Mission took him first to Canada for one week where he kick-started both industry and academic research into supporting the war effort giving them a clear understanding of what the priorities were and where they should direct their energies to be most effective.

From Canada, Tizard moved to Washington on 21st August where he was joined by Dr C.J. Mackenzie, President of the National Research Council of Canada. They were met by Lord Lothian, British Ambassador and Brigadier Charles Lindemann (Frederick's brother). Tizard set up his HQ in a hotel and was rather annoyed to find no preparations for his visit had been made – no office, typist, etc. Few knew why he was there and he also discovered that there were already many groups dealing with various aspects of Anglo-American cooperation, needless to say, in a totally uncoordinated fashion.

On the 26th, Lord Lothian took him to the White House to meet with President Roosevelt, whom he described as having a most attractive personality. Two days later he met with Dr Vannevar Bush, Chairman of the National Defense Research Committee over dinner at the Cosmos Club. Bush explained that he was not free to discuss the work of the Special defence Committee at that time (as the NRDC had not been authorized to discuss anything with the British, although Bush was also unable to tell him this).

Cockcroft, Bowen, Faulkner, Wallace and Pearce joined him on September 8th. Although there was a number of little, mainly legal problems, by and large the people they had to deal with were friendly and anxious to co-operate. It became clear very quickly that the US were a long way behind the UK with radar but had a good radio navigation system and on radar aids (directing search lights and gun-laying). They had also developed an impressive blind landing system which Tizard tried out in the air which proved to be not quite so simple as it looked but with practice, he felt it would be very beneficial.

Cockcroft and Bowen were in discussions with MIT which primarily centred round the magnetron. The Naval Research Laboratory had been experimenting with klystron 10 watt transmitters; the magnetron would enable then to increase this by 1000 times. The result of their discussions led to the creation of the Radiation

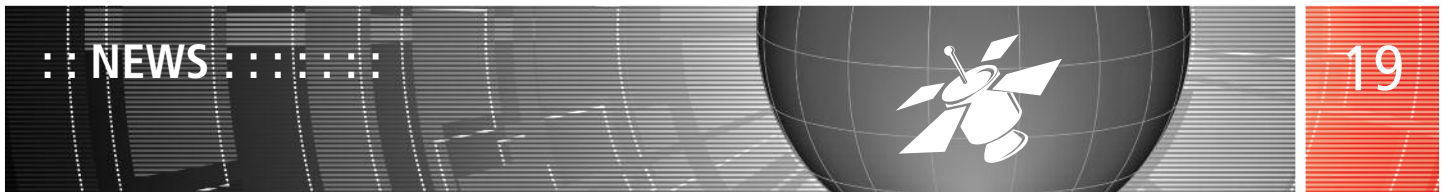
'My associates and I found Sir Henry to possess one of the most capable minds in England in his approach to these complex problems'

Laboratory at MIT which agreed to concentrate their efforts on an airborne radar system with Cockcroft staying behind until December to assist. They also established the British Commonwealth Scientific Office in Washington which would form the links between the USA, Canada and the UK for the exchange of information.

Tizard returned on the clipper via the Azores on 5th October arriving back in London after the Battle of Britain had been won due in no small part to the radar chain although at the time, it was at the height of the blitz on London. His first task was to move back into Imperial College and ask for a casualty and damage report. So far they had been lucky with no casualties but an unexploded bomb had hit the boiler has damaging a number of pipes but these had been repaired by two men even before the bomb had been defused working a few yards above it. Tizard immediately sort out the two men and thanked them personally, something he was always very keen to do.

In November, Tizard made four recommendations: radar experts should be sent to Canada to aid production; samples of all new equipment should be sent to both the USA and Canada; all new equipment should be tested under operating conditions in Canada and; any new devices developed in the US should also be sent to Canada for testing. This worked very well increasing cooperation and the development of new equipment throughout the war and beyond.

At this juncture, Tizard found himself in a rather awkward situation. Although he was still Chairman of the Aeronautical Research Committee, his work with the Mission had technically ended with the issue of his report and his various Scientific Committees had dissolved. He was, in effect, an unofficial adviser to many of the advisers. Although the Battle of Britain had been won, it would be



some time before the part that radar and hence Tizard had played in it would be fully recognised and understood. Newall as Chief of Air Staff was replaced by Sir Charles Portal who had no need of Henry's services. Dowding had also been replaced. The Luftwaffe continued to bomb British cities by night but, for the time being, at least, the threat of an invasion had been averted. But Tizard's influence was far from over.

Curiously, much of this was through Beaverbrook (Minister of Aircraft Production - MAP). On the face of it, these two people were complete opposites: Beaverbrook was a political animal with a love of money and power; Tizard saw politics as 'an evil smelling bog' (to quote Roseberry) and had no interest in making money – whilst he was still employed as Rector of Imperial College he accepted no payments for any of his government work. There was much about Beaverbrook that Tizard disliked but he did recognise him as a 'war winner' and later praised him as someone who had the ability to get things done.

Beaverbrook asked Tizard to take over on 'an unofficial, temporary, and advisory basis' Air Marshall Freeman's role in the MAP on research, development and production. Tizard wrote back saying he would be willing to do so until the end of the month (November, 1940) but advised him that he still had a number of other activities so would not be able to give it his full and undivided attention. Tizard continued to act in this capacity for another two and a half years.

Despite this caveat, Tizard, needless to say, threw himself wholeheartedly into this new job. Within days he was reporting on blind landing aids, radio research and the Whittle Scheme (jet propulsion). He appointed William Farren as the new head of R.A.E. Between the 10th and 16th December he visited 'unofficially' the Martin-Baker Aircraft Company (High Denham, Middlesex), Boscombe Down and Middle Wallop (Wilts), Gloster Aircraft Company (Hucclecote, Gloucs) Vickers-Armstrong (Blackpool, Lancs), Marine Aircraft Experimental Establishment (Helensburgh, Glasgow).

By the end of 1940, Tizard was well established with his own office, scientific assistant, secretary and yellow Rolls-Royce from the Ministry pool, subsequently replaced by a Packard. Tizard's office was, to quote one of his scientific assistants, '...rather like a bus-stop' with a constant flow of visitors from when he arrived punctually at 9:30am until he left. Many of these were Americans asking for his help in sorting out their problems. Lord Tedder said of him at this time, 'He didn't suffer fools gladly and there were a lot of fools around at that time.'

Much of Tizard's time was taken up with the collaboration with the US. Britain was still very cautious – the US was still at this time 'neutral' and there was no guarantee that information passed to the US would not find its way into the hands of the enemy. One of the difficulties he was in was that he had no authority and to overcome this he set up [yet another] committee to meet regularly to address such matters.

Tizard was very much a man of principles which did not always

'He didn't suffer fools gladly and there were a lot of fools around at that time.'

make him friends but people knew where they stood with him. They knew that his judgement would be made in good faith without fear of bias or for any personal gain. This proved to be invaluable in his dealings with the US.

Although he was very keen to promote collaboration, this was by no means unconditional. He did not feel that information should be given over about any new equipment that had not, at that time, been used in action. He also believed that information should only be given if it would lead to technical co-operation that would result directly in hastening development. In particular, for example, he was not in favour of passing across any information on the Whittle [gas turbine] engine. By June 1941, however, he was of the opinion that the US work on turbo-superchargers put them into a position where they could now add benefit to this project and recommended a full exchange.

At this time, Lord Portal, Marshall of the RAF said of Tizard that he was a 'good lubricator'. Bennett Archambault, his sort of US opposite number, also said of him, 'My associates and I found Sir Henry to possess one of the most capable minds in England in his approach to these complex problems'. By the time the US was dragged into the war in December 1941, US scientists were (to use modern jargon) 'well up the learner curve' with the result that they were able to 'hit the ground running'.

When Colonel Moore-Brabazon took over from Lord Beaverbrook (who moved to Minister of State) he recognised that Tizard should become Chief Scientific Adviser to the Ministry and a member of the Air Council in order to create a bridge between the Air Ministry and MAP. In practice, however, little changed: Tizard was still technically not employed by the government (indeed, it was pointed out in 1947, that he had not actually been a 'Government servant' since 1929 when he had resigned from the DSIR.

In 1941, Churchill wrote that he intended to propose Tizard should be made a Knight Grand Cross of the Order of the British Empire. Tizard wrote back declining, 'I would prefer no public recognition during the war'. Lindemann had no such scruples and happily accepted his baronetcy becoming Lord Cherwell of Oxford to which Tizard's only comment was 'Anyway, the Cherwell is a small and rather muddy stream.'

PRESIDENT'S MEDAL 2012

NIGEL CUMMINGS

The President's Medal is one of The OR Society's most prestigious awards



Colin Marston and Geoff Royston

The President's Medal is awarded for the best practical application of O.R. submitted to the competition (a wide definition of O.R. is used). Entries are welcomed from both industry based O.R. workers and consultants as well as from academics. One of the main qualifications for entry is that the work has been implemented before submission.

- Criteria for judging include:
- The level of demonstrable benefit
- The intellectual and novel content of the solution
- The likely longevity of the solution
- The excellence of the O.R. process

The winners of this award are selected during our national conference which is held in September of every year. Three President's Medal presentations were given during the 2012 national conference – they were all of an extremely high standard.

The two runners-up were: 'Modelling Demand and Performance in HMRC Call Centres' presented by Stephen O'Donnell, HMRC and; 'Decision Analysis in Nuclear Decommissioning: development in techniques and stakeholder engagement processes' presented by Simon Turner who worked with Stephen Wilmott both from Magnox Ltd. Both papers were well received and both received a significant number of the votes cast by the audience

The winning paper, however, came from Dr. Colin Marston and Dr. Patrick Rose, DSTL. Their presentation was called 'From Operational Research to Operational Planning: shaping the NATO plan for Afghanistan'. It illustrated how during 2011, Dstl deployed two teams of civilian volunteers to Afghanistan to directly support military planners in shaping NATO operations and how the Peace Support Operations Model (PSOM) was developed. This was a research-based decision support tool for examining operations and outcomes in complex environments such as Afghanistan.



Patrick Rose and Geoff Royston

PSOM was originally designed to inform future UK strategic planning, but it was also employed in Afghanistan within a new and bespoke O.R. Process. This simulated the planning, execution and assessment of real-world operations, giving senior military and civilian decision-makers clear direction and insights that continue to influence and shape the NATO campaign plan in Afghanistan.

Their paper provided an overview of PSOM and its development into a decision support tool used for Ministry of Defence strategic planning and force structure analysis. It then detailed the tactical, organisational and validation challenges that the Dstl team had to overcome in order to utilise PSOM to support real-world military operations

Geoff Royston, OR Society President, said: 'This was work done in the field in Afghanistan in combat conditions, not the easiest conditions to do research working, and I saw from the work they presented at the conference how influential they had been in working with military commanders and service personnel in actually trying to work out how to plan military operations in that area.

'This paper provided an overview of the decision support tool used for Ministry of Defence strategic planning for structural analysis and detailed the technical organisation and validation challenges that the Dstl team had to overcome in order to utilise this to support real-world military operations. It concluded by offering a brief overview of the of the planning conferences conducted with the Joint Command during 2011 and gave an assessment of how this type of O.R. supported, refined and shaped the cross – Afghanistan campaign plan executed at the present time security transition from NATO to local security forces.

'So I think this is a very worthy winner of the President's Medal, harking back to the early days of Blackett and wartime O.R. and bringing it up to the current day.'

THE STAFFORD BEER MEDAL 2012

NIGEL CUMMINGS

This award is named in memory of Stafford Beer, a world leader in the development of systems ideas, especially management cybernetics, and President of the OR Society 1970-71.



Stafford Beer



Reeva Lederman and Robert B Johnston

system used in air traffic control, the Kanban system and whiteboard systems used in hospital wards.

Lederman and Johnston showed, using a case study of a manual whiteboard-based bed allocation system in the ICU of a large general hospital, that it was inappropriate to consider this as a 'decision support system' but should be treated as a 'situated choice support system' (SCSS). Whereas DSS is concerned with the consequences of alternative actions, SCSS is aimed at reducing possible actions thus limiting the number of feasible solutions.

The findings of the research detailed in the paper, warned of the danger of uncritically applying the DSS design paradigm to supporting action choice in skilled routine work, and provided an alternative design theory, which could potentially inform new ICT-based designs. This research was judged to have made a significant contribution to the understanding of effective manual systems in control and the implications in Information Systems design.

Unfortunately, neither of the authors was able to attend the event so their awards will be forwarded to them.

<OR>

The Stafford Beer Medal is awarded in recognition of the most outstanding contribution to the philosophy, theory or practice of Information Systems and / or Knowledge Management published in the *European Journal of Information Systems (EJIS)* or *Knowledge Management Research & Practice (KMRP)* within the relevant year.

The 2012 recipients for this award were: **Reeva Lederman** and **Robert B Johnston**, Department of Information Systems, University of Melbourne for their paper published in the *European Journal of Information Systems (2011)*: 'Decision support or support for situated choice: lessons of systems design for effective manual systems'. This paper concerned systems in which the priority of the various 'players' can change dynamically such as card-based systems in emergency despatch, the paper flight progress strips

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GOODEVE MEDAL 2012

NIGEL CUMMINGS

This award was named in memory of Sir Charles Goodeve, one of the founders and pioneers of civilian Operational Research after WWII and a leader for many years of the O.R. Club and Society.



Roy Johnston and Adit Sheth receiving the Goodeve Medal on behalf of the team from OR President Geoff Royston

The Goodeve Medal is awarded in recognition of the most outstanding contribution to the philosophy, theory or practice of O.R. published in the *Journal of the OR Society (JORS)* or *OR Insight (ORI)*, within the relevant year.

The medal for 2012 was awarded to Roy Johnston, Estelle Shale, Adit Sheth, Ray True, and Sukhbir Kapoor for their paper: 'The breadth and range and depth of stock forecasting inventory management at Euro Car Parts Ltd', which was published in the *Journal of the Operational Research Society (JORS)* - Volume 62.3.

The paper described in detail the distribution of car parts from a single warehouse through many branches. The car parts market in the UK is very competitive and providing a high level of service is vital. It is sometimes overlooked that service has at least two dimensions, namely having a wide range of parts to meet the needs of the customers ('breadth of stock') and secondly, having an adequate and well balanced quantity of stock to meet the demand many businesses face ('depth of stock').

Having a lot of stock of only a few items would be as unsatisfactory as investing in a very wide range of parts but having too few of any part, irrespective of its relative popularity. The paper discussed the two issues of depth and breadth of stock which were recognised to be important and the approach adopted which allowed a linkage to be established between different facets of service.

The aim of the company is to ensure that every requirement of every customer will be satisfied in a single visit (i.e. a one-stop shop). With many thousands of parts and over 20,000 customers every week this is no mean feat.

Having established the basic scenario, the paper went on to describe the approach adopted to establish a basis for the breadth of range and how the resulting decision rule was extended to determine the depth of stock. This process was applied at the different levels of the internal supply chain and required considerable adaptation of standard forecasting techniques, which were outlined. The paper concluded with some specific implementation issues and developments.

The judges described the paper as an excellent case study which had a real and sustained impact on the client company. The work demonstrated that theoretical developments can lead to significant benefit to the real world so long as researchers and managers collaborate closely to address the practicalities.

<OR>

'Having established the basic scenario, the paper went on to describe the approach adopted to establish a basis for the breadth of range and how the resulting decision rule was extended to determine the depth of stock.'

PHD PRIZE 2012

NIGEL CUMMINGS

The prize, for the 'Most Distinguished Body of Research leading to the Award of a Doctorate in the field of O.R.', is an annual one, with the award being made at the OR Society's Annual Conference in September.



Richard Wood and Geoff Royston ORS President

The qualifying period is the calendar year in which the PhD or DPhil is defended or approved. The thesis being submitted for consideration must have been examined at a UK University within the relevant time period. The OR Society invites people to submit entries for the best doctoral dissertation in O.R. With a prize fund of

up to £2500 plus conference places available for the winner and runners-up, this represents an exciting incentive for PhD students.

The winner for 2012 was Richard Wood, Cardiff University. His Ph.D. project detailed in his thesis was entitled 'Modelling activity at a neurological rehabilitation unit' was undertaken in collaboration with the National Rehabilitation Hospital for Wales. He developed a multiserver queuing model for this hospital incorporating intensive treatment. His queuing model was used in combination with a multi-objective optimisation procedure that produces the treatment intensity levels by matching patient demand with staff supply.

The external examiner commented that the new insights in Richard Wood's thesis were impressive and his work had made a major impact in the function of the hospital unit. Richard worked closely alongside hospital staff while he was doing his Ph.D. to ensure that the model would be used and be of benefit to the hospital's organisational processes.

The external examiner also found the thesis was a 'pleasure to read' and the content was presented in an eloquent manner. The awards panel was impressed with this type of research which used appropriate theory to help provide a real-life 'practical' application.

<OR>

O.R. COMPANION RECEIVES CBE

GAVIN BLACKETT, SECRETARY & GENERAL MANAGER

Frank Kelly, professor of the Mathematics of Systems at Cambridge, and the chair of the Council for Mathematical Sciences, was appointed Commander of the Order of the British Empire in the 2013 New Year Honours.



Having been made a Companion of the O.R. Society in 2006, Frank must have thought he'd reached the pinnacle of awards in his illustrious career. He must have been delighted, therefore, to be recognised at an *even* higher level when he heard news of his CBE.

Frank has made sustained and outstanding contributions to operational research - in queueing theory, in analysing the performance of telephone, road traffic and other networks and in mathematical modelling of the internet. This recognition of his contribution, not only through his research but also in his extensive service to the research community, is warmly welcomed.

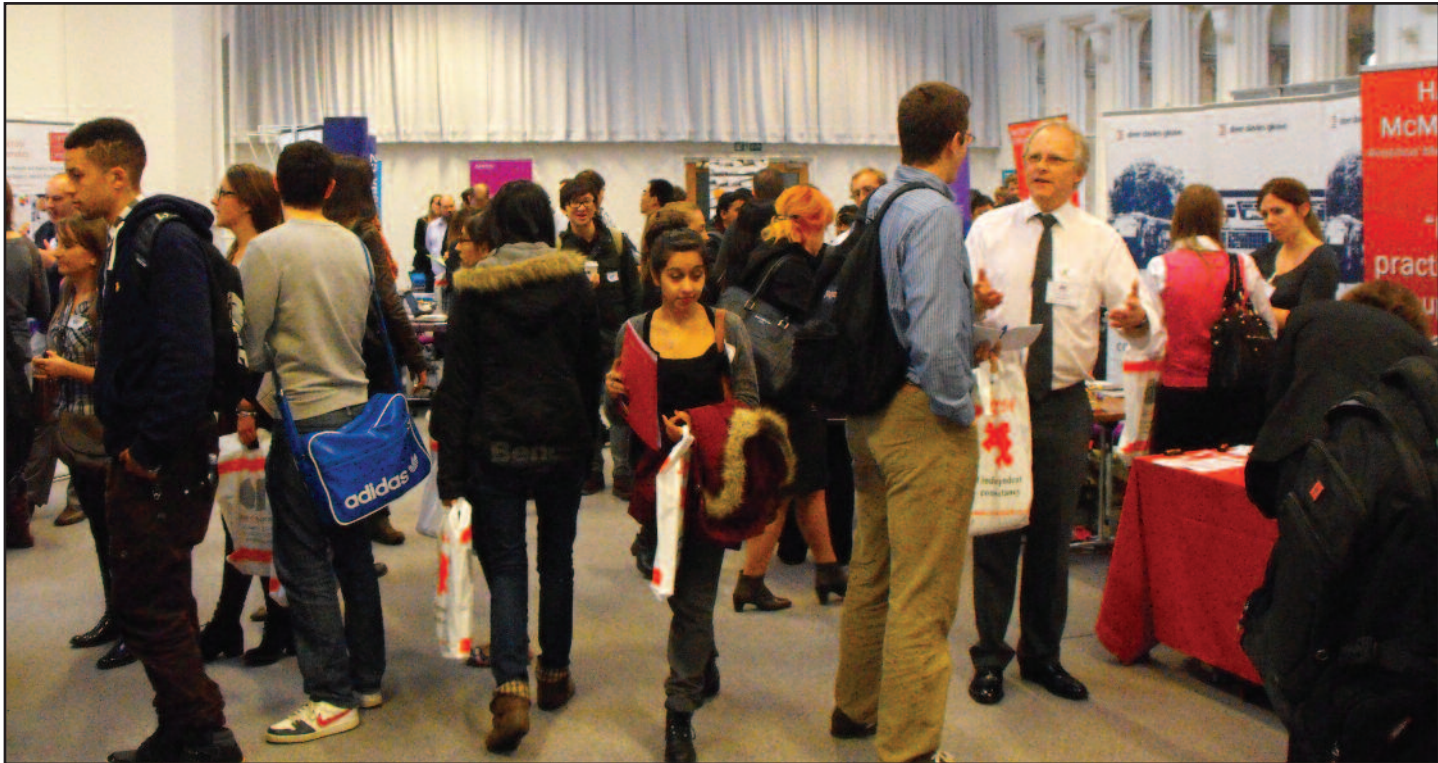
<OR>



CAREERS OPEN DAY

LOUISE ORPIN, EDUCATION OFFICER

Demand for O.R. careers still strong



Another successful Careers Open Day took place on 21 November 2012 in Nottingham. The venue, Nottingham Conference Centre, provided a great setting for the day and the room, the Old Museum, where the exhibition took place was stunning in contrast to the underground bar at the University of Birmingham (where previous Open Days have taken place).

This year's event saw a good variety of exhibitors, many thanks to:

- Atass Sport
- British Airways
- Capgemini
- Cardiff University
- Centrica (British Gas)
- CORDA
- Dstl
- GORS
- Hartley McMaster
- IBM
- Lancaster University
- LANCS Initiative
- NATS
- Prospect Recruitment
- RBS
- Steer Davies Gleave
- University of Southampton
- University of Westminster

Despite the rain and the Nottingham traffic we had a good turnout of students with about 250 attending. This would not have been possible without the continued support of universities promoting the event and even putting on coaches to bring their students on the day.

Feedback from the students indicates that they really value being able to talk to employers face to face to discuss recruitment opportunities and the application process. There were a high number of undergraduate mathematics students so having the postgraduate course providers there was very useful.

Geoff Royston gave a very good opening talk about his life in O.R. and gave the students some food for thought when considering their career choices. This was followed by presentations from Tom Bandy at Dstl and Sabine Veidemane from British Airways. Tom Dawson from GORS and Vicki Chase from NATS provided the afternoon talks.

You can view some of the talks on the Society's website under the Careers Open Day section or visit our YouTube channel, www.youtube.com/user/learnaboutor, where you can also view previous open day talks and the What is O.R.? film. More detailed information about the exhibitors can be found on the LearnAboutOR website under Career Opportunities in the Careers section.

JOURNALS & SPECIAL ISSUE

CALL FOR PAPERS

Call for Book Chapter

We are glad to announce the Call for paper for the edited book 'Business Performance Management' to be published by Cambridge-Scholars Publishing, UK in July 2013.

Further information: http://centrumwebs.pucp.edu.pe/icbpmm/call_for_book_chapter.php

Abstract: International Conference on Business Performance Measurement and Management (ICBPMM) took place in Lima during September 11th to 13th, 2012. The book, entitled 'Business Performance Management' is scheduled to be published in July 2013. However, the publication in this volume is not limited to the contributions presented in ICBPMM 2012. We would like to invite other scholars all around the globe to submit an extended abstract, followed by complete paper to be published in the above edited book.

Important Dates

Extended Abstract Submission: December 31 2012

Authors Notifications: As soon as possible

Full Papers Submission: 28 February 2013

Review Report: 31 March 2013

Final Paper Submission: 30 May 2013

Publication Date: July 2013

SPECIAL ISSUE

The Internet-of-Things: Shaping the new Internet Space CONCURRENCY AND COMPUTATION: PRACTICE AND EXPERIENCE (CCPE)

Further information:

<http://eu.wiley.com/WileyCDA/WileyTitle/productCd-CPE.html>

Abstract: The new version of the Internet Protocol - IPv6 - has astronomically increased the IP address space from around 4.3 billion IPv4 addresses to roughly 340 trillion trillion new IPv6 identifiers. This humongous pool of addresses ensure the continued expansion of the Internet for many decades to come and it realises the vision of everyday objects that are uniquely identifiable and are connected to the Internet – this is commonly known as the 'Internet-of-Things' (IoT).

IoT extends the human-centric view of the Internet market space wherein it was thought that the 'world of humans represented a market space that would reach saturation sometime soon' (Internet Society, 2012); IoT broadens the device-centric view that predominantly considered computing and electronic devices (e.g., PCs, mobile phones, home electronics, smart cars) as the defining elements of the Internet space.

IMPORTANT DATES

Paper submission deadline: 15 January 2013

Authors will receive initial decision and reviewer comments: 15 April 2013

Final papers due date: 15 June 2013

Final decisions: 15 July 2013

Accepted papers are expected to appear online for early view within 4 months of final decision.

SPECIAL ISSUE

Knowledge Management Research & Practice (KMRP) Sustainable Quality: Knowledge and Information Management

Further information:

www.theorsociety.com/Pages/Conferences/KIM2013/KIM2013.aspx

Abstract: This Special Issue, in conjunction with KIM2013 (the OR Society's inaugural Knowledge and Information Management conference) is dedicated to the theme of Sustainable Quality. This wide-ranging topic is relevant to organisations and individuals working in any sector of the economy. Knowledge Management has become a key process in understanding organisations and their use of resources and, ultimately, quality is a major differentiating factor when considering goods and services. Sustaining quality requires taking a strategic view that may present short to medium term challenges and knowledge management should be able to help address such challenges. For large organisations, knowledge management may be seen as an intra-organisation activity, but sustaining quality for small to medium enterprises may require inter-organisational cooperation. Papers that relate to the theme and to knowledge and information management will be welcome. Areas of particular interest include (but are not restricted to) the management, practical application, limitations, implications, lessons learned and challenges related to KM and sustainable quality in the areas of services, education, health and manufacturing.

IMPORTANT DATES (in conjunction with key dates for KIM2013)

KIM2013 conference paper titles and abstracts submitted:

7 December 2012

Full conference papers submitted: 11 January 2013

Notification of outcomes of reviews of conference papers:

1 March 2013

Final manuscripts submitted (for conference): 10 April 2013

Conference: 4-5 June 2013

Final manuscripts submitted for KMRP: 1 July 2013

Electronic publication expected in KMRP: 1 September 2013



ARTIFICIAL INTELLIGENCE KNOWS WHEN PEOPLE TWEET

NIGEL CUMMINGS

Salarix, the social media marketing company has upgraded its analytics product, Amplify, which is a machine learning program that focuses on social networks.



The purpose of Amplify is to search social media for conversations related to your business, but the application now goes beyond just looking for people talking about you. It looks for conversations that are relevant to the products and services you provide. Some of us may consider this rather intrusive analytics, but Salarix seem to think their 'improved' application gives users an even better opportunity to market products in 2013, both from you and to you!

According to Santanu Bhattacharya, Salarix CEO, Amplify allows brands to build preapproved messages and target people that would be interested in them, and enables them to maintain control over messages and avoid 'twitter fires'. Apparently, this is the term given to a situation where one tweet sets off a sort of chain reaction a bit like the old chain letters, I guess.

For those of us interested in what Amplify has on offer, it's best described as an artificial intelligence capable of operating with 'supervised machine learning.' It bases its criteria for locating relevant conversations based on scores given to hundreds of thousands of tweets that have been read through by humans. Based on how the humans scored their relevance, the program can then use that as a basis for improving its performance. Customers can then continue to fine tune it as the program works for them.

Amplify is built around different types of product verticals, in recognition of the way people talk about things. 'People talk

different ways about different products,' said Bhattacharya. 'The way they talk about cars is different from the way they talk about insurance or electronics. Every industry is modelled to make it easier to figure out the tone of conversations and even identify sarcasm.'

He says that context is crucial, too. 'When people are talking about apples and oranges, the program figures out whether they're talking about fruit or about tech companies'.

Of primary interest to marketers apparently, is Amplify's ability to identify influential people talking about conversations where their product is relevant – and send them a targeted tweet. (You really know you're important if a program like this singles you out it seems!)

Amplify even learns about what influential people are interested in hearing or talking about, so that someone who cares about the style of their car but not its fuel consumption for example, aren't going to get tweets about how fuel efficient a car is.

By using artificial intelligence to monitor what people are interested in, Salarix believes that advertising can be made more effective – and less annoying. 'Instead of just putting a banner in a network, Amplify sees what people are talking about before a message is sent.

O.R., ANALYTICS AND THE PUBLIC SECTOR SCORECARD

MAX MOULLIN, SHEFFIELD BUSINESS SCHOOL

O.R. and Analytics professionals are in an excellent position to contribute to performance management.

Their understanding both of cause and effect and of performance measures is particularly relevant. However with certain exceptions, the profession has had limited impact on this important area.

A large number of organisations in the private, public and third sectors make use of the balanced scorecard. Yet many of these do it poorly. Most have little understanding of cause and effect. Some produce a 'scorecard' by thinking up lots of measures and then putting them into different perspectives, rather than starting with the organisation's strategy.

Others use it within a blame culture so that people - or subsidiary organisations - are punished if targets are not met, without discussing what might have caused the problem. They therefore encourage people to achieve a target, rather than what the target is intended to measure. They do not understand that (Moullin, 2009b) and therefore encourage people to achieve a target rather than the intention behind the target.

In short, not only has O.R. and Analytics missed some opportunities to get closer involved in this area, the field of performance management is crying out for the analytical skills and awareness of such professionals so that organisations can get good value from their performance management systems.

One approach which overcomes these problems in the public and third sector is the Public Sector Scorecard (PSS). It has three phases:

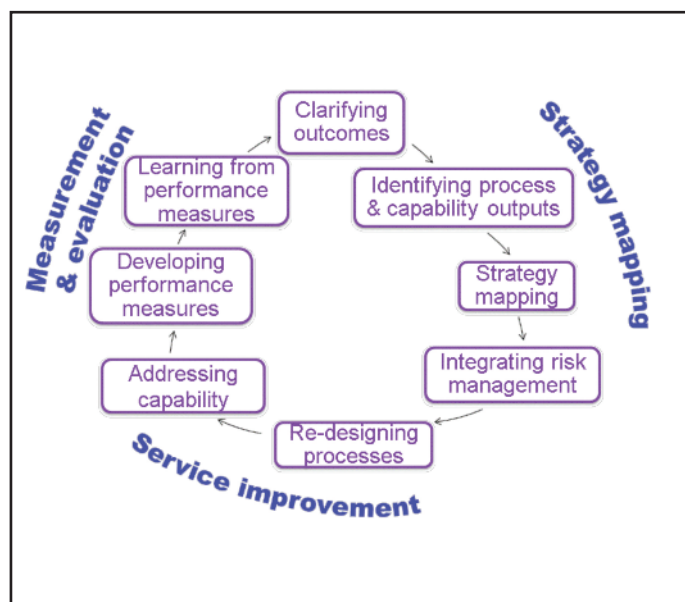


Figure 1. How the Public Sector Scorecard works

strategy mapping, service improvement, and measurement and evaluation - see Figure 1. It focuses on the outcomes that matters to service users and other key stakeholders, including value for money; the processes that deliver these outcomes; and the organisation's capability to support its people and processes in achieving the required outcomes (Moullin, 2009a). The latter includes its organisational culture, the way it manages its people's aims, its resources, and partnership working, all underpinned by effective leadership.

The PSS overcomes many of the issues around measures and targets by ensuring that all measures and targets are based on outcomes or evidenced-based drivers of targets, all measures go through a filtering process to ensure they offer value for money, and most importantly that the organisation adopts a culture of improvement and innovation rather than a blame culture.

The PSS uses a combination of soft and hard O.R. methods. It is workshop based, involving managers, staff, service users and other stakeholders, but supplemented by analysis using process mapping, lean management and other techniques as appropriate.

This outcome-focussed approach has become even more important in today's environment to ensure that services are not compromised by arbitrary cost cutting. It has proved particularly useful in working across organisational boundaries, for example the UK government's Ethnic Minority Employment Task Force and Sheffield Let's Change4Life.

Max Moullin, Centre for Quality and Performance
www.publicsectorscorecard.co.uk

Max is a Fellow of the OR Society and the Chartered Quality Institute and a member of the Healthcare Advisory Forum.

References

- Moullin, M. (2009a) Using the Public Sector Scorecard to measure and improve healthcare services. *Nursing Management*, September 2009, Vol. 16, No.5, pp.26-31
- Moullin, M. (2009b) What's the score? Feature Article, Public Finance, 21 May
 Chartered Institute of Public Finance and Accountancy,

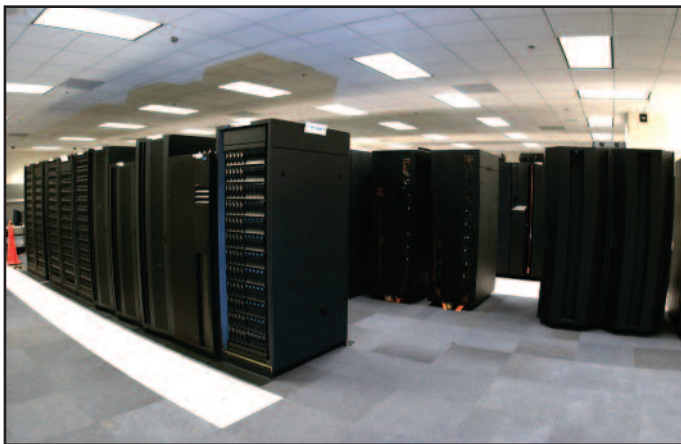
Max Moullin is facilitating an OR Society workshop on 'Improving quality and performance with the Public Sector Scorecard' in Birmingham on 12 March contact Jennie Phelps for more details at jennie.phelps@theorsociety.com



DATA FARMING

NIGEL CUMMINGS

Not a new term, it has been around since the late nineties, 'Data Farming' seems to be entering a domain near you now whether you like it or not! Why? Because it allows for the examination of whole landscapes of potential outcomes, not just a few cases!



Super Computers provide the processing resources necessary for efficient data farming

Conventional data mining will see analysts expending a great deal of effort sifting through enormous amounts of existing information for useful nuggets of information, data farmers grow their own. Researchers typically ask a 'what if' question, build a model and run a simulation thousands or even millions of times. Then they look for trends, anomalies and outliers in the 'grown' data.

Data farming provides the capability for executing enough experiments so that outliers might be captured and examined for insights, yet data farming is not intended to predict an outcome; it is used to aid intuition and to gain insight.

It is a technique which helps analysts identify paths to success. It can for example outperform conventional modelling pathways; consider a relatively simple scenario in which the Red Team is protecting an objective and the Blue Team is trying to penetrate it. Perhaps conventional analysis allows for the discovery, after running the simulation a few thousand times, that Blue achieved its objective in only a few dozen runs.

But conventional modelling may only look at the cases where Blue succeeded in penetrating, and identified what factors enabled Blue to do so. Add data farming to the modelling and you could run simulations where Blue purposely takes that path rather than randomly, to optimise their chances for success. Researchers can also vary the inputs and then restudy the outputs, allowing better understanding of what affects certain things more than others.

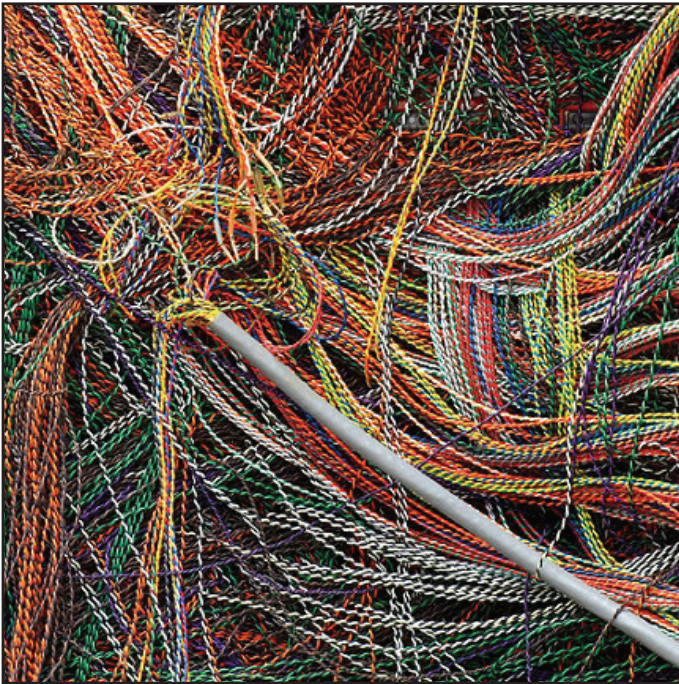
Inevitably anomalous outcomes will crop up in such analysis, and these are often the interesting ones. Finding the cause of why a model behaves in an unexpected way may lead to the discovery of an error in the model, its assumptions or in one's understanding of what is being modelled.

In defence modelling an application called MANA is proving useful to the New Zealand Defence Technology Agency, it can model asymmetric threats to frigates and arrive at a variety of interesting strategies. This may assist stakeholders in identifying the most useful tactical options, some of which would have required considerable lateral thinking to extrapolate from conventional analytical results. By adopting a data farming approach with multiple scenarios, figuring out where a tactic breaks down potentially allows analysts to gain greater understanding of tactical weaknesses and how adversaries might exploit them.

Data farming grows even more useful as problems grow more complex as the numbers of criteria and objectives increase. But a sufficiently fast computer can generate a vast array of possible outcomes and allow analysts to find the most desired ones when utilising the data farming approach.

Georgia Tech Research Institute is working with a data farming team to develop a socio-cultural model for a disaster relief scenario where shortages, lack of sanitation, famine and other factors could incite violence. The goal is to arrive at iterative processes to assist in highlighting emergent behaviour, where something that may seem like a good course of action eventually has unanticipated second- and third-order effects that actually make things much worse. Such insights would not be so easy to come by via conventional data mining and analysis.

Operational Researchers in Germany are developing data farming strategies too, because the use of the technique may prove useful for Germany's Federal Forces. Working in multidisciplinary groups is useful. In practical application, sometimes it is useful to divide large problems up for analysis. Klaus-Peter Schwier, senior manager and O.R. advisor at EADS' Cassidian division recently said. 'We are looking at the same question base under different angles of view, from a very high abstraction to highly detailed truth. We start evaluations in the high abstracted world, looking at the universe, and then we drill down to the highly detailed world. The two methodologies are not competing with each other; they are complementing each other.'



Computer cables

However, the adoption of new forms of analysis and data abstraction must not lead to paralysis through analysis, as with any modelling effort, data farming requires a balance. The model should be as simple as possible, and as detailed as necessary, with the goal being to apply the model, evaluate the results, and then visualise and present the results in a meaningful way.

Combined with global connectivity, data farming could herald a new era in reachback support. A commander in Afghanistan might

for example send a 'what if' to analysts back home, they in turn would number crunch using data farming techniques and send back insight on how to approach the situation as it unfolds.

The Swedish Defence Research Agency is already utilising data farming techniques to evaluate options for expeditionary operations. 'We have found the data farming methodology allows for robust evaluation of existing equipment alternatives using existing or new tactics, techniques and procedures,' said Johan Schubert, Deputy Research Director.

Data farming may also have value in improving acquisition decisions across coalitions by helping national leaders understand their options in aggregating coalition force structure to meet a range of threats. As you may have noticed, there is a trend in the application of data farming – defence! The military have always been 'early adopters' of new technologies and analytical techniques, after all they generally have access to the most powerful computing platforms.

However data farming is likely to arrive at a desktop terminal near you very soon – where it may become the tool of choice in making modelling and simulation more effective for decision makers. Currently the most efficient data farming takes place thanks to the 'number crunching capabilities' of super computers, but developments in office and even home PC technologies, point the way for ever faster, more powerful portable computing platforms accessible to all!

<OR>



Army action in Afghanistan

OR55 IS TAKING SHAPE NOW, SO START THINKING ABOUT JOINING IN!

University of Exeter, 3-5 September 2013!

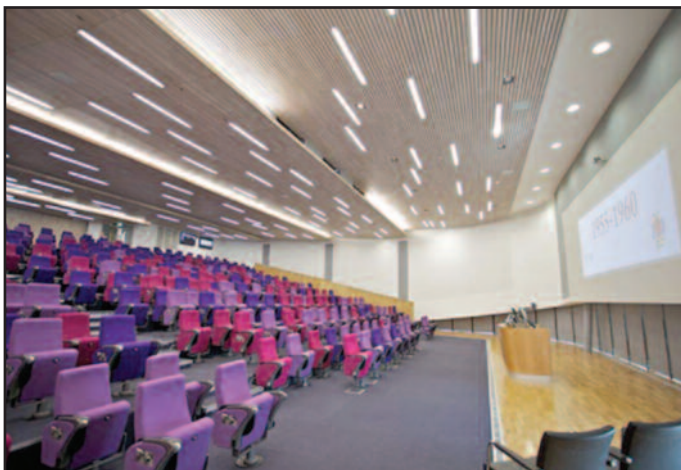


Forum Conference Centre

Voted University of the Year in 2012, the recently built Forum Conference Centre on the Streatham Campus is the location for our Annual Conference, OR55, for which details are now being finalised. The conference pages of the Society's website – www.theorsociety.com/OR55 – are being updated all the time which means that we're ready to receive offers to run streams, offers of sponsorship, booking of exhibition stands and all things conference! Why not start considering the title of the paper you are going to present? We will be open very soon for submissions of titles abstracts.

Would you like to run a stream?

Then we need you, please, to get in touch as soon as you can.



The Lecture Theatre

Proposed streams so far are; Community and O.R., Criminal Justice, Energy, Forecasting, MCDA, O.R. Consultancy and Case Studies, O.R. in Education and Project Management.

Delivering or listening to presentations of papers, plenary talks and keynote addresses are, of course, the main items on any conference agenda. But we also like to include a few recreational events to facilitate networking and leaven the mix. It's customary to arrange a number of visits to local places of interest on the Wednesday afternoon and your OR55 committee is now considering a wide range of potential locations before deciding which to offer.

As ever, one of the social highpoints will be the Conference Dinner which will be held in the Holland Hall restaurant on the Wednesday evening and, in addition to the amazing view across the Exe Estuary, excellent cuisine and wines, sparkling company and very short speeches, it is possible that there could even be some dancing although this is still to be confirmed!

We have an excellent committee so far, with current members being:-

Co-Chairs:

Philip Jones, *Dstl* - prjones@mail.dstl.gov.uk

David Smith, *Retired Member* - davidandtina@endfield.org.uk

Programme Scheduler

Ken McNaught, *Cranfield University* -

k.r.mcnaught@cranfield.ac.uk

Keynote Editor

Ibrahim Kucukkoc, *University of Exeter* -

I.Kucukkoc@exeter.ac.uk

Sponsorship and Exhibition Organiser

Hara Papachristou, *Lanner Group Ltd* -

HPapachristou@lanner.com

Conference Organiser

Hilary Wilkes, *The OR Society* -

hilary.wilkes@theorsociety.com



BLACKETT MEMORIAL LECTURE 2012

NIGEL CUMMINGS

The 2012 Blackett Memorial Lecture was held on 29 November 2012, at the Royal Society Carlton House Terrace, London.



Professor David MacKay at the Blackett Memorial Lecture 2012

The lecture was given by David MacKay FRS, a Professor in the Department of Physics at the University of Cambridge. In 2009, he was appointed the Chief Scientific Advisor to the UK Department of Energy and Climate Change. (DECC)

The title of his lecture was: **2050 Pathways**, it was structured to provide answers to pressing questions concerning energy utilisation and climate change. Part of Professor MacKay's presentation focussed on how easy it might be to get off the fossil fuel habit. He also wanted to highlight how our current energy consumption compared with available sustainable energy options and provide a structure which might make future energy plans that add up.

His talk was an animated rapid fire, straight-talking assessment of the numbers involved with energy consumption, instituting sustainable energy resources and the effects of climate change. He also had time to demonstrate in 'real time', the DECC 2050 Pathways Calculator (see <http://tinyurl.com/2050decc> for more details).

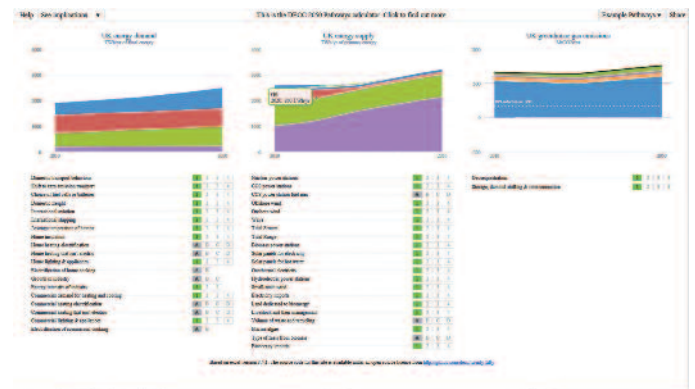
As we saw last month, the numbers are quite staggering. To be self-sufficient using sustainable energy sources we would need to cover about half the UK with wind turbines or a quarter with photovoltaic cells, provided we can find an efficient way of storing the energy produced so it is available when needed. We would need a strip of land about 5 miles wide each side of every road to grow sufficient bio-fuel to replace petrol.

Regarding energy conservation, Professor Mackay said it was necessary for 'people to understand numbers'. Bearing that in mind he wanted to draw our attention to a piece of software that had been developed in the Department of Energy, called the **2050 Pathways Calculator**.

The UK has major choices about how to move to a secure, low-carbon energy system over the period to 2050. For example:

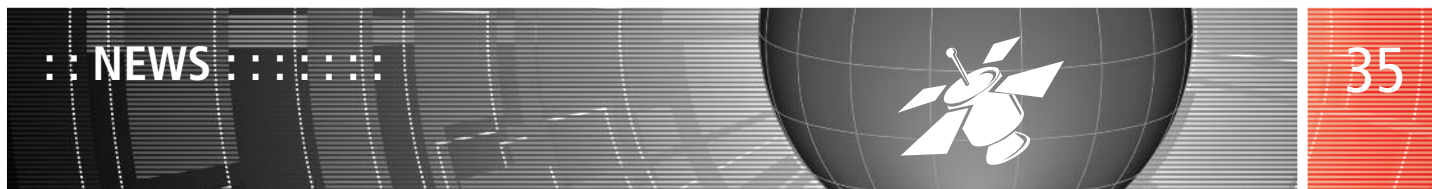
- Should we do more to cut demand?
- Should we rely more on decarbonising the energy supply?
- How will we produce our electricity?
- Which technologies will we adopt?

The 2050 Pathways calculator is a tool with an easy to use interface that provides clear visual depictions that change by adjusting energy usage inputs. It was designed to help policymakers, the energy industry and the public understand future energy choices. It allows those who use it, some insight into the ways we can better manage significant energy uncertainties and help to avoid making long-term decisions that are incompatible with meeting our 2050 emissions target.



2050 Pathways Calculator Screenshot

The tool presents three charts, describing the demand for energy, the supply of energy and the greenhouse gas emissions for the UK. Moving a mouse pointer over the charts, boxes will appear which describe what any particular line in the charts represents. On the bottom right of the screen, there are some key facts around greenhouse gas emissions reductions and energy security.



Geoff Royston with Professor David MacKay to the right during the questions and answers session at the Blackett Memorial Lecture 2012

Below the charts is a list of sectors. For each sector of the economy, four trajectories have been developed, ranging from little or no effort to reduce emissions to extremely ambitious changes that push towards the physical or technical limits of what can be achieved. These are indicated by four numbered boxes. If you click on a number, then that trajectory is selected and the charts are recalculated. This calculator was demonstrated to us in 'real-time' by Professor MacKay.

He told us it had four levels. The first of these assumes little or no attempt to decarbonise or change or only short run efforts; and those unproven low-carbon technologies are not developed or deployed.

Level 2 describes what might be achieved by applying a level of effort that is likely to be viewed as ambitious but reasonable by most or all experts. For some sectors this would be similar to the build rate expected with the successful implementation of the programmes or projects currently in progress.

Level 3 describes what might be achieved by applying a very ambitious level of effort that is unlikely to happen without significant change from the current system; assumes significant technological breakthroughs.

Level 4 describes a level of change that could be achieved with effort at the extreme upper end of what is thought to be physically plausible by the most optimistic observer. This level pushes towards the physical or technical limits of what can be achieved.

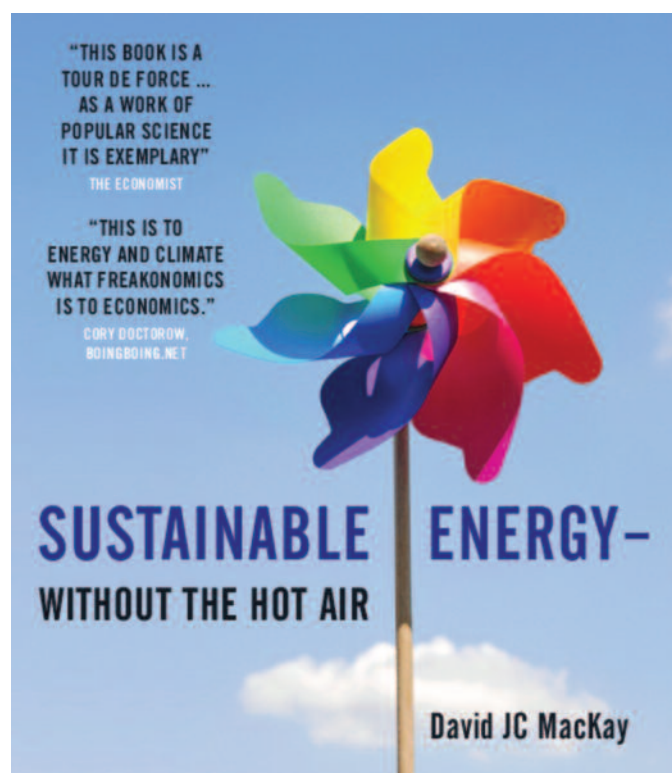
It should be recognised that even at level 2, the consequences of pursuing this effort across several different sectors in parallel will place a high demand on supply chains and skills, especially given that other countries are likely to be undertaking concurrent

infrastructure changes. A pathway containing level 4 ambitions in one or more sectors is likely to have very challenging consequences.

Please see:

<http://webarchive.nationalarchives.gov.uk/20100623194820/2050-calculator-tool.decc.gov.uk/> and <http://www.decc.gov.uk/en/content/cms/tackling/2050/2050.aspx> for more information.

Simply entertaining us and drawing our attention to the DECC climate change calculator is not enough though, Professor MacKay also spoke about a book he had written, which we should all perhaps consider essential reading. His book 'Sustainable Energy - Without the Hot Air' can be obtained from high street and online booksellers in printed form for around £19.99 or less as a paper back (a hard back version is also available). An on-line version is free to download and is available from www.withouthotair.com, or more precisely from a link on the page: <http://www.withouthotair.com/Electronic.html>.



Sustainable Energy - Without the Hot Air

The lecture concluded with a lively questions and answers session in which Professor MacKay responded to numerous questions posed from the floor. For the benefit of those who were unable to attend the 2012 Blackett Memorial Lecture, Professor MacKay's presentation is available to download or stream from our website.

ARTHUR VEINOTT

STANFORD O.R. EXPERT DIES AT 78

NIGEL CUMMINGS

Arthur F. Veinott Jr. Professor of Management Science and Engineering who made major contributions to the theory of O.R. died 12.12.12



Arthur F. Veinott Jr. was born Oct. 12, 1934, in Boston and grew up in Newton, Mass. He earned his BA and BS from Lehigh University in 1956, where he was elected to Phi Beta Kappa. He earned his doctorate in industrial engineering from Columbia University in 1960.

Veinott served in the U.S. Air Force Logistics Command as an operations analyst until 1962, when he joined the Stanford faculty as an assistant professor of industrial engineering. He retired from Stanford in 2009.

In 1965, it was said of him, 'He was without doubt one of the brightest young men in America in the field of O.R.' Later, Yale tried to lure him away with the offer of a full professorship but a similar note urged Stanford to retain him, warning that his departure would create a major gap in the Department of Industrial Engineering and O.R. there.

Instead he became a professor while at Stanford and made major contributions to the theory of O.R. and to its development as a field at Stanford, nationally and internationally. During this time he became a key figure in the creation and development of the

Department of O.R. and served as department Chair from 1975 to 1985. Professor Veinott also helped found the journal 'Mathematics of Operations Research', one of the leading journals for the publication of mathematical contributions to the field of O.R.

In the world of O.R. he was probably best known for three main contributions: lattice programming, inventory theory and dynamic programming. In lattice programming, he developed a type of qualitative optimisation theory to predict the direction and nature of change in global systems. In dynamic programming, he made fundamental contributions to sequential decision-making under uncertainty and created powerful insights and effective policies for determining optimal prices and capacity levels, as well as inventory stocking levels.

Throughout his academic career, Professor Veinott was devoted to research and teaching, publishing 56 papers and guiding 27 students to their doctorates. He received the Graduate Teaching Award for 2000-01 from the Department of Management Science and Engineering.

Professor Veinott completed a trifecta during the 1975-1976 academic year: he began a 10-year tour as Chair of the Department of O.R.; he played a big part in founding the journal 'Mathematics of Operations Research' and; he led the campaign that created the John von Neumann Theory Prize awarded by the Institute for Operations Research and Management Sciences (INFORMS).

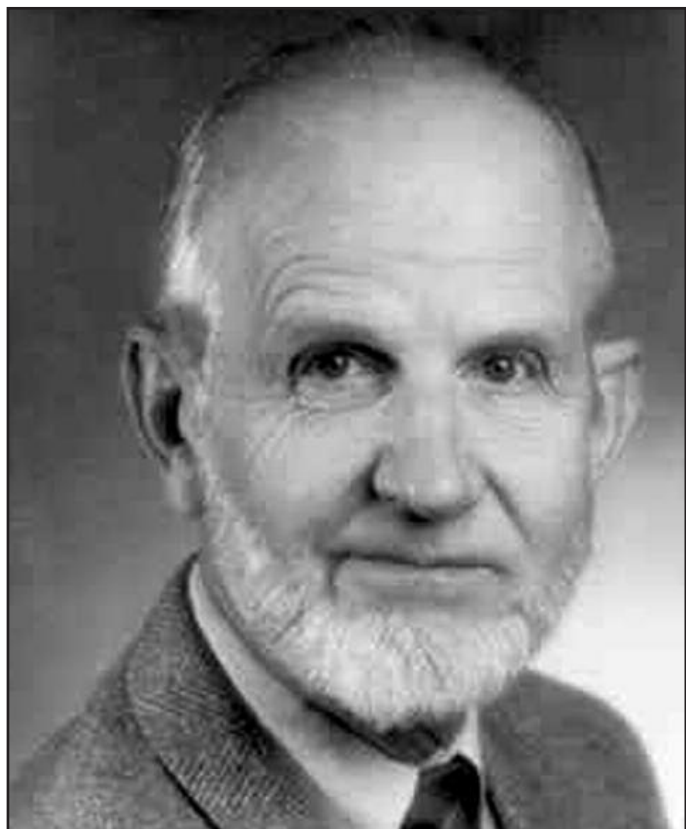
In 2002, Veinott was named an inaugural Fellow of INFORMS, and in 2007, he won the prize he helped create. He was elected to the National Academy of Engineering in 1986, selected as a Fellow of the Institute of Mathematical Statistics, and won a Guggenheim Fellowship in 1978-79.

Arthur Veinott was an emeritus professor in the Department of Management Science and Engineering at Stanford, he died on December 12 2012 at Stanford Hospital. He is survived by his wife, Adriana Diener-Veinott, of Stanford; two children from his first marriage: a son, Michael, of San Jose, California, and a daughter, Elizabeth, of Houghton, Michigan; a sister, Polly Reinacker, of Arizona; and two grandchildren.

CREATOR OF EQUATIONS FOR NATURAL PHENOMENA DIES

NIGEL CUMMINGS

Lars Hormander, the Swedish mathematician who received the honours in his field for his work on the equations that describe natural phenomena, from snowstorms to supernovas, died aged 81 on 25 November 2012



He spent much of his career at Sweden's Lund University and built a reputation as one of the world's foremost mathematicians derived from his efforts to create firm theoretical underpinnings for one of the most important mathematical tools used by scientists and engineers: linear partial differential equations.

Such equations, often extremely difficult to solve, can provide the answers to questions about the physical behaviour of the real world, including weather, electromagnetism and the flow of fluids of all sorts. His work has provided science with the power to understand physical reality.

Differential equations include terms that describe the rate at which one quantity changes with respect to another. Partial differential equations involve more than one variable usually all with respect to a common variable, usually time.

Partial differential equations govern, or predict, functions of physical phenomena, like heat, sound, and electromagnetism. They crop up almost everywhere in science, from seismology to climatology, and were first studied by physicists. But understanding these equations soon became a major thrust of mathematics as well.

According to Terence Tao a mathematician at the University of California at Los Angeles, Dr. Hormander, 'laid much of the foundations for the modern theory of partial differential equations, one could try to solve each such equation separately by an ad hoc collection of tricks but with Dr. Hormander's theory, it was possible to analyse large classes of such equations simultaneously and rapidly.'

Described as the foremost modern contributor to the modern theory of linear partial differential equations, Dr. Hormander received the Fields Medal in 1962 and the Wolf Prize in 1988. He was elected to the National Academy of Sciences in 1976. In a citation accompanying the award of the 2006 Steele prize for exposition, another major mathematical honour, the American Mathematical Society lauded Dr. Hormander's four-volume work entitled 'The Analysis of Linear Partial Differential Operators.' According to the award committee, almost all of the 'exciting developments' connected to the theory of such equations in the period from 1960 to 1985 could be found in Dr. Hormander's work, which has been described as a mathematical masterpiece.

Another of his works renowned among mathematicians is 'An Introduction to Complex Analysis in Several Variables.' Lars Valter Hormander was born 24 January, 1931, in Mjällby, a fishing village in southern Sweden, where his father was a teacher. He did his undergraduate and graduate work at Lund University and obtained a PhD in 1955.

He spent several years at major academic research centres in the United States, including the University of Chicago, Stanford University and the Institute for Advanced Study in Princeton, N.J. He also worked at the Courant Institute of Mathematical Sciences at New York University.

TRIBUTE TO PROFESSOR BOB JOHNSTON

NIGEL CUMMINGS

Bob Johnston was a leading authority in Service Operations Management; he will be honoured by being posthumously awarded a higher doctorate.



The Warwick Business School (WBS) Professor died on 12 November, 2012 at the age of 59 after several years battling against cancer. A devoted and loving family man, he leaves his wife, Shirley, and three children, Chris, Kate and Sam.

Dean of WBS, Professor Mark Taylor, said, 'This award for Professor Johnston is given not only in recognition of his outstanding scholarship but also for his sustained contribution to the University of Warwick and WBS for over 27 years. He was one of the leading authorities in Service Operations Management and his career and experience was rooted in both practice and academia. He consistently used his expertise and experience for the benefit of his students, his colleagues at WBS, and last but by no means least, the professionals and practitioners he guided and taught in both private and public sector organisations. His passing is a great loss to the Business School, to the University, and to the wider profession. But the legacy of his scholarly contributions lives on.'

Professor Johnston will be posthumously awarded a higher doctorate, the degree of Doctor of Science, by the University of Warwick at the Winter Degree Congregation in January. Higher doctorates, a form of 'lifetime achievement award', are a rare accolade. They are awarded to academics who have shown a considerable, original, and sustained contribution to their field of scholarship at the very highest international level. They are awarded only after consideration of the candidate's peer-reviewed research by external assessors who are themselves of the highest academic distinction.

Professor Johnston was born in Blackburn, Lancashire in 1953, the youngest of five siblings. He attended Accrington Grammar School, continuing into higher education, where he gained a first-class honours degree in Systems Analysis at Aston University. After completing a postgraduate certificate in education at Lancaster University, he became a teacher at Settle High School.

His love of the outdoor life led him to run holiday centres for the youth activity organisation PGL during school holidays. He decided to leave teaching and became PGL's Operations Manager based in the organisation's headquarter in Ross-on-Wye, working across England and France.

In 1980 he moved on to a post as lecturer in Operations Management at what is now Sheffield Hallam University, and five years later was asked to join Warwick Business School, lecturing in the same subject area. He spent the next 27 years at Warwick, building his academic career and attaining the highest level as Professor of Operations Management in 1998.

He gained his doctorate while at Warwick Business School, under the guidance and supervision of Professor Nigel Slack. Professor Slack spoke very highly of Professor Johnston's work, saying: 'Scholars and students many years from now will owe a debt to his creativity, his clarity and his ability to ground the rapidly expanding body of knowledge in his field in the reality of what it's really like to manage services.'

'He was one of the most engaging teachers of his generation who could bring complex models alive with a wealth of down-to-earth anecdotes and examples. His sense of humour and quick wit could make the classroom a 'jolly place' (one of his favourite phrases) as well as an exciting learning environment.'

'But he also demanded that his students take the subject as seriously as he did. More than once he cured late arrivals at his lectures by locking the lecture theatre door five minutes after the start of a session; and woe betides any student who had failed to prepare for a session!'

Concerning Professor Johnston's home life, Professor Slack was just as complimentary: 'Bob and his family lived in the village of Monyash, high in Derbyshire's Peak District, a part of the world that he loved. 'In all his years at Warwick University he never let the 140 mile round trip between home and the University interfere with his tireless work for the University. But he would not leave his beloved Derbyshire and he loved to hike through its dales and moors. 'He and Shirley, his wife, would often extend their hospitality to colleagues from around the World who were welcome to stay and join them on a walk.'

January – March 2013

ASTEC'2013 4th Annual Asian Simulation Technology Conference 2013

7-9 March 2013, Shanghai, China P.R. www.eurosis.org

GAMEON-ASIA'2013 5th annual Asian GAME-ON Conference

7-9 March 2013, Shanghai, China www.eurosis.org

EMO 2013 - the 7th International Conference on Evolutionary Multi-Criterion Optimization

19-22 March, 2013, Sheffield, UK, www.shef.ac.uk/emo2013

IMCIC2013 - 4th International Multi-Conference on Complexity, Informatics and Cybernetics

19-22 March 2013 Orlando, Florida, USA <http://www.2013iisconferences.org/imcic>,

KGCM2013 The 7th International Conference on Knowledge Generation, communication, and Management 19-22 March 2013, Orlando, Florida, USA www.2013iisconferences.org/kgcm

7TH IMA Quantitative Modelling in the management of health and Social Care Conference

25-27 March 2013, London, UK <http://www.ima.org.uk/conferences/health2013.cfm>

April – June 2013

EVO2013, 16th European Conference EuroGP, EvoCOP, EvoBIO, EvoMUSART and EvoApplications

3-5 April 2013, Vienna, Austria www.evostar.org

YOR18, Young OR18 Bi-annual Conference for O.R careers of less than 10 years

9-11 April 2013, University of Exeter, UK <http://www.theorsociety.com/Pages/Conferences/YOR18/YOR18.aspx>

FUBUTEC'2013 9th Annual Future Business Technology Conference 2013

15– 17 April 2013, Lincoln, , UK <http://www.eurosis.org/cms/?q=node/2281>

ICMSAO'13 5th International Conference on Modeling, Simulation and Applied Optimization

28-30 April 2013, Hammamet, Tunisia www.icmsao.org

ISORAP 2013 International Symposium on Operational Research and its Applications

8-10 May 2013, Marrakech, Morocco <http://isorap.uiz.ac.ma/>

ISCRAM2013: The 10th International Conference on Information Systems for Crisis Response and Management

12-15 May 2013, Baden-Baden, Germany <http://iscram2013.org>

IIE 62nd Annual Conference & Expo

18-22 May 2013 San Juan, Puerto Rico <http://www.iienet2.org/annual2/>

ISC'2013 11th Annual Industrial Simulation Conference 2013

22-24 May 2013, Ghent, Belgium <http://www.eurosis.org/cms/?q=taxonomy/term/334>

CIAC 2013 8th International Conference on Algorithms and Complexity

22-24 May 2013 Barcelona, Spain <http://albcom.lsi.upc.edu/ciac2013>

CORS 2013 The 55th CORS Annual Conference

27-29 May 2013, Vancouver, BC, Canada <http://cors.forestry.ubc.ca>

KIM2013 Knowledge and Information Management conference

4-5 June 2013 Meriden, UK www.theorsociety.com//KIM2013.aspx

MathSport 2013 – The 4th International Conference on Mathematics and Sport

5-7 June 2013 Leuven, Belgium <http://www.mathsportinternational.com>

SEA2013 12th International Symposium on Experimental Algorithms

5-7 June 2013, Rome Italy <http://sea2013.dis.uniroma1.it>

ICAPS'13 The 23rd International Conference on Automated Planning and Scheduling

10-14 June 2013 Rome, Italy <http://icaps-conference.org>

MCDM2013 22nd International Conference on Multiple Criteria Decision Making

17-21 June 2013 Málaga, Spain <http://www.mcdm2013.decytec.ccee.uma.es/index.php>

NUMTA2013: Numerical Computations: Theory and Algorithms International conference

17–23 June 2013 Falerna, Italy <http://www.info.deis.unical.it/~yaro/numta2013>

MIM 2013 IFAC Conference on Manufacturing Modelling, Management and Control19-21 June 2013 Saint Petersburg, Russia <http://www.mim2013.org/>**DEA2013 11th International Conference on Data Envelopment Analysis**27-30 June 2013 Samsun, Turkey <http://DEAsociety.org/dea2013>**11th EUROPT Workshop on Advances in Continuous Optimization**26-28 June 2013 Florence, Italy www.europt2013.org**CCISE 2013 International Conference on Complexity, Cybernetics, and Informing Science and Engineering**30 June-6 July 2013 Porto, Portugal www.2013iisconferences.org/ccise**AISE 2013 The Special Track on Academic Informing Science and Engineering**30 June-6 July 2013 Porto, Portugal www.2013iisconferences.org/aise**July – September 2013****Euro XXVI and INFORMS Joint Conference**1-4 July 2013 Rome, Italy <http://euro2013.org/>**IMSIO 5 2013 The 5th European Conference on intelligent Management Systems in Operations**3-4 July 2013, University of Salford, UK email s.vadera@salford.ac.uk**GECCO 2013 GENETIC AND EVOLUTIONARY COMPUTATION CONFERENCE**6-10 July 2013, Amsterdam, The Netherlands <http://www.sigevo.org/gecco-2013>**VeRoLog 2013 EURO Working Group on Vehicle Routing and Logistics Optimization**7-10 July 2013 Southampton, UK <https://www.ocs.soton.ac.uk/index.php/verolog/verolog2013>**ORAHS 2013 39th ORAHS 2013 Conference**7-12 July 2013 Istanbul, Turkey, <http://orahs2013.org>**EISTA 2013 The 11th International Conference on Education and Information Systems, Technologies and Applications**9-12 July 2013 Orlando, Florida, USA www.2013iisconferences.org/eista**IMSCI 2013 The 7th International Multi-Conference on Society, Cybernetics and Informatics**9-12 July 2013 Orlando, Florida, USA www.2013iisconferences.org/imsci**IMETI2013 The 6th International Multi-Conference on Engineering and Technological Innovation**9-12 July 2013, Orlando, Florida, USA www.2013iisconferences.org/imeti**WMSCI 2013 The 17th World Multi-Conference on Systemics, Cybernetics and Informatics**9-12 July 2013 Orlando, Florida, USA www.2013iisconferences.org/wmsci**MISTA 2013 Special Track on EDUCATIONAL TIMETABLING**27-30 August 2013, Gent, Belgium <http://www.schedulingconference.org/>**OR55 Operational Research Annual Conference**3-5 September 2013 Exeter, UK <http://www.theorsociety.com/pages/conferences/conferences.aspx>**International Conference on Operations Research**3-6 September 2013, Rotterdam, The Netherlands, www.or2013.org**CONFERENCE NEWS**

EVENT:	YoungOR18 Conference	DATE:	9 – 11 April 2013	VENUE:	University of Exeter
EVENT:	KIM2013 Conference	DATE:	4 – 5 June 2013	VENUE:	Forest of Arden Hotel, nr Coventry
EVENT:	IMS105 2013	DATE:	3 - 4 July 2013	VENUE:	University of Salford
EVENT:	OR55 Annual Conference	DATE:	3 – 5 September 2013	VENUE:	University of Exeter

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EMORG - Transport Analytics for the 2012 Games

Date/Time: Wednesday, 13 February 2013 at 6pm

Venue: Room BE1.42, Business School, Loughborough University

Speaker: Jemima Poole, London Underground

Abstract: The 2012 Olympic and Paralympic Games (the Games) were widely seen as a triumph for Public Transport in London. This wasn't achieved without a large amount of work both prior to and during the Games which ensured Public Transport was not only sufficient within London but that UK wide Public Transport for the Games was coordinated.

This talk will focus on the transport planning and analytics activities undertaken by London Underground prior to and during the Games. There will be a particular emphasis on how the needs of persons with reduced mobility were considered throughout the process.

EMORG - Sports Analytics Sports Analytics at Leicester Tigers

Date/Time: Tuesday 12th March 2013 at 6pm

Venue: Room BE1.42, Business School, Loughborough University

Speaker: Andy Shelton, Head of Sports Science at Leicester Tigers

Abstract: 'There is tremendous value to be gained by retaining experienced players within the squad and we are confident that, by adopting predictive analytics, our team will be able to leverage data about the physical condition of players for the first time and considerably enhance our performance.'

LONDON & SOUTH EAST (LASE OR S)

Programme 2013

Location (unless otherwise specified): In the upstairs bar of *Ye Olde Watling, on the Corner of Bow Lane and Watling Street nearest stations are Mansion House (Bow Lane exit) and Bank (exit 8) for tube, or Cannon Street and City Thameslink for rail. The event is open to all and with a free buffet of sandwiches available afterwards.*

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SWORDS Trip to the Royal Mint, Llantrisant

Date/Time: Wednesday, 20 February 2013 15.30

Venue: Royal Mint plant in Llantrisant

SWORDS members are invited to visit the Royal Mint plant in Llantrisant on Wednesday 20th February at 3:30pm. Places are limited and as names must be given to the Mint in advance, you must book your place if you wish to attend.

If you wish to attend, please contact me, Jonathan Thompson via telephone (029-20875524) or e-mail (ThompsonJM1@cardiff.ac.uk) to confirm your place.

theme of continuous improvement in the public sector. To this end we are very pleased to announce that speakers include Amanda Gregory from Hull University (who is also Director of the Institute for Continuous Improvement in the Public Sector), Chief Inspector Steve Precious from the National College of Policing (newly formed from the NPIA), Prof Duncan Shaw from Warwick University (on emergency planning), and others tbc from W Yorks Police and MoJ.

The event will run from 10.30am for 11am start, and will end by 3.30pm at the latest. Coffee and tea will be provided but as usual the event is a 'bring your own grub' one, the public purse being somewhat stretched at present. Further details will follow next month.

Please notify Sue Merchant as soon as possible if you would like to attend as space is likely to be limited. suemerchant@hotmail.com
Dates for your Diary:

Criminal Justice Special Interest Group Meeting

Date/Time: Monday, 04 March 2013

Venue: W. Yorks Police, Wakefield

Speaker: TBC

Details to be notified at the end of 2012.

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Quantitative Modelling in the Management of Health and Social Care Conference

Date/Time: Monday 25 March 2013

Speakers: See below

Venue: Woburn House Conference Centre, London

Abstract: Health and Social Care systems are facing major challenges worldwide, due in part to changes in demography and advances in technology and in part to changes in the structure and organisation of the system whether they are hospitals, general practitioners or long-term care settings. Yet running health and social care systems efficiently and effectively is crucial to improving or even maintaining our quality of life. Over the years, extensive research has been conducted to find immediate and long-term solutions to issues that are routinely faced by health and social care professionals, such as waiting lists and bed capacity, hospital redesign, workforce planning and scheduling, patient flow, performance management, disease monitoring, and health care technology assessment. Mathematical modelling and computer simulation techniques (statistical analysis, stochastic processes, queuing theory, mathematical programming, heuristics, discrete event simulation, system dynamics, etc) have shown to be increasingly valuable in providing useful information to aid planning and management. The aim of the conference is to bring together health care managers, clinicians, management consultants, and mathematicians, operational researchers, statisticians, health economists, computer scientists etc from across the world with a view to bridging the gap between the respective communities and to exploring recent developments and identifying fruitful avenues for further research.

Confirmed Invited Speakers

Professor Stephen E. Chick, Professor of Technology and Operations Management, Novartis Chair of Healthcare Management, INSEAD, France; Professor Malcolm Grant, CBE, UCL Provost and President and Chair of the NHS Commissioning Board; Dr David Paynton, FRCGP, DMS, MBE, Practising GP, Clinical lead for Out of Hospital care at Southampton City Clinical Commissioning Group and National Clinical Lead for the Royal College of General Practitioner's Centre for Commissioning; Dr Geoffrey Royston, President of the Operational Research Society and former Head of Strategic Analysis and Operational Research in the Department of Health for England, and Professor Peter Smith, Professor of Policy and co-Director of Centre for Health Policy, Imperial College London.

We invite researchers in all relevant problem domains and methodologies to submit abstracts of 300 words by Friday 14th December 2012 by e-mail to conferences@ima.org.uk.

For more information visit

www.healthcareanalytics.co.uk/conferences/imahealth2013/

OR-30

February 1983 (John Crocker)

What Harold Larnder did for O.R. in the RAF, Sir Owen Wansbrough-Jones did in the Army. Last month, you will recall, 'OR minus 30' looked at Ronald Stansfield's appreciation of Harold Larnder; this month Donald Hicks and David Smith have compiled a similar appreciation of Sir Owen Haddon Wansbrough-Jones.

Wansbrough-Jones was born in 1905, studied Natural Sciences at Cambridge gaining a First Class Honours in both Part I and Part II of the Tripos and a PhD in physical chemistry under Sir Eric Rideal in 1929. During WWII, he specialised in weapon development and vehicles and reached the rank of Brigadier as Director of Special Weapons and Vehicles. His close collaboration with the US gained him the US Bronze Star and the US Legion of Merit (Officer).

In 1946 he appointed Scientific Adviser to the Army Council where his main roles were to 'secure a well understood role for the Scientific Advisor vis-à-vis the Army Council and to secure a permanent place and role for the Operational Research Group in the Army and in the War Office generally. By 1951, the roles and responsibilities of both the Scientific Adviser's department and the Army O.R. Group (AORG) were well defined in a charter and ratified by the Army Council.

From 1951 to 1959, Wansbrough-Jones moved up through the Ministry of Supply reaching the position of Chief Scientist before moving out of the Civil Service to take up a directorship of British Oxygen International (1959-1976) and Executive Vice-Chairman (and later Chairman) of Albright and Wilson (returning back to his roots as a physical chemist).

Wansbrough-Jones was a founder member of the Operational Research Club and a member of the organising Committee (along with Goodeve, Slater and Swan) who held their meetings in

Wansbrough-Jones' flat in Pall Mall. The 'Club' voted to change the name to the 'Operational Research Society' at its AGM 10th November 1953. Wansbrough-Jones was elected Chairman 1953-54 and 1954-55. (The rest, as they say, is history.)

Whilst on the subject of start-ups, there was an interesting paper by Hugh D. Hemmer on starting up an O.R. Group within the Johnson Matthey Group which was, apparently first presented at the 1981 Conference held at the University of Sussex (which I had the good fortune to attend, although I have to admit, I do not remember listening to this particular presentation).

In the 'Letters and Viewpoints' section, J.C.R. Hewgill presents a 'personal view' on the 'O.R. Crisis' which is well worth reading both for its clarity and its commonsense. The conclusion is 'the O.R. organism will only grow as far as its environment will allow it, and to survive it must fight to maintain its economic niche against competitors by proving that it is a viable and economic option'. The fact that you are reading this means that 30 years on, we have clearly managed to meet those criteria although for how much longer, I, for one, would not be willing to venture a guess.

Stansfield, Ronald G. (1983), Harold Larnder Founder of Operational Research, *JORS* 34.1, Pp 1-7, (jors19831a.pdf)

Hicks, Donald and David Smith, (1983) Sir Owen Haddon Wansbrough-Jones, *JORS* 34.2, Pp 105-109, (jors198321a.pdf)

Hemmer, Hugh D., (1983), Pioneering O.R., *JORS* 34.2, Pp 111-117, (jors198322a.pdf)

Hewgill, J.C.R., (1983), The O.R. Crisis – a personal view, *JORS* 34.2, Pp 167-170, (jors198335a.pdf)

<OR>

OR-20 Extracted from OR Newsletter February 1993

Does O.R. suffer from the 'Woolworth Syndrome'?

Tell us what you think

Those of us who are too old to have heard of Madonna will probably remember Woolworth's. Back in the sixties, Woolies was a very useful shop, selling hardware and all sorts of cheap nick-nacks and most people shopped there regularly. Woolies had a major presence in every High Street.

But then, sometime in the seventies, they seemed to lose their way. You went in one day, to discover that all the lines you expected to

see had given way to a most perplexing mish-mash. A wardrobe here, a stereo there, a rosebush, a few kiddies' frocks. It was hard to make sense of it, though no doubt there was some underlying rationale – maybe an accountant had decided that, in future, they should stock only high margin lines. That might seem sensible if you're an accountant, but from the point of view of the customer who has no way of knowing what are high margin lines, it leaves you not knowing when to stop at Woolworth's. So you stop going there – and we all know what happened next.

Without knowing precisely what does influence consumers' choice of where to shop, it seems reasonable to suppose that one condition

for success might be that the range of goods on sale should make sense to a consumer who thinks in terms of categories such as grocery, haberdashery and ironmongery. If that's right, a shopkeeper would be unlikely to succeed unless (s)he were a haberdasher or an ironmonger or maybe a grocer and a greengrocer and a butcher and a wine merchant – but something that makes sense in terms of the conventional categories.

Now if that's right for shops, it prompts the question, does something similar hold true for professional services? Do clients hold categories, analogous to grocery etc., in mind and if so, what are they? In particular, what are the categories relevant to O.R. and does O.R. match up with any of the categories clients understand? Or do we suffer from the 'Woolworth syndrome'? Is our field of expertise, like 'high margin lines', something that clients simply can't relate to, or assess?

One strongly suspects that we do indeed suffer from the 'Woolworth syndrome'. After all, if we were haberdashery, so to speak, surely we'd know we were. There would be succinct form of words, which we would surely be aware of, to describe what we do. The fact that we have laboured long and so far unsuccessfully, to find a 'core message' for O.R., strongly suggests that this is not so.

This prompts the further question, are we right to be seeking a 'core message' to describe O.R. as it is now, or have we got the problem back to front – should we be seeking to redesign the product in some way, so as to make it comprehensible to clients in terms of vocabulary they already use?

The Society is anxious to make progress, as quickly as possible, in working to improve the image and marketing of O.R., and we therefore invite readers' views on the issues raised here. In particular we should be grateful for feedback on the following:

1. Is there evidence to the effect that conformity to well understand categories is important in determining the success of a product or service?
2. Is there information as to what categories of service, (relevant to the areas covered by O.R.) clients understand, and of how O.R. matches up to these categories?
3. If it were true that O.R. suffered from the 'Woolworth syndrome', and that that was possibly inhibiting the successful marketing of O.R., should we aim to redesign the product to conform to existing categories, or to instil a new category in clients' minds and in either case, how should we go about it?

<OR>

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IMPORTANT: Contributors please note. All contributions must be in four parts as follows (1) headline (approx 6 words); (2) mini-abstract (max 25 words); (3) main body of contribution (max 500 words); (4) keywords. At the editor's discretion, contributions exceeding 500 words will be shortened, serialised or published with the warning Long article. X words. Whenever possible contributions should be submitted electronically as Word files and emailed to insideor@theorsociety.com. Illustrations should be attached as JPG, GIF, TIF or files of other common formats. Contributions submitted in hard copy must be posted to The OR Society at the address above, or sent to the Society's fax number, and be clearly marked Inside O.R. All contributions must bear the author's name and address (not necessarily for publication). All contributions accepted by the editor will be published in the print version subject to availability of space. The editor's decision on all contributions is final and no correspondence will be entered into.



REVENUE MANAGER
To £55,000 + Benefits

This leading transport company is seeking to recruit an experienced Revenue Manager to drive their Yield Management and Pricing Strategy forward and identify opportunities within this area to grow their business. With previous pricing/revenue management experience, the successful candidate should be a numerate graduate with well developed commercial judgement and business acumen, a good understanding of what drives revenues and costs and how to deal with business risks and opportunities and have previous experience of managing a team. **London**

PRICING ANALYST
To £45,000

This global organisation seeks an experienced Pricing Analyst to play a significant role in pricing and related strategic decision support up to Board level. The successful candidate will need to compliment academic excellence with the ability to communicate effectively at Board level and an impressive modelling and data analysis track record. A minimum of 3 years experience of Pricing and business performance analysis supported by experience of complex pricing models and strategies is essential. For the successful applicant, the opportunity exists to make a significant impact on the business and be rewarded accordingly. **Bedford**

SAS MODELLING
£40,000 - £60,000

This specialist financial services consultancy, providing risk modelling solutions to the credit, payments and fraud industry, seeks modelling specialists with multi-product and Basel experience, for newly created home-based roles. Offering strong interpersonal and client facing skills to complement their proven SAS modelling capabilities, candidates will also need practical statistical and segmentation skills and a solid understanding of UK consumer credit and risk. **Home Base/UK Wide Client Sites**

MSc or PhD – CAREER START
To c£30,000 + Bonus & Benefits

If you have recently completed your MSc or PhD and are motivated by an international leader in the field of simulation and optimisation, this could be your ideal first career move. To be successful, you will need demonstrable modelling skills, proven programming experience, together with well developed communication and client interaction skills, underpinned by a 1st or 2i degree in a numerate subject.

Berks/Hants, M3 Corridor

OR/MODELLING CONSULTANCY
£35,000 - £50,000 Package

This premier OR/business modelling consultancy seeks additional consultants offering genuine self confidence and drive, underpinned by a minimum 2i Hons academic track record, ideally including an MSc. With engagements embracing a wide range of OR, optimisation and related modelling activities, those appointed can expect significant variety, commitment to training and career development potential geared entirely to individual achievement.

Central London based

COMMERCIAL MANAGER
£Competitive + Benefits

Joining this Planning and Commercial Insight department you will be supporting the company's planning process, providing commercial analysis, ensuring commercial oversight and working with key stakeholders to plan programmes that meet both consumer demand and strategic business objectives. You should be degree qualified, with excellent analytical and commercial skills, have a self-motivated and proactive approach and in addition to excellent interpersonal skills, be a persuasive and credible individual with the ability to communicate at all levels. **Peterborough**

RESOURCE PLANNING ANALYST
£30,000 - £40,000

Exciting opportunity to join one of the world's largest airline groups and help develop and deliver robust manpower plans for their world cargo operation, producing resource plans encompassing forecasts for both manpower and vehicle requirements. With a good numerate degree (ideally 2:1 or above in Maths, Statistics or OR), you will have excellent planning, numeracy and analytical skills with the ability to present complex analysis in simple terms. From a technical stand point, you should have 1st rate Excel and data manipulation and modelling skills. **Staines**

ANALYTICS MANAGER
£60,000 - £70,000

Working for one of most respected brands in the UK, you will be responsible for delivering insight in line with business priorities and designing and articulating insight capacity within a service solution. Our client needs someone with experience of delivering statistical analytical projects at a senior level, with consultancy background and who is comfortable within a sales environment. In addition to advanced technical skills in segmentation and modelling, the successful candidate will have excellent knowledge of SAS/SPSS/R, advanced macros, regression techniques and CHAID. Public Sector experience an advantage. **London**

DECISION SUPPORT CONSULTANTS
£Negotiable DOE

Our client provides analytical and management consultancy to help government and businesses make better-informed decisions. Due to demanding growth targets, they seek to recruit high energy, exceptional people to work as Decision Support Consultants. You will work across a range of areas covering services based on modelling and operational research techniques such as simulation, and providing more general decision support and business consulting. Experience from a Defence or Government background of particular interest but definitely not essential. **Hampshire**

With over 30 years of specialist market knowledge, Prospect is uniquely positioned at the forefront of Operational Research and related areas.

- Forecasting & Optimisation
- Business Modelling
- Process Re-engineering
- Financial Modelling
- Credit & Risk Management
- Change Management
- Simulation
- Customer Relationship Management
- Revenue/Yield Management
- Marketing Analysis

SUPPLY CHAIN MODELLING
To £50,000 + Benefits

Enviably opportunity to join this leading supply chain optimisation solutions consultancy, which is continuing to expand its European operations. Offering a proven track record of delivering real business benefit from modelling and associated analysis, successful candidates will need strong data manipulation skills (Excel/Access) plus experience of linear programming and discrete event simulation, underpinned by a good numerate degree and well developed communication skills. **London or Bucks**

PRICING INNOVATION ANALYSTS
To c£35,000 + Benefits

Our client is a growing financial services provider with a unique market position in the Personal Lines Insurance industry. On the strength of continued growth, enviable opportunities have now arisen for two new dynamic business modelling/pricing professionals, with c 1 - 3 + years proven postgraduate related/transferrable modelling and analysis experience, to join their analytical team in key decision support roles. Knowledge of the Insurance market and/or SAS could prove useful but not essential. **Surrey**

MARKETING INSIGHT CONSULTANCY
£30,000 - £80,000 Neg DOE

One of the world's leading research and insight consultancies, renowned for measuring the effectiveness of marketing related activities, are extending their client offerings and capabilities beyond their econometric roots and are seeking high calibre candidates from Analyst through to Associate Partner level. Applicants will need to offer a balance of sound technical and analytical tools and techniques, demonstrable problems solving skills, a genuine understanding of commercial imperatives – all underpinned by impressive academic credentials. **SE London**

For an informal discussion in total confidence on any of these positions or the market in general, please contact: Mark Chapman, Teresa Cheeseman, Kate Fuller or Sarah Sambrook. Alternatively visit our website to view our current vacancies.

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