OR NEWSLETTER

Operational Research Society of New Zealand (Inc.), PO Box 6544, Wellesley St, Auckland or PO Box 904, Wellington, New Zealand *http://www.esc.auckland.ac.nz/Organisations/ORSNZ/* **December 1997**

# EDITORIAL

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The March 1998 issue of the *OR Newsletter* will be edited by a team in Wellington, namely Dr Vicky Mabin and John Davies from the Management Group in the School of Business at Victoria University, and Dr John George, joining the Wellington office of Putnam, Hayes & Bartlett. To make their task easier, each one of you eager readers can help by submitting news items, relevant software reviews, outlines of unusual or unusually successful projects, book reviews of exceptional new OR/MS text, or share your advice, experiences, or thought about OR practice, and hopes about the future of OR/MS in NZ. So don't be modest or shy, get into print or twist somebody's arm to get into print. Admittedly, it will hardly enhance your job promotion, except under the much discounted 'public or community service' column, but you will feel pleased and proud, OR/MS brothers and sisters will tap you on the shoulder at the next conference, and your contribution might even be featured in the newsletter of a sister OR society on the other side of the globe, or at the other edge of the plate that is the Earth if you are a convert to the flat-earth theory. Take it from one who knows and has become an expert in arm twisting. I did this just the other day. I twisted Professor Fred Glover's arm into contributing some reflections (that are not TABU) towards the March issue of the *OR Newsletter*. (Yes Vicky, it is barely two months before your lot will have to get into high gear, but I have already secured the lead article for you. I hope you will appreciate this!)

This editorial is a good example of improvisation on the spot. I sat down with the intention of writing my last editorial (yes this time it is true — touch wood!), at least for a while. I had not the slightest idea what I was going to say. But then I am not easily deterred! I did not really want to bore you with my disappointment when my overseas publisher informed me today that my next book will only come out in May 1998 and not this month, as promised. And now you are curious to know what the book is all about. Sorry mate! All I will reveal is that the word OR only appears in lower case letters, and that it was much more fun and exciting to write than *Systems and Decision Making* (which at the time I thought was great fun). In fact, it was so much fun that I immediately embarked on its sequel.

At least you get a little piece of wisdom above: Never write a text or a book unless it is fun! I really admire the stamina that Hillier & Lieberman and other OR/MS authors display, churning out a new edition of their text every two to three years. It already gets boring the second time round and must be pure agony for the third and later editions. Even revising a text is about a 'one person-year' effort (applaud my efforts for gender neutral correctness!). In fact, some of these text book writers start preparations for the next edition immediately after the last one has issued from the bindery.

But let me get back to my editorial. There are exciting new prospects appearing on the OR/MS

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***Publication dates:*** *beginning March, June, September, December.*
***Deadline for submissions:*** *on the 15th of February, May, August, November (for issue in following month)*
*Send submissions (in electronic Word or WordPerfect form, with no formatting) to the new editorial board, c/o Dr V. Mabin, School of Business and Public Management, Victoria University of Wellington, PO Box 600, Wellington, or preferably by e-mail:* ***Vicky.Mabin@vuw.ac.nz***

horizon, and I do not refer to problem structuring-cum-soft systems-cum-critical heuristics which have taken sections of the academic world by storm, nor multi methodology which churns everything into one big pot and then fishes out suitable pieces for assembly as needed. No, I talk about what Grant Read in his APORS'97 keynote address so aptly termed "dual OR" in analogy to the use of 'dual' in mathematical programming. The traditional OR approach has been to develop models for the system as a whole to optimize its operation and the allocation of all types of scarce resources. This assumes the existence of a central unit that has the power and ability to enforce implementation of the rules derived. We all know that such control never really exists to the extent needed and its effectiveness in terms of responding to both internal and external events is sluggish. In today's turbulent economic environment with ever shorter product and project life cycles such an approach may well belong to the past. "Dual OR" delegates optimizing the operations down to the grass roots so-to-speak, i.e., to the decision makers of individual units at the operating level by providing appropriate prices for scarce resources used by these units and a relevant incentive structure for the local managers. This new philosophy opens up unexpected opportunities for operations researchers, and examples of it are already happening in a number of sectors, patricularly energy. If you care the read more about his, I refer you to the article by Daellenbach and Read "Success and survival of OR groups — Where to from here?". It comments on the in-depth investigations by Fildes and Ranyard (see references), and is scheduled to appear in JORS early next year.

References

Fildes R and Ranyard JC (1997). The success and survival of OR groups: a review. *JORS* 48: 336-360.
Ranyard JC, Fildes R, and Crymble WR (1997). Death of an OR group. *JORS* 48: 361-372.
Ranyard JC and Fildes R (1997). Winners and losers: adding organisational value. To appear in *JORS*.

# AMMO MAKES A RAD TOOL OF THE CPLEX CALLABLE LIBRARY

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CPLEX mathematical programming (MP) algorithms are arguably the fastest, most advanced and scalable today. However, OR practitioners wishing to exploit the power of CPLEX in their solutions have, until now, had to make a choice between learning a specialised mathematical programming (MP) environment, such as GAMS, AIMMS or AMPL, and opening the 'Pandora's box' of raw C programming with the CPLEX callable library.

Developers at Core Management Systems saw the need for a tool that supports describing, manipulating and solving mathematical programming problems with the kind of ease exemplified in the intuitive object model of Microsoft's Visual Basic. This was the vision that inspired them to create ActiveX Mathematical Modelling Objects (AMMO). AMMO brings the power of the CPLEX callable library to your existing programming environment and data models. The implications are rapid applications development (RAD) for MP problems and the ability to leverage existing programming skills, without the overhead of learning a specialised environment or exporting data from its native source into CPLEX.

AMMO promises reduced MP model develop and maintenance costs, and significantly improved application performance by:

- Bringing the solver to the data by adding functionality to existing applications such as Microsoft Office and Visual Basic via the Windows Component Object Model (COM);
- Allowing developers to leverage their existing knowledge base in Windows programming when developing, modifying and maintaining MP models and their data;
- Giving a level of abstraction from raw matrix generation by using an object paradigm to describe MP problems;
- Shielding the developer from the difficulties of memory allocation and management inherent in the development of CPLEX callable library applications.

With AMMO the developer need not learn a separate MP language such as GAMS or MPL. Thus they can leverage their existing programming skills in the language they use to develop the host application e.g. Visual Basic or C++. AMMO provides system-level objects via the Windows COM architecture. This allows developers to add an MP model to any existing ActiveX-enabled client e.g. Microsoft Excel or Access.

## The AMMO Architecture

In technical terms, AMMO is an 'in-process' OLE/ActiveX-automation server. It does not provide any graphical user interface (GUI) or even a macro language. Rather, AMMO adds functionality to COM that any client can use. Generally this client will be the application used to store or access the MP model's data. AMMO exposes an intuitively organised hierarchy of objects. Developers write code to create and manipulate these objects and AMMO takes care of the implementation using the CPLEX callable library. Problem definition, solution, modification and serialisation are handled seamlessly through object properties and methods. The developer does not need to handle memory allocation or maintain CPLEX environment pointers or problem databases, this is all taken care of 'behind the scenes' by AMMO. Further, objects are instantiated by AMMO on demand so that memory usage and processing overhead is minimised.

The AMMO object hierarchy is shown in Figure 1.

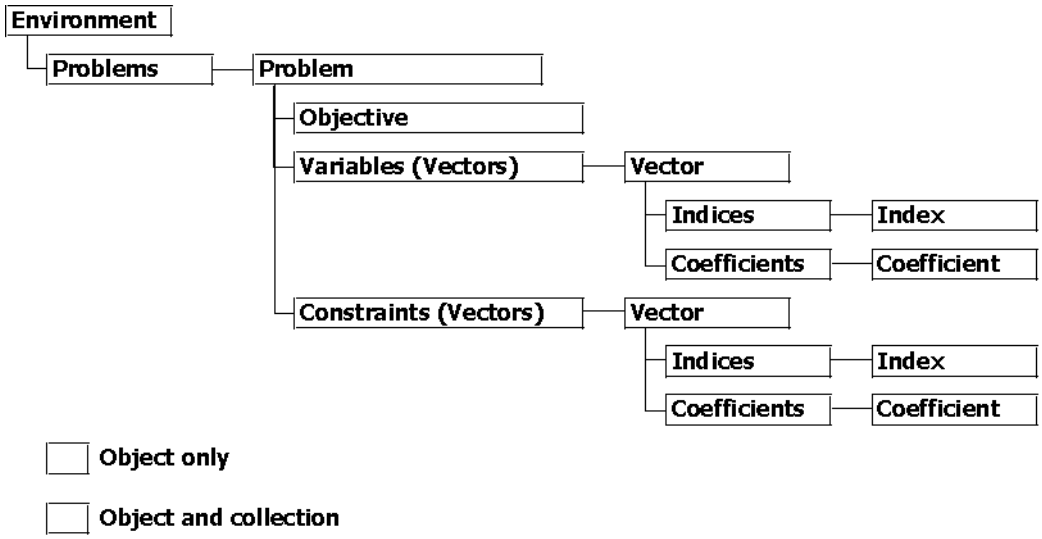


**Figure 1: AMMO object hierarchy**

## Examples

The following code fragment is adapted from one of the examples provided with AMMO that uses Visual Basic as the 'client'. Originally it read and wrote data to and from an Excel worksheet, but for clarity the actual values have been substituted in. In this simple example, the variable and constraint vectors do not use indices and hence only represent one vector in the formulation.

```
Option Explicit
Dim WithEvents env As Environment

Private Sub cmdRun1_Click()
On Error GoTo Err_cmdRun1_Click

' This example LP is taken from:
'
' Dallenbach, George and McNickle
' "Introduction to Operations Research Techniques"
'
' Chapter 2 - Introduction and Applications
' ----------------------------------------
'
' Objective function:
' Maximize z = 24 x1 + 20 x2
'
' Constraints:
' subject to 0.5 x1 + x2 <= 12 (smoke)
' x1 + x2 <= 20 (loading)
' 1/16 x1 + 1/24 x2 <= 1 (pulverizer)
' 1200 x1 - 800 x2 >= 0 (sulfur)
'
```

```
' Nonnegativity conditions:
'
' x1 >= 0, x2 >= 0

Dim vrs As Vectors, cns As Vectors

 ' An instance of the AMMO Environment object is declared in the
 ' General section of this Class Module. We use the WithEvents keyword
 ' so that we can supply our own implementations of the Environment's
 ' outgoing event interface functions such as Error and Callback.
 ' We still need to create the Environment using the New operator.
Set env = New Environment
 ' Add a problem to the Environment.
With env.Problems.Add("DGM Example", amIncremental)
     .Objective.Sense = amMaximize ' Objective sense.
     Set vrs = .Variables ' Handle to the Variables collection
     Set cns = .Constraints ' Handle to the Constraints collection
     With vrs ' Add variables, supplying the full name and LP symbol
          .Add "coal A", "x1"
          .Add "coal B", "x2"
     End With
     With cns ' Add constraints, supplying the full name and LP symbol
          .Add "smoke", "Sm"
          .Add "loading", "Ld"
          .Add "pulverizer", "Pu"
          .Add "sulfur", "Su"
     End With
     ' Set up the variables and constraints. Note that variables are
     ' automatically defined as non-zero, so we don't need to set the
     ' Lb and Ub properties in this case. Constraints default to
     ' equalities with zero right-hand side values.
     vrs("coal A").Obj = 24
     vrs("coal B").Obj = 20
     With cns("smoke")
          .Sense = amLessThanOrEqualTo
          .Rhs = 12#
          .Coefficients(vrs("coal A")) = 0.5
          .Coefficients(vrs("coal B")) = 1
     End With
     With cns("loading")
          .Sense = amLessThanOrEqualTo
          .Rhs = 20#
          .Coefficients(vrs("coal A")) = 1
          .Coefficients(vrs("coal B")) = 1
     End With
     With cns("pulverizer")
          .Sense = amLessThanOrEqualTo
          .Rhs = 1#
          .Coefficients(vrs("coal A")) = 1/16
          .Coefficients(vrs("coal B")) = 1/24
     End With
     With cns("sulfur")
          .Sense = amGreaterThanOrEqualTo
          .Coefficients(vrs("coal A")) = 1200
          .Coefficients(vrs("coal B")) = -800
     End With
     ' Solve the problem using the primal method.
     .Primopt
     ' Display the solution values.
     MsgBox "Obj:= " & .Objective.Value
     MsgBox "coal A:= " & vrs("coal A").Primal
     MsgBox "coal B:= " & vrs("coal B").Primal
End With
```

```
Exit_cmdRun1_Click:
     Set env = Nothing
     Exit Sub
Err_cmdRun1_Click:
     MsgBox Err.Description
     Resume Exit_cmdRun1_Click
End Sub

Private Sub env_Callback(ByVal Message As String)
     Application.StatusBar = Message
End Sub
```

Note the use of the `WithEvents` keyword on the declaration of the `Environment` variable. This allows the client to 'wire-up' their own functions to the CPLEX warning, error, result, log and callback channels.

Although AMMO can be used to solve small problems like this, it is ideal for large implementations, and has demonstrated its efficiency on problems with millions of rows and columns. AMMO permits indexed vectors, and is able to set properties and coefficients on multiple vectors in one action. This means that it is possible to define large problems with a minimum of code. The following is an example of defining and using indexed variables and constraints.

```
Dim env As Environment
Dim vrs As Vectors, cns As Vectors, idxHours as Index

...

With env.Problems.Add "Widgets", amAbsolute
     Set vrs = .Variables
     Set cns = .Constraints
     Set idxHours = .Indices.Add("Hours", 24) ' The Hours index.
     ' Add variables and constraints.
     vrs.Add "Widgets", "w", idxHours
     cns.Add "Total Widgets", "w"
     ' Set up variables and constraints.
     vrs("Widgets").Obj = 10
     With cns("Total Widgets")
          .Sense = amLessThanOrEqualTo
          .Rhs = 100
          .Coefficients(vrs("Widgets")) = 1
     End With
End With
```

Here we define an index called `Hours` with 24 elements. Then we add "`Widget`" variables for each "hour" by passing the `Hours` index to the Add method of the `Variables` collection. There is also a `Total Widgets` constraint that we will use to put a limit on the total number of widgets. AMMO allows vectors to be defined as indexed but referred to with any number of their indices. Hence, when we execute `vrs("Widgets").Obj = 10`, the objective value 10 is applied to all 24 variables. In the block following this we set constraint coefficients for the total widgets constraint with the single line `.Coefficients(vrs("Widgets")) = 1`. AMMO detects that there are 24 variables and one constraint in the expression, and adds a term for each variable to the constraint, thus creating the sum constraint. AMMO allows any combination of variables and constraints in these expressions, provided that the number of elements in one collection factors the other.

## AMMO Public Beta

The free AMMO public beta is available from Dr Glenn Drayton-Bright, Core Management Systems Ltd., PO Box 1659, Wellington, or via the Internet from *Glenn @ core.co.nz*. Registered beta testers get free updates throughout the beta program and discounts on the price of the full release in first quarter 1998.

AMMO is available now for CPLEX Versions 4 and 5 on Windows 95/NT. The beta distribution includes example implementations in the Office 97 versions of Excel and Access, as well as documentation that describes how to build full-featured callable library applications from clients that supports COM, including Visual C++ and Visual Basic.

# APORS '97 — SOME IMPRESSIONS

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Over the last 3 years I have been providing regular reports on APORS '97, so it is with a mixture of relief and satisfaction that this final report is of a great conference. It was attended by more than 400 delegates from 30 countries, including 33 from New Zealand. Peter Bell from Canada, the outgoing President of IFORS, and Andres Weintraub from Chile, the incoming president of IFORS, were both present. Japan with its 3000 members sent 94 delegates. So a great effort by the Kiwis to get 1/5 of our members to Australia (DON'T mention the cricket)! The next APORS conference will be held in the year 2000, in Singapore. Perhaps we can muster an even greater number over there. Professor Chew of Singapore was duly elected the next President of APORS, for a 3-year term.

As well as doing well in terms of numbers, I think the Kiwis put on a good show, . and I am not thinking only of John Scott performing with the Aboriginal dance group after the conference dinner (I hope to have a photo for the next newsletter), nor the various efforts at the neighbouring casino. There were strong NZ contributions in the electricity, rostering, sport, theory of constraints, MCDM, problem structuring, and OR education streams. The keynote address by Grant Read was the highlight of the conference, and John Adams address from Australia gave some interesting perspectives from someone who has left the OR scene some 16 years ago to take up managing positions. I also enjoyed Les Foulds' tutorial on World Class Manufacturing.

Another highlights for me was to hear Peter Bell talk on Strategic OR: of the growing number of North American companies which are gaining sustainable competitive advantage through the use of OR. He quoted American Airlines whose staff includes 500 people trained in OR/MS (40 work in yield management, 27 in the crew scheduling area). Without OR this company would not have survived. With OR, they have survived, unlike their competitor People Express airline. Federal Express has 20 OR people, some of whom operate at Board level — the head of OR chairs the Strategic Planning Committee, and meets the CEO every other day. They talk of 'Absolutely Positive Operations Research'! He gave other examples too, including CITGO, Merit Brass, National Car Rentals, and Harris Semiconductors. All these companies have survived because of OR. Inspiring talk! Peter has an article on this coming out in JORS early next year.

As I listened to this talk, our own examples in dairy, energy, and airlines, to name just a few came to mind. How about contributing some local stories for the *OR Newsletter*, or as viewpoints in *JORS* to follow Peter's article? Grant's keynote address is already available on the APORS website.

Another amazing story came from Bryce Peach of Courtaulds Coatings NZ. He reported on how they doubled their sales, while at the same time experiencing huge staff cuts, and that market share increased so dramatically they too "blew their competition out of the water". I admit to being less than impartial about this case, as they used the theory of constraints to achieve these results. So I was pleased to see others were equally impressed.

A large vote of thanks was expressed to Moshe Sniedovich and Paul Lochert who were the main organisers of this most successful conference. Moshe has offered to make the APORS web page permanent, and many authors have placed their presentations on the web, so they will be available for you to browse. APORS also plans to link its member societies' web pages. Pleasingly ORSNZ is one of the most advanced in this respect. The APORS web page is *http://www.maths.mu.oz.au/~worms/apors/apors.html*

# TOC — RELIGION OR MANAGEMENT TOOL?

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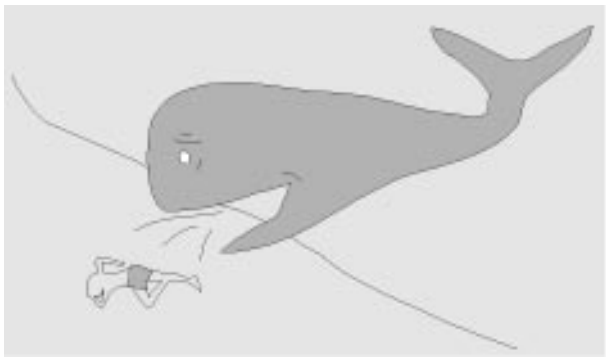
Snake Oil Merchants plied their trade in the American frontier towns, selling bottles of some unknown substance which they extolled as the cure for whatever ails you. As a form of entertainment they had undoubted value, but whether the product achieved more than a placebo effect is questionable. As I sat through a tutorial on the Theory of Constraints, I felt more and more uneasy and wondered if the presenter was in fact a snake oil merchant.

I have heard about the Theory of Constraints, and naively thought it must be something to do with Linear programming. So the APORS conference in Melbourne gave me the opportunity at least to find out what it was about. A train strike meant that I arrived half an hour into the presentation, which I hoped was the reason for my confusion. A later discussion with a colleague who had been at the first part suggested that it wasn't the case.

There were some good ideas, I thought. “All problems can link down to a few core problems.” Yes, that made sense. “An evaporating cloud can help a problem to disappear.” Hmm, I’d need to know what it was. “Prerequisite trees provide a necessary and sufficient plan.” Seemed reasonable. “What we had initially charged large amounts of money for, and took two months, could now be accomplished in under a day.” So why did it take two months in the first place? A reminder that 2.98 weeks is “about 3 weeks.” Yes I try to remind my first year students of that.

Much of it seemed like good practice, heavily embedded in a rather exclusive jargon, including banana diagrams, evaporating clouds and a variety of trees. There was a call to use it for personal applications. Maybe if I had used it, I would have been there on time, despite the train strike. But I had a general uneasiness about the presentation. What bothered me was the evangelical fervour with which James Powell, from the Avraham Y Goldratt Institute, Australasia, was promoting what appeared to be some good rules and common sense about production management. I almost expected someone to leap up shouting “I believe!”, and rush forward to receive cleansing.

I decided that I still needed some more substance. I wanted to see a banana diagram at work and had yet to see a cloud evaporate, so along with two of my colleagues I attended a further session on the Theory of Constraints. I was not convinced. I witnessed further evidence of a semi-cult-like following. It seems the trained proponents of this new religion are called “Jonahs”, and one pays a considerable amount of money to train to become one. Those who know their Bible will be aware that Jonah was asked by God to call the Ninevites to repentance. He headed in the opposite direction and ended up three days in the belly of a big fish before it spat him up on the shore. He decided to do the job he was asked to and then sulked when he was successful. Though I’ve always liked Jonah and felt a kinship to him, I don’t know if it’s the ideal choice of name.



Perhaps a further session would have given me some more idea of TOC at work, but really I had had enough. Instead I learned about urban snow removal and disposal. My moment of enlightenment at the APORS conference came at the session entitled Operations Research when J. Donald R. de Raadt discussed the need to use OR to do good and the idea of ethics in modelling, and suggested we might like to teach the students to look at how they think the world ought to be as well as how it is. He was passionate about what he was saying, but there was substance more than just style. The contrast was salutary.

There is no doubt that there are good things about TOC. There are some illustrations that I can see being useful in my teaching. I’m glad I know what it’s about and I quite enjoyed “The Goal”. But I wasn’t converted, and I didn’t buy any snake oil.

# BRANCH GOSSIP COLUMN

## *Wellington News*

### John Ranyard: ORSNZ Visiting Lecturer 1997

by Dr Victoria Mabin, Victoria University of Wellington

Such is the nature of APORS, with its 11 parallel streams, that it is quite likely you won’t be able to get to every talk you want to hear. It so happened for me that I was presenting at the same time as John Ranyard, so it was with great pleasure that we had a second opportunity to meet and hear John as our ORSNZ Visiting Lecturer for 1997. He spoke to the Wellington Branch on Monday 8th December to a good crowd of nearly 20, hosted jointly by ORSNZ and Victoria University of Wellington.

His talk was titled “Trends in OR Practice in the UK”, and though his data came from the UK, there were many parallels with our local scene. Amoung other things, John has been a manager of a large OR group, the Operational Research Executive at British Coal. He overlapped briefly with Tony Vignaux there, though it was called the National Coal Board then, before Tony came out to take up a position with the DSIR and then later with Victoria University. John has also been prominent in the UK ORS, serving as President, and several other offices. He recently carried out a study, commissioned by the UK ORS, which looked at the success and survival of OR groups in the UK (see references in the Editorial). He also drew on the UK ORS’s earlier study in 1986 to enable comparisons, and an examination of the changes in the OR scene.

He found many OR groups had closed, others had reformed or been taken over by external consulting groups. In all there were over 100 OR groups in the UK in the mid 90s. Lessons from those who survived included that OR groups need to be flexible, adaptable, pragmatic and helpful. OR groups should recognise they need to market themselves: this includes building up data to show the value of OR. He stressed that just having happy clients is not enough — some OR groups

with satisfied clients have still been closed down. He said that presentation and report writing skills are essential, as are oral skills: communicating with the client to ensure the OR groups supplies what is called for. One successful group's motto was to "Under-promise, over-deliver".

In all he said OR is still popular, but times do change, and we need to keep apace. He listed the new tools that were viewed as having made substantial improvements to OR groups' performance. These new tools were:

| | |
|---|---|
| Spreadsheets/Graphical user interfaces | 18 |
| Simulation improvements (eg VIM) | 13 |
| Soft OR | 9 |
| Systems dynamics | 6 |
| Neural networks | 5 |

Others rated much lower counts.

He talked also about what is unique about OR, giving OR it its competitive edge. These include:

Understanding systems to a reasonably complex level
Quantitative/ analytical/OR /statistical skills
Ability in model building, verifying, validation
Handling complexity, uncertainty, variability
Ability to home in on key issues/factors
Accessing relevant data, however stored, and add value, e.g., via Decision Support Systems, or by finding patterns.

Looking to the future, he referred to Peter Bell's work in North America, and some UK data, and identified dynamic pricing (yield management) to be an opportunity for good results, especially in the travel and accommodation industries. Also in finance: e.g., credit risk scoring. He also singled out two other approaches being used by prominent UK OR people that can provide strategic advantage: Colin Eden's SODA (Strategic Options Development and Analysis), and Robert Dyson's scenario approaches.

More results and discussion can be found in various articles in JORS (which he hastened to add were accepted before he became editor). There are 2 articles out already, and another 2 will appear shortly.

As Editor of the prestigious JORS journal, John also repeated his call for more practically oriented papers.

## *Waikato Murmurs*

Some of the things that members of the department are working on are noted below. We would welcome any feedback and dialogue.

Eric Deakins and Hugh Makgill are continuing work on a large BPR/Change Management survey, which will take place in both NZ and the UK, where Eric is presently on leave. A recent publication by Deakins and Makgill (1997) examined the current state of BPR, as evidenced by the present literature. A survey of some 2,000 articles showed that 98% of them were written since the beginning of 1993. There is almost a complete absence of research articles that underpin BPR and provide a methodological foundation. Seminal papers on BPR stressed the two important enablersof BPR; Information Technology (IT) and people. However, there is a noticeable absence of people issues in the BPR literature. Our casual observation and interaction with people who are doing reengineering or being reengineered confirms this. Deakins and Makgill conclude that, "there is plenty of anecdotal evidence which suggests that BPR is being currently perceived as nearing the end of the its useful life cycle." It would be interesting to see if this is also the view of the larger management consulting practices.

John Scott and Bob McQueen are looking into the "new" topic of Knowledge Management. More maybe next time.

Decision making continues to be of fundamental importance in management. In a book review of Witch Doctors: Making Sense of the Management Gurus, Eileen Shapiro (1997) states,

> *"...although conflicting theories are a fact of managerial life, it's the manager's responsibility to make a diagnosis and then, with incomplete information, to act. That's what managers are paid to do: to make tough decisions intelligently in environments of shifting uncertainties. They have the authority to make those decisions, and ultimately they are the people who must be held accountable for the outcomes."*

Stuart Dillon is completing his Masters' Thesis in our department on this topic of managerial decision making. His empirical work has been to investigate the decision making of all managers within a local body and he has uncovered some interesting results. 23 upper level managers were asked to describe the type of decisions they make and the processes they follow in making those decisions.

Of most interest is the apparent gap between what was observed in this study, and what the

literature suggests we should be observing. Much of the "descriptive" theory of decision making focuses on the more structured decisions problems involving choosing between a number of alternatives each being made up of several measurable and comparable attributes. In this study at least, decisions of that nature were almost non-existent. Factors such as time and financial constraints, public pressure, and lack of knowledge regarding more prescriptive decision making techniques, all contribute to an environment where decisions are typically made in a way most similar to the most recent successful decision. Local government decision makers are, in general, risk averse and as a result, rely heavily on the experience they gain from earlier decisions both they and others have made. The observations in this study are not dissimilar to the behaviour observed by Klein (1988) in studying the decision making of fire ground commanders, tank platoon leaders and design engineers. The background of the study participants also appears to influence their approach to making decisions. Those with extensive local government experience display relatively conservative decision making behaviour. In contrast, a number of those interviewed had more diverse employment backgrounds and their decision making styles reflect that.

Alarmingly, although not surprisingly, the majority of the decision makers spoken had little understanding and awareness of the processes they were following when making decisions. The development of decision making methodologies or objectives are also uncommon.

The cartoon below shows the "darker" side of managerial decision making - which, as Stuart has observed, is often very ad-hoc.


***"Okay then, it's agreed. We'll go with chart B."***

**References**

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Klein G.A. (1988). Recognition Primed Decisions, In W.R. Rouse (Ed.*) Advances in Man Machine Systems Research*, 5. Greenwich, CT: JA Press.

Shapiro, E. (1997). Managing in an Age of Gurus, *Harvard Business Review*, March-April 1997, 142-147.

Les Foulds has been on study leave since July and has attended a number of conferences, mainly in Europe. Here are his impressions:

**NOAS97, Copenhagen, August 1997**. NOAS is a biennial conference, organized by the Nordic Operations Research Societies. It brings together both researchers and practitioners to present and discuss operations research issues. One of its main aims is to establish and strengthen contacts between Nordic Operations Researchers, in particular doctoral students, and to bridge the gap between those in universities and in industry, and people working in related fields. It is remarkably similar to the NZOR jamborees: friendly, informal, with a high standard of content, presentations, and organization. NOAS97 had 3 special sessions on OR in: telecommunications, energy, and transportation. Denmark has a long and proud record of achievement in each of these fields, which was enhanced by some interesting related talks.

**IEEE International Conference on Intelligent Engineering Systems, 15-17 September.** Growing industrial international competition has created a demand for the introduction of intelligent manufacturing techniques to improve: product quality, production process effectiveness, and related costs. However, unlike many other recent conferences concerned with computational

intelligence, INES97 focussed on the application of this field to manufacturing systems. It was a small, friendly conference; with the hosts making heroic efforts to please, despite rather difficult systems. The welcome reception and banquet were held in a hotel of the grand European style that looked like an old spy movie set.

**IEPM'97 Conference, Lyon, October 20-25, 1997**. Following the success of the First International Conference on Industrial Engineering & Production Management, which was held in Mons, Belgium, in 1993, it was decided to hold a second conference in Marrakesh, Morocco in 1993. As this was an even bigger achievement, French academics and Practitioners in the operations management field felt the desirability to create a biennial series. The third conference has just been conducted in Lyon. It was noticeable that the conference organizers obtained significant support from both French industry and government. This was all the more remarkable, given that conference was organized by the staff of the Catholic University in Mons, Belgium, hundreds of kilometres away. The industrial visits and the social program were outstanding. Lessons for NZ conference organizers: Review submitted papers carefully, with suggestions for improvement as a condition of acceptance. Have a poster fair for those that are considered unsuitable for presentation or for the proceedings. Ensure session chairs and presenters have adequate English. Select plenary speakers with care.

### *Mainland News*

**John A. George** has resigned from the Department of Management at the University of Canterbury. He is joining the Wellington office of Putnam, Hayes & Bartlett, the largest OR consulting group in NZ and Australia, and part of PHB's international operation, particularly well-known for their work in energy management. He will be sorely missed as a friend, colleague, teacher, and as an effective and efficient head of department, as well as a seasoned and influential member of important university committees. (It is murmured that he actually enjoyed his position as HOD.) Over the last few years, John's research has been mainly in confidentiality issues for statistical tables and the use of heuristics for container loading, all resulting in publications in JORS and EJOR. The OR group at Canterbury wishes him much success in his new life as an international consultant.

**Overseas Visitor in Production and Inventory Control at the University of Canterbury**

Prof. Edward Silver from the University of Calgary will be an Erkine Fellow in the Department of Management from 28 February to 4 April 1998. Prof. Silver holds the Carma Chair in the Faculty of Management. His publication list is in the triple number, the majority having appeared in the top OR/MS and production/operations management journals. Many of us have either taught from or used his text *Decision Systems for Inventory Management and Production Planning* (Wiley, 1979, 1985), co-authored with Rein Peterson — its third edition either out or out shortly. He will offer seminars to graduate students and staff on advanced topics in inventory/production control and his current research.

His current plans include a visit to the Business School, University of Auckland (contact: D.J. Robb). His e-mail address at Canterbury, starting Early February 1998, will be: *e.silver@mang.canterbury.ac.nz*.

**No Symonds Street Stories:** they are still sorting out their roster who in on next!

**Massey Mutterings:** They have gone quiet too!

## *SHORT NEWS ITEMS*

### *Using Multimethodology*

Do you or have you mixed or combined together different systems/OR methodologies in a practical intervention? If so, we would be very grateful if you would be willing to participate in a survey.

It is becoming much more common for practitioners to combine together different methodologies or approaches in tackling problems. This is partly because different approaches focus on different aspects of the problem situation - quantitative, social, political etc, and partly because there are several phases to an intervention that also involve different tasks. Particular combinations combinations of methodologies have become quite well established, for example cognitive mapping and systems dynamics, SSM and strategic choice, SSM and structured IS methodologies, but we are sure that there are many others that have been tried and found to be effective.

We will be carrying out a postal (and possibly web-based) survey to discover the extent of multimethodology usage and to explore combinations that have been found to be successful, or unsuccessful.

If you have had practical experience of combining methodologies, especially across the hard/soft divide, and would be willing to participate, please contact me (John Mingers) on: *j.mingers@warwick.ac.uk* or phone +44 1203 522475. Thanks for your time.

John Mingers, Iain Munro, John Brocklesby, Warwick Business School, Warwick University, Coventry CV4 7AL, UK

### *IFORS Secretariat new address*

As from 1 January 1998, the IFORS Secretariat will be located with
Ms Loretta Peregrina, IFORS Secretariat
Richard Ivey School of Business
University of Western Ontario
London, Canada N6A 3K7
e-mail: *IFORS@Ivey.uwo.ca*
WWW: *http://www.ifors.org*

### *Andres Weintraub — IFORS President for 1998 – 2000*

Andres Weintraub is taking the helm of IFORS from Prof. Peter Bell (University of Western Ontario). He was Vice-President of IFORS, past president of the Chilean Institute of Operations Research, and past president of the Latin American OR Association, an IFORS regional grouping. He is a full professor and member of the Chilean Academy of Sciences. Trained originally as a civil engineer, he got a masters in statistics and a PhD in OR from the University of California in Berkeley. He has published numerous papers, both on OR methodology and OR applications, and is particularly well-known world-wide for his work in OR modelling for forestry management, silvicultural operations, tree harvesting, and log utilization.

## *1998 COUNCIL MEMBERSHIP*

The following people were elected to Council at the Melbourne AGM:

| | |
|---|---|
| President: | A. Philpott |
| Treasurer: | A. Mason |
| Secretary | M. Thornley |

Council members: J. Buchanan, B. Cavana, L. Foulds, J. George, J. Lermit, V. Mabin, G. Read, D. Robb
Minutes of the meeting will appear in the March isssue or the *OR Newsletter.*

## *33RD ORSNZ ANNUAL CONFERENCE 1998*

### *CALL FOR PAPERS*

**31 August - 1 September 1998, University of Auckland**

The 33rd Annual Conference of the Operational Research Society of New Zealand will be held at Auckland University on the 31st of August and the 1st of September, 1998. The annual Conference brings together operational research theoreticians and practitioners from throughout New Zealand, as well as attracting some overseas participants. There are two plenary addresses from invited speakers, and contributed papers of 25 minutes duration. All papers to be given must be submitted in written form (of up to 10 pages in length), and are collated in a proceedings volume which is issued to all ORSNZ members as part of their subscription.

Participants who are under 25 on September 1, 1998 may enter their paper for The Young Practitioners Prize. These must be solely authored. Please notify the Conference Committee of your intention to compete for this prize on the submission of an abstract.

**Timetable**: May 1 Closing date for submission of abstracts July 15 Closing date for submission of full papers

**Send Abstracts to:** Dr Andrew Mason, Department of Engineering Science University of Auckland, Private Bag 92019, Auckland

# MEETINGS CALENDAR FOR 1998 AND BEYOND

**INFORMS/CORS Montreal Spring 1998 Meeting: 26 – 29 April 1998**
Queen Elizabeth Bonaventura Hilton, Montreal, Canada
General Chair: Paul Mireault, École des Hautes Études Commerciales, 5255 Avenue Decelles, Montreal, Quebec
*Paul.Mireault@HEC.CA*

**3rd Int. Conference on Multiple Objective Programming and Goal Programming: 31 May – 3 June 1998**
Quebec City, Canada
Information: Jean-Marc Martel, Université Laval, Sainte-Foy, Québec, G1K 7P4, Canada
*jean-marc.martel@fsa.ulaval.ca*

**XIV Int. Conference on MCDM: 8-12 June 1998**
University of Virginia, Charlottesville
Abstract deadline: 5 January 1998
Chair: Yacov Y. Haimes, University of Virginia
mcdm98@virginia.edu
*http://www.virginia.edu/~risk/mdcm98.html*

**INFORMS Israel International Meeting 1998: 28 June – 1 July 1998**
Chair: Jacob Hornik, Tel Aviv University, Recanati Grad. School of Mgt., Ramat Aviv 69978, Israel

**EURO XVI: 12 – 15 July 1998**
Brussels, Belgium
Contact: Jaques Tegham
*euro@mathro.fpms.ac.be.*
Deadline for paper submission is Dec. 15, 1997

**3Rd Int. Conference On Systems Science And Systems Engineering: 25 – 28 August 1998**
Beijing
Contact: Prof. Jian Chen, School of Economics and Management, Tsinghua University, 100084, Beijing, China
*jchen@mail.tsinghua.edu.cn*
Deadline for paper submissions is December 30, 1997

**OR40: 8 – 10 September 1998**
Lancaster, UK
Information: Operational Research Society, 12 Edward Street, Birmingham B1 2RX, UK.
email@orsoc.org.uk
*htpp://www.orsoc.org.uk*

**INFORMS Seattle Fall 1998 Meeting: 25 – 28 October 1998**
Seattle, Washington
Chair: Marisa Altchuler, Boeing Computer Services, P.O.Box 24346 M/S 7A TH, Seattle WA 98124-0346
*marisa.altschul@boeing.com*

**Int. Conference On Nonlinear Programming And Variational Inequalities: 15 – 18 December 1998**
Hong Kong
Contact: *maopt@cityu.edu.hk* or
*http://www.cityu.edu.hk/ma/*

**INFORMS Cincinatti Spring 1999 Meeting: 2 – 5 May 1999**
Chair: David F. Rogers, University of Cincinnati, Ohio, 45221-0130, USA
david.rogers@uc.edu

**IFORS'99 Beijing: 16 – 20 August 1999**
Friendship Hotel, Beijing, China
Contact: Ms Loretta Peregrina, IFORS Secretariat, Richard Ivey School of Business,
University of Western Ontario, London, Canada N6A 3K7
*IFORS@Ivey.uwo.ca*
Deadline for electronic submission of abstracts: December 31, 1998
Follow instructions on *http://www.IFORS.org/leaflet/triennial.html*
or *IFORS@Ivey.uwo.ca*, subject: HELP ABSTRACT
Abstract fee (non-refundable) payable by December 31, 1998: US$100
IFORS OR in development prize: contact Dr Elise Del Rosario, *elisear@sanmiguel.com.ph*