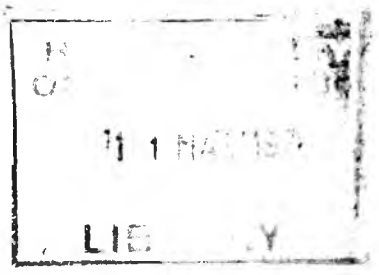
NEWSLETTER

Operational Research Society of New Zealand (Inc.)



COUNCIL NOTES

From the Council Meeting of October 26 held immediately after the Annual General Meeting.

1. Dr Daellenbach (Canterbury Chairman) and Mr Rosser (Auckland Chairman) were co-opted to the Council.

2. The subcommittees are now as follows:-

Constitutional	:	Convener, Mr Cook, Members: Dr Daellenbach, Professor Jackson, Mr Rosser Professor Vignaux.
Education	:	Convener, Dr Barr, Members: Mr Rosser, Dr Schroder, Mr Taylor, Mr Walker.
International Affairs	:	Convener, Professor Vignaux, Members: Mr Cook, Dr Daellenbach, Mr Foster, Professor Jackson, Mr Purdie.
Membership	:	Convener, Mr O'Brien, Members: Mr Elder, Mr Lusk, Mrs Fancy (nee Watson)
National Events	:	Convener, Mr Lusk (subject to his acceptance), Members: Mr Cook, Mr McKenzie, Mr Nutsford.
Public Issues & Awareness	:	Convener, Mr Foster. Members: Mr Jelicich, Mr McArthur, Mr Slocombe.
Publications	:	Convener, Mr Scott, Editor NZOR Dr Daellenbach, Editor Newsletter, Mr Scott. Members: Mr Elder, Dr Murtagh.

3. Mr Campbell was appointed as the Society's representative to the Royal Society of New Zealand.

4. As last year, provision is to be made in the Council budget for air trips to two Council meetings by each branch chairman (or nominee)

From the meeting of December 13.

1. The Council was told that the 1973 Annual Conference ran at a loss. Total expenditure was $631 and the deficit is at least $80 and may be $120, depending on a disputed account.

2. Council adopted a 73-74 budget incorporating estimated expenditure of $1672. Council has decided to seek corporate support to increase the Society's income.

3. The constitutional amendment passed at the S.M. held on October 26 has been registered by the Assistant Register of Incorporate Societies and has thus taken effect.

4. In England the President has had discussions with the President of IFORS, Professor Arne Jensen, about the possibility of an IFORS sponsored but otherwise self-supporting tour of New Zealand and Australia by Professor Jensen and another, perhaps Rivett.

BRANCH NOTES

AUCKLAND

A meeting of the Auckland Branch was held on Tuesday 16th October. A panel from the Operational Research Department of New Zealand Forest Products spoke on "Operations Research Applications" in which they were involved. The emphasis being placed on Linear Programming. The three speakers were:-

Frank Coulter,
Keith Reay, and
Dereck Johansen.

Frank started the meeting with a description of the structure of the relevant Organisational Tree. As is now becoming noticeable with other New Zealand companies NZFP now has Operational Research under the general title of Management Services which also includes Work Study and EDP Applications. The O.R. section has its Manager, 5 Graduates and 1 Technical Assistant.

Linear Programming nas been used for a number of years in:-

Logging Truck scheduling and
Paper Trim Models. Later applications include
Saw Milling,
Wallboard Plant Planning and
Pulp and Paper.

Saw Milling Linear Programming was set up to determine the sizes of boards and quantities needed to be cut to satisfy sales. Difficulties arose in its operation because of the time lag involved in getting sufficient data in time to make reports useful. Other problems also arose with changes to wood grades and changes in the log size mix.

The Paper Trim Linear Programming was used for generating patterns for slitting but stopped short of Machine Sequencing. It was found that the constraints were too exacting and too many setups resulted. The system could be useful for several orders covering a few days work but falls short for several orders covering a couple of hours of work, i.e. a mix with a majority of short runs. The paper trim is now run on a System/7 on an hour to hour basis.

The Wall Board system is still in development. One interesting factor which Dereck mentioned was the progress he had made in bringing together the people involved from the various disciplines, i.e. O.R., Accounts, Sales, Production and Marketing to give a "total plant activity."

A general opinion of Linear Programming applications was that they are not very practical in short term production methods, and that at the other extreme very valuable in assessing year to year sales and in Marketing over a similar period.

CANTERBURY

1. Joint Meeting with Christchurch Transport Group - 6/6/73

W.A. Harding, Director of Management Services, Railways Department, Wellington, gave an adress on "O.R. in the Railways Department" to an audience in excess of 100 people. O.R. in the Railways is in some sense still in its infancy. However, this is not due to a lack of O.R. or similar activities on the part of the Management Services which is in charge of such applications, but rather on account of the enormous complexity of railroad operations. A natural application for O.R. is the scheduling and redistribution of the various types of railroad cars, so as to maximize their utilization. To undertake a project of this nature requires a data base that is not available at the present time and detailed knowledge about movement and location of individual cars which requires a continuous monitoring system. It is here where efforts are presently underway. To acquire experience, a simulation model covering a small portion of the network is run in view of predicting car status and location into the future, based on manually transmitted real data. The meeting was followed by cocktails and supper.

2. Lincoln College Meeting on O.R. in Agriculture - 27/7/73

This was without doubt one of the highlights of this year's local programme. Professor W.O. McCarthy talked about "Plant Size and Location Studies" drawing from his research and modelling efforts for wool processing both in Australia and N.Z., where the potential benefits of implementation could run into the tens of millions of dollars. Due to the political as well as economic implications of such recommendations he stressed the need to provide policy makers not only with the optimal solution but also with a range of close to optimal or suboptimal solutions and the corresponding loss in benefits.

Mr A.T.G. McArthur, reader at Lincoln College, followed with a neat application of dynamic programming to dairy cattle culling in view of maximizing the return on a herd. As an interesting side point he could show that the rules of culling he had developed from empirical analysis some 20 years ago and which are widely followed in practice are close to optimal. Both talks stimulated a lively question and answer session. The meeting closed with cocktails and supper.

3. AGM Canterbury Branch - 26/9/73

The business part of the meeting was kept to a welcome minimum with a brief report by the Branch chairman on the status of the constitutional review, the changes proposed for the special AGM during this year's conference in Wellington and a brief outline of this year's conference. The treasurer's report followed with receipts and expenditure for the year balancing out. R.A. Clements, H.G. Daellenbach, D.G. Elms, M.L. Gimpl, T.A. Lusk, J.L. Rodgers were elected unopposed to the new committee which will decide at its first meeting on a chairman and secretary-treasurer.

The business meeting was followed by short presentations from three economics students on projects undertaken for a Masters seminar in O.R. Mr. F. Stewart talked about an inventory control model for Kiosks (housing for transformers). The particular feature of the problem was the fact that local suppliers due to shortages of raw materials and production capacity tend to lag behind the contractual supply rates. A Markov process model with two control parameters, the monthly supply target rate and an upper control limit to reduce supply rate, was presented.

Mrs S. Cook presented a forecasting model for food products subject to seasonal variations in demand where promotions play an important part of marketing strategy. Exponential smoothing with trend and seasonal adjustment was used. Tests indicate that the model performs well.

Mr. R. Proctor analyzed a highly complex model to optimize the number of cavities in dies for plastic molding so as to minimize the total production costs.

Each presentation stimulated considerable discussion and the three students should be commended both for the tremendous effort put into their projects as well as for their excellent presentations.

SIMULATION OF CONTINUOUS SYSTEMS

Seminar Report - By Mr A.M. Surti

A seminar on the topic of the simulation of continuous systems was organised by the Applied Mathematics Division of DSIR and held at AMD on 16 October 1973. The attendance was about 40 and included representatives from Auckland and Christchurch. The seminar was introduced by Professor G.A. Vignaux (Information Science, Victoria University) who outlined the background and the importance of modelling and simulation methods to the study of continuous systems. He discussed the fundamental aspects of simulation and described the wide variety of problems which can be tackled using simulation methods.

Dr. R. Allen (Fisheries Research, Marine Department) discussed the increasing use of simulation models as a guide for fisheries management. One of the most successful approaches has been the use of differential equations which simply treat the fish population as a homogeneous aggregate of biomass. The estimation of parameters and problems involved with the use of such models were discussed with particular reference to the yellow fin tuna fishery in the Eastern Tropical Pacific.

The use of Analog and Hybrid Computers as a tool for simulation was dealt with by A. Surti (A.M.D, D.S.I.R.). He then described a model study of a digital motor on a Hybrid Computer. The results and advantages of this approach were discussed. There then followed an animated discussion in which a question was raised about automatic patching. Surti said that today it is practical. There are hybrid computers incorporating automatic patching units in USA and UK, but in New Zealand it will be hard to justify the cost of incorporating such system, although cost wasn't a factor that held up the development in digital computer systems.

Dr R. Wooding (A.M.D., D.S.I.R.) reviewed a simple mathematical theory of a Hele-Shaw Cell which demonstrates a slow flow of a viscous liquid under the influence of pressure field and of gravity. Its application as a physical analogue to problems of potential theory, problems in water-oil interaction associated with oil production, and flow in porous media, including models of possible geothermal flow configuration were described.

In order to achieve complex engineering objectives in controlling modern electric (Hydro or Thermal) power stations a detailed study using computer modelling and simulation methods, will be necessary. Such objectives and possible methods were described, by C. Axford and B. Durdle (NZED).

Several contributions to the seminar dealt with simulation model studies using the finite element method. A detailed investigation of a suspension insulator with a view to design improvement was reported by Dr M. Fama (A.M.D., D.S.I.R.) A mathematical model, using the finite element method, is used to predict high tensile stresses and strains in the ceramic and hypothesize the probable fracture area.

Today in an environment conscious society, careful studies for management control of the use of natural resources are called for. Dr. S.M. Thompson (MOW) illustrated a simulated study of Lake Manapouri and discussed a method for comparison of hydro-electric operating rules for management of water storage.

Future advances in the field of weather prediction lie in the application of physical laws and theories to forecast the evolution of an initial observed state. A study of numerical weather prediction was described by Dr K. Trenberth of N.Z. Meteorological Services. A hierarchy of atmospheric simulation models of increasing complexity is being developed for use in the New Zealand area. However, inadequate initial data, because of the vast open oceans in this area, pose problems for numerical analysis of data and predictions.

Simulation of models used for forecasting are quite often criticised, specially in areas such as World Dynamics, Industrial Dynamics, Economic Dynamics, and Political Dynamics. Dr G. King (P.E.L., D.S.I.R.) described some of the drawbacks and limitations of Forrester's methods of forecasting world problems and a caution as to use and abuse of World Models for predicting world future. Dr King also described an effective forecasting method which is achieved by a panel of experts interacting anonymously through an executive panel.

Dr R. Deane (Reserve Bank) dealt with objectives and the results of the Reserve Bank econometric model, the nature of the model structure, and the problems involved in solving the system of 90 equations. One point made in the discussion was flexibility of models to enable incorporation of changes in policy variables which is important in forecasting.

Dr. R. Heath (D.S.I.R., Oceanographic Institute) described a computer model simulating the response of the ocean by employing a numerical method, using a space and time finite difference scheme. The results of the model, applied to both the New Zealand tide and the tides in Cook Strait, were discussed.

Finally, the seminar concluded with a general view that the wide variety of simulation studies, as required for New Zealand environment, justifies a need to form a special interest group, devoted to all aspects of simulation, under the auspices of an appropriate institute or learned society. In addition, the seminar also showed a need to hold a national seminar in the near future.

CONFERENCES AND COURSES

1. Second International Discussion Conference - 1974 Edinburgh, Scotland 8 July to 12 July

In 1971, the Universities of Lancaster, Pennsylvania and Sussex sponsored the First International Discussion Conference on Operational Research, held at Oxford. The motivation behind this venture was the realisation that people attending conferences often come away wishing there had been more time for informal meetings and discussion. Furthermore, the long lead time that is usually required of authors who write papers for conferences can be such that the work described is already superseded by the time the paper is read and published. The 1971 venture was an experiment in an entirely different way of running conferences. Its unique feature was that there were no formal papers. Instead about 24 eminent persons in the O.R. and contiguous spheres were each invited to lead a discussion on a subject of particular current interest to himself. The experiment was a great success and the three Universities are now sponsoring the second such conference to be held in the summer of 1974, the administration this time being from Lancaster.

The Conference will be for five days. Some sessions will go on in parallel, but each speaker will have two sessions so that there should be a good chance that every participant will be able to attend at least one session of every speaker that interests him. Discussion leaders will be encouraged to prepare advance notes of the points they wish to raise in their sessions.

The following are expected to take part as discussion leaders: Ackoff, Balinski, Charnes, Cooper, Churchman, Collcutt, Emery, Emshoff, von Falkenhausen, Feeney, Gupta, Hertz, Krarup, Lindberg, Mercer, Moore, Muller-Merbach, Niehaus, Ozbekhan, Pau, Rapoport, Rivett, Roberts, Rosenhead, Sachs, Simpson, Thrall, Tomlinson, Williams.

The Conference is recognised by the International Federation of Operational Research Societies.

A brochure giving full details can be obtained by completing the slip below and forwarding to:

International Conference Secretary,
Dept. of Operational Research,
Cartmel College,
University of Lancaster,
Bailrigg,
LANCASTER, LA1 4YL,
ENGLAND

I have two copies of the Conference Booklet.

- Ed (J.L. Scott, C/- NAC,
P.O. Box 96, Wellington)

2. The University of Lancaster, Department of Operational Research has three Postgraduate Courses in O.R.

2.1 M.A., a one-year degree aiming to provide students with a basic training in O.R. The syllabus content is presented in three sections.

i. Mathematical and Statistical topics.

ii. O.R. Methodology and Associated Disciplines.

iii. Optional Courses for Application to particular problem areas and Advanced Techniques.

The lecture courses cover some 25 weeks between October and May followed by project work.

2.2 M.Sc., a research degree - minimum of 12 months.

2.3 Ph.D., a research degree - minimum period: 2 years (full time)
3 years (part time)

Admission is conditional on a student either:

i. Possessing a recognised postgraduate degree or diploma in O.R. or equivalent qualifications, or

ii. Performing satisfactorily in nominated papers of the M.A. examination.

For more detailed information on these courses I have an information booklet.

- Ed. (J.L. Scott, C/- NAC,
P.O. Box 96, Wellington)

3. 9th New Zealand Mathematics Colloquium -

The 9th New Zealand Mathematics Colloquium will be held on Tuesday to Thursday 14 - 16 May 1974 at the University of Auckland.

Contributed papers from all fields of pure mathematics, applied mathematics, statistics, computing, operational research, mathematical physics and the teaching of mathematics are called for. Also of interest are papers with a substantial mathematical content from other disciplines, e.g. economics, social sciences, theoretical physics. In addition there will be some invited speakers.

Accommodation - Rooms have been reserved in modern University Halls of Residence within a short distance of the Campus. These include a number of double rooms suitable for married couples. Families may also be accommodated. The tariff per day, for bed and three meals, will be about $7.00 per person. Motel and hotel accommodation at higher rates can be arranged.

Preliminary Registration - To help the organizing committee with their preparations those who might attend are asked to complete a pre-enrolment form (which is not a commitment) obtainable from the Colloquium Secretary.

D.P. Alcorn,
Department of Mathematics,
University of Auckland,
Private Bag,
Auckland,
NEW ZEALAND

to whom general enquiries should also be addressed.

4. New Zealand Computer Society Inc. -

4th National Computer Conference to be held 21-23 August 1974 at the University of Canterbury, Christchurch.

The theme of the conference will be "Practical Computing" and the conference committee has been successful in recruiting eminent overseas speakers.

Registration forms will be circulated in March 1974, and registrations will close on 31 May 1974.

Accommodation will be arranged by the committee at Hotel or Motel and at the University Halls of Residence. A varied and interesting ladies programme will be organised.

Further information from -

The Chairman,
Fourth National Computer Conference,
P.O. Box 2557,
CHRISTCHURCH

5. IFORS 7th Triennial Conference. Japan 1975 July 17-24: Charter Flights -

IFORS is trying to arrange charter flights through JAL to the IFORS Meeting in Tokyo and Kyoto in 1975. At the moment these charter flights are from Europe and the USA but we may be able to arrange one in conjunction with Australia.

If anybody is interested in going to Japan at that time, and/or attending the conference, could they please contact

G.A. Vignaux,
Convener, International Affairs Committee,
Department of Information Science,
Victoria University of Wellington,
Private Bag,
WELLINGTON

NOTICES

1. Experienced O.R. Scientist Seeks a Position in New Zealand

An Operations Research scientist with experience in the National Coal Board Operational Research Executive is seeking a suitable position in Operations Research with New Zealand. He has had experience in communications and control, network analysis, linear programming, simulation and teaching.

For further information please contact Professor G.A. Vignaux, Department of Information Science, Victoria University of Wellington, Private Bag, Wellington, Telephone 46-040.

2. Developing Countries - Systems Engineering

During the International Federation of Automatic Control - International Federation of Operational Research Societies 1973 Conference on "Applications of Systems Engineering Methods to Developing Countries" it appeared necessary to promote future contact between politicans in charge of development and systems specialists. IFAC has set up a Developing Countries Group (DECOG) which initially wishes to establish a list of specialists working in the systems field who could contribute to such contact. DECOG also wants to define the problems of developing countries where automatic control and systems theory could help.

Members of ORSNZ interested in participating actively in DECOG work are invited to write to the Convener of our International Affairs subcommittee (Box 904, Wellington).

3. HAVE YOU ANYTHING THAT MAY BE SUITABLE FOR THE JOURNAL !

Full details on the procedure for submitting manuscripts were in the last Newsletter

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O.R. PROGRAMS

(A pinch from the NLTR of our Australian Brothers)

Attached is an index of O.R. oriented programs for which information has been received. If any member would like further details of these programs please contact the Australian Company concerned.

1. Control Data Australia

The following programs and packages are available:

APEXI	Incore lp system - no integers
CSSL3	Simulation of continuous systems
MAGEN 6000	Matrix and report generator program
MIMIC	Solution of ordinary differential equations
NETFLOW II	Automated analysis of transportation networks
OPHELIE II	Mathematical programming system
PDQ/LP	Rapid Linear programming system
PMCS	Project management control system
PPS IV	Project planning and scheduling program
SAAM	Model fitting from experiemntal data
SIMI5	Advanced system simulation programming language
FEPLOT	A finite element code plotting system
SACM	Surface approximations and contour mapping
PI-PLOT	Ahighly versatile x-y plotting system
POLYGRID/ GRIDCON	A system for producing contour maps from randomly distributed data
LOADFLOW	Electrical power network analysis
SYSCAP	System of circuit analysis programs

ADLPIPE	A computer program for pipe stress analysis
AUTOFLEX	Automated design of modern pressure piping systems
EAC/EASE	Elastic analysis for structural engineering
MARC-CDC	Anonlinear finite element analysis program
MRI/STARDYNE	A static/dynamic structural analysis system
NASTRAN	NASA structural analysis program
PIPEFLEX	Piping system flexibility analysis
PISCES	Violent stress analysis program
CIVCO	Civil engineering computation system
DCO/TRANPLAN	A system for transportation planning
ENPAL	A system for petroleum mining and production analysis
MITAS	Athermal analyzer system
X-RAY-70	Structural analysis of crystals from diffraction data
APT 6000	Automatically programmed tooling system
SYSTEM 2000	A system for efficient management of data
SPSS	Statistical package for social sciences
AID	Tree analysis of market research data
BMD	Statistical analysis programs
MATH SCIENCE LIBRARY	A comprehensive library of mathematical and statistical programs
CDC/MACRAN	Random data analysis system
MATSTAT	Subroutines for matrix manipulation and statistical analysis
Q-A-PAK	Questionnaire analysis program
RISK ANALYSIS	An automated financial analysis system

2. IBM

From IBM we received a most comprehensive KWIC index for O.R., which unfortunately goes only to 1967. The index is divided into three sections:

A: lists titles by topic in alphabetical order
B: lists keywords in title by alphabetical order
C: lists articles by journal in chronological order for each

The 345 topics covered in Section A are:

accounting	accounts	adaptive
administration	advertising	aerospace
agriculture	air	aircraft
airlift	airline	allocations
allocating	allocation	analogue
analog	application	applications
applied	applying	arms
army	assembly	assignment
assignments	automated	automatic
automation	balancing	bank
banking	banks	bargaining
bayesian	behavoural	best
bibliography	bidding	bonds
bond	boolean	branch
brand	budget	budgeting
budgets	business	calculus
capital	chance	chemical
choice	choosing	classification
coal	combat	command
commercial	communication	communications
comparison	competing	competition

competitive
computers
conguestion
control
corporate
correlation
cpm
cybernetics
decomposition
design
dispatching
distributions
dyamic
economics
electricity
expansion
facilities
feed
firm
flows
forecasting
fractional
gaming
government
growth
heuristic
information
insurance
inventories
investments
lanchester
learning
loading
locations
logistics
machine
management
manufacturing
markets
material
media
military
mixed
naval
nonlinear
operations
optimizing
organisation
packaging
pert
plant
prediction
probalilistic
process
production
project
psycho
quadratic
queueing
railroad
railways
regression

computer
computing
construction
controlling
corporation
cost
credit
decision
defence
development
distributing
dual
econometric
education
engineering
exploration
facility
feedback
fleet
food
forecasts
game
gas
gradient
handling
highway
input
integer
inventory
job
layout
line
locating
logic
long
machines
manpower
market
markov
material
medical
minimax
monte
navy
oil
optimal
optimum
organisational
parametric
planning
police
price
probabilities
procurement
productivity
projects
psychological
quality
queues
railroads
real
reject

computerized
conflict
consumer
convex
correlated
costs
critical
decisions
dependability
discriminant
distribution
duality
economic
electric
equipment
exponential
federal
financial
flow
forecast
forest
games
geometric
graphs
health
industrial
inspection
international
investment
lagrange
layouts
linear
location
logistic
lot
maintenance
manufacturer
marketing
markovian
maximum
medicine
missile
national
network
operational
optimization
or
organisations
personnel
plans
portfolio
pricing
probability
product
products
psychiatric
public
queue
queuing
railway
regional
reliability

repair
resource
risks
route
sales
sampling
schedules
selecting
sequence
server
services
shop
simulations
sociological
statistical
stochastic
stocks
strategy
survey
symbolic
systems
target
telephone
traffic
transportation
trucking
underdeveloped
urban
walk
warehouses
weapon
z-transforms

replacement
resources
road
routes
salesman
savings
scheduling
selection
sequences
servers
servicing
simulating
smoothing
sociology
statistics
stock
strategic
submarine
survival
symposium
tactical
targets
terminal
training
travel
trust
universities
utility
walks
warfare
weapons

research
risk
roads
routing
sample
schedule
search
sensitivity
sequencing
service
shipping
simulation
social
standards
steel
stockage
strategies
surveillance
switching
system
tactics
tax
textile
transport
trunk
uncertainty
university
waiting
war
water
work

3. Computer Sciences Australia

CSA publish an exhaustive list of all programs available on their INFONET system. This is a subset of that catalogue.

CONDXA	Construction cost estimating and scheduling
COST	Computerised management system which provides cost and profit estimates for new or modified processing facilities.
AREA	Evaluates areas in traverses
COGO	Surveying and engineering geometry program
HYNAL	Analyses flow in hydraulic networks
STORM	Computes variables for storm drains
SYMAP	Produces maps on a line printer which depict spatially variable data
ANSYS	General purpose engineering analysis program
GASP	General purpose structural analysis package
STRESS	Linear analysis of elastic, statically loaded structures
BMIS	Basic management information system
ECAP	Classical electronic drcuit analysis program
FILTER	Computes steady state and transients of filter functions
QCSTAT	55 programs to aid the quality control engineer in virtually all areas of statistical quality control and analysis.
RELAN	19 programs designed to perform systems and component reliability analysis

CSTRES	390 programs for stress-strain analysis
CAPVAL	Comprehensive tool for making advantageous decisions on capital planning and resource management
FIPLAN	Financial forecasting and planning system
CALNDR	Calendar routine for CPM
CPM	Critical path upto 350 activities
SPREDX	A CPM and resource analysis system
PRISM	Investigate models by simulation of past history
LINSYS	Small linear and quadratic programming
LITUMP	Incore UMPIRE - no integers
UMPIRE	Mathematical programming system
RISK	Risk analysis
GPSS	General purpose simulation system
CRIPS	A project network analysis tool using CPM
CSTS MATH-PACK 78	Mathematical subroutines plus many mathematical programs
CSTS STAT-PACK/UCLA BIOMEDICAL PROGRAMS	Many statistical routines, particularly for handling large amounts of data

NEWS OF MEMBERS

W.P. Foster and T.W. Marks are now Registered Systems Engineers and we extend our congratulations.

LATE ADDITION

The 4th Internet Congress entitled Project Management in the Seventies will be held in Paris from Sept 30 to Oct 3, 1974. "The Congress objectives are to give the state of the art, to provide for exchange of knowledge and multinational experience in project management, to spread operations management concepts in Industry, Commerce and Government and to present up to date project management techniques."

The Programme Committee are calling for papers which focus on the areas of Top Level Management, Project Management, Project Management Tools, and Research and Advanced Techniques.

The Congress official lanaguage is English and copies of the Conference booklet are available from the Ed. (J.L. Scott, C/- NAC, P.O. Box 96, Wellington.