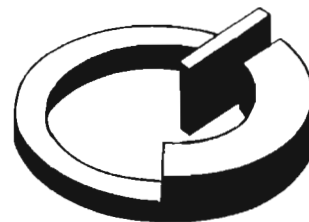


THE AUSTRALIAN METROLOGIST



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FROM THE PRESIDENT

What a remarkable success! The first national conference of the Metrology Society of Australia, held at the National Measurement Laboratory in November, exceeded all of our expectations. There have been many significant and memorable events in the short history of the MSA, but to me this conference has been the highlight.

Running over three days, the conference attracted 150 metrologists from all over Australia, a terrific result for a country with such a small, widely scattered population. International visitors included the keynote speaker, Professor Paul de Bièvre from the European Union, Dr Wang Li from the Singapore Institute for Scientific and Industrial Research, Dr Nhi and Mr Van from the Vietnam Metrology Institute and Dr Laurie Christian from IRL in New Zealand.

The conference brought together people from a diverse background but with a common interest in measurement. We all learned, taught, met new people and shared experiences. The conference was an embodiment of the most basic and fundamental objectives of the MSA, the essence of what the MSA is all about.

Having attended a number of conferences, the features of this conference that stand out were the superb organisation, the very high quality of the speakers and the friendly atmosphere. My enduring memory will be the conference dinner spent cruising Sydney Harbour on a warm, moonlit evening with the Harbour Bridge and Opera House as a magnificent backdrop.

Just 12 months ago the task of organising and conducting the first MSA national conference was "given" to the then newly formed NSW branch. A conference committee, consisting of Glenda Sandars, Kerry Marston, Bob Kelly, Ilya Budovsky and Barry Sutcliffe, joined later by Tony Collings, Margaret Ball, Jan Roberts and Mike Gibbes, was, to put it nicely, drafted.

To be honest, no one knew what to expect. What eventuated was, I believe, a truly remarkable achievement.

These people, in just 12 months, organised a national conference from scratch, with 150 people attending, three program streams, refereed papers and published proceedings, speakers of international reputation, technical visits, catering (including a conference dinner of more than 100), advertising, sponsorship, trade displays, merchandising. It just goes on and on!

Of course this was not achieved by the conference committee alone. Many people, too numerous to mention, contributed to turning the conference into a reality. To everyone involved, congratulations and thank you.

It's not always appropriate to single people out, but I am absolutely confident that everyone involved in the conference organisation would agree that Glenda Sandars of NML and Kerry Marston of NSC deserve a special mention. They were truly the engine room of the conference committee. Sadly, after all the work she put in, Kerry was not able to attend the conference, having left to work in China for two years. To Kerry and Glenda, a special thank you.

It was also most appropriate that our first conference was held at the National Measurement Laboratory, truly the centre of excellence of measurement in Australia. I would like to thank CSIRO for its generosity in allowing the facilities at NML to be used for this conference and the NSC and AGAL for opening their laboratories for guided tours.

The second MSA AGM was held during the conference. The retiring Management Committee was re-elected with the exception of Glenda Sandars, who retired after two years of excellent service. Glenda was replaced by Richard Duncan from Duncan Tool and Gauge Company in South Australia. I would like to congratulate Richard and all members of the Management Committee on their election and I look forward to facing the challenges and working with them in 1996.

Glenda retired due to her increasing commitments in the Asia-Pacific region and her work as NML's Principal Standards Liaison Officer. She is the first to retire from the inaugural management committee of the MSA and it is a sad occasion for

(continued on p3)

THE AUSTRALIAN METROLOGIST

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North Melbourne VIC 3051

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The Editor
The Australian Metrologist
c/o 71-73 Flemington Road
North Melbourne VIC 3051
Fax (03) 326 5148
Phone (03) 329 1633

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Management Committee

President	Dr John Miles	(03) 9542 2964
	CSIRO Division of Applied Physics	
Vice-president	Dr Barry Inglis	(02) 413 7211
	CSIRO Division of Applied Physics	
Secretary	Mr Colin Wagg	(03) 9329 1633
	NATA	
Treasurer	Mr Stuart McDonald	(03) 9295 8700
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	Mr Richard Duncan	(08) 276 4088
	Duncan Tool and Gauge	
	Dr Grahame Harvey	(02) 888 3922
	National Standards Commission	
	Mr Ron McBain	(03) 9850 3919
	Quality Calibration Services	
	Mr John Mitchell	(03) 9329 1633
	NATA	
	Mr Horst Sieker	(03) 9555 0671
	ACM Laboratory	
	Dr Jane Warne	(03) 9669 4122
	Bureau of Meteorology	

Marketing	Mark Pilkington	(03) 9295 8700
------------------	-----------------	----------------

State Contacts

NSW	Barry Sutcliffe	736 8222
	Kerry Marston	888 3033
	Ilya Budovsky	413 7201
Postal	C/O Mr Barry Sutcliffe	
	NATA	
	7 Leeds Street	
	Rhodes NSW 2138	
Queensland	Roy Hood	274 7750
	Erwin Schilling	864 2248
	Ian Cowling	864 2592
Postal	C/O Mr R Hood	
	GEC Alstom Australia Ltd	
	GPO Box 406	
	Brisbane Qld 4001	
South Australia	Brenton Watkins	268 6077
	Jeffrey Tapping	362 1240
Postal	C/O Mr R Duncan	
	Duncan Tool & Gauge	
	10 Allan Street	
	Melrose Park SA 5039	
Western Australia	Denis Baylis	333 8832
	Paul Edwards	451 0883
Postal	C/O Mr P Edwards	
	NATA	
	Suite 5, Technology Centre	
	2 Brodie-Hall Drive	
	Bentley WA 6102	

Editor	John Mitchell
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FROM THE PRESIDENT (cont)

those of us on the committee who have worked so closely with her for the last two very exciting years. We will miss Glenda's hard work, her knowledge, her wisdom and her humour. On behalf of all members of the MSA, I would like to thank Glenda for her magnificent contributions to the MSA.

I believe that 1995 has been a successful year for the MSA, culminating in our first National Conference. 1995 has been a year of consolidation and sheer hard work, after the heady days of 1994.

At the beginning of the year, the management committee held a one day planning meeting, in which the MSA objectives for 1995 and the next five years, were formulated. I am pleased to report that most of our 1995 objectives were achieved.

The highlights of 1995 include the following:

- ▶ Membership certificates were printed and mailed to all members.
- ▶ MSA promotional brochures were produced and circulated.
- ▶ A major seminar on measurement was conducted in conjunction with the Advanced Engineering Centre at RMIT and Melbourne University.
- ▶ A number of submissions were made to the Kean Committee, including a detailed response to the Kean report.

- ▶ Rules for the operation of Technical Groups were formulated and our first Technical Group, the Pressure Technical Group, was established.
- ▶ The requirements and procedures for admitting MSA Fellows were formulated.
- ▶ TAM and the Bulletin continued to develop and provide vital communication with the members.
- ▶ Many State groups conducted very successful site visits and technical workshops.

Our priorities for the next 12 months include the development of proper State organisation in conjunction with the national organisation, the continued improvement in communication via *The Australian Metrologist* and *The MSA Bulletin* and a stronger emphasis on technical workshops.

I would like to personally thank all members of the Management Committee for the magnificent effort they have put in over the last two years. They have all worked very hard for you, the members, and have achieved an incredible amount. Remember that these people are all working voluntarily and are motivated by a belief in the value of the MSA to Australia and to their fellow metrologists.

Finally, I would like to wish all members of the MSA and their families a very merry Christmas and a happy new year. I look forward to working with you all again in 1996.

John Miles

THE AUSTRALIAN METROLOGIST

MEMBERSHIP NEWS

The Society has continued to grow steadily through 1995 and we have now passed the 300 member milestone.

While it is disappointing to lose any members, there have been some with whom we have lost contact and others who have indicated that they will not be continuing their membership.

With twenty-two outstanding applications still to be processed as at the time of printing, it would seem that we are in no danger of having a net loss of members. Indeed, with the membership drive combined with a large number of non-members attending the MSA Conference who sought information on membership, we expect to see the MSA grow further in the coming months.

We are also delighted that our key-note speaker, Professor Paul de Bièvre, handed his application to the President at the conference.

For the benefit of those who did not make it to the AGM, the Secretary's report on the membership follows.

There have been 310 memberships granted as of 10 November 1995. This represents an increase in membership of 56 (or 22 %) since the last AGM in October 1994. The breakdown of the membership by State is as follows.

State	Members
Australian Capital Territory	2
New South Wales	81
Northern Territory	3
Overseas	1
Queensland	33
South Australia	31
Tasmania	6
Victoria	137
Western Australia	16
Total	310

The first memberships were granted in December 1993. Memberships were granted as detailed in the following table:

Dec '93	36	Feb '94	41	Mar '94	68
May '94	86	Jul '94	6	Jul '94	7
Oct '94	11	Nov '94	3	Feb '95	10
Apr '95	3	Jun '95	11	Sept '95	6
Oct '95	8	Nov '95	14		

CMM USER GROUP OFF-SHOOTS TAKE ROOT

The Coordinate Measuring Machine (CMM) User Group, launched in Australia in 1988, has proven to be a major asset to the Australian CMM community. Ongoing support indicates that the role of the group in disseminating CMM technology and providing access to CMM verification programmes has not diminished.

The success of the CMM Group has not gone unnoticed overseas and a CMM Technology Club was set up at NPL in England in 1991. Over the last couple of years, I have assisted with the formation of one group in Canada and another in Italy.

I was honoured to be a guest and the first speaker at the inaugural meeting of the Canadian CMM Club at Oshawa (near Toronto) on 2 - 3 November. Their club, which is supported by the National Research Council Canada (NML's equivalent), has been closely modelled on the Australian Group and will include a Coordinate Measurement Assurance Programme (COMAP) using a 300 mm ballplate. Plans to make an intercomparison of our ball plates were discussed during my visit to the NRC.

During November, the Italian club also held its first formal meeting although other meetings had been held during the last year leading up to the formation of the group.

There is a lot of evidence that the need and desire of metrologists to get together and discuss metrological problems in all disciplines is being well served by groups like The CMM Group and the MSA.

I was also fortunate to be able to visit Dr Steven Philips at NIST in Washington DC. Those of you present at the last CMM Group meeting in Melbourne on 28 June will remember his excellent talks. My visit was dominated by the impending shutdown of NIST due to the government budget debate and the bills before congress to dismantle NIST and privatise it. It would seem that their valuable work in metrology, particularly in the CMM area is not seen as important politically.

Carl Sona
Secretary, CMM User Group

LABORATORY COMPUTING

Data validation

With this discussion, I intend to try to highlight an emerging dilemma. I have written briefly of the need for data validation in a previous issue of TAM (Issue 5 June 1995, Automatic Data Acquisition) where an automated data acquisition system is involved. Data validation is something we do as metrologists when recording data. Put simply, you observe a process and determine a reading by averaging, estimating, etc depending on the process. You then record the data on a record sheet and the recording becomes the permanent record of the actual value observed.

There is no way this recording can be validated against the process again unless the reading process is repeated. Most good data collection processes require at least a second and often more values to be recorded to allow an effective assessment of things like repeatability and hysteresis and ultimately an uncertainty of the measurements.

When a repeat value is determined and recorded during data collection, this new value can be compared immediately with the original recorded value to gain an early estimate of the repeatability of the process. At times when a second value is recorded there may be significant disagreement, well in excess of the amount normally expected for that process. This can be put down to incorrectly estimating a vernier, or a lost segment on a digital display or a similar, regular fault that will allow a legitimate alteration to the original recorded value.

This discussion so far relates to values recorded on a record sheet in plain handwriting. The dilemma comes about with primary data recording moving from handwriting to hand keying directly into a keyboard. Remember, all data collection must be subject to some form of data validation and as stated above, regardless of the value estimated from the process, the value recorded becomes the actual estimated value. A simple mis-keying on the keyboard will suddenly produce a value that was not the value estimated for that reading.

A quick look at a standard keyboard will also show that a small fingertip slip will turn a 5 into any other number. This will often be not so big that it could be legitimately questioned but it may affect repeatability estimates. There is also no way to validate which way you slipped or mis-hit the keyboard upon entering another value, the two values disagree unacceptably.

Trying to validate or legitimately correct for the all-too-common three finger typist mis-keying a value into a keypad raises some concern. Remember that

regardless of what value was displayed or read by the process, the value that is recorded becomes the actual estimated value.

This sets the scene for stressing the need for some care in setting up data recording directly into a keyboard. Maybe all recordings should be displayed to allow the operator to validate them as new values are recorded. Simple validation would involve careful checking of the value before moving off that value or hitting Enter. More reliable validation would involve presenting the value back to the operator for confirmation before accepting the value. This is essentially a software task or possibly a macro task. Awareness of the need for care when keyboarding may be all that is required, however, the pressures to work cheaper and faster will erode care.

The last of my concerns relates to the all too simple ability to alter the original data in say a spreadsheet if values do not agree. On a record sheet original data may be neatly crossed out and the new value entered. Both are visible. On a spreadsheet, you simply step up a few cells and write over the original data. This will often be necessary to allow the spreadsheet to calculate your results. We now have the case where only **selected** original data is being presented for assessment and other recordings are discarded without any chance to determine the justification. If we start seeing a substantial reduction in the uncertainty of processes that used to scatter more, then maybe a check of the data collection processes will reveal all.

The dilemma is simply one of data validation and the nature of data recording. Handwriting, however bad, can usually be reliably interpreted. Keyboarding produces very readable data but validation and correction is not as easy. Some careful thought should be put into the development of any data recording process and the accompanying staff training.

Neville Owen

If language is to be a means of communication there must be agreement not only in definitions but also (queer as this may sound) in judgement... It is one thing to describe methods of measurement and another to obtain and state results of measurements. But what we call "measuring" is partly determined by a certain constancy in results of measurement.

Ludwig Wittgenstein
Philosophical Investigations #242

[Thanks to Garry Price for this quote. Ed.]

THE MSA CONFERENCE - MORE THAN WE'D HOPED FOR

The first MSA conference has come and gone. It took twelve months to organise, cost many thousands to stage and left the vast majority of delegates with a very good feeling about the future of the Metrology Society of Australia. Our sincerest thanks to the organising committee for a job extremely well done.

After the event, we asked four of our members what they thought of the conference, likes, dislikes and where we should go in the future. Here are their responses.

Jeffrey Tapping (South Australia) *To me the conference was invigorating for a number of reasons, but one of my greatest joys came from the discussions about what actions could be taken to enhance the profession of measurement. Many professional societies are little more than social clubs and conferences are often at best, networking meetings and at worst, junkets. While I value networking very highly, I think that meetings of professional societies should be much more than that.*

Our society has started off with such enthusiasm and high hopes that it would sadden me, and I am sure many others, if it degenerated into another one of those social clubs. And so I challenge my fellow members to ensure that the discussions of the conference lead to actions and achievements to talk about and build on at the next national meeting. Our objectives should not be to build a great Society but to build a great profession, for then a great Society will surely follow.

Paul Edwards (Western Australia) *I thought the conference was of excellent value. There was enough variation between and within the three streams of lectures to cover most people's expectations. My interests lay within the dimensional metrology stream and I was satisfied with the content and presentation of all papers.*

The opening keynote address by Professor de Bièvre was very well presented and I felt quite honoured to have been a member of the audience. It really left a lot for the other presenters to live up to. The venue had excellent facilities for speakers and, with a captive and expectant audience, the majority of presenters did maintain the standard. Most used the tools available to good effect enabling complex points to be understood.

The technical visits could have been a little longer, maybe spread out over the three days enabling more

time to be spent within your choice of laboratory.

A big plus was putting the faces to the names which crop up in our publications and the chance to meet up with former colleagues. Also judging by the activity between presentations, most people made the most of the networking opportunities.

Also, no one fell overboard.

Brian Phillips (Queensland) *Judging by the presentation of our conference, I guess that the trepidation of the organising committee was matched by their enthusiasm (with an uncertainty of plus or minus two points). I believe our committee must be applauded. I have attended many conferences, but never have I had so much information passed on and retained. This is obviously due to my own interest in the subjects, but must also have a relationship to the quality of presentations given.*

The opening address by Professor de Bièvre was a highlight for me and, from discussions with colleagues during the conference, I was not the only one impressed and intrigued. One gratifying element for myself was that my views on "quality consultants" were not just isolated opinions.

I offer my thanks and congratulations to everyone involved in the organisation of our first conference and I am looking forward to the next with a great deal of anticipation.

Steven Grady (New South Wales) *Overall I consider the conference very good. It was excellent value for money and good value for time. I was particularly taken by the diversity, both of papers and discussion. As an electrical metrologist, getting lost in my own world is easy and I enjoyed interacting and learning from other metrology disciplines. The social occasions were excellent and one important benefit was to be able to talk with people I had not seen in a while.*

I justified my attendance at this conference on the basis that I needed to keep up to date and would learn something and that it would be applicable to my laboratory. In the future, I would like this to be kept in mind when considering papers being submitted as I found some to be too esoteric. I would also like to see some lectures on acoustics and temperature measurement at the next conference.

Finally, I am really looking forward to the next conference although it is going to be a hard act to follow.

THE AUSTRALIAN METROLOGIST

THE 1995 MSA CONFERENCE - THE BIG GUNS



Top left: Dr John Miles, President of the MSA gives his opening address and welcome.

Below left: The Keynote Speaker, Professor Paul de Bièvre from the European Community's Institute of Reference Materials and Measurements.

Top: Dr Bill Blevin, the MSA's first Honorary Fellow, gives the closing address.

Below: Professor de Bièvre receiving something by which to remember his visit.



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THE 1995 MSA CONFERENCE - METROLOGISTS AT PLAY



From left to right, top to bottom:
Alex Smart is a bright bloke, Bill Blevin finally receives his certificate, Berwyn and Tony Collings either side of Barry Inglis, ?(sorry) and John Peters, South Australians David Gray, Peter Crawshaw and Tony Adams, Mr Van and Dr Nhi from Vietnam with Nick Brown and Jim Gardner, Neville Owen, Jane Warne and Paul Huysing, John Miles and Jana Zeleny



THE AUSTRALIAN METROLOGIST

THE ASIA-PACIFIC METROLOGY PROGRAMME - FORGING TOWARDS 2020

With the increasing emphasis on opening up markets in the Asia-Pacific to global trade, the Asia-Pacific Metrology Programme (APMP) joins the other Specialist Regional Bodies¹ (SRBs) in Standards and Conformance in support of the goals of the Asia-Pacific Economic Cooperation (APEC) to eliminate technical barriers to trade in the Asia-Pacific region.

Having taken up the role of APMP Regional Coordinator at the end of 1994, Dr Barry Inglis of NML is keen to encourage the increasing pace of development within the programme over the past year. The pace set has been largely due to the energy and commitment of APMP members and culminated in the highly successful annual meeting from 15 - 19 October.



This 11th Committee Meeting of APMP was held in the Tsukuba Science City, Japan, hosted by the National Research Laboratory of Metrology (NRLM), Japan. Participants from 17 of the 22 member countries/territories attended. The following synopsis of the meeting agenda demonstrates the current levels of activity within the Programme.

In the 'Regional Coordinator's Report', Dr Inglis noted that, in fulfilment of his responsibilities, close contacts were being maintained with the other APEC SRBs, the APEC Standards and Conformance Sub-Committee (SCSC), and the other regional metrological bodies involving European (EUROMET), North American (NORAMET) and Commonwealth (CIMET) countries, Dr Inglis has also visited Fiji, Vietnam and the Philippines to review their measurement capabilities and assess needs.

One of the fundamental activities of the Asia-Pacific Metrology Programme has always been the

coordination of intercomparisons between member laboratories. This process is designed to help regional laboratories assess and improve their measurement competence.

The current round of APMP intercomparisons has been launched by Vietnam with its coordination of a hardness intercomparison. Vietnam's program will be followed by at least 8 other member laboratories coordinating 14 intercomparisons before the end of 1996. APMP members are also providing ongoing support to the APLAC proficiency testing programme through technical advice and assistance as well as the provision of artefacts.

A new initiative, proposed at the 10th Meeting and produced in draft form at the 11th committee Meeting, is an APMP Memorandum of Understanding (MoU), designed to formalise the commitment of members to the objectives of the Programme.

Similarly, following the 11th Committee Meeting, members are considering the formation of a Mutual Recognition Agreement (MRA) as a stepping stone towards eliminating technical barriers to trade and achieving the APEC objectives.

The latest 'Directory of Calibration Facilities' for the region is due for publication and distribution by the Taiwan APMP member laboratory in the near future.

The Australian APMP Secretariat was established in late 1994 and, over 1995, has produced the Reports of the Tenth (and now Eleventh) APMP Committee Meetings, an APMP information booklet and brochure, two issues of the APMP newsletter (April and October), and a Management Plan for APMP intercomparisons.

Additionally, the Secretariat has produced reports for the APEC Standards and Conformance Sub-Committee (SCSC), and is in the process of organising an APEC

Conference on Standards and Conformance in late 1996. The Philippines national measurement laboratory, Industrial Technology Development Institute (ITDI), has agreed to host the Conference. All Asia-Pacific Specialist Regional Bodies have committed their support for the Conference which is aimed at representatives from government, memberships of the regional bodies, and industry, business and commerce representatives, particularly those from developing Asia-Pacific economies.

The 11th Committee Meeting was held in association with a seminar titled 'Dissemination of standards and laboratory accreditation in the Asia-Pacific region'. The seminar, presented in both Tsukuba and Tokyo, was extremely well supported by representatives from Japanese industry. The success of the event was assisted by lectures from International delegates representing BIPM, OIML, ILAC, EUROMET, NORAMET, NPL (UK) and the APEC Specialist Regional Bodies as well as Japanese Industry spokespeople from Mitutoyo, Yokogawa Electric and Matsushita Electric Industrial.

For further information about the Programme or any of its activities, please contact the APMP Secretariat, National Measurement Laboratory, CSIRO Division of Applied Physics, POB 218, Lindfield, NSW, 2070 (Ph: [02] 413 7788; Fax: [02] 413 7383; email: angelas@dap.csiro.au).

Angela Samuel

† Asia-Pacific Laboratory Accreditation Cooperation (APLAC), Asia-Pacific Legal Metrology Forum (APLMF), Pacific Accreditation Cooperation (PAC) and Pacific Area Standards Congress (PASC).

NML NEWS

New Chief of the Division

The Division of Applied Physics, CSIRO, which incorporates the National Measurement Laboratory, has a new Chief. Dr John Collins, formerly Acting Chief, has been appointed Chief for a period of six months. He replaces Dr W R Blevin, who retired at the end of 1994.

Recent resistance inter-comparison with NIST, USA

NML's Brian Pritchard has recently completed calibrations involving two 100 Ω resistors from NIST (National Institute of Standards and Technology), USA, and three NML 1 Ω resistors. The NIST resistors were measured in the US, airfreighted to NML, and re-measured.

The measurements showed a discrepancy between the difference in the two resistances at NIST (ΔR_1) and at

NML (ΔR_2). While the 100 Ω resistors could be hand-carried without any significant problems, they did not travel by airfreight as successfully. The 1 Ω resistors not only travelled well but also stabilised quickly.

Final NIST and NML values for the 1 Ω resistors agreed to a part in 10^8 , when related back to NIST's and NML's QHR (Quantum Hall Resistance) respectively. Previous comparisons with commercial resistors have led to agreements to only parts in 10^7 .

Both outcomes, the travel-resilience of the resistors and the good agreement between NIST and NML measurements, are independently of benefit to the laboratories involved.

Bilateral Projects

with Indonesia...

Tony Russell, Corporate Affairs manager at NATA, and Glenda Sandars, Principal Standards Liaison Officer at NML, visited Indonesia between September 23 - October 13, to commence a collaborative project with the Indonesian accreditation system for calibration laboratories. The visit involved discussions with the accreditation body, Komisi Metrologi, the accreditation secretariat and visits to the 14 calibration laboratories.

It is expected that the collaboration will continue over the next two years and will involve advice from NATA about the accreditation process and assistance from NATA and NML in conducting proficiency testing programs. The project is being funded through the APEC initiatives of the Department of Industry, Science and Technology.

Korea...

On 24 October, the President of the Korea Research Institute of Standards and Science (KRISS) and the Chief of the Division of Applied Physics, CSIRO, met in Taedock Science Town, Korea, to sign Statements of Equivalence in eight measurement areas. The quoted measurement accuracies in the eight areas are based on both bilateral and multilateral intercomparisons of travelling standards.

Korea is the fifth country with which Australia has signed Statements of Equivalence, and the first in Asia.

and the Philippines...

A project has been initiated between NML and the Industrial Technology Development Institute (ITDI), the national measurement laboratory of the Philippines. The project aims to achieve international recognition of the Philippines national standards of measurements. A review visit by a scientific team from NML took place in November to identify measurement quantities with highest priority for International recognition and to draw up a strategy for achieving the stated objectives.

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MEMBERSHIP SURVEY

Thankyou to everyone who completed the membership survey supplied with the last issue. We have received more than eighty responses so far but would like to have many more.

If you have not completed one, please do. While it is realised that some people have an objection to completing such surveys, if the reason that you have not sent one in is that you a) forgot or b) hadn't bothered, please help to give the results better statistical reliability.

1. Age

1	18 - 24	-
2	25 - 29	8
3	30 - 34	9
4	35 - 39	8
5	40 - 44	10
6	45 - 49	16
7	50 - 54	17
8	55 - 59	14
9	60 - 64	2
10	65 - 69	3
11	70 and over	-

2. Gender

1	Male	79
2	Female	4

3. In which state or territory are employed?

1	NSW	25
2	VIC	33
3	QLD	12
4	SA	6
5	WA	4
6	TAS	2
7	ACT	-
8	NT	-
9	Overseas	2

4. Are you currently?

1	Self employed/contractor	9
2	Full time employee	72
3	Part time employee - seeking full-time work	-
4	Part time employee - not seeking full-time work	2
5	Unemployed - seeking full-time work	-
6	Unemployed - seeking part-time work	-
7	Unemployed - not seeking work	-
8	Retired - seeking full-time work	-
9	Retired - seeking part-time work	-
10	Retired - not seeking work	1

Due to time constraints, it has not been possible to provide you with more than the tallies of the raw data. A more complete analysis of the results will appear in the next issue (when, hopefully, we will have received more responses). At that time, we will attempt to correlate some of the responses. The plan is to make this survey an annual event so that we can begin to look at trends in the profession.

That the total number of responses for each question does not always equal the number of respondents simply reflects the fact that not all questions were relevant to all members and, in some cases, they exercised their right not to respond to some questions.

4(b) For what period has this status applied?

0 - 3 years	11
4 - 6	3
7 - 9	6
10 - 12	3
13 - 15	4
17 - 19	4
20 - 22	6
23 - 25	6
26 - 28	2
29 - 31	5
> 31 years	10

5. If employed full or part-time, are you?

1	Employed in metrology in an engineering or scientific position	39
2	Employed in metrology in a technical officer or technician position	34
3	Employed outside of metrology in an engineering or scientific position	7
4	Employed outside of metrology in a technical officer or technician position	-

5. If employed part-time, what percentage of full time hours do you work?

1	< 20%	-
2	35-39%	1
3	40-59%	-
4	60-79%	1
5	≥ 80%	-

6. If employed full-time, indicate hours per week you actually work

1	< 35	-
2	35-40	36
3	41-49	31
4	≥ 50	12

7. Compared to last year, is this

1	more	16
2	about same	59
3	less	5

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8. MSA membership category

1	Member	73
2	Associate	6

9. Which of the following describes your main job responsibility?

1	Development	3
2	Production	1
3	Research	5
4	Teaching	-
5	Calibration	35
6	Sales	-
7	Service	5
8	Testing	6
9	Consulting	3
10	Management	13
11	Quality Assurance	8
12	Quality Control	-
13	Computing	-
14	Other	2

Percentage of total work time spent on this activity

1 - 10%	-
11 - 20	1
21 - 30	2
31 - 40	3
41 - 50	7
51 - 60	11
61 - 70	11
71 - 80	12
81 - 90	11
91 - 100	14

10. What is your highest qualification in an engineering, scientific or technical discipline?

1	School	year 10 or less	2
		year 11	1
		year 12	3
2	Certificate of Technology (or equivalent)		21
3	Associate Diploma		14
4	Associateship Diploma		12
5	Bachelor Degree		15
6	Post graduate diploma		3
7	Masters Degree		1
8	Doctorate/PhD/DSc		10
9	Other (specify)		2

11. Are you currently engaged in formal study? If so, please tick the level of your course?

1	Certificate	1
2	Associate Diploma	2
3	Bachelor Degree	4
4	Graduate Diploma	1
5	Masters	2
6	Doctorate/PhD/DSc	-
7	Other (specify)	1
8	Part-time	
9	Full-time	

12. Your general job title

Senior management	9
Middle management	26
Supervisor	34
Technician	12

13. In which industry is your organisation mainly engaged?

1	Calibration and testing	28
2	Research and development	13
3	Manufacturing	15
4	Public admin (Federal or State)	9
5	Education	3
6	Sales	-
7	Other	10

14. In which category is your organisation?

1	Private sector	38
2	Australian Public Service	4
3	Australian Gov. Instrumentality or Gov. business enterprise (inc. CSIRO)	19
4	State Public Service	4
5	State Government Instrumentality	9
6	University or Tertiary Institution	1
7	School including TAFE	-
8	Independent organisation	3
9	Other	2

15. Are you covered by an employer-funded superannuation scheme?

1	Yes	76
2	No	6

16. Is this scheme

1	Contributory	65
2	Non-contributory	4

17. Employer's total contribution to superannuation, (% or \$pa, include Super. Guarantee Levy)

3	4
4	3
5	13
6	9
> 6	25

18. What percentage of salary do you contribute?

0%	9
1	-
2	1
3	5
4	2
5	33
> 5	16

19. Have you changed employers in the last 12 months?

1.	Yes	9
2.	No	69

20. Did the change increase your remuneration?

1	Yes	1
2	No	7

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21. % change in salary because of new employment

-15%	1
-5%	1
0%	2
+25%	1

22. What is your base salary pa? (\$1000s)

0 - 5	-
6 - 10	-
11 - 15	-
16 - 20	1
21 - 25	-
26 - 30	3
31 - 35	8
36 - 40	23
41 - 45	15
46 - 50	9
51 - 55	2
56 - 60	4
61 - 65	5
66 - 70	5
71 - 75	-
> 75k	1

23. What was it 12 months ago? (\$1000s0)

0 - 5	-
6 - 10	-
11 - 15	-
16 - 20	1
21 - 25	1
26 - 30	3
31 - 35	7
36 - 40	25
41 - 45	6
46 - 50	7
51 - 55	4
56 - 60	6
61 - 65	5
66 - 70	3
71 - 75	-
> 75k	1

24. Other allowances (\$ value)

Car	13
Parking	5
Travel	5
Home office	5
Uniform	8
Other	5

25. How many years of experience in a metrology related position have you had in total?

0 - 5 years	12
6 - 8	9
9 - 11	7
12 - 14	8
15 - 17	13
18 - 20	12
21 - 23	2
24 - 26	4
27 - 29	2
30 - 32	5
> 32	7

26. How did you become involved in metrology?

1 Deliberate move to a measurement career	31
2 Metrology formed part of duties	47
3 Other	5

27. Has your training in metrology been

1 Solely on-the-job	31
2 On-the-job augmented with formal training courses	47
3 Predominantly by formal training	5

A START FOR OUR LIBRARY

Philips Scientific have very kindly donated to the MSA a copy of the Fluke company's book *Calibration: Philosophy and Practice*, second edition. In particular, we extend our appreciation to Gavin Mathew who was manning the Philips display at the MSA Conference.

Not surprisingly, this publication deals mainly with electrical metrology and has Fluke equipment illustrated. It should not, however, be dismissed as an expensive advertisement. The introductory chapters dealing with the philosophy of calibration are such that they would fit into any textbook on the subject.

The following chapters get into the nitty gritty of a range of mainly DC and low frequency calibrations which, while being written around Fluke

instrumentation, are useful to anyone performing such measurements.

Not to limit itself too much, the last third of the book deals with issues of laboratory management and practice, statistics for the metrology laboratory, uncertainty of measurement, laboratory accreditation and issues relating to ISO 9000.

Apart from being more up-to-date, this edition is far broader in scope than the first edition.

The volume is currently residing in the editors office (where it will remain until I have finished looking at it - Ed.) but what we will do is to circulate it to the States in February when most are having meetings. Members can have a quick look at it before we make it available for loan.

STATE EVENTS

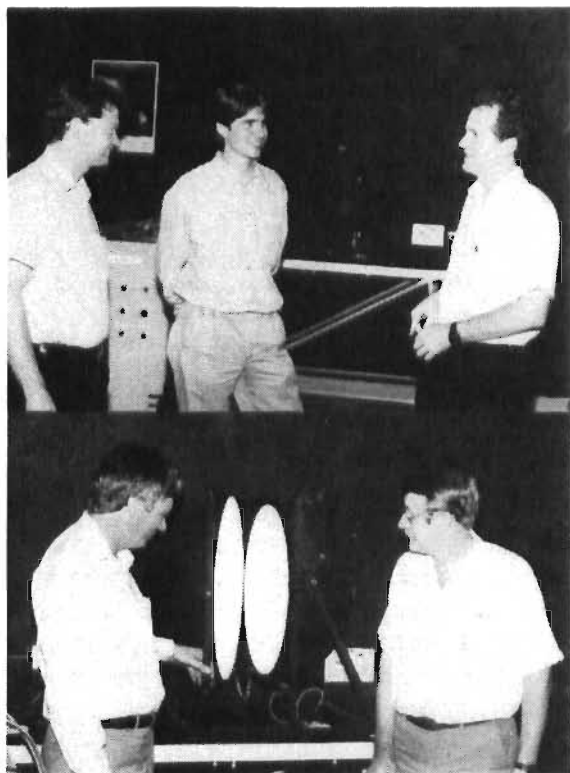
NEW SOUTH WALES

The NSW members have spent the last twelve months preparing for the MSA conference. Now we will find out if there is life afterwards. Our first technical meeting for 1996 will include an election of the NSW Coordinator(s) for the coming year. Our Vice-President will preside over the meeting which will conclude with refreshments.

Next Meeting

Date: Wednesday, 14 February 1996
Venue: National Measurement Laboratory
Bradfield Road, West Lindfield
Time: 6:30 pm
Speaker: Mr Alan Squirrel
Manager, Proficiency Testing
NATA
Subject: "Conducting measurement comparisons for calibration laboratories"

QUEENSLAND



Top: Shane Brann, Ray Pippia and Geof Barnier at the Queensland group visit to the QUT Photometry Laboratory.

Bottom: Ian Cowling, the host for the visit, explaining the mysteries of luminous flux measurement using the integrating sphere to John Darling.

Quiz No 2

1. Where do you go with a goniometer?
2. What would you see in the single mirror of a goniophotometer?

The Queensland members were treated to an illuminating evening at the Queensland University of Technology Photometric Laboratory when Dr Ian Cowling traced the development of his laboratory from its establishment in the late 1980's. It stands presently as the only commercial light measurement facility in Queensland and holds NATA accreditation for many of its services.

From the first commercial tests in 1989, the laboratory has developed to perform extensive computer controlled measurements of motor vehicle signal lights for compliance with the Australian Design Rules for motor vehicles and trailers covering light intensity, direction and colour.

The laboratory is equipped with several photometers, filament lamps standards and optical filters calibrated by, or traceable to, the National Measurement Laboratory. These are then used for the calibration of customer photometers as well as the measurement of light transmittance through glass and polymers.

Ian and his Senior Laboratory Technician, Nick Reitsema, ably demonstrated their eight meter tunnel which is set up with the goniometer and a range of detectors and which can measure luminous intensity and spatial angles down to 12 minutes of arc.

Colour characterisation by chromaticity measurements (x and y coordinates as per the CIE colourimetric system) on paints, inks and textiles are performed. Consultancy, collaborative research and prototype testing are other valuable services provided by this laboratory.

Quiz answers

1. The principle of the goniometer was invented by a French mineralogist by the name of A Carangeot in the 1780's and has been adapted to many fields of measurement including crystal gemology, human joint movement and, in this case, to rotate a luminous source in defined angles so that its luminous intensity can be measured throughout the spatial range of its output.
2. Members were able to see the first stages of construction of the 2.5 metre goniophotometer in which a lamina can be rotated through a vertical plane and also a horizontal plane. The light energy is reflected by an inclined mirror onto a photodetector. Luminaires up to 1.5 meters in length can be evaluated by this unit.

Next Meeting

Date: Mid-February (final date TBA)
Venue: All Seasons Abbey Hotel
Subject: Annual Dinner and 1996 business planning meeting

The Queensland Coordinators extend the season's compliments to all of our regional members and families with wishes for a prosperous 1996.

SOUTH AUSTRALIA

South Australian Members visit Pope

On Wednesday, 1 November, the SA members met for a technical evening at Pope Electric Motors at Woodville. This is one of the few companies still making electric motors in Australia and Pope manufacture a range of motors specialising in custom designs for heavy industry.

Our host for the evening was Brenton Watkins who manages their NATA accredited laboratory for testing the performance of these motors.

The evening began over a cup of coffee and a short, very informal meeting. The main (only) subject of discussion at this round table meeting concerned the structure of the Society, in particular that of the State branches (or chapters) and there was consensus among those present that, while some formal recognition by the society was necessary, with basic constitution and common procedures desirable, it was evident nevertheless that we prefer to avoid a rigid formality of meetings.

Brenton then led us on a conducted tour through the plant to see the various fabrication and assembly techniques. This was followed by a visit to the test laboratory where we talked torque, efficiency, standards and traceability while conducting an experiment to see how many living metrologists could be kept in a confined space without initiating a chain reaction.

The evening was interesting and informative and our thanks go to Brenton for his efforts on our behalf.

Finally, we wish all a VMC & HNY with no uncertainties whatever.

Next Meeting

Date: February (final date tba)
Venue: tba
Subject: AGM and the Conference

VICTORIA

The Victorian members have not held a technical meeting since the last issue of TAM (apart from those who attended the conference). Our next meeting will, subject to final confirmation early in the new year, be to Australian NC Automation, a machine tool manufacturer and 1995 Export Award winner.

Next Meeting

Date: Mid-March
Venue: Australian NC Automation Bayswater
Subject: Company-wide tour including design, manufacture and assembly areas.

MANAGEMENT COMMITTEE ELECTION RESULTS

You will recall from the last issue that all members of the existing Management Committee, with the exception of Glenda Sandars, stood for re-election for the next twelve months. The only other nomination received was from Mr Richard Duncan of Duncan Tool and Gauge in South Australia.

In accordance with the rules of the Association, the twelve candidates were declared elected at the AGM held on Wednesday 29 December.

It is pleasing to have a South Australian on the Committee to better represent the interests of our members there and to keep the big two (in terms of population) honest. Welcome Richard!

Here is a brief profile of our new Committee Member.

Richard Duncan is Managing Director of Duncan Tool and Gauge Pty Ltd which he established in 1961. Richard is also Chairman of Directors of DRM Production Services Pty Ltd, a company specialising in wire EDM machining in Adelaide. He has run a NATA accredited dimensional metrology laboratory at DT & G for 26 years and has served on NATA's Council since 1960.

Other activities in which Richard involves himself include being a member of the NSC Industrial Measurement Committee and the SA Committee for Engineering Tolerance Systems, Metrology and Surface Quality. Finally, Richard enjoys making things, a family trait which he says goes back many generations.

We look forward to your contribution Richard.

COURSES AND CONFERENCES

TAFE Metrology Units

The Department of Electrical and Control Technology, Faculty of Engineering, Royal Melbourne Institute of Technology invites expressions of interest from persons wishing to undertake metrology modules in 1996.

Modules offered (subject to participant numbers) are the nationally accredited modules developed by the National Standards Commission.

Introduction

EA775 Introduction to Metrology

Instrumentation and Process Control

EA771 Temperature Measurement
EA774 Hardness Measurement
EA781 Acoustics: Instrumentation, Measurement
EA792 Introduction to Flow Measurement
EA794 Gas Flow Measurement
EA796 Liquid Flow Measurement
EA793 Force Measurement
EA797 Optical Instrument Calibration
EA799 Pressure Measurement

Further information can be obtained from:

Philip Woods
Course Coordinator
Department of Electrical and Control Technology
RMIT
Level 5, Building 56,
115 Queensberry Street
Carlton South VIC

Telephone: 03 9660 4387
Facsimile: 03 9660 4394

MORE ERRATA

The last issue was not one of my better ones in terms of accuracy. Firstly, I credited the President with chairing the Steering Committee which established the MSA. This was not quite right. It was in fact Ron Cook, John's boss! Sorry about that Ron.

Secondly, as John Miles pointed out to me, I was guilty of stripping Dr Noel Bignell of his Doctorate. Noel was too polite to mention it but thought that I had better put the record right. I agree.

Ed.

EDITOR'S RAMBLINGS

With 1995 drawing to a close, please forgive me for indulging in a spot of reflection. (One of the good things about being the editor is that I have the final say anyhow)

Being involved with the formation of the MSA from day one has been one of the most satisfying things I have ever been involved in. To see a good idea grow and develop into a professional society of over 300 members in two and a half years has been terrific. To be part of it has been even better.

I remain, however, acutely aware of the need to maintain good communications with our members and to give them some value for money. *The Australian Metrologist* is vital to achieving both of these requirements. As such, I need to ask the question, is TAM what you want?

I pose this question not out of a need to be affirmed or encouraged as producing TAM is one of the more enjoyable tasks on my programme (Indeed, if it could feed the family, I'd do it full-time!). But, what I do not want to be guilty of is producing a publication which is irrelevant, boring, too lightweight, too heavy or too anything else. In other words, do not suffer in silence! If you are suffering and you do not tell me, you are liable to get more of the same.

The changes since the first issue have been fairly subtle. Over the next twelve months, it is hoped that we will be able to become a little more adventurous in terms of format and style. It is also hoped that some more regular contributors will come on board so that we can either increase the frequency or the size. Please do not feel shy in offering either contributions or suggestions for improvement.

Thanks to all of you who have contributed. In particular, thanks to John Miles for regularly trotting out his *From the President*, Neville Owen for his *Laboratory Computing*, Jack Deller for his *Membership News*, Brenton Watkins, Jeffrey Tapping and Roy Hood for their *State Events* articles and Glenda Sandars and Angela Samuel for their *NML News* and other contributions. Thanks to Denise for helping out with the typing when I get snowed under and to my fellow committee members for the assistance and encouragement given and, in particular, Colin Wagg.

Finally, I add my own best wishes for a joyous and safe Christmas and hope sincerely that 1996 will be a terrific year for all of you and your families.

Ed.