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1. Introduction

The 5th World Conference for Science Journalists was held in Melbourne, Australia in April 2007 from the Monday 16th to Friday 20th. It was an unprecedented event in the history of science journalism in Melbourne, Australia and even the world.

Some 600 persons attended the conference, nearly half of whom were science journalists from over 50 countries, with over 75 journalists from developing and emerging countries. Others included Scientists and Science Communicators.

The event was hosted by the Australian Science Communicators in collaboration with the World Federation of Science Journalists with the support of the Australian Writer's Association and the University of Melbourne as its academic partner.

The main objectives of the event was to maintain and develop a global network of science journalists, enhance the quality and scope of science reporting, and increase the international coverage of Australian science and scientists. The event included plenary sessions on some of the issues facing science journalists, such as climate change, emerging diseases and conflicts between science and faith. Workshops explored science journalism and science communication skills.

The conference also featured lively discussion on the challenges facing science journalism - the impact of the web, of blogs and podcasting, the role of journalism, the politicisation of science and the biasing of scientific information.

But most importantly, the conference allowed participants to build networks, share ideas and building contacts with colleagues in other countries - and helping to build the global network of science journalists. It was also an opportunity to celebrate the special craft of effective science communication.

Traditionally in Fiji and Pacific Islands Countries, science doesn't get a big run in the media. The reason usually given is that science is boring, dull or complicated, and that the public is not really interested. It is often said that senior media executives – the gatekeepers of the media organizations – remain unconvinced that science sells.

So the Conference was also an opportunity to find ways to effectively communicate information about scientific achievements so that it's able to pass from the research community into the public domain.

I was able to attend the conference with the sponsorship of UNESCO in conjunction with the South Pacific Regional Environment Program. UNESCO offered me the trip after I won the 2006 Pacific Islands News Association (PINA) Environmental Print Award.

What follows is a report on the conference and what I have learnt from it. I hope Fiji and Pacific Islands Media Associations could in someway benefit from this report also.

2. The Conference

The 5th World Conference of Science Journalists included three plenaries, 44 sessions and panel discussions, 9 sponsored breakfast and 8 sponsored luncheons, two meetings of boards of directors of science journalist associations, an exhibition, a poster presentation, field trips in Melbourne, as well as several receptions including that hosted by ABC on the opening night and the final reception at Government House on Thursday 19, hosted by the Governor of Victoria - David de Kretser.

The tone of the Conference was set on Monday 16 – the opening night which began with a welcome reception hosted by the Australia Broadcasting Corporation (ABC). The night introduced participants not only to good Aussie light food and wine but also to the Australian indigenous culture, science and natural history.

This was followed by three full days of sessions from Tuesday 17 to Thursday 19. The final day (Friday, October 8) was devoted to tours. There were a range of site visits around Melbourne which gave journalists, scientists and science communicators from the 50 plus countries an insight into Australian Science. The tours included that to the CSIRO Marine and Atmospheric Research Center; the Walter and Eliza Hall Institute of Medical Research; Phillip Island Nature Park; The Royal Botanic Gardens Cranbourne; the Howard Florey Institute and the Surf World Torquay.

Numerous stars and prominent personalities of science journalism around the world had accepted the organizers' invitations, amongst them were: Geoff Carr, Science Editor, *The Economist;* Pallab Ghosh, Senior Science Reporter, BBC TV News; Peter Calamai, National Science Reporter, *Toronto Star;* John Rennie, Editor-in-chief, *Scientific American;* Philip Campbell, Editor-in-chief, *Nature;* Clive Cookson, *Financial Times;* Mariko Takahashi, Deputy Science Editor, *Asahi Shimbun*; Nadia El-Awady, Science Editor, IslamOnline.net; Diran Onifade, Nigerian Television; Wolfgang C. Goede, Science news Editor, *P.M.* magazine; Robyn Williams, ABC Radio, Australia; Deborah Smith, Science Editor, *Sydney Morning Herald* and Chris Mooney, *Seed Magazine* (US)

There were over 40 sessions. The highlights included:

- science: climate change; emerging diseases; quantum computing; polar science; and the future of nuclear energy; challenges of reporting on disease outbreaks; and the reporting of sensitive issues like mental health and suicide; etc
- issues: fraud; balance; biasing of information; and the challenges of reporting from within and outside emerging economies; and corruption of science by politics; and the culture clash between science, media and business;
- workshops: reporting on clinical trials; dealing with risk; information management in a crisis; when to trust peer review; editing and creating journalism associations.

- education: a UNESCO supported summit on journalist training and education in developing countries and forums to help build global science journalism.

Every session had a producer - this was not an academic conference and there were no invited papers.

END..

3. Session and Workshops highlights

Monday 16 April, 2007

Topic: UNESCO Journalism Education and Training Workshop

Time: 9.30am – 4.30pm

A workshop, sponsored by UNESCO was held on the first day of the Conference to discuss the training, mentoring and support needs of science journalists in developing countries. It was also to review the initial results of a UNESCO project to develop a generic science journalism course and share the experiences of teachers around the world.

Abdul Waheed Khan, UNESCO's Assistant Director-General for Communication and Information, in his message to the Conference stresses the challenges of science reporting and the importance of improving the standards of science writing and science communication education. "One of the central issues of today's world", he says, "is the creation, sharing, acquisition and use of knowledge and, more specifically, of scientific knowledge."

For UNESCO, Mr Khan said, the challenge of building knowledge societies was about bridging the gaps and overcoming exclusion and inequity. He said media and science journalists have a special role to play in developing and expanding science literacy in all cultures and all sectors of society.

In order to empower journalists to play this role, UNESCO was closely engaged in capacity-building. Its strategy is to establish collaborative partnerships and to support the development of professional training centers at national or regional levels, to develop and produce training materials online and offline, and to promote high professional standards for journalists and media workers.

The UNESCO workshop also discussed:

1. the training, mentoring and support needs of science journalists in developing countries;
2. review and discuss the initial results of a UNESCO project to develop a generic science journalism course for developing countries;
3. discuss current mentoring programmes for developing country science journalists and future opportunities for collaboration - organisers of several of these programs will speak about their experiences; and share the experiences and learning's of teachers of science journalism around the world.

Journalists were then given a Questionnaire to fill in regards to their needs in terms of developing a one year Science Journalism Course in developing countries and emerging democracies. **(Attachment 1).**

Topic: Editing Workshop

Time: 2pm-5pm

This workshop discussed about the fine dividing line between substantive editing and rewriting.

The discussion covered the following topics:

- Is substantive editing/rewriting acceptable for journal articles?
- What should the editor do if they find serious flaws in logic/fact?
- Is it ethical to rewrite an author's work?
- What are the boundaries?
- How can editors develop good relationships with authors?
- What are the issues for editing ESL (English as Second Language) authors and /or translating from another language?
- How can we measure how much editing really improves a manuscript?

The most widely discussed issue was Substantive Editing – Where do you draw the line between "Keeping it Simple" and 'Accuracy".
It has been found that many reporters/editors tweak scientific information so much that the information is no longer factual or accurate.

The workshop also discussed the need for an Australasian Science Style Guide. But the question raised were – (i) what it should have in it; (ii) and how can we produce it?
Many participants argued that newsrooms already have an in-house style guide book and having a Science Style book might contradict current standards/style.
So it was suggested that in-house style guides should be kept in mind when producing the Science Style Guide.
It was also suggested that:

- the Science Style Guide to include the definition of widely used scientific terms simple words that can be used instead of the generic term.
- the Science Style Book to include the correct spelling of scientific terms
- the Science Style Guide to include correct scientific terms – where and when it can be used.

Tuesday 17 April

Topic: Welcome Breakfast for developing country journalists

Time: 7.45am-8.45am

The breakfast was sponsored by the International Development Research Center Canada (IDRC).
Developing and emerging country journalists were invited to the networking breakfast. It was an opportunity to meet peers from around the world and discuss how we could make

the best use of the conference. Business cards were exchanged and bonds of friendship established.

Topic: Investigating Scientific Fraud

Time: 11am-12.30pm

During this session, we heard first hand the experiences of journalists in fraud cases. The panel included an editor, a whistleblower and a science administrator.
It was heard that without robust mechanisms for dealing with fraud allegations, those who suffer most are often the 'whistleblowers'.
And for journalists who have investigated scientific frauds vow they would never follow up another lead because of the drama associated with it; the time factor and most importantly the expenses involved.

Topic: Developing Communication Strategies

Time: 2pm-3pm

This interactive workshop explored the key elements needed to develop a robust and effective science communication strategy. Communication strategists drew from case studies to outline what has worked for them and what has not.
Finally, delegates got the opportunity to work on a hypothetical of their own to hone their own strategic skills.

Topic: Creating Clear Science Messages (workshop)

This practical workshop looked at issue in conveying clear scientific messages to the media.
Using the example of climate change/climate variability, the workshop explored how the media can misinterpret scientific information and what can be done to avoid such circumstances.

Wednesday 18 April, 2007

Topic: Australian Climate Change Science – Sponsored Breakfast

Time: 7.45am to 8.45am

Mr Malcolm Turnbull (Australia Minister for Environment) was guest speaker. He spoke on how the Australian environment and economy will be affected by climate change. He said the Australian Government was investing heavily in scientific research on climate change to underpin its policy making. This briefing by Mr Turnbull, highlighted recent research areas such as:

- Understanding the impact of climate change on habitats like the Great Barrier Reef
- Developing low emission technologies such as geothermal and solar power
- Investigating geological storage of carbon dioxide
- Adapting to climate change in the Australian context

Topic: Reporting Climate Change

Time: 9am-10.15am

A panel of senior reporters talks about their experience in reporting climate change stories in an increasingly political environment. The panel also discussed – how accurate has the climate change story been covered.

Topic: Climate Change and the Spread of Disease

Time: 11am-12.30pm

In this panel discussion, including scientists and senior science journalists, it was heard that global warming poses an increasing risk to human health. Higher temperatures, altered rainfall patterns, sea level rises, and more extreme weather events, will have a serious impact on the lives of many people.
The toll will be both physical and mental. Yet this threat, and its associated social and economic costs, has not received as much attention as many other aspects of the climate change debate. Already, human-induced climate change is claiming more than 150,000 lives each year, according to World Health Organisation.
Also discussed was the spread of infectious disease such as malaria, dengue fever and diarrhoea which will be profoundly by climate change. And many of the poorest nations will be hit.
Another issue of discussion was heatwaves –a severe problem exacerbated by the heat island effect of living in large cities. As the theometer continues to climb, the very young and very old as well as those with cardiovascular disease or respiratory conditions, will among the people most affected.
Floods, droughts and hurricanes bring death, destruction and displacement, and are likely to increase in intensity in a warmer world. Exposure to disaster has serious psychological consequences for many of those involved. Extreme weather events also interrupt the delivery of services and health care, and have an impact on food production and supply. How best to address this new risk is one of the biggest practical and ethical challenges facing the world.
During the session, population health specialists examined the latest research findings on health risks, possible responses, and the challenge of reporting on the uncertainties in this area.

Topic: Some Secrets of breast milk revealed? (Sponsored lunch)

Time: 12.45pm-1.30pm

This session was presented by Macquarie University.
The session highlighted that most mothers are aware that breast milk helps boost their baby's immune levels, but up to now it has been thought that it is mainly because of the mothers antibodies found in human milk.
And that new preliminary research suggests that complex protein sugar structures within human breast milk may bind to harmful bacteria in a baby's gut, allowing it to then be flushed out. If this is the case, it may soon be possible to synthesis these structures and add them to cow's milk or formula so that mothers who are unable to breastfeed – due to malnourishment, for example – can ensure their babies are still well protected against disease.
Professor Nicki Packer of the Biomolecular Frontiers research group at Macquarie University believes this defence may have evolved in humans but not in cows because of our different physiology – after all cows have four stomachs and only eat grass.
Professor Packer also discussed her theory, and how glycoprotein's can help us detect cancer and drug use by athletes.

Topic: Coral reefs: going, going, gone

Time: 2pm-3.30pm

Coral reefs cover less than one per cent of the earth's surface but are one of the most diverse and valuable ecosystems on our planet. It is estimated that they support at least a million species of animal and plant, and provide food for approximately one billion people in Asia alone. The Great Barrier Reef is a particularly special reef; it is the world's largest natural feature, stretching more than 2000km along the east coast of Australia.
Coral Reef Scientist John (Charlie) Veron talks about how climate change will affect these incredible ecosystems and the industries that depend on them. He also described how reefs will change as the world's climate shifts.
Daniel Gschwind of the Queensland Tourism Council talked about how these changes will impact the industries that depend on coral reefs. And Paul Marshall of the Great Barrier Reef Marine Park Authority, looked at how they are managing the Great Barrier Reef to build up resilience, and how these strategies can be applied to reefs around the world.
The session also explored the role of the media in communicating the likely impacts.

Topic: Seducing Gatekeepers: getting more science past your editor

Time: 2pm-3.30pm

If you are a Pacific journalist covering science, getting prominent coverage can be a problem.
Traditionally in the Pacific and most developing countries, science doesn't get a big run in the media. The reason usually given is that science is boring, dull or complicated, and

the public is really not interested. It is often said that senior media executives – the gatekeepers of media organizations – remain unconvinced that science sells.
But there has been a good deal of research showing if science is presented in the right way people are fascinated. And science seems to sell in many other countries.
So where is the roadblock? Why is science not more widely reported? Or does science get the coverage it deserves?
In this session, some key gatekeepers were confronted and were asked as to what it takes to get better coverage into the main stream media.
Their responses - that if science stories has to sell, it needs to satisfy the criteria of being newsworthy that is, it should be recent news; should have an impact on the people or community; the proximity and relevance to the country and its people; the timeliness of the event; and the style of writing needs to attract the audience.

Topic: Evening Reception

Time: 6.30pm-8pm

Hosted by the University of Melbourne. It was an evening where science and theater creatively merged in the spectacular atrium of the Bio21 Institute.
On the night, University students also launched its new Science Journal Magazine called *The Triple Helix*.
The Journal, which began two years ago at Cornell University in the United States, explores the impact of science on socio-economic, legal, political and technical issues.
Melbourne joins the ranks of 28 other universities around the world, including Cambridge, Berkeley, the National University of Singapore and the entire Ivy League.
Kym Huynh, Australian Region Triple Helix Chief Operating Officer says the organisation and its journal offers students the opportunity to develop a sense of university pride akin to other universities such as Harvard and Cambridge.
Sook Jin Ong, President of the Melbourne chapter, says students will have the opportunity to become part of an international community and have their work propelled onto the world stage through the journal and its online archive.

Thursday 19 April, 2007

Topic: Reporting science in emerging economies

Time: 9am-10.15am

In this session, we discussed the opportunities and challenges facing science reporters in 'middle-income' or emerging economies, and how these compare with circumstances in both poorer, and richer, countries.
We also touched upon differences in the types of scientific issues that journalists are likely to report, and how this is influenced by the way in which they gather information, investigative stories, and make use of information and communication technologies.

Topic: Climate Change

Time: 12.45pm – 1.30pm

Topic: Working with scientists to improve their media skills

Time: 2pm-3pm

This interactive workshop looked at overcoming individual and institutional barriers to help scientists improve their interactions with the media.
A lively panel discussion of scientists and journalists introduced the possibilities and problems related to communicating with the media on both the personal and organizational levels.
Groups of participants then discussed and reported solutions to issues and made recommendations that can be shared online on the Australia Science Communicators website.

Topic: Writing Plain English

Time: 2pm-3pm

This was a technical writing 'workout' in which we learnt to trim, tone and tweak! In the whirlwind of modern technology it is easy to lose sight of the most basic element of professional writing – the fact that is must communicate clearly.
If writing for the web and online applications has taught us anything, it is the value of brevity and simplicity. No one wants to read 40-word sentences on the web.
This light-hearted look at the writing process gave participants a series of fixed guaranteed to make our writing better. For writers, we become more aware of the problems that contribute to foggy readability.
The workshop was based on solutions to the most common problems found in technical writing, many of which also form part of the Plain English concept. This includes: word problems such as passive voice usage, weak verbs and weak nouns; and sentence problems associated with length and construction failures.

Topic: How to make a big science story bigger

Time: 4pm-5.30pm

Local stories, particularly in developing countries, can be of major importance or interest, but don't emerge on the world scene for lack of knowledge about how to approach or to market them. The practical session looked at some of the challenges involved in disseminating local stories, and also strategies for success.
Fiona Fox, director of the UK's Science Media Centre, used the UK media as an example looking at the works of international science stories that make it into mainstream British media and the scope for coverage of stories from other countries.
Amt Forbes, lecturer of journalism at Monash University, talked about her 15-years experience as a journalist in the Philippines in getting wider attention for important local

stories. She considered different ways to approach a story to improve the chances of wider pick-up, using examples of stories that did get international attention, and looking at some of the key journalistic factors involved in this.
Kim Griggs, a freelance journalist based in New Zealand, talked about how to market a story overseas – giving practical information on everything from pitching a story to building a relationship with a foreign editor, and also offering some tips about organisations that might be able to provide some help.

Topic: Working with journalists to improve their science reporting skills

Time: 4pm-5pm

During the session, a panel discussed that journalists do not need to have science training to report science news. In fact, some would argue that it is better if they don't. Ideally, however, they should have a knowledge base and an understanding of how science operates.
During the session we learnt:

- How can science communicators and publicists work with journalists to improve science reporting
- How do we avoid those stories that scientists hate – 'revolutionary' cures for cancer; or contradictory stories that say tomatoes cure disease on week and cause it the next week; or stories that equate all nuclear physicists with weapons research or claim a device has been invented that creates energy?
- How do journalists get reticent or non-media savvy scientists to talk? How can public relations officers build a relationship with journalists so they (PRO) see journalists as an asset rather than as a roadblock preventing the flow of information rather than promoting it?

Topic: The Challenges of reporting suicide and mental health issues

Time: 4pm-5.30pm

The sessions was an informed discussion among medical writers about the intricacies of reporting on mental illness and suicide, with a view promoting balanced reporting and greater accuracy of the information circulated within the wider community. The discussion included reporting of indigenous and culturally diverse communities, and the complexities raised by the euthanasia debate and recent critiques of the mental health system.
Jaelea Skehan (of he Hunter Institute of Mental Health) talked about the Australian Government's Mindframe National Media Initiative, which aims to promote responsible and accurate reporting of suicide and mental illness. She also provided an overview of the issues, controversies, and dilemmas pertinent to medical writers.
Jane Pirkis (of the University of Melbourne) presented an overview of her research into how the media in Australia and internationally, portrays suicide and mental illness.

Steve Waldon (a senior writer/editor at the Melbourne Age newspaper) spoke about the various articles he has written widely about depression and suicide. He also discussed the particular frame which the media sees mental illness, the internal workings that govern the way material is presented in the media, and the traps faced by both reporters and experts.

Event: Farewell reception at Government House

Time: 6.30pm-7pm

The Governor of Victoria Professor David de Krester and Mrs Jan de Krester hosted conference participants for a farewell reception at Government House.

Friday 20 April

Topic: Tours

Time: 8.54am – 5pm

There were six tours arranged and participants were asked to choose which one they would prefer. The tours were to give participants an insight into Australian Science.
I chose Tour 3 which included a visit to the Royal Botanic Gardens Cranbourne and to the Phillip Island Nature Park.
At the Botanic Gardens, we got to experience one of Victoria's most precious areas of native bushland, which is home to thriving animal life, including several rare and endangered species
At Phillip Islands, we got to see the world's smallest penguins – the Little Penguins – emerge from the sea after a hard days fishing and waddle ashore to their sand dune burrows. We enjoyed this natural spectacle from elevated boardwalks and viewing stands that allow us to enjoy all the action without disturbing the penguins or their burrow homes. We also heard from a researcher about their world-leading penguin research programs and how the penguins can contribute to their management and ongoing survival and also of other precious species.

END.

4. What was learnt at the Conference?

(i) Science journalism in the developing world

In the developing world, science and technology, two powerful tools for development, remain underdeveloped. With the lack of public knowledge of science and technology in the developing world, it is difficult for people to use them effectively. Science media have the potential to become the missing link between scientists, the public, and local industries.

Developing countries, including Middle-East countries, Africa and the Pacific, are greatly ignoring science journalism or the public communication of science at large. If we compare the state of science journalism in these countries with the West, we find that we are not spending even 0.1 percent of our higher education budget on science journalism.

Recently there has been improvement in Middle-East countries and Africa, but there still needs much more improvement, especially at policy-making level. Unfortunately in the Pacific, this is not the case because Editors still believe that Science stories do not sell, too dull, too complicated for their readers or the issues covered are still too far off example Climate Change and Global Warming.

But science media experts say that research have found that Science can be made interesting reading. Aleem Ahmed the chief editor and publisher of the monthly Global Science, the only popular science magazine in Pakistan, say: “It's only our mindset, because we think that science awareness is either "children's stuff" or it is merely a waste of our time and money. I can assure you that a well-told story on science can be as interesting and involving as a romantic fiction can be. It is our mindset that makes us ready for time- and money-wasting activities while ignoring science.”

Developing countries now have many pioneering scientists. So what is the reason for this lack of science media? And what is the role of scientists to promote science in the media? It was heard at the Conference, that being a good scientist is very different from being a good science journalist. That is, without learning the art and craft of the public communication of science, it's impossible to become an effective science communicator.

For scientists to become good science journalists they must first improve their communication skills. Then they must study the subject of their interest; that is, the subject they want to specialize in as science journalists. Finally, they should try to present their work to different media organizations that have different styles of presentation. That will give them flexibility and depth.

Ironically, our scientists are only able to write research papers, reports, synopses, and so on. For them, the public communication of science isn't that important. Instead, they think the public communication of science is a waste of their expertise and precious time. The other reason for this lack of science media is our institutions of journalism, where public communication of science is greatly neglected as a subject of studies.

In the face of such a scenario, how can we expect good science media from developing countries? In the "Creating Clear Science Messages' workshop session, it was discussed that for someone who wants to get involved in scientific media, the best advice is to present science in the style of a bedtime story, using the easiest possible vocabulary and interesting anecdotes. Something the media can very easily do it. In fact, the art of storytelling lies at the heart of any good science story aimed at the public.
And that science awareness requires the tool of personal interest, coupled with the art and craft of public communication. With these tools, the public understanding of science in developing countries — like our own — can be revolutionized.

Three very simple rules of thumb that the media can follow and produce exciting and interesting science stories (as learnt from the Conference) were:

- Avoid [using scientific] jargon as much as you can.
- If you can't, try to explain these [terminologies] in plain, simple, and easy language that is comprehensible to everyone.
- Try to dramatize your story [when writing about] complicated disciplines of science. It ensures the sustained attention of your target readers in what you are telling them.

What is the importance of increasing science awareness among the public? This is a typical question, often asked by the policy-makers and decision-makers of developing countries. According to experts at the Conference, public awareness of science is the single most important factor that can revolutionize everything, from education to the real understanding of democracy in these countries. In other words, public understanding of science is the real savior of the socioeconomics of developing countries. The political leadership of developing countries almost always underscore (and sometime undermine) the importance of the public awareness and understanding of science for their limited and localized benefits.

(ii) Lost in translation – Science and the Media
(University of Melbourne, Voice publication, interview with Professor Phil Batterman)

Print, broadcast and digital media coverage of science was in the spotlight this month (April 2007) as science writers from around the world gather in Melbourne for the 5th World Conference of Science Journalists. University of Melbourne scientist Associate Profession Phil Batterham (Genetics) raises here some of the key issues that were discussed.

Question: Why do political issues feature so prominently in our media?
Hypothesis: The public want it?

Professor Batterman says:

"All available evidence strongly refutes this proposition. Consumers consistently indicate that political news stories are low on their priority list. Nonetheless media gatekeepers continue to prioritise political reporting.

Why is this? Could it be that politics is prioritised because a well informed public is an essential element of strong democracy? Is it deemed that we *need* to know?
More broadly applied the need to know principle would lead to a massive increase in reporting of science. Around the world nations are basing their economic future on science.

The major issues that confront the world (malnutrition, disease, the impact of global warming and the conservation of biodiversity) are the focus of intense research. New science-based technologies continue to change out lives.
The public *needs* to be informed.

But beyond that *need* all available evidence indicates the public *want* to know. The power and mystique of scientific discovery has the allure associated with the exploration in days past. There are countless engaging journeys to be followed as scientists seek to understand the intricacies of our world and the Universe which it is placed.

Many of these stories remain untold. Many of these modern day explorers remain unknown. With notable exceptions the main stream media deserve criticism for a lack of commitment to science. Opportunities to communicate stories of substance are often by passed. Science is often trivialized with quirky stories to amuse but do little to inform.

While it is fair to expect more from the media, the scientific community needs to lift its own game. Too often communication is considered an optionally activity. While note everyone will do well when facing a TV camera, there are many ways to engage.

Having a sharp focus on facts and truth, scientists have a fear of inaccurate reporting. Well, yes, it happens but this provides no excuse for baulking. Our political leaders consistently front up, accepting that the media will not always be kinds or get it right. Politicians do this accepting their responsibility to be seen and heard. And they realize that the downside of being cooperative is countered by a power to reach out and change public thought.

Research cannot be understood; new innovations cannot be adopted without clear communication. The Australian scientific community cannot expect the public to fund the massive expenditure increases that science needs if the benefits of research are not deeply appreciated. There is no freedom to opt out. Scientists use the expression 'publish or perish'. Without effective communications the growth of science will be stunned.

While emphasizing the imperative of communication, the quality issue must also be addressed. Science is a foreign language. As foreign language speakers we must have the courtesy to translate for those who do not understand. In the Fresh Science competition a

sparkler is lit. A young scientist is challenged to explain her or his research without using any scientific terminology before the sparkler burns out.

Speaking science in common English is a skill that must be honed with constant practice. But the traditions of science must be honored in the speaking. We are Scientists, not Salespeople.

Traditionally scientists have been faithful interpreters of data. This practice created trust. It is not hard to think of examples of sensationalist claims or instances where scientists have morphed into a campaigner. Having crossed the line it is hard to appear unbiased and to be trusted.

Where science creates concerns or opportunities scientists should provide the cool voice of reason and realism. Other voices will be heard and should be. Some voices raised in the dialogue may be biased and irrational. But we should not fall into the trap of believing that scientists offer the valuable perspective when the application of science is on the agenda. Ultimately the people and their elected representatives will decide the way forward in the adoption of scientific applications. Scientists should provide evidence and future options.

Whether communicating the excitement of fundamental discoveries or discussing issues of controversy, scientists cannot conceal their passion. There is no conflict between a call for reason and an appeal that a passion for research be evident for al to see. More than anything else the Hollywood image of scientists as the social misfit who works in isolation needs to be debunked. The term *boffin* needs to be driven out of existence by the accurate portrayal of science as a highly social endeavour that unites creative people with different skills and personalities in solving problems of significance.

In communicating the power, beauty and joy of science we need to more actively engage the public. Moving beyond the newspapers, radio and television there is a real need for face to face encounters. Augmenting the traditional 'public lectures' we need to creating opportunities for dialogue, a genuine bilateral exchange of idea. The visual and performance arts can assist us in communicating in more deeply meaningful ways.

In starting with a clean slate in building new degrees, the University of Melbourne is in a unique position to develop the communication skills of its science graduates. In the new Bachelor of Science degree all students will be able to undertake a course in Science Communication. Science students studying for a Masters degree will be required to study Science Communication.
But an even greater opportunity exists. In a University that teacher's science, the history and philosophy of science, journalism, film-making, performing and visual arts, web-based communication, public policy development, marketing and the law there is a capacity to produce Masters graduates with a capacity to re-shape science communication in this country. This is our goal."

(iii) Science journalists 'need code of ethics'

Science journalists need a code of ethics if they are to communicate increasingly complicated science accurately, delegates at the 5th World Conference of Science Journalists heard on 17 April.

Science communicators say this should be combined with better practice. Various journalistic codes have been adopted by the media worldwide, but few have been suggested specifically for science reporting.

Bob Williamson, a professor of medical genetics at the University of Melbourne and an active science communicator, told a conference session that a code would help both scientists and science journalists define what constitutes science reporting.

Williamson implied that both sides were at various times guilty of hyping research findings. "This could be important to science journalists in the developing world, who are often required to boast about particular research," he said.
Williamson added that by insisting on such a code, science journalists in the developing world could defend themselves against being required to hype or hide information.

Rob Morrison, vice-president of Australian Science Communicators, presented research showing that almost half of the news releases posted on the science press website EurekAlert during 2006 were labeled as a 'breakthrough'. Morrison said overuse of the term fuelled the hype around science, but noted that such sensational language was all too often required to grab the attention of editors.

Wolfgang C. Goede, senior editor of German science magazine P.M., highlighted the increasing influence of public relations in science communication, with institutions using science reporters to paint a positive image of their work. Goede said a code of ethics could include rules and descriptions to help journalists distinguish science news from public relations material.

Pallab Ghosh, a senior science reporter at the BBC and the incoming president of the World Federation of Science Journalists, welcomed the idea of a code.
But he said it was more important for science reporters to improve their general journalistic skills. "It is easy to understand the research and peer review process, but what's needed more is the sense of finding the new and exploring the truth," said Ghosh.
He said the World Federation has no plans for a code of ethics, but will continue to help train science journalists in better practice.

(iv) Climate Change

Australian scientists have called for more research into the impact of climate change on human health – a topic that could make interesting reading as lives will be affected.
Addressing the World Conference of Science Journalists on 18 April, Neville Nicholls, a professorial fellow in the regional climate group at Australia's Monash University, said

scientists know too little about how climate change will affect the spread of disease. He said this limited the ability to predict future trends.

Another Speaker, Tony McMichael, from the National Centre for Epidemiology and Population Health at the Australian National University, added that because mosquitoes breed faster in warmer temperatures, global warming could change the spread of insect-borne diseases like dengue fever and malaria. But he pointed out that climate change would have further influences on health outside of disease.

McMichael said that prolonged drought would bring more mental illness in adults, and emotional and physical disorders in children. He added that, "We should begin looking into the more serious impacts of global warming on food production and productivity of oceans". At the conference, Nicholls emphasised the need to identify vulnerable groups in different regions. He said demographic studies were needed into relevant health risks, such as malnutrition resulting from decreasing crop yields.

A recent report by the UN Intergovernmental Panel on Climate Change estimated that by 2050 wheat yields in northern China — home to more than three million people — will decline by 30 per cent.

A report on climate change was also available at the conference. It warns that rising world temperatures could threaten human health and increase the number of displaced people in the Asia-Pacific region. The report, released on 22 September, 2006 by the Australian Medical Association and the Australian Conservation Foundation, warns that by 2100, as well as causing more droughts, floods and typhoons, climate change could also increase the incidence of malaria, dengue fever and cholera.

"Failure to dramatically cut carbon dioxide emissions will leave the world with serious environmental and health problems. But urgent action could curb climate change and reduce the suffering of millions in the Asia-Pacific region," says Ian Lowe, one of the report's authors.
The report, which focuses on the effects of climate change on health in Australia, says global warming will increase the number of displaced people across the Asia-Pacific region — such as residents of low-lying regions in Bangladesh that will suffer from rising sea-levels.

The authors concede that the relationship between climate change and the origin, number and fate of 'ecological refugees' is "highly complex and uncertain" — and depends on factors such as the reaction of local governments. However, they write, "even in the best case, the number of displaced people within the Asia-Pacific region is likely to increase by hundreds of thousands of people, most of whom will be internally confined within slums and camps". At the worst case, large scale state failure and major conflict may generate hundreds of millions of displaced people in the Asia-Pacific region, a widespread collapse of law, and numerous abuses of human rights."

They say the number of people displaced by climate change will depend on national and international efforts to reduce poverty. "Replacing the war on terror with a rejuvenated war on want still appears a pipedream," they write.

They conclude: "If a 'coalition of the giving' between Australia, China, India, and the G8 could combine forces in an effort to genuinely reduce greenhouse gas emissions then the future could again be promising."

(v) Climate reporting 'too balanced' say scientists

Airing the views of climate change skeptics in the media only serves to keep controversy boiling, scientists told the Conference.

Kevin Hennessy, Australian scientist and lead author of the Intergovernmental Panel on Climate Change (IPCC) Working Group II report, said on 18 April that media attention on "the view of a handful of climate change sceptics" amplifies their opinions and "implies that there is little agreement about the basic facts of global warming".

Speaking in a session about climate change reporting, he said editors and journalists have a duty to ensure that facts are presented in context. Balanced reporting, he said, "perpetuates the public's perception that scientists are in disarray, which is misleading in the case of climate change".

Geoff Love, vice chair of the IPCC Working Group II, said that the IPCC assessment reports — from 1990, 1995, 2001 and February 2007 — are strong evidence of "the coming together of the scientific community" and that emphasis on the skeptic view does not help public understanding of climate change.

Media coverage has not always reflected the consensus of the majority of the scientific community, said Ian Lowe, president of the Australian Conservation Foundation. "That only makes the public and political discussion more difficult," he said.

The problem is compounded by a lack of reporting on climate change, according to Chris Mooney, a US-based science journalist. Although the 2006 hurricane season attracted a lot of media attention, Mooney presented statistics from the United States showing that climate change has never been a priority in the media.

The situation is similar in Africa, said Kenyan SciDev.Net correspondent Ochieng' Ogodo. Articles about deaths caused by floods or other natural disasters, and political scandals related to climate change tend to get precedence, he said.

(vi) Science journalists urged to report fraud

Science journalists have a duty to investigate and report scientific fraud, according to retired research scientist Phil Vardy, formerly of Macquarie University, Australia.

Speaking at a session on investigating scientific fraud at the Conference on April 17, Vardy told reporters, "You must reveal scientific misconduct, for if you do not, they will commit their frauds again." Vardy emphasised the importance of securing primary scientific evidence to confront scientists suspected of committing fraud. He said journalists should critically assess the evidence in totality and seek corroborative information from reliable sources. "Focus just on a few points [of evidence] but be prepared for the institutions to defend themselves vigorously with claims of insufficiency and incompetence against you," he advised journalists.

Korea Times reporter Kim Hee Won said journalists face enormous resistance to investigating fraud when scientists are considered national icons, including opposition from within the scientific community. "Relying on scientists could be tricky, as they may choose to be economical with truth," she said. Kim also warned of the potential for journalists to be used as conduits for hype about science.

Philip Campbell, editor-in-chief of the journal Nature, said it is important to independently verify any new research, because advancing information technology means scientists could manipulate data. But he advised journalists to pre-empt legal challenges by assessing the risk of a libel lawsuit with a lawyer. In a similar vein, Vardy called for tougher laws to protect journalists and whistleblowers in the event of legal challenges.

(vii) Science journalism faces 'new rules'

Political pressure, conflict of interest and government intrusion are among the barriers encountered by science journalists around the world.

Those were the remarks made at the opening session of the Conference on 17 April. SciDev.Net correspondent Jia Hepeng spoke about the problem of propaganda-based science journalism, citing it as one of the main factors limiting effective science communication in China.
"Science journalism has mainly been used to boast about the government's achievements and hide bad news," said Jia. He said there was pressure on science reporters to deliver the official government line, to the detriment of public interest.

The lack of science coverage was also a concern, he said, largely due to the Chinese media's failure to capture the public's imagination.
"Discussion or debating about science policies and the impact of science on society is lacking in China," said Jia. He cited a lack of information on the achievements of China's manned spaceship programme — launched three years ago — as an example of this. "There are no meaningful questions [asked about] what the key national science and technology programmes have brought to people's lives," he said.

Chris Mooney, a North American science journalist and author of the book *The Republican War on Science*, highlighted the difficult relationship between science and politics that has developed during George W. Bush's presidency. He said, that in the

United States, the scientific community has clashed with the government's moral viewpoints on issues ranging from climate change to evolution, stem cells and cloning.

Mooney said both scientists and journalists have had to adapt to new rules to cope with this. "In this context, translating scientific knowledge is today more crucial than ever," he said.

(viii) Government interference 'impeding science reporting'

Government interference is impeding reportage of public-funded research in developing and emerging countries, say journalists.

In a session at the Conference, delegates were told that governments are interfering with science reporting in Africa, Asia and Latin America. Governments in these regions tend to guard information about "charismatic mega scientific" research projects — large and expensive public-funded research programmes — in areas such as nuclear energy and telecommunication.

According to Sri Lankan science journalist Nalaka Gunawardene, the big projects often drain public research funds, and any journalist who questions their viability is branded an enemy of national development. "These projects are beyond both public and parliamentary veto as they involve sensitive state information. Whoever questions how they are done, let alone criticises them, is met with state force," he said.

Gunawardene said these projects are driven by "government ego" in Asia, where senior officials develop an abrasive approach to the media. He noted that while the public funds research, they rarely receive information about its outcomes. He gave the example of the Sri Lankan government, which had prior warning of the Indian Ocean tsunami in 2004 but decided not to alert the public. He said that scientists in Sri Lanka are intimidated by government control. Referring to the tsunami, he said "scientists knew the threat but they could not disclose it as the government had not given an approval".

Talent Ngwande, a SciDev.Net correspondent from Zambia, said that most governments in Africa police what goes to the media and any article thought to be anti-government is blocked. "Its very sad to see a minister of information going through the newspaper before it goes to print, removing any 'offending' articles. It gets worse when it's a science article," said Ngwande.

"The good thing with science journalists is that we are like bacteria, always mutating to adapt to the current challenge," said Christina Scott, SciDev.Net's sub-Saharan Africa regional consultant. "This gives us hope."

(ix) Training Program for Science Journalists

1. PEER TO PEER NETWORK FOR AFRICA AND MIDDLE EAST JOURNALISTS

The World Federation of Science Journalists (WFSJ) has recently launched a project allowing science journalists from Africa and the Middle East to partner with their Northern and Southern counterparts in an international peer-to-peer network.

President of the WSFJ Wilson de Silva, who announced the launching of the project, said "Our objective is to support journalists who want to report on science, but lack the peer support and training more common in wealthier nations."

An initial funding of CA$800,000 (approx. US$700,000) is being provided by Canada's International Development Research Center for the 3 year project. The project will expose 60 journalists to the latest techniques in science reporting, providing them an opportunity to report emerging developments and issues in science in their regions.

Through the WFSJ, these journalists will also be connected to a large network providing contacts, advice and opportunities in their field. Peer-to-peer learning is an established form of learning amongst journalists, which will also be applied to associations, by introducing the emerging ones to established associations of science journalists.

While participating journalists will be trained to effectively communicate complex science topics to the general audience, emerging national, regional and international associations of science journalists will also be provided support and services through the project.

“This will certainly help bridge the capacity challenge we face as science journalists on the African continent,” said Diran Onifade, science journalist with the Nigerian Television Authority.
The WFSJ is a global network of 27 associations of science reporters contributing to the network with the shared aim of strengthening science journalism in developing countries.

For more information, contact: Nadia El-Awady at nadia.elawady@iolteam.com.
More information about this project may be found at PtoP Project Flyer.

2. UNESCO TO PROVIDE SCIENCE REPORTING TRAINING FOR DEVELOPING COUNTRIES (including the Pacific)

UNESCO is ready to provide training, mentoring and support needs of science journalists in developing countries and emerging democracies. During the UNESCO workshop, the initial results of a UNESCO project to develop a generic science journalism course for developing countries was also reviewed and discussed. Also discussed were current mentoring programs for developing country science journalists and future opportunities for collaboration.

To identify the education and training needs in terms of developing a one year Science Journalism Course), UNESCO gave out Questionnaires for interested participants to fill. **(Appendix 1).**

(x) **Networking**

The conference no doubt achieved its aim of building links between science reporters from around the world.

"If you are reporting from Cairo or Washington or Melbourne, you need to have good contacts in China to know what's happening there," said Niall Byrne, the Conference Director. "You need to have good contacts in Thailand and in the Philippines, because if bird flu appears in one of those countries, you need to know who to talk to on the ground, who can say what is really happening."

"Sometimes, they [science journalists] are all by their own — they are the only science journalists in their newspaper — and if they've got friends and colleagues, they can help them."

In addition to offering a chance for networking, the conference had many scientists talking about their researches and is ripe ground for many stories for the journalists to pick.

Aleem Ahmed, founder and owner of the only science magazine in Pakistan said, "we must decide how we can make the best of this experience. We need to think what we can learn from it. As science journalists coming from the developing world, this conference is most important to us."

I was fortunate to have attended the conference, with contacts established with journalists around the world – from Africa, Asia, Europe, US, America and Australasia.

(xi) UK to host next world science journalism conference

On the Wednesday, 18 April, the World Federation of Science Journalists announced that the United Kingdom will host the next World Conference of Science Journalists in 2009. Conference organisers hope it will be the biggest yet, bringing together over 650 journalists from all over the world.

The conference bid was put forward by the Association of British Science Writers, the UK-based International Institute for Environmental Development, the journal Nature and SciDev.Net.

The proposed programme will feature key scientific issues such as climate change, biodiversity, the environment and disease, and the conference team plans to organise tours of scientific research centers in the United Kingdom and Europe.

Special focus will be given to increasing the representation of journalists and scientists from developing countries in Africa, Asia, the Pacific, the Middle East and South America, with plans to raise funds for travel and accommodation.

Julie Clayton, conference director and SciDev.Net consultant, said, "We shall have the best of the UK's science media exchanging ideas with science journalists from around the world, plus top scientific research for them to report on. We hope to see as many delegates as possible from developing countries."

Diran Onifade, African regional coordinator for the World Federation of Science Journalists Peer to Peer Mentoring programme, said, "London, being the capital of the Commonwealth and a universal city, brings the World Conference of Science Journalists closer to most of the world like never before."

"I am sure the [conference] in London will command an unprecedented interest among science journalists in Africa."

President of the Association of British Science Writers Ted Nield said, "It's a great opportunity to welcome the world of science journalism back to the home of the profession."

"Our aim is to build on the tremendous success of previous meetings and to work with our colleagues in the UK and internationally to create a conference that will continue to promote the highest standards of science journalism across the world," said Pallab Ghosh, BBC journalist and new President of the World Federation of Science Journalists

END..

5. Conclusion

The Conference provided a unique opportunity to build networks, to share ideas and, most importantly, to celebrate the special craft of effective science communication.

With issues of climate change, sea-level rise, HIV/AIDS etc affecting our small island nations and its people, there is no better time than now to educate our journalists on science reporting.

Science journalism is a vital part of excellent science communication. At its best, it helps the public understand complex scientific concepts, encourages investigation and debate on scientific issues, and challenges the community to consider new ideas.

Developments in science and technology also continue apace, having ever more pervasive impacts on our lives and requiring effective communication of scientific issues to engage and inform the community of scientific advances. As the latest developments in science and technology in science and technology enhance the ways news is delivered and increase the variety of media formats, journalists face new challenges and can reach new audiences.

The Conference stimulated a new awareness of the important role of science journalism the region. There is a need for more science journalists working in our newspapers and on our radio and TV stations. And these journalists should receive far greater recognition from the editors, producers and directors.

Science is a global activity. The stories science journalists report on often involve global themes, global concerns and global issues. But that does not mean that locals would not be interested in it. Journalists are like craftsman – the can make anything interesting out of nothing, if they put their mind and soul into it.

The key lies in the gatekeepers (Editors). They need to open the gate.

Vinaka.

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