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# Endpoint

OF THE AUSTRALASIAN SOCIETY FOR ECOTOXICOLOGY

## ***Volume 6, Number 2***

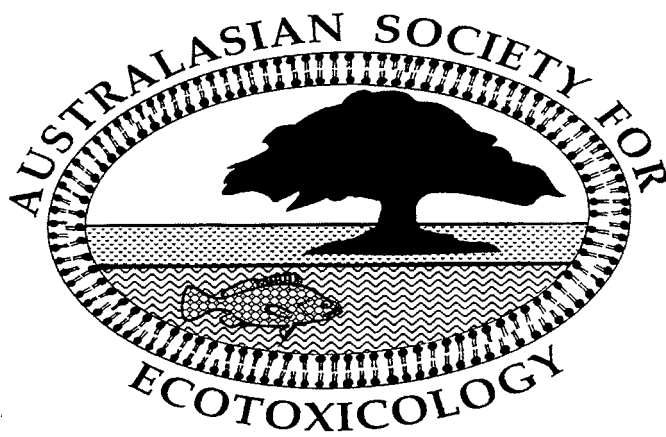
December/January 2000

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A scientific society for biologists, chemists, engineers and other environmental scientists concerned with environmental protection and management.

The specific aims of the ASE are:

- to advance the science of ecotoxicology as it relates to environmental protection and management
- to promote education, research and the application of knowledge in this field for the development of ecologically acceptable principles and the practice of environmental protection and management
- to provide for the transfer and dissemination of information on these issues via workshops, conferences, the production of a periodical and other publications
- to provide a forum for communication among professionals in this field in industry, government, research and teaching organisations, for environmental protection and the benefit of the community
- to collaborate with other societies with similar purposes on a national and international basis, to further these aims.

*ASE will soon have a new home page:*

[www.ecotox.org.au](http://www.ecotox.org.au)

See page 6 for details



## ASE SUSTAINING MEMBERS

ASE gratefully acknowledges support from the following organisations in their sustaining membership:



## Deadlines

Welcome to the new millenium (if you concur with that view) or to at least the new year. We hope you have all had a great start to the year, and that the millenium bug doesn't get us on leap day 2000! And now for a New Year resolution - we will get better at deadlines... Well, we have never been sticklers for the real deadline, and every time we're late, we vow to do better next time. This issue has been particularly difficult with the general hecticness of the festive periodness as well as Greg's change of position and Gary's commitment to frolicking and enjoying his new unit (with a fine view of the golf course too, I might add). So, our apologies and we hope to make the March issue by at least April!

All the best for 2000 and the naughty decade - why do we have to label them, anyway?

**Deadline for the next issue is 25 February 2000** for the March issue. We will be looking for any material at all, especially any ideas for a major theme. If you want to send anything in, contact the newsletter editors or your state representative.

**4 issues a year** - March, June, September, December with the deadline falling on the Friday prior to the start of the month of issue. For 2000:

**25 February, 26 May, 25 August, 24 November**

**Editor** - Greg Rippon,

**Assistant Editor** - Gary Fan

(See back cover for contact details.)

# Editorial

To some people, bureaucracies would appear to be of a cancerous nature, always having to grow to sustain itself, ignoring the flaw that it could eventually kill the host, and therefore killing itself. And if not perhaps this blacker a description, at least they are seen as not particularly constructive. And after an experience at what was euphemistically called a “preparatory session” of a working group of experts on enforcement and implementation of multilateral environmental agreements (MEAs) hosted by UNEP in Geneva, at the very least, this latter image has re-inforced itself. While it would bore readers to dwell on the definitional issues that were raised on “compliance”, “implementation”, “enforcement”, etc, etc, there was the interesting interface between policy issues and the technical focus of the working group.

I attended the “preparatory session”, which was itself the result of an earlier workshop held in July, fresh from the fifth meeting of the Conference of the Parties for the Basel Convention on the control of the transboundary movement of hazardous waste (COP5 of the Basel Convention). This was my first meeting of this type and, I’m sure you would agree, suitably qualified me as a policy type with vast international experience! In itself, COP5 was an incredible (learning) experience, but it did give me an edge on some of the other “experts” at the “preparatory session”, whose focus was solely technical. There were also others from COP5 at the “preparatory session”, and other MEAs were also represented at the “preparatory session” apart from just the Basel Convention (eg Montreal Protocol, CITES, etc).

The organisation for the “preparatory session” was extremely poor, with delegates receiving the papers for the meeting either only a few days prior, or at the meeting. Therefore, no-one knew what was to be discussed, what the agenda was, let alone what the “hidden” or underlying agenda was.

The UNEP secretariat chaired the meeting on the first day, highlighting that it wanted to be transparent and do only what we, the experts, wanted. I find this always a bad sign when these sort of things have to be stated. And so it was. As the secretariat outlined the mandate of the proposed working group of experts that this “preparatory session” was to refine, the hairs on the back of my neck started to

stand on end. Not only mine, but several other delegates (most notably those recently arrived from COP5) were also visibly alarmed. The mandate that UNEP was claiming concerned the development of guidelines for compliance, implementation and enforcement of MEAs, and the development of an over-arching treaty that MEAs would be covered by. The countries that sponsored the initial workshop in July indicated to me that this was not what the July workshop had intended.

Having just seen how a COP worked for one MEA, I could not conceive of a more clumsy mechanism for trying to improve the performances in compliance, implementation and enforcement of MEAs, than by having COPs of a listed 120 odd MEAs dealing with a COP for an overarching treaty, especially when positions had to be reached by consensus! The legal ramifications were also somewhat obscure, with delegates questioning whether the guidelines would be viewed as “soft” law (yet more definitional discussions). Also, how would a COP for a treaty be bound by another COP for the over-arching treaty, when the Parties are very likely to be different for each (ie not all countries will ratify every treaty that comes along for various reasons – the US for instance, has not ratified the Basel Convention).

So this was the setting of the start of the “preparatory session”. Several “experts” confided to me that they found it frustrating to be at the “preparatory session” discussing the mandate, when they were there to try and get practical ideas for better improving their performance in, particularly, enforcement (the issue of compliance with MEAs is a particularly sensitive issue with some countries). Instead of coming away with a better idea of how other countries deal with the issue, some practical tips (even in the form of guidelines), and case examples, the “experts” were able to only prepare two reports, one on compliance, the other on enforcement (implementation was cut out). For the compliance, this consists of some recommendations on the previous draft, and even a definition, while the enforcement report gives what is essentially a table of contents after substantial reworking of the proposed guidelines, with inclusion of only some of the guidelines from the background paper.

It was interesting to note that the sub-group which worked on the issue of enforcement, having put behind the policy issues of mandate and even definitions (we agreed to simply list definitions from

*Continued page 4*

ATTENTION ALL STUDENTS!!

# Inaugural ASE Student Prize

**Applications Close 30 September 1999**

At the recent EnviroTox '99 conference in Geelong, it was announced that the ASE would be sponsoring an annual student prize for the best Honours thesis submitted to an Australasian University in the previous calendar year. The aim of the prize is to encourage the development of ecotoxicological studies within the university system. The prize consists of a medal, a cash prize of \$500 and an invitation to give an oral presentation at the next ASE conference.

The ASE is now calling for nominations for the inaugural prize to be awarded in 1999. If you are a member of ASE and have submitted an Honours thesis anytime in 1998, you may be eligible for the prize. Details of what is required are given below.

1. The prize is offered for the best Honours thesis submitted at an Australasian University in 1998.
2. The criteria will be excellence in the field of ecotoxicology.
3. Nominations may be by individuals, groups or self nomination.
4. The Nomination should include:
  - the thesis,
  - name and brief CV of the nominee,
  - official statement of Honours result and
  - a letter of support from the supervisor(s) and a statement that the thesis is in its originally submitted form.
5. The ASE Council will appoint a judging panel of three ASE members to make a recommendation for the award if nominations are of an appropriate standard.

**Applications should be submitted by 30 September 1999 to:**

Dr Michael Warne	(02) 9710 6808 or
Centre for Ecotoxicology	jenny.stauber@det.csiro.au
University of Technology Sydney,	
Westbourne St, Gore Hill NSW 2065	

**For further information contact**

**Jenny Stauber:**

**Editorial continued from page 3**

various MEAs and other sources as a starting point), quickly focused on the more technical aspects of the guidelines/guidance notes/framework/whatever (well, it wasn't completely free from policy issues). And what does this all have to do with ecotoxicity? Well, firstly, it ties in nicely with a book review of "International Toxic Risk Management: Ideals, Interests and Implementation" written by Aynsley Kellow on page ???. As the book deals with toxic chemical risk management, and even mentions ecotoxicity within the first few pages, need I say more? Secondly, the up and coming Envirotox 2000 will have as its theme "*From Representations of Reality to Regulation*". It will aim to look at this area of policy/technical interface. Technical experts, scientists, and the like tend to dismiss policy as mere noise – it is however, necessary noise as it provides the context for the science. Scientists need to learn how to manage this policy area to achieve a better context for the science. Readers may have heard

Professor Peter Cullen talk on the concept of information brokers which allow policy makers to access credible and transparent information when they need it. Policy can thus benefit from being better informed about the scientific issues. But science is not in itself the only solution. All areas of society need to have input into the policy, something which scientists tend to struggle with because they feel it lacks objectivity and works on an emotional level. The recent review of the NSW legislation, the Animal Research Act, is a recent example of this (see Endpoint volume 6, issue 1), and the concept of "moral outrage" is also discussed by Kellow. But good policy is necessarily a melting pot of views – it is necessarily messy, complex. It is, however, sometimes biased, lacking in objectivity, and plain unscientific, as it covers ethics and morality. Scientists therefore need to be better informed of this area, to better understand and contribute to the process. Therefore, the scientific sub-committee is considering having a component of this in Envirotox 2000.

## **Laboratory testing: clouded by the sediment on our antennae?**

Single species toxicity tests, biomarkers, QSAR's, field monitoring, whole ecosystem approaches and modelling are just some of the techniques routinely used in ecotoxicology to assess or predict the fate and impact of contaminants in the environment. However, an understanding of the limitations of the techniques we use is critical to their appropriate application to specific problems. We are often too busy "selling" our techniques to commercial clients or trying to attract research funds that we fail to critically assess the techniques we use every day.

At a recent sediment toxicity testing workshop at CSIRO, we openly discussed problems with currently-used sediment tests, particularly problems associated with sampling sediments to maintain "field" conditions, limitations of using metal-spiked sediments, selection of appropriate control sediments and inadequacies of the tests themselves for assessing bioavailability of contaminants. We all tended to get a little defensive when our favorite tools were criticized, but such feedback is essential to ensure continuous improvements in the techniques we use daily.

At CSIRO we have been developing and using single species microbial tests (mainly bacteria and microalgae) for many years to assess potential impacts of contaminants for industry, government and water authorities. These bioassays have been essential to helping provide effects data for ecological risk assessments, and for understanding the links between chemical speciation, bioavailability and mechanisms of toxicity. However, these tests have a number of limitations, which we are continuing to try to solve.

While it is well known that the speciation of metals can affect bioavailability/toxicity to organisms, less account is taken of the fact that the organisms themselves can affect the speciation of metals in solution, resulting in under or over prediction of toxicity from simple laboratory tests. For example, most algal toxicity tests are static tests, without water renewal, which often results in depletion of the test chemical in solution due to adsorption losses to algal cell surfaces or test containers. Under these circumstances the partitioning of metals between cells and solution (and their subsequent toxicity) is very dependent on the cell densities used. In general, standard algal toxicity tests use high cell densities for ease of counting, despite the fact that such high cell densities are only encountered in extreme bloom conditions in natural waters. If we want to reliably assess bioavailability of some contaminant in a

river or estuary, the standard laboratory test is a poor surrogate until these problems have been addressed. Our current research aims to use tests with more environmentally-realistic cell densities so that bioavailability determined in the laboratory more closely reflects bioavailability in the real world.

Other problems, equally applicable to invertebrate and fish bioassays, include a lack of appreciation of the chemistry in the bioassay. The literature (and ecotoxicology databases in general) are full of examples of data using inadequate analytical chemistry. While ecotoxicologists are now quite good at incorporating good QA/QC procedures in our toxicity testing programs, less attention has been paid to QA/QC in the chemical aspects of testing. For example, there are many reports of toxicity endpoints (LC50 and EC50 values) for metals that substantially exceed the solubility of the metal in the test water. Ignoring precipitation calls into question the value of the data, with major ramifications if the data are then used to derive water quality guidelines. Measured rather than nominal concentrations are the minimum requirement in all toxicity tests especially if losses by volatilisation (e.g cyanide), adsorption (e.g copper) or degradation (e.g chlorocatechols) occur over the duration of the test.

Use of a particular ecotoxicological tool also requires at least a limited understanding of the mechanism of toxicity of the chemical contaminant of concern. For example, the toxicity of chlorate, produced during pulp bleaching in the paper industry, is dependent on the nitrate concentration in the test water. Chlorate and nitrate compete for uptake at the cell surface and chlorate is then converted by the enzyme nitrate reductase to the more toxic chlorite. Carrying out algal toxicity tests of pulp mill bleach effluents under standard bioassay conditions of high nitrate, leads to a gross underestimation of chlorate toxicity. Understanding the mode of uptake of chlorate in this case is therefore essential to designing and interpreting toxicity test results.

These are just some examples of the current limitations of laboratory toxicity tests. Other techniques routinely used in ecotoxicology have similar problems, which are not always widely acknowledged. I am not advocating that we abandon the use of such techniques but rather that we are open and honest about their particular limitations so that together we can think about ways to solve the problems. Even small incremental advances in the ecotoxicological techniques we use will enable better assessment and prediction of ecosystem impacts in future.

## Up date on ASE PRIZE FOR EXCELLENCE

Mick Warne, CET

The ASE Prize for Excellence has not been awarded for 1999 due to there being no nominations. This lack of nominations most probably reflects the innate modesty of all members as I know we do some excellent work.

This reluctance to self-nominate may be overcome if we are all more active in nominating others. For example, if you have read an excellent article/book/publication by an ASE member you could approach them and ask them if they would be willing to accept your nomination for the prize, and assuming they are you could then nominate them.

Please note the following information when nominating someone.

## New ASE Website

Munro Mortimer, QEPA

The ASE website is to be outsourced! Well, it's happening to the rest of us, why not ASE! Up to the present time, and thanks to Narelle Richardson's efforts and UTS allowing server access, we have been doing it ourselves. But it's one of those things that takes time and effort better devoted to other things, and Council decided at their last meeting to "go commercial".

The company ASE has chosen is Australia Online. They are at [www.ozone.com.au](http://www.ozone.com.au) if you want to have a look at their own site (probably a good indication) and those of some of their clients.

We are currently registering the site [www.ase.org.au](http://www.ase.org.au) and hope to have it in use as soon as possible.



## Inaugural ASE Award for Excellence

*Call for Nominations by 30 September 2000*

Nominations are now invited for the first ever ASE Award for Excellence to be given for the best paper, book, review or any peer-reviewed publication relevant to the ASE's interests (as defined by the Society's aim). The award will be made every two years, with the recipient expected to give an oral presentation at the next ASE conference.

Conditions of the award:

1. The nominee must be a member of ASE in the year of nomination and have been a member for at least the two preceding years.
2. The nominee should submit a single written scientific work published during the previous five calendar years.
3. The nomination should include:
  - the written publication,
  - a statement outlining the value of the contribution to the field of ecotoxicology, and
  - for individual nominations from a multi-authored publication, a statement from all co-authors outlining the contribution of the nominee.

Nominations should be sent, by 30 September 1999, to:

Dr Michael Warne  
Centre for Ecotoxicology  
University of Technology Sydney,  
Westbourne St, Gore Hill NSW 2065

For further information contact Jenny Stauber (02) 9710 6808 or [jenny.stauber@det.csiro.au](mailto:jenny.stauber@det.csiro.au)



## Baaad Science

"It isn't pollution that's harming the environment. It's the impurities in our air and water that are doing it."

Vice President Al Gore

submitted by:

**Munro Mortimer, Queensland EPA**

## Job Snippet

On a completely different matter, rumour has it that a prominent, indeed prestigious soils laboratory is looking for some-one to develop soil toxicity tests. The position sounds like it would be good for a recent Masters or PhD graduate – give me a ring or send an email and I'll tell all. (Greg Rippon)

# The 3 Rs

## PASSIVE SAMPLERS WORKSHOP

Munro Mortimer, QEPA

A very successful 1-day PSW was run by ASE in Brisbane on 22/11/99 to update members and other interested people on developments in this field. Twenty-three people attended from as far afield as Townsville and Sydney and had the opportunity to hear and discuss 8 presentations covering a range of topics in the use of passive sampling devices to detect and quantify organic and inorganic contaminants in air, water and sediment compartments of the environment. This was followed by a discussion session which focussed on the advantages and disadvantages of using these devices to monitor the environment.

### PAPER TITLES AND ABSTRACTS:

#### **Passive sampling of persistent hydrophobic trace pollutants in the environment - an overview**

Jochen F Müller, National Research Centre for Environmental Toxicology, 39 Kessels Road, Coopers Plains, Queensland 4108.

*Environmental concentrations of many hydrophobic pollutants in the environment may pose a risk to biota and humans despite the fact that they are below the limits of quantitation using standard sampling and analytical techniques. Hence over the last three decades many attempts have been made to develop, validate and use passive sampling methods for trace organic chemicals. Here an overview will be given of the attempts which have been made and advantages and disadvantages of many of these methods will be discussed.*

#### **Passive samplers - They're things you use for trace organics - aren't they?**

Ross Sadler<sup>1</sup> and Barry N Noller<sup>2</sup>

<sup>1</sup>Queensland Health Scientific Services, 39 Kessels Road, Coopers Plains, Queensland 4108.

<sup>2</sup>National Research Centre for Environmental Toxicology, 39 Kessels Road, Coopers Plains, Queensland 4108.

*Passive samplers are devices which can be placed in situ to collect soluble or ionic forms primarily by diffusion through pores of a membrane or gel and collection in a solution. Although passive sampling is a technique usually identified with the sampling of trace organics, the technique has also been applied to the sampling of*

Outcomes from the discussion were that the use of passive samplers had a number of clear advantages over traditional methodologies in many situations, particularly where the focus was on the quantitation of the bioavailable fractions of contaminants. It was suggested that although further work needs to be done to validate the data from these devices to the point where they would be accepted by regulatory authorities, this should be the long term goal, and was something that ASE should support.

It was suggested that passive samplers should be a topic on the next ASE conference, and that a (named) USA expert in this area should be an invited speaker. (This has been endorsed by ASE Council and passed on to the organising committee).

It is intended to produce a proceedings from the workshop when all the presentations have been gathered together, and this will be available to ASE members. But in the mean time, the presentation titles and abstracts are listed below.

*inorganic analytes. There are a number of reasons why such devices are of potential use in the sampling of anions and cations: By nature, the passive samplers parallel the situation in biota, where a semipermeable membrane separates the matrix from the cytoplasm and organelles; Many inorganics exist in a variety of chemical species and there is ongoing debate as regards which species are bioavailable. Pure chemical techniques such as specific digestion provide at best, an equivocal means of identifying bioavailable species; and the technique allows direct access to environmental phases such as sediment porewater that are difficult to separate by physical techniques.*

*As regards sampling of inorganics, successful design and utilization of passive samplers requires an understanding of analytical principles, which apply to the separation and collection of labile or discrete chemical forms. Some understanding of the nature of labile species, their collection and measurement may therefore assist in the design of passive samplers. Key variables are; (i) diffusion of the ionic species through a membrane or gel; (ii) size of pore vs the size of the chemical species; and (iii) collection in a suitable solution or media (eg dilute acid or higher ionic strength).*

*Passive samplers have been successfully used in sampling various environmental phases for components such as heavy metals, inorganic anions, dissolved gases, and radionuclides. The techniques has proven very useful for the sampling of groundwater, because its non-invasive nature permits stratification in boreholes to be preserved. The noninvasive nature of the technique has also been*

If you are wanting an insight into the politics of international treaties with an environmental perspective, then Aynsley Kellow's book on "International Toxic Risk Management: Ideals, Interests and Implementation" could be of some value. It is likely not to interest the more generalist reader of environmental literature, as it requires some persistence and fortitude to digest and follow Professor Kellow's thesis.

In essence, he argues that there is a dysfunction in how environmental policy is worked out at the international level (ie in various international treaties like the Basel Convention on the Control of the Transboundary Movement of Hazardous Waste) and then implemented at the national level. He attributes this to environmental non-government organisations (ENGOS) having, in part, greater success through being able to simplify an argument to what amounts to "moral outrage". On the other hand, NGOs representing industry's concerns can not present sophisticated argument to counter this "moral outrage".

On the surface, the thesis appears to have some merit, and I would not presume to say that I have presented all that Professor Kellow has to say on the subject. However, I feel that he does not adequately address other issues that affect the politics of international treaties, like the role of various regional or economic groupings in the lobbying process in reaching a consensus position. Also, in one of the examples he uses, the Basel Convention, the material he draws on is from the first 6 years or so of the Convention. The implementation of the Basel Convention is not, to be sure, without its difficulties, but does appear to be working reasonably well after 10 years (admittedly some issues are still not resolved). Moreover, Australian industry appears to have little difficulty in coming to grips with the Convention and its implementation through Australian legislation.

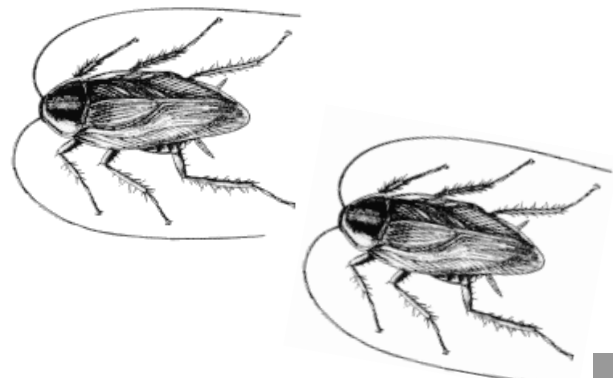
This perhaps is the weakness of his thesis – there is some ability for industry to influence the process, with some governments ensuring that industry is consulted to ensure effective policy. Moreover, the ability for ENGOS to generate "moral outrage" is likely to exist only in the initial phase of the treaty


negotiations and implementation. This is due to a) countries learning more about the ramifications of the suggested actions, and b) the public not seeing the negative results predicted by the ENGOS.

This might, for instance be true for the Biosafety Protocol dealing with genetically modified organisms (GMOs). We might find that some of the more extreme actions may be moderated when the ramifications of those actions proposed are made apparent, and then contrasted with the actual risk rather than the perceived risk. We might also find that ENGOS will need a new campaign to generate income as the fears that were raised about GMOs are not realised. Of course, the ENGOS might, in the long run, be able to say "We told you so".

Despite the above, this book of 222 pages is relatively well structured, and a worthwhile read for those interested in risk management. Chapter 1 gives the context and overview of the book – some readers might be satisfied with this alone. In Chapter 2, there is some discussion of risk assessment and the science underpinning it, with a contrast then made to risk management. Professor Kellow indicates, and I tend to agree, that both risk assessment and risk management can lack objectivity. This lack of objectivity can cause some issues to cause a "global panic". In response to this "global panic", he considers multilateral environmental agreements (MEAs) in Chapter 3 and the influence of lobby groups in Chapter 4. The next two chapters consider case studies of MEAs: the Basel Convention in Chapter 5 and the OECD Risk Reduction Program in Chapter 6. Chapter 7 concludes with an appealing title of "Belling Cats and International Policy Implementation".

This article, amended to some degree, has been published in the Australian Journal of Environmental Management, December 1999.





to major theme(s), speakers, and conference structure, including how many workshop/mini-symposia.

## Thoughts so far...

### Background

The starting point for our thoughts are:

1. Theme of "From Representations of Reality to Regulation" - in ecotoxicology, we can make different representations of the environment, but whatever we do use, will still be artefactual and not reality itself. The way we choose to represent reality will also affect the way we regulate, but also the way we regulate will affect the way we represent reality.
2. We will aim to involve various government departments to give more exposure to government policy makers, and other institutions whose expertise may lend themselves to developing the conference theme.
3. We will develop one or more mini-symposia, workshops or short courses on environmental modelling, statistical methods and risk assessment.

We consider that it is essential to develop the above theme of regulation because of Canberra's political environment (with respect to policy development and regulation), as well as remind ourselves of what ecotoxicology aims to make sense of (and what we are trying develop policy for and regulate ie with respect to the environment). We now have to firm up our ideas, particularly the conference structure with respect

### Date

The Conference will run from the 11 February to 14 February 2001. EnviroTox will follow directly after an international limnology meeting in Melbourne, and we might be able to get some speakers from that to detour via Canberra on their way home.

### Conference Aims

The conference aims to:

- provide a venue for hands-on knowledge transfer from experts, and
- link to areas of expertise/institutions in the ACT region that would bring complimentary perspectives to the discipline of ecotoxicology.

The problem in coming to Canberra is that there is not a big ecotox presence, with those of us who are here mainly in the one institution (ie *Environment Australia*). This is one reason that I am keen to capture synergies with other institutions, and gain some momentum. While some of the above might be a bit removed from pure ecotoxicology, it might be a good opportunity to try and promote some knowledge transfer and cross-pollination of ideas.

Also, to the sub-committee is pleased to welcome Meg Burchett as chair of the sub-committee. There will be more from Meg in the next issue!

### Carmel Pollino

RMIT University, Department of Applied Biology & Biotechnology, Melbourne (Vic) (Associate Prof. Doug Holdway - RMIT), PhD

*The effects of petroleum hydrocarbons on rainbowfish development and reproduction.* [c.pollino@rmit.edu.au](mailto:c.pollino@rmit.edu.au)

### Caroline Teasdale

RMIT University, Department of Applied Biology and Biotechnology, Melbourne (Vic) (Associate Prof. Doug Holdway - RMIT). *Vitellogenin, MFO, 17-Beta-estrodial and bile metabolite levels in Sand Flathead to dispersed crude oil* - Masters App Sc; [c.teasdale@rmit.edu.au](mailto:c.teasdale@rmit.edu.au)

### Bill Dixon

RMIT University, Department of Applied Biology & Biotechnology, Melbourne (Vic) (Associate Prof. Doug Holdway - RMIT). *Scale Issues in Ecotoxicology - Investigating the effects of spatial scale - container volume -*

*RMIT Student Listing continued from pages 9 & 10*

*on pond microcosm communities exposed to 2,4-Dichlorophenoxyacetic acid; PhD; [bill.dixon@rmit.edu.au](mailto:bill.dixon@rmit.edu.au)*

### Kelly Ryder

RMIT University, Department of Applied Biology and Biotechnology, Melbourne (Vic) (Associate Prof. Doug Holdway - RMIT). *The effects of petroleum hydrocarbons on echinoderms*, [K.ryder@bigpond.com](mailto:K.ryder@bigpond.com). PhD

### Shahnaz Khan

RMIT University, Department of Applied Biology and Biotechnology, Melbourne (Vic) (Dr Dayanthi Nugegoda - RMIT). *The effects of heavy metals on the freshwater yabby;* Masters App. Sc

### Liliana Zaluzniak

RMIT University, Department of Applied Biology and Biotechnology, Melbourne (Vic) (Dr Dayanthi Nugegoda - RMIT & Michael Barry - Victoria University). *The effect of*

# Students' Say

Grant Hose, UTS

Welcome to another instalment of Students Say.

There's not a great deal to report on the student front, except that those of you that submitted an application for the ASE Honours Prize, your theses are currently being reviewed and the prize should be awarded shortly. For any of you who have recently finished Honours, I strongly encourage you all to enter. The award is open to any students who have completed an Honours thesis in Ecotox. The closing date is early 2000 so get to it. The details should be listed somewhere in this newsletter, otherwise contact Jenny Stauber or myself for more information.

I was recently fortunate to be able to attend the joint conference of the Australian Society for Limnological and New Zealand Limnological Society conference held near Taupo on the Nth Island of New Zealand. There were some excellent presentations made and it was good to see a few ASE faces in the crowd.

Cristie Stoopman displayed a poster on Daphnia, cadmium and crests before her supervisor Michael Barry rounded up the conference with a talk about Daphnia, drugs and neck teeth. Our PNG rep Ross Smith spoke about biomonitoring in the Boac River (Philippines) after a mine tailings spill and I had a bit of a gasbag about killing bugs with endosulfan. Louisa Oswald arrived at the conference via the rest of the world and spoke of the difficulties of putting bugs in cages and trying to kill them *in situ*. Kate Willis, best known for killing zooplankton with PCP has turned into fish girl and spoke about conservation of Black Mudfish.

Congratulations to Kate who will soon be leaving the sunny shores of NZ to take up a postdoc position in Scotland looking at zooplankton in fish farms. Best of luck with your new job Kate! Kate has promised to give a demonstration of the Highland fling at the next ASE conference dinner!



This month's celebrity student is Warren Davies who obligingly supplied the following bio (at very short notice - thanks Warren!).

In 1992 I started my BSc at Victoria University in the Department of Environmental Management. By the end of second year I had decided a career in ecology and toxicology was the thing for me, thanks largely to the enthusiasm of my lecturer Dr Paul Lam. By the time I got to my Honours year I made the move to RMIT to do an ecotox project with Dr Michael Barry. My project looked at the effect of a pesticide (endosulfan) on aquatic community structure. This was achieved by constructing microcosms using soil from dried temporary ponds and flooding with water. In no time a

community arose, comprised mainly of zooplankton, algae and plants. I later increased the environmental realism of these microcosms by introducing an insect predator (notonectid).

After Honours I returned to Victoria University and worked for the year as a technician. At the end of 1997 I had the opportunity to start a PhD investigating nutrient effects on zooplankton in large outdoor mesocosms. Unfortunately I did not have any scholarship funding for this project and had to reduce my workload to part-time whilst working as a technician at RMIT by late 1998.

In March 1999 RMIT I was fortunate to get a PhD scholarship at RMIT as part of a major study on the Gippsland Lakes in SE Victoria. My current project involves the effects of the blue-green algae *Nodularia spumigena* and its toxin nodularin on zooplankton from the Gippsland Lakes. My supervisor is Dr Dayanthi Nugugoda and Dr Leanne Gunthorpe from MAFRI is a consultant to the project. My candidature has been submitted and fieldwork is slowly getting underway.

Spare time (if there is such a thing for a PhD student) is spent researching my family history, watching TV and travelling. I have part-time work during the year as a Waterwatch officer in the Melbourne region, demonstrating at Uni and have recently worked on the Index of stream condition project (Victorian NRE).

Warren is one of the many RMIT students doing some pretty interesting work in a wide range of ecotox projects. A list of RMIT students and what they are up to is also included in this issue.

If you have any questions or suggestions for Warren I'm sure he'd love to hear from you, he can be contacted at [Warren.davies@rmit.edu.au](mailto:Warren.davies@rmit.edu.au). If you would like to follow in Warren's footsteps and be the next student celebrity, please email me a short blurb on who you are, what you do and the meaning of life.

Well, with a bit of luck, I'll soon be finishing my thesis and with it will shed the title of ASE student rep. If you feel like nominating yourself or another to carry on this role, please let me know - the only requirements are that you're a current ASE member and a student. As always, I can be contacted at [Grant.Hose@uts.edu.au](mailto:Grant.Hose@uts.edu.au) should you wish to vent your spleen, tell how much you look forward to the next students say, or have anything that you wish to include in the next newsletter.

Cheers, Grant.

## Up in smoke

A paper in *Environment Science & Technology* by Ed Rubin (33, 3062-3067, 1999) has estimated that the magnitude of the electric utility industry release, once they are reported to the TRI (which they were required only to do at the beginning of 1998), will surpass those of the manufacturing industries which currently report to the TRI. Sounds scary doesn't it? And all at the stroke of a legislator's pen, if one takes the oxidation of the materials as "manufacturing". Thus, if Zn is in the coal, burning the coal "manufactures" ZnO. Products from 17 metals have to be reported and some other inorganic compounds, such as HF, HCl and H<sub>2</sub>SO<sub>4</sub>. Indeed, the last two volatiles were modelled to be the largest of the emissions, followed by barium compounds in the fly ash which would be land-filled.



## And blowin in the wind

Wind-borne soil particles were analysed for herbicides, with diclofop and bromoxynil associated with the larger fraction, being captured at lower heights. Soil incorporated herbicides appeared to have higher concentrations in the surface soil, whereas surface-applied herbicides had higher concentrations in wind-borne particles than in the surface soil. Larney et al conclude that "The results demonstrate the potential hazard of hazard of environmental transport of herbicides on wind-eroded sediment and its associated implications for off-site air and water quality". I'm not sure whether water quality would be more affected by desorbed chemical or suspended particulate matter – anyway, it's all the same to a South Australian. (*J. Environ. Qual.* 28, 1412-1421, 1999)

## A drop in the ocean

Or the ocean itself? The US EPA with State agencies will prioritise waterbodies for cleaning up, rather than concentrate on discharges of pollutants. For this, they will calculate the maximum amount of a pollutant that the water body can handle and still meet water quality guidelines. It sounds like there

will be some potential for tradeable emission rights, as all pollution sources will "share responsibility". (Julie Grisham, *Chemical & Engineering News*, August 23, p10-11, 1999; KL Werner *Chemical Regulation Reporter*, 23(32), 1285-1286)

## Even a well mixed drop

In September, the EPA also announced plans to limit the discharges of bioaccumulative substances into the Great Lakes. What is novel about this? Well, the EPA is also arguing that the concept of "mixing zone" does not work well for these substances; for rapidly degraded substances released to fast flowing streams, transient pulses may not do cause too much long-term damage, while for bioaccumulative substances, in a pollution sink like the Great Lakes, it can. The scheme will take 10 years to phase in, although the concept of mixing zone would be immediately abolished. As it turns out, the mixing zone concept would only apply to three states, as most already do not use the concept. This might be one reason why the Chemical Manufacturers Association is not opposing the move – but it might be a different story if it was to be extended for the rest of the USA. (J Johnson, *Chemical & Engineering News*, October 4, p7-8, 1999)

## Hormonally Active?

Not about teenagers, but the report: "Hormonally Active Agents in the Environment". After a four year study, it appears that the US National Research Council has concluded that exposure to endocrine disruptors found in the environment can cause adverse reproductive effects and developmental effects in humans and wildlife. Pretty shocking, eh? What's more stunning is that it will apparently need many more years to determine how wide-spread the effects are in humans (it would appear to be pretty homocentric), and at what levels they are dangerous (the chemicals, not the humans, that is). (B Hileman, *Chemical & Engineering News*, August 9, p 6, 1999)



## To ameliorate, or not to ameliorate

In Denmark, the surfactant linear alkyl benzene sulphonate (LAS) is the target of a new campaign by the Danish authorities, modelled on a Swedish program. The claim is being made that LAS is harmful to soil bacteria and aquatic organisms. So, the authorities are planning to withhold ecolabels of detergents that have the LAS in them – apparently with the potential to cause a large market shift away from these unlabelled detergents. While I'm not sure about the soil bacteria, I didn't think LAS was a major culprit when compared to some of the other common detergents? Also, I thought it was pretty well degraded in treatment plants. However, the Danes appear to be concerned that in high concentrations it can kill beneficial soil bacteria when sewage sludge is used as a soil ameliorant. The counter claim by surfactant manufacturers is that the surfactant is harmless, and are threatening to go to court. Well, it's the dose that determines the poison, that's all I know. (Anon. *Chemistry & Industry*, 18 October, p 780, 1999)

## And while in Europe

Whether the European waterways have enough suds is one thing, but at least they appear to be recovering from all that past acid rain. North America also appears to be benefitting from the international campaign to fight acid rain. A report in *Nature* (401, 575, 1999) indicates that from a slow beginning in the 1980s, there was more rapid progress in the 1990s, with anthropogenic sulphate levels decreasing "everywhere", with a concurrent decrease "almost everywhere" (ie in some parts of North America and across Europe). Nitrates on the other hand, which are less well controlled but which could still cause acidity and acid rain, have not fallen. Unfortunately, in the same issue of *Nature*, Alan Jenkins claims that there is still little evidence of biological recovery. What is done in a blink of an eye, may take a lifetime to repair, or patience is a virtue, whatever. (Anon. . *Chemistry & Industry*, 18 October, p 781, 1999)

## And here's a nice mice mouse-house problem

If you were to screen, say mice, with compounds for endocrine disruptor activity, would you want it confounded by the mice reacting to other mice? Well, John Ashby of AstraZeneca warns that this

could occur if the mice are not housed appropriately (eg in single mouse-house vs couples mouse-house, same sex mouse-house, etc). (Anon. *Chemistry & Industry*, 18 October, p 784, 1999)



## And an offer Monsanto would find hard to refuse?

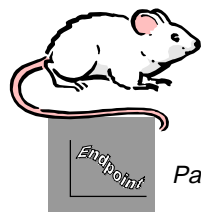
Again, thanks to the Anon. of *Chemistry & Industry* (18 October, p 788, 1999), there is a claim that Greenpeace has offered Monsanto a new leash of life (so-to-speak) – Monsanto can apparently borrow the "ecological vision and global credibility" of Greenpeace in exchange for Monsanto selling its soul, or at least to stop developing GM crops, sell its assets in the pesticide business, and reject the idea of patenting life forms. I suspect, even given Monsanto's current difficulties, selling its soul might be easier, and just because it was willing to give up its "terminator technology", it doesn't actually want to terminate all its GM or pesticide business. Robert Shapiro, Monsanto's chairman, on the other hand, would appear to be under some terminal pressure.

## Feel the power

Just to get a bit of stats into the newsletter, Nelly van der Hoeven performed a power analysis for the NOEC to try and establish the probability of detecting small toxic effects on three different species using the appropriate standardised test protocols. She used a water flea, earthworm and springtail. The power analysis, based on a one tail Dunnett test, used ring test data, and indicated that a "reduction inhibition" of 20% will be observed in 80% of the water flea tests, and in only 18% of the other other tests. To observe an effect of 20% in at least 95% of the experiments, for both the earthworm and springtail tests, in which 1 control was compared with 5 treatments, 21 replicates are needed per concentration, and 47 in the control. This compares with the water flea needing only 12 and 27, respectively. I do get the gist of it, although I'm still having trouble with "reduction inhibition". (*Ecotoxicology*, 7, 355-361, 1998)

## And for oestrogenically-challenged persons

You would certainly pick up on the following title: *Great and blue tits as indicators of heavy metal contamination in terrestrial ecosystems*. (*Ecotoxicology & Environmental Safety*, 44(1), 81-85, 1999)



# What's on

**28 February - 2 March 2000, 14th Biennial International Plant Resistance To Insects Workshop**, Ft. Collins, CO, USA. Contact: F. Peairs, Dept. of Entomology, Colorado State Univ., Ft. Collins, CO 80523, USA. E-mail: <[fbpeairs@lamar.colostate.edu](mailto:fbpeairs@lamar.colostate.edu)>. Phone: 1-970-491-5945.

**19 March - 1 July 2000 International Course On Integrated Pest Management**, Wageningen, The Netherlands. Contact: H.A.I. Stoetzer, PO Box 88, 6700 AB Wageningen, The Netherlands. Fax: 31-317-418552. E-mail: <[iac@iac.agro.nl](mailto:iac@iac.agro.nl)>. Website: <[www.iac-agro.nl](http://www.iac-agro.nl)>. Phone: 31-317-490111.

**9-13 April 2000, Enviro 2000**, The Convention Centre, Sydney. Contact: fax: 02 9415 1599; email: [quitz@dot.net.au](mailto:quitz@dot.net.au)

**9 May 2000, International Symposium On Crop Protection**, Coupure Links, Gent, Belgium. Contact: P. DeClercq, Dept. of Crop Protection, Univ. of Gent, Coupure Links 653, B-9000 Gent, BELGIUM. E-mail: <[Patrick.DeClercq@rug.ac.be](mailto:Patrick.DeClercq@rug.ac.be)>. Fax: 32-9-264-6239. Phone: 32-9-264-6158.

**22-25 May, 2000. The second international conference on remediation of chlorinated and recalcitrant compounds**, Monterey, California. Contact The Conference Group, 1989 West Fifth Avenue Suite 5, Columbus, Ohio 43212-1912 USA, phone 614-424-5461, fax 614-488-5747, [conferencegroup@compuserve.com](mailto:conferencegroup@compuserve.com).

**5-9 June 2000, R'2000: Recovery, Recycling, Reintegration**, Peak, Markham, York Region, CSR et al. Toronto Convention Centre, Ontario, Canada. Contact: email: [barrage@peak.ch](mailto:barrage@peak.ch)

**01-03 August 2000, Conference On Human Conflicts With Wildlife: Economic Considerations**, Fort Collins, CO, USA. Contact: D.L. Dwyer, USDA National Wildlife Research Center, 4101 LaPorte Ave., Fort Collins, CO 80521, USA. Phone: 1-970-266-6015. E-mail: <[Diana.L.Dwyer@usda.gov](mailto:Diana.L.Dwyer@usda.gov)>. Website: <[www.aphis.usda.gov/ws/nwrc/econsymp.htm](http://www.aphis.usda.gov/ws/nwrc/econsymp.htm)>.



**20-26 August 2000, 21st International Congress Of Entomology**, Iguassu Falls, PR, BRAZIL. Contact: D.L. Gazzoni; e-mail: <[gazzoni@cnpsobr.br](mailto:gazzoni@cnpsobr.br)>. Website: <[www.embrapa.br/ice](http://www.embrapa.br/ice)>.

**12-16 November 2000, Brighton Crop Protection Conference 2000, Pests And Diseases**, Brighton, UK. Contact: The Event Organization, 8 Cotswold Mews, Battersea Square, London SW11 3RA, UK. Fax: 44-171-924-1790. E-mail: <[eventorg@event-org.com](mailto:eventorg@event-org.com)>. Phone: 44-171-228-8034. Website: <[www.BCPC.org](http://www.BCPC.org)>.

**4-10 February 2001, 28th Association of Theoretical and Applied Limnology Conference**. (We have no official details at this stage, but I am sure, in the interim, some details can be obtained from Michael Barry: p +61 3 9365 2768, f +61 3 9365 2465, email [michael.barry@vu.edu.au](mailto:michael.barry@vu.edu.au) Ed)

**11-14 February 2001, EnviroTox 2001**. Australasian Society for Ecotoxicology, Rydges Canberra Hotel, ACT. Contact: ph: 02 6250 7599 & 02 6250 0779; fax: 02 6250 0387; email [greg.rippon@ea.gov.au](mailto:greg.rippon@ea.gov.au)

**8-13 July 2001, Ninth International Congress of Toxicology (ICT-IX)**, Brisbane Convention and Exhibition Centre. International Union of Toxicology (IUTOX). ICT-IX website at <http://www.uq.edu.au/ICT9> and Congress Secretariat (Intermedia Convention & Event Management) at [ictix2001@im.com.au](mailto:ictix2001@im.com.au)

**May, 2001, 53rd International Symposium On Crop Protection**, Coupure Links, Gent, BELGIUM. Contact: P. DeClercq, Dept. of Crop Protection, Univ. of Gent, Coupure Links 653, B-9000 Gent, BELGIUM. E-mail: <[Patrick.DeClercq@rug.ac.be](mailto:Patrick.DeClercq@rug.ac.be)>. Fax: 32-9-264-6239. Phone: 32-9-264-6158.

**25-29 August 2001, American Phytopathological Society Annual Meeting**, Salt Lake City, UT, USA. APS, 3340 Pilot Knob Road, St. Paul, MN 55121-2097, USA. [aps@scisoc.org](mailto:aps@scisoc.org), fax 1-612-454-0766, website [www.scisoc.org](http://www.scisoc.org).

**November 2001, Brighton Crop Protection Conference 2001**, Brighton, UK. Contact: The Event Organization, 8 Cotswold Mews, Battersea Square, London SW11 3RA, UK. E-mail: <[eventorg@event-org.com](mailto:eventorg@event-org.com)>. Fax: 44-171-924-1790. Website: <[www.BCPC.org](http://www.BCPC.org)>.