SENTINEL

NOVEMBER 2005

Australian Biosecurity CRC for Emerging Infectious Disease

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FROM THE CEO

Dr Stephen Prowse

Foot-and-Mouth Disease Forum

While many people are preoccupied by avian influenza, I recently attended a foot-and-mouth disease (FMD) forum. The forum was organised by Animal Health Australia (AHA) and the Australian Government Department of Agriculture, Fisheries and Forestry, with support from Meat and Livestock Australia. The objective of the forum was to review and update the FMD emergency response plan. FMD remains a serious threat to Australia and the region. FMD still causes significant economic loss and hardship in many countries of the world.

Dr Gardner Murray, Australia's Chief Veterinary Officer, presented an overview of national and international developments in FMD, highlighting a number of key issues including shifts in community acceptance of large scale slaughter, changes in diagnostic capacity and capability, and increased international reporting of outbreaks of FMD. Dr Renello Abila, the South-East Asia FMD Campaign Coordinator gave an overview of the FMD situation in that region, highlighting the success of the campaign and the strategies that are in place to continue improving FMD control in the region.

Dr Rob Keogh from AHA outlined the status of the FMD vaccine bank purchased by the Australian Government and industry, and Dr Greg Hafner presented the progress on the implementation of the recommendations flowing from Exercise Minotaur. Exercise Minotaur was designed to test our national response plans using a simulated FMD outbreak.

The comprehensive FMD response plan is managed by AHA and includes outbreak response, communication, welfare, carcass disposal, modelling, training, regulation, diagnosis and research. Many of these issues were discussed at the forum, with the aim of identifying any changes in the environment that would result in the need to update or revise the plan.

The AB-CRC supports a number of projects that contribute in part to the plan. These include improved laboratory diagnostics, pen-side diagnostic testing and enhanced FMD modelling. It is of great value to be able to put the AB-CRC's research into the national context and see how our research can improve our national preparedness.

New Associate Members

NSW Department of Primary Industries has joined the AB-CRC as an Associate Member. Dr Peter Kirkland is involved in several AB-CRC projects and Dr Helen Scott-Orr is a member of the International Advisory Standing Committee. NSW DPI brings a broad cross section of expertise to the AB-CRC and we look forward to a productive partnership.

The National Centre for Epidemiology and Population Health (NCEPH) has also joined the AB-CRC as an Associate Member. NCEPH is a world-class research establishment committed to furthering our understanding of the determinants of population health. A broad, multi-disciplinary approach is taken, encompassing the social, behavioural, environmental and genetic influences on health. The Director of NCEPH, Professor Tony McMichael, is on our International Advisory Standing Committee and is involved in the supervision of a PhD project. The AB-CRC has also undertaken a consultancy in collaboration with NCEPH.

AUSTRALIAN SCIENTIST WINS MALAYSIA'S INAUGURAL AWARD FOR SCIENTIFIC EXCELLENCE

Professor John Mackenzie AO has been awarded the inaugural Academy of Sciences Malaysia Award for Scientific Excellence in Honour of Tun Dr Mahathir Mohamad.

This award recognises Professor Mackenzie's work in tropical medicine, which has made tremendous contributions in the area of emerging tropical diseases, and has led to significant benefits to society. For example, a team led by Professor Mackenzie played a pivotal role in the identification of the West Nile Virus incursion into the USA in 1999 through the provision of diagnostic reagents.

Professor Mackenzie said "I feel deeply honoured by the Award from the Academy of Science Malaysia, and also honoured in that it is in Honour of Tun Dr Mahathir Mohamad, a very remarkable and visionary leader.

"Science and scientific achievements are never the culmination of work by a single person, but reflect the combined efforts of many. While I am greatly honoured as the recipient of the award, I am very conscious of the many colleagues and friends who have been largely responsible for many of the achievements made by others in my research group over the years.

"I am also lucky to have the backing of my wife, Isobel, who has sometimes been my critic and conscience, but always my support."

Professor Mackenzie has a distinguished academic, advisory and consulting career and has made an outstanding contribution to the understanding of viral diseases. He is an internationally recognised microbiologist, an advisor to Federal and State Government departments, and has been an advisor to the World Health Organization for viral diseases since 1984. He is also a member of the Scientific Advisory Group for Global Health Security at the World Health Organization, has consulted to Aventis Pasteur and Smith Kline & French, and is Secretary-General of the International Union of Microbiological Societies.

Professor Mackenzie is broadly interested in emerging infectious diseases, especially zoonotic (transmitted to humans from an animal) and vector-borne (e.g. transmitted to humans by mosquitoes) viral diseases, and the establishment of national and international surveillance systems to detect, monitor and verify such disease outbreaks. He is interested in understanding the role of fruit bats (flying foxes) in the appearance of novel virus diseases such as Hendra virus and Australian bat lyssavirus; other animal reservoirs for diseases such as SARS; and in the spread of mosquito-borne diseases, such as Japanese encephalitis virus.

The ASM Award for Scientific Excellence is Malaysia's most prestigious science award for tropical research, launched in honour of Tun Dr Mahathir Mohamad.

As the winner of the award, Professor Mackenzie received RM 100,000, a medal and certificate. The prize was conferred by DYMM Yang Dipertuan Agung (His Majesty the King) during an award presentation ceremony held in conjunction with the Academy of Sciences Malaysia 10th Anniversary Dinner in Kuala Lumpur on 3 September 2005.

SHORT COURSE IN BIOSURVEILLANCE

Realtime Outbreak and Disease Surveillance (RODS) Laboratory University of Pittsburgh, Pennsylvania, USA

Lynne Dailey, PhD student

Four members of the Advanced Surveillance Systems program - Rochelle Watkins, Serryn Eagleson, Richard Shephard and I - attended a short course in biosurveillance in the United States.

The course was geared toward public-health professionals, consultants, and researchers in the field of biosurveillance. It provided an intensive review of state-of-the-art biosurveillance systems. The course was split into four main streams: organisations and the data they collect; algorithms; building biosurveillance systems; and decision making.

Dr Michael Wagner, other RODS staff and our very own Richard Shephard taught the organisations, building biosurveillance systems and decision making streams. Richard's presentation was based on animal biosurveillance and a preview of his surveillance system, the Bovine Syndromic Surveillance System (BOSSS). Dr Andrew Moore of Carnegie Mellon University (CMU) taught the algorithms stream. The course was very valuable as it developed our understanding of different data sources, algorithms, the architecture of building a biosurveillance system and, finally, the basics of decision making and how to interpret and react to a signal produced by such systems. This, in effect, allowed for a broad understanding of the topics surrounding biosurveillance and future areas for potential research.

The following week, Rochelle, Serryn and I were based at the Auton Laboratory at CMU. We spent time speaking with researchers in biosurveillance, computer programmers and mathematicians in order to work through the technical issues associated with our respective projects. This was invaluable and, as a result, we have formed links with these organisations for future research and collaboration.

Overall, this experience has been worthwhile and very beneficial to our research. In particular, we would like to thank the AB-CRC for granting approval for this trip, and the respective teams under Dr Michael Wagner and Dr Andrew Moore.

Left to right: Dr Richard Shephard, Lynne Dailey, Dr Rochelle Watkins and Dr Serryn Eagleson.

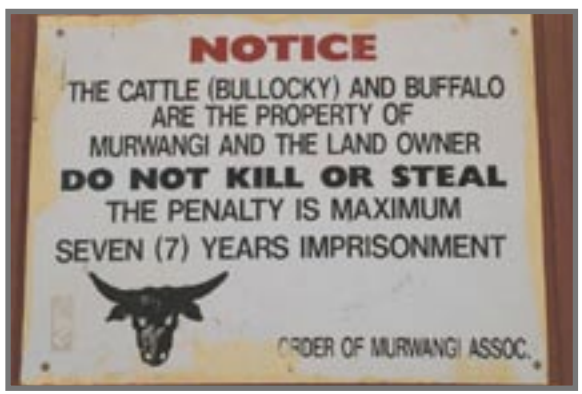
FIELD TRIP TO THE NORTHERN TERRITORY

Celia Smuts, PhD student

I started my PhD at Murdoch University in January 2005. The aim of my project is to develop tools to improve surveillance for *Trypanosoma evansi*, the cause of surra. One of my specific aims is to validate a paper-based blood and/or serum collection system suitable for use in remote Australian conditions.

I set off for the Northern Territory in trepidation. A two week camping trip with strangers and no showers was a daunting prospect. My task was to see how samples are collected during a Northern Australian Quarantine Strategy (NAQS) animal survey for exotic diseases, and whether a paper-based blood and serum collection system would be useful and usable for sample collection in the remote areas of Australia.

Surveys are regularly carried out in northern parts of Australia but, due to the vast areas to be covered, each area can't be targeted specifically each year. Sample numbers are relatively small, and restricted to the time of the survey. To overcome these problems, training of the local rangers and communities is undertaken during the surveys, with the aim of getting the local communities to collect samples whenever an animal is acquired for food.



The Aboriginal people living in remote communities have more knowledge about normal animal anatomy that your average city dweller, but technical expertise in sample collection is non-the-less limited, and facilities such as refrigeration and easy transport to the local laboratory are luxuries. Blood samples are currently collected in serum tubes by the NAQS team at the time of culling, and the serum spun, separated and refrigerated for the duration of the survey, which normally lasts 1-2 weeks.

This trip to the Northern Territory showed that an easy-to-use method of blood collection with extended storage time would improve the efficiency and ease of surveillance in remote areas. Rangers appeared interested in and willing to collect samples themselves. Being in the field has shown the problems to be faced in developing this product, including heat, humidity, technical limitations and access problems.

Locals learn post-mortem techniques.

PERSPECTIVE FROM A STUDENT - A RESEARCH EXPEDITION TO NORTHERN AUSTRALIA

Tze-Hoong Chua, PhD student

I had the privilege of following my PhD supervisor, Dr Trevor Ellis, to Kununurra in the Kimberley region for surveillance of avian influenza in wild birds, 24-28 October 2005. The expedition was organised by the Northern Australia Quarantine Strategy under the coordination of Dr John Curran. We were joined by Chris Hanssell, who is an ornithologist, Dr Cheryl Johansen from the University of Western Australia, and Dr Peter Harding from Camperdown Veterinary Practice. The team was supported by Western Australian Department of Conservation and Land Management officers. The event was also followed by an ABC film crew and was featured on *Catalyst* on Thursday 17 November 2005.

The purpose of the expedition was to collect blood and cloacal samples to test for the presence of avian influenza viruses as well as several arboviruses. Our sampling targets were Australian waterfowl species, the whistling ducks that migrate between the Ord River where we were based and the floodplains in Northern Territory and New Guinea. Considerable effort was needed each time we prepared traps, toiling loads of equipment across different firing sites on the riverbanks, loading explosives, and positioning cannon-nets along the banks under hot conditions of 40°C and on baking sand. Chris' advice on drinking plenty of water was heeded appreciatively. The team was also aware of the dangers lurking in the river – saltwater crocodiles – as we had to travel along the river by boat and worked very close to the water. On a few nights one could see the refractive glare of eyes staring from the waters and there were probably at least ten pairs of them.

Taking swabs and blood samples of wild ducks by the Ord River.

Our activities involved preparation and laying of traps, a brisk nap, and waking up early (at 3.00 am) to fire off the cannon-nets and bleed the birds caught before the sun became too hot at noon. We would return in the late afternoon for another round of catching and bleeding, often working late into the night. It was an unforgettable experience every morning as we slipped under the cover of dawn by boat to the netting site, surrounded by whistling calls of ducks near the riverbanks. Much patience was needed prior to every firing. Sometimes, we would have to wait several hours behind bushes for the ducks to walk into the net area. Often the birds became edgy and they would take off at the slightest suspicion. Even the nets have to be carefully camouflaged and footprints concealed to deceive the birds. I have to mention that the first firing was disappointingly uneventful as we only caught two ducks, which we named Daffy and Donald. However, things got into momentum very soon and by the third day a record-breaking 308 ducks were caught and sampled. The samples were quickly sent off to CSIRO Australian Animal Health Laboratory in Geelong.

Overall, there was a sense of quiet accomplishment after the last bird was bled. Cheryl felt it was one of her toughest field work assignments and Peter said it was a "good experience" and nothing more. I was glad to be back to civilization after four days of memorable field work.

After the expedition (from left): Peter, Chris, John, Cheryl, Trevor and Tze-Hoong.

WILDLIFE HEALTH INVESTIGATION MANUAL *GIVE-AWAY*

The Australian Registry of Wildlife Health

Dr Marion Macnish (AB-CRC Senior Project Officer) and Dr Karrie Rose (Australian Registry of Wildlife Health)

The Australian Registry of Wildlife Health (ARWH), established in 1985 at the Taronga Zoo, recently published a beautifully illustrated and much needed *Wildlife Health Investigation Manual*.

Dr Karrie Rose, a Veterinary Pathologist at the Taronga Zoo and manager of the ARWH, says the manual was written as a practical guide for wildlife carers, rangers, rural land protection board staff and veterinarians to assist in disease diagnosis and outbreak investigation. Karrie says the manual will help ensure that these groups will collect appropriate information and samples to assist in the diagnosis of wildlife disease.

It is designed to be used alone or to accompany wildlife health investigation workshops, and Karrie firmly believes the manual will be an effective first step in the development of an effective and national wildlife health surveillance program.

Karrie became interested in working with wildlife while conducting field research and population studies with Ferruginous Hawks and Burrowing Owls during university summer breaks. Further summer employment within the wildlife rehabilitation and pathology programs at Calgary Zoo cemented her commitment to the study of wildlife health. Shortly after graduating with the faculty gold medal from the Western College of Veterinary Medicine, Saskatoon, Karrie pursued a 3-year residency at the Metropolitan Toronto Zoo. This residency was completed in conjunction with a Doctor of Veterinary Science Degree in Zoo and Wild Animal Medicine and Pathology at the Ontario Veterinary College. Completion of this degree lead to 16 months in New Zealand as the manager of a charitable wildlife rehabilitation organisation that was contracted by the Maritime Safety Authority of New Zealand to provide preparedness and response to wildlife affected by oil spills. After a twelve month period conducting locum zoo veterinary work and wildlife health surveillance contracts, Karrie moved to Sydney in 1998 to undertake the position of Veterinary Pathologist for the Zoological Parks Board of NSW.

Following in the auspicious footsteps of Dr Bill Hartley, she now provides a diagnostic pathology service for the Board and manages the Australian Registry of Wildlife Health.

When the manual was first written, Karrie approached the AB-CRC to ask for financial assistance for the inclusion of high quality photographs with line drawing overlays. The AB-CRC was delighted to provide this support to allow the AWHR to hire a professional illustrator as well as offsetting some of the costs associated with publication and dissemination of the manual. The manual has been a great success so far and is now into its second print run.

The AB-CRC is very pleased to announce that we have **eight copies of this manual to give away** (normally retailing at $35 each) – first in, first served. To obtain a copy, contact Marion in the Perth office:
P (08) 9266-1649
E marion.macnish@abcrc.org.au (Please remember to provide your postal address!)

SARAH PALMER

PhD Student

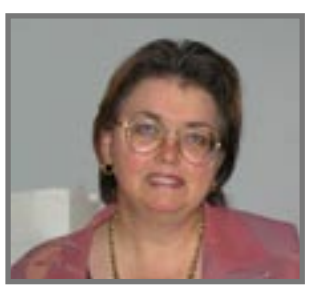
My path to research has been somewhat convoluted. I joined Perth's daily newspaper, *The West Australian*, as a cadet journalist as soon as I finished high school. After three years I found myself a little disillusioned; my naïve impressions of working in a newspaper office with cultured literary types jarred with the reality – mostly hard-nosed, hard-drinking types chasing stories that will sell newspapers. I thought I would be happier freelancing and enrolled in a three-year photography course. At the end of that I realised how difficult it was going to be to set myself up as a freelancer and when the newspaper offered me a sub-editing and writing job in the Features department I took the easy option. At the same time I enrolled in a Bachelor of Arts at Murdoch University, majoring in Sociology, which I completed part-time, externally, over seven years. In 1997 and 2000 I had my two daughters, taking a years leave from the newspaper each time and returning to work two days a week.

After a two-year break from study, having completed my undergraduate degree, I made the decision to step outside my comfort zone and resign from the newspaper once and for all. My newfound love was sociology and social research. With one child not yet at school, I decided to enrol in Honours part-time over two years. Then came another difficult decision: whether or not to pursue a PhD. I was determined not to go back to the newspaper but I didn't think an Honours degree would take me where I wanted to go. The fact that my husband has a PhD and I don't has nothing whatsoever to do with it!

When I saw the social research project into farmers' surveillance habits offered by the AB-CRC, I became very excited at the prospect of working on a real research project. My project entails studying the cultural and social factors that affect the management of sheep health and disease. Suffice to say I am enjoying it immensely and I can't wait until the survey and interview phases begin so we can get stuck into analysing some results.

TONI CANTARELLA

PhD Student



I completed my undergraduate degree at Murdoch University while working part-time for a manufacturing jeweller in Perth City, raising four children, keeping house, maintaining a 600m^2 exotic garden, and sitting on a collection of committees. In my spare time (which equalled about 1.5 hours a week) I belonged to the public speaking group Toastmasters. I was able to achieve all this with the support and cooperation of my very lovely husband!

In mid-2004 I received an advert via email for my current project, *Producer perspectives on the management of cattle health and disease*. I applied and was accepted, along with Sarah Palmer. This project represents a shift for me from Cultural Studies to Sociology, but so far I seem to be coping – at least my supervisors have not (yet) intimated otherwise!!

It is quite a shift in mind-set moving from Humanities to Health Sciences, and I am coping with the challenge on a week-by-week basis. Each piece of research builds upon the knowledge base created from what I learnt the previous week.

Sarah and I are in the process of preparing our questionnaire, which will represent a significant part of the data we plan to collect. We have a deadline to meet, and so the next three months are going to be both hectic and productive (fingers crossed).

BIOAEROSOLS AND DROPLET INFECTION IN PUBLIC HEALTH WORKSHOP

March 2006

This workshop will bring together national and international experts in the science of bioaerosols and their controls. The scope of the workshop will be the basic physics, microbiology and physiology of aerosols and droplet infection, the epidemiology of airborne infection, measurement and modelling of aerosol transport, and new control technologies and their applications. This workshop will be of relevance to hospital and public health physicians, hospital and building engineers, microbiologists and environmental health officers.

In the 1930s, the physics of aerosol generation and survival was applied to the bioaerosols generated by people infected with viral or bacterial illnesses. Breathing, coughing and sneezing all generate aerosols. Larger droplets fall to the ground but evaporation from droplets in a critical size range remain suspended in the air. These infective suspended particles were shown to be responsible for many of the observed characteristics of viral and bacterial infection.

An understanding of the mechanics and microbiology of droplet infection is essential if proper control strategies are to be put in place. The original research heralded the use of the first generation of control strategies for droplet infection in the built environment, including increased ventilation of buildings, air cleaning and sterilisation of air.

Emerging infectious diseases such as Legionnaires disease and, more recently, severe acute respiratory syndrome (SARS), the prospect of terrorist attacks by biological weapons and the recurring threat of pandemic influenza have brought a new focus to the science and control of bioaerosols. In addition, the control of infections in health care settings, in airline cabins and in schools are increasingly issues of public health concern.

For more information contact:
Dr Stephen Corbett
Acting Director
Centre for Population Health
Sydney West Area Health Service
E: Stephen_Corbett@wsahs.nsw.gov.au
P: (02) 9840-3603

This international workshop on bioaerosols and their controls is being conducted jointly by The University of Sydney and the National Centre for Epidemiology and Population Health Atmosphere as part of a Commonwealth-funded PHERP project on the Atmospheric Environment and Health.

DISTANCE EDUCATION COURSE ON THE OIE (WORLD ORGANISATION FOR ANIMAL HEALTH)

Course begins 9 January 2006

In February 2005, the OIE, in collaboration with the Michigan State University, launched its first distance learning course aimed at increasing overall knowledge and awareness of OIE activities, in particular amongst members of the veterinary profession (including those in private practice and veterinary students). The course covers all issues relevant to the role of the veterinarian in protecting animal and public health in international trade. It also indicates how the world community is being kept informed about issues of animal diseases and zoonoses. Members of the veterinary profession, veterinary students, as well as scientists and stakeholders in international trade, will benefit from this course.

The course includes topics on:

- OIE History/Objectives/Operations
- The OIE and International Trade Development/ Adoption of Standards Content/Implementation of Standards
- FMD: A Model for Risk-Based Trade Decisions
- OIE's Animal Health Information System
- An Introduction to Risk Analysis
- OIE in Animal Production Food Safety
- The OIE and Animal Welfare
- The OIE and Aquatic Animal Health
- OIE/The World Bank/Capacity Building
- Future Challenges and Opportunities

Specific information as to how to participate may be found at www.vu.msu.edu/preview/anr-ifl/2002/oie.html or can be obtained by sending an email to verlege3@msu.edu

PHD PROJECT: RESERVOIR TRANSMISSION DYNAMICS OF EMERGING PATHOGENIC LEPTOSPIRA SPECIES IN NORTHERN AUSTRALIA: IMPLICATIONS FOR PUBLIC HEALTH MANAGEMENT

Deadline for applications: 7 December 2005

Leptospirosis is recognised by the World Health Organization (WHO), the United Nation's Food and Agriculture Organisation (FAO) and World Organisation for Animal Health (OIE) as an important re-emerging zoonotic disease in the Australasian region.

Queensland Health has been investigating increased incidence of infection in northern Queensland in recent years, and related research has found evidence of a previously thought exotic serovar in rodents and flying foxes. Flying foxes may play a previously unrecognised role in the ecology of leptospira in nature, and may facilitate the introduction of exotic pathogenic strains to Australia.

This project aims to elaborate the ecology of pathogenic leptospira species in nature, and determine the role of flying foxes and the transmission dynamics of pathogenic leptospiral serovars in a community reservoir involving flying foxes and rodents.
For more information about the project see www1.abcrc.org.au/pages/Education.aspx?MenuID=20 or contact Dr Luke Leung:
P +61 7 5460-1264
E luke.leung@uq.edu.au

For information about applying for a PhD Scholarship with the AB-CRC see www1.abcrc.org.au/pages/Education.aspx?MenuID=20

CONFERENCES

A conference database is available at www.abcrc.org.au > News & Events

Epidemiology and Vaccines – Society for Applied Microbiology Winter Meeting
5 January 2006
London, United Kingdom
For more information visit www.sfam.org.uk/janmeet.html

Applications of Reverse Genetics of Viruses
3 February 2006
London, United Kingdom
For more information visit www.regonline.co.uk/eventinfo.asp?EventId=25083

Science Meets Parliament
28 February – 1 March 2006
Parliament House, Canberra
More information will be provided when it becomes available

Advances in Influenza Research: From Birds to Bench to Bedside
28 March – 2 April 2006
Steamboat Springs, Colorado, USA
For more information visit www.keystonesymposia.org/Meetings/ViewMeetings.cfm?MeetingID=802

Avian Disease, Diagnosis and Treatment
9 June 2006
London, United Kingdom
For more information visit www.regonline.co.uk/eventinfo.asp?EventId=25478

12th International Congress on Infectious Diseases
15-18 June 2006
Lisbon, Portugal
For more information visit www.isid.org/