

"The Accidental Pathologist"

*Christchurch AWIS focused their February meeting on women who had started off in research in science but were now doing something different. **Karen Bailey** shares her journey to a career in veterinary pathology.*

I didn't set out in my career with an ambition to become a veterinary pathologist, it was a twisted path that led me to where I am now. I've tended to be more of an opportunistic person than one who has a grand plan! After training as a vet at Massey University and getting my Bachelor of Veterinary Science degree with distinction, I was asked by some of the lecturers if I would like to consider doing a PhD. I quite liked the idea, but didn't fancy being poor for much longer, having got through that fairly long course on a measly student allowance and holiday earnings (this was in the days before student loans). Although I managed to win a 3 year fellowship, it wasn't really enough to live on comfortably, so I decided to delay my study while I built up a bit of a cash reserve, and I figured the fastest way to do that as a new veterinary graduate at that time was to work in the meat industry in a slaughtering plant, so I joined MAF as a meat veterinarian.

My initial training was at the ancient Kaiti works beside the port at Gisborne where the underground freezers

resembled Aladdin's cave with a century's worth of ice build up and slippery wooden steps that OSH would have a fit at today. The culture was pretty last century too, what with the noise of the equipment and the vocal reaction of the exclusively male workforce when a woman stepped onto the slaughterfloor, it wasn't very female friendly, though in my youthful feminist mode I relished that as a challenge! There were no women's toilets, so I had to call out to make sure there were no occupants, and then sneak in, and I became adept at quick costume changes in my office which had no lock on the door!

After my training I spent some time at the equally ancient Waingawa works near Masterton, but my permanent posting was to the relatively new and civilised plant at Oringi near Dannevirke which was one of the first in the country to have a significant female component to its workforce and was a much more comfortable environment for a 21 year old graduate, though living in a small rural town had its challenges.

Anyway, with the bank balance eventually looking pretty healthy I headed back to Massey to do my PhD, determined that it would take no longer than 3 years, as I would be running out of money by then - and, well, I almost made it! I loved doing my PhD which was on the immunology of a genital bacterial infection which causes infertility in rams. My project was to try to figure out the most effective and least damaging method of immunisation. It was difficult to get a good immune response as the bacteria, a type of *Brucella*, lives quite happily within the host cells, hidden away from the usual protective mechanisms of the host's immune systems, but the vaccine adjuvants which helped to produce a protective immune response also caused unpleasant and long lasting blemishes on the sheep. A very practical problem which I enjoyed working on. I spent lots of time palpating rams scrotums, collecting blood samples for immunological testing, and obtaining large numbers of semen samples by electroejaculation. I did all my own bacteriology and learnt a lot of pathology so that I was able to do that side of things too, and I also did some part time tutoring of final year veterinary students.



Karen and her family paddling on the Avon

After gaining my PhD, I wasn't sure that the academic world was for me, and decided it was time to use my veterinary training for its original purpose and so I joined a relatively new and progressive small animal practice in central Auckland. I found the contact with the animals and their owners extremely rewarding but the long hours, being on call, and the emotional drain (for example lying awake at night trying to figure out how to keep alive the cat with terminal cancer who was the only companion of an elderly owner who had lost both her husband and son to similar diseases in the last few years) were quite exhausting, I couldn't seem to find the knack of "switching off". After a while I started to look for something else back in the academic/research side of things.

I was offered a postdoctoral position with the Natural Environment Research Council in a multinational team based in Oxford, (with another lab in the US) studying the viral disease bluetongue, a major problem in ruminants in many parts of the world. However it didn't take me long to figure out that being expected to work 6-7 days a week for 12-14 hours a day on a pittance for the next few years was not my idea of a good time. I think the prestige factor of working in Oxford was supposed to make up for all the other drawbacks, but it didn't work for me.

So I found temporary work, enjoyed the whole OE thing, travelling etc, and then returned to NZ to find a "real" job doing something I would enjoy. After looking without success for a couple of months, I was eventually offered 3 jobs in one week, one in a pharmaceutical company, one in a large laboratory specialising in high volume testing and one in a small government owned regional diagnostic laboratory providing a wide range of services to veterinarians in practice. The last one seemed like the best fit for me because I enjoy the buzz of helping people and the intellectual challenge of working out the puzzle of what might be going on in sick or poorly producing animals.

So that's how I came to Christchurch and started my career in diagnostic pathology, and although my employers have changed over the years and the work has evolved continuously with new developments in knowledge and technology, the core of the job, helping vets in practice solve their difficult cases, has been something I have loved doing.

When working for the government, my job also involved a lot of state veterinary medicine like disease control and emergency responses to suspected introductions of exotic diseases such as Foot and Mouth Disease. One of my roles a few years ago was regional Exotic Disease Response Manager, and when the Rabbit Calici Virus (RCD or rabbit haemorrhagic disease) was deliberately introduced to NZ and I was pregnant with my first child, I had the frustrating job of trying to track and contain the disease. It was the total opposite of what we were trained for, which was a disease like Foot and Mouth, where everyone, or, at least, most members of the rural community, would be expected to be trying to be helpful and cooperative. In this situation, however, we had non cooperation, frank obstruction and outright hostility as the farmers were covertly spreading

the disease as fast as they could, and I had to insist on investigating veterinary staff having police escorts on some of their visits to suspect properties. We were on a hiding to nothing, and within a couple of days it was obvious there was no way we were going to contain this thing, but we still had to go through the process, sending helicopters to remote sites, setting up road blocks, etc. etc. until the response was officially called off. It was one of the most frustrating experiences I have ever had!

Anyway, my job has involved doing post mortem examinations on species from fish and finches to cheetahs and giraffes and everything in between. Microscopically examining brains for mad cow disease, lungs for tuberculosis, eyes for retinal degeneration and looking for tumours of every organ you can think of. I spend a lot of my time looking at stained smears of cells harvested by fine needle aspiration, a favoured technique for the investigation of abnormal lumps, bumps or fluid accumulations because it is minimally invasive, well tolerated by the animal and can often be done without anaesthetic (so it is also relatively inexpensive).

A large part of my job also involves interpreting numbers – concentrations of hormones, chemicals and enzymes in blood and other body fluids, numbers and types of blood cells, etc and putting the combinations of findings together with the clinical signs to come up with the most likely explanations or possible diagnoses, or suggestions of what to do next.

Over the years I have had roles as leader of the veterinary team, and as laboratory manager, and a few years ago, a small group of people at the lab left to start our own private laboratory, using our own individual savings as capital.

It was a huge risk. Equipment was expensive, and we had little idea how many (or if any) of our clients would switch to our services. We leased an empty teaching lab on the 7th floor of Lincoln University's Burns building, and off we went. I had just had my first child, so after some time off, began working there part time. We grew fast and moved to a surplus building at the biological husbandry unit at the far end of the campus. Before 5 years were out and by this time I had 2 children, we had had a takeover offer from an Australian based human pathology business with labs scattered over Australia and in several countries in Asia. Most of the shareholders thought the offer was too good to turn down, and so we stopped being self employed and became mere employees again.

That company has since been eaten up by another, and two weeks ago we moved into a new laboratory in the central city, but the basic work goes on. I still enjoy it and find with sympathetic employers I have been able to negotiate an employment agreement which involves working part time so I can pick the children up from school most days, and working from home with a microscope and computer (the wonders of the internet) during the school holidays – and it's great, I still love it!

Women in Science Enquiry Network Inc.

Last year Lisa Berndt and Fiona Carswell put together an article about AWIS activities for our Australian equivalents WISENet. **Diane Webster and Anna Robinson** kindly supplied this information about WISENet's activities.

WISENet was established to increase women's participation in the sciences and to link people in different branches of science, and those working towards a more participatory and socially useful science.

Margarita Bowen of Canberra and Irene Irvine of Melbourne proposed the formation of WISENet in 1984 following a successful Women's Studies Section at the ANZAAS Congress in Canberra. The organisation grew as a national linking network and was incorporated in 1987. The foundation link team was in Canberra. Representative link groups then formed in other cities: Sydney, Melbourne, Adelaide, Brisbane, Perth and Hobart. The Sydney group took over responsibility for the administration of the network and production of the journal in 1991. The national executive passed back to Canberra in 2002 and will move to Melbourne in 2006.

In addition to capital city branches, there is a group in Wollongong on the NSW south coast and we are currently investigating the formation of a group in our more isolated north Queensland. Link group branches act autonomously and arrange activities focused on local issues, meetings with guest speakers and get-togethers when new people can meet or re-meet. There have been special interest events such as WISENet's special traveling exhibition on the history of women in science and Women Achieving In Science (WAIS) conferences.

In a national capacity, WISENet lobbies government and other authorities on issues significant to women in science. In 1996 WISENet became the first Affiliate Member of FASTS, the Federation of Australian Scientific and Technological Societies, thus increasing our lobbying power. Aspects of women in science have been publicised at conferences and science shows, at which WISENet has displayed posters and arranged talks.

The WISENet Journal is produced by regular rotation between link groups which provides a panoramic representation of stories about women in science throughout the country. A special issue of the Journal to promote careers in science was produced and circulated to every Australian secondary school in 1998, assisted by a grant from the federal Science and Technology Awareness Unit. Back issues of the Journal can be downloaded from the WISENet homepage or purchased from the National Convenor.

The WISENet web site (<http://www.wisenet-australia.org/>) has become a core feature of the group and is regularly updated with profiles, journal editions, notices, and

interesting internet links. WISENet also runs an email list-server that encourages trans-national 'discussion'.

WISENet Objectives

- To build a supportive and active network of people interested in the objectives of WISENet and to liaise with other interested groups;
- To increase women's participation at all levels in the sciences where they are now under-represented;
- To provide comment and to examine the education, training and employment structures which currently restrict women's opportunities in the sciences;
- To gather and disseminate data on women in science - the sciences here including the physical, social and life sciences, mathematics, computing, medicine, engineering and associated technologies;
- To explore linkages between the different disciplines and promote communication between scientists and the community on science related social and environmental issues;
- To promote research and technologies for the benefit of communities;
- To explore programs for change in the sciences and support more democratic and participatory systems as an alternative to the traditional models;
- To support appropriate action to achieve these objectives.

For more information about WISENet please visit our website <<http://www.wisenet-australia.org/>>. Much of the text for this article has been taken from the WISENet website which has had many authors over the years. We would like to acknowledge their contribution to this article and to WISENet.

European Database of Women Scientists

The Central European Centre for Women and Youth in Science (<http://www.cec-wys.org>), funded by the European Commission, whose objective is to empower women and young scientists in Central Europe and to contribute to achieving gender equality in R&D, have set up a database of 800 women scientists from Czech Republic, Slovakia, Hungary and Slovenia working in all areas of hard and soft sciences. The database is a tool with which the Centre aims to increase women scientists' visibility and participation in national, European and international research by regional and international networking, and to increase their invitation to advisory boards and scientific committees, for which the database is a rich resource. The database may be of interest and use to scientists searching for collaborators abroad.

To visit the database go to <http://www.cec-wys.org/html/index.php?s1=1&s2=7&s3=2&lng=13&PHPSESSID=6b3b62ad01b9055b6545ed46bcdbbaf>

There are no such things as set backs, just new opportunities

*The Royal Society of New Zealand regularly highlights the achievements of students on their RSNZ Young Achievers' database. With their permission, we have reprinted the story of **Roseanne Coulter***

Roseanne Coulter's science career really started when she won the NIWA award at the Genesis Energy National Science and Technology fair in 2000. The project she submitted in the fair was a Gold CREST project on the Geology of the Saddle Road area (in the Tararua ranges). Roseanne finished high school after 6th form, and went to Elam School of Fine Arts in Auckland. She won a scholarship to study in America for her second year of study, the Rebecca Lynch Memorial Scholarship to study at the University of Idaho in Moscow Idaho.



Halfway through her year in America, Elam said that they would not be able to credit the papers she was taking at the University of Idaho. This was a big disappointment. However she discovered Auckland University School of Science would credit a certain amount of fine arts subjects from anywhere.... so she was faced with the decision of arriving back in New Zealand with either three years to go for a BFA, or one year and summer school for a BSc. Roseanne chose the BSc majoring in geology, and graduated in 2004. About 2 months after graduating from her BSc, she graduated from a Post Graduate Diploma of Science in Geology with Distinction from the University of Otago. During her last year at Auckland, she had applied to do a research project in Antarctica through

the University of Otago. Two days after applying, she got a phone call asking her if she had a good camera! She was very excited, and had to arrange for one of her final exams to be taken in a hotel in Christchurch while waiting to board the plane to Scott base.

The two months in Antarctica were magic, very hard work, but so rewarding. The first month she stayed at a four man camp on White Island, about 60 km south of Scott Base. They were in polar tents, using olympus cookers - just like the ones Captain Scott used. Each day (weather permitting) they would venture out to the edges of the island mapping and collecting samples, with the majestic back drop of the Trans Antarctic mountains. The project was part of the ANDRIL scheme which involves drilling into the sea sediments below the Ross Ice shelf in order to understand climate change in Antarctica, of which we know very little about.

Knowing that she wanted to get into Engineering Geology, Roseanne did a Post Graduate Diploma (being one year in length, it was the shortest option). At Otago University a Post Graduate Diploma involves doing a 20,000 word dissertation. The rocks she studied from Antarctica were basaltic, very similar to that found in the Dunedin Volcano, and on Banks peninsula. Along with mapping and geochemistry she also looked at the paleomagnetism of some samples. This was very interesting, as no one had ever look at fully orientated samples from Antarctica before and no-one knew what the effect would be of the south magnetic pole being north of where she collected her samples from.

After graduating from Otago, she started a part time MSc at the University of Canterbury (2005). Roseanne decided to study part time and work as an Engineering Geologist. She believes that experience in what you are studying is vital to your understanding, especially at something like engineering.

Roseanne has until mid 2008 to finish her MSc, but hopes to finish in mid 2007. She is studying the paleoseismicity of a segment of the Hope fault. She recently finished three weeks field work, and is really enjoying her project. Late last year she was awarded a MSc Scholarship from the University of Canterbury.

Realise the Dream

Realise the Dream is a 5 day national celebratory and educational forum for high achievers in research and technological practice in New Zealand schools. The event is organised by the Royal Society and the principal sponsor of this event is Genesis Energy.

This event aims to build a strong culture for sciences, mathematics, social sciences and technology (sciences and technology) in New Zealand by

- building on the foundation provided by our young,
- providing an incentive for achievement,
- encouraging and acknowledging young people in their development of creativity and lateral thinking in sciences and technology and entrepreneurialism, and
- supporting parents and educators to inspire our future wealth creators.

Using young achievers and their achievements to promote science and technology to other young people and the community is one of the most powerful ways encouraging them and others with potential.

- enable the recognition and celebration of excellence and achievement in the sciences and technology education community,
- provide further learning for our young achievers in sciences and technology,
- promote outstanding students for New Zealand and international honours,
- give scientists and technologists opportunities to inform and enthuse about their work,
- support scientists and technologists to present their work as champions/role models to a the youth sector and their parents,
- develop and build links with, and networks for, excellent undergraduate and postgraduate students,
- use our young achievers in leading and inspiring others, and
- develop links between international young achievers which will continue into their working careers.

This will be achieved through a program which includes:

- Presentation by students of their work
- Evaluation of student work to recognise and promote excellence
- A formal celebration dinner with high profile leaders of New Zealand,
- Presentation of current NZ research and technological practice by our leading scientists, mathematicians and technologists

- Workshops for students in innovation, entrepreneurship and the development of an idea to commercial reality.

The major sponsor of Realise the Dream is Genesis Energy Ltd.



Other sponsors include:

Victoria University of Wellington
Ministry of Research Science and Technology
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Statistics New Zealand
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Industrial Research Ltd
Intellectual Property Office NZ
AgResearch
Ministry of Education

and the following support in principle:

NZ Association of Science Educators
NZ Association of Mathematics Teachers
Technology Education NZ
Board of Geography Teachers
Social Studies Teachers' Association
Electrotechnology Industry Training Organisation

Awards structure

Each of those students invited to attend has previously been recognized for their achievements at a national or regional level in activities such as regional science and technology fairs, CREST, Geography Decision Making competition, ETITO Bright Sparks, Young Enterprise Scheme, The Royal Society selection panel selects participants from those nominated from such activities.

All participants receive recognition of their acceptance at this national level. As it will be difficult to compare the work of each participant against others because of the differing formats and original requirements, the awards are of the nature of Young Researcher, Young Technologist, Most Commercial Idea etc. The awards are either cash scholarships for tertiary study, cash grants and assistance in commercializing the results of their work, or entry to international events.

Realise the Dream 2006 will be held from Sunday 10th December to Friday 15th December.

2005 Realise the Dream participants

The following describes some of the research undertaken by school students as part of the Realise the Dream 2005.

'What are your cows really drinking?'

Louise Davison, Morrinsville College, East Waikato

Louise has lived on a farm all of her life and she has always been interested in cows and their welfare and milk production. Louise helps out on a small dairy farm and her manager is always trying to perfect his water quality to get optimum milk production. The water was always of excellent quality in the tank but by the time it reached the cows it was less than desirable. Her investigation has taken weeks of travelling to the farm every day from school to sample and test the water.



'Filter feeding Bivalves in Wellington Harbour: Are metals on the menu?'

Hana Christenson, Wellington Girls' College, Wellington
Kiwana's New Zealand South Pacific Travel Award

Hana investigates the accumulation of heavy metals by the filter feeding mussel *Perna canaliculus* in Wellington Harbour. There are many sources of metals around Wellington harbour, and the metal concentrations in the harbour sediments are very high at some sites. Hana wanted to find out if these metals could pose a threat to wildlife in the harbour. As mussels are a renowned bio-indicator of toxin, they were ideal for her investigation.



'Re Generation'

Ellen Jones, Rosie Keane, Victoria McLennon, Palmerston North Girls High School
Ministry of Education Award

This work has stemmed from a Gold CREST (Creativity in Science and Technology) project which has been to produce a professional documentary in which (as a sub aim) they tried to find ways to improve their town for its youth (ages 10 – 17). They chose this topic as they knew many youth were dissatisfied with the leisure options available.



'Bay of Plenty Floods 2004'

Nicole McIlroy-Brown, Whakatane Intermediate School, Eastern Bay of Plenty

Nicole felt shocked as she watched news reports of her community being evacuated, her area underwater and houses demolished. Nicole and her family were also evacuated which gave her incentive to research into the floods because there were so many questions that needed answering. Through Nicole's research she has come to the conclusion that there were some main causes for the flooding and she hopes that the research work she has carried out will give the community hope that they will be better prepared if it ever happens again.



'Lipfizz'

Zoe Brooks, Orewa College, North Harbour
Dreamers choice award

Lip gloss is very popular with teenage girls and Zoe wanted to make a lip gloss that was different. To develop the product she selected ingredients to make the fizz and then chose ingredients that interfered less with the fizz reaction. There were many issues that she had to resolve, among these, the unpleasant taste. Through careful balance of ingredients and the introduction of sweeteners and flavours, she has designed a product that is pleasant tasting and feels smooth on the lips.



'Gause's niche exclusion principle in bivalves'

Nathalie Saurat, Katikati Collge, Bay of Plenty
AgReserach Biofuture Travel Award

Nathalie's research aimed to test the application of Gause's niche exclusion principle with regard to the cockle and the wedge shell (*Austrovenus stichburyi* and *Macomona liliana*). The carrying out of Nathalie's investigation was a very time consuming process and



involved collecting from 20 quadrats at 5m intervals along a transect line perpendicular to the shore. At each quadrat the substrate was removed in 2cm sized strata and placed in zip-lock bags, which she then took to analyse. Her investigation concluded that both the cockle and the wedge shell exhibited Gause's niche exclusion principle through differences in burrowing depth and substrate preference.

'Mimosa movements'

Josephine Mak, Diocesan School for Girls, Auckland
AgResearch Award

Josephine became interested in this investigation after *Mimosa pudica* caught her attention. When she saw its leaves open and close each day. Josephine wanted to investigate why, and hypothesised that light might be a factor. After testing this she has come to the conclusion that the plant has its own biological clock.



'Moos the Boss?'

Victoria Smith, Awatapu College, Palmerston North

Victoria has investigated the dominance hierarchy of dairy cows. Her investigation identified, which age and breed of cow was the most dominant and whether it made a difference if the cow was an old cow from her father's herd or was a new cow in the herd. During her research she found information stating "cows rose in rank up to nine years old as their weight increased; therefore, dominance declined as weight was gradually lost". Her investigation involved testing the authenticity of this statement.



'The wiggles'

Anna Palmer, Carncot School, Palmerston North
Genesis Energy Excellence in Research Award

After hearing about a study based in the USA to see if introduced earthworms were taking over native earthworms Anna decided that a similar New Zealand study would be interesting. She



found a suitable location with the help of identifying earthworm species and she was given permission by AgResearch to work at Ballantrae, Woodville. Anna selected six different pasture types including native bush; transition zone; low fertility; high fertility; low fertility dump; pine forest with interesting results.

Disclaimer

The views and opinions expressed in this newsletter are not necessarily those of the Publisher or AWIS. Whilst the Publisher has taken care to ensure accuracy of material contained in the newsletter, no responsibility for errors or omissions will be accepted.

'Science! It's all around!'

Alysha Johnson, Natalie Lansdaal, Morrinsville College, East Waikato

Natalie really enjoys science and Alysha enjoys working with computers. They wanted to invent something that used both of their skills. Natalie and Alysha came up with the idea of creating an educational interactive computer science game that teaches primary school students the basics of science in an exciting way. They have created a computer game which they believe will provide positive learning of science facts.



'Number Chase'

Alison Blanchard, Rangī Ruru Girls School, Christchurch
Industrial Research Ltd Most Commercial Idea Award

Alison's aim was to design and construct a toy that would promote hand-eye coordination for pre-school children. To challenge herself a bit more, she decided to make the toy for a child with cerebral palsy. A magnet attached to a wooden paddle activates a series of reed switches which operate various circuits from a toy phone. Different sounds are emitted depending on where the paddle is.



'Blowing in the wind'

Emily Adlam, Diocesan School for Girls, Auckland

Emily is interested in alternative energy as she thinks it is very important to New Zealand. She compared the efficiency of various different kinds of rotor and investigated the efficiency of these rotors in different wind speeds. Finally, for each rotor she had to determine the load resistance for optimum performance using physics.



Successful Marsden Researchers

We continue to profile some of the women who have been recently successful in gaining Marsden funding.

Nicole Philips

Victoria University of Wellington

The unforeseen consequences of larval history for marine community structure and dynamics (140K Fast Start)



My area of research is marine ecology, and I usually work on marine invertebrates that live on rocky reefs, such as mussels, barnacles, paua, kina, etc. In marine ecosystems, many coastal species have a complex life cycle, with a free-living larval stage that drifts in the ocean for days to weeks or even months. These larval stages differ greatly in their body plans and life strategies

from the adults into which they will eventually metamorphose. Much of my work has focused primarily on questions about the ecology of reproduction and larval stages of different marine species, and a core objective of this work is to understand important connections across very different life stages (e.g., larvae and adults). I am particularly interested in how stresses that affect larvae (for example low food availability) may continue to have lingering effects much later in life, after those larvae have metamorphosed into juveniles or grown into adults. I have recently received a Marsden Fast-Start award to pursue these questions at the community level. That is, to examine how variability in larval stages of co-occurring species influences the outcome of interactions of those species to shape the community.

I have always been passionate about marine animals, admired their amazing diversity, and been deeply curious about their form, function, and relationships with each other. When I was nine years old my teacher asked the class what each wanted to be when we grew up, and I said "marine biologist". I never changed my mind! Four years ago, while I was writing up my doctorate (from the University of California at Santa Barbara), my family and I moved to New Zealand. My partner (who is also a marine biologist) had been offered a lectureship at Victoria University of Wellington and we were thrilled to start a new life in New Zealand. After finishing my PhD, I was a postdoctoral researcher at Victoria for two years, funded from a US National Science Foundation fellowship. I have recently attained a permanent academic position as a lecturer at Victoria University myself, which is exciting. It is also a relief, as it can be difficult for two scientists in the same field to find jobs in the same city! We, and our two young children, have become very happy and comfortable in Wellington, and look forward to calling it home for a long time to come.

Fabiana Kubke

University of Auckland

How does the songbird know who is singing? The role of auditory filtering in the brainstem. (710K)



As a biologist, I have always been curious as to how differences in the way that brains are organised in different animals determines the way in which they perceive their world and the way in which they behave. This interest led me to seek admission to the Biology Department at the University of Buenos Aires, Argentina.

I was admitted to University, while the country was still under military dictatorship. (I still remember being searched for political pamphlets as I went into the building with my other “politically conscious” friends.) In the following years, and after the first democratic elections, there was a strong student movement driving the reorganisation of the University System. The shift from a dictatorial to a democratic government made us really think about the role of the University and of University graduates in society. I guess the career choices I have made since then, which may seem very unusual and against the grain, have been strongly influenced by this experience.

Although none of the women in my family had gone to University, neither had the men! Indeed, I grew up in a family with very strong women who valued education and I was raised to follow my dreams. I had my primary and secondary school education in an all-girls school, so I had never competed with boys. At the University, more than half of my teachers and fellow students were women, so gender was never an issue to me or my friends. I therefore never questioned being a professional and a woman, there were heaps of role models around me.

Towards the end of my undergraduate studies, I was offered a fellowship to do my PhD in embryology at the University of Connecticut (funding for a PhD abroad was unheard of among my friends at the time). I quickly became keen on understanding brain function from a behavioural point of view, and completely shifted fields to join a lab at the University of Maryland, where I spent 7 years studying how barn owls use their hearing to hunt. It was there that I met Dr. Martin Wild, who offered me the opportunity to move to New Zealand. I had visited the South Island as a tourist 10 years before, and I did not think twice about spending every penny I had on moving to Auckland, a decision I do not regret. The University of Auckland and especially the Department of Anatomy with Radiology (a strange place to study birds, I know) have offered me a wonderful and supportive work environment.

Dr Wild and I continue the collaboration we started in the USA, and, together with Dr Mark Hauber from the School of Biological Sciences, we now plan to study how birds learn to recognise each other. Birds learn their song from their parents, very much like we learn to speak by listening to ours. This project provides me with the unique opportunity to continue to develop my career in New Zealand, and I look forward to sharing the next three years with these two wonderful colleagues and friends.

Ayako Mabuchi

University of Otago

Endotoxin-stimulated liver regeneration: a new role for hepatic stellate cells? (755K)



On September 8, 2005, the best morning of my life arrived. “Congratulations. Well-done.” I heard the words on the phone, loud and clear. Professor Tony Wheatley, PhD students Yatin and Beth, who were listening to me answering the phone, ran up to me and we shared the great happiness. Soon, this news of my Marsden Grant success was told to friends in Dunedin, Auckland and Japan; coworkers; and of course my family, my best supporters. In the excitement, a lot of past events in my life passed through my mind. I am sure all of these events led up to this great day.

In December, 1998, a letter was delivered to me. I was 53 at that time. It was from Professor Tony Wheatley of Physiology, Otago University in New Zealand and told me that I was invited to come to Dunedin and to research and study there. Professor Tony Wheatley also reassured me that he believed in my ability. Two years previously, I had spent days struggling with serious illness and many troubles had followed it.

In 1999 when I first came to New Zealand. Life again had a purpose and direction! My life completely changed. All my previous research, liver immunology mainly, that I had carried out with Professor Kozo Yokomuro, at Nippon Medical School in Tokyo, Japan, had prepared me well for my new research direction namely liver immune physiology with Professor Tony Wheatley at Otago. It just goes to show, you are never too old to learn or to change the direction of one’s research.

From 1999 to 2003, I spent time in New Zealand and Japan but finally I decided to settle in Dunedin, whatever happened. I took New Zealand permanent residency and bought a house, my home. Despite problems with funding, I always believed our research was novel and important, but was it fundable?? On December 2005, the phone call about my Marsden grant answered that question! The 3 year project has begun and our initial results look most encouraging.

So if you are currently having problems with your research career, I have some advice; believe in yourself and your abilities and it is never too late to change. Trust me, I know!

Men, Women, and Ghosts in Science

The following essay written by Peter A. Lawrence appeared in *PLoS biology* in January. Penny Cooke contacted the author about the paper, and his response regarding how difficult it was to get this essay published was very interesting.

Peter Lawrence writes “the article has created quite a stir. I have had about 120 letters so far. There are over 300 web pages discussing my article which has been downloaded 30,000 times so far and discussed in many newspapers and on radio stations. Most of the letters I received are from women and nearly all are very positive. I guess people who disagree may not write to me, so I may not have a balanced impression of opinions.”

Peter Lawrence first started to plan this essay in 2003 and began writing it in early 2004. He was discouraged by his friends and colleagues who told him that it was too dangerous to publish on this subject. After much pondering Lawrence wondered “how can such an important subject could be banned from public discourse just because people have concerns and sensitivities? It is silly.” He then wrote a version in December 2004 which was submitted to *Nature* where he had published some other essays on modern science.

<http://www.mrc-lmb.cam.ac.uk/PAL/pdf/415835.pdf>

<http://www.mrc-lmb.cam.ac.uk/PAL/pdf/politics.pdf>

<http://www.mrc-lmb.cam.ac.uk/PAL/pdf/natureGR142.pdf>

While *Nature* considered the paper, Larry Summers made his remarks and unleashed a furore, and this probably contributed to *Nature* eventually (ca 2 months) deciding not to publish the article. Lawrence believes it was read by many of the editors in *Nature*, and much discussed, but they thought it was OK for them to read and discuss it but not safe for the public. His impression was that it went down well with the almost entirely female junior editors, but he speculates that it did not get past the senior editor. The article was then sent to *Science*, and over 6 months it was accepted in principle, cut, and then reaccepted. Lawrence dealt with a female senior editor over a long period, and got a publication date, proofs and even a letter from the separate publication office about reprints permissions etc, but at the very last it was pulled by the chief editor. There was no

further communication from the original editor. Lawrence’s interpretation is that after the women accepted it, the top man got cold feet, but there is no way of knowing the truth. Lawrence says “Authors have no rights nowadays we submit, we wait, we are told bits of the truth, a decision is made upon which maybe our careers depend, and that’s it.” Finally the article has been published online and is included here in full.

At the current pace, European women are not expected to reach parity with men in academic science positions until 2050. —Gerlind Wallon [1]

The paper is available online at http://biology.plosjournals.org/archive/1545-7885/4/1/pdf/10.1371_journal.pbio.0040019-L.pdf

Some have a dream that, one fine day, there will be equal numbers of men and women in all jobs, including those in scientific research. But I think this dream is Utopian; it assumes that if all doors were opened and all discrimination ended, the different sexes would be professionally indistinguishable. The dream is sustained by a cult of political correctness that ignores the facts of life—and thrives only because the human mind likes to bury experience as it builds beliefs. Here I will argue, as others have many times before, that men and women are born different. Yet even we scientists deny this, allowing us to identify the “best” candidates for jobs and promotions by subjecting men and women to the same tests. But since these tests favour predominantly male characteristics, such as self-confidence and aggression, we choose more men and we discourage women. Science would be better served if we gave more opportunity and power to the gentle, the reflective, and the creative individuals of both sexes. And if we did, more women would be selected, more would choose to stay in science, and more would get to the top.

It is not easy to write or talk about this subject. If you say, for example, that women are *on average* more understanding of others, this can be interpreted as misogyny in disguise. If you state that boys *on average* are much more likely than girls to become computer nerds, people may react as if you plan to ban all women from the trading rooms of merchant banks. The Cambridge University psychologist Simon Baron-Cohen published research on the “male brain” in a specialist journal in 1997, but did not dare to talk about his ideas in public for several years [2]. One reason for this absurd taboo is that we cannot think objectively because our minds are full of wayward beliefs and delusions—“ghosts” (Box 1). And one of these ghosts is the dogma that all groups of people, such as men and women, are *on average* the same, and any genetic distinctions must not be countenanced. Such ghosts bias our perceptions and censor our thoughts.

Baron-Cohen makes one point crystal clear: you cannot deduce the psychological characteristics of any person by knowing their sex. Arguing from the scientific literature that men and women typically have different types of brains, he nevertheless points out that “some women have the male brain, and some men have the female brain” [2]. Stereotyping is unscientific—“individuals are just that: individuals” [2]. Yet Baron-Cohen presents evidence that males *on average* are biologically predisposed to systemise, to analyse, and to be more forgetful of others, while females *on average* are innately designed to empathise, to communicate, and to care for others. Males

tend to think narrowly and obsess, while females think broadly, taking into account balancing arguments. Classifying individuals in general terms, he concludes that among men, about 60% have a male brain, 20% have a balanced brain, and 20% have a female brain. Women show the inverse figures, with some 60% having a female brain. Many facts (see [2] for references) argue that these differences have their roots in biology and genetics. Here are some examples. First, it is hardly necessary to point out that distinguishing between the contributions of nature and nurture to animal or human behaviour has proved difficult. However, newborn infants (less than 24 hours old) have been shown a real human face and a mobile of the same size and similar colour. *On average*, boys looked longer at the mobile and girls looked longer at the face [5]. Second, such differences at birth must have developed earlier. One factor is the level of testosterone in the developing brain around three months of gestation, which is higher in males (due to the hormone being produced by the foetus itself). Many studies show that testosterone affects development and behaviour, not only in humans, but also in other mammals. Testosterone sponsors development of the male phenotype, and can influence behaviour even of animals of the same sex. For example, giving older men testosterone specifically improves their ability with those spatial tests on which males normally score higher than females [6]. Third, autism spectrum conditions are genetically based, and have been described in detail [2,7]. People with these problems communicate poorly; they are unable to put themselves in another's place, and have difficulties with empathising. They may treat others as objects. They often become obsessed and show repetitive behaviour. The less severely affected can become experts on recondite subjects, such as train timetables or ocean temperatures. Most relevant for our arguments is that autism spectrum conditions are largely sex-limited, being between four and nine times more frequent in males. From many studies, including psychology and neuroanatomy, Baron-Cohen argues convincingly that autism spectrum conditions are an extreme form of maleness [2,8]. It will not have escaped the notice of many scientists that some of their colleagues and maybe themselves have more than a hint of these "autistic" features. There is good evidence that this type of single-mindedness is particularly common in males [2]. Indeed, we might acknowledge that a limited amount of autistic behaviour can be useful to researchers and to society—for example, a lifetime's concentration on a family of beetles with more than 100,000 species may seem weird, but we need several such people in the world for each family. And most of these specialists will be men. (The Web pages of the Smithsonian Institute in Washington suggest that their systematists consist of about 30 women and 125 men.) It follows that if we search objectively for an obsessive knowledge, for a mastery of abstruse facts, or for mechanical understanding, we will select many more men than women. And if males *on average* are constitutionally better suited to be this kind of scientist, it seems silly to aim at strict gender parity. However, in professions that rely on an ability to put oneself in another's place, at which women *on average* are far superior, we should expect and want a majority of

women. For example, among current student members of the British Psychological Society, there are 5,806 women to 945 men; and among graduate psychologists, 23,324 women to 8,592 men. Of those who practice as chartered psychologists, the ratio has fallen further (7,369 women to 4,402 men). Yet among Fellows of the Society, honoured largely for their research, there are 428 men to only 106 women!

Boys and girls are born different and remain so “The chance that a woman will mug you tonight on the way home is somewhere around nil. That is a quirk specific to my gender.” —Michael Moore [4]

Among biomedical students in Europe and in the United States, there are similar numbers of males and females, suggesting perhaps that this subject is equally well suited to both sexes. But with higher and higher rank, the proportion of women falls inexorably—full professors are only about 10% female [9]. Women drop out steadily, and many of them have demonstrated high ability. There is plenty of evidence for similar trends in different branches of science [9]. For example, at the Laboratory of Molecular Biology in Cambridge, UK, where I work, the gender ratio of graduate students is currently 43 male to 35 female, yet the ratio of group leaders is 56 male to 6 female. Are there social or practical reasons why we would like to maintain a more equal balance, especially where scientists have power over others? The short answer is yes, and here are three reasons: First, these top research jobs call for a mix of skills, which a mix of men and women can deliver best. Nowadays, holders of these jobs plan science projects, write grants and articles, and try to network their papers into the top journals. Their students and postdocs, mostly young and inexperienced, usually do all the bench work. These students need more than instructions; they also need mentors who are able to listen to them and teach them understandingly. Indeed, some individuals deserve freedom to work out their own ideas: for example, Einstein did not have his doctorate when he wrote four of six of his great papers. Not many students get such opportunities now—whatever their potential. Understanding individuals and working out how to make the best of their diverse abilities are, as we have seen, predominantly feminine qualities. Second, if we had a balanced mix of men and women in charge of our institutes, I believe we would have more contented and productive workplaces. We should not forget that the motivation to work hard and solve problems can come from supportive colleagues, as well as from competitiveness. Third, it is self-evident that scientific leaders should include a diversity of people from whom younger individuals can pick role models as they choose their careers. The present lack of top female scientists will divert young women from scientific ambition; it makes no sense to discourage a future Frances Crick. Many have turned their attention to explaining the fall out of women from science; it is traditionally ascribed to a mixture of discrimination and choice [9]. Regarding overt discrimination, in a lifetime in science, I have seen only little, and it has been both for and against women. Surely, gender discrimination cannot explain more than a tiny part of this trend. However, choice is certainly a main factor.

Some choices are unavoidable; if there are to be children, women must bear them. However, after about six months or so, there is no reason, in principle, why the main carer of the children should not be the father. Later on, it could just as well be the father who takes time off work to look after a sick child. Yet partly because of the different priorities that *on average* men and women have, a much higher proportion of women put the needs of their children first and climbing the career ladder second. But there is a different kind of discrimination that particularly damages creative pursuits such as science. There is good psychological evidence that aggression and lack of empathy are *on average* male characteristics, and we may agree with Baron-Cohen that for both sexes, “nastiness... gets you higher socially, and gets you more control or power” [2,10,11]. Science should not be a military or a business operation, but nowadays it increasingly resembles one—for most, it is a vicious struggle to survive. In this struggle, men climb higher because they are *on average* more ruthless, and many women, as well as a gentle minority of men, shy away from competing with them [12]. And I think that our selection methods exacerbate this tendency.

About 100 years ago, Ibsen shed light on the secrets of contemporary life, and in doing so, championed women’s rights. But since then, the feminist campaign for equality has helped build the belief that men and women, *on average*, have exactly the same aptitudes. It is time we exorcised this particular ghost, and if we do, it will help put more of the less aggressive members of society, most of whom are women, into positions of power. For example, in job searches and in considering people for promotions, we have been asking women to take tests, largely devised by men, that tend to overvalue masculine characteristics. If men and women *on average* were identical, no one would see fault in this, but if it is agreed that they are not, these tests become discriminatory—for they favour those many men and those few women with masculine behaviour. At present, in the competition for academic posts, we expect our candidates to go through a gruelling process of interview that demands self-confidence. We are impressed by bombast and self-advertising, especially if we don’t know the field, and we may not notice annexation of credit from others, all of which *on average* are the preferred province of men. But we should also seek out able scientists who would care well for their groups, those who would mentor a distressed student and help her or him back into productive research. And if we did, we would choose more feminine women as well as more feminine men. And most important of all, could we try to select for the one characteristic we need most, scientific originality? Originality and creativity are all too rare, and I know of no evidence that these traits are more frequent in one sex [13]. As we busily compare candidates, adding up their papers and calculating impact factors, do we remember to look for these qualities? Instead of reading the papers, we count them. Counting rewards those who have had many papers accepted, and those who have worked their names into the author list. But is the editorial process of selecting papers an objective one? Certainly not; in the jungle where we fight to publish, salesmanship and pushiness pay off [14], and these tend to

be masculine characteristics. Thus, if we were to read the papers of candidates and search for originality and insight, I believe we would select more women, as well as more men with feminine qualities. So I am not advocating overt positive discrimination; instead, I suggest we consciously try to see through showmanship and select the qualities we actually need. I have argued that reducing the premium we give to aggression would, in several different ways, lead to more women in science and also to better science. Even so, in this Utopia, I think that far less than 50% of top physicists would be women (and far less than 50% of top professors of literature would be men). But I don’t think that would matter—we would be making better use of the diverse qualities of people. Both women and men might accept that although there is much overlap in the two populations, we are constitutionally different—a diversity we should be able to celebrate and discuss openly. Both women and men should be leading such discussions with pride.

The author thanks Birgitta Haraldson for teaching him about autism and Simon Baron-Cohen for advice.

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Women’s Participation Survey

7.13 per cent of the country’s top 100 listed companies have women directors – up 2.9 per cent since 2004.

A total of 63 of the top 100 New Zealand companies have no women on their boards (46 women out of 645 directors), compared with the total workforce being 47 per cent women.

32.2 per cent of Members of Parliament are women and 16.9 per cent of University associate professors are women.

Source: The NZ Census of Women’s Participation released April 06 by the Human Rights Commission

From the National Executive

A fairly quiet month on the exec front. Sadly, Tamsin Braisher will be stepping down as newsletter co-editor after this issue but Julia Wilson-Davey will take up the reins. We thank Tamsin for the tremendous job she has done with the editing and thank Julia also for agreeing to continue in the role.

Subscriptions are now due for 2006. The year finished on the 31st March. There is a date on your newsletter address label which indicates which financial year your subs are paid up to. If it says 2005 or earlier your sub is due – please complete the subscription form on the last page of this newsletter and return (with payment) to the address on the form. If the date on the address is 2006 or later you have already paid for the upcoming year. If you have any queries contact Julia.

Fiona had another baby boy in February (Lewis) and in her hormonal haze thinks another might be nice but her partner is pretty certain that this will be it!

Not a member and interested in joining AWIS?

Go to www.awis.org.nz for more information and to download a membership form.



New members

A warm welcome to the following new AWIS members:

Wellington

Eleanor Dashfield
Nicole Phillips
Christine Van Dalen

We have 159 financial members.

Julia Wilson-Davey
Membership Secretary

AWIS listserver (free!)

A forum for announcements and discussions relevant to women in science.

To join, visit

<http://lists.otago.ac.nz/listinfo/awis-list>

Congratulations

New Year's Honours List

Delayed congratulations to the following, who received honours in the New Year's Honours List:

Dr Ruth BONITA **BEAGLEHOLE**, of Vesancy, France, who received an O.N.Z.M. in the New Year's Honours, for services to medicine.

Dr Anne **KOLBE**, of Auckland, who received an O.N.Z.M. in the New Year's Honours, for services to medicine.

Professor Joyce Mary **WATERS** (Lady Waters), of Auckland, who received an O.N.Z.M. in the New Year's Honours, for services to chemistry.

Congratulations to Wellington College science teacher Andrea **SHAW** who is spending this year with NIWA researching the genetics of sharks on a NZ Science Mathematics and Technology Teacher Fellowship. Andrea aims to learn more about the principles and practice of collection and analysis of shark DNA, initially from dogfish but culminating in collection from great white sharks in Australia.

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Branch news



Christchurch

*Fiona Carswell, Convenor
(CarswellF@landcareresearch.co.nz)*

Not much to report from Christchurch this quarter as we have only met once. This was a great evening, however, as we heard from three women with PhD's who have chosen alternative careers to research. They were Laura Sessions, Sonya Olykan and Karen Bailey. Laura and Karen offered additional insights into running your own business so I expect a few AWIS members are now tempted!

Laura Sessions completed her doctorate thesis in 2003 which examined the reporting of science in New Zealand media. Laura now runs her own company that offers educational travel and study programmes for American students in New Zealand, Australia, Fiji and Belize. Laura shared with us the trials and tribulations of setting up her own company, her sentiments about moving away from academia and her experiences of trying to establish a career in scientific journalism in New Zealand.

After working as a scientist (predominantly part-time) for Forest Research for 11 years in the area of 'Sustainability' (tree nutrition and soil science) Sonya Olykan took the plunge and left to train as a secondary school science teacher. Sonya is now 'out' and job-hunting. And, as a parent of two primary-school aged children, the job-family juggle continues!

Karen Bailey last worked in research during her PhD studies. She now works in commercial diagnostic veterinary pathology which basically involves interpreting clinical pathology (haematology, clinical chemistry) results and microscopic examination of samples from sick animals, sent to the lab by veterinarians. Part of Karen's journey was also setting up a business and then selling it off for a tidy profit! Karen also juggles work with family commitments and had some hilarious stories about being a female vet at the "works"!

Next meeting will be April 13 when Nicola Beswick will tell us what we need to know about protecting our intellectual property.

Auckland

The Auckland branch is currently looking for a new convenor. If anyone wants to take over please get in touch with the exec.

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From the editors

Many thanks to everyone who provided articles or suggestions for articles for this months newsletter. Please keep the suggestions coming.

We need YOU!

Although I've really enjoyed co-editing the AWIS newsletter with Malina, I'm overcommitted, and something has to give...so I am stepping down from the role. AWIS thus needs someone who is interested in sharing the job of newsletter editor.

The role includes seeking contributions, laying out the newsletter, and arranging the printing and distribution. However, as this is a shared role, there is the opportunity to negotiate 'who does what' to suit both people.

If you think you may be interested, or would like to know more, please contact me or Malina.

Tamsin Braisher

CALL for CONTRIBUTIONS

Got any exiting research results?

Started a new project recently?

Got any difficult questions about that tricky balance between work and family, that you'd appreciate the views of AWIS members on?

We'd love to include all or any of these in future editions of the AWIS newsletter. All contributions and suggestions to Malina Storer
(stoma140@student.otago.ac.nz)



Subscription Form

Your subscription for the year beginning 1 April 2006 is now due. Subscriptions fund regular newsletters and local branch activities. Please renew your membership now.

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New members names and branch details are published in the first newsletter issued after joining. Are you happy to have this published? **Yes/No**

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Mailing address: _____

Contact details -please complete those you are happy to have used for AWIS business:

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The following details are sought to give AWIS better information about its membership base:

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- Full membership \$25
 - Associate membership \$20 (libraries, organisations and men supportive of AWIS)
 - Student/Unwaged membership \$15
- [you may pay for more than one year if it suits (e.g. overseas members)]

Privacy declaration: I agree that the National AWIS committee and my local branch convenor may use my contact details for the purposes of communication within AWIS.

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