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# Welcome to the new Oldsletter

by JAMES CURRAN AND MARTIN HAZELTON

Many professional societies and associations have newsletters published to a routine schedule - monthly, quarterly, or whatever the case. No such mundane practices here at the New Zealand Statistical Association. To reflect the interests of our readership, we have gone for the random process publishing model. This has, however, left a somewhat large waiting time between the previous issue and this one and the last (published, so historians tell us, in March 2012). The period encompasses almost the entirety of NZSA's "James Curran years", which were in danger of being lost to posterity. Thankfully new newsletter editor Steffen Klaere has done a superb job in trawling the archives and producing this bumper issue of the NZSA newsletter.



The last three years have seen some significant events in New Zealand Statistics. These include changes to the school curriculum in mathematics and statistics, the establishment of a new department of biostatistics and epidemiology at Auckland University of Technology, the creation of the NZSA Worsley Early Career and Littlejohn Research Awards, and David Vere-Jones' receipt of the 2014 Vaughan Jones Medal in the mathematical sciences from the Royal Society of New Zealand. All are reported in this issue, along with lots of local news and a variety of nice anecdotes (be sure not to miss Rachel Fewster's piece on infant gender inequality in Auckland).

James Curran (NZSA President Nov 2011 - Nov 2014)

Martin Hazelton (current NZSA President)

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# My first newsletter

by STEFFEN KLAERE

Douglas Adams once said



“I love deadlines. I love the whooshing noise they make as they go by.”

Compiling this newsletter felt a lot like this. Between deciding whether to stay with Adobe or moving to the more familiar  $\text{\LaTeX}$ , I wasted a lot of time. The most productive time was (appallingly) the conference in Wellington, where I spent many a talk compiling.

The meeting in Wellington was also great for meeting people and discussing the format of the newsletter. I had a great discussion with Vanessa Cave, who is in charge of the NZSA website. Tentatively, we have the following plans: I, as the newsletter editor, will request local news about twice a year (April and September). But instead of collecting them for later publishing in the newsletter, I will upload them to the website within a week of reception so that the authors of these blurbs can rest in the knowledge that their work is published. The actual newsletter will then be more of a reader's digest of these local news. In addition, I spent quite a few insightful hours admiring the newsletter of the Mathematicians. One feature I personally like is the **Centrefold** which I attempted to emulate here with David Vere-Jones. Another nice feature from the Mathematicians are **Little Problems of Interest**, I propose we start in this newsletter with Rachel's story on the **Sex Ratio of Births** at the UoA Stats Group.

Anyway, here is the 75th NZSA newsletter, trying to pick up where the last ended, which covers a whopping three conferences. I present the short summary of the three past conferences, a bio of David Vere-Jones, the 2014 Vaughan Jones Medal recipient, a few stories of interest, and the local news of the last years. Enjoy reading.

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# A Short (Short) Recap of Conferences

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## 2012 NZSA conference, Dunedin

by STEFFEN KLAERE AND AUSTINA CLARK

The 63<sup>rd</sup> NZSA conference was held November 29-30, 2012 in Dunedin. The conference covered the wide variety of statistics in New Zealand. Attendants commented on the strange food provided, including but not restricted to inanga (whitebait) and tītī (mutton bird). We were pleased to welcome plenary speakers Thomas Lumley (University of Auckland), Roger Payne (VSN International), Alastair Scott (University of Auckland), and Patty Solomon (University of Adelaide).



Brigid Betz-Stablein and Darcy Webber with NZSA president James Curran.

As usual, Hoare Research sponsored the awards for the best student presentations. This year the honour went to Brigid Betz-Stablein (Massey University Palmerston North) and Darcy Webber (Victoria University of Wellington).

Further, Chris Wild (University of Auckland) received the NZSA Campbell award recognising his sustained contribution to the development and advancement of statistics.

## NZSA 2013 conference, Hamilton

by VANESSA CAVE

The 2013 NZSA conference was held jointly with the Operations Research Society of New Zealand (ORSNZ) in Hamilton. The two societies last held a joint conference in 1994 at Massey University (Palmerston North). Despite the success of this earlier conference, and the complementary (and overlapping) research interests between members of the two societies, unfortunately nearly 2 decades passed before another joint venture.

The conference, entitled “Analytics for a Changing World: From Data to Decisions”, encouraged talks covering a wide range at applied and theoretical statistics and operations research. We were pleased to have as plenary speakers John Neuhaus (University of California), Ken Rice (University of Washington), Chris Wild (The University of Auckland), Martin Hazelton (Massey University), Kevin Ross (Fonterra) and Vicky Mabin (Victoria University of Wellington).

For the first time **Harmonic Analytics** sponsored the student prizes. First prizes were awarded to Daniel Fernandez (Victoria University of Wellington), Roy Costilla (Victoria University of Wellington), and Christopher Bryant (University of Canterbury).

John Harraway (University of Otago) received the NZSA Campbell award recognising his sustained contribution to the promotion and development of statistics. Richard Barker (University of Otago) received the inaugural NZSA Littlejohn award recognising his excellent research over the past five years. Ting Wang (University of Otago) received the inaugural NZSA Worsley award recognising his recently published research at this early stage in his career. Lifetime memberships have been awarded to Harold Hen-

derson (AgResearch Hamilton), Peter Johnstone (AgResearch Invermay), Murray Jorgensen (University of Waikato) and Judi McWirther (University of Waikato).



Left to Right: Daniel Fernandez, Shirley Wu (Harmonic Analytics), Roy Costilla, James Curran (NZSA President), Christopher Bryant

Hosted by the University of Waikato, the four day Hamilton event was very well attended attracting over 160 delegates. Special thanks to the conference platinum sponsor, SAS, who not only provided generous financial support but also conference bags that proved very popular with attendees. Thanks are also due to [Harmonic Analytics](#), [Derceto](#), [NeSI](#), [Catalyst IT](#), [Dragonfly Science](#), [Statistics New Zealand](#) and [ANZJS](#) for their generous support of prizes and sponsorship.

Photos from the 2013 conference are available on [flickr](#) courtesy of Harold Henderson.

## NZSA 2014 conference, Wellington

by STEFFEN KLAERE

The 2014 NZSA conference was held jointly with the Operations Research Society of New Zealand November 23-26 in Wellington. The conference covered all practical and theoreti-

cal aspects of statistics and operations research (OR). We were pleased to have as plenary speakers Geoff McLachlan (University of Queensland), Chid Apte (IBM Research), Peter Green (Sydney University of Technology, University of Bristol), Miguel Anjos (Trottier Energy Institute), and Alan Brookhart (University of North Carolina).



Left to Right: Shirley Pledger, Roy Costilla, Daniel Fernandez, Alison Sefton, Zoe Williams, Shirley Wu (Harmonic Analytics)

As for last year, **Harmonic Analytics** sponsored the student prizes. Daniel Fernandez (Victoria University of Wellington) and Alison Sefton (Massey University Palmerston North) received a joint award for best talk, while Zoe Williams (University of Canterbury) received a close second prize. Roy Costilla (Victoria University of Wellington) received the award for the best poster.

Shirley Pledger (Victoria University of Wellington) received the NZSA Campbell award for her sustained contribution to the development of statistics. Martin Hazelton (Massey University Palmerston North) received the NZSA Littlejohn award recognising his excellent research over the past five years. Tilman Davies (University of Otago) received the NZSA Worsley award recognising his recently published research at this early stage in his career. Lifetime NZSA memberships have been awarded to Jennifer Brown (University of Canterbury), Neil Cox (AgResearch), Stephen Haslett (Massey University), and David Scott (University of Auckland).

In addition, Harold Henderson celebrated his 40th anniversary working for AgResearch and its predecessors.



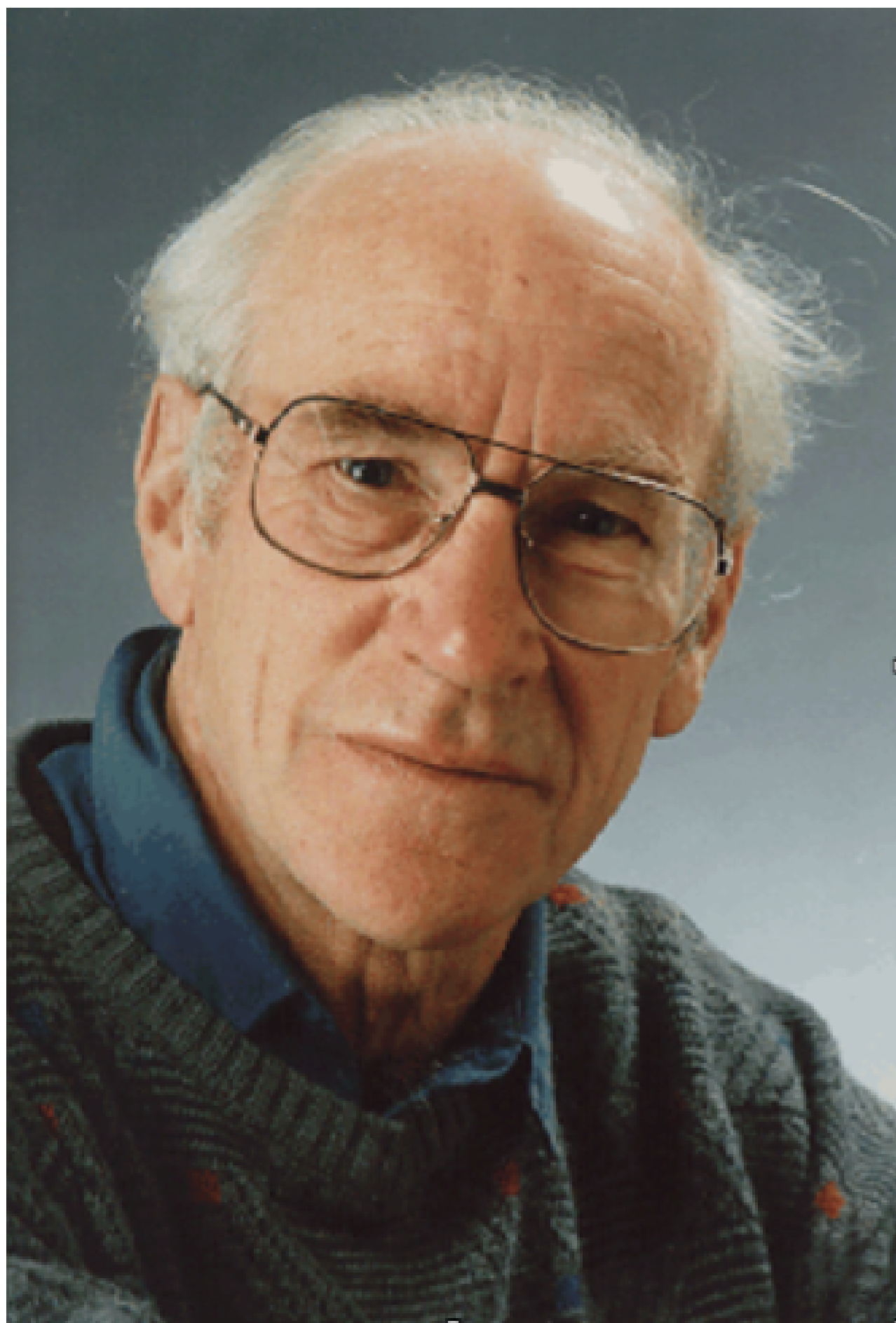
The NZSA executive also made some changes. Martin Hazelton (Massey Palmerston North) replaced James Curran (University of Auckland) as President, John Haywood (Victoria) replaced Beatrix Jones (Massey University Albany) as Secretary, and Howard Edwards (Massey University Albany) replaced Judi McWhirter (University of Waikato) as treasurer.

Photos from the 2014 conference are available on [flickr](#) courtesy of Harold Henderson. For more information on the conference visit the [website](#)

## Future Conferences

by STEFFEN KLAERE

The 2015 conference will be in Christchurch, Canterbury. The 2016 conference will be hosted by the Auckland University of Technology, and the 2017 conference will be hosted by the University of Auckland.



# David Vere-Jones

by GRAEME WAKE

Professor David Vere-Jones has been awarded the prestigious Vaughan Jones Medal for 2014 by the Royal Society of NZ. Awarded biennially, this is the third award. He received it in person at the Science Honours Dinner in Wellington on 26th November.

David Vere-Jones is New Zealand's leading resident mathematical statistician. He has made major contributions to the theory of probability and statistics, their applications, and to the teaching of statistics and mathematics in New Zealand. He is highly regarded internationally, and has received numerous invitations to overseas institutions and conferences over the course of his long and distinguished career. He has well over 150 refereed publications.

Professor Vere-Jones has received numerous honours and distinctions. In 1995 he was awarded the International Statistical Institute Henri Willem Methorst Medal, and in 1999 he received NZ Science and Technology Gold ('Rutherford') Medal. He was elected as a Fellow of the Royal Society of New Zealand in 1982. He has been an ordinary elected member of the International Statistical Institute since 1978 and a Fellow of the Royal Statistical Society since 1969.

## Research

His research areas have been concerned with Point Processes (the statistical theory of sequences of events that occur at discrete points in time or space, such as earthquakes, neuron firings, volcanic eruptions, etc.) and Markov Processes (including branching processes and queuing theory). A substantial body of theory owes its origins to him, either directly or via his students. Of particular importance and relevance to New Zealand is his pioneering work on the applications of point process theory to seismology. He received the International Journal of Forecasting Prize in 1997 for the best article in the preceding 5 years for his 1995 paper "Forecasting earthquakes and earthquake risk". He obtained Marsden grants (as principal investigator) on the projects *Non-linear modelling of fracture mechanisms* (1997-1999), *Statistical models for the approach to criticality in earthquake occurrence* (2001-2003), and *Hidden Markov models for earthquake processes with ancillary measurements* (2005-2009).

## Contributions to Mathematical Sciences Education in New Zealand

Professor Vere-Jones has made substantial contributions to mathematical and statistical education in New Zealand. He was the Subject Convener for Mathematics for the University Entrance Board of the University Grants Committee (1978-85) and chaired the Education Committee in the Royal Society of New Zealand (1987-90). He was instrumental in setting up Victoria University's Institute of Statistics and Operations Research, in 1975, which promoted and coordinated research, teaching and consulting in those fields.

## Professional Associations

Professor Vere-Jones is a former president of the NZ Mathematical Society (1974), which he helped found, and a former president of the NZ Statistical Association (1981-83). He was Chairman (in the 1980's) of the East Asian and Pacific Regional Committee of the Bernoulli Society (a branch of the International Statistical Institute). He was Interim President (1991 - 92) of the International



Association for Statistical Education, which took over the role of the International Statistical Institute Education Committee which he chaired from 1987.

Professor Vere-Jones was a key member of a team responsible for writing a major review of the mathematical sciences for the Ministry of Research, Science and Technology. As Professor Jeffrey Hunter (review chair) wrote in the preface to their 1988 report, *Mathematics in New Zealand: Past, Present and Future*: "I wish to express my debt of gratitude to Professor David Vere-Jones who has borne the brunt of the writing of the final report. Without his efforts and dedication this project would have faltered."

## A Short History

David Vere-Jones was born in London but came to New Zealand at the age of twelve. He studied at Victoria University of Wellington in the 1950s, and then won a Rhodes scholarship to undertake postgraduate research in probability theory at Oxford, supervised by Professor David G. Kendall. After completing his doctorate he went, as an exchange Scholar, to Moscow University where he made contact with the strong Russian school on probability and, in particular, Professor Boris Gnedenko. These contacts led to life-long mathematical links and friendships. His two papers on non-negative matrices, although developed as part of Markov chain theory, are relevant to areas of mathematics quite unrelated to statistics. David returned to Wellington in 1962 and took up the post at the Applied Mathematics Laboratory of D.S.I.R. which he held until the 1960s. After short appointments at the Australian National University, Michigan State University and Manchester University, the call to Wellington was again answered by his appointment, in 1970, to the chair of mathematics at Victoria University. Under David's leadership, the group in statistics and operations research (later to become the Institute of Statistics and Operations Research) built up a strong national and international reputation in research, teaching and consulting. In 1988 he authored (with Dr DJ Daley) an influential reference book *An Introduction to the Theory of Point Processes*. This was revised, extended and updated in 2003 and 2008. The resulting books *An Introduction to the Theory of Point Processes (Volumes I and II)* are the pre-eminent reference texts in the subject.

David "retired" from the Victoria University of Wellington in 2000, becoming Professor emeritus. He remained an active researcher, founding *Statistics Research Associates Limited* in 1999 (with Dr RB Davies and Dr PJ Thomson) and was a director of this company until 2009. Under its auspices, David led a number of successful research projects on earthquake risk modelling with funding from the Marsden fund, the Institute of Geological and Nuclear Sciences (an ongoing involvement) and the NZ Earthquake Commission. He was Director of a research programme funded by the New Zealand Institute of Mathematics and its Applications on Hidden Markov Models and Complex Systems. In 2005 David was a joint author and reviewer for the Statistical Society of Australia sponsored review *Statistics at Australian Universities* with Professor AFM Smith (Queen Mary College, London) and Professor LR James (Murdoch University, Western Australia). This review has been influential in both Australia and New Zealand. David has also played a leading role in setting up an annual series of Statistical Seismology workshops, with the first in China (hosted by the China State Seismological Bureau) and the second timed to coincide with his Festschrift on the occasion of his 65th birthday in 2001. These workshops continue to be held and have helped the formation of Statistical Seismology as a sub-discipline in its own right. He now lives on the Kapiti Coast north of Wellington. His wife Mary died some years ago. They have three adult children and grandchildren. Many of us can attest to the kindness and generosity of spirit David extends to all with whom he has contact.

The Mathematical and Statistical Sciences community is glad to applaud the awarding of this top award to one of our most famous and distinguished sons.

## Otago: Brian Niven retires

by DAVID FLETCHER

After more than 40 years of invaluable service, Brian Niven recently retired from the Department of Mathematics and Statistics. Brian provided statistical advice to many students and staff, and also worked on external consulting projects.



Brian Niven with John Harraway

He graduated with Honours in Mathematics in 1970, followed by an MSc in Computer Science in 1974, supervised by Brian Cox. He was taught by both Geoff Jowett and John Harraway. Geoff influenced Brian to go into statistics. Most statistics courses were primarily mathematical in those days, with little in the way of application, but Geoff made sure the students had fun, for example by generating random numbers and collecting their own data, such as a multivariate data set of leaf measurements.

Brian began working as a tutor in 1970 in what was then the Department of Mathematics. Between 1972 and 1975 he worked as an Assistant Lecturer, before being appointed to the role he occupied for the next 39 years, working as a consultant within the newly formed Biometrics Unit, which became the Centre for the Application of Statistics and Mathematics (CASM) in 1987. Brian collaborated on papers with many of his clients, and was a co-author on 57 articles.

Brian has many perspectives on how his job has changed over this period. Much of his early work

involved giving advice about programming (typically SPSS, SAS or Minitab on a mainframe), as there was a much narrower range of analysis options available in those days. Brian recalls one Zoology postgraduate suddenly realising the value of statistics when Brian helped her with the analysis of data from an experiment in which some of the observations had been lost due to damage in the field. A common theme throughout his working life has been the educational role of the consultant, such as helping people interpret a  $p$ -value properly and providing guidance as to the meaning of statistical significance.

Interestingly, Brian says that the proportion of people with little or no background in statistics appears to be increasing, perhaps due to an increase in the use of statistics in the humanities. He estimates that only 5% of clients asked for help with design, whereas about 50% should have done so! He also says it can be hard to tell someone that they cannot draw any conclusions from their data, such as when there is clear confounding or lack of replication.

Brian will also be greatly missed after many years dedicated service as the Department's Health and Safety Officer, and as a Member of the University's Timetabling team for over 40 years. He also provided excellent financial oversight as treasurer for both the International Biometric Society (Australasian Region) and several conferences, including all four of the Statistics in Ecology and Environmental Monitoring (SEEM) conferences.

Brian provided advice and support to so many people over his time at Otago, and always did so with a gentle sense of humour. He will be greatly missed and everyone in the department wishes him well for the future.

# Is there Something Significant going on in the Auckland statistics group?

by RACHEL FEWSTER

In the last few NZSA newsletters much commentary was made about an unusual sex ratio among offspring produced by members of the UoA Statistics department. This was based upon the observation of the erstwhile newsletter correspondent that a very large number of baby boys had been born to department members over the past decade, seemingly unaccompanied by corresponding numbers of baby girls. Many impressive  $p$ -values were quoted, growing tinier and tinier by the newsletter.

It should now be mentioned that these figures were based on some questionable survey protocols. Specifically, the correspondent (who shall remain anonymous) employed a technique known as “anecdotal recall” for data collection, and assimilated results on the back of an envelope. Occasionally, data points were verified by cross-checking with the anecdotal recall of other randomly-selected department members, with reckless disregard for correlated errors in the resolute quest for statistical significance.

Finally, in January 2014, the Head of Department demanded that the study be placed on a firmer scientific footing. A census was carried out of all staff and PhD students housed in the department since 2000, with regards to their known or suspected offspring. Only offspring thought to have been conceived during the parent’s time in the department were counted. Non-response error was near-eliminated by an aggressive follow-up strategy, and forgetfulness was mitigated by consultation with family members. The survey was conducted with blinding, in the sense that nobody had a clue why the correspondent was asking these questions.



A male UoA stats offspring, picture provided by the proud father.

As a result, a complete record of departmental offspring since 2000 was compiled. Intriguingly, the study uncovered a number of hitherto-unknown baby girls, while some baby boys were expunged from the record. These errors were attributable to confusion in the anecdotal record over the dates, sex, and existence of some offspring. The grand total was 36 offspring since 2000, comprising 25 boys and 11 girls, yielding an only-slightly-impressive  $p$ -value of 0.03 against the null hypothesis of equal chance. However, in a much more impressive statistical twist, we noted that a total of 14 births occurred between 2004 and 2010: all of them boys! Seen in the context of all 36 births, the chance under an equal sex ratio of having an unbroken run of 14 of either sex is only 0.0015. With honour and  $p$ -value (nearly) restored, we are proud to conclude that there does indeed exist a hypothesis test with respect to which the statistics group at Auckland is statistically significant.

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# News from the Stats Education Teams

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## Statistics Education News

by MAXINE PFANNKUCH

### International News

*International Conference on Teaching Statistics 2014*, 13-18 July in Flagstaff, Arizona. The theme of the conference was Sustainability in Statistics Education. Rachel Fewster, Auckland University, a plenary speaker, gave a talk on *Teaching statistics to real people: Adventures in social stochastics* in which she described her innovative team-based learning approach for Stage Two probability. There were 500 people at the conference. Eighteen people from New Zealand attended and gave presentations at the conference. Conference papers are available on the [IASE website](http://iase-web.org).

*The International Research Forum on Statistical Reasoning, Thinking and Literacy* will be held on 26 July to 1 August 2015 in Paderborn, Germany. Proposals to participate in the conference are currently being sought (see [srtl.info](http://srtl.info)).

*World Statistics Congress 2015*, 26-31 July in Rio de Janeiro. The International Association for Statistical Education (IASE) is currently organising invited paper sessions for this conference (see [iase-web.org](http://iase-web.org)).

*IASE Satellite Conference 2015*, 24-25 July in Rio de Janeiro. The theme of the conference is *Advances in Statistics Education: developments, experiences and assessments* (see [iase-web.org](http://iase-web.org)).

*International Congress on Mathematical Education 2016*, 24-31 July in Hamburg. Topic Study Groups are being organized in statistics and probability. (see [icme13.org](http://icme13.org)). The *IASE Roundtable Conference* will be the week before ICME and will be held in Berlin (watch out for an announcement on [iase-web.org](http://iase-web.org)).

*An International Statistical Literacy Project Poster*

*Competition* is currently being held. Emma Mawby, Statistics New Zealand, is the coordinator (see [iase-web.org](http://iase-web.org)).

*First International Handbook of Research in Statistics Education*. The editors of this landmark Springer publication are Dani Ben-Zvi (Israel), Joan Garfield (USA) and Katie Makar (Australia). Chris Wild and Maxine Pfannkuch (also a Co-Editor) from Auckland University are lead authors for two chapters, while Tim Burgess (Massey), Pip Arnold (Cognition) and Stephanie Budgett (Auckland) will be co-authors for chapters. The book should be published in 2016.

*Statistics Education Research Journal*. Recently Maxine Pfannkuch (Auckland) was appointed co-editor of this Journal, which is under the auspices of IASE.

### Local News

*FutureLearn MOOC - Data to Insight: An Introduction to Data Analysis*. On the 6 October 2014 this Auckland University MOOC was launched. The course ran for eight weeks, 3 hours each week. Chris Wild has spent many months with Eileen Wild and Tracey Meek (Auckland) developing this exciting course, which is centred around his innovative software [inZight](http://inZight). For more details see [futurelearn.com](http://futurelearn.com).

[Stats Chat Blog](http://statschat@gmail.com) launched by the Department of Statistics, Auckland University, is continuing to have a good hit rate (about 5,000 hits per week – by June it had accumulated half a million page-views, the majority of the traffic being from NZ). Thomas Lumley and David Scott, Auckland University, are the main contributors. If you would like to become a regular contributor please contact Rachel Cunliffe, the coordinator of the blog, at: [statschat@gmail.com](mailto:statschat@gmail.com).

*CensusAtSchool Project*. This project, sponsored by the Department of Statistics of The University of Auckland, Statistics New Zealand and



the Ministry of Education, has become the central repository of resources for teaching the NZ school statistics curriculum. Chris Wild is the Project Director and is assisted by Rachel Cunliffe and Anne Patel in the running of the website. Neville Davies, Director of the Royal Statistical Centre for Statistics Education, Plymouth University, who runs CensusAtSchool in the UK, visited and worked with them from August 2013 to April 2014. (see [censusatschool.org.nz](http://censusatschool.org.nz)).

*Learn and Teach Statistics & Operations Research.* Nicola Petty (Christchurch) is running an interesting website on her thoughts about statistics teaching (see [learnandteachstatistics](http://learnandteachstatistics)).

*Statistics Education Research Project.* A two-year research project at Auckland University (Stephanie Budgett, Maxine Pfannkuch) is currently underway on *Visualizing chance: Learning probability through modeling*. The research is focused on ways of enhancing undergraduate probability students' reasoning and thinking. A synopsis of the project can be found on the [Teaching and Learning Research Initiative website](http://Teaching and Learning Research Initiative website).

*Doctoral Thesis in Statistics Education.* Congratulations to Pip Arnold (Cognition) who not only completed her PhD this year but also gained a Dean's Award for her thesis titled *Statistical investigative questions: An enquiry into posing and answering investigative questions from existing data*. Her supervisors were Maxine Pfannkuch and Chris Wild (both University of Auckland).

## NZSA Education Committee

by MIKE CAMDEN

### We keep growing

We're still here, still meeting bi-monthly, and at present have 24 members on the email list. This includes several people with their feet firmly on the floors of their classrooms. Our focus is on all the teaching, learning and assessment for statistics in schools.

### Curriculum and assessment

We gather that NZ is not only ahead of most of the world with the curriculum's statistics con-

tents. We're also ahead with the tricky business of assessing it. Last year was a milestone year for this: the last of the new NCEA achievement standards in statistics, for Level 3, went into use for the first time. We aim to smooth the path for teachers, wherever we can.

The Ministry of Education has just kicked off its *Review And Maintenance Programme: 'for curriculum, learning, and NCEA achievement'*. The Ministry has arranged for us to engage in this process, and work has begun. RAMP will review all NZ's existing materials and also international research for all the learning areas of the curriculum. The review gets going this year, with Maths and Stats and Science being the first to start.

### Some specifics

We're working on plenty of fascinating issues. Here are some of our current interests.

Last year's crop of NCEA examinations: we're impressed at how the examiners are incorporating a statistical thinking approach and we intend to give some detailed feedback.

Ethical issues in experiments and surveys: we'd like to help teachers to guide their students into good practice when they perform or analyse experiments and surveys. Here's our piece on this: [censusatschool.org.nz](http://censusatschool.org.nz)

Growth in use of background context information in assessments: some students put large amounts of writing into this. We'd like to assure that the effort is reasonable, and we're working on some guidelines.

*Datasets for use in assessment:* teachers need to provide datasets in assessments, and need to be able to ensure authenticity of student work. How fresh do datasets need to be? Again, we're working on some guidelines.

*Sampling:* sampling from an existing dataset has some point in the teaching world, but not outside it. Yes, we're working on some guidelines.

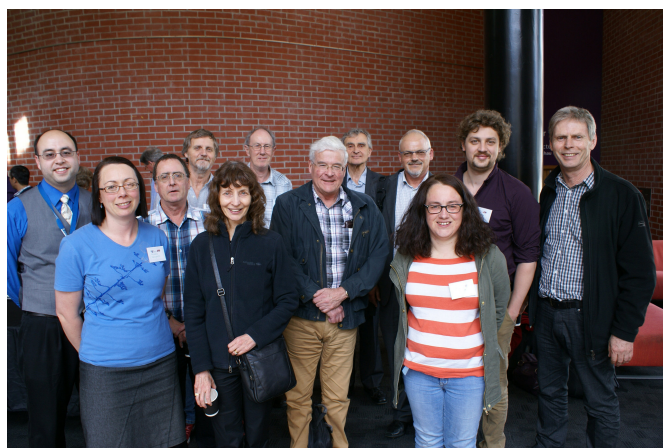
*The 'Bring Your Own Devices' (BOYD) direction:* this is happening for schools. We can't ignore it, or its use in teaching, learning and assessment. But students can't get all the programs they need on these devices.

*ASTTLE testing:* we're aware that this system is lagging behind the curriculum, and we'd like to

help it move.

*Stats in primary and intermediate:* we'd like to put some of our energy into this.

*Conferences with NZ teacher involvement:* last year's NZ Association of Maths Teachers conference, NZAMT13, had several of our committee members on its organising team. Statistics had a good presence, and committee members organised a forum, where teachers stated some strong and pretty unanimous views about their needs. They are summarised under [cen-susatschool.org.nz](http://cen-susatschool.org.nz). Also, we're impressed by the teacher-friendly sessions at our NZSA conference in Hamilton in November 2013.



Participants of the Teachers' Workshop at the NZSA 2014 conference in Wellington.

*Conferences in statistical education:* we look forward to reports from the many NZers who were at ICOTS9, in July last year, at Rio. ICOTS3 was in Dunedin in 1990, and moved statistical education in this country along nicely. A test for readers: what's the frequency of ICOTS conferences?

*Free software:* NZ seems to be a hotbed, with: [iNZight](#) and [VIT](#) (Visual Inference Tools) from Auckland; [GenStat](#) for teaching and learning, with supporting 'lessons', coming via Otago; [CAST](#) from Massey of course; and a new player: Jake Wills, with [NZGrapher](#).

*Science fairs:* along with Stats NZ, we're still supporting stats prizes and finding judges.

*ISLP (International Statistical Literacy Project) poster competition:* we hope for a good response from NZ students here.

*Archiving of committee records:* we're producing

a limited edition of 20 CDs with the committee's deepest thoughts, from 1999 to now.

*The ever-present underlying issue:* the ongoing need for professional development in the teaching of statistics.

*Doing research that matters: A success story from statistics education* In August this year, the New Zealand Council for Educational Research published a report by Rose Hipkins, titled as above. It analyses 2 major recent projects that involved several members of the committee and others from the statistical education community: *Building students' inferential reasoning: Statistics curriculum levels 5 and 6* Statistics: *It's reasoning, not calculating*, and *'Bootstrapping' students' understanding of statistical inference*.

The NZ Curriculum is out in front in terms of its methods of making inference intelligible. These projects used the 'scholarship in practice' approach not only to research how students think, but to advance teaching methods and software tools to help them think. *Rose concludes:* The projects featured in this first TLRI Project Plus report were chosen because they have been so successful in generating powerful new knowledge about New Zealand students' statistical reasoning, and for having a positive impact on the teaching and learning of that reasoning in our schools. My aim in developing this synthesis was to generate insights that might support further strong design work in future TLRI projects while celebrating the success of selected work already completed. The concept of scholarship in practice has provided a strong theoretical framework within which to document and organise the complex nature of the activities that took place within the two featured projects. More than this, the six criteria for scholarship in practice have provided an explanatory framework that can account for the power and impact of these two projects. The model has been useful for interrogating judgement calls, such as when it is appropriate to develop resources as part of a project, how and why project participants might get involved in policy-related activities, and how best to leverage the partnership requirement so that everyone involved in the project learns something. The report is at [tlri.org.nz](http://tlri.org.nz).



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# Local News

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## Canterbury tales

by PATRICK SAART

There were no significant seismic events, so after nearly a year in temporary and shared offices department staff moved back into their old offices in February 2012 in time for the start of term 1.

Our statisticians were successful with new Marsden grants and received many other distinctions. In the 2012 round of the Royal Society of NZ/Marsden Fund Awards, Mike Steel and Charles Semple secured 3 years' funding for their project on *Genetic jigsaws with missing pieces; mathematical challenges for piecing together evolution from patchy taxon coverage*.

Congratulations to Mike Steel and Jennifer Brown on their elections to international bodies. Mike Steel has been elected to the Council of the Society of Systematic Biologists (by the largest number of votes). Jennifer Brown has been elected as a new International Statistical Institute member.

Congratulations also to Marco Reale, who was appointed as a member of the CPI Advisory Committee 2013.

Raaz Sainudiin has been awarded a Research Chair in Mathematical Models of Biodiversity held by Veolia Environnement, French National Museum of Natural History, Paris and Centre for Mathematics and its Applications, Ecole Polytechnique, Palaiseau, France for September 2013. During this time he will be offering a short course on statistical learning theory to PhD students and developing novel spatially explicit population pedigree models for the black robins in order to improve conventional population viability analyses.

There are also some excellent news items from our PhD students and graduates. Let us list these

in alphabetical order.

Congratulations to Anna MacDonald who was awarded her PhD in April 2012. Her supervisors were Carl Scarrott and Dominic Lee. Anna is now working at Statistics NZ as a Statistical Analyst in the Population and Census Team, which is currently looking at how future censuses will be run.

Congratulations to Claudia Seibold, PhD student working with Jennifer Brown and Elena Moltchanova. Claudia has been awarded a prestigious fellowship to Vienna on the Young Scientists Summer Program at IIASA. The International Institute for Applied Systems Analysis (IIASA) is a scientific research institute located in Laxenburg, near Vienna, Austria. The program offers research opportunities to young researchers whose interests correspond with IIASA's ongoing research on issues of global environmental, economic and social change. From June through August 2014 Claudia worked within the Institute's research programs under the guidance of IIASA scientific staff. In 2014 there were 51 participants from 23 countries participating. Claudia is one of the three Germans who are funded by the National Member Organization (NMO) for Germany which is the German Association for the Advancement of IIASA.

Congratulations to Gloria Teng who defended her PhD Thesis entitled *Statistical Regular Pavings and Their Applications* on 8 January 2013. Her supervisors were Raazesh Sainudiin and Dominic Lee. We wish Gloria well as she returns to Malaysia to take up a permanent lecturing position in data mining at the Faculty of Engineering and Sciences, University Tunku Abdul Rahman, Kuala Lumpur.

Congratulations to Dawn Lemke who defended her PhD thesis in November 2012. Dawn worked with Jennifer Brown and Philip Hulme on her thesis, *Alien plants and their invasion of the*

*forested landscape of the south-eastern United States.* Dawn is based in Huntsville, Alabama at Alabama A&M University.

Congratulations and best wishes to Joe Zhu, who departed in January 2013 to take up a postdoctoral position at Oxford University. Joe's PhD supervisors are James Degnan and Mike Steel.

Congratulations to Miriam Hodge who was awarded her PhD in February 2013. Miriam's PhD thesis is entitled *Bias correction and change measurement in spatio-temporal data*. Miriam was supervised by Jennifer Brown and Marco Reale. She is now based in Abu Dhabi as a manager at the Statistics Centre - Abu Dhabi.

Congratulations to Xin Zhao, a former PhD student and a postdoctoral fellow, who is now working at Jade Software Cooperation in Christchurch.

Several new statisticians have arrived at the department.

Patrick Saart joined us in June 2012 as a lecturer in statistics after completion of his PhD in Statistics at the University of Western Australia. His research interest includes Semiparametric and nonparametric inferences, Asymptotic theory, Statistical methods and applications in social science and Financial mathematics. Although not born in New Zealand, Patrick grew up in Christchurch with only the exception of a few years spent in Australia during his PhD study.

Nuttanan (Nate) Wichitaksorn joined us in February 2012 as a fixed term lecturer in Statistics after completing his PhD study in Econometrics from University of Sydney. Nate's research interest includes Bayesian econometrics, Markov chain Monte Carlo methods, Financial time series models, Limited dependent variable models, Scale mixtures of normal, Scale mixtures of uniform, Copula modelling, Skew distributions and Quantile regression.

A few academic events were organized by our statisticians at the UC and abroad.

The 16th Annual NZ Phylogenetics Conference, with 55 participants from 11 countries, was held at the University of Canterbury's Edward Percival Marine Laboratory in Kaikoura from 28 January - 3 February. It was organised by Mike Steel

and Charles Semple. The conference brought together leading experts and students to discuss the latest questions on how best to use genetic data to understand the history and interconnectiveness of life on the planet. About half the participants were mathematicians or statisticians and the other half were biologists.

The 1st Annual Canterbury Statistics Open Day was held at the Department of Mathematics and Statistics, University of Canterbury on 2nd November 2012. It was organized by Patrick Saart, Jennifer Brown and Peter Jaksons. The event brought together more than 60 statisticians, mathematicians and biometricians from all over Canterbury region, who work on various areas of statistics. There were 12 presenters including an invited speaker, Professor Thomas Lumley of Auckland University. As it was the first time such an event was organized in Canterbury, the purpose was to give people in the area opportunity to interact and to introduce themselves and their research to enable future collaborations.

Finally, Raaz Sainudiin successfully co-organized Intervals Pavings and Applications 2012 ([IPA 2012](#)) in Uppsala, Sweden, with support from the Royal Swedish Academy of Sciences. IPA 2012 brought together mathematicians, statisticians and engineers to promote computational set-valued mathematics to solve problems in estimating, testing, controlling, planning, designing and verifying, among others. Decision problems included autonomous navigation of sailboat and submarine robots and guaranteed rendezvous of crafts in space.

Let us finish with a nice NZ story from our HoD, Jennifer Brown, titled: "WHAT'S THE CHANCE? 3 HEADS IN A ROW!"



Over Summer, while on holiday with her family on Stewart Island, Jennifer went to the local pub, the South Seas Hotel, for a 6pm Friday night drink. At the same time, Prof

Bryan Manly was there, as was Prof David Fletcher. All three had no idea that the oth-

ers would be on Stewart Island at the South Seas Hotel. Are these three independent events? Or is there some underlying process that results in statisticians holidaying in Stewart Island and drinking beer at the South Seas Hotel at 6pm on the same night in January?

## Statistics at AUT

by KATE LEE

Since the last Newsletter (late 2011) the Analytics team within the School of Computer and Mathematical Sciences at AUT has seen some new appointments - Dr Katharina Parry joined us early 2013 and Dr Sarah Marshall at the beginning of 2014. Katharina Parry completed her PhD with the title *Statistical modelling and inference for traffic networks* from Massey University. Her research interests are multivariate statistics, the modelling of rainfall systems and dynamic day-to-day traffic flows. Sarah, an ex-Victoria University Wellington graduate, completed her PhD in Management Science from the University of Edinburgh Business School in 2012 with the title *Refuse or Reuse: Managing the Quality of Returns in Product Recovery Systems*. Her research interests include stochastic modelling, particularly Markov decision processes, with applications to inventory management, reliability, product recovery and recycling. Katharina gave birth to a baby girl, Michelle, in November 2013. Sarah attended the 12th Global Conference on Sustainable Manufacturing (Johor Bahru, Malaysia) in September 2014.

The Analytics program was restructured in 2012 to a tight core of papers that focused on the research interests of the academic staff. Coupled with CAUP approval of our new Masters in Analytics degree, we are very much focusing on quantitative and computing techniques for business and industry. The team will be complemented with a new appointment at Senior lecturer or Associate Professor level.

On the research scene we have set up a Mathematical Sciences Research Group (MSRG) focusing on two main areas *Applied Mathematics and Mathematical Finance* and *Analytics and Statis-*

*tics*. We held a Research Day early in 2014 ending with a BBQ dinner at Jeff and Hazel Hunter's residence. The MSRG holds regular seminars. We hosted an AUT Mathematical Sciences Symposium, 27-28 November 2014, with a number of invited speakers and contributed talks. [Link to Mathematical Sciences Symposium](#)

Murray Black successfully completed his PhD in Statistical Education through Deakin University in July 2012. Murray continues to handle the Program Leader role for our BSc and BMathSc degree and continues with his research in statistical education with a focus on the development of statistical reasoning in both the teaching and assessment of statistics across a variety of learning environments.

Paul Cowpertwait was active in 2012 with a research grant for Sener International (Spain) that involved developing a full spatial-temporal stochastic rainfall model. In 2013 Paul also received an external consultancy with Auckland Council to develop a similar rainfall model for the region. This has led to a number of research projects involving Katharina Parry, Kate Lee and Oliver Hannaford. Paul has been granted Compassionate Leave from AUT for the rest of 2014 and plans to take a Sabbatical Leave in 2015.

Robin Hankin handles much of the statistical consulting activity that comes our way and has been visited on three occasions in the past few years by Dr Farnon Ellwood, currently at the University of the West England. Robin reciprocated with a visit to Farnon in the UK whilst on a sabbatical leave in Semester 1, 2014. They are engaged in collaboration in the field of community ecology. Robin's sabbatical also included a visit to the University of Bielefeld to work on a three way research proposal, and he gave a talk to the UK Health and Safety Executive on atmospheric physics.

Jeff Hunter has continued with his global trotting with a variety of visits and conferences. 2012 saw him invited to speak in January at a Workshop and Conference on Combinatorial Matrix Theory and Generalized Inverses of Matrices at Manipal, India. Visits in May to the National University of Ireland (visiting Steve Kirkland), University of Ulster (visiting Sally

McLean), University of Nottingham (visiting Frank Ball), followed in June with the organization (with Steve Kirkland) of a Mini-symposium on Markov chains at the SIAM Applied Linear Algebra Conference in Valencia. In November he participated in the Haifa Matrix Theory Conference speaking at a special session honoring the late Miki Neumann. 2013 was just as busy with an Invited talk in July at the PIM ("Preconditioning of Iterative Methods") conference at Prague honoring the 80th Birthday of Ivo Marek. He returned to NZ through Brisbane to speak at the Aust NZ Applied Probability Workshop in Brisbane. In August he participated at the International Workshop on Matrices and Statistics (IWMS2013) organizing a special session on Applied Probability and a Memorial Session to the late Shayle Searle. In September he represented AUT at the opening of the academic year at China Jiliang University in Hangzhou, China and at the graduation ceremony at Ho Chi Minh University of Science, Vietnam. Our School teaches degree courses at each of these universities. Jeff also delivered seminars at both universities. In November he repeated his Memorial Session on Shayle Searle at the NZSA+ORSNZ Conference in Hamilton. 2014 has seen him speak at IWMS 2014 at Ljubljana, Slovenia in May and at the International Linear Algebra Conference in Seoul in August when he was involved with the organization of a mini-symposium on Generalized Matrix Inverses.

Jeff's major current activity is the organization of IWMS 2015 to be held in Hainan, China over the period 25-28th May. Jeff is the Chair of the International Organizing Committee and the Scientific Program Committee and with a number of mini-symposia to be offered this is proving to be a major undertaking.

Jeff stepped aside from the Head of the Mathematical Sciences within the School at the beginning of 2013 and reduced to part-time but continued as Head of Research for the Mathematical Sciences. This has not been as straight forward as he had hoped as he agreed to do some post-graduate teaching during the first semester of 2014 and recently took on the role of Acting Head of Mathematical Sciences until January 2015.

Kate Lee attended the International Society for Bayesian Analysis world meetings in 2012 (Kyoto, Japan) and 2014 (Cancun, Mexico). From November 2012 to January 2013 she had a trip for conferences and collaborative visits to Australia (Bayes on the beach 2012, Caloundra, Australia), Boston (ICERM workshop on Performance Analysis on Monte Carlo Methods, Brown University), Paris (Dauphine Universite) and Dunedin (The Southern Uncertainty Quantification workshop 2013, Otago University).

## Biostatistics at AUT

by STEVE TAYLOR

In June 2014 the Department of Biostatistics and Epidemiology was officially formed within the School of Public Health and Psychosocial Studies at AUT's North Shore campus. Associate Professor Alain Vandal leads the growing department of seven biostatisticians/epidemiologists and one health economist. The other members of the department are: Dr Nick Garrett, Ms Priya Parmar, Dr Mark Wheldon, Dr Maheswaran Rohan, Ms Janet Pearson, Mr Braden Te Ao and Mr Steve Taylor. The department has close links to research institutes throughout the Faculty of Health and Environmental Sciences, as well as external links (via part time secondments) to the Centre for Clinical Research and effective practice (CCRep), Ko Awatea and researchers at Counties Manukau District Health Board, all based at Middlemore Hospital.

Alain's main activities since returning to New Zealand from Canada have been centred around the design and analysis of randomised controlled trials, particularly via his secondment to the Health Intelligence and Informatics Unit of Ko Awatea. He maintains an interest in order theory-based survival analysis and in capture-recapture modelling for human epidemiology.

Nick is interested in the environmental, social and spatial determinants of health, especially in regards to the urban environment. He is presently working on a number of research projects across the faculty including: problem gambling, tobacco, Maori and Pacific health,

physical activity, environment and family violence.

Priya is interested in understanding the genetic factors underlying the developmental origins of health and disease. She is currently focused on analysing ethnic disparities of obesity in children and the genetic and environmental factors associated with poor neurological outcomes.

Mark's research includes the development of statistical methods for demography, with a focus on Bayesian models. He is also seconded to CCRep where he collaborates with other researchers as the biostatistician on clinical studies in a range of areas.

Rohan recently arrived from the Department of Conservation in Hamilton where he was a scientist for nearly eight years. His academic career has also included roles at the University of Waikato and the Eastern University Sri Lanka. At AUT, Rohan's research projects are being developed and will include collaborative work with environmental scientists.

Janet joined the department in June 2014. She provides research and statistical support to members of the department, as well as providing statistical advice to Faculty researchers and postgraduate students. Current projects include a problem gambling study and a rheumatology project, both of which are being analysed using mixed models.

Braden is interested in health economics and health services research. Much of his work relates to the cost and access to services for those having either a stroke or traumatic brain injury. He also has interests in evaluating the cost effectiveness of interventions aimed at reducing health disparities for vulnerable populations.

Steve is the biostatistician for the longitudinal Pacific Islands Families study, a role he has held for the past five years. He also helps on many other projects and organises the department's clinics.

Postgraduate studies are beginning to take off within the newly formed department. There is one full-time PhD student and there have been several students on placements from overseas during the year. The department is currently offering postgraduate scholarships for study at

Masters and PhD levels in biostatistics and epidemiology. Successful students will have excellent opportunities to work on a variety of health research projects, both within AUT and with Middlemore Hospital collaborators. In particular, two CCRep/AUT scholarships for Master's candidates, both of a 2-year duration, will provide the successful candidates with on-site training at Middlemore Hospital with clinical researchers, under the supervision of departmental members.

The mandate of the department is to foster quantitative research of high quality and to provide high quality training in biostatistics and related fields. Although methodological research does take place within the department, its primary mission is collaborative in nature; this is also the stance adopted by the department in setting its postgraduate programme. The department intends no compromise on the quality of its theoretical training, but will add to it a requirement of high applied proficiency, including the ability to collaborate successfully with other researchers.

Regular biostatistics clinics are held by the department. These provide academics and postgraduate students within the Faculty with opportunities for one-on-one consultation with a biostatistician. Discussions cover the whole life cycle of quantitative research projects, from the early experimental design and grant securing stages through to data analysis, write-up and publication.

The department will be organising and hosting the 2016 NZSA conference, for which preparations have already begun. For any enquiries about the department, its activities or its members, please contact: Dr Nick Garrett, phone (09) 9219999 x7773.

**Massey University Palmerston North**

by JONATHAN GODFREY

It's been so long since last doing a local update, that the first thing I needed to do was a body count. While the nucleus of statisticians remain

within the Institute of Fundamental Sciences, there are (or were) others scattered around campus (not all of whom are reported on here).

### Who's here?

*Professors:* Martin Hazelton, Steve Haslett, Chin-Diew Lai, and Mark Bebbington.

*A/Profs:* Geoff Jones and Murray Cox (Bioinformatics)

*Senior Lecturers:* Doug Stirling, Raj Govindaraju, Matthieu Vignes, and Jonathan Godfrey.

*Lecturers:* Jonathan Marshall and Chris Jewell.

*Senior Tutors:* Debbie Leader and Anne Lawrence.

The newest name in the above list is Matthieu Vignes who some of you will have met as he attended the NZSA conference in Wellington. The previous arrival was Anne Lawrence who has plenty of valuable experience to share with us through her previous work with Massey's College of Education; she has numerous contacts with secondary school teachers across the lower North Island, and lots of ideas for how we should be engaging with them.

We are just about to lose Chris Jewell who will return to the UK in February; he will be based at Lancaster and is taking Poppy Miller with him to start her PhD there. Chris may have been here for only a short time but his expertise will be missed. We can't begrudge his departure though as the opportunity is too good to miss. We wish both Chris and Poppy well.

After many years of service Ganes Ganesalingam has retired and left Palmerston North. Ganes joined what was then the Department of Mathematics and Statistics and has had a hand in so many of the outreach activities that our group undertook. We hope the move to be closer to their children goes well for Ganes and Prima. Ganes has also played a crucial role in attracting PhD students from Sri Lanka to NZ and Massey in particular.

Perhaps the most noteworthy activity of the last couple of years is the number of awards Massey people have received. Martin Hazelton received the Littlejohn award in 2014 and two of our PhD graduates received the young researcher award (Ting Wang in 2013 and Tilman Davies in

2014). One must observe that the next step for those that complete a PhD at Massey seems to be Otago – Tilman and Ting have just been joined by Rebecca Green, but there are alternatives; Brigid Betz-Stablein took a research position in Sydney in early 2014.

Two other departures need a mention.

While Hugh Morton has been outside our group for a number of years now, he will be known to many. Hugh retired in 2014.

Some of you may have met Jean Sanderson at the 2013 NZSA conference. She returned to the UK in early 2014.

Our group continues to do all the things most statistics groups do. In addition, we run the Palmy Stats Forum each year and have now made it to ten annual events. This event pulls the region's statisticians together as well as former students who live outside the region. It's a pretty special day in our calendar and that's not just because it occurs after lectures have finished and before we start the exam marking!

## State of the Nation: Department of Statistics, University of Auckland

by RACHEL FEWSTER

*'It is the mark of a truly intelligent person to be moved by statistics'*

– 95% attributable to Bertrand Russell, 1926

2014 marks the 20th birthday of the University of Auckland's Department of Statistics, which was born in 1994 when the former Department of Mathematics and Statistics split into its two component parts. According to life expectancy tables, the department's life expectancy at birth was 77 years, so we have a while to go yet. As is befitting of a 20-something, since its birth the department has grown a lot, has a few good qualifications, and enjoys diverse interests. To celebrate our coming-of-age, and because the Editor asked for them, here are some statistics about Statistics.

- We have about 32 academics, 9 teaching fellows, 5 staff in the Statistical Consulting



Service, and 30 PhD students. At midnight on 9th August, 2013, we first reached 1000 EFTS – equivalent full-time students in undergraduate and taught postgraduate papers. As far as EFTS go, we compete with the Computer Science and Psychology departments for the coveted title of Second in the Faculty of Science. (The School of Biological Sciences is well in the lead with nearly 1300 EFTS).

- Of our EFTS, 63% are at stage 1 level, thanks to the foresight of our forebears in securing most of the university's statistics service teaching in the late 1980s. Stage 2 and 3 courses account for about 15% of EFTS each, and postgraduate courses for 7%.
- Bearing in mind that students take multiple courses, the headcount of physical people (as opposed to that mythical creature, the EFT), tells a different story. Each year, about 5100 real people do stage 1 statistics, which means a lot of *t*-tests by any standards. This diminishes to 1260 people at stage 2; 260 at stage 3; and 70 studying postgraduate papers. With this uncannily faithful illustration of an exponential decay model, our students have demonstrated that they practise what we preach. As statisticians, we can confidently deduce that the coefficient of retention is one quarter of the cohort from each stage to the next; so if we taught four more levels of courses, we would have nobody left.
- Undergraduate students don't arrive at university believing that statistics and statisticians are boring. In fact, doing statistics is quite cool these days. This, and many other interesting facts, was uncovered by a survey we commissioned in 2011 to discover more about statistics students, graduates, and employers. The resulting guide to statistical career planning can be found at [careers](#). As to not being as boring as we thought we were: we await the exit survey to ascertain what the same students think when they leave university!

As far as research goes, the department has many thriving interests. In the PBRF exercise

we ranked 6th in the University of Auckland in terms of the percentage of A grades, at 30.94% just a whisker behind the Mathematics department, which was in 5th place with 30.97%. (One suspects that this triumph of Mathematics over Statistics was achieved by the machinations of an advantageous denominator).

Our spectrum of research interests and achievements is too broad to attempt a complete catalogue, but some particular strengths are below, listed alphabetically and with an attempt to explain what they mean:

- Bayesian statistics – how to update your beliefs on everything from astrophysics to fisheries;
- Biostatistics – using statistics to cure diseases, or at least to inform people how unlikely they are to be cured;
- Statistical computing – creating software systems that enable statisticians to do statistics;
- Statistical ecology and phylogenetics – methodologies relating to all things *Animalia, Plantae, et alia*;
- Statistics education – how best to do it, and how to spot it when it happens;
- Experimental design and sampling theory – the things that statisticians would have told you, if you had asked them before you collected your data;
- Forensic statistics – how to ensure that other people don't get away with murder, with 95% confidence;
- Operations research – how to optimize everything, including hospital beds, electricity markets, and selfish drivers;
- Probability and statistical physics – a very mathematical way of having fun with random walks and other stochastic processes; probably.

Perhaps most importantly, the department covers a rich spectrum of work involving mathematics, computation, and data analysis and management, with most of our staff doing a combination of all three. As Tukey famously said, statisticians 'get to play in everyone's backyard', so most of us also have a favourite applications area such as ecology or astrophysics where we brandish our statistical tools, often requiring substantial addi-

tional understanding of the applications field.

Finally, some stand-out elements of our history and outreach activities deserve a special mention.

- The worldwide statistical computing package, **R**, was born in our department *circa* 1993 from a conversation in the corridor between Ross Ihaka and Robert Gentleman. **R** is now used by millions of people worldwide, and has changed the way that scientists and business professionals interact with data.

*Conclusion: keep on talking in corridors!*

- The department has its own blog, [StatsChat](#), which is especially notable for Thomas Lumley's entertaining and erudite thoughts about nearly everything. David Scott is the media go-to man for predicting who will win the rugby, and Andrew Balemi is a regular on TV and in the national press for elucidating your chances of winning Lotto.

*Conclusion: not a lot, given that Andrew*

*still seems to be coming to work.*

- The department is heavily involved in developing statistics in the NZ school curriculum, particularly through projects such as Census at School, resampling theory as a basis for statistical inference, and iNZight, which are initiatives led by Chris Wild, Maxine Pfannkuch, and colleagues from around NZ. As a result, the NZ school statistics curriculum is regularly cited on statistics forums as being the international gold standard.

*Conclusion: this is why nobody arrives at university thinking statistics is boring any more!*

- From 2004 to 2010, members of the department produced 14 children: all of them boys. Seen in the context of all 36 births from 2000 to 2014, the probability of having an unbroken run of 14 births of just one sex is only 0.0015, assuming an equal chance of a boy and a girl each time.

*Conclusion: Statisticians are statistically significant!*