ASSOCIATION FOR THE ADVANCEMENT OF ANIMAL BREEDING AND GENETICS
FELLOWS OF THE ASSOCIATION

"Persons who have rendered eminent service to animal breeding in Australia and/or New Zealand or elsewhere in the world, may be elected to Fellowship of the Association…"

Elected February 1990
R.B.M. Dun
F.H.W. Morley (deceased)
A.L. Rae (deceased)
H.N. Turner (deceased)

Elected September 1992
K. Hammond

Elected July 1995
C.H.S. Dolling
J.R. Hawker
J. Litchfield

Elected February 1997
J.S.F. Barker
R.E. Freer

Elected June 1999
J. Gough
J.W. James

Elected July 2001
J.N. Clarke
A.R. Gilmour
L.R. Piper

Elected September 2005
B.M. Bindon
M.E. Goddard
H.-U. Graser
F.W. Nicholas

Elected September 2007
K.D. Atkins
R.G. Banks
G.H. Davis

Elected September 2009
N. Fogarty
A. Fyfe
J. McEwan
R. Mortimer
R. Ponzoni

Elected September 2011
B.P. Kinghorn
A. McDonald

Elected October 2013
H. Burrow
P. Fennessy
G. Nicoll
P. Parnell

Elected October 2015
P. Arthur
D. Johnson
K. Meyer
B. Tier
R. Woolaston

Citations for the 2015 Fellowships are presented in the following pages.

HONORARY MEMBERS OF THE ASSOCIATION
"Members who have rendered eminent service to the Association may be elected to Honorary Membership…"

Elected September 2009
W.A. Pattie
J. Walkley

PAUL ARTHUR

Originally from Ghana, Paul Arthur completed his postgrad research and worked in Canada before commencing his very prolific career with the New South Wales Department of Primary Industries. Paul is an expert in animal breeding and genetics with a strong national and international reputation, and simultaneously has made an enormous contribution in leadership and direction of animal production research within the NSW public service.

Paul completed his M.Sc. thesis on the use of large dairy breeds in crossbreeding for range beef production, and Ph.D. thesis on the nature, genetics and physiology of double-muscled cattle, at the University of Alberta, Edmonton. The winters of Canada finally proved too long and cold for Paul and he moved his young family to sub-tropical Grafton, NSW, to join the research team at the then NSW Agriculture Grafton Research Station, and became immersed in publication of results from the decade-long beef-cattle crossbreeding and growth research projects being conducted in NSW.

Then a move to Trangie and Paul took on leadership of the Net Feed Conversion Efficiency project, and then onto Sydney where Paul's emerging skills in leadership and management were recognised and he was appointed Director of the Elizabeth Macarthur Agricultural Institute. His research output never slowed and Paul was invited to work in cattle feed efficiency projects in Japan and France, and pigs in Australia. Over the past decade Paul has been a leader in research into the genetics of greenhouse gas emissions in beef cattle, and development of genetic technologies to reduce methane emissions from Australian beef cattle.

Paul has achieved a number of career highlights. He earned promotion to the rank of Senior Principal Research Scientist, the highest rank available to a public-service scientist, with more than 250 scientific publications to his name, including one paper now ranked 3rd among the top 50 most-frequently cited papers ever published by the Journal of Animal Science. He has been awarded the Public Service Medal (PSM), under the Australian Honours System, for "Outstanding public service in the field of animal breeding and genetics". The cattle methane research was runner up for 2013 Eureka Award for Sustainable Agriculture.

To recognise Paul's quiet determination, hard work, leadership and achievement in animal breeding and genetics research, the Association for the Advancement of Animal Genetics and Breeding is pleased to enrol him as a Fellow of the Association.

DAVE JOHNSON

Dave Johnson was born and bred in Southland, New Zealand. After completing his BSc and MSc at Otago University, Dave undertook a PhD at the University of Toronto (his thesis was titled "The symmetric structure theorem for reductive Lie algebras"). He then joined Ag Research as a research statistician: analysing numerous field experiments, as well as providing animal breeding expertise to New Zealand's sheep and beef cattle breeding programs.

Dave also worked in the area of variance component analysis during his years at Ag Research, and this lead to the development of variance component software based on the AI REML algorithm. The software enabled both univariate and multivariate analyses and was subsequently used to estimate genetic and phenotype parameters from the data recorded in progeny test herds at Livestock Improvement. These analyses were based on 100,000s of records collected on multiple traits: analyses that would have been computationally infeasible with any other available software at that time. Many of the genetic and phenotype parameter estimates are still in use in the current national genetic evaluation.

Dave joined Livestock Improvement in 1993 and continued there until now. Over this period Dave has made a significant contribution to New Zealand's dairy cattle genetic evaluation. In the early 1990s many countries, including New Zealand, were adopting the animal model methodology for routine genetic evaluation. During the introduction of the animal model, Dave developed a new methodology to predict total lactation yields from individual test-day information thus providing phenotypic production records for the mixed model analysis. These records accounted for any number of herd tests over any testing frequency and allowed for variable information among herd-mates and for the effects of culling.

Dave was involved in research to improve the methods for estimating the reliability of estimated breeding values. Exact reliabilities can be calculated from the inverse of the mixed model equations. However, in national evaluations, the mixed model contains more than 10 million equations, making them computationally infeasible to invert. A new method of approximating reliability that was computationally fast and provided estimates with low amounts of bias was developed and published by Dave Johnson and Bevin Harris in 1998. This method has been extended to several complex models including test-day and genomic selection models, and to estimation of reliability for Interbull multiple across country sire genetic evaluations (MACE).

In 2007, Dave was an integral member of the team that developed a test-day model (TDM) to provide a national genetic evaluation for dairy production traits. One aspect of the TDM development that has gone unrecognised was Dave's on-demand TDM build for herd-testing customers. The national TDM model is only run approximately every 3 weeks, but farmers required a system to provide updated results at the time of an individual herd-test to enable breeding and culling decisions based on the most up-to-date information. Dave developed a computationally simple solution that incorporated the latest herd-test results into the most recent TDM evaluation, allowing up to 1000 herds (300,000 cows) to be processed daily in peak season.

Over recent years, considerable research effort has been directed towards the application of genomic selection in a national evaluation system for a number of livestock species, including dairy cattle. In New Zealand there was the additional complication of requiring an across-breed genomic evaluation system in order to get genomic evaluations on progeny-tested Jersey Holstein-Friesian crossbred sires. Dave made valuable contributions to a method for the prediction of breeding values incorporating genomic information in an across-breed evaluation: the novel component being the estimation of the genomic relationship matrix in the context of a multi-breed population.

KARIN MEYER

Originally from Germany, Karin completed her training in quantitative genetics with a PhD program at the University of Edinburgh. It would be difficult find three more outstanding people to have had as supervisors in one place than hers of Bill Hill, Alan Robertson and Robin Thompson. Her studies there sparked her lifelong interest in characterising genetic variation.

A series of short-term post-doctoral appointments in Australia, Canada and Edinburgh followed. These appointments generally focussed on specific problems. Indeed, her outstanding ability to assess a task, prepare and analyse the data and, most importantly, complete the study by publication in a scientific journal was recognised widely and her talents were in high demand. Eventually Karin settled into a full time position at AGBU where she still plies her craft.

Estimating variance components for unbalanced data and writing software to do so are the centre pieces of her career. Her work generally involved examining alternative models methods for the analysis of very large sets of data. Generally it required writing the software to complete the analysis as 'off the shelf' programs were unavailable. While at AGBU her primary focus has been the analysis of Beef cattle data, and a seminal paper describing a series of alternative models for analysing data with maternal effects is still cited today. She is, and has been, a key player in the team at AGBU involved with the development of its beef (BREEDPLAN) genetic evaluation system. Her theoretical and practical contributions to characterising genetic variation in livestock have also been appreciated by evolutionary biologists and the plant breeding community where she has made regular contributions over the last 15 years.

Providing software was essentially a 'spinoff' of having solved her own problems but for colleagues, it was often their introduction to Karin and her methods. She was in the vanguard when sire models were replaced by animal models. With DFREML, she played the central part in providing the animal breeding community with the tool they needed. The early 1990s saw new algorithms for maximising likelihoods – some developed by Karin herself – which were quickly incorporated into DFREML. In the late 1990s a new method for analysing longitudinal data – random regression – was added to DFREML. Karin has always been interested in getting the best out of the data. Advances in computing technology has meant that more difficult questions could be posed, but there has always been an underlying goal of having her programs run more quickly. Regular enhancements were made to DFREML and in 2006 Karin released a new incarnation called WOMBAT which she continues to enhance today.

By providing tools for the job, Karin has had an immeasurable impact on the animal breeding community and other related communities. Some indicators of her output include more than 21,000 downloads of WOMBAT since its release, over 90 refereed scientific articles with more than half as sole author, and 51 papers presented to the AAABG including a number of invited papers. Highlights of her career to date were the award of a D.Sc for her contributions to the estimation of variance components by the University of Edinburgh in 2002, her addition to the list of highly cited researchers in 2004 and her elevation to Professor in 2013. Her ability to focus on a task until it is completed with one or more publications is an example to all young scientists.

BRUCE TIER

After science studies at the Australian National University and service with the Department of Foreign Affairs, Bruce Tier completed a Bachelor of Agricultural Sciences at the University of Western Australia in 1980, majoring in Plant Breeding and Agricultural Economics subjects. Raised on a diet of logic puzzles at the family dinner table, Bruce became interested in computer science and programming early in his studies and insisted on including respective courses in his degree schedule, despite discouragement from the faculty. Bruce began his career at AGBU in October 1981, making him the longest serving staff member.

Affectionately known as "Dr. Thong", Bruce was awarded a Ph.D. from the University of New England in 1999 and became a full professor in 2011. In his spare time, Bruce is an avid and competitive Bridge player at national level.

During his 34 years at AGBU, Bruce has played a pivotal role (together with Hans Graser) in the development and implementation of genetic evaluation schemes for Australian livestock. Indeed, Bruce more or less single-handedly devised, built and maintained the software engines driving genetic evaluation for beef (BREEDPLAN) and sheep (OVIS) and provided major inputs to schemes for pigs (PIGBLUP) and trees (TREEPLAN), among others. In this time, BREEDPLAN progressed from a multi-trait analysis of three traits to twenty-five or more traits and, for the larger breeds, millions of animals in the pedigree.

This expansion posed major computational challenges and would not have been feasible without Bruce's analytical and programming skills which allowed him to develop his own, highly efficient strategies – unsurpassed worldwide – to cope with them. Currently, Bruce is implementing the next generation of BREEDPLAN and OVIS, incorporating genomic information through the so-called single-step method, having postponed retirement to do so. No doubt, he will deliver another Rolls-Royce of genetic evaluation schemes to put, yet again, cutting edge methodology for genetic improvement at the fingertips of Australian livestock producers.

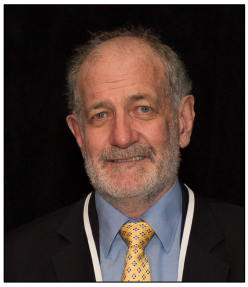
Moreover, Bruce has an impressive record of scientific publications in refereed journals and has been highly active in disseminating research results at conferences. He first attended a AAABG meeting in 1984 and has been an author on 78 AAABG conference papers (until 2013), which speaks volumes for his involvement with the society. His key journal papers not directly related to genetic evaluation addressed diverse topics ranging from efficient REML estimation, fast calculation of inbreeding coefficients and gametic imprinting to one of the first studies on the use of multiple genetic markers.

Bruce has provided essential and substantial leadership in scientific research in a range of areas, both within AGBU and with collaborating institutions. For instance, he has been a key person in both the Beef and Dairy Collaborative Research Centres and served on the advisory board of the Australian Dairy Herd Improvement Scheme. Bruce has been instrumental in developing strategies to deal with the avalanche of genomic data in AGBU, and made contributions to problems of genome scans, haplotyping, genotype imputation and polled horn testing, to name a few.

Last but not least, Bruce's impact as a supervisor and colleague has been immeasurable. Known for his irreverence and critical thinking, he has been and is a great team player, willing to work with all sorts and unstinting with his time, advice and, where needed, hands-on assistance to anyone asking, may it be colleagues, students, visiting scientists or emeriti.

For his enormous contributions to animal breeding and quantitative genetics, reflecting brilliance paired with dedication, the Association for the Advancement of Animal Breeding and Genetics is delighted to elect Bruce Tier to a Fellowship of the Association.

ROB WOOLASTON



Raised at Somerton, NSW, Rob grew up on a livestock and grain property, attended Farrar Agricultural High School, and then completed a B.Sc(Agric) degree at UNSW, graduating with first class honours. He then undertook postgraduate training under the supervision of Professor Euan Roberts. After attaining his PhD in 1975, Rob returned to the family farm and spent 7 years finding out about the vagaries of primary production. A desire to return to research saw him then spend 7 very productive years at the Animal Breeding and Research Institute, Katanning, WA, where he began his studies of genetic variation in Merino sheep. Working with Bob Howe and Roger Lewer, Rob's research outputs and delivery to breeders, had a major impact on Merino breeding in WA during this time.

After a stint as Senior Biometrician in the Tree Breeding Section of Queensland Department of Forestry, in 1989 Rob joined CSIRO as Quantitative Geneticist and Project Leader of the Parasite Resistance group at CSIRO Animal Production in Armidale, NSW. During the ensuing 5 years, Rob initiated and conducted many insightful investigations into the genetics of host-parasite interactions in sheep, with particular focus on *Haemoncus contortus* in Merino sheep. During this period he was also involved in breeding research in Fiji and China.

From 1993 Rob's career in CSIRO moved increasingly into research management, and between 1996 and 2001, he was the Manager of the CSIRO Livestock Improvement Program and the Senior Officer-in-Charge of the CSIRO Pastoral Research Laboratory at Armidale. It was during this time that Rob led the successful bid for the establishment of the Australian Sheep Industries Cooperative Research Centre. In 2001 Rob moved to Brisbane, and between this time, and when he left CSIRO in 2004, Rob filled roles as Deputy Chief, and Acting Chief of the Division of Livestock Industries. This was a particularly exciting time within CSIRO as the molecular technologies began to become available to research into livestock breeding. Under Rob's leadership CSIRO made key strategic investments that led to leadership in the international efforts to map key livestock genomes.

Rob's career since 2004 has focussed on provision of consulting services to the major livestock industries. He has performed roles as MLA R&D co-ordinator and technical advisor, and R&D Manager of Pfizer Animal Genetics, and contributed to many other industry boards and advisory committees. In particular Rob has made a major contribution to the Technical Committee of Sheep Genetics, filling the role as Chair between 2005-2008, and again currently.

Rob is the author of over 130 scientific and technical publications, including invited papers at international conferences in Australia, New Zealand, Canada, UK, USA, Uruguay, China, Pakistan and Indonesia. He has co-edited three books on the genetics of host-parasite interactions and animal breeding.

For Rob's very significant contributions to the Australian livestock industries through his research, research management, and contributions to industry boards and advisory bodies, the Association for the Advancement of Animal Breeding and Genetics is please the elect him as a Fellow of the Association.