

HELEN NEWTON TURNER MEDAL TRUST

The Helen Newton Turner Medal Trust was established in 1993 following an anonymous donation to the Animal Genetics and Breeding Unit. The Helen Newton Turner Medal is awarded to provide encouragement and inspiration to those engaged in animal genetics. The Medal is named after Dr Helen Newton Turner whose career with CSIRO was dedicated to research into the genetic improvement of sheep for wool production. The Medallist is chosen by Trustees from the ranks of those persons who have made an outstanding contribution to genetic improvement of Australian livestock.

The Helen Newton Turner Medal was first awarded in 1994 to Associate Professor John James and a list of all recipients to date is given below. The recipient of the Medal is invited to deliver an Oration on a topical subject of their choice. The Oration of the 2015 Medal recipient, Dr. Arthur Gilmour, is reproduced in these proceedings.

Trustees of the Helen Newton Turner Trust are:

- Dr Richard Sheldrake AM (Chairman), representing NSW Department of Primary Industries
- Professor Brian Kinghorn, representing the University of New England
- Mr Scott Dolling, representing the Association for the Advancement of Animal Breeding and Genetics
- Dr Roly Nieper, Representative of the National Farmers Federation
- Dr Robert Banks, Director, Animal Genetics and Breeding Unit

MEDALLISTS

1994 J.W. James

1995 L.R. Piper

1997 J. Litchfield

1998 J.S.F. Barker

1999 C.W. Sandilands

2001 G.A. Carnaby

2003 F.W. Nicholas

2005 K. Hammond

2007 L. Corrigan

2009 R. Hawker

2011 R. Banks

2013 M. Goddard

2015 A. Gilmour

2017 A. Collins

HELEN NEWTON TURNER AO



HELEN NEWTON TURNER MEDALIST ORATION 2015

ACCEPTANCE SPEECH

Arthur Gilmour

Introduction

I never met Helen Newton Turner but I understand she had a big influence on the Australian Sheep Industry by introducing new management and breeding strategies. This is part of a worldwide development, especially post World War II, which continues to the present: the increase in agricultural production by the simultaneous improvement of management and genetics. It had not crossed my mind that I might be considered worthy of an honour given in her memory. I would like to take this opportunity to document some of my background, my collaborators and my motivation.

Some History

I was born in Lockhart in 1949, the eldest of six children, and grew up on the family sheep/wheat farm at Boree Creek. Life was hard on those heavy soils for my parents but it was there I learned to take the initiative and to work hard at what had to be done. I attended Yanco Agricultural High School, built around Sir Samuel McCaughey's (1835-1919) mansion, and was dux in 1965. Not having much idea what to do, after a few months at Port Kembla flat products, I secured a Commonwealth scholarship to do Agriculture at Sydney University. I transitioned to a Department of Agriculture traineeship in 1967 and so began almost 42 years service. In the fourth year, I specialised in biometry and began service as a biometrician in the State Office Block in 1970.

This was a period of expansion in agricultural research with a dozen or so biometricians supporting researchers in the design and analysis of their experiments, a role I pursued for 39 years. Computers were becoming available and I engaged in Fortran programming, to enhance the computational capability of the group. Consequently, my time was divided between research consulting and software development to meet growing demands.

When biometricians were urged to move to country research stations, I transferred to Trangie in January 1976 where I developed links with the sheep breeding team. The Australian Wool Board then gave me a scholarship to study for a PhD at Massey University under Prof Robert Anderson and Prof Al Rae between 1980-1982. After almost a year again in Sydney, I transferred to the Orange Agricultural Institute in 1984. The Department was my very supportive employer through to 2009.

Some colleagues

My PhD was on the estimation of genetic parameters for categorical traits. I met Robin Thompson in New Zealand in 1981 and visited him in Edinburgh in 1982 when I also attended the second world congress (WCGALP) in Madrid. This led to regular contact with Robin, which continues today.

Brian Cullis, a fellow biometrician, wanted to fit a Genotype x Year x Location mixed model to 10 years of wheat data but it was too large for Genstat. So, I wrote a derivative free program to perform the estimation in 1992. This was also the year I wrote BLUP software for the wool industry and the lamb industry. Robin dropped by and suggested the Average Information algorithm for Brian's analysis; it was a simple extension to the program I had. He then invited by to spend the last half of 1993 with him at Roslin Institute outside Edinburgh, extending a multiple

trait BLUP program for the British Dairy Board. We three worked on the Average Information paper which was published in 1995. I then wrote a more general program which was released as ASReml in 1996. ASReml has dominated my life ever since.

Some philosophy

I learned about Jesus from my mother while at primary school, and committed myself to Him in 1961 just before going to Yanco. Therefore, I have studied and sought to share the Scriptures throughout my career. Whenever Jesus taught the crowds, he told stories based on nature, especially agriculture, and my understanding of agricultural science is underpinned by what I read in Scripture.

In the beginning God created the heavens and the earth' including all its life forms and He 'saw that it was very good'. Although it is now getting old, we still marvel at the systems God has put in place. Not least is the DNA code, the digital program specific to each kind of living thing. I conclude that the SNPs we observe today are primarily part of the initial variability built into living things so that they not only performed well at the beginning, but have been able to adapt to changing environments through history.

Critical to reconciling what we now observe with creation is the event known as Noah's flood, and the subsequent ice age. As well as explaining the origin of sedimentary layers containing fossils around the world, it also caused a genetic bottle neck for animals in particular, so that founder effects and natural selection in initially small populations have resulted in the many species we see today. This was reinforced to me when Pattie Cunningham explained the distinctions between European, African and Asian cattle at a AAABG meeting (1992?), a classic founder effect related to dispersion after the flood. And again, by a talk I heard at WCGALP in Vancouver (1994) reporting that an analysis of SNP variation indicated two genetic bottlenecks, which I associate with Creation and the Flood.

As animal and plant breeders, we are restoring a partly decayed system and I am confident there is a lot of potential for further progress. The problem for the future though is primarily a political one, not just a scientific one. The world could feed itself except for political agendas. The Scriptures anticipate the political issues will be resolved when Jesus, the Jewish Messiah, is acclaimed first by them, and then by the world, as world leader.

Conclusion

I am privileged to have been given a small part in genetic improvement and thank those who have made this possible. I encourage us all to take the initiative to do what we can each day to meet the needs around us. We each have a role, whether prominent or unnoticed, and it has been a privilege to collaborate with so many who are doing so much. I acknowledge the grace of God through Jesus Christ in giving me this role.

Arthur Gilmour
30 Sept 2015