HELEN NEWTON TURNER MEDALLIST ORATIONS

James Litchfield (awarded Medal in 1997)

Mr Chairman, Professor Stoddart, Members of the Helen Newton Turner Trust, ladies and gentlemen.

I have always been interested in birds and as a child visiting country shows I spent most of my time in the poultry pavilion.

Then one day, I believe I was eight at the time, my father said to me "Son from now on you are in charge of the chooks". He then added "and your pocket money will be performance based - a penny per egg so you will have to watch those feed costs".

At the first opportunity I headed for the poultry pavilion at Cooma Showground. It was after school on the Friday which is judging day. My friend the Chief Steward was too busy looking after judges to spare much time to hand on the expert advice I so keenly sought. In my eyes he was the fountain of all chook wisdom. He bred Australorps that won awards all round the country including the holy of holies Sydney Royal. Anyway we arranged an appointment for the next day.

Saturday at show time is a major social event. Families gather to picnic beneath the trees, watch the ring events and gossip in the pavilions.

Of course I made a beeline for the poultry and after receiving much learned advice on the care and maintenance of chooks my friend the head steward said, "If you haven't a broody hen at the moment no doubt you soon will have", and to my great delight presented me with a setting of 10 eggs from his champion flock of Australorps.

In due course they hatched and grew to a stage when I was able to determine that I had six pullets and four cockerels. Five of the pullets conformed to the best Australorp standards but it became obvious with time that number six was a ring-in, a crossbred. Yellow legs instead of black, a scrawny neck, an irregular comb and a tail that consisted of a few short white tipped feathers pointing to the sky. I named her Poker Tail and marked her down for a Sunday roast in company with her step-brothers.

Early one morning, however, on my routine trip to the chookyard to let the flock out for the day I noticed a very dejected looking Poker Tail still roosting at the back of the shed. I stooped beneath the front perches in order to inspect the situation at close quarters whereupon Poker Tail gave a mighty shudder and to my astonishment dropped a large shiny brown egg which I managed to catch.

To this day I clearly remember the feel of that warm, wet object resting in the palms of my hands and the expression of relief on the face of Poker Tail.

As I rarely wore shoes in those days there was probably a similar message emanating from between my toes but I don't remember that.

In contrast the Australorps proved to be reluctant starters in the egg laying business. Even two months later Poker Tail had earned for me more pocket money than the other five combined.

And that is how I became a Performance Breeder and interested in genetics.

I then had to think about the future and prepare a breeding plan. By this time I had become an avid reader of the poultry section of Country Life and knew that White Leghorns were the stars when it comes to egg laying. So at the next family meeting I moved an appropriate motion. This immediately drew a strong dissenting view from my mother who said that white feathers blowing all over the yard would make it impossible to keep the place tidy. Father and I conducted a hasty Environmental Impact Study and were forced to agree.

Fortunately I had prepared a fall-back position (even at that early age I had picked up the rudiments of committee tactics) and suggested Brown Leghorns. This was passed unanimously. This variety were comparable performers re eggs but were out of favour with the butcher because of a darker coloured flesh. There was no mention of this latter point in my contract.

I was beginning to learn that no matter how compelling a priority for selection based on measured factors of economic performance may be there are others of a subjective nature that cannot be ignored. Or to put it more succinctly, I was acquiring a grasp of the obvious.

Useful genetic progress depends on setting the right priorities in stock selection and discarding irrelevant fads and fancies handed down from the past. For the broad acre wool and beef industries the breeding objective can be very simply defined. It is to select the parents of the next generation on their ability to turn grass into dollars in a more efficient and sustainable manner than their forebears.

It must be acknowledged that the beef industry has now started down this track following in the footsteps of the poultry, pig and dairy industries. And the same can be said for prime lamb. Why is it that wool still drags the chain? I sometime think it is a miracle that wool is still with us as a major export earner but I do believe that the watershed has been reached, old paradymes are fading and a new order founded on genetic progress and modern marketing techniques is now in sight.

A cursory glance at the results of most wether trials tells us that the teams at the top of the list yield as much as twice the number of dollars as those at the bottom. Most of this disparity can be attributed to genetic diversity. The potential for improved productivity over the whole Australian Merino flock through application of performance breeding principles alone is therefore enormous. The opportunity is there and the means of achievement are at hand.

The performance breeding concept is simple and straight forward and implementation well within the capacity of most ram breeders. However a full understanding of the biology, heritabilities, trait correlations, environmental interactions, the technology and development of practical procedures are

complex. In this as in most aspects of Agriculture R & D the availability of specialist advice are essential and achievement requires the intellectual capacity, professionalism and dogged persistence so amply personified in the life and long career achievements of Helen Newton Turner. It is indeed a great honour for me to be awarded this medal in her name.

But what of the future?

In real terms resources allocated to rural research have been declining for many years. In part this is due to the extended depression afflicting the wool industry which has a record of allocation of money to R & D far in excess of any other industry in the country. The decline is also due, however, to an unbroken trend of reduction in support by successive federal governments.

The CSIRO Division of Animal Production (the division with which I am most familiar) approaches the eleventh hour of major decisions that will continue the decimation of resources both human and material. This will have adverse consequences for the future well being of a vast area of rural Australia and the economy of the nation as a whole.

All of this at a time when there is a growing awareness of the need for improved sustainability of production, for the repair and preservation of the environment and a continually growing demand for rural products from a rapidly expanding world population. An expansion that includes both people numbers and buying power.

Searching the signs upon which to pin hopes for better things to come I note the current Federal Government's intention to devote some of the funds obtained from the part sale of Telstra to environmental projects. This is a policy trend I find appealing because it establishes an investment in the foundations of future national prosperity and quality of life. As an aside to this observation I make the comment that in the field of commerce perhaps the role of government in a democracy should be restricted to the setting of the rules and refereeing the play for it is extremely difficult to attempt both at once.

My other ground for hope rests with the younger generation of farmers and pastoralists. They are better equipped technically and better educated than was my generation. They have broader horizons and are more environmentally and politically aware. They are therefore better able to understand and communicate with scientists, bureaucrats, politicians and urban communities. This is just as well for in my lifetime the demands placed upon the capacity for understanding and determination of wise decisions by farmers has grown from the simple evaluation of a cross bred chook in Cooma to the cloning of a sheep in Scotland.

A robust and progressive agricultural sector driven by high standards of quality control and sustainability of production in harmony with care of the environment (and these things are inseparable) is essential to the future well being of our nation.

As with all other material aspects of our lives a desirable outcome is not possible without an on-going commitment to research and development, education and communication in excess of current levels.

Professor J.S.F. Barker (awarded Medal in 1998)

May I first thank the members of the Helen Newton Turner Trust most sincerely for honouring me with the 1998 Medal. Words cannot express my emotions in being here today as recipient of this highest honour for an Australian animal geneticist. I am proud to accept, but I do so with humility, as one does not stand alone. Whatever I may be seen to have contributed is due in no small way to the efforts of the more than 100 colleagues, research assistants, postgraduate students and technicians who have worked with me. Some of them are here in this gathering, but in my mind, all are standing here with me. I accept also on behalf of my wife and children, who tolerated my absences in the laboratory, and my pseudo-absences when at home, but closed away in my study. I should tell you that my wife asked me a couple of years ago "Did you know that our babies wore nappies?" (i.e., diapers for my American colleagues).

I must also say it is somewhat embarrassing to be here this evening accepting this award, because as a member of the Organizing Committee for this Congress, I was responsible for making the arrangements with the Trust that the 1998 Medal should be presented during this Opening Ceremony of the Congress. Only later was I advised that I was to be the recipient!

Nevertheless, it is fitting that this event take place during our World Congress, as many of you here knew Helen Turner personally, and many more certainly know of her outstanding contributions to sheep genetics and breeding.

I first met Helen Turner when I was an Honours student, but I confess that her enthusiasm for sheep breeding had little influence on my research interests. Twenty years later, however, when she was awarded the 1974 Farrer Medal, her oration "Hidden Treasure: Genetic Diversity in Plants and Animals" opened my eyes to the importance of genetic diversity in the broadest sense, and of the conservation of that diversity.

As geneticists and animals breeders, we all work with genetic diversity and we often maybe take it for granted. However, it is the basic material of our endeavours - at all levels from fundamental research aiming to understand the nature of genetic variation through to applied research aiming to understand the nature of genetic variation through to applied research and the development of breeding programs to improve productivity of our domestic livestock.

What then is the magnitude of this genetic diversity that we could, or better perhaps, should consider? Clearly it encompasses the variety of all life forms - the species of plants, animals and microorganisms. At a lower level, it also includes the genes in these species, and at a higher level, the ecosystems of which they form a part. In an animal breeding context, we partition the genetic diversity into three hierarchical levels:

Between species
Between populations, i.e., breeds, within species
Between individuals within breeds.

Perhaps as a gross oversimplification, the emphasis on diversity in animal breeding is in the reverse order to this - that is, most attention is given to variation among individuals, some to breed differences, but practically none to species diversity.

About two million species have been formally described and named, but estimates of the total number now living on this earth range from 10 million to 100 million. All are the outcome of genetic variation and evolutionary divergence, and this enormous diversity inspires a sense of wonder, elegantly expressed by Charles Darwin in the last sentence of "The Origin of Species" - "There is a grandeur in this view of life, ... from so simple a beginning endless forms most beautiful and most wonderful have been, and are being evolved".

As biologists, we surely all recognize that grandeur, but as geneticists involved in livestock production, we restrict our view only to the 40 or so species that are used by humankind to meet our needs for food, fibre, draft power and so on. I ask you - Are the other millions of species irrelevant to us? I think not.

Firstly, there are some, admittedly still a small number of species that are close relatives of our domesticated species, that should be conserved and investigated as possible future sources of useful genes.

Secondly, there are a number of animal species that are harvested by various peoples, where the efficacy of that harvesting might be improved by some simple controlled breeding.

Thirdly, there are the large number of species that are pathogens, parasites or competitors of our domestic species. Certainly these species have received increasing attention in recent years, primarily in terms of breeding livestock for increased resistance, but I believe that our consideration of them is not yet integrated into our thinking about animal breeding for livestock production systems.

Which brings me to my fourth point. In animal breeding, we aim to make genetic changes in particular livestock populations to improve their productivity in a particular production system. That production system may be defined in terms of physical (e.g., climatic) and human imposed management variables, but I suggest the need for a broader view - the need to recognize any production system as an ecosystem, where tens, hundreds and probably thousands of species other than our own are interacting to affect the survival, growth and productivity of the particular livestock species that is our primary concern. These other species, or at least those that are key components of the ecosystem, need to be known and their effects understood if our breeding objectives are to be correct, not only for increasing productivity, but also to ensure the long-term sustainability of the production system.

Let me turn now to diversity at the breed level. When defining the hierarchy of diversity earlier, I said that "some attention" had been paid to breed differences. Many of you most likely thought that to be a rash denigration of the large number of studies of crossbreeding and heterosis, composite

development and between breed variation, but were too polite to interject and say so. But no doubt it caught your attention, and now I want to elaborate.

In essence, the point is really quite simple - it is that we have had a limited vision of the breed diversity available, and have largely concentrated on the so-called improved breeds of the temperate, developed world. Clearly there are exceptions, but in both the developed and less-developed countries of the world, it is these breeds that primarily have been considered when seeking breed diversity. The end result is that these relatively few breeds are well-characterized, but for the vast majority of breeds, little or nothing is known about their production and adaptive traits. These largely unknown breeds are mainly indigenous to the less-developed countries, and what is known, or at least has been assumed, is that their production performance is low. What is important, however, is that these breeds have evolved under conditions of low input and high stress (due to climate, poor nutrition and parasite/pathogen exposure), and are thus likely to be highly adapted to the ecosystem in which they are used.

From a less-developed country perspective, the genotypes of at least some of these breeds could well be crucial to maintaining sustainable production systems, and a major contribution to increasing animal production in these countries could be made by a combination of within-breed selection and crossbreeding among these adapted breeds. From a developed country perspective, genes and genotypes from these breeds for traits such as disease, parasite and stress resistance could well make substantial contributions to breed improvement programs for sustainable production systems.

As geneticists and animal breeders, we have a role to play in addressing the pressing problems facing our species - namely, population, food security and the environment. We can provide new knowledge and apply that knowledge to increase animal production, and increase it in sustainable systems. But the problems are global, and we are here at this Congress as a global community. I urge you all to keep in mind the global diversity of species and of livestock breeds, and the need for the conservation of that diversity. That is, conservation defined as "to use, manage and preserve for the benefit of future generations".

Let me close on a personal note. Like Helen Turner, I became a geneticist by chance. I gained entrance to University with one of two scholarships from the Queensland State Department of Agriculture. I really had no idea what career I wanted to follow, but University seemed a better option than finding a job. The scholarship entailed working for the Department for five years after graduation, and towards the end of the course, my fellow scholar and I were called before the Director of the Animal Industry Division. We were told that we were to become animal scientists - one to work in genetics and one in nutrition. My colleague immediately said he wanted to be a nutritionist!

I have thanked him ever since. Being the geneticist has been rewarding, it has been fun, and it still is.