

Presidential Address

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In presenting this, the second Presidential Address to the Australian Society of Animal Production I should like to say at the outset how pleased I am with the development of our comparatively young Society. It may interest you to know that our membership now exceeds 500, representing a wide variety of interests in animal production, after the Society has been in existence for only four years.

In that time we have, apart from the regular meetings of State Branches, held one very successful Federal Conference at Armidale, N.S.W., in January 1956, and we have published the papers from that Conference as our first Proceedings. This, our second Biennial Conference, promises to be equally successful, and its papers will be published shortly in our second volume of Proceedings.

This satisfactory growth rate can, of course, be explained in terms of heredity and environment, with favourable interactions. Our heredity is, I suggest, our common interest in the application of science to animal production, with variations due to the range of aspects from which we view this subject. Our environment at large is a world with a rapidly increasing population to be fed and clothed, and I stress the importance of animal products in this regard. Our particular environment is Australia, with large undeveloped areas of great livestock potential on the one hand, and on the other, developed areas in which, although we have already discovered some methods of increasing efficiency of animal production, so much more must be done in this direction.

Therefore, although it is pleasing to record, the growth of our Society under these conditions is not surprising, and it is in fact a clear indication of the increasing impact of scientific development on animal production in this age of science.

As the science of animal production has not only been successfully launched in Australia but has completed preliminary trials, I feel that we should now take bearings on our position and consider the possible courses we can travel. With such a wide field to cover, and limited resources at our disposal, it is essential that the course we select is that which will yield maximum efficiency of production from our efforts, both individually and collectively.

We have all had the experience of stopping on an unfamiliar road to ask and receive directions, which invariably seem to end with those helpful words "You can't miss it", and how often that flattering statement has been proved wrong. Are we, as a Society or in our individual spheres of animal production, on the right road? Or are we missing a turning which, if followed now, would lead us more rapidly or more expeditiously towards our objective, and save the time taken to retrace our steps from some more distant point?

The primary objective of our Society as set out in our Constitution is "to promote the advancement and further the interests of animal production in Australia". This broad aim we have set out to achieve by our Federal and State meetings, and publication of our Proceedings, and the value of all these activities in better equipping us all for our respective tasks has been considerably enhanced by our unique range of membership, from producers to research workers.

In these ways I believe we are making progress in the right direction, and that the formation of new Branches, and the holding of both Federal and State meetings in different locations, will further assist in widening the horizons of our discussions and our thinking.

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Can our Society do more to achieve its stated objective? Where do we stand in relation to the industries we serve? On our end of the soil-plant-animal relationship, we have the responsibility of developing and disseminating scientific knowledge which will enable the livestock producers of Australia to achieve the most efficient and economical output of animal production from every acre of the national pasture, and from part of the crops. Towards this objective we follow the four main lines of nutrition, genetics, reproduction and management, and in each of these lines we have already made valuable contributions—I refer to such examples as drought feeding, trace element nutrition, progeny testing, artificial breeding, and control of animal parasites.

It is difficult to measure the value of such achievements in terms of monetary value, but there is abundant evidence that the application of Australian animal research has already increased the value of our livestock production by untold millions. The point I wish to make is this—if this much can be done by a very small number of workers in such a comparatively short time, how much more could be achieved by the provision of funds to expand animal research and extension on a scale bearing a realistic relationship to the size, value and potential of the industries to be served.

Let me remind you that **animal** production accounts for approximately 25% of the net value(*) of all Australian primary and secondary production, while at least a further 14% of this total is derived from the processing of animal products. On the export side, animals and animal products contribute about 60% of the value of all exports; the price of wool may still be inflating this figure, but it would remain at 50% even if we assessed the value of wool on a price index comparable with the current indices for other animal products. These figures clearly establish the relative importance in our economy of the livestock industries, which in 1954-55 showed a gross value of production of over £760 million.

Taking a brief look at the potential for expansion of these industries, it has been estimated that within the belt of rainfall capable of supporting improved pastures there are over 300 million acres awaiting development, compared with only 70 million acres already developed in crops, forest and pasture. It is therefore obvious that pasture development, with assistance from the soil scientist and the agrostologist, will ultimately provide for a very much larger livestock population, with still wider scope for the application of animal science.

What secondary industry of such dimensions, let alone future potential, would fail to give top priority to an adequate research service? Our Governments and our livestock industries both have responsibilities in this regard, but until these are fully appreciated, Australia will continue to lag behind her competitors in achieving greater efficiency and economy in animal production.

I suggest that we, in this Society, should define our attitude to this situation. Are we to meet and discuss the problems we encounter in our various spheres, return to our laboratories and our paddocks stimulated as we shall be to greater efforts, and cheerfully accept the fact that the sum total of all our strivings represents only a fraction of what is really required? Should we develop a policy towards animal research and extension for Australian conditions, firstly to clarify our own thoughts as to the most effective lines for expansion of our efforts, and secondly to stimulate and guide Governments and the livestock industries as to what could be done with an enlightened outlook?

Is it our function, or our duty, to make wider use of publicity, and if so, in what forms and directions? In one direction, we have a public which, largely concentrated in the cities, seems blissfully unaware of the importance of the industries which not only provide the bacon and eggs for the breakfast table but also ensure the

*Net value = gross value at wholesale market, less cost of production, without allowance for depreciation and maintenance costs.

prosperity of Australia. Nor should we overlook the future citizens in our schools-it is my opinion that agriculture, in its widest sense, should be featured more prominently in the curricula of our schools, particularly those in the cities, with correct facts and figures to place it in its true perspective.

I do not propose to delve more deeply into these questions at this stage, but simply offer them for consideration in determining the future place of this Society in the Community.

I now turn more specifically to the field of animal research, to make a few observations on the efficiency of conversion of effort to results. In our research units, we have the choice between narrow or wide programmes, i.e., between specialisation along one main line to which a whole team may devote its energy, or a wider approach on a number of fronts, any one of which may bring results, but which involves splitting our forces in different directions. The tendency has been to maintain too many fronts, with resulting inability to make significant advances on any of them. It is my opinion that animal research is rapidly becoming a team job, involving consolidation of our forces for greater effort along fewer lines; we must select these lines with due care, and we must not make the mistake of attempting to cover too much ground in one operation.

At our present stage of development, we have few centres of specialisation in one particular field, but I believe that we will find a need for more such centres as we define our problems more clearly, and that we should bear this in mind in our planning for the future.

While fundamental research may well be more effectively conducted at one location, applied research requires to be carried out at a number of points. It is obvious that this is necessary to cater for the range of conditions for which applied results are required; but I suggest that there are two more reasons for having numbers of active Stations for this type of work-firstly, they should serve as the focal point around which our field extension services revolve; secondly, they should be readily accessible to the livestock producers they are intended to serve.

With regard to extension, no other extension medium can compare in value with the farm visit. We may stimulate interest in other ways, but when it comes to putting our recommendations into practice on his own property, the producer often finds that his particular set of conditions require adjustment to fit the procedures we have advised or vice versa. He, and hundreds of others like him, will have to wait for the day when we have adequate extension staffs to cope with the increasing demand for scientific assistance on the farm, where advice is required on subjects ranging from minor improvements in technique to major changes of the livestock policy of the farm as a complete unit.

I referred earlier to the need for efficiency in the conversion of the national pasture into animal products, and I should like to discuss one important aspect of this subject in a little more detail, as a further illustration of the need for correct thinking in determining our lines of attack. I refer to the utilisation of pasture, particularly when dealing with the seasonal fluctuations of pasture production in relation to the requirements of our livestock for a more or less even supply of feed throughout the year, a problem which presents a challenge to producer and research worker alike. In Victoria we find that pasture improvement is producing more and more growth in the spring, with comparatively little change in the other seasons of the year, except under irrigation.

In theory we could bring in more stock to fatten on the spring flush, and carry only basic numbers through the rest of the year. In practice, there is keen competition for the few available stores, and prices leave no worthwhile margin for profit.

We have not yet reached the stage of needing to conserve all the surplus growth of spring, and with pasture to spare at that

time we see the need for solution of problems, notably pleuro-pneumonia and transport, which now prevent the southward movement of larger numbers of cattle bred in the drier northern areas.

To return to our pasture, the next move **we** can make is to adjust the time of matings of our stock so that the heaviest grazing pressure on the pasture coincides with the spring peak of growth. This is of some value in seasonal dairy production, and a better example is the production of fat lambs to be sold off at the end of the spring. The same principle cannot be so readily applied to other classes of livestock production on account of factors operating outside the spring months, e.g. it is not desirable for lambs or beef calves to be dropped in the middle of the cold wet winter of our western plains, nor for lambs to be weaned on to dry summer pastures.

It is therefore apparent that we can do little towards really efficient utilisation of our fluctuating pasture growth unless we conserve the spring surplus to be fed back at other times, with the aim of continuous animal production throughout the year. I should not need to point out that this principle looks beyond the conservation of reserves only sufficient to **maintain** our livestock through periods of drought.

We are studying this principle of continuous full production in several trials in Victoria, both with dairy and beef cattle. Supplementary feed supplied to grazing animals for the purpose of maintaining full production in these trials is producing results ranging between two extremes—on the one end supplement and pasture are both being consumed with consequent increase in production; on the other, the cattle are maintaining themselves on the supplement and eating very little of the pasture. In the latter case, the spared pasture is not wasted as it is still there for future grazing, but we have not achieved the intended full production. We may be able to avoid this sparing of pasture by using different techniques of feeding the supplement, but before the story is complete I suggest that we will have to develop techniques for measuring the variable pasture sparing effect so that we can compare results obtained under different sets of conditions.

In the Western district of Victoria, we have a sheep situation in which the supplement is spared. Weaners on grazing alone regularly lose weight in the dry summer months, the only exceptions being those which have access to a green pick in gullies or swamps, and the fortunate few whose owners provide even limited areas of summer forage crops. This summer decline in weight is sometimes arrested by feeding a grain supplement; however, when the first green shoot appears after the autumn break, the sheep completely ignore the maintenance supplement and proceed to show further losses of weight on the early autumn pasture. A cold, wet winter follows, with virtually no growth of pasture, **and these** sheep may not regain their weaning weight until the following spring.

In the midst of this situation, we have the unconventional but effective approach of Mr. Harry Bishop, graduate of the School of Agriculture of this University. On his property near Penshurst, the sheep are confined to one-third of the grazing area from late spring until mid-winter. Every blade of surplus spring pasture is conserved as hay from the remaining area, and this is then fed back to the sheep on their restricted area over the next six months. In the meantime, autumn growth continues unchecked on the area from which hay has been cut, and by mid-winter there is enough feed to carry the ewes and lambs through to the spring flush. To guard against a shortage of winter feed following a poor autumn, a special reserve of hay is kept aside each year. This system has at least trebled the carrying capacity of this property.

At the State Research Farm, Werribee, we are building up a very interesting story on the effect of grazing intensity on the utilisation of pasture during the main period of pasture growth,

using dairy cattle. This work started with a comparison between strip and rotational grazing, from which animal production (measured as the total energy of liveweight changes and milk production) was the same on both systems. I should add that we believe the electric fence has definite uses, but we do not include among them strip grazing in the spring flush.

We then turned our attention to the effect of stocking rate itself, and, grazing equal areas with one of them stocked at the rate of $1\frac{1}{2}$ cows per acre, we lifted the stocking rate on the other area to 2 cows per acre. The result, not unexpected, was that the animal production from the cows on the heavier stocked area rose by 40% per acre above, but was 20% per cow less than the corresponding figures for the other group. The lower production per cow on the heavier stocked area shows, of course, that at this level of stocking the pasture intake of the individual cows in this group is being restricted, but their greater numbers account for the higher total production per acre. This work indicates that, during the period of pasture growth, grazing intensity rather than grazing management is the main factor in achieving better utilisation of pasture.

In studying the nutrition of grazing animals, the individual animal must also be considered. At any given point of time in the animal-pasture relationship three main factors are operating in order—the quality and quantity of the pasture, the intake of pasture by the animal, and the value of this intake in terms of effective nutrition—and I suggest that this is also the order of our present knowledge. We are on the way to estimating the intake with a fair degree of accuracy, but the fate of that intake inside the animal presents a wide field of study, hardly touched as yet, in which the physiologist, the biochemist, and the bacteriologist will all have important roles.

In considering our present stage of knowledge of this and other phases of animal nutrition, I find that we have for too long neglected the important task of establishing our own Australian feeding standards for the nutritional requirements of our livestock, although a start has been made in respect of drought requirements of sheep.

I have briefly outlined some aspects of efficiency in utilisation of the national pasture, not only because this subject should be of great intrinsic interest and importance to every Australian, and to members of this Society in particular. It also presents an excellent example of a very broad problem in animal production, the solution of which requires the services of many specialists, covering the full range of animal science and grouped most effectively for attack on selected aspects.

The science of animal production is advancing, in Australia as elsewhere, at least as rapidly as other sciences capable of writing their names in the heavens for all to see. The sheep which carries Australia on its back is on its way to becoming a different sheep—it is being microscopically examined from every conceivable angle, and is slowly being fitted with improvements designed for even more dependable and luxurious carriage of its increasing load. However, the development of new models takes time, and the frequency of their unveiling is limited only by the total effort devoted to efficient research, design and testing. We also require more demonstration models for public inspection, and these must be backed by an adequate sales campaign.

Let us also remember that the effects of our work are not confined to our own country. Australia, with its great potential for livestock production, has serious moral obligations, and some more specific, to assist in feeding the undernourished of the world in which, since I commenced my address, the population has increased by approximately one thousand—roughly one more at every second beat of the human heart.