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HIGHER AGRICULTURAL EDUCATION

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IT IS WITH PLEASURE that I welcome you to this Conference of the Animal Production Society and it is with particular pleasure that I welcome those who were present at the first meeting of the Society held in Wellington twenty-one years ago in 1941. Approximately one-third of the 66 foundation members are still active and I trust will be making contributions in the field of animal production for many years to come. No less welcome are our more recent members and I hope that they will derive as much pleasure and satisfaction from their membership as have the older members.

I have an even more important function than welcoming you this morning. It is to provide you with a viewpoint on some aspect of animal production. I do so with some hesitation and the hope that my thoughts may give rise to useful discussion. Though keenly interested in the subject of dairy cattle improvement, I have chosen another field of animal production as the subject of my brief address. The animal in this case is the human, the productive capacity of which is determined very largely by the educational processes to which it is subjected. In other words, I wish to make some comments on that sphere of animal production labelled higher agricultural education, and in particular to consider some aspects of the degree training which we provide for what seems to be an ever-increasing number of students.

There are many questions relating to degree training for which we seek answers: What will be New Zealand's annual demand for agricultural graduates during the next quarter century? What sort of jobs will these graduates get and how should they be trained so as to be well fitted for them? What type of agriculture will the graduates be expected to service in 25 years' time? The answers to these questions are needed for us to plan efficiently for the future. Since the answers are not likely to be known until the period has almost elapsed, we must rely on educated guesses. My opinion is that probably one-third

or more of our students will, in twenty-five years' time, be employed in types of jobs that do not now exist. Even in types of jobs that do exist today one cannot estimate the need for trained personnel in 1985 from the level of demand in 1960. The speed of the technological revolution which we are witnessing is accelerating and the need for technologists and technicians increases year by year. There may be some who feel we have reached a plateau of technological achievement from which we can advance but slowly and therefore have little need for more technologists. I can see no evidence of this. On the contrary, I think we are on the threshold of major advances which will be realized when we bring under control some of the sources of power which at present are almost within reach. The new potentials in agriculture, however, will be realized only if there are adequate graduates available to capitalize on the fresh opportunities as they appear.

For our own domestic needs, I foresee increasing demands for the products of the Agricultural Colleges which we will be unlikely to meet for at least the next decade. When to this local need is added the requirements of overseas countries, I am confident that the 100 agricultural graduates which New Zealand will be producing each year from 1964 onwards—in contrast with the total of 20 per year hitherto—need have no fear of unemployment nor that they will not be making a worthwhile contribution.

Spectacular increases in the number of degree students at the Agricultural Colleges have been of interest to us all and, if I may digress, I would like to put forward some of the reasons for the phenomenal rise in enrolments at the Agricultural Colleges during the last three years.

- (1) The increase in the birth rate from the low point of the depression years to the increasing rate of the early war years has contributed a little but the full effects of the "rising tide" will not be felt until 1963 and 1964.
- (2) Approximately one undergraduate in six at Massey is from overseas—from Australia, from South-east Asia and from the Pacific—and they have accentuated the natural increase. In 1960 Massey had almost as many overseas undergraduates (36) as its total undergraduate roll three years previously.
- (3) The sudden popularity of university education has had a very marked effect. This should not have been unexpected if the increasing popularity of secondary school education over the last fifteen years had been noted.

- (4) Perhaps as important as the last reason and applying only to the Agricultural Colleges has been the provision of Pure Science teaching together with hostel accommodation in an agricultural environment for first-year students. This appears to have encouraged into professional agriculture many country youths who previously were reluctant to attend the crowded city universities and live in "digs".

The phenomenal growth in student enrolments may be best expressed in terms of second-year Degree students. The 1954-57 average second-year class was 15, with the number down to two in 1955. In 1958 there were 26 second-year Degree students, in 1959—43, 1960—62, and in 1961 we estimate that there will be at least 75. A five-fold increase in four years has educational implications which are only now being thought out. There is considerable strain because of lack of equipment and accommodation and also because we are having to develop new educational methods appropriate to large classes. For example, there is now understandable reluctance on the part of staff to set projects since this involves marking them and this important aspect of instruction can be employed only if staff/student ratios are high. Further, staff-student contacts are necessarily decreased though we have endeavoured to counteract this with a mentor system. Again, the proportion of students living in hostels is declining rapidly with no compensating provision of Student Union facilities. Thus the proportion of students engaged in extra-curricular activities and the process of educating each other is falling.

Remedial measures for these shortcomings consist in the main of persuading Government to make increased financial arrangements. But there are other more fundamental aspects of technological education which deserve our attention. There are two in particular that I would mention and both relate to course content. The first is, how we can cram into the minds of our students all the extra knowledge that is the result of recent scientific achievement. The second is, should we provide a general component in the agricultural undergraduate course which will encourage in our students an interest in the humanities.

In respect of the first—coping with all the extra knowledge—the answer appears to be a very much greater concentration on mathematics from an early age. The two great instruments that have been devised for understanding the world are words

and numbers. Our schooling to the age of 18 emphasizes the verbal disciplines. Years are spent in teaching languages and, while I appreciate that words must be used with precision so that the statements they comprise are meaningful, I think it more important to train young minds to think logically. Because mathematics is exact, and unlike language has no irregularities, it is more readily absorbed. It makes demands on reason rather than on memory and all other things being equal it appears that those well trained in mathematics are able to assimilate greater quantities of scientifically based information than those who are not so well trained. But at Massey we have students commencing our degree courses with only vague notions of mathematics. Are we to repair these omissions at Massey with formal courses in elementary mathematics in an already crowded curriculum? The real need is for our students to commence their agricultural course at least competent in sixth-form mathematics and prepared to advance still further in this discipline. Quite apart from the value of maths *per se*, in view of the extensive use made of mathematics in the undergraduate course, there is a growing body of opinion in favour of Mathematics I at least being taught as an integral part of the agricultural degree.

The second aspect of course content to which I wish to refer is the need for technological courses to be designed to meet the danger of narrowness and "cultural" starvation as a result of the specialization which takes place or should take place at the university. Many will hold that it is the function of the secondary schools to provide the broad cultural base which will develop subsequently in extra-curricular activities at the university. Unfortunately the secondary schools do not always provide this broad base and University Special Schools may, because of their isolation, be remiss in their provision of extra-curricular cultural activities. In such cases should formal courses in general education be provided? Two or three hours' instruction each week in the humanities may find response in the most unexpected quarters. Just where compulsory courses in "culture" can be fitted into a programme already overcrowded and now threatened with mathematics is a problem. It is one, however, that we must face up to. Though some employers of our graduates will be concerned mainly with their academic attainments, there will be a number to whom personality and breadth of interest will mean a great deal provided the graduate has shown reasonable competence in his formal courses. Further, the graduates themselves are likely to derive a great deal more

from life if they have an appreciation of interests other than their own narrow professional ones.

I have deliberately kept away from the physical problems which confront us at Massey—those of accommodation, research facilities and so on—and emphasized the new things we might consider teaching in the future in order to produce better graduates. Any developments, however, must depend upon staff and it is the staffing situation which is likely to be the critical issue during the next decade. In ten years' time, some of the increasing numbers of people who are now passing through our post-graduate classes may be ready to join the teaching staff. In the meantime, as an interim measure, the shortage of staff can probably be made up only by placing more and more reliance on part-time teachers. But to ensure that we attract the best of the students at present passing through our graduate classes back to the university we must be prepared to see the responsible positions in the universities being better paid than their equivalent non-university positions. It is axiomatic that the best men should be attracted back to the university to teach the next generation. It is likely that some of our colleagues in the research stations may find themselves in mild disagreement with these thoughts.

I trust that in omitting mention of research, extension, food technology, diploma teaching, and veterinary schools, I have not inferred lack of interest in these topics. Far from it, but it seemed to me that an audience such as this, composed in the main of graduates, was the most appropriate with which to discuss the important topics I have endeavoured to outline.