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University Agricultural Education

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I ASSUME that your Executive when asking me to read a paper on University Agricultural Education in New Zealand had in mind a review of the major problems confronting the two agricultural colleges with particular reference to the Degree Courses and their requirements. As 30 minutes is a very short time for such a large subject, I shall have to confine myself to certain major questions and keep very much to the point.

I am not, of course, empowered to speak for Lincoln, but at the same time I cannot speak as if the problems were purely those of Massey. I trust, therefore, that I shall be forgiven if I appear to exceed my authority. The views expressed in this paper are, I would emphasize, entirely my own.

THE COURSE FOR BACHELOR OF AGRICULTURAL SCIENCE:

A suitable starting point is, I think, a consideration of the Bachelors or pass degree in Agriculture in its relatively new form, which has come in for a certain amount of criticism.

The standard set in this course is high, as comparison with institutions overseas shows, and an able student can obtain a first-class training. On this point I will give way to no one. This is not to say, however, that the course itself cannot be improved. As is frequently the case in the University, where matters of this sort are concerned, there are some differences of opinion on several fundamental aspects of its design.

The basic conception of this design is a course which provides in the first three years an adequate training in the necessary pure and applied sciences cognate to agriculture together with a balanced introduction to what I will call farming subjects, the whole providing an adequate general foundation for the fourth year in which training may take one of several directions. In this final year a student may select from the list of subjects offered either what may be described as a general and balanced course suitable for, say, extension workers, or a combination of subjects which represent the beginning of specialisation in some one major field, for example plant work or animal work. The point to note is that the training in the first three years is considered to give the student who elects to begin specialisation a sufficient background of general agriculture.

This course and its structure is criticised by some on two scores; firstly on the ground that being a year longer than the course for B.Sc. and, therefore, more expensive, it tends to divert students to the shorter course, and secondly because it permits a certain amount of specialisation.

There is undoubtedly some truth in the first contention, but any shortening of the course is fraught with considerable difficulties, as those of us who have tried to design a satisfactory shorter course know only too well.

In the first case the subjects which together make up agricultural science have developed to a point where considerable amounts of certain basic sciences are essential pre-requisites. I do not think anybody would argue with this contention, but I doubt if those not familiar with the teaching of the present course appreciate the extent

to which basic pre-requisites, just as much pure science in character as he Intermediate Examination, now form essential parts of certain subjects of the First Professional Examination. Further, I would remind you that in order to lighten the Intermediate Examination, which was too heavy for the average man, Organic Chemistry was moved into the First Professional Examination—thus further increasing the amount of time allotted to basic science in this examination and consequently decreasing that available for essentially farming subjects.

Any suggestion of worth-while reductions of this fundamental training at once brings forth statements from the teachers concerned that such action would make it impossible satisfactorily to teach their subjects in their present-day form, especially for the purpose of men who may later decide to take higher degrees. The inclusion, however, in a three-year degree of the amount of basic pre-requisites considered essential by the teachers, results in the unavoidable cutting down of too great an amount of applied agriculture—farming.

It has been argued that the problem could be solved by lengthening the course for the Master's degree to two years, in the first of which students would pick up those portions of science subjects necessarily dropped in the re-casting of the three-year course. Such an arrangement would have two disadvantages.

In the first place the standard of the pass degree would be lower, and men leaving the University at this stage would therefore have a poorer foundation for their life's work. It is argued by some that the training would, however, be adequate for some fields of work, such as teaching in schools and even, perhaps, extension work. This is possibly correct in the case of teachers in secondary schools, although I would remind you that such teachers have, almost invariably, to teach certain science subjects as well as Agriculture.

Further, as teachers must spend a year at a Training College, their total training involves five years if they take a degree in Agriculture, whereas a graduate in Science can qualify as a teacher in four years. The additional cost, which includes a year in which they would be drawing a salary, is no doubt deterring a number of would-be teachers from taking Agriculture. This is a strong argument in favour of the shorter course.

However, to lower the standard of a degree is a very serious step to take unless the weight of evidence in favour of such action be overwhelming. It must be remembered that we must try to foresee future developments in agricultural instruction and research and the consequential training which the graduates of to-day should be given if they are to be of the fullest use to their country and successful in their professional careers. What may appear expedient to-day might prove quite inadequate in the light of the demands made on to-day's graduates in 10-15 years' time. I personally anticipate that the steadily increasing employment of research, together with the development of a still receptive farming community, will see a far more highly geared agricultural service than we have to-day.

In the second place, students would have a very strong objection to harking back to certain sections of relatively elementary basic science in their fourth year, especially if, in their opinion, some of the ground to be covered did not appear to have very much bearing on the field in which they had decided to specialise.

It can be argued that this ground could be confined to subjects cognate to a man's field of specialization. This would be possible, but I doubt if it would be found, on analysis, that much could be dropped. From experience I would hazard a guess that any pruning would be more than offset by the insistence of teachers on increased amounts of the cognate sciences.

I would remind you that it is axiomatic that the plan of any course should provide, as far as possible, logical progression to the final stage. The majority of the most able students take a Master's degree, and it is essential that the design of the course should not only be sound but also appeal to them.

Stated succinctly, our problem arises from the fact that we are trying to make one course serve the needs of students who are going out into different fields of work, and who, therefore, require slightly different training. There are the men with the ability to go to the top in the University, in the international field of research and in those Government Departments concerned with one aspect or another of the agricultural industry. Such appointments carry heavy responsibilities, and the men filling them should have had the assistance of the best training we can give.

There are several Government Departments, the majority of whose employees are engaged mainly in work "in the field". Such departments prefer men who are particularly strong on the practical side, although when in senior positions as a result of promotion they are expected to possess a knowledge of their subject and the vision for which a first-class training is of great assistance.

Then there are those who wish to become teachers in secondary schools, whose requirements in terms of advanced agricultural science are again different.

As I stated earlier, our present course offers an excellent training as college training goes; our men can hold their own with the graduates of any agricultural college. We must, therefore, walk warily in the matter of alterations to the degree course. Our endeavour, however, should be to meet the country's requirements. As a rule one cannot "have it both ways" in this world, but it may be possible on further examination of the problem so to re-design the pass degree as to meet the requirements both of those who need the present type of course and those who require a more elementary training. Personally I am not wedded to any one type of course; my concern is that any course should do efficiently what it is intended to do—meet the requirements of the particular circumstances but with an eye to the futures of the men being trained. The latter is a considerable responsibility. Perhaps I may add for your consideration the suggestion that a graduate is probably a better man in the long run if his training in fundamentals has been sound; after leaving College he can more easily build up his knowledge of applied agricultural science than fill the gaps in his basic training. In many appointments few opportunities occur for the latter, and, as a matter of fact, not many men have the inclination to do it.

Representatives of the Professorial Boards of the two agricultural colleges will be meeting before long to discuss various matters of common interest, when the structure of the present degree will come under review.

The suggestions which have been made will be examined very carefully, and, I may add, for the benefit of those who have not worked on this type of problem, that the only sound method is to set out proposed syllabuses in detail, showing the number of hours available for lectures and practicals for each section of the component subjects in the light of the number of hours available in each academic year.

Finally, I may add that in 1949 I discussed this matter with the heads of several well-known Colleges in Great Britain, and found that in a number of cases they would like to extend their undergraduate courses to four years in view of the increasing difficulty of covering adequately in three years the ever-widening field of work. In this

connection it must be remembered that as research progresses, so the field of work to be covered, even at the pass stage, expands. A large number of graduates of British agricultural colleges, however, return to farming, and for these men four years would be too long a course. The colleges are afraid of a drop in enrolments, and, therefore, adhere to the shorter period.

Turning to the degree of specialisation permissible in the present pass degree; this has come in for a certain amount of criticism, but personally I am still strongly in favour of it. It seems to me absurd to expect a man who is inherently a plant man and does not like animals, to take an interest in advanced animal husbandry in his fourth year, and vice versa. How many members of this Society are genuinely interested in horticulture, which is merely intensive plant husbandry? There are, of course, many men primarily interested in farming, as opposed to some specialised subject, which theoretically involves an equal distribution of one's favours. Under the present arrangement such men can select a group of subjects which gives them a balanced training in their fourth year—one, as I remarked earlier, suitable for the extension worker. On the other hand, in any group of students of any size one will always find those with an intense love of animals, or a born love of working with plants, and I maintain that it is absurd to force down their throats in their fourth year, subjects in which they are not interested. They are naturally critical of such an arrangement as being a waste of their time, and put the minimum amount of work into such subjects.

The first three years of the course provide a fair foundation of general agriculture for those who are going to specialise. To insist on a further year is too idealistic—the men can afford neither the time nor the expense.

DIPLOMA AND SHORT COURSES.

These courses are not University courses, and to that extent might be omitted from a paper dealing with University Agricultural Education. Nevertheless, the fact that both agricultural colleges offer such courses has resulted in a certain amount of criticism on the ground that such work is a waste of the time of highly trained staff, and interferes with the degree teaching and research. I feel, therefore, that a few words on this subject are necessary.

Let me say in the first place that I have no doubt that the majority of the staffs of the two colleges would much prefer their teaching to be confined to University courses, as such an arrangement would simplify their personal programmes and, theoretically, allow them far more time for reading and research. I would point out, however, that the colleges, as I see it, have a duty to the country and to the agricultural industry. There is unquestionably a demand for non-degree courses of one kind and another. The industry clearly needs the help of such courses, and, if efficiently given, they can do a great deal of good. Since at the moment there is nobody else to give them, it is, in my opinion, the duty of the agricultural colleges to do so, always provided they don't try to take on too much. Some of the courses are certainly elementary by University standards, but I think that in these days we have got to use commonsense and give the technical assistance where it is required, if we are best fitted to do so.

As regards interference with University work proper, this can be very much reduced by adequate staffing so that those with an aptitude for research do not have to carry too heavy a load of teaching. Further, the ideal, in my opinion, is to so arrange duties that certain men carry the bulk of the short course teaching, and others the University lectures. I grant you that it virtually involves

the appointment of two types of men within the departments mostly concerned with short course work, which in this College are Dairying, Dairy Husbandry, Sheep Husbandry and Soiles and Manures.

Further, and as a matter of fact, specialist short courses do not have as wide an impact on the staff as a whole as many people would appear to imagine. In this College it quite often happens that a course affects only one or two departments at the outside. The rest of the College, one might say, is hardly aware that the course is being given.

I would remind you also that the contact with the industry arising from short courses is very valuable; it is of considerable help in keeping staff in touch with problems and with what the industry is thinking. Further, it has considerable advertising value.

In my opinion, if this College, for example, were to drop all courses of the type in question, it would not only rapidly lose the support of the farming industry, but also be unable to justify a staff of the present size. The lecturers, as members of a reduced staff, would find themselves having to cover very much wider fields, and would very soon complain that they were unable to keep abreast of the amount of reading connected with such fields. It is doubtful if opportunities for research would be any greater than they are at the moment.

Finally, I should like you to know that this College does not go looking for work of this type. We are not giving nearly so many short courses as we were in the immediate post-war period, but if the need is genuine, the number of students offering worthwhile, and we are able to give the course, we do so. In this I think we are perfectly right, always provided we do not allow such work seriously to interfere with our University work; it is a matter of careful judgment. I should be sorry to see this institution shutting itself up in academic seclusion; an agricultural college to be a success must be continuously in close touch with the industry and keep its feet firmly on the ground. In any case, at this stage of the development of agricultural instruction in New Zealand the complete dropping of diploma and short courses is in my opinion out of the question.

RESEARCH.

I am a firm believer in research at the agricultural colleges, and I imagine that most of you will be of the same opinion. I am, of course, familiar with the statement so often made that at a college teaching and research must clash—that one or the other must suffer—but I am confident that with adequate staffing there need be no serious clash. Quite apart from the fact that colleges cannot run the risk of becoming moribund and that they are capable of making valuable contributions to knowledge, they must undertake research if they are to give the right sort of training to men going for higher degrees. The value of the training at any post-graduate school is largely proportionate to the extent to which the staff is itself engaged in major research. You all know that perfectly well. It is, therefore, essential that sufficient funds be provided annually to enable the problems of administration and finance adequately to be overcome.

I would also call your attention to a point which would appear to be overlooked by so many of those who hold the opinion that research should be delegated almost entirely to research institutions and that the colleges should confine themselves to teaching, and that is that first-class men will not, as a rule, take up teaching appointments if the latter preclude any opportunities for research—and I think you will agree that they would be foolish to do so. Over a period of time this could have a serious effect on the standard of teaching. Employers of graduates would begin to ask what was the matter with the

colleges—they lacked life and the quality of their graduates was falling off. Such criticism would probably be justified, but the fault would lie with those responsible for the policy. I say, quite frankly, that I am afraid that the re-organization of research in Great Britain, as it is developing in practice, will tend to handicap the agricultural colleges in that country.

I am well aware that cases can be quoted of grants to colleges for research purposes not being efficiently utilized for one reason and another, but I maintain that the return on money invested is just as high as in the case of purely research institutions where plans often go adrift. The results may not bulk very large, but in this country the amount granted annually to the colleges for research is a mere bagatelle compared to the total amount spent annually by Departments of State.

I sincerely hope that with the steady development of the colleges, the addition of a greater number of senior staff and the provision of more facilities, their potentialities for research will be better appreciated by both the Research Council and our confreres in the University. The past twenty-five years have been a difficult time so far as Massey is concerned. The establishment of the college has inevitably taken up a lot of the time of the staff. Development in the future can hardly be at so rapid a pace, and far more time should, therefore, be available for work at the research level.

THE QUALIFICATIONS OF GRADUATES.

There is a tendency in some quarters unfairly to criticize the young graduate in agriculture. This arises from the fact that the impossible is often expected of him. The practice of farming plus agricultural science together constitute an enormous field in all parts of which no one man can be an expert even after a lifetime of hard work. The practice of farming demands years of apprenticeship and agricultural science a long training. When a man is engaged in the one, he is not becoming proficient in the other. It is unreasonable to expect a young man in his early twenties to know all the answers to practical farming under widely varying conditions and also to have at his fingers' tips the answer to any technical question you may care to put to him, simply because he has been to an agricultural college.

The most that a college can give a man is a good grounding in agricultural science and in the principles underlying the practice of farming while at the same time seeing that he gets good experience in practical farming during the three summer vacations—rather less than twelve months in all. Clearly the raw graduate has still much to learn, especially as regards practical farming, and his initial employers must continue his education. In the case of those Government Departments concerned more particularly with work 'in the field' the young employee should be attached for some time to an experienced officer, more or less as a supernumerary. Unfortunately, this is not always possible owing to shortage of staff, and the beginner is placed in a position where too much is expected of him.

The problem of training the efficient extension worker exists in all countries with an extension service, and I can see no solution to it other than an appreciation of the fact that a college can provide only a part of the training required—the employing body must provide the remainder.

I have heard it suggested that in the training they give the agricultural colleges should concentrate far more on the practice of farming and leave advanced agricultural science to men who have come up on the pure science side. While admitting that research is

requiring more and more a thorough grounding in science, and that the argument holds good so far as applied chemistry and physics are concerned, I would point out that for a number of subjects the degree in agriculture is still the best training. Take, for example, the cases of Genetics, Entomology and Plant Pathology. Further, a well-trained graduate in agricultural science is so frequently needed in a research team composed otherwise of graduates in science, since the latter are unable to see their work in relation to the practice of farming. At the same time, I毫不犹豫地 agree that the University should devise some scheme whereby graduates in science can take advanced training in the agricultural application of their subjects and be rewarded with suitable higher degrees. This is another matter that the Professorial Boards of the two agricultural colleges will shortly be considering.

There are other matters on which I might have given you my views had more time been available. I refer to a better appreciation of our work by the four main colleges, and, in particular, factors affecting the intake of students. Their inclusion would, however, have extended this paper considerably—in fact the latter is big enough for a paper on its own. In any case, it is best left until we have received the memoranda on the subject which are being prepared by the present and past students' associations.

In conclusion, I should like to say that although I was surprised at the inclusion of Agricultural Education on the agenda for the Annual Meeting of the Society of Animal Production, I am particularly pleased with the interest thus shown in this very important subject. The different points of view which I expect to hear this morning should be of considerable assistance to those of us responsible for the academic work of the agricultural colleges.