Age. 17.8.25

AFFORESTATION

Federal Education Plans.

Co-operation with the States.

Slow progress is being made in the establishment of a Federal forestry school. The need of education in forestry has been abundantly emphasised in recent years, and innumerable warning voices have been raised against the consequences of apathy, neglect and wastefulness that have characterised the management of Australia's forest resources past and potential. So far Western Australia has decided to nominate two students to the school, and New South Wales three. Replies from South Australia, Victoria and Tasmania are still awaited. The Commonwealth forestry adviser, Mr. C. E. Lane-Poole, has visited all States except Tasmania, and explained the proposed system of higher forestry education. With the exception of the Provisional Forestry Board in Queensland, forest authorities of other States visited have supported the scheme.

In Queensland students may now take a special two years' science course at the university, then a year's practical experience in the forests, and finally one student is chosen annually to go to the forestry school at Oxford to take another special course if it can be arranged. This European course will have a duration of one and a half to two years. The system has only been going eighteen months, so none of the students have as yet reached the stage of being eligible for selection for Oxford. The provisional forestry authority of Queensland, however, considers this a better system than the Commonwealth proposal, under which the student would do two years' special course at the university and then two years at the Australian forestry school.

Senator Pearce said on Saturday that those best qualified to judge were of opinion that the advantages that a student would gain in seeing the well-managed forests of Europe, while very great indeed, were to a great extent dependent on the degree of forestry education the student had received. The teaching at Oxford was mainly directed towards training men for India and the tropical Crown colonies; the professors were not acquainted with Australian conditions and forestry problems.

Putting aside altogether the national outlook, which was that all training should be given in Australia, the advantages of the Queensland department's proposal, the Minister said, were outweighed by the obvious disadvantages. It was hoped, therefore, that the Government of Queensland would come into line with the other participating States and nominate students for the Australian school. The preliminary university course to fit students to take the forestry course had been discussed with the universities of Western Australia, New South Wales and Queensland, and satisfactory arrangements made with each. The council of the University of South Australia had decided to close its own course in favor of the Australian school. It had, however, an obligation to those students who had not completed their course, and it had asked the Commonwealth Government to assist in completing their forestry education. While the Government was very anxious to assist in any way possible, it was unable to decide this question until participation of the majority of the States in the Australian forestry school was assured.

It was anticipated that finality would not be delayed much longer. In the meantime the forestry adviser had left for Canberra to consult with the Federal Capital Commission to choose the site and go into the plans that had been prepared for the school buildings.

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Steady Progress at Waite Research Institute

STATE EXPERIMENTS WILL BENEFIT COMMONWEALTH

Australia is under a debt of gratitude to this State for having consistently through the years shown the way in agricultural research and development generally.

The invention of the reaping machine by Ridley marked but one of the many forward steps in agricultural development in the Commonwealth initiated in South Australia. The use of artificial manures, and the practical utilisation of artesian water for farm purposes might also be mentioned in this connection. Experimental farms throughout the State are doing valuable work.

Without any fanfare of trumpets the latest progressive move has been begun on a fertile area nestling at the foothills of the Mount Lofty Ranges. Here Dr. A. E. V. Richardson and several other scientists are delving deeply into the secrets of nature in the search for information calculated to advance our great agricultural industry.

The Waite Agricultural Research Institute is already established on a firm basis. With remarkable foresight Dr. Richardson (Director) has planned its activities. Professor J. A. Prescott and Messrs. G. K. Samuel and C. S. Piper are valuable lieutenants, and the combined activities of the four are destined to have a far-reaching effect on the progress not only of South Australia, but also of the Commonwealth.

A pioneer pastoralist of South Australia—the late Mr. Peter Waite—set a the example when he made a gift to the Adelaide University of Adelaide of the beautiful Urrbrae Estate at Fullarton for the benefit of future men on the land.

On this magnificent property the Waite Agricultural Research Institute has been established, and research work in agriculture is being conducted in the interests of agricultural science and the agricultural community.

Research in agriculture is an insurance against the future. Without it the practice of agriculture will remain stationary and the teaching of agriculture have but little meaning. Progressive countries have long recognised that by fostering research work in agriculture the productive capacity of the nation is greatly increased.

If we are to keep pace with the progress in other countries science must subtend an ever-widening angle to agricultural practice. The farming methods of the country must be improved by the application of the teachings of science to every form of primary production.

Development of Institute

The land left to the University under the Waite bequest amounted to 300 acres, comprising the three estates of Urrbrae, Claremont, and Netherby.

Portion of the area comprises land typical of the Adelaide Plains, and on this the main field experiments are located. The remainder consists of hilly country rising to an elevation of 1,200 feet, and on this portion the investigations on native and seeded pastures are being conducted.

The Institute began its official existence in March, 1925, when the staff was appointed. The initial work comprised the clearing of a sufficient area of land for laying down experimental field plots, and the establishment of laboratories in which the scientific work of the staff could be conducted.

Forty-two acres of land, originally covered with peppermint and sugar gums, have been cleared and a permanent experimental field of 30 acres has been sown with 250 experimental field plots.

Dr. A. E. V. RICHARDSON,
Director of the Waite Agricultural Research Institute.

Portion of the existing outbuildings have been converted into an agricultural chemical laboratory and plant pathological laboratory, and fitted with scientific apparatus and equipment.

A pot culture house and a wire-screened enclosure 80 ft. by 18½ ft. have been erected for conducting certain fundamental investigations on the food and water requirements of farm crops.

A meteorological station has been established at the institute, and daily records are taken of air pressure and temperature, soil temperatures at depths ranging from 1 inch to 24 inches, the rate of evaporation from a free water surface, amount of bright sunshine, and atmospheric humidity.

A grass garden has been established consisting of 100 varieties of native and introduced grasses and fodder plants. On the Claremont estate a series of demonstration field tests comprising the top dressing of native pastures with various fertilisers has been laid out in plots one acre each in size. Portion of the homestead building is being used for offices, library, and museum.

A set of permanent field experiments was considered essential by Dr. Richardson for the scientific study of problems relating to the production and utilisation of farm crops. The field experiments supply the data on which improvements in practice are ultimately based, and provide material for laboratory work in soil chemistry, soil physics, soil bacteriology, and plant pathology.

Thirty acres of land, typical of the Adelaide and coastal plains, has been cleared and sown with 250 field plots. The tests in this field comprise the following:—Permanent rotation tests; fertiliser tests with wheat, oats, barley; rate of seeding and time of sowing tests with wheat, oats, barley; experiments to determine the experimental error in field investigations; and plots for the study of the inheritance of characters in wheat, oats, and barley.

Crop Rotation Systems

The object of the permanent rotation tests is to determine the best system of crop succession for land with a 20-inch rainfall, and the changes which take place in the fertility of the soil as a result of varying systems of crop rotation.

Under some of the systems of rotation cropping practised in these plots the land is improved in fertility. Under other methods the fertility is gradually depleted. In future years, therefore, this series of plots will provide the soil chemist, bacteriologist, and physicist with valuable material for studying the influence of varying systems of cropping on soil fertility.

A group of 60 fertiliser plots has been sown to determine the influence of varying fertilisers on the growth and yield of wheat, barley, and oats, and the cumulative effect of each fertiliser on the fertility of the soil.

A series of 60 plots has been sown without fertiliser to determine the experimental error in field tests, and what might be termed the natural fertility of soil.

Other field plots comprise early and late sowing and rate of seeding tests with wheat, oats, and barley. Quantities of seed ranging from 30 lb. to 120 lb. an acre have been sown to determine the influence of rate of seeding and time of sowing on the yield of cereals. Field tests of 45 varieties of wheat have been sown to determine the best varieties for the Adelaide coastal plains.

Top-dressing

An area of land on the Claremont estate has been set apart for top dressing tests on natural pastures. Twelve different dressings of fertiliser have been applied to the natural grass to determine the effect of fertiliser in stimulating the growth of natural pasture.

Striking differences are already noticeable between adjoining plots. On one plot treated with two cwt. of superphosphate there is a marked increase in growth, the border line between the unmanured and manured portions being pronounced. Over the unmanured section is poor, scanty pasture, while the phosphate treated plot is covered with a dense growth of grass and clover.

One important section of the field work is that relating to cereal breeding, and the determination of the mode of inheritance of various unit characters in wheat, oats, and barley with a view to providing a scientific basis for the production of imporved varieties of cereals. More than 300 cereal plants, comprising varieties of wheat, oats, and barley from all parts of the world, have been sown in this section with a view to conducting systematic experiments in hybridisation.

A grass garden consisting of 100 varieties of native and introduced grasses, fodder plants, and clovers has been established. All those varieties of grasses and fodder plants of possible value to South Australian conditions will be tested in this section before being grown on a larger scale in the field.

Chemical Laboratories

The original coachhouse at Urrbrae has been adapted and equipped as a chemical laboratory, and will serve admirably for the purpose until something of a more permanent character is available. The work of the laboratory is in the hands of Professor Prescott and Mr. Piper. The application of the science of chemistry to agricultural problems are manifold, and include the nutrition of plants, problems of manuring, and soil amelioration, the composition of crops, and the feeding of the farm animals.

For the present attention is being devoted exclusively to those branches of agricultural chemistry related directly to crop production and particularly to soil problems. Probably the most important need at the present moment is a soil survey of the agricultural areas of the State, but this is a large problem, and in the first place is essentially an extension of the geological survey.

Meanwhile it is hoped to make a study of the most important agricultural soil types of the State. Of recent years many new methods of investigation have been developed and are being developed at the present moment. Such methods as seem likely to prove useful are being tested out and applied to local conditions.

Many Australian soils are notably deficient in phosphates, and the study of this problem is probably well worth undertaking so as to determine the most effective method of remedying the defect by the skilful manuring of cereal crops and of pastures.

The question is not so much whether superphosphate ought to be used or not, but how much is to be used, and whether it is not possible to make use of other types of phosphates, particularly in the top-dressing of pastures.

One of the most important of soil characters is what is known as the soil reaction. This can be expressed in many ways, but to the farmer the question eventually comes in the form whether or not he ought to use lime or gypsum and how much should be profitably applied. This question is also interesting in connection with native vegetation, pastoral problems, the incidence of plant diseases, and with the effective use of irrigation waters, and is of world-wide interest at the present time.

The field experiments will afford valuable material for chemical investigation, the changes that take place in the soil under the different systems of rotation and during the processes of cultivation are being followed in the laboratory.

Pot Culture Important

A pot culture house and wire-screened enclosure 80 ft. x 18½ ft. has been erected for undertaking certain fundamental investigations on the water and food requirements of Australian farm crops and native grasses at vary-