REG. 12.2.27

MAN ON THE LAND.

AGRICULTURAL RESEARCH.

World's Increased Activities.

Address by Dr. A. E. V. Richardson to the Adelaide Rotary Club.

In all countries I have visited during the past 12 months agricultural research was being pursued with an earnestness of purpose which left no doubt as to its value and importance to the community. The great war served to demonstrate to Europe how vitally necessary agriculture was for national defence. At the same time the great demand for foodstuffs stimulated agricultural development in all neutral countries. Agriculture in Europe had reached a high level of development prior to the war, and it was recognised that as most available land had already been intensely farmed, the best way for further production would be through the application of science to agriculture. Hence, though the national exchequers had been depleted by the war, the support for agricultural research had been most liberal.

In England the Imperial Government had given material encouragement and excellent work was being done in every branch of agricultural and livestock production. The appropriations for the Ministry of Agriculture for the present year exceeded £2,000,000, of which one-third was expended on agricultural education and research. The appropriations of the Government of the Irish Free State for the Department of Agriculture exceeded £500,000, while £200,000 was devoted to a similar purpose by the Government of Northern Ireland. The great interest taken by the British and Irish Governments in the development of agriculture and agricultural research was in marked contrast to their attitude prior to the war.

Object Lesson in Denmark.

Denmark provided an interesting object lesson in intensive agriculture. It was a small and relatively poor country of some 11 million acres in area, but nowhere in Europe was the yield per acre from crops and the production of milk from dairy cows so high. This was undoubtedly due to three things—(a) the keenness of the agriculturists for education; (b) the intense co-operative spirit displayed in every phase of production; and (c) the organized system of extension work which enabled the teachings of research to be carried to every farmer in the kingdom. As an example of the demand for adult education, more than 12,000 persons—practically all farmers or farmers' sons—attended the folk high schools for courses of instruction last year. More than 60 of these folk high schools were established in Denmark, and they have had an extraordinary influence on the people. When one traverses Denmark, and meets on every hand comfortable farm houses, with neat gardens around the homes and marked artistic taste displayed within the homes, electric light and power in farm houses and farmsteads, telephone on every farm, it is difficult to realize that much of this is due to the influence of the folk high schools.

Marked Progress.

A feature of agricultural research in Sweden was the success obtained in the breeding of new and hardy varieties of wheat, barley, and oats to resist the rigorous conditions of Northern Scandanavia. The plant breeding institutes of Svalof and Landskrona had been remarkably successful in producing new varieties of cereals. Wheat production in Sweden had nearly trebled during the past 25 years through the use of hardy prolific varieties of quick maturing habit, which enabled the boundaries of the wheat belt to be pushed hundreds of miles nearer the Arctic circle. In the United States, Canada, and South Africa public policy towards agricultural education and research has hitherto been very different from that prevailing in Britain. Agriculture has no longer the dominant economic interest of England as it was prior to the rise of industrialism. The wealth of England, and the prosperity of her people compared with other nations, is primarily dependent upon her industries and her seaborne commerce. On the other hand, in the United States, Canada, and South Africa, agriculture is the mainstay of the prosperity of the individual and the community. This economic supremacy of agriculture in these newer countries has many consequences. In these countries agriculture looms large in the public eye, and it is of such paramount importance to the State that vigorous promotion of agricultural research and education is regarded as essential to the continued welfare of the nation. The consciousness of rapid material progress in the past, and the almost boundless opportunities for progress in the future, generates the sanguine temperament, which is highly favourable for educational enterprise. It is easier to help the farmer in these newer countries because the new settler has usually less farm experience than the average European farmer, and the conditions are generally very different from what he has been accustomed. Hence, the conditions of life in a new country stimulate the habit of enquiry, and a readiness to learn. The settler needs help and he knows it. As a result of these various factors, two types of services have been developed to an extraordinary degree in the United States, Canada, and South Africa:—1. Federal and State aid to agricultural research, which through the medium of agricultural experiment stations and research institutes have endeavoured to determine the lines along which improvements in production may result. 2. Agricultural extension, which provides a full force of skilled agricultural scientists to convey the teachings of the experiment stations to the man on the land.

Value of Research.

A few instances among many that might be given will serve to show the value of agricultural research in these countries. One outstanding example of the value of scientific wheat breeding might be mentioned in Canada—One of the outstanding results of scientific wheatbreeding in Canada has been the production by Dr. Saunders, of the Dominion Experiment Farm, of Marquis wheat. This variety, a prolific early maturing wheat of good quality had practically superseded all other varieties in Canada, and the spring wheat region of the United States. Canadian authorities estimated that the production of this one variety had resulted in an annual increase of 20 million bushels in the spring wheat areas of Canada, or approximately five millions sterling. This was a handsome return for the expenditure incurred in agricultural research. So far as the United States is concerned, many great contributions have been made from the discovery of the Babcock test for butter-fat in milk to the discovery that certain species of parasites are conveyors of tick fever. The Babcock test enabled dairymen to pay for milk on the basis of quality, dairy factories to control their losses of fat in skim milk, and provide a scientific basis for the improvement of dairy herds. The discovery that certain species of parasites could convey tick fever—that infections could be carried only through an intermediate host—led to the opening up of a new field of medical research which had an important bearing on the discovery of the cause of malaria. In South Africa the losses of cattle, sheep and horses through disease had previously been enormous, but during recent years the losses had been almost entirely eliminated by the investigational work carried out at the Animal Research Institute near Pretoria. The discovery of the causes and methods of control of virulent diseases of stock, formerly prevalent in South Africa, had enabled the pastoral industry to be placed upon a sound economic basis. It was estimated that the monetary value of the work of the Animal Research Institute had paid the whole cost of agricultural research and education in South Africa.

The Teeming East.

So far I have been relating to you some of the outstanding phases of agricultural research in the Western world. Now let us turn to the Far East—where agriculture has been practised for more than 40 centuries, and where on a relatively limited area the land is made to carry nearly a third of the human race. China proper (18 provinces), excluding Mongolia, Manchuria, and Thibet, carries on an area of 1,530,000 square miles, approximately half the size of Australia, 320 millions. In the Japan Empire more than 73 millions of people are maintained on an area about one-tenth of Australia, while in Java, a purely agricultural country, with practically no industries, nearly 40 millions of people are maintained on less than one-thirtieth of the area of Australia.

Japan and Agriculture.

My purpose is to tell you how the Japanese have developed their agriculture. Japan proper has an area of 140,000 square miles, about 5 per cent. of the area of Australia. Of this, more than 85 per cent. is unfit for agriculture. The greater part of the country is mountainous with a narrow fringe of coastal plain. On this limited surface agricultural products exceeding in value 150 million pounds per annum are raised. Included in these products are rice, of which the total crop is 300 million bushels, approximately twice the total wheat crop of Australia. Japan also produced more than 100 million bushels of barley and wheat. This result is only attained by the utmost diligence and skill, as the soil has small natural fertility. The average size of all the farms in Japan is less than 2½ acres, while in China and Java it is sightly less. The rainfall in Japan, China, and Java is very bounteous, and falls mainly during the summer months, when its efficiency for crop production is very high. Notwithstanding the large and favourable rainfall of these countries, each has selected as their staple food the one crop, which permits them to utilize not only the entire amount of rain, which falls on their fields, but in addition enormous volumes of the run off from the adjacent uncultivable mountain country. The difficulty of feeding the immense natural increase of the population, estimated at 750,000 per annum, had caused the Imperial Government much concern. The Government realized that the pressure of food supply was the most pressing national problem, and that scientific agriculture afforded the best means of fully utilizing the land resources.

Rice and Silk Production.

For these reasons agricultural education and research had been organized with a thoroughness characteristic of the nation. All political groups in Japan co-operated to promote agricultural research. What had been achieved might be illustrated by reference to the rice and silk industries. The area under rice had been greatly increased during the last 40 years by bringing in land that was hitherto regarded as unsuitable for rice culture. Notwithstanding this, the average yield for the last five years was 39 bushels to the acre, as compared with 27 bushels to the acre 40 years ago. This remarkable achievement was brought about mainly by the production of new and prolific varieties of rice by the plant breeding institutes and improvements in cultural methods developed by the agricultural experiment stations. One of the most remarkable industries of the Orient is that of silk production, and its manufacture into one of the most exquisite fabrics in the world. Probably no more difficult and variable materials for investigation were the mulberry tree and the silkworm. The optimum conditions for humidity and temperature for the growth of silkworms was first determined. All known varieties and strains of silkworms were introduced to Japan, and rigorously tested for their silk producing capacity. A few varieties were chosen which proved to be superior, and the best strains were finally selected for breeding. It was found that two particular pure strains crossed together gave the most vigorously and productive progeny. It was also found that certain diseases inimical to silkworms could be detected in the cocoon stage by the use of ultra violet light. This enabled pure strains free from hereditary disease to be isolated with certainty. The average length of silk on the cocoon had been increased by 40 per cent. by selective breeding. Not only had the productivity of the silkworm been greatly increased, but the mulberry, which provided the necessary food supply, had been greatly improved as regards production and quality of leaf.

Vital Public Concern.

Agricultural research is regarded by other countries, both in the west and in the east, as a matter of vital public concern, because it provides a rational basis for the systematic and progressive development of a country's agriculture. Experience elsewhere has shown that production from every source can be permanently stimulated by fostering fundamental and applied research in agriculture. There is immense scope for the application of science to agriculture, especially in the newer sparsely settled countries, where the industries have not age-old traditions and experience to guide them. The provision of adequate facilities for the development of agricultural research and the application of its findings to agriculture is one of the most urgent needs of the present day.

ADV. 14-2-27.

Mr. Noel A. Webb, who until the reorganisation of the court last year was Deputy-President of the Federal Arbitration Court, will sever his association with it to-day. Mr. Webb worked at the

Mr. N. A. Webb.

court until last November, when he was granted a month's leave of absence and the usual vacation, which terminates to-day. Prior to his appointment to the Federal Court Mr. Webb was for six years Deputy-President of the State Industrial Court.

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ELDER CONSERVATORIUM.

The attention of teachers of music is directed to a special course of lectures in ear training and musical appreciation, which will be inaugurated at the Conservatorium during the first week of the new term. This important part of the musical education is coming more and more into prominence, and all those who are interested in the musical training of children are finding it advisable to make themselves acquainted with the modern systems of teaching, which now lay so much stress upon the actual development of the musical faculty. Those who intend to enrol for the lectures—to be given by Miss Ayers—are requested to send in their names immediately.

REG. 16.2.27

SCHOLARSHIPS AWARDED.

S.A.C.T. and W.A. Philanthropy.

"The South Australian Commercial Travellers' and Warehousemen's Association fully realizes its responsibilities as an important organization, and is always ready to do its part in fostering anything beneficial to the State." So said the secretary (Mr. C. A. M. West), in the course of a chat with a representative of The Register on Tuesday.

The pressman had called to ascertain latest results concerning certain scholarships which had been founded for members' children by the association. There are now 10 altogether in active operation, and occuping various terms. Some fall due each year, but others have their longer course. The oldest scholarship is that now bearing the name of Eric Smith, which was endowed in 1879 by the association, and provided some commercial education at the Adelaide University for the child of a member of that association. Following the death of Lieut. Eric Smith, grandson of the late Sir Edwin Smith—who was a Patron of the association—the latter increased the endowment by £500. Lieut. Smith died at the Dardenelles, in the Great War, in 1915, and the scholarship subsequently perpetuated his memory. It covers any full course at the Adelaide University, and has been just vacated by Dr. Jack Moreland. Out of a number of applications received, that of Ronald Donovan Elliott was selected. The successful youth, who is a son of Mr. R. E. Elliott, of Lower Mitcham, was dux of St. Peter's College last year, and also won an important monetary scholarship at that college. Now he will go to the University to take up the law course. Mr. Elliott is noted for his exceptional linguistic gift.

Other Scholarships.

The 10 scholarships comprise:—Two at the University, one at St. Peter's College, one at Pulteney Grammar School, one at the Methodist Ladies' College, one at Stott's College, and one at Muirden's College—which have all just fallen due. Then there are three others still in operation:—The Lady Smith, the Sir Edwin Smith, and the Robert Leaver Bursary. The two former offer three years' tuition for boys or girls at any school approved by the committee; and the lastnamed concerns a diploma in commerce and three years, at the University.

The second University scholarship is known as the Archibald Mackie, and was founded in memory of the late secretary of the association by the members, in recognition of 21 years of service in that capacity. This provides three years' tuition at University in connection with the diploma of commerce course, and was awarded to Martin Raphael Freney, son of Mr. M. R. Freney, the well-known Australian mining and geological expert. Young Freney studied at St. Peter's College, and now will take up the commerce course as provided.

The St. Peter's College bursary founded by the association has been secured by Ronald Hallett, a brilliant boy. The standard of education required in this competition was the passing of the qualifying examination of the South Australian Education Department. There were 14 candidates, who competed last November. R. Hallet won with a total of 669 marks out of a possible 700. About 8,000 children sat for the qualifying examination in South Australia, and Hallett won fourth place on the list. He is a son of Mr. W. A. L. Hallett, of Knoxville, and was educated first at Rose Park School, and now is at St. Peter's College for three years.

Pulteny Grammar School scholarship has been awarded to R. E. Cavanagh, son of Mr. L. J. Cavanagh, of Wayville, who is entitled to three years' attendance at the above college.

The Methodist Ladies' College distinction has gone to Jean Margaret Warhurst, daughter of Mr. V. A. Warhurst, of Henley Beach, who will be given one year's gratuitous instruction.

Stott's College scholarship was obtained by Murray Prisk Tonkin, who secured the highest aggregate of marks set for such test. He is a son of Mr. O. A. T. Tonkin, President of the association, and is entitled to one year at Stott's College. The association granted a second and special scholarship at the same college, which was won by Mary Edith Brazel, daughter of a late member, Mr. D. F. Brazel, and it lasts for 12 months.

Muirden's scholarship fell to the lot of Beryl Tidemann, daughter of Mr. Geory Tidemann, of Hawthorn. This girl has attained a fine school record, and twice has previously won scholarships of the C.T.A. and W.A. She thus received two years' tuition at M.L.C.

The three other regular scholarships are in occupation, and do not fall due this year.

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News has been received that Mr. H. Houghton Swift, B.E., son of Dr. H. Swift, of Brougham place, North Adelaide, has been appointed by the English Electric Company to be engineer-in-charge of the electrification of the railway be-