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# SCIENCE AND AGRICULTURE

## ADDRESS BY PROFESSOR RICHARDSON

### Primary Production Pillar of Prosperity

In an address to the Science Congress at Brisbane on June 2, Professor A. E. V. Richardson, Director of the Waite Agricultural Institute, said the agricultural and pastoral industries provided the food supply of the nation, the raw material of the manufacturing industries, and were the pillars on which the prosperity of the Commonwealth rested.

The Professor said that the total value of production from all sources in Australia in 1927 was 430 million sterling, of which the primary industries, excluding mining, contributed 262 million, or roughly 60 per cent. Every day in the year the aggregate production of new wealth from the soil in Australia averaged over half a million sterling, or over 180 million per annum. Each bushel of wheat, added to the wheat yield per acre of Australia resulted in a permanent addition of three millions to the national income, and every pound of wool that could be added per sheep by improved nutrition or elimination of pests, would add at least five million.

#### Increasing Primary Production

Broadly speaking, there were two ways by which primary production might be increased—firstly, by increasing the acreage under crop or carrying stock, and by extending the margin of cultivation into drier areas; secondly, by increasing the efficiency of production within the areas at present in use by improving the output per acre and per animal. The three great primary industries of the Commonwealth—wool, wheat, and dairying. A substantial increase in production could be brought about if the majority of cultivators could be induced to follow the methods practised by the most progressive farmers and pastoralists.

Taking the wheat industry as an example, the wheat yield of South Australia for the period 1916-1926 was 12.4 bushels per acre, as compared with an average yield of 4.74 bushels per acre for the decade 1892-1901, notwithstanding the fact that the area under crop had been increased by over 50 per cent. by bringing under cultivation land in regions of light rainfall. It was safe to say that so far as South Australia and Victoria were concerned, the average yields of wheat per acre might be increased at least by 50 per cent. if all wheatgrowers followed in entirety the standard practices which were suggested by the research and demonstration work carried out by those States. That was one of the important problems in agricultural education and extension.

#### Pastoral Industries

Passing to the pastoral industries—sheep, cattle, and dairying—it might be said that practically the entire stock population, consisting of 100 million sheep and 14 million cattle, was maintained on the pastures. The output from the pastoral and dairying industries could be enormously increased if that large stock population could be (1) kept free from disease, and (2) adequately nourished, especially during periods of nutritional stress.

It must be borne in mind that the pastures of Australia over wide areas had seriously deteriorated in value. Moreover, for several generations there had been a continual drain on the pastures to supply the mineral nutrients required for the bony framework of the animals sold off the farms to supply the cities with food and raiment. In many parts of Australia the depletion of the soil in mineral nutrients, and particularly in phosphates, had been reflected in the condition of the stock, and the so-called deficiency diseases, or malnutrition as evidenced by bone-softening, were the result. A calculation made some years ago for the rate of depletion of phosphates from pastoral properties in Victoria showed that the equivalent of 1,800,000 tons of superphosphate had been removed from the pastoral properties of Victoria in the form of slaughtered animals and animal products during the last sixty years. Many million tons of phosphates would be needed to bring back the phosphate content of the pastoral soils of Australia to what they were at the beginning of settlement.

#### Value of Sown Pastures

About 43 million acres, mostly in the coastal and elevated areas of Australia, had been sown with grasses. That area was quite insignificant in comparison with the area of Australia, or even the area of sown grassland in New Zealand. There was room for an enormous expansion in the area under

sown pastures, which normally exceeded in carrying capacity and nutritive value the indigenous pasture which it replaced. The remarkable transformation of the coastal areas of New South Wales and Queensland by the introduction of the Brazilian pasture plant—*Paspalum dilatatum*—and the equally remarkable effects of the introduction of subterranean clover in the better rainfall country of South Australia and Western Australia were illustrations of the greatly increased carrying capacity following on the introduction of superior types of pasture plants for specific environments.

#### Value of Top-dressing

The top-dressing of pastures with artificial fertilisers provided a means of greatly increasing the output of grass in regions of liberal rainfall. In the light of numerous investigations in several of the States, it was safe to say that the carrying capacity of pasture lands in regions of heavy to moderate rainfall could be more than doubled by top-dressing with soluble phosphates at a comparatively trifling cost. While there had been a gratifying development in the practice of top-dressing in the southern grassland region during recent years, it might be said that there were enormous areas of grassland—many millions of acres—in the higher rainfall areas of Australia which had never yet received a dressing of artificial fertiliser.

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#### MEDICAL BOARD

Nominations from registered medical practitioners for a member of the Medical Board closed at noon on Friday with the State medical registrar (Mr. H. T. Young). The board consists of three members nominated by the Chief Secretary, one nominated by registered medical practitioners, and one by the council of the University of Adelaide. The present board comprises Drs. A. A. Lendon (chairman), B. H. Morris, R. S. Rogers, H. H. E. Russell, and Sir Henry Simpson Newland.

## The Register NEWS - PICTORIAL

TUESDAY, JUNE 10, 1930

### SAVING ON SCIENCE

IN his inaugural address to the congress of the Australasian Association for the Advancement of Science, which ended in Brisbane last week, the President (Mr. E. C. Andrews) made an eloquent prophecy. In the world's history he said, universal progress had been unbroken and unending, and man, "or some similar organism," would eventually penetrate to the inner meaning of things. The knowledge that was Newton's and Darwin's was to be but a basement stone to the mighty temple of knowledge whose peak would pierce the clouds. The Governor of Queensland declared that it was the most brilliant speech of its kind that he had ever heard. The congress began its work on a high and enthusiastic note. It became evident, however, in the course of the subsequent proceedings, that universal progress, so far as Australia is concerned, is in danger, if not of being broken, at least of being arrested.

**BITTER** complaints were made of the probable effect on scientific advancement of the existing financial stringency. It was pointed out, for example, that, for the sake of economy, the Federal Government proposed to postpone the census to be taken, after the usual interval of years, in 1931. The economic section of the congress unanimously resolved that this postponement would be "a far cry away from the standard of all civilised people, and a counsel of despair."

On allusion was made to the Government's determination to economise at the expense of the Council of Industrial and Economic Research. The money which, in the ordinary course of events, the Council would have spent in one year, said Professor Wilmore, would now have to be made to last two years. This was the falsest of false economy, and little short of madness.

**PROFESSOR A. E. V. Richardson**, Director of the Waite Agricultural Institute, was not content merely to show what science has already done for agriculture as a contribution to national wealth; but he pointed to the economic possibilities of only slightly higher achievements. If, by better feeding and breeding, he said, the production of butter fat could be increased by the small amount of 10 lb. per cow every year, the added value would be £2,000,000. Similarly, another bushel of wheat to the acre would mean £3,000,000 added to the national income; and another pound of wool on every sheep's back would result in an annual increase of £5,000,000. In these hard times, we could do with the money.

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### Professor Macbeth Back From Brisbane Conference

South Australia was well represented at the Brisbane Conference of the Australian Association for the Advancement of Science, 40 of the 200 delegates coming from this State, Professor A. K. Macbeth said on his return yesterday.

Members of the Adelaide University took a prominent part in all sections. There were about 200 lectures given during the conference, a public lecture was given by Sir Douglas Mawson, and another by Professor A. E. V. Richardson.

"Some interesting papers on economics, bearing on the present financial difficulties in this country," said Professor Macbeth, "were read by the Professors of Economics at Sydney and Melbourne Universities. They were agreed that the cost of production must be reduced, and that the tariff barrier was not the solution of the problem."

The party paid a visit to the Brisbane water supply works. The plant was modern, and satisfactory, he said. The chemical plant for treatment of water was extraordinarily good. In addition to ordinary requirements, an artificial lake, Lake Manchester, contained reserve supplies for two years.

During his absence Professor Macbeth gave two lectures at the Sydney University. The Relation of Research to the University, in which he emphasised chiefly the lack of endowment for research work in Australian Universities. The other lecture, on Carbohydrate Chemistry dealt with research work in that field.

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Prof. A. Richardson, of the Waite Institute, after having attended the Science Congress at Brisbane, has gone to Grafton, the chief dairying centre in New South Wales to inspect the dairy farms.

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Messrs. Anthony, Dawes and Warner, M.P.'s, were elected members of the University Council by the House of Assembly yesterday.

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## DR. J. R. WILTON RARE CAMBRIDGE DEGREE

Professor J. R. Wilton, Professor of Mathematics at the Adelaide University, has been awarded the degree of Doctor of Science by the University of Cambridge for his published work in Higher Mathematics.

This Cambridge degree has a rare distinction among university honors. It is awarded exclusively for an original contribution or contributions to the advancement of science. It was stated last night, that Dr. Wilton's works on mathematics, were published in the proceedings of the London Mathematical Society and elsewhere. The honor is also in recognition of years of distinguished research work.

#### Distinguished Scholar

Dr. Wilton, who was appointed Professor of Mathematics at the Adelaide University in 1919, is a son of the late Mr. C. R. Wilton (who was for many years on the editorial staff of "The Advertiser"). He had a distinguished scholastic career at Prince Alfred College and the Adelaide University. At the latter institution he graduated with first-class honors in 1903. He then proceeded to England and entered Trinity College, Cambridge, where he graduated in arts and was fifth wrangler. Later he was placed first-class in physics in the second part of the natural science tripos, and was braced

with two senior wranglers as highly recommended for the Sheepsheads Astronomical Scholarship of the University. He was also awarded a major scholarship in mathematics at Trinity College, where he won other scholarships. After a period spent in doing research work under Sir J. J. Thompson in the Cavendish Laboratory, he was appointed lecturer in mathematics at the Sheffield University. Subsequently he accepted the post of lecturer in the same subject at Manchester. During the war he did X-ray work at Sheffield and at King's George's Hospital, London.

He received his degree as Master of Arts (honors) from Cambridge and Adelaide, and in 1914 he received his degree as Doctor of Science (honors) in Adelaide.

In the "Quarterly Journal of Mathematics," the "Cambridge Mathematical Messenger," the "Philosophical Magazine," and other journals, Dr. Wilton has, for years, contributed articles containing the results of his original research, which have made his name well-known among mathematicians.

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## JAPANESE DRAMA

### LECTURE BY SIR ARCHIBALD STRONG

The first of a series of extension lectures at the University was delivered last night by Sir Archibald Strong, who spoke on Japanese drama. A second lecture carrying the same subject further will be given next Tuesday night.

The lecture was illustrated by lantern slides, and Sir Archibald dealt with the "No" plays—the classical and miracle drama of Japan, the kabuki or popular and romantic drama, and the puppet drama.

He pointed out remarkable parallels between the "No" drama of Japan and the early mediaeval drama of England. The miracle play became secularised and entered on its heyday at the beginning of the 14th century, and the "No" play had its period of greatest popularity from 1368 to 1398. "No" plays and miracle plays lost their vogue at the same time, although the "No" drama existed still in the hands of a certain class.

The best of the "No" plays lacked the firmness of outline and the closely-knit sequence associated with Western drama, but they contained a great subtlety and intensity of suggestion. All were very short.

Sir Archibald illustrated his remarks by reading translations of portions of one of the plays. He showed views of the Fortune Theatre and the largest "No" theatre in Japan, and pointed to similarities in their construction.

On the subject of Western drama in Japan, he said that all the 37 reputedly Shakespearean plays had been translated into Japanese. There was in Japan a perfect reproduction, on a slightly smaller scale, of the Globe Playhouse. He wished Australia could follow Japan's example and have in one of her capitals a similar theatre.

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## MUSICAL ASSOCIATION Formed in Adelaide

Mr. I. G. Reimann presided at a meeting of music teachers, held in the banqueting-room of the Adelaide Town Hall, last night to consider the formation of a Musical Association of South Australia, on the lines of the one in New South Wales. There was a large attendance.

Professor Harold Davies outlined the objects of such an association, which would be to unite together in co-operation and friendly intercourse all qualified teachers of music and professional musicians, with an associate membership of music lovers. The idea was eventually to join with similar Australian bodies into a Federal Association, as a prelude to linking ultimately with the Incorporated Society of Musicians of Great Britain in an Imperial association.

Mr. Harold Denton moved, and Mr. Peter Bornstein seconded, a motion that the association be formed. This was carried, and the membership subscription fixed at a guinea for the first year, half that amount being regarded as entrance fee. The associate subscription rate was left to the committee to fix. It was agreed to hold a further general meeting on July 9.

Officers elected:—Chairman, Mr. I. G. Reimann; secretary, Mr. C. H. Mates; committee, Misses E. Williams, W. Eitel, and K. Cook, Messrs. J. M. Dunn, J. Dempster, T. Grigg, Brewster Jones, E. E. Mitchell, E. H. Wallace Packer, and Arthur Williamson.