## SCIENCE AND AGRICULTURE

New Varieties of Plants.

Effecting Artificial Hybridiza-

No. 9. Resuming his lecture on science and agriculture at the University extension lectures, Dr. A. E. V. Richardson (Director of the Waite Agricultural Research Institute), dealing with new varie-

ties of plants, informed his audience of the manner in which artificial hybridization is effected. He said the essence of hybridizing was merely the transfer of the pollen from the stamen of one flower to the stigmatic surface at the end of the pistil of ancther. If the flower had stamens of its own, they must be removed before they were fully ripe. The emasculation of the flower was effected a day or two before the flower was ready for pollination. The emasculation was performed by removing the anthers with forceps. After emasculation the pistil should be protected from foreign pollen by covering the flower with a small paper bag or cotton wool until the stigma had become receptive and ready to receive the pollen. That stage of receptivity was easily judged by the operator with a little practice. When the stigma was receptive, which might be a few, hours, a day, or two days-after the removal of the anthers-the covering was cific characters which should be combined removed and pollen from the desired source was transferred to the receptive the local climatic requirements. stigma. The necessary pollen for that ! purpose might be secured from a flower by shaking it on to a watchglass or small receptacle, and transferring the poller with a small camel hair brush or a pair of small forceps. The receptive portion of the pistil should be covered fully with pollen. The flower was then covered for a few days with cotton wool or a light paper bag to prevent undesirable pollen from reaching the stigma. The plant was staked and marked with the details of the hybridization. After a few days the covering was removed, and the fertilized

The mechanical details varied from the type of flower, but the principles were alike with all flowers. With some flowers with short pistils-the cherry and apple. pear, and plum-the top of the unopened until fertilization was assured.

them on each stigma.

seed allowed to ripen.

nation was usually impracticable. A good method was to wash away the pollen with a carefully directed stream of water from a fine hose. When that was completed, the heads of the pollinating flowers were rubbed vigorously against the de-polli-

Importance of Genetic Research.

There were two lines of plant-breeding work which were of importance to Australia-(1) The production of improved varieties of wheat which would be more prolific and resistant to drought and heat; and (2) the improvement in native grasses and edible forage plants. The work of William Farrer was a remarkable illustration of what might be done in respect to wheatbreeding. He produced no less than 33 varieties of wheat during the 20 years in which he devoted himself to wheatbreeding. Of them, 15 varieties were still Wales and one of Live and New South works rehearsed for this concert. Brahms's Wales, and one of his master creations, powerful "Pianoforte quartet in G minor" Federation " man by the Manda Paddy "Federation," was by far the most popular was a triumph for Miss Maude Puddy, and prolific wheat in Australia. In who played the extremely difficult plane many parts of Victoria, notably in part. Her scholarship, technique, and the Wimmers, probably the pre- artistic phrasing did much to ensure the the Wimmers, probably the pre- artistic phrasing did interpretation. Mr. Wordle, Olive Basnett, Linda Wald, mier wheat-producing region in the excellence of the interpretation, and Mr. Katle Joyce Study Cult. wheat grown was Federation. Its intro- Harold Parsons shared in the enthusiastic Commonwealth, 90 per cent, of the duction to Victoria had meant at least reception accorded to the music. The Con-£500,000 per annum to Victorian farmers for the past 15 years. So popular had the Federation variety become that Farrer might be said to have changed the colour of the harvest fields of Victoria from golden yellow to dull bronze, the colour of his own Federation wheat. He was Hadyn's "Quartot in C" was notable for Australia's pioneer wheatbreeder, and tone gradation and color, clarity of was regarded by authorities in other countries as the most successful wheatbreeder and all the autistic devices without which of all time. In native grasses and fodder a Hadyn work is worthless. The indiviplants, Australians had a source of wealth dual members who participated in this son, director of the Waite Institute. The of almost incalculable value,

basis on which the pastoral wealth of the country was dependent. They were without rivals in the plant world in respect to their nutritious qualities, and their resistance to extremes of heat and drought. Other countries had imported Australia's saltbushes and danthonias, and were growing them extensively on their arid spaces. A wonderful opportunity existed for the application of the same systematic metheds of Farrer with wheat to the problem of the improvement of the native grasses. There lay a virgin field of research, illimitable in scope, and of the highest practical value to the State. Whatever methods were followed for the improvement of wheat or native grasses or other plants, the plantbreeder should have a clear conception of the goal towards which his efforts were to be directed. His aim would vary in the different countries, but his methods would be alike in all, The aim would be to combine into one variety the environment in which it was to be grown. The methods available were selection and crossbreeding. The aim and action of selection was to detect the desired heritable variants in a variety and through them isolate a race with the desired characters. When that was occomplished, selection could no nothing more until Nature produced another desirable. variation. Crossbreeding, on the other hand, enabled the plantbreeder to combine into one plant the unit characters of two or more plants and thus create a new combination or variety. It was creative in its action, and was the most valuable instrument the wheatbreeder possessed for the creation of new types adapted to specific environments. To make real progress, the breeder had not only to be thoroughly familiar with the morphological and agricultural characters of the plants he sought to improve, and to know the manner in which those characters were inherited; but he should also have a clear conception of the speinto a new variety to make it suited to

Dr. Richardson will give his third and final lecture on this subject at the Uni versity to-night.

Tuesday Night's Lecture. Dr. Richardson delivered the third lecture of the series on Tuesday evening, the full text of which will be published in sequence with this article which concludes his second lecture. In his third lecture he dealt with methods of increasing primary production and suggested new

Por. 5.8.35.

## CHAMBER MUSIC CONCERT.

sources of national revenue.

THE CONSERVATORIUM QUARTET.

flower bud might be cut off with a scalpel. There was an interested audience at the the anthers being excised at a single Liberal Union Hall last night, when the stroke. With maize, the young corncob Elder Conservatorium String Quartet, was merely covered with a paper bag until assisted by Miss Maude Puddy, concluded the "silks" were receptive. The pollen the series of chamber music concerts arfrom the tassel of the desired variety was ranged for this season. Throughout the shaken into a paper bag, and the whole three concerts which Mr. Charles Schilsky contents dusted in a shower over the re- and his associates have presented to the ceptive silks. The cob was then covered musical enthusiasts of Adelaide, under new conditions, a high artistic standard With wheat and barley, the central has been maintained. Mr. Schilsky has flowers were emasculated by removing with directed the attention of lovers of chamfine forceps three stamens from each ber music to works of particular value flower. The car was then wrapped in from an educational point of view, chooscotton wool until the stigmas were recepting from all periods and schools, and tive. The hybridization was effected by making use of his vast experience in reseizing with fine forceps several ripe pertoire-building. In a short specen Mr. anthers of the desired variety and rubbing Schilsky thanked the assemblage for the interest taken in the vecitals. It was Some flowers of the order compositae- gratifying to know that part of the comdaisy and sunflower-required special treat-munity was attracted by the highest form ment. The true flowers were very small of musical art-chamber music. He knew and grouped in masses. Individual polli- the possibilities of Australia before he came to Adelaide, and now, after more intimate knowledge, he felt sure Australia twould be one of the greatest musical countries in the world. This would occur when music had arrived at the point of necessity, not a luxurious pastime. In Italy nated head, thus effecting fertilization en opera was a national necessity, and everyone adored it. Working men in their shirt-slogvos were excellent judges of a singer's qualifications, and did not hesitate to express their feelings if singers were not up to the mark. With regard to future intentions, he outlined a scheme which had been discussed. In order to obtain a sound financial basis it had been decided to form an Adelaide Chamber Music Society. A committee would be formed and subscriptions invited, so that the continuance of these concerts should

be assured; Wide variety was obtained in the three Schilsky, Miss Sylvia Whitington, and Mr. servatorium String Quarter was culogised warmly for a fine presentation of Frank Bridge's "Novelette." As an example of emodern British style, originality in design, and accepting workmanship, it was a valuable study, full of harmonic beautywhythm, contrast of legato and staccato,

HOVERTISER. 48.25 the mainstay of the sheep and cattle of The Commonwealth Institute of Science President of Teachers

and Industry has announced that a South Australian candidate, Mr. H. K. Lewcock. B.Se., has been appointed travelling restarch mycologist to the Prickly Pene Board at a salary of £730 per year. Mr. Lewcock, who is the younger son of Mr. and Mrs. W. G. Lewcock, of Clare, will be engaged in specialised study and research on the mygology of the prickly pear at various ceneres in the United States and elsewhere. Mr. Lewcock has had a brilliant scholastic career, and has already given evidence of ability to conduct original scientific research. He received his early education at the Clare State School, whence he proceeded to the Reseworthy Agricultural College on a Government scholarship. At the conclusion of a successful course at this institution he was awarded the John Ridley Memorial Scholarship to enable him to continue his studies at the Adelaide University. At



Mr. H. K. Leweck.

the end of his first year of study at the University Mr. Lewcock gained the John Bagot Scholarship, and medal in botany. and on graduating as Bachelor of Science in December, 1923, he was awarded the Lowrie Scholarship for research. Since then Mr. Lewcock has been engaged in investigations on various microbiological problems. He has recently published a paper dealing with the stimulating effect. of phosphatic fertilisers on nitrogen-fixation by soil bacteria. This constituted the major thesis of a report to the University Council of the work carried out by him whilst Lowrie Scholar and was highly commended by the examiners. Mr. Lewcock will take up his new duties almost immediately. After spending several weeks in the prickly pear areas in Queensland he will proceed to the United States of America to undergo a period of specialised training at specified universities and experiment stations. Subsequently he will visit the cacti belts in America, and Mexico in search of fungus and bacterial pests likely to prove pathogenic to the prickly pear.

Professor Wood Jones left for Melbourne he the evaness on Monday.

## NEWS. 3. 8.25 Students' Association

The second meeting of the Conservatorium Students' Association will be held tonight. The objects of the association, to which all past and present students are eligible, are the advancement of the cause of music in South Australia to foster a feeling of fraternity, and to create opportunities for friendly intercourse and co-operation among all lovers of music and to welcome and entertain visiting artists of renown. Mr. Frederick Bevan is the president.

The programme tonight will be devoted to original compositions of members, and will include two preludes for the plane by H. J. Perkins, T. P. Campbell's "Brolgas" for the plane, and a piano concerto by H. Brewster Jones, Arthur Williamson will be represented by a violin number and some songs, and songs by Maude Puddy, Frances Walker, Harold Wylde, Reg. Bevan, and Alex Burnard will be presented.

The vocalists will be Misses Ada Katle Joyce, Hilda Gill, and Ethel Ridings, and the instrumentalists Misses Alice Moncrieff, Clarice Gmelner, and Messrs, H. J. Perkins, Alex Burnard, Spruhan Kennedy, and Harold Parsons.

4. 8.25 SCIENCE AND AUDICULTURE.

The last of the series of extension lectures on the application of science to agriculture will be delivered this evening at the University by Dr. A. E. V. Richard-Wealth dual members who participated in subject will be "Methods of increasing Those success were Mr. Spicilaky, Miss Kathleen primary production," and the lecture will

Determination and attention to detail have resulted in the progress of Mr. Harold Merton Lushey, B.A., from the ranks of the teacher to the important post of lecturer at the Teachers' College, North

terrace. In addition to his many other interests Mr. Lusbey has found time to concentrate on the welfare of his fellow teachers, and as an appreciation they have elected him to the penetion of president of the South Australian Teachers' Union, He will take up his new duties this month.

Mr. Lushey, who was born at Alberton in 1884, received his early education at the Hindmarsh public school, and later in Western Australia. eight years he returned to South Australia and attended evening lectures at the Adelaide University, graduating in 1923.

Mr. Lushey speaks appreciatively of the facilities open to achool teachers in connection with the academic side of their training. It is doubtful, he said, whether better conditions exist anywhere in the British Empire in this particular aspect. Mr. Lushey gained experience in this State at Unley, Port Pirie, Finders street, and the Currie street practising school, where he was the first chief demonstration assistant. He was the first assistant



MR. H. M. LUSHEY, B.A.

teacher to gain a first-class teaching certificate under the new classification scheme. In 1924 Mr. Lushey was appointed lesturer at the Teachers' College in succession to Mr. James H. Williams, M.A. In his younger days Mr. Lushey was a keen follower of football and cricket, and still takes an active interest in all the athletics connected with the college. As a member of the central executive of the Teachers' Union for seven years, he occupied the positions of assistant treasurer and treasurer. He is the youngest teacher to occupy the presidential chair.

In circles outside his professional sphere Mr. Lushey takes a keen interest in literary and debating society work, and is a member of both the Johnian Club and the South Australian Poetry Society.

REGISTER.68.25

UNIVERSITY STUDENTS' DRESS. Whether the wearing of academic gowns by Melbourne University students should be compulsory, or the gowns condemned as sartorially obsolete, was a question referred to the council of the university on Monday by the students representative council. The students' council (states The Melbourne Argus) pointed out that 200 women students had almost unanimously voted in favour of compulsory wearing, while the men students, by 450 votes to 300, had condemned the custom. In favour of the practice it had been contended that Melbourne was one of the few British umversities at which the wearing of gowns was not compulsory; that the wearing of gowns lent dignity to the university gatherings, and tended to create a corporate spirit; that the cost of the gown was small; and that the plimate saving in ordinary dress more than counteracted the initial cost. This feminine argument was received with amusement, as was another contention that the length of the gown was not fixed by statute, and could easily be shortened to follow the lines of the Oxford commoners' gown. Reasons advanced against the wearing of the gowns were that the custom was "a nuisance, expensive, a waste of time, undemocratic, uppecessary, dangerous, and a badge of ser-

REGISTER. 6.8.25

PROFESSOR PHILLIPSON'S DEPARTURE.

Carrie and

From PROFESSOR COLEMAN PHIL LIPSON:-As I am leaving Adelaide to-day (Thursday), may I, through your paper, thank heartily all those who have been so kind as to send me communications expressing their good washer. regret that it has been impossible for me to reply to hundreds of people individually. and I beg them to forgive me for not doing so. I shall never forget their kindness. nor the recent visits of several groups of