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QUEENSLAND AGRICULTURAL JOURNAL

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Event and Comment.

The Current Issue.

The great event of Queensland's year—the Royal National Exhibition at Brisbane—is fittingly described and illustrated. The Gutta Percha tree, the eating of which is reputed to have caused considerable mortality in a mob of travelling sheep, is briefly noted by Mr. Cyril White. A further report on Fruit Fly Investigations at Stanthorpe is contributed by Mr. Hubert Jarvis. Mr. Tryon has some notes on Tomato Blight and on the Bean Fly. Some interesting entomological notes for cane-growers are also supplied by Mr. Edmund Jarvis. The marketing of pigs in Queensland is discussed by Mr. Shelton in a further instalment. Among other special features is an account of the Pig Club movement which is embraced in the Home Projects Scheme initiated recently by the Education Department in connection with our rural schools. Other specially contributed matter, referred to in these notes in the last issue, has had, quite unavoidably, to be held over again. The October number will be a comprehensive issue, and among other interesting special features will be an impressive farewell message to the farmers of Queensland from His Excellency the Governor, the Right Hon. Sir Matthew Nathan.

The Royal National Association—Fifty Years of Progress.

The President of the National Association, Mr. Ernest Baynes, in the course of an address at the opening of the Brisbane Show, said that this year marked an epoch in the history of the Association. For fifty years annual shows had been held, each showing an improvement on its predecessor. Last year they established many records, but further records would be broken. Fifty years ago the situation of the present two show rings was marshy swamp land and rocky broken gullies, and it was only by an expenditure of over £15,000 that portion of it was reclaimed and made available for show purposes. Since the foundation of the Association fifty years ago nearly £250,000 had been expended in the purchase of freehold land and the erection of permanent improvements, including the splendid grand stands and other seating accommodation, capable of housing nearly 40,000 persons. Show buildings and other improvements tended to make the Brisbane Show Ground one of the best in the Commonwealth. Mr. Baynes also paid tribute to the early pioneers and the work they had done in building up the Show and making it a success. Some little time ago, he said, the Association had issued invitations to all who had been present at the first Show fifty years ago, and they were gratified to know how many had accepted the invitation.

Give Your Best !

"I do not propose, on this last occasion, to dilate upon any topic or offer you any long advice. I am going to give one word, however, and the one advice I wish to leave behind me is—get rid of two words in your vocabulary—get rid of the words 'good enough.' There is nothing that is good enough when you come into competition in world-wide markets." These striking phrases formed the keynote of the speech of His Excellency the Governor-General, Lord Forster, at the official luncheon on the opening day of the Brisbane Show. "Australians," he continued, "would have to look to the world market for the continued development of their great continent, and if they were going to succeed in the world's markets the words 'good enough' must be marked out of their vocabulary. Therefore he hoped the lesson given by that great Association would be taken to heart deeply by the man on the land. If he were going to market his stuff in the world's markets, he had to meet the world's competition. The only way to meet that was to send their best. They could produce it in Australia. They knew they could. What they wanted to do was to encourage the men who were engaged in production to realise it and accomplish it. When he laid down the great honour conferred on him by the King, the honour of representing him in the Commonwealth, he would do it with the greatest reluctance. He held that to so represent the King was the greatest honour that could befall a man. He wished Australia and Australians every blessing that God could give them."

A Forestry Conscience.

"This Jubilee Show reflects not only the courage and energy of the Association, but is also a tribute to the work of the pioneers and of all who have helped to bring about its success," said the State Premier (Hon. W. N. Gillies) on the same occasion. "The only tinge of sadness about it," he continued, was the absence of the State Governor (Sir Matthew Nathan). Last year the Governor-General had given good advice to the people of the country, and personally he (Mr. Gillies) had been grateful to him for his remarks about cotton and afforestation, and particularly for trying to create in the minds of the people a forestry conscience. It was difficult for politicians to concern themselves about forestry, for it had to do with posterity, and they were inclined to say, 'What has posterity done for us?' But there was a duty to the people in this matter, because the present generation was largely destroying what belonged to the coming generation."

The Best State of the Commonwealth Group.

"As for the Show," Mr. Gillies continued, "it was a reflex of the State, because it showed the energy displayed by the community in getting together such a display during the winter season. Visitors from the South must have been surprised at the really wonderful display that was put before them. He was satisfied that people from the Southern States would take away a full recognition that Queensland was the best State of the Commonwealth. Such a Show must bring home the words of President Garfield, 'That the head of civilisation was not militarism or commerce, but agriculture—the great mother of industry.' Primary production must be encouraged, and the wisdom of these words brought home to the people. It would be better, of course, if the capital of the State were in a more central situation, but with the completion of the great Coastal railway they had been able to attract the people from the North to Brisbane to see what the country could do. The Local Authorities' Conference and other conferences had also afforded an opportunity to bring home the truth that the country was necessary to the city and the city to the country. It also brought home the duty to provide markets and to establish secondary industries. As Minister for Agriculture during five years, his job had been to encourage primary production. He recognised that the country must have two legs on which to stand—primary and secondary industries. In this connection, he was pleased to notice that the Federal Treasurer (Dr. Earle Page) had declared that he was going to amend the Commonwealth Bank Act to make it possible for farmers to harvest and market their produce. Farmers had the best security to offer, but in many cases the industry was disorganised, and it was pleasant to note, therefore, that the Federal Treasurer was going to make it possible for the bank to provide the finance necessary for the pooling system, and for the marketing of primary products. Too much praise could not be given to the present president, the committee, and those who had organised the Show, but they must not forget what the pioneers had done. Going back fifty years they could recall the names of Sir Robert Mackenzie, John Fenwick, Governor Cairns, Sir Arthur Palmer, Sir Thomas McIlwraith, Sir Joshua Peter Bell, Messrs. Raff, Grimes, and others, who had taken an interest in the establishment and early history of the society, and had helped it in later years. He would like to compliment Messrs. Baynes, Affleck, and the secretary (Mr. J. Bain) on their efforts—the success of the present Exhibition reflected the support received from the officials, stewards, and exhibitors."

Bureau of Sugar Experiment Stations.

CANE PEST COMBAT AND CONTROL.

The Director of the Bureau of Sugar Experiment Stations has received the following report (30th July, 1925) from the Entomologist (Mr. Edmund Jarvis) at Meringa, near Cairns:—

Poison Baits for Cane Grubs.

Laboratory experiments were carried out towards the end of June with sodium arsenite, which was administered to grubs of *albohirtum* in the form of certain baits of presumably palatable nature.

These consisted of thin transverse sections of cane sticks, megass, and bran, that had been boiled for about five minutes in a strong solution of this poison, and then allowed to dry before application to the soil.

The baits were placed at the bottom of cages of moist earth, each containing a third-stage grub of the greyback cockchafer.

The best results were secured from the sections of cane stick, which caused a mortality of 25 per cent. the first day, 50 per cent. on the fourth day, and 100 per cent. a week after application. The poisoned megass and bran yielded about 85 per cent. mortality after seven days. These initial preliminary experiments will be followed up by further research in connection with this interesting phase of grub control.

Parasites of Cane "Skippers."

The larvæ of several species of Hesperidæ ("skipper" butterflies) have been recorded as destructive to the foliage of cane in several sugar-growing countries, such as Porto Rico, Mexico, Trinidad, British Guiana, &c.

Since the year 1915 five species have been discovered eating cane leaves in North Queensland; two of these occurring also on cane in Java. Hesperid caterpillars usually feed under cover, by drawing together the edges of a leaf-blade in such fashion as to form a short tube from 2 to 4 in. long, in which they are effectually screened from the view of birds and other predaceous foes.

Transformation to the pupal condition generally takes place within the seclusion of this tube, the tail-end of the pupa being affixed by anal hooks to a mass of threads spun for this purpose, while the body is further secured by a strong girdle of silk crossing the middle of same and firmly attached to the leaf-blade on either side. *Padraona marnas* Feld is, perhaps, our commonest cane "skipper," varying in size from 1 to 1¼ in. across the expanded wings. Its general coloration is dark-grey to black, with tawny orange-yellow markings arranged in the form of a broad band on the middle of hind wing, and irregular patches extending over the basal and central portions of the front wing.

The life-cycle was briefly described to canegrowers by the writer in 1916 (Bulletin No. 3 of this Experiment Station).

Its plentiful occurrence this season at Saw Mill Pocket, Kamma, and Meringa, enabled us to obtain interesting data regarding the native parasites of this species, which evidently serve to effectually control its increase. Those bred here between the dates—4th to 30th June—consisted of an ichneumon wasp (allied to Henicopsilus); a braconid (near *Opius*); three species of Chalcididæ (*Chalcis parflavipes* Gir., and two undetermined) and a proctotrypid wasp. The cane affected by this butterfly was reported by Mr. Bates to be growing on low-lying ground bordering swamp land, and closely surrounded by blady grass. The headlands were covered with burrs; and weeds were much in evidence also among the cane.

In all probability blady grass will prove to be a native food-plant of more than one species of our Hesperidæ; so that when growing on headlands those butterflies are liable to invade and oviposit on young cane leaves, and in some cases may gradually acquire a liking for the foliage of sugar-cane.

Benzine as a Grub Fumigant.

During 1923 laboratory experiments with benzine were made by the writer to test the effect of its vapour on grubs of the greyback confined in cages of moist soil. The fumes quickly caused diarrhœa accompanied in some instances by protrusion of a portion of the alimentary canal. The first experiment consisted of six cages; each containing a third-stage grub in about 80 cubic inches of moist soil. A dose of 5 cc. (about $\frac{1}{6}$th oz.) was applied to the surface soil of each cage; the result obtained being a mortality of 100 per cent. after three days. In two similar experiments conducted during March, 1923, these results were confirmed, all grubs used being dead about three days after application of the fumigant.

The toxic action of benzine fumes was further studied by us last May, 1925. The soil in eight cages, holding about 27 cubic inches, was injected with $1\frac{1}{2}$ and 3 cc. doses, which, although very small, caused a mortality of 100 per cent. by the end of six days.

The above amounts of benzine, however, were found too little to destroy grubs in big cages of soil (80 cubic inches). A final experiment was accordingly carried out in which doses likely to be used in field application were given to fully grown grubs of *albohirtum* in large cages of earth.

These grubs, which were placed on the bottoms of the cages, were treated with $\frac{1}{2}$ oz. doses of benzine, poured on top of the soil about 4 inches above them; all cages being left open at the top.

Within twenty-four hours these grubs were very sickly; 100 per cent. ultimately dying within forty-eight hours after treatment.

This fumigant would probably act more quickly during warm weather, at a time when cane grubs are feeding vigorously and display greater activity; hence the results mentioned above obtained during the month of March (100 per cent. mortality in three days from a dose of $\frac{1}{6}$th oz.). Those used for our recent experiments in July were about to transform into pupæ; a condition during which respiratory movement—consisting of alternate contraction and recovery of the shape of the body—becomes less frequent or pronounced; the grub at such times lying inert in a pupal chamber while its internal organs are undergoing profound changes in order to fit the species for an aerial existence during its imago or perfect state.

Crickets Attacking Sugar-Cane.

A curious insect was forwarded to me last month for identification from Home Hill, Ayr district, by Mr. E. H. Osborn, whose attention was drawn to its occurrence in canefields as a pest.

This proved to be one of the Gryllidæ or crickets, a family of the Orthoptera, a group of insecta which comprises locusts, grasshoppers, stick-insects, cockroaches, &c.

Some of the crickets are of considerable economic interest, as they injure various root crops in different countries.

Gryllus lepidus is very destructive at times to pasture land in Victoria; while *Scapteriscus didactylus* Latr., occurring in Hawaii, is said to cause much injury to seed cane by burrowing into it and destroying the eyes. When plants are about 2 feet high these crickets eat into the centre of cane stalks underground, thus destroying same.

These insects are always more abundant on ground inclined to be swampy, but although able to swim well cannot live under water.

The chief remedy for this pest is to flood infested land when practicable, and when the crickets come to the top catch them by hand and drop them into a vessel containing kerosene and water.

When little heaps of fresh earth are noticed betraying the presence of young crickets the land should be hoed, and then spread with a poison bait made of 25 lb. of rice husks or any chopped green stuff, 2 lb. of powdered lead arsenate (or failing that, 5 lb. of copper sulphate), six finely chopped lemons (or 12 drops of lemon essence), and 6 lb. of gur, with 4 gallons of water.

The gur and water should first be mixed, then the lemons, lastly the poison, and the mixture then poured on to the green basis.

Another bait recommended consists of maize and white arsenic. The latter, to amount of 1 lb., is boiled in water with 10 lb. of maize until the latter is soft, water being added when necessary. Grain prepared in this way is buried in the ground at a depth of about 2 inches, and at intervals of about 1 foot.

A little napthalene buried in drills alongside the cane is said to have given good results.

Description.—This insect is 1½ inches long by nearly ¾ inch in width; the body being highly polished like that of a typical wireworm, and practically cylindrical in form, having the head a deep reddish-brown and abdominal segments dark-yellowish. Its front legs, like those of the common mole cricket, resemble short broad hands, projecting laterally on each side of the head, and are strongly toothed and well adapted for digging. The distal extremity of the intermediate tibiæ is armed with two, and the posterior tibiæ with four, large spurs, between which arise the rudimentary tarsi. The end of the abdomen is terminated below with two short pointed protuberances or cerci.

The Director of the Bureau of Sugar Experiment Stations (Mr. H. T. Easterby) has received the following report (25th August, 1925) from Mr. E. Jarvis, the Entomologist at Meringa, near Cairns:—

Relative Merits of Paradichlor. and Carbon Bisulphide.

A few notes regarding the value of paradichlor. and carbon bisulphide as effective soil fumigants for controlling our root-eating scarabæid cane grubs will doubtless interest growers who suffer periodically from the ravages of this pest.

The latter and better known insecticide is being employed universally at present for combating the subterranean larvæ and grubs of notable economic insects in various parts of the world, including also ants, termites, wood-boring beetles, aphides, and many other species affecting grain, stored products, &c.

Paradichlor., however, owing to its action in the soil being more lasting than that of carbon bisulphide, has enabled entomologists to bring under control certain formidable insects which had for many years defied all other remedial measures brought against them, and appeared well-nigh invulnerable.

Touching briefly on the success obtained by our Sugar Bureau with this fumigant against grubs of the greyback cockchafer, no further proof of its efficiency is required than that afforded at Woree last year, when a plot of D.1135 injected with this fumigant was found to yield an increase of 13.428 tons of cane as a direct result from such treatment. On this occasion infestation was not excessive, but had grubs chanced to be sufficiently numerous to kill the cane the figures would have been 27.208 tons per acre as a result of the fumigation against nothing at all for the untreated area.

It should be remembered that paradichlor. and carbon bisulphide will both kill cane grubs if applied at the proper time and in the correct manner. Fumes generated by the latter insecticide, however, do not operate in the soil longer than from twenty-four to forty hours, whereas those arising from ½-oz. injections of paradichlor. are given off for about six to eight weeks. This being so, one should be absolutely sure that the land to be treated with carbon bisulphide be in the right condition, since otherwise (if too wet) the fumes will not have time to reach more than a small percentage of the grubs.

With paradichlor., on the other hand, the soil is almost certain to be in a fit condition at some time or other during the period—following the date of any injection—occupied by evaporation of the chemical, provided that such treatment be carried out during December or January. The individual merits of these fumigants have stood the test of many years' experimentation, both here and in other countries. It is important to bear in mind that paradichlor., when dissolved in any liquid medium, does not exercise its deadly influence for much longer than the time that elapses after fumigation with carbon bisulphide; thus, its chief merit, viz., that of operating efficiently in the soil during a period of several weeks is thereby destroyed, so that by using paradichlor. in solution one would not get the best results from the purchase of this costly fumigant.

As a matter of fact, it is this undoubted advantage possessed by paradichlor. over other soil fumigants that has enabled American entomologists to control the notorious Peach-tree Borer (*Aegeria exitiosa*), whose larvæ are so difficult of access, tunnelling as they do in the roots of these trees. Similarly, when the fumes from injections of the nodules of paradichlor. continue to evaporate for week after week in grub-infested cane land, the toxic vapours can hardly fail to ultimately reach grubs chancing to be ensconced in compact lumps of soil not easily entered by such vapours, or those grubs situated immediately under cane stools, among earth more or less consolidated by pressure due to expansion of the growing plants, where the earth is often a little moister than that moved by cultivation and far more difficult to penetrate.

If we dissolve some nodules of paradichlor. and then allow a drop of the mixture to fall upon a glass slide, the fluid will be seen to have evaporated after two or three minutes, a small portion of the paradichlor. remaining behind in the form of scattered and very minute crystals, which about twenty minutes later will be found to have completely volatilised. When such fluid is injected into the ground these crystals are deposited in that portion of soil moistened by an injection and appear, about twenty-four hours later, in the form of minute glittering specks lying amongst the soil particles. Although taking a little longer to volatilise underground than when fully exposed to air and wind, these crystals, on account of their minute size, would naturally evaporate away very quickly in well-ærated land.

It was shown by experiments conducted in America during 1923 for fumigation of insects affecting stored grain, &c., that when paradichlorobenzene is dissolved in carbon tetrachloride, about 1 per cent. only of the former chemical is given off during evaporation of the carbon tetrachloride, regardless of whether the amount of paradichlor. dissolved be large or small, thus indicating that the toxicity or killing power of the carbon tetrachloride was not greatly changed by such addition. This fumigant is used very largely at present in the same way as carbon bisulphide for combating the same insect pests. Unlike the latter fumigant, however, carbon tetrachloride is not inflammable and if thrown on fire tends to extinguish it. It is insoluble in water but dissolves in alcohol, &c.

It is interesting to note that as presumed by the writer in a previous report ("Australian Sugar Journal," vol. xvii., p. 40) the price of paradichlor. has fallen very considerably during the last few months—from about £160 to £90 per ton. On our experiment plots at Aloomba and Freshwater, in 1924, doses of ½ oz. and ¼ oz. of paradichlor. appeared equally effective against cane grubs, so that at £90 per ton the cost at present for treating an acre of cane with ½ oz. injections of this chemical would not exceed £3.

Control of *Rhabdocnemis Obscurus*.

Additional consignments of the parasite of this borer (*Ceromasia sphenophorus* Boisd.) were distributed during July and August by the Assistant Entomologist, Mr. A. N. Burns, at Aloomba, Daradgee, and Goondi. The abovementioned liberations consisted of 82 living parasites and about 400 of their puparia; the flies being let go among borer-infested stools, and a breeding box containing the puparia established between cane rows affected by this pest.

At Meerawa, it was encouraging to learn that these useful parasites have commenced breeding naturally and are likely to become well established. Such success is owing largely to the grower concerned being personally interested in this phase of control work, and aiding our efforts in this connection by reserving suitable spots for the tachinids to breed in, at the same time making sure that the cane in such places does not get burnt. On another farm at Highleigh, where similar interest and attention is manifested by the grower, these parasites bid fair to become firmly established, and definite beneficial results from such liberations have proved a stimulus to all parties concerned.

A Promising Grub Fumigant.

On 29th July experiments were started with an insecticide consisting of benzine, containing napthaline in solution, which it was considered might prove a valuable fumigant in connection with cane grub control.

These laboratory tests were carried out against third-stage grubs of *albohirtum* placed in the bottom of cages containing about 10 cubic inches of moist soil, a dose of 1 drachm of the above mixture being poured on the surface soil in each cage.

On the following day all grubs were dead, the dose given having been too large, although amply demonstrating the power of this fumigant.

Mr. R. W. Mungomery, Assistant Entomologist, who was given charge of this experiment, stated in a preliminary report supplied to me that these dead grubs were "in a very flaccid state." All had vomited to a great extent, and one had the rectum protruding about ¼ inch outside the anal orifice, showing this mixture to have the power of upsetting the stomach to a great degree, causing purging as well as vomiting.

On 30th July, 1925, four small cages were stocked as before with grubs, and in this case ½ drachm dose was used on each cage and results noted as follows:—31st July, 1925.—All grubs very sickly and flaccid, but regained somewhat rigid conditions on exposure to fresh air. All showed very little movements, those noted being only in the antennæ and legs, and these were very feeble. 1st August, 1925.—Three grubs were motionless and apparently dead, while the fourth was very weak. 3rd August, 1925.—The effects of the napthaline began to show up and their bodies turned a pinkish colour. 4th August, 1925.—All the grubs were dead and decomposition beginning to take place.

At the same time as the commencement of this last experiment, *i.e.*, 30th July, 1925, four large cages holding about 48 cubic inches of soil were stocked with third-stage *albohirtum* grubs as before and treated each with a 1-drachm dose of the napthaline-benzine solution.

On the following day all grubs were alive, but very sickly, and the vomiting and purging condition was noticeable in two. Three grubs were found to be dead on 3rd August, 1925, being pinkish and discolouring, and the fourth was dead on 4th August, 1925, which represents a mortality of 100 per cent. in five days in these two latter series of experiments.

At the conclusion of these experiments the odour of napthaline was still fairly strong in the soil and would still have had some effect as an insecticide.

INVESTIGATION OF PESTS AND DISEASES.

The Director of the Bureau of Sugar Experiment Stations (Mr. H. T. Easterby) has received the following report (22nd August, 1925) from Mr. W. Cottrell-Dormer, who is investigating pests and diseases:—

Cairns District.

Since returning to this district, I have concentrated most of my work in the investigation of Gumming disease, the outbreak of which in the Aloomba district was observed on my last visit. As far as my inspections to date show, it would appear that the disease is restricted to the cane lying in that tract of country bounded on the west by the railway line running from the Aloomba Station to the Behana Creek bridge, on the south by Behana Creek, and on the east and north by the Mulgrave River. However, this must not by any means be taken as a final statement of the case, since my inspections have not included country situated much more than half a mile from these boundaries in any direction and a great number of the canefields have been already harvested, which precludes the detection of the disease in these paddocks for some months; furthermore, small patches of the disease may occur in a field and be missed in a single visit. At all events the outbreak is more extensive than was at first thought, and this area at least should, for the present, be regarded by those outside as a perfectly unsuitable source for plants, while those within this area should at once attempt to replace the present stock, with healthy material from outside farms, though preferably not from other districts. D.1135 and H.Q.426 should be discarded in favour of B.147 on the poorer soils, and only Badila grown on the richer lands of the infected area. Q.813 is a gum-resistant cane, but will not stand up to the heavy winds common to Aloomba. E.K.28, H.109, Pompey, and H.Q.458, all of which are tending to become popular in this district, must be considered as unsuitable for a gummed locality, being too prone to infection. A meeting will be held on one of the gummed farms on Sunday, the 23rd instant, when the position will be put before the growers and advice and instruction in the detection of Gumming disease given. I cannot yet give a complete summing-up of the situation, so this will have to stand over until my next report.

South Johnstone Experiment Station.

A short visit was paid during last week to the South Johnstone Sugar Experiment Station in connection with matters pertaining to seedling raising and cane diseases. The varieties which have been allotted for distribution were inspected. These appear to be free from serious disease.

ENTOMOLOGICAL HINTS TO CANEGROWERS.

ENTOMOLOGIST'S ADVICE FOR SEPTEMBER.

"Army Worms" on the War Path.

Caterpillars of the so-called "Army Worm" (*Cirphis unipuncta* Haw.) have commenced operations, and during this month growers should be on the lookout for the occurrence of this pest on areas under young ratoon and plant cane.

Low-lying flats, bordering river banks are very liable to invasion, and in severe infestations, damage to or complete destruction of the heart-leaves becomes a noticeable feature of attack.

These caterpillars feed at night-time, hiding during the day among the unfolding leaves in centre of stools; their whereabouts, however, being invariably betrayed by numerous pellets of excreta or powdery fragments of same scattered among the central leaves and on the ground close to stems of affected plants.

Control measures are seldom necessary, unless in cases of severe infestation, as these caterpillars are attacked by many species of hymenopterous and dipterous parasites, and also by a virulent disease known as "wilt," which occasionally destroys 90 per cent. or more of the larvæ. Owing to the combined activities of such enemies the second and succeeding broods of this moth-pest are usually rendered harmless, on account of the proportionate increase of its parasitic foes.

When cane is severely damaged, while the caterpillars are found to be still small or half-grown a poison-bait consisting of the following ingredients is said to have given good results:—Bran, 20 lb.; Paris green, 1 lb.; syrup, 2 quarts; orange or lemon, three fruits (finely ground); water, 2¾ gallons. The various components should be well mixed together to form a fairly thick mash, fragments of which, about the size of a walnut, are scattered between cane rows close to the plants in the early evening, as these caterpillars feed at night-time. Another good method is to spray badly eaten plants with lead arsenate in the proportion of 1 to 2 lb. arsenate to 50 gallons of water. This strength if correctly made will not burn the foliage.

Protect Your Beneficial Insects.

Soil-frequenting larvæ of insect friends of the grower, which are parasitic or predaceous on cane grubs, should not be destroyed.

Some of the commonest of these may be easily recognised by the brief descriptions and illustrations given in the "Australian Sugar Journal" in vol. xvi., p. 830 (March, 1925); and the "Queensland Agricultural Journal," vol. xxiii., pp. 273, 274).

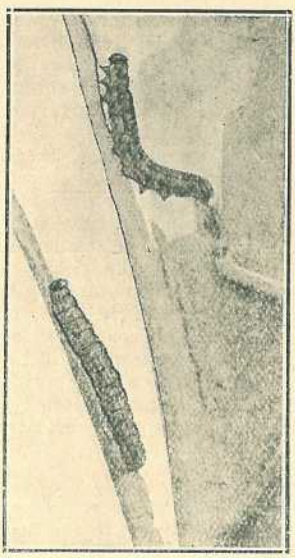

PLATE 58.—"ARMY WORM" CATERPILLARS
(About three-quarters grown).

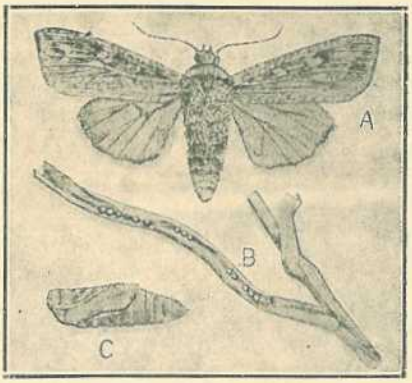

PLATE 59.—A. MOTH OF "ARMY WORM"
B. EGGS OF SAME
C. PUPA OF SAME
(All Natural Size).

The Beetle-Borer Wakes Up.

As the season advances, accompanied by milder temperatures, the activity of the weevil-borer of cane is becoming gradually more noticeable. Inspection of cane, growing in low-lying situations, should not be overlooked, and growers discovering evidence of attack at the basal portion of sticks should lose no time in communicating with the Entomologist at Meringa Laboratory, in order that tachinid parasites of this pest may be released on such borer-affected areas.

Fumigating Grubs and Pupæ of the Greyback Cockchafer.

Most growers are familiar with the pupal stage of this beetle, when it appears as a dark reddish-brown, angulated object, of somewhat top-shaped form, sharply ridged on the abdomen, the extremity of which bears a couple of large blunt spines. This pupa, about 1½ by ¾ of an inch in size, lies in an ovate chamber formed in the ground by the grub at depths varying from 1 to 2 feet, and usually out of reach of the plough. These pupæ can, if desired, be killed by fumigation with carbon bisulphide, the fumes of which are able to penetrate the walls of the pupal chambers.

FIELD REPORTS.

The Northern Field Assistant, Mr. E. H. Osborn, reports:—

Bowen.

Very dry conditions prevailed. Among many good blocks of cane were three small paddocks of Badila grown by Mr. C. C. Boulter, showing extremely heavy growth and prolific stools, while some Tableland Badila near by had also made good headway. As green manure and fertilisers are also being tried out on this farm, results will be worth noting. Another field showing very heavy even growth and good cultivation was a 6-acre block of N.G.15 belonging to Mr. H. Livesey.

Disease.—In a former report mention was made of Mosaic seen in some plant B.208, alongside of which a plot of corn was also carrying the suggestive leaf symptoms.

The ratoons now show a much heavier infection, being easily noticed at quite a distance. At another farm, about 2 miles away, a block of eight months' old plant B.208 was noticed to be very diseased, and upon inquiry it was learnt that the seed had been obtained from the first-mentioned farm. Surely this is enough to make growers realise how imperative it is that only the very best of seed should be used.

Burdekin (including Home Hill).

Here the conditions were very dry, no rain having fallen since the middle of March. All plants were busy watering. Early estimates for the district were easily a record, but owing to dry weather these figures may be materially reduced, for the young cane may have to be watered at the expense of the present crop. At each side of the river some remarkably good plant cane was seen, but ratoons were mostly poor.

Probably 80 per cent. of young cane had been planted and had made a very fair strike.

Some of the land had broken up very lumpily, necessitating much work to bring it into good planting tilth. Disc harrowing in this connection was useful.

Many growers have ploughed in green manure, and all seem satisfied with the results, claiming that the ground worked up much better. It certainly should retain the moisture better.

Cane Varieties.—Among newer canes some splendid E.K.28 was noticed, consisting in most cases of fair stools of thick heavy erect canes up to 9 and 10 feet in length. Many farmers remarked how very well it stood up to irrigation methods. As this cane has been planted out to a fairly large extent this year and has struck well its returns under local conditions will be interesting.

Some very heavy H.Q.458 and Q.903 (May plant) were remarked at Mr. M. Coyne's Nartham Farm. These were planted adjacent to M.1900, B.208, and H.Q.426, and the former cane was a far heavier cropper.

Mr. Coyne says that these two canes gave him good density returns when cut about October. Q.813 is also doing fairly well upon the poorer soils—one splendid crop of it going probably 40 tons per acre and standing well up was noticed at Messrs. Stapleton Bros. of Home Hill.

Pests.—White ants are very serious pests in some parts of the area. In the vicinity of one farm are growing very many heavy trees such as Blue Gum, Moreton Bay, Blackbutt, which were noticed to have many odd dead limbs eaten right out, while several large trees were but a shell.

Upon the adjoining farm much damage had been done in a fine crop of Badila, many sets having been eaten out before germinating, while in most stools the dead heart proclaimed the presence of ants. Very many stalks looked all right, but when cut into after closer examination were found to be absolutely eaten right out from the butt to the cabbage.

One grower said that he replanted many sets as many as four times last year. Further away from the timber belt was seen a paddock of eight-months' old plant cane. In December the owners, after noticing many dead hearts, pulled them out, pouring down the opening a small dose made up from three-quarters of a kerosene tin of molasses, half a fruit tin of arsenic, and about half a jam tin of caustic soda. (It might be said that a little water was added to help the caustic dissolve the arsenic.) This work occupied two men two weeks, and at the same time all the adjoining fence posts and timber were also poisoned. At the present time a good crop seems assured, and the owners aver that, had this not been carried out, the whole crop would have been lost.

Grubs.—These have been rather noticeable this year, principally near Plantation Creek. One grower procured a pump and some carbon bisulphide and injected each side of the stools early in April, with the result that his crop looks remarkably well, despite the fact that he had left such treatment rather late. He intends to ratoon again, but will fumigate a few weeks after the beetles emerge in December.

Diseases.—Leaf Stripe seemed to be more prevalent in the area, especially upon the northern side of the river, than the writer had noted before, the variety chiefly affected being B.208. Some really splendid crops of this cane were very heavily infected.

Some small variety plots, such as H.146, H.227, and Rappeo, were also seen to be suffering. These are all to be discarded. On another farm two lines of 7R.428 (Pompey) were growing among H.Q.426 and B.208. The B.208 was heavily infected although only eight months old, and upon close examination one stool of Pompey also showed stripe, evidently from the B.208.

Mosaic was noticed in some H.Q.426, also in a few stools of Rappoe, in the Airedale area. The owner had grown corn near the H.Q.426, and it is probable that the disease was transmitted from this crop to the cane.

Top Rot does not seem to have done as much damage this season as in other years.

Invicta Mill (Giru).

From January until March this area registered 40.62 inches of rain against 27.94 inches at Ayr, but since then no rain had fallen. Generally the country seen looked remarkably well, and some magnificent cane was being harvested, several crops of over 50 tons per acre Badila being in evidence. Q.813 and E.K.28 also seemed to be doing well, although only in small lots; some of the latter looked a picture with its erect heavy growth. Some very good B.208 was also seen to have

grown well, but carries too much Leaf Stripe disease. One block in particular had suffered very much, the sticks in many cases being pithy and carrying pipes, while the density was too low to be payable. Mosaic was also seen in this paddock and in a couple of stools of first ratoons of the same variety on another farm close by. Some distance away Stripe was noticed in a few rows of Imperial and Mosaic in several stools of Plant B.208. Quite near the latter was a small plot of stunted-looking corn growing with Mosaic Leaf markings very distinct. Local growers would be well advised to discard these two varieties, and after burning off plough out the ratoons, planting up with some more resistant variety such as Goru, Q.813, E.K.28, Badila, &c. Otherwise their loss may become serious, and, with the present price of sugar, that would be fatal.

The mill was busy operating upon a record crop of about 70,000 tons.

Giru has progressed wonderfully, and now that hotel accommodation is expected in the near future the prosperity of the district should become better known.

24th July, 1925.

Ingham Railway Line.

At Rollingstone the prolonged dry spell of practically three months had caused yellowing of the cane upon the poorer forest areas, but upon the lower lying portions adjoining the creeks some good patches of cane were seen, notably some first ratoon Badila near Rollingstone Creek, while at Moongabulla some second ratoon H.Q.426 showed splendid growth upon some alluvial soil.

Bambaroo.

Although this area has also had a dry time lately, the cane looked better than expected, some good crops of plant being noticed in several places, but the ratoons were only middling.

Principal varieties seen were H.Q.426, Badila, H.Q.409, Goru, and Q.813, the quantity of H.Q.409 and Q.813 having increased considerably during the past two years. Both do remarkably well hereabouts, but H.Q.409 is a very early and prolific arrower, and most probably would want cutting ere too old, while Q.813 seems to keep its density very well. Of the newer varieties some thirteen months old E.K.28, carrying about 12 feet of thick cane and a fair stool, was seen upon Mr. Hecht's farm. This looks remarkably healthy. Nearby some H.146 and E.K.1 were also growing vigorously. The latter lies down too much in this class of soil (creek bank) and a certain percentage rots, while the former (H.146) has not too heathy a looking leaf to be satisfactory.

Further up the line at Waterview, where the cane-killing weed was reported to have caused some damage, many dead stools were seen, but of the weed itself no signs were then noticed. Probably it will appear again early in the year.

In the area (Waterview) some minor damage had been caused by grubs, but not to a large degree.

Herbert River.

This district was visited about the second week in June, the weather conditions then being very dry, for to date only 54.95 inches of rain had fallen.

Ingham is certainly growing very rapidly, many new shops and residences having been erected quite lately, most of the former of a substantial character. In the outside area a good telephone system is being installed.

Between the Macknade cane area and Halifax a traffic bridge across the river is now being constructed. In general the whole area seems prosperous; both of the fine local mills were very busy crushing and each expected to handle a record crop.

Varieties.—Among approved canes now grown in this area, H.Q.409 is favoured. It has been planted extensively throughout the district, mostly however in land that is not rich enough for Badila. Very good returns are claimed for it; one Macnade grower expects to cut a 20-ton crop of second ratoon following up a 40-ton and 25-ton crop of plant and first ratoon, respectively. His paddocks (fairly stiff) had been previously limed and green manured, also he makes a point of ploughing in trash when practicable. This cane is a very early arrower, and if paid for upon its density figures throughout the season might not be so satisfactory. Its freedom from Gumming disease is doubtful.

Green Goru in one or two cases was giving a good crop, but this also seems to be a cane very liable to pick up disease. The writer saw crops of Q.813 upon very poor ground looking very well, in one place comparing very favourably with Korpi

planted alongside, but several months earlier. So far it is a clean cane and in a district like the Herbert should give good returns upon medium to poor soils. Being such a splendid striking cane, too, adds greatly to its value.

Disease.—Gumming at the time of my visit did not seem as much in evidence as in former years.

Grubs were noticed in several places, but although one or two farms have suffered, yet in general the damage does not seem to be as much as in other years.

Borers were seen in several places, but have not caused a great amount of damage. Growers are reminded that the Government Entomologist at Meringa (Mr. E. Jarvis) is at all times ready to give any advice in connection with this or any other matter connected with pests.

Innisfail.

When this splendid area was visited early in July, very good weather conditions were being met with, and the crops in general looked very well indeed. A very large area of land was being planted, the soil in most cases being in a very good condition. Several paddocks in Daradgee planted a short time previously were coming on well. According to individual growers, crops were cutting well up to estimates, and some very heavy ones were then being harvested. Naturally losses from grub damage were spoken of, and it seems that, although individual growers have suffered severe losses, the whole damage will not amount to a very large tonnage.

21st August, 1925.

South Johnstone.

About 60,000 tons had then been crushed, the density of which was gradually improving. Crops are not as heavy as last year. This is accounted for by the continuous rain followed by cool weather in the earlier part of the year, also by the fact that late cut cane has made such indifferent growth that a very large proportion of it will not be harvested.

Borers and grubs also are worse than in previous years, the latter accounting for heavy losses in widely scattered parts of the district. Nerada on the 2-foot Government line also shows much loss. Borer damage seemed at its worst upon one area on the main tramline to Japoon, for although Tachinid flies had been twice previously released by the staff of the Meringa Laboratory, a large fire had evidently destroyed their breeding places. Subsequently very heavy losses occurred in the newer growth of cane, portions being absolutely worthless.

Very little early planting was noticed, but many growers were then preparing.

It was interesting to see the many substantial houses and barracks that are now being erected.

The township is also growing gradually, but when the size of the mill is considered it yet has a very long way to go. What is badly wanted is hotel accommodation.

Excellent drainage on one farm at Japoon has been a great factor, and goes to prove how very necessary adequate draining is in seasons like the present. Over and over again the writer sees improvement on farms that are being drained. It stands to reason that without them it is impossible for the cane to give best results in such a wet district as Innisfail.

El Arish (Soldiers' Settlement).

This area is going ahead steadily, and this season's output should easily beat last year's. Numerous new dwellings were noticed upon farms, and several cane-cutters' barracks were also in evidence, while a telephone system is now being installed. As the main North Coast Railway passes through this busy little centre the area is sure to commend itself to sugar-growers. Part of the cane will go to the Tully Mill this year, with a probability of the entire crop going there in 1926.

Varieties.—Badila is, of course, the main cane here, but small quantities of H.Q.426, Q.813, 7 R.428 (Pompey), Goru, and E.K.28 were noticed. On the reddish stoney soils adjacent to the hills some remarkably good plant, first and second ratoons were seen. Some of the young plant cane hereabouts looked particularly fine, carrying a beautiful dark green top.

Several growers were inquiring for Q.813 for heavy poor ground. This cane should give better results than Badila now does. Goru, if obtained from clean healthy seed, should also do well here. Clark's Seedling, being so liable to disease, cannot be recommended.

So far hardly any manuring has been carried out, for nearly all the farms are still under the "stump."

Diseases.—A couple of stools of N.G.15 carrying Leaf Scald were seen, and pointed out to growers.

Pests.—Grub damage to a small extent was also noticed for the first time.

Tully.

This area was having a fine spell when visited. Very rapid progress was being made everywhere. A fine town is being formed. Great progress is being made with the mill, and a medium crushing will be put through, while for next year probably 6,000 acres should be harvested. The tramway system seems to be a very complete one, and the millyard with its very numerous 2-foot lines and also 3 feet 6 inches Government tracks is in accordance with the fine mill. All through the area new land had either been planted or was in its preparatory stage. Of the cane planted the strike seemed to be medium, but the weather conditions then were on the cold side. A good deal of activity was seen on the Government blocks recently balloted for. The main cane land is situated on the southern side of the Tully, extending from Hugh Henry's (Bellenden) on the western side of the railway to Steve Theodore's on the eastern side, a distance of, say, 4 miles, and following the river down. Right throughout this particular area some very fine Badila is growing, some early planted cane on both the Henry's farms being very heavy. Some of the best, though, was noticed on Mr. S. Theodore's, some ten months' old ratoons looking particularly healthy.

Crossing the river here (at McBryde's Crossing) a return was made along the northern side going through, among other farms, the area formerly part of Mrs. Dean's. Among different farms here are probably 100 acres of young plant cane, principally owned by Italians, and all showing good work. This is mostly low-lying ground and takes plenty of work to keep clean. Nearer to the mill the cane (Badila) upon some of the low-lying, yellowish, stiff soils has made very indifferent growth. This land wants draining and liming. Several growers realise this, and are ploughing out and liming. Coupled with this grubs have also done a certain amount of damage, more especially in low-lying places. Most probably, owing to poor soil conditions, the cane roots did not develop well and could not penetrate sufficiently the bottom soil to give the cane enough resistance to withstand grub attack.

Varieties.—At present Badila is the main cane, but it is doubtful if parts of the area will grow this variety successfully, and upon these areas Q.813 and the Gorus might give better results. Q.813 is a shallow rooter and requires planting in a fairly deep drill with a fair amount of covering after it has stooled out (not before).

On the poorer areas likely to suffer from grubs D.1135 should do well, but whatever canes are used it is imperative that they are from a district free from gum. On no account should any cane from the Herbert River be planted, for if gum once gets a start in the low-lying badly-drained lands the resultant losses will be very serious.

Mourliyan.

Crushing was proceeding very satisfactorily at this mill, a record run having been experienced just before my visit, when 5,185 tons of cane had been crushed the previous week.

The c.c.s. was 12.6 and steadily improving. The cane going into the mill, too, was the cleanest noticed in the district, and the crops were cutting well up to the estimate. In the dark-red soil some splendid young plant was noticed looking extremely healthy. As a whole, the late cut cane did not look at its best, but compared well with the same class seen elsewhere.

Q.813 was still giving good returns; for instance, some ratoons were going 13.2 when the mill average was 12.5 (Badila), and at an earlier date the two (Q.813 and Badila) were upon the same mark, *i.e.*, 12.4.

Babinda.

Owing to too much rain in the growing portion of the season, and subsequent cold conditions, the growth of cane did not come up to earlier estimates. This was particularly so in the late cane, quite a portion of which will hardly be forward enough to harvest. Despite this, some really good cane was to be seen. Bartle Frere, as usual, looked very fine, and of its cane-growing qualities there can be no doubt; the southern side of the Russell at Buckland's also had very heavy cane, and also the portion formerly known as the Queensland National Bank property. A fair

area of land had either been planted or was being prepared then. Of the former the strike was very slow, caused no doubt by cool weather conditions.

Varieties.—In this area Badila is, of course, the main cane; of the others Q.813 was giving good results on a paddock of Dr. Knowles. The cane was cutting at the rate of about 30 tons per acre and its density was 1½ per cent. over the mill average. Considering that the cane was barely twelve months old, and that a fair proportion of the mill's average was from standover cane, the result is promising. Unfortunately, the Q.813 was lying down badly, probably because it was not planted deeply enough, and also because it had been badly knocked about by heavy wind earlier in the year.

H.Q. 458, H.Q. 409, and Oba Badila were noticed upon Mr. A. Mayer's red soil farm at Bartle Frere. The lastnamed (first ratoons) was looking very well, but the two others had grown too quickly and were too straggly. This class of soil is evidently too good for such quick-growing canes.

Pests.—Grubs have done more damage in the area than at any previous time, for, although the actual loss was only severe in a few places, yet on very many farms the cane received a severe check, and the subsequent cool weather did not do it any good.

Borers and Rats.—These also did a certain amount of damage, but not above the average.

Diseases.—Leaf scald was only seen to a small extent, but probably the effects of it were not noticed so much on account of the quantity of cane showing "yellowing off" from grubs.

The Southern Field Assistant, Mr. J. C. Murray, reports (25th July, 1925):—

Childers.

Cane here is backward, especially late cut ratoons. Heavy rains fell during June, but there will be little benefit from these owing to low soil temperature. Although the mills have reduced considerably their original estimates, the crushing will still be a very fair one.

There is a considerable amount of agricultural activity in this district, the farmers getting through their farm work prior to the rush of the season. Tractors are coming into more general use and the growers are taking a keen interest in new types of implements, especially those calculated to lower in any way the cost of production. Two new types of implement have been demonstrated recently in the Childers district—a rotary cultivator attached to Fordson tractor and a plough for working in trash and green manures. The latter implement is an excellent one and supplies a means whereby cane trash and dry cowpea or beans can be effectually ploughed under.

The practice of green manuring is extending, and it is now quite common to see fields of legumes growing for this purpose, whereas five or six years ago very few growers practised green manuring. Cane varieties making a good showing in the Childers district are Q.813, M.55, Pompey (7 R.428), M.1900, and H.Q.285. Of these the firstnamed looks best. The C.S.R. Company has variety plots at various points in the district, but as yet the canes from these have not been tried under field conditions. Canes undergoing trial by the company include Korpi, a variety that has done well in North Queensland.

The most prevalent disease is the common root-rot or "peg-leg." As this has been discussed several times previously, there is no occasion to repeat the recommendations, especially as growers are doing a great deal more crop rotation than hitherto, a factor which goes a long way towards minimising the damage done by fungoid parasites. Gumming was noticed in several blocks of D.1135. Where growers know they have gum in a block of cane they should always sterilise the cutters' knives before leaving that block. The men are themselves asked to co-operate with the farmers in this respect, for gumming is a very serious sugar-cane disease. A tiny drop of gum contains thousands of organisms, so it is plain that the disease can be readily carried on a cane knife.

The most successful fertilising results are being obtained from potash and bonemeal.

Booyal.

The cane here has made good growth considering the adverse weather conditions that prevailed during the autumn. Some standover cane will cut as high as 30 tons per acre. Farmers are experiencing no trouble with pests or diseases. Varieties being tried include Q.1098, H.Q.77, J.247, Petite Senneville, E.K.28, E.K.2, Q.970,

E.K.1, Black Innis, H.Q.285, Q.813, N.G.40, Meerah, and M.1900 Seedling. Of these, the canes making the best showing are Q.813, H.Q.285, Meerah, and Petite Senneville. The teacher in charge of the local school intends to establish a small experiment plot for the benefit of his scholars.

A sample of a fairly typical soil, taken at last visit, shows to be fair in humus, nitrogen, and potash, low in phosphoric acid, and fairly high in lime.

Maryborough.

Although the crops here are not as heavy as last year, the mill anticipates a crushing a little above the average. The Mary River flats are very productive, and growers of cane on the banks of the river have crops that should harvest over 20 tons per acre. The crop would have been heavier, but the late cut ratoons are poor.

Farmers are doing much better and are becoming more up to date in their methods than a few years back. Mechanical traction for ploughing is coming into use, and growers are taking a greater interest in experimental work than hitherto.

Older varieties of cane are gradually being discarded, canes with a higher sugar content and greater resistance to disease taking their place. Two varieties are giving outstanding results: M.1900 Seedling and Q.813. Both are useful for the grower and the miller alike, the latter finding them good canes to treat and the grower finding that he gets a high percentage of c.c.s. from them.

"Gumming" is showing in the striped Singapore. Any farmers observing this disease in their crops should take precaution against spreading it during the crushing.

To get the best results this season, farmers are recommended to avoid cutting immature cane and not to cut more than their allotment. During the coming season, if a farmer notices that his ratoons are shy, he will be able to give them a start by a light top-dressing of sulphate of ammonia, provided, of course, that dry weather is not prevailing. In ratooning, while opinions differ as to the best method, the main item is to get the interspace thoroughly worked up. Farmers would do well to harvest their best varieties in September and October. Old ratoons would be best cut late in the season, and early maturing varieties or canes that the growers intend to replace would be best cut early.

Pialba.

The cane appears to be generally rather backward. Farmers have had plenty of rain, but no doubt the late season last year prevented their doing as much cultivation as they would have liked, especially those with long haulage. Some of the standover crops are heavy and in good condition. Some varieties are showing a tendency to arrow, particularly H.Q.285.

Pialba farmers, especially those back from the coast a few miles, are strongly recommended to carry out green manuring. They will find the light loams immensely improved by this process. Assume, for instance, that they allowed the peas (if cowpea were grown) to mature. They can get a good price for the seed, and can work the top and the roots into the soil, where they quickly decay and form humus and act as a nitrogen source.

Yerra.

The cane is remarkably healthy at present, and some of the crops are heavy. Very slight frosts have occurred, although nothing heavy enough to affect the cane. The farmers here are growing the recommended varieties and gradually discarding the useless ones. The variety Petite Senneville is a cane that has made about the best growth. M.1900, Q.813, and Black Innis show good crops also. Good strikes of D.1135, too, are in evidence.

20th August, 1925.

Mount Bauple.

Very fair crops are growing on this area this season; in fact, some of the cane to be seen in the southern district is showing at Bauple. The writer has in mind particularly Q.813, H.Q.285, M.1900 Seedling, and E.K.28. At present there is no new cane that could be recommended to displace the staple ones.

A matter towards which the growers' attention is directed, however, is the presence of considerable patches of gummed cane in their district. The two most effective measures of control for this disease (gumming) are plant selection and cane knife sterilisation during the cutting season. As an illustration of the importance of the latter, the following will show:—An examination of a field of cane showed abundant evidence of gum. The owner was starting on this block,

and from that point the cutters would carry on right through the farm, with the inevitable result that in a few years the disease would be in almost every stool. The farmers are earnestly requested to dip the set of knives in a drum of boiling water after each block is cut, irrespective of whether they have noticed the disease present or not. In the writer's opinion cutters are the greatest, though unconscious, distributors of gumming disease.

Agricultural activity in the Mount Bauple district is extending, especially in the direction of banana culture. It is surprising that the rich eastern slopes of Mount Bauple have not been cleared before now for bananas, as they appear to be ideally situated for this fruit.

Crushing was in full swing. A good type of labour was offering, and the season should assist the district one step more along the road of progress.

Nambour.

Whenever one comes to the Nambour district there is always an impression of freshness and prosperity, a feeling that one day there will be a great city with outlying orchards, farms, and sanatoria, a place where tourists will come to enjoy the wonderful beaches and equally splendid mountain scenery.

Frosts have caused considerable damage, but the frosted blocks are being milled as rapidly as possible, so that it is unlikely the farmers affected will suffer serious financial loss. Unfortunately, some cane intended for plants has been seriously affected, a circumstance that will probably compel the growers to buy plants elsewhere. Taking the cane on the whole the crops are good. The cane exhibit at the Nambour Show was well up to standard. Some of the M.1900 Seedling exhibited, grown on the high lands west of Nambour, showed phenomenal growth. Growers are strongly advised to keep working against the spread of disease.

Most farmers are familiar with the primary symptoms of the two major diseases, but co-operation is the only thing that will free a district from pests and diseases and bring about a 100 per cent. efficiency.

Mosaic disease can be very readily controlled by plant selection, and the farmers could soon rid themselves of what is present in this district if they tackle it wholeheartedly next planting season. Advices from Louisiana, U.S.A., show that Mosaic disease cane cause very heavy losses if not checked.

Beenleigh.

The crops here look well, and the small mills scattered about the district will have fair crushings. Many of the farmers are leaving canegrowing in favour of other crops such as bananas, potatoes, and arrowroot, all of which are profitable at present. Those continuing to grow cane will find they will do better if they plant Q.813 more extensively than at present. M.1900 Seedling also does very well here at present, also H.Q.285. These canes also give the small mills, which are without shredders and are not heavy roller plants, a better chance.

GUTTA PERCHA TREE *(EXCAECARIA PARVIFOLIA)* AND ITS EFFECTS ON SHEEP.

The Inspector of Stock at Normanton, North Queensland (Mr. D. A. Logan), has recently reported to the Department as follows:—

"I have inspected a mob of travelling sheep, J. S. Kirby and Son, owners, travelling from the Winton district to Inverleigh West (late Wernadinga).

"When between Wurung and Inverleigh West some of the sheep developed a sickness with the following symptoms:—The sheep lost all sense of sight and hearing, would bleat for their mates while alongside of them, would sometimes travel round in a circle and drop on their sides and lie there. They would chew the cud but not swallow the food, as some would fall out of the mouth; would sometimes walk backwards from the other sheep. Not many deaths occurred, but sheep that died bucked in the air and fell dead. Some also frothed at the mouth.

"Sheep, when affected with the sickness, would not travel and consequently had to be left behind, while the strong sheep travelled on. The internal organs of the sheep appeared quite healthy on examination.

"The mob comprised 6,887 ewes, and out of this number about 300 were affected. The sheep had been eating Gutta Percha leaves, and it is thought that these leaves may have been the cause of the sickness, as it did not appear among the sheep until they commenced to eat the leaves of the Gutta Percha.

"Under separate cover I am forwarding you a few of the leaves, which have a drastic effect on the human eye and mouth, if the milky sap of the same happens to come in contact with them.

"I may state that the sheep in question are the first to arrive in the Gulf, and will be followed by several mobs within the next twelve months."

The specimens of leaves referred to were handed to the Government Botanist (Mr. C. T. White), who identified them as the leaves of the Gutta Percha Tree (*Excæcaria parvifolia*), and reported as follows:—

I have no doubt that the leaves of the Gutta Percha Tree (*Excæcaria parvifolia*) are responsible for the trouble among travelling sheep reported by Stock Inspector J. A. Logan, of Normanton.

The members of the genus *Excæcaria*, to which the North Queensland Gutta Percha belongs, all possess a very acrid blistering milky sap and for this reason are variously known as "Blind-your-eyes" and "Poison Trees." When leaves and twigs are eaten by stock the sap has a blistering effect on the inner membranes and may cause sickness and in some cases death.

It is common practice with school children to chew the dried sap of the Moreton Bay and other fig trees, and on p. 87 of Bailey and Gordon's "Plants Reputed Poisonous to Stock," there will be found a reference to a child having mistaken the Milky Mangrove (*Exæcaria Agallocha*) for a fig-tree and chewed some of the sap with very nearly fatal results.

CHEESE MAKING.

A. R. WILKIN, Instructor in Cheese Making.*

My duty being to closely watch the cheese industry and assist it in any way I can, I am very pleased to state that I find that a very satisfactory advance has been made in the quality of the cheese generally this year, and there is no doubt the great majority of factory managers and cheesemakers are thoroughly acquainted with their work. This is borne out in the grading, for although their cheese may grade second they invariably procure full points for manufacture, but cut down for flavour, showing that they have done their part of the work intelligently. Still the general results are not satisfactory.

This brings us to a matter where there appears to be divided opinions, and summed up it comes to this: Only with a proper system of raising aeration and cooling of milk on the farms can it be delivered to the factory in such a condition that the cheese maker can guarantee to make a 92 per cent. grade cheese, or is it better to install a pasteurising plant which gives you an assured control of the milk and makes it possible for the cheese maker to turn out 99 per cent. of first grade cheese.

With our erratic seasons and the many different kinds of pastures which include such varieties of highly flavoured weeds, I am convinced that we will never get rid of weedy and other bad flavours in the cheese without the aid of pasteurisation. Hence my advice is, install them as quickly as you can.

Whilst on this subject I may say that during the past some unpasteurised cheese of second grade quality brought a higher price in London than pasteurised cheese grading 94 points. This, to my idea, is no criterion, but very detrimental to the industry for this reason—the person who bought the second grade cheese would be dissatisfied with his purchase and not likely to advertise our stuff, whereas the purchaser of the pasteurised cheese would be quite satisfied and come again; and what is more, if all our factories have pasteurisers we could export 90 per cent. of our cheese under the Kangaroo Brand and the price overseas would immediately advance the same as the butter has done and put the industry on a very much better footing.

I did not intend dealing with the manufacturing side of the question, but as one defect has been quite common in our cheese—viz., uneven colour—a word or two here may be useful. This defect appears in both pasteurised and unpasteurised cheese.

Discolouration is caused by injurious bacteria acting upon the natural and artificial colouring in the cheese. Inferior colour, keeping milk at too high a temperature, insufficient acid, too much acid at drawing off whey, curd packed too high when cheddaring, if not turned often enough, salting at too high a temperature, uneven mixing of salt in body of curd, quick and heavy pressing, too high a temperature in curing room, are the principal causes.

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* In a paper read before the Butter and Cheese Factory Managers' Conference at Brisbane, 24th June, 1925.

FRUIT FLY INVESTIGATION.

ENTOMOLOGIST'S REPORT.

Mr. Hubert Jarvis, Entomologist investigating the Fruit Fly problem in the Stanthorpe District, has submitted the following Report covering observations and activities during the months of June and July, 1925.

FRUIT FLY.

Field Experiments (Winter Life).

(1) The Departmental Fruit Fly cages, erected over fruit trees in the orchard of Mr. J. W. Barlow, and referred to in my previous reports, have, during the months of June and July, been periodically examined.

On 1st June three fruit flies were still found to be alive in Cage No. 1 (in which forty fruit flies were liberated in the autumn); two of these flies were crawling over the fruit (that had been previously placed on the ground) and were in a "crippled" condition; and one fly was resting on the wire gauze, covering the cage. As there was a large quantity of maggot-infested fruit placed in this cage it is probable that the two "crippled" fruit flies had developed from this source.

On 8th June these cages were again examined and no fruit flies were found therein alive; six living maggots were about half grown and very sluggish.

The soil-temperature at a depth of 2 inches was, at this time, about 38 degrees Fahr. at 11 a.m.

(2) On 20th June Inspector St. J. Pratt submitted an apple harbouring a living and nearly full-grown maggot. The fruit was placed in the Insectary in a breeding jar, and the maggot subsequently perished, owing, presumably, to the very cold climatic conditions.

Several very severe frosts were experienced during the month of June, more particularly during the early part of the month, the 5th, 6th, 7th, 8th registering 18 degrees Fahr., 19 degrees Fahr., 17 degrees Fahr., and 22 degrees Fahr., respectively.

The soil-temperature throughout the winter months in the Granite Belt remains very low, and must retard, and in fact stop, all fruit fly maggot growth; and this low temperature, sustained for many weeks at a stretch, is, in my opinion, an important factor in the destruction of a large percentage of fruit fly maggots and puparia, should such be present in the soil in the Stanthorpe district during the winter months.

Fruit Cold Storage and Fruit Fly.

In relation to the influence of low temperatures on the maggots and puparia of the fruit fly *C. tryoni*, the subjecting artificially of such maggots and puparia to cold storage temperature, with a view to their destruction, has already been made a matter of investigation, both in this country and also in other parts of the world, with most encouraging results.

The cold storage of fly-stung apples from this district, by Mr. A. H. Paget in 1922, and later by the Department of Agriculture under the supervision of Mr. H. Tryon, Government Entomologist, gave very satisfactory results, both from the point of view of the destruction of all eggs and maggots of the fruit fly, and also of the freedom of possible consequent impairment of the keeping and marketable quality of the fruit.

In my report, 16th May, 1922, the importance of this possible control measure was stressed, and I am still of the opinion that (provided it is financially practicable) a cold storage plant, of generous capacity, would be an invaluable asset to the Granite Belt, and would go a long way towards controlling the fruit fly.

We are now fairly certain the fly travels into this district by flight, also that it is breeding in very many native fruits. This being so, we must look to some practical means of safeguarding the condition of our fruit, recently "stung," or menaced by fruit fly attack, prior to its being sent out of the district. Cold storage seems to go far towards meeting the requirement, and we are at present certain of this in regard to apples. We have, however, little or no data on the effect of low temperatures on ripe or ripening stone fruits—e.g., peaches, plums, &c. This data, I submit, should be early obtained.

Subjecting fruit to cold storage after its journey to Brisbane is of little use; as the damage, the outcome of recent fruit fly attack it may have experienced, is done during the twenty-four hours' transit. A maggot, say in a peach, can, although only just emerged from the egg in a fruit on its leaving Stanthorpe, develop into a nearly full-grown maggot by the time the fruit is opened up in the markets, everything meanwhile being in favour of its rapid development.

Persistence of Fruit Fly in Native Fruits.

On 19th June a consignment comprising the following native fruits was received from Dr. T. L. Bancroft, of Eidsvold, Queensland:—(1) *Bryonia* sp., (2) *Carissa ovata*, (3) *Solanum aviculare*.

Five fruit fly puparia (evidently that of the new species of fruit fly, bred from Bryonia by Dr. Bancroft) were found in the Bryonia fruit; the maggots had pupated during transit. In the two latter fruits, no eggs or maggots were found.

Visit of N.S.W. Entomologist and Fruit Expert.

On 16th June, Mr. W. Gurney, Government Entomologist, New South Wales, and Mr. W. J. Allen, Chief Instructor in Fruit Culture of the Department of Agriculture of that State, arrived in Stanthorpe with the object of conferring with the Entomologists, the Chief Inspector, Mr. T. W. Lowry, and Mr. J. Henderson, Instructor in Fruit Culture, on fruit fly control work, &c.

A visit was first made to the departmental cages at Mr. Barlow's, and the object of experiments involving their use explained.

Some of the fruit lying in the cage was turned over at random and several fruit fly puparia found. Both Mr. Gurney and Mr. Allen were much interested in this "over-wintering" experiment, and concurred with us in considering that it should prove a fairly conclusive test of the possibility or otherwise of the hibernation of the fruit fly as a pupa in the Stanthorpe district.

A visit was then made to Mr. A. H. Paget's orchard at the Summit, to inspect the work accomplished by the introduced and acclimatised Woolly Aphis parasite, *Aphelinus mali*.

Great numbers of parasitised Woolly Aphids were seen, clustering at the base of the trees, and also scattered among the colonies of this notorious apple-tree pest. The thorough manner in which Mr. Paget had spread this useful insect was very satisfactory, and both Mr. Gurney and Mr. Allen realised that this Chalcidid wasp, *A. mali*, should prove of great use in helping to control the Woolly Aphis of the apple here.

Fruit Fly Conference.

On 17th June a Fruit Fly Conference was held in the office of the Chief Inspector, Diseases in Plants Act, those present being Mr. W. Gurney, Government Entomologist, New South Wales, Mr. W. J. Allen, Chief Instructor in Fruit Culture, New South Wales, Mr. F. A. Perkins, Entomologist, Mr. T. W. Lowry, Chief Inspector, Mr. J. Henderson, Instructor in Fruit Culture, Mr. S. M. Watson, and myself. Every aspect of the problem was discussed on the occasion, and a general agreement arrived at on the following points:—

(1) The probability of the migration of the fruit fly (*C. tryoni*) from one district to another.

(2) The importance of native host fruits as a factor in fruit fly propagation (i.e., that of the fruit flies *C. tryoni* and *C. jarvisi*).

(3) The inefficiency of lures, as at present constituted, as a practical control of *C. tryoni* and *C. jarvisi*.

An excursion to one of the more important native scrubs in New South Wales, adjacent to the Stanthorpe district, was suggested, Mr. Gurney and the Stanthorpe Entomologists co-operating.

The visit of Mr. Gurney and Mr. Allen was greatly appreciated by all the Stanthorpe official staff, and the conference was of great mutual benefit.

On 18th July a native fruit was discovered growing about 30 miles from Stanthorpe. Specimens of this fruit were forwarded to Mr. C. T. White, Government Botanist, who reported that this fruit was the fruit of a native tree, *Capparis mitchellii*, of the family Capparidaceæ.

As this fruit is known to harbour the maggots of the fruit fly, this discovery is of some interest.

Capparis mitchellii is quite an abundant tree in the locality in which it was discovered, and the fruit of this tree is in about December full of maggots.

OTHER INJURIOUS INSECTS.

Black Peach Aphis.

The serious damage caused by this insect more or less every season and the costliness of the only really effective control-measure known here, *i.e.*, spraying with Nicotine Sulphate (Blackleaf 40), called for special investigation of other possible remedies. It is well known that the Black Aphis passes the winter months attached to the roots of the host tree. It was, therefore, considered that soil-fumigants, used

at midwinter or early spring, might prove useful in destroying the aphids present on them. Accordingly, application was made to the Entomologist in Chief, Mr. H. Tryon, for a quantity of the new soil-fumigant paradichlorobenzol. This was in due course received, and several experiments have been carried out with it; the following trees in different localities being treated. The particulars, noted by Mr. S. M. Watson, Assistant, are as under:—

Experiment No. 1.—Orchard of Mr. J. S. Mehan, Broadwater. Six trees were treated at this orchard, the trees being all of one variety, *i.e.*, Wickson Plum, and comprised one row. The quantity of paradichlorobenzol used per tree was as follows:—

——	Amount Fumigant.	Particulars.
Tree No. 1	1 oz.	Applied in shallow circular trench, 4-6 in. in depth, at a distance of 1 ft. from trunk of tree
Tree No. 2	1 oz.	Check tree. Applied in shallow circular trench, 4-6 in. in depth, at a distance of 1 ft. from trunk of tree
Tree No. 3	..	Check tree
Tree No. 4	1 oz.	Same as 1 and 2
Tree No. 5	2 oz.	Same as 1 and 2
Tree No. 6	2 oz.	Same as 1 and 2
Tree No. 7	..	Check tree
Tree No. 8	..	
Tree No. 9	..	
Tree No. 10	2 oz.	Applied in two circular trenches, 4-6 in. in depth, 1 ft. and 2 ft. from trunk of tree, 1 oz. in each trench.

Experiment No. 2.—Orchard of Mr. A. Johnson, Glen Aplin. Five trees were treated in this orchard, as under:—Tree No. 1, Lady Palmerston Peach: This tree was growing close to Mr. Johnson's house, and was isolated. Every season during the last five years this tree has been infested with Black Aphis. The amount of paradichlorobenzol used in treating this tree was 2¼ oz.

Three circular shallow trenches were made 4 to 6 inches deep around the tree, one 1 foot from the tree, one close to the trunk, and one 2 feet away from the tree, using 1¼ oz. and 1 oz. doses respectively.

Tree No. 2: Santa Rosa plum, amount used ½ oz. applied in circular shallow trench, 6 inches deep, 1 foot from tree.

Tree No. 3: Santa Rosa plum, amount used 1 oz. in two shallow circular trenches, 4 to 6 inches deep, one close to trunk of tree, and the second 1 foot from tree, ½ oz. in each trench.

Tree No. 4: Santa Rosa plum, amount used 1 oz. close to tree, and 1 oz. 2 feet from trunk, applied as above.

Tree No. 5: Isolated plum-tree (Japanese variety), amount used 2 oz., 1 oz. close to tree and 1 oz. 2 feet from trunk, in circular 4 to 6 inches trench as above.

Experiment No. 3.—Orchard of Mr. H. M. Jones, Broadwater.

Tree No. 1: Wickson plum, amount used 1 oz., applied in circular trench 4 inches deep, around and close to trunk of tree. The soil was then heaped up around the tree and pressed firmly.

Tree No. 2: Santa Rosa plum, amount used 2 oz., applied as above, close to trunk of tree as above.

Tree No. 3: Alpha plum (Peach stock), amount used 1 oz., applied in shallow trench, close to trunk of tree as above.

Tree No. 4: Mayflower peach, amount used 1 oz., as above.

Tree No. 5: Peach (Wonderful), amount used 2½ oz., applied 1½ oz. close to trunk of tree and 1 oz. 2 feet from tree, in 4 to 6 inch shallow trenches as before.

It is too early in the progress of the experiment to pronounce on the comparative efficacy, if any, resulting.

Very good results have been obtained by the use of paradichlorobenzol against the cane grub and other soil-frequenting insects, by Mr. E. Jarvis, Entomologist, who was the first to record the use of this chemical as an insecticide in Australia, and it is hoped that this soil fumigant may prove useful in helping to control similarly also the Black Aphis of the peach in this district.

San Jose Scale *(Aspidiotus perniciosus).*

The undoubted increase of San Jose Scale during the last eight or ten years in the Stanthorpe area is a matter for earnest consideration. One neglected tree or orchard can quickly infest a surrounding clean area.

The following popular description of this scale insect, and of suggested control-methods, might be of interest, as meeting the requirements of many local orchardists under their circumstances.

The Insect.—One of the most destructive orchard pests in the Stanthorpe district is the San Jose Scale. This scale insect, owing to its small size and inconspicuous appearance, is often difficult to locate, and does a considerable amount of damage before it is detected.

The female scale insects (more numerous than the males) are circular in outline and of a conical shape, not unlike a minute tent; in colour they are a greyish brown; they vary in size from 1-2 mm. (about as big as a pin's head).

Underneath this horny tent-like structure is concealed the scale insect proper, a curious unsegmented yellow legless object, possessing a hairlike sucker or beak which it inserts into the tissue of the host plant, therewith sucking up the sap.

The male scales are smaller than the female ones and more elongated.

When a tree or a branch of it becomes infested with San Jose Scale, the wood presents a roughened greyish appearance, hard to distinguish sometimes (especially when occurring on a plum or peach) from the natural bark of the tree; on closer examination, however, with a hand lens, this rough appearance will be seen to be due to the presence of countless numbers of these minute scales which, when rubbed with the finger or a knife-blade, yield a yellow oily fluid.

Life History.—The scale insect usually passes the winter here in an immature condition, hibernating beneath its tent-like covering, a very large number of the adult female scales perishing in its course; but many of the insects (usually those about half-grown) remain, these in due course multiplying and start reinfestation in the spring. As soon as the sap in fact begins to move, the young insects (see below) become active.

The female insect under the scale virtually becomes eventually but a sack of eggs, and give rise to six-legged larval forms, as hatched within her one by one, has itself no power of movement; but as soon as the young scales are born these each crawl from under the tent-like scale, and may wander all over the tree, finally settling in one fixed position, and then inserting their beaks into the plant-tissue and cell-sap. The waxy scale soon grows and protects them. These young scales when first hatched, are just discernable to the naked eye; they are reddish-brown in colour and are active little creatures, and it is in this stage that they may be carried afield by birds and insects through having crawled on to their feet and legs.

It is possible for one female scale to give birth to about 400 young during its breeding season. Experiments were carried out by the United States Department of Agriculture to determine the progeny from one parent possible during one season. From results obtained the number was estimated at 1,608,040,200.

The rapidity with which this pernicious insect will spread will thus be easily realised, and also the need for prompt control measures on its discovery.

Damage to Host Plant.—The San Jose Scale has been found on nearly all deciduous fruit trees, such as apple, pear, plum, peach, apricot, &c. It also infests many other cultivated trees and plants, "over 100 different species being recorded as host plants of this scale."

In our own district the English Hawthorn (*Cratægus oxyacantha*) is one of the known local host plants of San Jose Scale, and doubtless there are others, such as Poplar, Elm, and Willow trees, on all of which San Jose Scale has been found in other countries.

Injury to the host tree results from the extraction of the sap by thousands of these minute insects, each of which is anchored to the branch by its hair-like sucking tube or beak. If the scale is unchecked a branch, here and there, will first die, and finally the whole tree. It is possible for San Jose Scale, if unchecked, to kill a fruit tree in two or three seasons.

On peach and plum trees the scale may be looked for on any portion of the trunk or branches; on the apple, however, it is more often on the young wood and

fruit, and sometimes on the leaves, red spots being associated in all cases with its presence there.

Distribution.—San Jose Scale may be conveyed in various ways. Birds undoubtedly carry the young active larval insects on their feet, from orchard to orchard, so also do beetles, green grasshoppers, and other tree-frequenting insects. It is possible for the young scales to be transported, too, by strong winds, and they may also attach themselves to the clothing of any person brushing against a scale-infested tree.

Natural Enemies.—As enemies of the San Jose Scale, several species of Ladybird Beetles are of prominent importance. Two, at least, of these useful beetles are actually present in this district, and wage unceasing war against the San Jose Scale. The two species referred to are Orcus Australasiæ and Orcus chalybæus; but there is yet another Ladybird Beetle here associated with San Jose Scale, *i.e.*, *Rhizobius hirtellus*.

The first two Ladybird Beetles mentioned are about one-eighth of an inch in length, and nearly as broad; both are shining steel blue in colour; and Orcus Australasiæ is varied with six orange spots on the wing cases.

The third species, *Rhizobius hirtellus*, first observed and recorded by Mr. H. Tryon in 1898 in the Stanthorpe district, is not much over one-thirty-second of an inch in length, and is greyish black in colour, marked with a reddish spot on each wing case.

The larvæ of a small tineid moth also victimises the San Jose Scale in the district; and the Entomologist named mentioned and described it as preying on the San Jose Scale in the Darling Downs area in 1898. In certain parts of this district this season these moth-larvæ did remarkable work in cleaning up San Jose Scale.

There are also several minute parasitic "wasps" (Chalcididæ, Order Hymenoptera) known to attack San Jose Scale in other countries. Doubtless, some of these minute parasites are in this district also, but we have as yet no record of it being so.

Control Measures.—Lime sulphur, is, in my opinion, one of the best sprays for San Jose Scales, the commercial lime sulphur, or the home-made lime sulphur being alike effective.

The best time to spray for San Jose Scale is during the dormant period of the tree. The spray can then be applied at its full winter strength, and a maximum killing effect on the scale secured. A simple receipe for making home-made lime sulphur is as follows:—Boil 20 lb. of unslaked lime and 15 lb. of sulphur in 20 gallons of water for about an hour. The above method produces a spray of the right strength for deciduous trees during the period mentioned.

Very good results have also been obtained in spraying for San Jose Scale in the winter again with miscible oils, such as "Gargoyle Red Spraying Oil." These should be used at a strength of about one part of the oil to twenty or thirty parts of water, and with great care when the bark is dry, especially in the case of the peach and nectarine.

Further, in using any oil spray, great care must be taken to see that the oil is properly emulsified. This can be secured by taking one gallon of oil and one gallon of water and thoroughly mixing them by aid of the spray pump until a perfect emulsion is secured, when the remaining amount of water can be added.

Diseases of Orchard Trees.

On 19th June, Inspector St. J. Pratt brought to my notice an instance of a gumming disease severely affecting plum trees in the Broadwater district. In order to obtain specimens illustrating this plant so conditioned for the Pathologist, a visit was made to several orchards in company with Inspector Pratt; many specimens were secured and forwarded to Brisbane for investigation by Mr. H. Tryon, who furnished a comprehensive report on this plant malady. Several other diseases of fungus origin also affecting deciduous fruit trees in the Stanthorpe district have been brought to his notice and specimens illustrating them been supplied.

Concluding Remarks.

Field work: Two Entomological Field Days were held during June and July, and much interesting material secured.

Entomological Contributions.

Many additions have been made to the entomological collection during the last two months by Mr. S. M. Watson (assistant), and I am indebted, too, to many of the departmental inspectors for contributions to it also; and so, too, to Mr. E. Sutton, of Broadwater, who has supplied us with many quite new and interesting insects.

TOMATO BLIGHT DISEASE (*Phytophthora infestans*).*

By HENRY TRYON, Entomologist and Vegetable Pathologist.

INTRODUCTORY.

The tomato plant when grown in Southern Queensland has many natural enemies —in the onslaught of diseases proper, and in the attacks of special insects that injure it by feeding upon its living tissues.

Amongst the latter, its insect enemies, we may mention the Cutworm (*Agrotis*), that, dwelling in the soil, may sever its stem across at its base soon after it has been planted; the Isodon Beetle that, either in its grub-stage or as an adult, gnaws away its roots; the Brown Weevil (*Desiantha*) whose green slug-like larva will consume any part of the young plant; the Lady Bird bettles (*Epilachna*) that erode its foliage; the Tomato Worm (*Chloridea*) that especially tunnels into its fruit. Then we have the small Tomato Fly (*Lonchaea*) that "blows" this when it is also still green, laying its eggs in the fissures at its base. Worse than all these, however, is the soil-frequenting nematode that causes root galls, and so makes the root-system maintain it, and to this extent rob the plants of their sustenance.

Diseases again of the tomato are both numerous and formidable. Firstly, we have various forms of wilt, that cause the plants whilst apparently in full vigour to fade away as if their roots were deprived of the moisture in the soil. There is the wilt sometimes spoken of as "sleeping sickness" due to certain bacteria living in its sap vessels—as I was the first in the world to discover; then there is the Fusarium wilt caused again by a fungus-parasite similarly inhabiting them; and further, tomato wilt of unknown origin. Then we have such fruit diseases as Gloeosporium Rot, Blossom End Rot, and lastly one affecting it when it is still green—the Wet Rot. Sunscald of the fruit may also be considered in this connection. Then occur two leaf diseases—Black Spot and Grey Spot—and perhaps worst of all still to be mentioned the Tomato Blight, victimising the entire plant and occasioned by one of the so-called Downy Mildew fungi.

All these obstacles to successful tomato growing, must now however be put on one side whilst consideration is given to the last mentioned of them—"The Blight."

Tomato Blight.

General.—This malady, that is now especially to be spoken of in connection with the tomato, is one that at the outset we must refer to—and this is a very important consideration—as not being peculiar to it, since the potato plant is also subject to the malady (and to a less extent also the egg plant or Brinjal). In fact it is better known as the Potato Blight since it is in connection with it that its devastations have earned for it such world-wide notoriety.

But, after all, the same remark applies to almost the entire series of tomato insect enemies already mentioned. Thus it happens, that the tomato grower must, in his own interest, have regard to the potato plot in his own land, or growing in its neighbourhood, as a possibly prolific source whence his staple crop may at any time receive harmful visitation from both insect life and from the seeds of these infectious diseases—the one under consideration especially. In fact the very winds even that his tomato plants feel may be laden with air-borne spores that have originated in this way. Further, the plant-treatment, that in considering this matter of Tomato Blight will be later dwelt upon, has special regard to this possibility of infection from without.

How are we to recognise this particular malady? When, and where to look for it? are questions first to be dealt with.

Conditions of Occurrence.

Meteorological.—Now it must be borne in mind that the Tomato Blight as is here under consideration is a cold weather disease. In fact it apparently "works" even when the temperature is almost low enough to destroy its host plant. Thus humidity and warmth combined that we usually associate with the growth and destructiveness to plant-life of a mildew, is far from being conducive to the development of this Tomato Downy Mildew; in fact, with the advent of hot weather it practically disappears, the high temperatures of summer killing it as far as we can observe, whilst the other plant parasites may thrive then.

*This formed in part an address at the August meeting of the Aspley L.P. Association.

Again, although mention has just been made of humidity combined with warmth as an unfavourable condition, it must be still realised that without wet and moisture the infection of the tomato plant by blight in the first instance cannot take place. Thus it is only when water resulting from rain or mist, or such as is distilled by dew, persists on the foliage, that the parasite that occasions the malady can secure a holding, and bring about infection. These necessary weather conditions go to explain why it is that Tomato Blight is in evidence at one time of the year more than at another. Also (what is most important) we learn from this when preventive measures against its attacks are to be prosecuted with the likelihood of success.

Soil.—Those soils most productive of quick and vigorous plant-growth occupying valleys and hollows; in fact conditions in this respect most suitable for the tomato favour again blight occurrences.

The Plant.—Again, one has to consider that the disease is a very virulent and active one, and may attack the plant at any stage of its growth—in the seed bed when recently planted out, or even when much of the fruit although still green is almost ready to gather; a remark that will suggest that any preventive treatment needs, for its effectiveness, to be long continued.

Symptoms.

In the case of quite young plants, a slight development of a "yellowishness" of colour may be the first feature noticeable, but this is very soon followed by a sudden and general withering and drooping to the ground, the plants being blasted as it were. In plants of older growth, the younger shoots only may thus wilt, hang over, and shrivel up whilst still green. Now on the foliage generally and to greater or less extent, will develop indefinite palish yellow patches, usually involving the leaf-margins, but often, too, isolated from them. These are observed to gradually increase in size as meanwhile also in number, and as this happens to become of a dull brown colour denotive of death, the affected leaves too as they become wholly infected droop, shrivel up, and dry. Thus, too, the leaf-stems become involved and develop a translucent sickly hue, as they lose their consistence. Again, these brown patches may arise on the branches, especially where these originate or divide, and as these extend, and the plant-tissue here collapses, all growth beyond wilts and dies. The flower-buds and flowers again may be directly attacked. In the case of the green fruit: this early manifests a rusty brown cloud-like marking that may be of some size; but as the change beneath, that this indicates, passes outwards and inwards, not only has the "flesh" (as seen on incision) become brown, but the affected area outwardly is obscurely marked with grey and shows shallow pitting and wrinkling—the outcome of destruction that is being effected. These occurrences as they develop, as usually happens, result in death of the plant, and soft-decay of the fruit as it becomes the prey of other organisms.

It must, however, be remarked that in so much as heat is as we have seen destructive to the agent causing the disease, and leaf-wetness to its propogation, the blight may be arrested at any stage of its growth when the one weather condition arises and the other fails.

Cause.

The agent, the cause of this Tomato Blight, can scarcely be satisfactorily portrayed without illustrative figures. However, some material points may be conveyed by verbal description.

It is a fungus and one of the diminutive forms of this very comprehensive group of the lowest forms of plant life. Moreover, it is not only a parasite living at the expense of the tomato, the potato, and a few other plants, as we have seen, but an obligatory parasite—that is, one that cannot grow and reproduce itself outside its host (one of these plants named). Hence the destruction—say by fire—of the plant or any part of the plant in which it inheres reduces the extent to which it occurs. (*Note.*—This is very important when one has to consider its occurrence within the tubers of the potato, in whose tissues it can long subsist and so be transported over wide areas to originate new centres of blight occurrence). It is named for purposes of recognition *Phyto-phthora infestans*; of which the former, the generic word, merely signifies plant-supporter, or borne.

Appearance.—As to this, although a diminutive, or microscopical organism (micro-fungus), it can be seen when several individuals are massed together. Thus,

if a tomato leaf, exhibiting the earliest features of blight, be looked at from beneath, especially in the early morning, it will be observed that surrounding the yellowish blotch is a halo of greyish colour that has the appearance of the very finest powder. This is the fungus in one phase of its existence—a mass of individual forms. Let us conceive a picture of *one*, as it really is. First of all it has issued from a minute breathing-pore (stoma), one of thousands in the lower skin or epidermis of the leaf. In fact it is really rooted in the innner leaf-substance that this protects. It is in form like a little tree, with short little branchlets, ending in two-pronged forks; the points of which instead of supporting what might be taken to represent leaves, actually bear each a single oval fungus-fruit or spore, that serves the purpose of a seed.

These microscopical tree-like forms all point—hang as it were—downwards, and as the day advances and the air becomes dry, a mechanism with which the "trunk" of the tree is endowed causes it to swing around and reverse the process, and thus are the fungus-spores dropped into the air, and so come to float therein, forming motes in the sunbeam, passing to and fro, passively conveyed to wherever wind currents are proceeding.

Fortunately, these fungus-fruits or seeds (spores) are not very tenacious of life, and the majority under ordinary conditions die soon, some few—comparatively speaking—but millions amongst billions fall upon the leaves and other parts of available tomato or potato plants. Here they get imprisoned, in dew-drops, and other forms of water there occurring. Further, these fungus fruits when in this position break up usually, and give rise each to bodies smaller than themselves, that after swimming about come to rest, being in fact zoo-spores—fungus-seeds endowed with motility—one of the main features of life.

These settle down and each now gives rise to a sprout or germ-tube, that penetrating into the leaf-substance—if on a leaf the resting place occur (so also if elsewhere with little difference), ramifies therein, its branches forcing their way between the cells of the tissue of which this is composed, sending offsets or suckers into these cells and whilst thus feeding poisoning their contents—the cell sap. Then, in turn, ramifications of the parasites' growth having gained the lower-leaf surface, issue outwards in the form of those fruit-laden micro-fungus "trees"—that we have described—and so does further dissemination of the agent causing the disease ensue.

Meanwhile, the tomato leaf, stem, or fruit, as the case may be, has died and turned from green through yellow to brown—cell after cell.

Whilst realising this that has taken place, one must insist on the fact that the time occupied between the first act of infection, whether the site of this be a leaf, stem, or fruit, and the outward appearance of the fungus again—say on the under-leaf surface—is always of some days duration, apparently nearly one week at least. This period, occupied with the vegetative growth of the parasitic fungus, is termed its incubation stage. Meanwhile there may be little if any evidence of its presence. Further, in some cases (for example in the case of the fruit), the vegetative stage may persist long without the fungus-spore production.

By reason of its existence of this obscure phase of life during the incubation stage, protective treatment against infection and infestation, if too long delayed—though prosecuted when there is as yet little or no manifestation of the blight—may be ineffective.

At present we have little or no evidence tending to show that any variety of tomato plant will not serve the blight fungus for the purposes of its growth and development—in other words, that it is immune from its attacks or even blight resistant.

Treatment.

Obviously, the agent occasioning the tomato plant, operating entirely within the tissues of the plant itself, the disease that it brings about cannot be overcome by any remedial agent when once it has been inaugurated. However, it has been found possible to destroy the blight fungus, both during its short transitory life when it has issued from the under-leaf surface or other part of the tomato plant, and when its "germs" have come to rest on the foliage elsewhere, and the germ tubes are being given forth by them, but have not yet penetrated and so effected the initial act of infection.

This is done by placing beforehand a germicide on the plants' entire outer surface, that, taken up by the water in which these germs occur, effect their destruction—the treatment being in this respect a preventive one against blight attack.

Bordeaux Mixture.

This spray-fluid will probably be found to be the cheapest and most efficient preventive. It can be prepared according to the direction given now in most of the works relating to horticultural practice. In this connection it may be pointed out that the present writer dwelt fully on this subject in a paper entitled, "Natural Enemies of the Potato and How to Fight Them," pages 12-14, copies of which are available.

Burgundy Mixture.

As alluded to in this paper, it may be possible to use ordinary washing soda for the sulphate of copper; but in this case it is recommended that special care be taken to ensure that the fungicide—termed under this new form Burgundy Mixture—be not alkaline, especially seeing that the tomato is a somewhat delicate plant, and it is unknown to us to what extent it can tolerate an alkaline spray-fluid without injury through "scorching."

To ensure this being so it should be tested with phenolphthalein paper, fixed in the split of a piece of wood before being dipped therein, so as to avoid contact with the soiled fingers. The "test" may be in a liquid form, as in the case of the ferrocyanide of potash one, the phenolphthalein being dissolved in dilute alcohol, the solution being of ½ to 1 per cent. In the latter case the services of the chemist will, perhaps, be needed for its preparation. Using this test, a pink coloration will indicate alkalinity, and should it occur bluestone solution should be gradually added until it disappears. The employment of this alkaline test does not preclude the need of the use of the ferrocyanide of potash test for detecting the presence of the sulphate of copper. In fact, this should be resorted to first, and soda solution added if its requirement be indicated.

As stated in our paper for treating the potato plant for blight prevention, an arsenical salt (*e.g.*, arsenate of lead) should be added to the spray fluid when made, so that each application may not only serve this end in the case of the tomato, but its use also compass the destruction of all leaf-eating insects that have, or may invade, the plant.

With regard to the question: When is one to spray? This should be done at any stage in the growth of the plant, successive applications being made, the latter ones being with Burgundy rather than Bordeaux mixture. Further, the procedure should be repeated as long as there is any foliage, &c., that, owing to its being the outcome of recent growth or to the cleansing action of rain, is without the protective "film" of fungicide bestowed upon the plant by an earlier dressing.

It may be also remarked that the amount required for any one spraying procedure is best ascertained by first applying simple water to a few plants unless one has previous experience to guide one.

Again, that effective spraying does not imply the continuance of the application until the fungicide is running off the plant, and wetting the soil-surface beneath and around it, but on the other hand, that it should be applied in quite a mist-like form and yet in sufficient force to reach every part of the plant being treated.

Finally, it may be remarked that although the correct preparation of Bordeaux Mixture or Burgundy Mixture needs a good deal of writing to describe it, still it is a very simple process really, and one quickly mastered.

Further, that under Queensland weather-conditions—except those obtaining during the hotter months of midsummer—the attempt to grow tomatoes without resorting to the application of a fungicide as a protection to the foliage constitutes a very great risk indeed of losing the crop, through some sudden infection of the plants by the blight organism so easily brought about.

Obviously again, tomato plants that have been victimised by "blight" should be eradicated and burnt and not left either in or on the ground so as to serve a means for perpetuating the trouble on the farm or beyond its limits.

THE BEAN FLY (*Diptera-Agromyza phaseoli*).*

By HENRY TRYON, Entomologist and Vegetable Pathologist.

The damage associated with the presence of this insect, in such beans as the Canadian Wonder (*Phaseolus*), and its allies, is characterised by the development of an irregularly swollen stem, principally below the lower leaves, more or less fissured and covered with a brown scaly investment, derived from the bark proper, as the result of underlying injury and consequent changes, due to the maggots of the insect feeding beneath.

On exploring these peculiarly altered bean plant stems, say with a penknife, not only will the actual depredators be brought to light in the form of very small yellowish maggots, but the puparia of these (little oblong oval smooth bodies of much the same colour), into which these maggots have metamorphosed, and in which the insects have come to rest prior to transforming to flies.

The beans exhibiting these injuries are very much damaged indeed; in fact, the plants are practically ring-barked eventually, notwithstanding the endeavour to heal the wound, shown by the production of callus, whose substance largely contributes to their gouty appearance. Thus, at the very outset, growth is seriously checked, and soon brought to a standstill. In fact many plants attacked succumb after they have long proved unprolific.

If one of these bean plants, or even one or more of them is placed in a pickle bottle, and the mouth of this secured, small black flies soon come upon the scene, each being only but little bigger than a good pin's head. This final form of this destructive maggot is spoken of as the Bean Fly—named *Agromyza phaseoli*.

Its method of establishing injurious relationship with its host is very remarkable, and has been well described by a former Assistant Government Entomologist—Mr. E. Jarvis:—

"If we visit a bean crop on a summer's day and quietly watch the plants, it will not be long before one of the flies settles on a leaf close at hand to deposit eggs, and we shall then find it an easy matter, with the help of a small magnifying glass, to watch the interesting operation from start to finish.

"Having first raised the hinder portion of its body, the insect bends its abdomen downwards, and, with a special egg-laying instrument, called an ovipositor, punctures the surface, and skilfully inserts an egg in the thickness of the leaf under the skin or epidermis.

[NOTE.—The ovipositor in Agromyza really consists of a toothed-cutting instrument.—H.T.]

"If we pick an apparently sound leaf from a badly injured plant, and, holding it against a strong light, look through it, we shall at once notice numbers of watery-looking semi-transparent dots and minute holes distributed over the basal portion, and, upon examination of the former with a pocket lens, discover that a few of these enclose minute elongated eggs.

"A young leaf taken from a big Tonga bean on the 3rd of December, 1912, was found by the writer to have received ninety-one punctures, but only nine enclosed eggs, and his observations incline him to suggest that these empty punctures may have been made in position that would have proved unfavourable to the young larvæ, by preventing, in some way, their easy access to a big vein. He has noticed, too, that when a fly makes a puncture destined to receive an egg, she takes a little longer than ordinary over the operation, and then, moving quickly backwards, remains for nearly half a minute with her mouth to the hole, as though engaged in closing the wound or covering the egg. Such behaviour, however, does not invariably indicate the presence of an egg, as she will occasionally put her mouth to a freshly-made empty puncture, to suck the sap, perhaps, that flows freely from such injuries. Punctures made in leaves of the above-mentioned bean often become noticeable when the damaged tissue has dried and turned brown, and it is not unusual to see hundreds of such dots on the basal portion of a mature leaf. The egg stage occupies from about three to four days."

As Mr. Jarvis also informs us, on the egg hatching, the tiny maggot burrows its way through the soft tissue intervening between one face of the leaf and another into the leaf-stalk, and then proceeds in the same way down through this until it reaches the main stem, leaving in doing so only the most obscure outward indication of the course it has pursued. Having gained the stem in this remarkable manner, it joins its fellows, that may be already present therein through action of a like kind, and that are associated with it henceforth in its destructive habits.

*This formed in part an address at the August meeting of the Aspley L.P. Association.

Owing to connection between the bean fly and the bean plant being, in the first instance, brought about by eggs laid one by one in the leaves, one leaf after the other, a work in which several insects may co-operate, maggots of different ages may be present in the stem and its branches at any one time, and the injury moreover be prolonged, the plant continuously endeavouring through the activity of its cambium to repair its damage.

Moreover, the bean fly depredations are all the greater insomuch as the seedling may be attacked almost before it has produced its true leaves, and the plant ever afterwards.

Remedies.

Notwithstanding this injurious insect has an immense range of occurrence—throughout coastal New South Wales and Queensland, the East Indies and the Philippines, and west even to Madagascar—and thus efforts at overcoming it have occupied the attention of many investigators, no certain and efficacious method or methods of coping with it has been arrived at.

1. Great stress has been made on the possibility of discovering bean varieties immune from attack; experiments to this end so far, however, have only yielded negative results.

2. Again the question of utilising the services of natural enemies has been considered; but then here in Australia, as F. P. Dodd has recorded, we have several small hymenopterous insect parasites, and yet the fly's great destructiveness is experienced.

3. Farm Hygiene.—A great deal, however, can be accomplished by preventing excessive breeding of the "pest" by a very simple operation. Given an opportunity, brood follows brood with some intermingling in this latitude (South Queensland) almost throughout the long season in which bean plants can be profitably grown. Thus by March usually the fly has become so numerous as to defeat efforts at securing a crop. But it would seem as though the farmer had been endeavouring—such is his usual practice—to raise flies rather than beans. Allusion is made to the custom of leaving the insect-infested plants, when no question as regards their worthlessness can be raised, or when they may have even perished where they occur, to produce myriads of bean flies; instead of immediately, as soon as either condition has been brought about, eradicating them and destroying them by burning them in the field where they are. In this connection one should ascertain if any cowpeas are being grown near the bean cultivation, since although these may be used as a trap-crop, still to some extent they may serve as sources for bean fly supply.

4. Preventive Measures.—Recognising the fact that it is the special odour, attaching to the bean plant, that in the first instance attracts the fly; our experiments have been directed to masking or neutralising this by some volatile substance placed on or near the growing plants. Unfortunately, so far, no constantly effective one has been discovered. Kerosene, phenyl, and others of the kind applied mixed with sawdust to the soil wherein the plants have been used, similarly carbide waste from acetylene gas manufacture, naphthalene, &c., and still with little satisfaction. However, experiments in this direction have not exhausted every substance that appears to meet the requirements, and it may be remarked that this tentative method might include the use of fly-repellants—a single substance being endowed conceivably with this quality, as well as with the preceding ones.

5. Formerly there were some grounds for concluding that ordinary lime scattered on the soil around the "feet" of the plants would repel fly visitation, but it was found that such result was by no means invariably secured. It is now considered by us that any positive action on its part noted might have been brought about by the slow production of ammonia, whose liberation lime would effect from certain nitrogenous bodies already present where it was applied—a possibly suggestive fact.

6. Some little promise appears to be yielded by spraying the plants with a liquid, so as to produce a delicate film on the upper leaf-surfaces. Of these Bordeaux Mixture appears to be the best, especially when used in connection with a spreader—*e.g.*, soap solution. Of course the purpose in view is to deter the female bean fly from inserting its eggs in the leaves as is its habit of doing. The procedure is otherwise useful since it serves to deter fungus attack.

7. Earthing Up, &c.—As we have seen, the fly-injured plant is constantly endeavouring to repair the damage as it is being wrought. To aid this effort, it may be assisted in two different manners; painting stem with a form of limewash as we formerly recommended, or piling earth around this stem so as to cover it for some way up; a procedure that will, when weather conditions are favourable, cause the emission of adventitious roots to take on the work of those whose office has been rendered useless by the ringbarking, produced by the bean fly maggots, lower down towards the stem-base.

EGG-LAYING COMPETITIONS.

MOUNT GRAVATT.

During July 5,049 eggs were laid, being an average of 18·7 eggs per bird. This is an average that can be considered satisfactory and it is ½ an egg per bird better than for the same period last year. No deaths occurred and the general health has been satisfactory. The following are the individual scores to date:—

SECTION 1.

White Leghorns.

Name.	A.	B.	C.	D.	E.	F.	Total.
W. and G. W. Hindes	84	81	82	80	82	88	497
W. E. Woodward	86	86	93	70	83	62	480
John J. McLachlan	77	86	83	68	83	50	447
B. Driver	81	58	65	77	78	83	442
J. Harrington	62	66	77	85	75	77	442
Mrs. R. E. Hodge	76	71	70	91	59	73	440
Eclipse Poultry Farm	92	81	70	76	75	40	434
M. F. Marsden	72	68	64	56	76	83	419
E. J. Stilton	78	74	71	83	84	28	418
R. C. J. Turner	73	67	70	79	36	71	396
Jas. Hutton	66	65	82	43	63	70	389
S. L. Grenier	87	75	84	25	48	59	378
Jas. Earl	58	76	43	67	56	73	373
H. Fraser	33	73	79	72	66	49	372
W. Wakefield	79	83	49	65	60	35	371
L. Bird	81	70	46	46	91	26	360
N. F. Newberry	35	54	81	71	53	54	348
J. E. G. Purnell	69	37	69	78	58	35	346
E. Anderson	21	54	43	58	78	83	337
Geo. Marks	34	70	55	48	78	51	336
G. W. Cox	55	41	71	68	61	37	333
H. P. Clarke	41	74	42	54	47	73	331
A. S. Walters	64	58	42	57	27	76	324
T. H. Craig	41	70	52	50	44	62	319
Mrs. H. P. Clarke	34	71	53	52	73	34	317
Chris. A. Goos	75	24	49	65	32	65	310
Mrs. C. E. Lindley	46	30	51	73	52	55	307
T. W. Honeywill	43	1	75	56	66	46	287
W. D. Melrose	68	76	14	..	59	15	232

SECTION 2.

Black Orpingtons (except where stated).

Name.	A.	B.	C.	D.	E.	F.	Total.
Eclipse Poultry Farm	80	74	86	84	83	78	485
Jas. Potter	95	65	69	67	75	87	458
H. Cutcliffe	101	61	69	61	82	77	451
E. W. Ward	71	73	78	77	78	69	446
Geo. E. Rodgers	62	84	84	64	79	72	445
W. and G. W. Hindes	97	45	56	36	67	95	396
Mrs. A. E. Gallagher	68	67	76	38	64	81	394
Carunya Poultry Farm	73	73	27	60	79	61	373
Thos. Hindley	89	58	72	41	76	36	372
J. Pryde (R. I. Reds)	49	66	41	78	56	70	360
R. Burns	63	45	52	63	70	55	348
W. D. Melrose	10	65	73	84	73	36	341
C. Dennis	61	53	80	62	32	53	341
E. Walters	32	50	58	59	79	56	334
Jas. Hutton	54	45	80	61	18	44	302
E. C. Stead (Silver Wyandottes)	..	25	31	41	25	23	145

N.U.P.B.A. TOOWOOMBA SUB-BRANCH.

The winter test resulted as follows:—Light breds: First, No. 52, R. B. Howard, 75 eggs; second, No. 9, A. C. Horne, 70 eggs. Heavy breeds: First, No. 120, Jas. Hutton, 76 eggs; second, No. 117, T. Hindley, 71 eggs.

Special prize donated by Mr. Jas. Hutton, Kingsthorpe, for highest score for two birds, one breed, belonging to one owner, in competition, for first four months:—Winner: Mr. Jas. Hutton's Black Orpingtons—No. 120, 97; No. 119, 80. Total, 177 eggs.

Single Test Egg-Laying Competition—Scores to 30th July, 1925.

WHITE LEGHORNS.

Pen No.	Name.	Weight of Eggs.	Total for Mth.	Total to Date.	Pen No.	Name.	Weight of Eggs.	Total for Mth.	Total to Date.
42	D. H. Dipple ..	2·25	23	89	26	W. G. Harper ..	2·01	20	52
52	R. B. Howard ..	1·99	27	88	48	G. Stilton ..	2·12	13	51
40	R. C. Cole ..	2·14	20	84	45	M. J. Frawley ..	2·15	21	51
41	D. H. Dipple ..	2·05	22	83	17	W. D. Williams ..	2·10	11	51
8	H. S. Wagner ..	2·00	22	83	59	M. Murphy ..	2·30	21	48
9	A. C. Horn ..	2·19	24	81	2	Jas. Taylor ..	2·06	15	47
50	C. A. Keen ..	2·05	19	78	3	E. Parker	2·27	23	44
39	R. C. Cole ..	2·02	18	76	20	H. Dibbs ..	2·37	20	41
29	J. H. Jones ..	1·99	9	74	13	J. E. King ..	2·25	22	41
33	H. J. Manning ..	2·08	19	71	37	P. J. Fallon ..	2·35	17	40
46	M. J. Frawley ..	2·25	23	70	10	A. C. Horn ..	2·01	17	33
49	C. A. Keen ..	2·00	22	68	55	J. F. Dalheimer ..	2·27	20	31
32	J. Newport ..	2·10	17	68	25	W. G. Harper ..	2·25	19	29
21	G. E. Rogers ..	1·98	24	68	6	G. Maurer ..	2·12	14	29
43	S. R. V. Sharkey ..	2·30	15	67	12	J. Hutton ..	2·20	15	28
28	J. W. Short ..	2·03	23	67	5	G. Maurer ..	2·31	22	22
27	J. W. Short ..	2·02	23	67	53	*E. W. Howe ..	1·88	22	77
19	H. Dibbs	2·20	20	66	58	*S. Chapman ..	1·90	23	72
60	M. Murphy ..	2·12	18	66	57	*S. Chapman ..	1·88	23	69
11	Jas. Hutton ..	2·10	14	62	23	*Everlay P.F. ..	1·93	20	69
54	E. W. Howe ..	2·05	17	61	14	*J. E. King ..	1·95	15	66
38	P. J. Fallon ..	2·18	14	61	7	*H. S. Wagner ..	1·95	19	63
44	S. B. V. Sharkey ..	1·98	20	58	36	*R. C. J. Turner ..	1·90	6	34
35	R. C. J. Turner ..	2·08	20	58	16	*W. Grant ..	1·74	17	34
30	J. H. Jones ..	2·00	23	58	24	*Everlay P.F. ..	..	1	31
51	R. B. Howard ..	2·09	23	57	47	*J. Stilton ..	..	..	30
1	Jas. Taylor ..	2·32	20	56	15	*W. Grant ..	1·74	21	30
56	J. F. Dalheimer ..	2·25	20	54	18	*W. D. Williams ..	..	3	18
62	J. Goggins ..	2·04	16	53	34	*H. J. Manning ..	..	1	12
61	J. Goggins ..	2·02	16	53	31	*J. Newport ..	..	..	..
22	G. E. Rogers ..	2·07	16	53					

BLACK ORPINGTONS.

120	J. Hutton ..	2·28	27	97	98	V. J. Rye	2·20	16	67
117	T. Hingley ..	2·00	24	91	111	E. Walters ..	2·07	21	65
89	A. W. Le Pla ..	2·10	24	91	114	D. W. Williams ..	2·02	20	63
128	J. W. Short ..	2·10	23	90	108	C. Graham ..	2·17	12	63
103	L. Maund ..	2·20	24	89	112	E. Walters ..	2·30	21	61
121	E. W. Brock ..	2·15	22	83	102	T. J. Carr ..	2·15	15	59
107	C. Graham ..	2·00	25	81	96	R. Burns	2·04	26	59
99	A. R. Petty ..	2·15	17	81	85	— Kelly	2·35	23	58
132	G. E. Rogers ..	2·37	25	80	118	T. Hindley ..	2·03	27	57
119	J. Hutton ..	2·42	23	80	90	A. W. Le Pla ..	2·27	24	57
131	G. E. Rogers ..	2·33	25	78	126	H. B. Stephens ..	2·11	26	56
105	L. Maund ..	2·06	11	75	88	J. Head	2·03	22	56
97	V. G. Rye ..	2·30	23	75	109	S. McBean ..	2·13	21	55
100	A. R. Petty ..	2·30	16	70	123	P. Hopkins ..	2·06	25	54
95	R. Burns ..	2·24	22	69	113	D. W. Williams ..	2·25	12	47

* Signifies bird laying under-weight eggs.

N.U.P.B.A. TOOWOOMBA SUB-BRANCH—*continued.*

Black Orpingtons—*continued.*

Pen No.	Name.	Weight of Eggs.	Total for Mth.	Total to Date.	Pen No.	Name.	Weight of Eggs.	Total for Mth.	Total to Date.
86	— Kelly	2·12	20	45	130	*R. Neil	1·81	23	100
84	W. R. Wilson ..	2·08	26	43	116	*Everlay P.F. ..	1·87	21	85
122	E. W. Brock ..	2·18	19	37	127	*J. W. Short ..	1·92	24	79
125	H. B. Stephens ..	2·27	7	36	124	*P. Hopkins ..	1·91	19	64
103	W. S. Adams ..	2·05	12	35	129	*R. Neil ..	1·61	9	48
115	Everlay P. F. ..	2·16	17	32	91	*K. Macfarlane ..	1·86	13	42
92	K. McFarlane ..	2·27	13	32	94	*T. C. Ollier ..	1·96	19	33
83	W. R. Wilson ..	2·05	21	31	101	*T. J. Carr ..	1·95	19	30
87	J. Head	2·02	14	26	103	*T. C. Ollier ..	1·95	25	27
110	S. McBean ..	1·98	21	22	104	*W. S. Adams ..	1·86	13	26

Other Varieties.

Pen No.	Name	Variety.	Weight of Eggs.	Total for Month.	Total to Date.
71	H. Dibbs	Langshan	2·12	21	79
64	S. Chapman	Brown Leghorn	2·00	20	63
75	— Badcock	Rhode Island Red ..	2·14	19	61
73	A. W. Le Pla	Rhode Island Red ..	2·15	19	55
65	Mrs. K. O'Connor ..	Brown Leghorn	2·17	20	43
69	— Badcock	Langshan	2·16	23	38
74	A. W. Le Pla	Rhode Island Red ..	2·22	18	32
72	— Dibbs	Langshan	2·18	20	30
68	E. Parker	Brown Leghorn	2·12	20	26
70	— Badcock	Langshan	2·23	21	21
81	V. Brand	Black Langshan ..	2·05	15	19
67	E. Parker	Black Langshan ..	2·15	6	17
80	*Everlay P.F.	White Wyandotte ..	1·80	27	66
77	*L. Maund	Coloured Wyandotte ..	1·88	14	62
79	*Everlay P.F.	White Wyandotte ..	1·95	22	56
82	*V. Brand	Brown Leghorn ..	1·85	24	54
63	*S. Chapman	Brown Leghorn ..	1·93	22	51
66	*Mrs. K. O'Connor ..	Brown Leghorn ..	1·90	21	47
78	*L. Maund	Coloured Wyandotte ..	1·70	12	40
76	* — Badcock	Rhode Island Red ..	1·90	17	32

* Signifies bird laying under-weight eggs.

J. GARNER, Government Supervisor.

CLOTTED CREAM.

By L. VERNEY, Dairy Inspector.

The manufacture of this luxury was originally confined to the counties of Devon and Cornwall, but it is now successfully carried on in practically all countries where dairying is done. It is now largely recommended by the medical profession as an excellent fatty food, and is often ordered in place of cod liver oil for invalids. Clotted cream is exceptionally rich in fat. It often contains as high as 60 per cent. The fat of clotted cream is more digestible than any other kind, as it is in a finely emulsified condition. The milk required for use must be rich. The evening's milk is better for the purpose than that of the morning.

Method of Preparation.

The method of preparation is as follows:—

Immediately the milk is drawn from the cow it should be properly strained into setting pans, the pans most suitable being glazed crockery ones, holding about 8 quarts. If these are not procurable ordinary well-tinned pans will suffice.

These measure about 16 inches across the top and are about 6 inches deep and 12 to 14 inches at the bottom.

The milk is left in the pan or pans undisturbed for about eight hours in the summer and during the winter months it is advisable to allow them to stand for twelve to fourteen hours.

After standing for the times mentioned above the pans should be removed to the stove. Great care should be taken not to shake them, as this has a tendency to disturb the cream on the surface. The milk should be heated to a temperature of 180 degrees Fahr. and the slower the better. It should not be hastened, as the characteristic scald flavour is wanting and the cream may be rendered greasy. After the milk has attained the temperature of 180 degrees it should be removed from the stove and placed in a cool room with a current of air playing on the pans.

When the contents of the pans are cold the cream may be taken off with a perforated cream skimmer in a thick clotted condition and it is ready for use.

In England the cream treated as mentioned above finds a ready sale, and when once tried it generally means further inquiries.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF JULY, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING JULY, 1925 AND 1924, FOR COMPARISON.

Divisions and Stations.	Average Rainfall.		Total Rainfall.		Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	July.	No. of Years' Records.	July, 1925.	July, 1924.		July.	No. of Years' Records.	July, 1925.	July, 1924.
North Coast.					*South Coast—continued:*				
	In.		In.	In.		In.		In.	In.
Atherton	0·97	24	0·17	1·62	Nambour	3·06	29	0·23	9·97
Cairns	1·63	43	0·55	2·75	Nanango	1·79	43	0·57	2·87
Cardwell	1·45	53	...	0·20	Rockhampton ...	1·53	38	0·18	2·02
Cooktown	1·02	49	0·46	3·37	Woodford ...	2·59	38	0·25	4·89
Herberton	0·75	38	0·26	1·19					
Ingham	1·58	33	0·32	0·50					
Innisfail	4·80	44	0·98	8·89	*Darling Downs.*				
Mossman	1·61	17	0·35	1·98					
Townsville	0·58	54	0·11	...	Dalby	1·80	55	1·13	1·65
					Emu Vale ...	1·62	29	0·93	2·13
					Jimbour	1·66	37	1·30	1·34
Central Coast.					Miles	1·75	40	0·63	2·06
					Stanthorpe ...	2·09	52	1·92	2·75
Ayr	0·68	38	0·15	0·01	Toowoomba ...	2·12	53	0·84	4·83
Bowen	0·95	54	0·13	0·14	Warwick	1·87	60	1·09	3·45
Charters Towers ...	0·64	43	0·23	...					
Mackay	1·73	54	0·39	0·47					
Proserpine	1·43	21	0·42	0·72					
St. Lawrence ...	1·33	54	...	2·08	*Maranoa.*				
					Roma	1·53	51	0·56	2·92
South Coast.									
					State Farms, &c.				
Biggenden	1·48	26	0·87	4·58					
Bundaberg	1·96	42	0·45	3·63					
Brisbane	2·33	74	0·72	5·33	Bungewergerai ...	1·74	11	0·55	3·44
Childers	1·84	30	0·43	6·64	Gatton College ...	1·48	26	0·59	2·62
Crohamhurst ...	2·94	30	0·50	9·17	Gindie	1·06	26	0·52	0·33
Esk	2·08	38	1·07	4·96	Hermitage ...	1·86	19	0·86	2·85
Gayndah	1·54	54	0·41	2·42	Kairi	1·27	10	...	1·80
Gympie	2·26	55	0·58	5·64	Sugar Experiment Station, Mackay	1·54	28	0·42	1·55
Caboolture	2·36	38	0·43	6·90					
Kilkivan	1·73	46	0·81	2·63	Warren	1·36	11	0·18	1·59
Maryborough ...	1·98	53	0·34	4·69					

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for July this year, and for the same period of 1924, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND,
Divisional Meteorologist.

TUBERCULIN TESTING OF SWINE.

By W. J. PENFOLD, M.B., Ch.M., B.Hy., Director, Commonwealth Serum Laboratories.

Tuberculous infection of pigs is observed almost solely in countries where these animals are fed with refuse from dairies, the proportion of cases being much lower where they are fed entirely on vegetable tubers, cooked grains, or pasteurised whey. Frequently the glands of the neck are first involved, probably a result of infection by digging with the snout into infected cattle manure. P. de la Cruz Mendoza (1) reports that diagnosis of tuberculosis post mortem in swine requires a very minute examination. This may be due to the short life of the animal, the infection being chiefly glandular and abdominal. Localised forms of tuberculosis are reported as well as the generalised form, the latter sometimes being acute.

Swine are susceptible to the three types of tuberculosis—human, bovine, and avian—the majority probably being bovine, as indicated by the investigations of the English Royal Commission, and by Eastwood and Griffith (2).

For the diagnosis of tuberculosis in swine, either the ophthalmic or the intradermic method is recommended.

Schroeder and Mohler (3) drew attention to the fact that a thermic test in pigs is rather unreliable owing to the fluctations of temperature which may be due to the comparatively small size of the lungs. If it is desired to use the subcutaneous method of testing, each animal should be separately confined in a quiet place for twelve hours before taking the temperature, and before the injection of tuberculin. The dose to be used for this test in swine varies from 0.1 c.c. to 0.3 c.c. of raw tuberculin, according to the age of the animal (Calmette) (4).

In making the ophthalmic test, which is the best for general use in swine, Koch's Old Tuberculin, containing no carbolic acid, is used—about 0.2 c.c. is allowed to drop from the phial into the eye chosen for the test. The untreated eye is used as a control. As a rule, the characteristic manifestation of the reaction for tuberculosis following the ophthalmic test commences in three to six hours and lasts twenty-four to forty-four hours or even longer. This manifestation consists of a typical purulent discharge from the conjunctival sac, frequently associated with swelling, reddening, and gluing of the eyelids. The tested animals should be examined in a good light at frequent intervals from the third hour. A purulent secretion from the tested eye is an indication of a positive reaction. At times only a very small quantity of pus may be present, while at other times the reaction may result in true pyorrhœa. The reaction is indicated in varying degrees in different animals, but the intensity of reaction bears no relation to the extent of the disease in the reacting animal. If there is any doubt as to whether the reaction is positive, a second test can be carried out in the same eye seventy hours later.

The reaction disappears in several days, leaving no trace.

The intradermic test is done on the ear, about 0.1 c.c. of Koch's Old Tuberculin being inoculated into the dermis of the antero-lateral portion of the ear. The skin is pinched up and the needle introduced almost parallel to the surface, care being taken that the bevelled side be turned outward, and consequently toward the epidermis, not toward the hypodermis when the needle is in position (Mantoux) (5).

When the reaction is positive, it is already visible within a few hours—the maximum being reached at about forty-eight hours.

There is a central nodular infiltration, pink or bright red, surrounded by a halo of pink erythema. The central infiltration may vary in diameter from one to several centimetres. The skin is hot and sensitive and gives a sensation of thickening of the dermis. The reaction as a general rule begins to recede after forty-eight hours, though a pigmented trace may remain for several weeks.

When the reaction is negative, the slight needle traumatism is practically invisible after forty-eight hours.

The intradermic test may be done in conjunction with the ophthalmic test.

Tuberculins for each of these tests may be obtained from the Commonwealth Serum Laboratories. Every batch of these products is fully tested for potency.

REFERENCES.

(1) Boletin de Agriculture y Ganaderia, Jan., 1906.
(2) Report to the Local Government Board No. 91, 1914.
(3) Report of the U.S. Dept. of Agric., Washington, 1906.
(4) Tubercle Bacillus Infection and Tuberculosis in Man and Animals (Calmette).
(5) Compt. Rendus Acad. des Sciences 1908, pp. 147, 665. Compt. Rendus Soc. de Biologie 1909, pp. 67, 54, 436, 665.

PIG CLUBS.

THEIR VALUE IN QUEENSLAND AGRICULTURE.

E. J. SHELTON, H.D.A., Instructor in Pig Raising.

Much of the information contained in these notes has already appeared in the Journal, and the whole will be incorporated in an illustrated pamphlet, "Pig Clubs for Queensland Scholars," which will be available for issue shortly, free of cost to those interested. Application for copies of this and other extracts from the Journal should be made to the Under Secretary, Department of Agriculture and Stock, Brisbane.—Ed.

Considerable interest has been evidenced in connection with the initiation of Pig Clubs in a number of State schools in the Maroochy district, on the North Coast line of this State, as well as at the Nambour Rural school, and at State and Rural schools in the Fassifern and Brisbane Valley districts, and as some very definite objectives have been gained the time is opportune to take a general survey of this very important aspect of agricultural education.

In the United States of America, in Canada, in Great Britain, and in other countries, some thousands of extremely practical and profitable Pig Clubs are in operation, and a deep and wide-spreading interest has been displayed among the younger generation of farmers in the development of this branch of the Home Project Scheme.

It has been shown that in the countries named the boys and girls are being trained and are actively engaging in the most modern phase of pig raising, a training that has proved of the greatest value to these youthful farmers and to the pig industry in the countries in which they reside and operate.

Experience in Queensland also has already shown that interest is being stimulated, and that where Pig Clubs have been in operation the conditions under which pigs are kept are being very considerably improved, a result in itself that most assuredly justifies the nominal expenditure involved in taking up these schemes. In the United States, Pig Clubs will be found in operation in almost every county and small centre in Kansas, Iowa, Missouri, and other hog raising centres. These include clubs for both pork and bacon pigs, for breeding sows, and for sow and litter, and in numerous instances club members have competed successfully in the "Ton Litter" scheme of which the American pig farmer is so proud.

An endeavour is being made in Queensland to develop clubs along similar lines to those that have proved so successful abroad, and, though at present the scheme is in its infancy, there are immense possibilities with ample opportunities for future extension work.

Pig Club Leaders.

It will be necessary in the development of the Pig Club project here that Pig Club leaders be appointed to control this work and to co-operate with the State Instructor in Pig Raising and the head teachers of Rural and State schools in initiating clubs in the various agricultural and dairying centres throughout the North.

In America, for instance, the work is supervised by the Boys and Girls' Pig Club Department through a State Club leader, who is employed co-operatively by the United States Department of Agriculture and the State Agricultural Colleges; these officials plan details of the work, and put them into operation through assistant State leaders or specialists in club work, who have direct charge of the live stock club work promoted by the colleges. In many centres the detailed work is carried on locally by the County Farm Bureau (an organisation similar to our Local Producers' Associations) as a definite and very important part of its programme. In centres where Pig

Plate 60.—Group of Pig Club Members, Nambour Rural School, and Head Teachers of District Schools.
Back Row (Left to Right)—E. J. Shelton, Instructor in Pig Raising, Messrs. Slater (Yandina), Steele (Nambour Rural), Watt (Mapleton), Frawley (Palmwoods); Name not available.

Clubs are to be introduced for the first time, the county agent (known as district agents here formerly, and now as district secretaries and organisers) secures a local leader who helps to enrol the members and to organise the clubs, while in communities where the Farm Bureau has not yet been organised other agencies are made use of, such, for instance, as county superintendents, Chambers of Commerce and Agricultural instructors. Most of the work, however, is in organised centres having a Farm Bureau or similar association. The local leaders' duty is to encourage boys and girls and to help in an advisory capacity in giving instructions *re* feeding, preparing for shows, and in record keeping. Arrangements are also made for members to meet once a month at least to give attention to club matters, and at these gatherings, which are conducted on social lines, business problems are discussed and suggestions brought forward; thus the meetings are interesting and helpful, and are a pleasure and stimulant to both members and staff. As a progressive step, club tours, picnics, camps, &c., are arranged, and in general the whole scheme is approached as worthy of the utmost consideration and attention. The club motto is especially applicable to our conditions here, viz., "To make the best better."

Enthusiasm, loyalty, and service are the three outstanding features in the organisation. Up to the present, however, matters have not progressed to this stage in Queensland, though on numerous occasions lantern lectures on various aspects of pig raising have been a feature of the work, and in the Mapleton district particularly several round district tours were arranged, when an official inspection of the various animals competing in the competition formed part of the outing. On these occasions both club members, the head teacher of the State school, and the Instructor in Pig Raising were present, as is shown in Plate 60. These homely visits were much appreciated, and were a source of inspiration to the children. They were equally interesting and encouraging to the club leaders, and were the means of encouraging the different competitors to try and do better than their neighbours in preparing their exhibits for exhibition.

Additional Features.

In all club work two principal objectives are being steadily kept in the forefront. First, it is the intention to demonstrate per means of these competitions that there is "Profit in Pigs"; and secondly, that the industry is an interesting and remunerative one well worthy of recognition and of taking up on sound commercial lines. The educational feature is also constantly stressed so that members may the more fully realise that their work in the club means more than the making of money and winning of prizes; for it is important that they should be given opportunities to co-operate in community enterprises and programmes of work which are always best carried out on truly co-operative lines.

Through Pig Clubs the American boys and girls have been taught to look upon the community and its problems not from the mere selfish point of view, but with a spirit that makes for general improvement. The spirit of service and citizenship thus engendered is one that the younger generation can apply all through their lives.

From the industry standpoint it is hoped members here will realise more fully the necessity of proper care and attention and of improved methods of feeding and housing. Records of the kinds and amounts of food used and the cost or value of same, together with details as to the time spent on the work, are to be kept by club members, and in due course these are to be formulated and presented for the inspection of all concerned in the organisation of the clubs. From a perusal of the essays appended to this article it will be found that quite a number of these features have become impressed upon the young members' minds.

The Extent of the Work.

To show the extent of the work overseas and indirectly the possibilities here, it is interesting to note that during 1923 and 1924 boys and girls' Pig Clubs owned or managed approximately 1,800 pigs at a profit to themselves of nearly 30,000 dollars—this in Kansas (U.S.A.) alone with 107 clubs and 980 members. A special feature of the work there is that the members are taught and encouraged to fit their animals

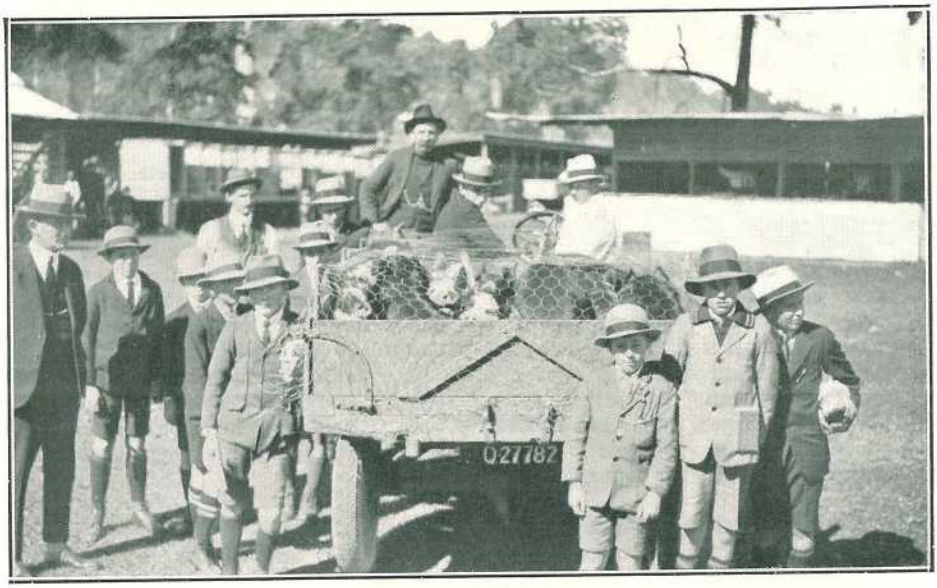

Plate 61

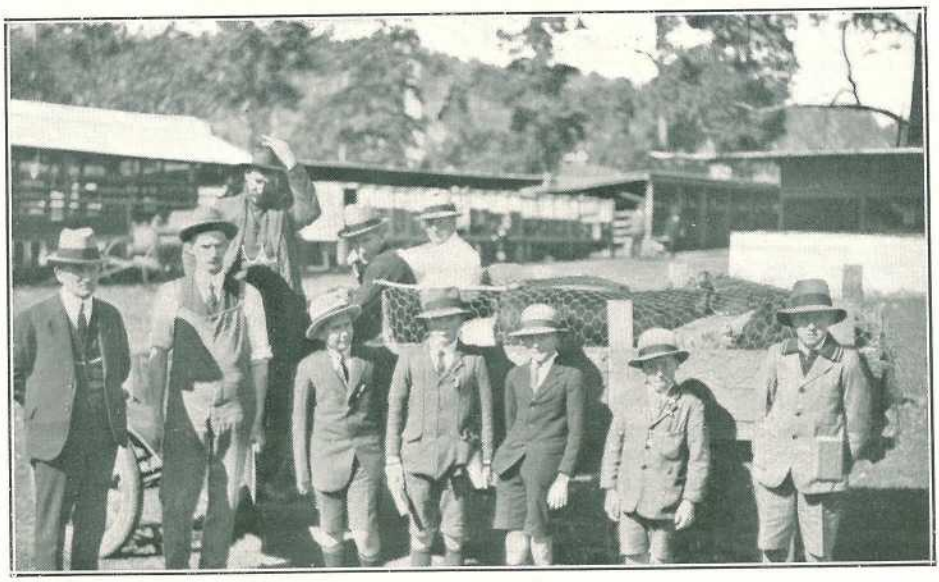

Plate 62.

The Transport of Pigs to the Nambour Show aroused the interest of Pig Club Members. Consignments by motor lorry from Mapleton, Blackall Range.

for the show ring, with the result that large numbers of Club Pigs have been shown at local, county, and State fairs, and generous prizes have been won, many times in competition with adult breeders. Club members conduct many valuable demonstrations in this way, and this has stimulated others to better things. Some of the phases demonstrated (and it is along these lines that we in Queensland are working) include the value of balancing the ration, the importance of pasture and forage crops for pigs, costs of pork production, use of self-feeders, care of the brood sow—especially prior to and at farrowing time—care of the litter from birth onwards, proper selection and judging of animals, disease prevention, treatment, and control.

One striking example of this latter phase is in inaugurating new methods in the prevention of worm infestation in young pigs. In this connection it is on record that the United States Department of Agriculture worked out one efficient system by which worm infestation could be prevented, but farmers have been slow to put it into practice or to realise its advantage. For this reason club members in about twelve counties in Kansas were selected to take up demonstration work on these lines. The work was carefully supervised and records kept, and in due course a complete treatise is to be issued showing the nature of the experiments, results, &c. Other demonstrations are conducted in a similar manner. There is a wide field for work in this direction in Queensland, for though in general the health of the pigs in this State compares more than favourably with that of pigs in other States and countries, there is ample scope for reducing the losses and for stamping out the many diseases to which pigs are subject here.

Young Judges' Competitions.

Extended reference was made in the August (1925) issue of the "Queensland Agricultural Journal" to this phase of live stock work. It is a branch of the business to which the attention of Pig Club members is being directed, for we need to train judges to adjudicate at our various agricultural, horticultural, and pastoral shows. It is hoped during the coming year to inaugurate young judges' competitions in connection with Queensland Pig Clubs in the expectation that the winners may be induced to compete at the Royal National Exhibition 1926, at which quite a list of valuable prizes will be offered, not only for pig judging but for other classes of live stock also. Owing to local difficulties of transport, &c., it is hardly possible here to arrange country show stock judging tours and contests as are a special feature in American agriculture, but we should be able to enter teams from various districts at the Royal National Shows.

The Pure Bred Scheme.

A feature of Pig Club work is to encourage the use of pure bred breeding stock on farms generally throughout the State. The stock which are to be introduced and used in these clubs will, it is hoped, be retained as the foundation of many new herds; in some instances the stock will be retained on their own farms by club members and their people, in other instances the animals will be disposed of to neighbouring farmers either by auction or private contract. In this way the whole industry should benefit, though this is necessarily a slow process in an immense State like Queensland. Nevertheless, the State is, after all, only a collection of communities so that as in other parts of the world we are starting at a logical place in the improvement of the herds.

The Pig Club competition at the Nambour Show in July created very considerable interest, not only among club members and officials, but among visitors to the show from various parts of the State, while locally the interest created in the different centres was quite a feature.

Rules of Membership.

Membership in Pig Clubs is not necessarily confined to any particular class of boys or girls. If required, the membership may be arranged into classes.

(*a*) For school pupils up to the age of fourteen.

(*b*) For pupils whether still attending school or over the age of fourteen.

Plate 63.—School Pig Club Competitions.
Boys keenly interested in penned porkers at the Nambour Show.

Plate 64.—Housing Pigs on the Show Ground is another phase of Pig Club Work.

The Nambour Show Officials were not wanting in providing necessary conveniences. Boy exhibitors are interested in the comfort of their animals in their Show quarters.

The rules require that each contestant raises his or her own pig to not more than six months old in the case of bacon pigs, or as arranged in porker classes or classes for stud sow with litter or stud boar, in each case the member must feed and attend to the animal and be entirely responsible for its management and exhibition; this usually requires that the pig be housed and fed apart from any other pigs on the farm unless the member is actually caring for all the pigs kept. Each contestant is required to keep a record on forms to be provided (a notebook may also be kept as an aid to writing the essay) containing any points of interest such as the animal's name and breeding, its purchase price and details of purchase, date pig was purchased or entered the contest, its actual live weight at time club commenced operations; the nature and quantity of feed used, notes *re* bedding, cleanliness of sty and of animal; the number of days fed, the name, quantity and value of food grown, including crops such as pumpkins, sorghums, maize, lucerne, sweet potatoes, waste fruit, &c.; the animal's weight at end of contest, gain in weight per week or month, market value at current rate per pound when ready for market, profit gained as a result of the transaction; notes *re* the health and well being of the club pig and of other pigs on the farm, class of sty, its size, situation, aspect, approximate size of grazing area, and any other information available.

Where convenient the pigs are to be exhibited at the local or district show, where arrangements will be made for the housing of animals, for judging, &c. If at all possible, contestants are to attend the show and care for their animals there also.

The following scale of points has been drawn up for use in club work, and, if at all possible, will be strictly adhered to in every club initiated.

PIG CLUB AWARD CARD.

Points will be awarded as follows:—

	Possible Points.	Points Awarded.
1. Type and quality of animal selected	15	
2. Rate of increase in weight of animal	10	
3. Cost of production; the use of home-grown foods being an important consideration	15	
4. Sanitation, condition of pig sty and grazing area ..	10	
5. Health of animal, freedom from parasites (lice, &c.)	5	
6. Interest shown in management of the animal by the club member	10	
7. Arrangements for marketing, exhibiting at Show, &c.	5	
8. Essay in "How I selected, fed, managed, and Exhibited my Pig"	10	
9. Market value of animal. Actual live and actual dressed weight and value per pound to be taken into consideration	10	
10. Order of Merit in Prize List at Show	10	
Possible	100	
Total Points Awarded.		

When Pig Club members have competed in the first instance with a young sow pig, arrangements may be made at the end of the competition for this sow to be entered in a sow and litter club, this competition to be continued into the following year, but this is only possible where sufficient inducement offers and up to the present has not been adopted; this contest it will be found requires much more skill, care, and attention than that required in fattening a pig for market, important and all as is this latter feature of the work.

Pig Club Competitions in the Maroochy District, July, 1925.

Following is a list of the members and of the Awards in the School Pig Club Competition at Nambour Show, July, 1925:—

Class.	Name of Club Member and School.	Prize Awarded.	Live Weight of Pig as Recorded over the Scales.	Dressed Weight Estimated at 30 per cent. less than Actual Live Weight.
			Lb.	Lb.
Heavy Baconers, 126 lb. and over	Fred Bruhn Mapleton ..	1st Prize	180	126
	Robert Williams, Mapleton	2nd ,,	182	127
Prime Baconers, approximately 106 lb. to 120 lb. dressed	John Tanner, Mapleton ..	1st ,,	167	116
	Samuel Sellick, Yandina ..	2nd ,,	167	116
	Douglas Wells, Kureelpa ..	3rd ,,	160	112
Light Baconers, approximately 86 lb. to 105 lb. dressed	Arthur Kuch, Mapleton ..	1st ,,	148	103
	James Cramb, Mapleton ..	2nd ,,	120	84
Heavy Porkers, approximately 75 lb. to 85 lb. dressed	Kenneth Senescall, Mapleton	1st ,,	117	81
	Dave McGrath, Nambour ..	2nd ,,	108	75
	Clifford Richardson, Perwillowen	3rd ,,	105	73
	Joyce Best, North Arm ..	4th ,,	107	74
Prime Porkers, approximately 56 lb. to 70 lb. dressed	Eddie De Vere, Mapleton ..	1st ,,	94	65
	Ronald Watt, Mapleton ..	2nd ,,	82	57
	Vincent O'Brien, North Arm	3rd ,,	92	64
	John Harding, Flaxton ..	4th ,,	97	67
Light Porkers, approximately 40 lb. to 55 lb. dressed	Harold Alford, Traveston ..	1st ,,	72	50
	John Alford, Traveston ..	2nd ,,	67	46
	Errol Gibbons, Forest Glen	3rd ,,	78	54
	Alex. Howe, Woombye ..	4th ,,	64	44

Prize for Champion Bacon Pig of Show was awarded to Fred. Bruhn, of Mapleton, for his Tamworth-Berkshire cross barrow pig.

North Coast Pig Club Competition at Nambour Show, 1925.

Prizes awarded for Pig Club Essay on "How I Selected, Fed, managed, and Exhibited my Pig."

Name.	Points Awarded.	Name.	Points Awarded.
Ronald Watt, Mapleton ..	10*	Dave McGrath, Nambour ..	8
James Cramb, Mapleton ..	10*	Joyce Best, North Arm ..	8
Eddie De Vere, Mapleton ..	9½†	Errol Gibbens, Forest Glen ..	7
Douglas Wells, Kureelpa ..	9½†	Vincent O'Brien, North Arm ..	7
Arthur Kuch, Mapleton ..	9‡	Samuel Sellick, Yandina ..	7
Alex. Howe, Woombye ..	9‡	John A. Tanner, Mapleton ..	6
Fred. Bruhn, Mapleton ..	8	Kenneth Senescall, Mapleton ..	6
Robert Williams, Mapleton ..	8	Jack Alford, Traveston ..	6
John Harding, Flaxton ..	8	Harold Alford, Traveston ..	6
Clifford Richardson, Perwillowen..	8		

*Divide First Prize of 10s. †Divide Second Prize of 8s. ‡Divide Third Prize of 6s.

PRIZE WINNING ESSAYS.

Appended are copies of the prize winning essays. Copies of any of the other essays submitted may be obtained on application to the Department of Agriculture and Stock, Brisbane, but they will be included with this article when it appears in pamphlet form.

HOW I RAISED MY PIG.

By RONALD WATT, Mapleton (age 12 years).

I obtained a pig from a local piggery in March, 1925, with the object of preparing it for the pig competition, but it soon developed the "staggers," and I tried to find out a remedy. Luckily just about this time Mr. Shelton visited our school, and after having a good look at my pig he promised to try and get another pig for me. The second pig arrived on 8th June, and was at that time about six weeks old and weighed 25 lb. The pig was a Tamworth-Berkshire cross.

To keep my pig away from the other one we had I had to build a new sty. I got some waste timber from the mill and made a small sty and put down a wooden floor. Then I got some wire netting and built a small run for my pig. To start with, the run was covered with thick paspalum grass, but it was not very long till the pig ate up all the grass. I covered part of the sty with a roof of bark and iron, so as to make sure that my pig would have a dry sleeping place, and I gave him plenty of dry grass to sleep on. When the cold westerly winds were blowing he could stay in his shelter and keep warm. We had some very wet weather, and he liked to come out to his run and scamper round in the rain. He soon made a hole in the corner of his run, and got muddy and dirty. When the weather cleared I washed him and made him nice and clean once more, and filled up the hole he had made. It was not long before I found out that my pig liked to be scratched and rubbed. He became very quiet, and when I rubbed him with a stick he would lie down on his side and stay there as long as I would scratch him. My pig has a very good appetite, and will eat up all the scraps from the kitchen—the only thing he will leave out of a tin of scraps is the orange peel. We have a cow at home, and the pig gets all the skim milk, and he likes it very much indeed. I have some cow cane and a small plot of sugar-cane growing, and I give him cane and banana stems after putting them through the chaff-cutter. He is very fond of potatoes, and I have been able to give him quite a lot from a little plot I have. I give him a regular supply of charcoal and a little lime water now and then. Also, sometimes a dose of salts. He likes grass and thistles, also chick weeds. I have some kikuyu grass growing, and he likes that, too. I had some cobs of corn saved up, and he has eaten them all.

Several times I have given him a good rubbing with oil, and it keeps his skin nice and clean. When the weather is dry it is easy to keep him clean, but when it rains he likes to run in the wet and get muddy.

When I came to get my pig ready for the show I gave him another good bath, with plenty of soap and warm water, and rubbed him with a scrubbing brush. He kept still, and I had no trouble with him. Then I rubbed him dry, and gave him a good rub with oil, and cut the coarse hairs out of his ears, and he looked so nice and clean that I did not feel like parting with him. He is to go to the show in a motor-truck on Wednesday, 29th July. Mr. Shelton visited our school twice while we were raising our pigs and gave us lots of good advice about raising pigs.

He visited all the homes of the boys of the Pig Club and looked at the pigs. I was lucky enough to be with him one afternoon at the slaughter-yard when he examined a pig which had the "staggers." The pig was killed, and he cut it open and looked at its kidneys, liver, heart, brain, stomach, and intestines. He said he thought the feeding had a good deal to do with the trouble, as the stomach contained a lot of fibrous material which should have been got rid of. Mr. Shelton gave us two lantern lectures, and showed us some very nice slides. He also gave us some printed papers which had a lot of useful information about pigs. My pig is to be sold at the show, and I want to get another little pig and rear that to be ready for Christmas.

HOW I SELECTED, MANAGED, FED, AND EXHIBITED MY PIG.

By JAMES CRAMB, Mapleton School (age 12 years).

Selection.—When I decided to get a pig I thought it would pay best to get a good one. But as I did not know enough about the merits of any particular breed, I decided it would be good policy to get one from the most successful dairyman. So Freddy Hill accompanied me around the dairy farms of the district. And as he is a better judge of pigs, I knew I could not go wrong in letting him be spokesman. We visited the piggeries of the following gentlemen:—Messrs. W. E. Pope, J. C. Dixon, A. J. Hooper, McMahon, W. Whitecross, W. Johnson, Kuch, Herron, Geirin, and Mrs. Ekin. Most of these people required all their pigs for their own purposes, or had already sold all of suitable age. One or two had older pigs which were too big and expensive for our pocket. Fred said it would not be good business to pay more than 30s. for any pig, no matter how big it was. One gentleman had only one pig left, for which he wanted 20s. This price served all right, but Fred said it was the little one of the family, and his dad said there was nearly always one little one in every pig family, and it would never do as well. We finally got a nice little black and white pig from Mr. McCann, of Dulong, for 20s. This pig was only four weeks old when we got it on 17th March, so it would be born about the 17th February. We guessed it would weigh about 10 or 12 lb. when we got it. The only fault we could find with this pig was that it was a bit young.

Management.—Before we set out to select a pig we first built a pigsty on a site with a good slope for drainage. Fred and I built the sty of posts we got from the bush and some waste sawn timber we got from the sawmill and some timber that Dad gave us. We put a wooden floor over most of the sty, leaving the lowest corner without a floor for sanitary reasons, and putting a roof over the top corner with a little room partitioned off for him to sleep in; we made his bed of straw and sometimes cane trash, changing it about once a week.

Mr. Shelton visited the school twice, and on each occasion inspected the pigs of the club members, and also gave a lantern lecture at night on pig raising, which was very interesting and instructive. After his first visit we built a small run for our pig 20 feet by 15 feet. We also groomed him well with a dandy brush, and oiled him with cocoanut oil several times. He is not a dirty pig, but we have washed him twice with clean warm, soapy water to make him look nice for the show. If pigs are properly cared for they are very cleanly in their habits.

Feeding.—The pig being young, we fed it well with fresh milk for the first two or three weeks; after that we changed its diet to skim milk and kitchen scraps, potato peeling, &c. He was a particular little chap about his food, and would not take kindly to everything we offered him, often picking out the dainty pieces and leaving anything in the line of raw vegetables, but as he grew older he became less faddy about these things, and relished raw vegetables, green weeds, and a bit of soft sugar-cane occasionally. We also gave him charcoal, as advised by Mr. Shelton.

The only item of expense apart from home-grown foods was 1s. 6d. for pollard.

Exhibition.—Mr. C. Allen is to take all of the Mapleton Club pigs to the show on Wednesday morning, and as our schoolmaster (Mr. Watt) has made all arrangements on our behalf I cannot write any more about this at present.

PIG-RAISING.

By EDDIE DE VERE, Mapleton State School (age 10 years).

I have only just become a member of the Pig Club at Mapleton State School. Being my first experience, I will try my best to write an essay on "Pig Raising."

I am ten years of age, and being on a dairy farm since I was seven I have always watched my father feeding the pigs, so I had a little knowledge of how to feed my

pig, especially when feed is limited; but since joining the club, and having the help of the Government pig expert (Mr. Shelton) by his lectures and explanation, it has come much easier to me.

In the first place, Mr. Shelton went to a lot of trouble selecting a pig for me, a Berkshire-Tamworth cross, which breed I find develops a nice marketable pig, not showing too much weight on the cheaper cuts, which if all pigs were bred this way I believe bacon would always command a good price, as there would be a lot less waste than at present, when the cheaper cuts have to balance up the dearer ones.

The method I adopted was first to select a place for the sty with good drainage, as it is the main thing in keeping the pig healthy. The next thing I did was to make a nice warm bed, as a pig likes to be clean and comfortable, and fed my pig three times a day, giving him as near as possible a balanced ration, such as skimmed milk, boiled maize, green wheat and barley. I also gave my pig two packets of Epsom salts a week with pollard. I also have a supply of charcoal in his sty, and I have found by this system that I am raising a good healthy pig; his weight when I received him was 30 lb. I have increased his weight in seven weeks to about 60 lb., and I hope to do better next time.

PIG RAISING.

By DOUGLAS WELLS, Kureelpa.

When Mr. Steele announced that there was to be a Pig Raising Club formed at the Nambour rural school, I asked Mr. Steele to write to Mr. Shelton to get me a pig, which was a purebred Berkshire sow from Gatton College.

I received my pig on 27th May, 1925, which was sired by the purebred boar "Murray Glen Star" out of a purebred sow named "Gatton Lady Conceit," and was born on 27th December, 1924.

When I received my pig my father and I built a sty, and I was able to have the use of it. For food I used milk and water as a drink, and corn, saccaline seed, lucerne, cane chaff, green saccaline, and various other green foods, which were all home-grown. The corn was boiled for the first three weeks so as it could be easily digested. The cost of raising the pig was £2 10s. For a mineral food I mixed up a mixture comprised of 20 parts charcoal, 20 parts wood ashes, 8 parts salt, 4 parts lime, 4 parts sulphur, and 2 parts sulphate of iron. For a run I let her run in a 2-acre pig paddock once a week. For bedding I used corn husks and grass, which I changed every fortnight. I also whitewashed my sty, which made it smell nice and sweet.

I bathed my pig a few times with soap and water, and also rubbed some linseed oil over her. I also gave her a couple of doses of linseed oil to liven her up.

I will exhibit my pig at the Nambour Show in the Pig Raising Club, and also as the best Berkshire sow over six months and under twelve months.

As my father allowed me to keep her, I decided to keep her as a breeding sow, which I will always look after.

HOW I SELECTED, FED, CARED FOR, AND HOUSED MY PIG.

By ARTHUR KUCH, Mapleton (age 12 years).

I bought my pig from Mr. R. M. Staves, Obi Obi, who breeds nothing but pure Berkshire pigs.

The mother of my pig is known in the Gatton College pedigree book as "Claremont Doris," 1575 B.H.B. of A. (sire) "Prairie Champion," 3127 B.H.B. of A.

My pig is named "Obi Queen," and she is now fifteen weeks old.

She has been fed principally on milk, chokos, pineapples (which she seemed to prefer to all other kind of food), also green weeds such as chickweed and milk thistles, also sweet potatoe vines, sweet and English potatoes boiled and mixed with the kitchen scraps, clean water, and green food for her midday meal, and the milk for morning and evening.

I paid £2 5s. for my pig when she was six weeks old. Mr. E. J. Shelton visited our place and had a look at my pig, and recommended me to enter her as a light baconer.

He also advised me to rub her with oil, which I have done. I also washed her with butter milk, and brushed her with a dry brush. I gave her clean hay in her sty every week.

The sty is nice and warm, being built of slabs, and has a bark roof. There is a nice little yard for her to run in.

In concluding, I may state my pig has not had any kind of grain. The full pedigree of my pig has been supplied with my essay.

HOW I SELECTED, FED, MANAGED, AND EXHIBITED MY PIG.

By ALEX. HOWE, Woombye State School.

Mr. Shelton, Instructor in Pig Raising, visited our school some time ago. He gave a very fine address to the pupils. He made his speech very interesting by telling about the different countries in which pig raising is carried on as an industry. Mr. Shelton told us also about marketing, and compared Australian markets with those of Denmark and America.

I was very interested in the address, and wanted to join in the pig competition at the Nambour Show.

One day on a visit to a friend, Mr. Bignell's pig farm, I was looking at his pigs.

They were Berkshires, and I learned were good pigs both for bacon and breeding purposes.

I was allowed to have my pick. The one I selected had a white patch on its ear, but the others were too small.

My pig had a fair amount of milk until the wet weather, when our cow got very low in her milk, and then I had to give the pig pollard.

Susy, as we named her, got all the house scraps as well as boiled pumpkin and potatoes. Every morning I gave her some green food as well as some sugar-cane and charcoal.

I soon got her very quiet, and was able to brush her every morning.

Her shelter was always kept well stocked with dry grass to keep her warm at night.

The day before the show I was very busy. I gave her a good bath in softsoap.

On show morning Mr. Bignell came round and took her up in his motor-truck.

A SUITABLE CLUB PLEDGE.

I pledge my head to clearer thinking,
My hands to larger service,
My heart to greater loyalty, and
My health to better living for my
Club, my Community, and my Country.

MARKETING PIGS IN QUEENSLAND.—IV.

E. J. SHELTON, H.D.A., Instructor in Pig Raising.

The marketing of his products is claiming much closer attention from the man on the land, and in this series Mr. Shelton describes how the farmer's pigs are handled at the selling end. In previous instalments several marketing systems with which Queenslanders are familiar were reviewed, and in the fourth article are many points of equal interest to the wide-awake pig-raiser.—Ed.

The Sale of Stud Pigs.

Although breeding pigs for sale as stud animals may scarcely be regarded as a separate and distinct branch of the pig industry in Queensland, it is one of the avenues through which larger numbers of pigs are being marketed each year with, in many instances, excellent returns to the breeder.

As with other phases of pig-raising there are certain definite lines of action which must be strictly adhered to if it is hoped to establish one's self successfully in the business and to create a demand from the four quarters of this and the sister States.

First and foremost the stud pig breeder must associate himself with the membership of the Australian Stud Pig Breeders' Society (formerly the Berkshire and Yorkshire Society of Australasia), of which a branch has been in operation in this State for some years. Full details as to the scope of this society, its objective, its membership, &c., may be obtained at any time from the secretary, Mr. R. G. Watson, of Inns of Court, Adelaide street, Brisbane, or from the writer who is a member of the Council of the society.

Membership in this society is necessary, for the reason that the stud pig trade has grown to such an extent throughout Australia as to require the publication annually of a Herd Book in which are recorded the registered pedigrees of stud boars and sows in each of the several breeds of pigs in which breeders here are interested—viz., Berkshires, Large and Middle Yorkshires, Tamworth, Poland-Chinas, Duroc-Jerseys, British Large Blacks, and Gloucester Old Spots. These, in fact, are the only recognised pure breeds of pigs in Australia at the present, though, of course, there are many other pure breeds of pigs in countries overseas.

Membership in the society gives a breeder the right (on payment of certain fees) to register approved boars and sows; in fact only pigs the property of members are accepted for registration, and now that it is generally recognised among stud pig breeders that an animal's stud value is to an extent based upon its eligibility or otherwise as far as the Herd Book is concerned, it becomes necessary on entering into the stud business to bear in mind that buyers will in almost every instance first require to be informed as to whether an animal is eligible for registration or has been registered before they will make an offer at public auction or by private contract for any individual animal they fancy. Many of our leading Agricultural Show Societies, notably the Royal Agricultural Societies in the other States and several country shows and the Royal National Association of Queensland only now accept for competition in the stud classes animals complying with the registration clauses, *i.e.*, that all animals—over six months in the Southern States and over twelve months in Queensland—be already registered, and that all animals entered as under these ages be eligible for registration, which indicates that they must be the progeny of a registered sire and dam.

One of the principal objects of the Stud Pig Breeders' Society is to promote fellowship amongst the pig breeders of Australia and to further their mutual interests generally in so far as the breeding of stud pigs is concerned, hence the value of associating one's self with a body of men and women of similar interests and ambitions.

Breeders are reminded that a pamphlet entitled "The Australian Stud Pig Breeders' Society" can be obtained on application to Mr. R. G. Watson or the writer, and that this pamphlet gives a host of other detail apart from rules of membership and other particulars.

Advertising.

Secondly breeders of stud pigs will need to spend some money on advertising if they wish to build up a successful business. The following excerpt from a prominent pig breeders' journal published overseas is worthy of commendation:—

He who has the goods to sell
And goes and whispers down a well,
Is not as apt to collar the dollars
As he who climbs a tree and hollers.

There is much truth in this so far as stock breeding is concerned, as has been proven many times by men who have had the goods to sell. But the best form of advertising after all is the class of stock one sends out, for sending a good pig into a new district will do more to advertise one's stud than many pounds spent on newspaper advertising. Nevertheless, the latter medium is not to be despised, though the choice of the journals in which one advertises is a matter of very considerable importance. Newspapers and journals specialising in stock breeding are, of course, the best business getters; they are the ones that "pull" the business as the advertising contractor would say. Another form of advertising too often overlooked is that embodying the breeder's name and the class of stock produced as stencilled on the boarding of which the pig crates are constructed. The writer made a speciality of this years ago when in charge of the stud piggery at the Hawkesbury Agricultural College, Richmond, N.S.W., and has since noticed college crates on farms as far north as the Atherton Tableland in Queensland and as far south as the South Gippsland district in Victoria, and in many other centres and show yards.

Live Stock Auctioneers.

The breeder of stud pigs will find that it pays handsomely to make a good friend of the live stock auctioneer selected to attend to various matters connected with this business. This is a far more important consideration than might appear on the surface, as the writer's experience has demonstrated, and as correspondence with various stud breeders and stock salesmen will show. From the standpoint of the auctioneer, who has an established connection and who is ready to do business, it is necessary that he should have full particulars of animals available for sale with extended pedigrees showing their breeding, prize records, &c., and that he should have the price crated on rail or steamer (or as required) at which the seller is prepared to part with any particular animal. Breeders will do well to take the auctioneer into their confidence in all these matters, and to co-operate in every way with a view to building up the business.

Business Correspondence.

To be successful the stud breeder must be prepared to answer promptly and in detail all correspondence and inquiries relating to the purchase or sale of stock or produce. Nothing is more discouraging to would-be buyers than to fail to receive replies to correspondence promptly, or that when a reply is received to find that the information supplied is not complete. Many of the most successful men have found that the typewriter has proved a boon, while having proper letterheads and endorsed envelopes helps considerably. Every letter going forward should carry some advertising matter relative to one's stud, hence the necessity of illustrated posters, dodgers, or stud catalogues. The Secretary of the Stud Pig Breeders Society stands prepared to quote for the supply of all necessary literature, letterheads, pedigree forms, litter records, transfer forms, &c.

Quoting Stock.

The stud breeder should be prepared to quote all available animals at a price to allow of cartage, crating, feeding, and delivery to the buyer's nearest railway station or wharf, or to quote for the pig crated on rail or steamer at point of despatch. A great deal of time, correspondence, and annoyance will thus be saved. Many breeders simply quote the price at which they are prepared to sell the pig, then after despatch they send a belated statement showing amount due for cartage, crating, and other expenses, but this is extremely unsatisfactory and will do more than anything else to kill business and give one a bad reputation.

The seller should always be prepared to extend liberal consideration to the buyer and to immediately replace unsatisfactory animals, animals that die in transport or that otherwise prove bad purchases. Confidence is the soul of business so it is said and it has its application in building up a stud trade as elsewhere through life.

Send out nothing but the best, and when quoting always make it clear to the purchaser whether the animal is perfectly marked and up to stud book standard or otherwise.

Isolation Pens.

It will pay to have a set of isolation or "hospital" pens in which to quarantine all new purchases for at least three weeks after their receipt and before they are permitted to mix with the other stock on the farm. Similarly avoid sending out animals infested with lice or fleas or in an otherwise unsatisfactory condition. An instance came under notice only a few weeks ago in which an enthusiastic buyer made a purchase without first inspecting the animal. He was intensely disgusted when the animal arrived at the railway station to find that it was heavily infested with lice, was in a filthy condition, and had a bad cough. Such a purchase proves disastrous to both the buyers' enthusiasm and to the sellers' reputation, and the stud pig trade suffers accordingly. All new purchases should be quarantined for thirty days whether there is any indication of disease or not.

Purchasing Fresh Blood.

The purchase of prize-winning animals and their introduction into the stud will do much to assist breeders generally in popularising their studs. The writer could relate numerous instances in which the purchase of some well known strain of blood has done much to put a new breeder on the map as far as stud breeding is concerned, and the matter of expense should not necessarily be the only consideration when new purchases are to be made, though there is no advantage in paying any more than is necessary for any individual pig.

The stud sales, now an established feature at the Royal National Show, Brisbane, and at other Royal Shows, are definite proof that there is an increasing demand for all classes of stud stock. This year's Jubilee Show Sales were markedly successful, and higher and more consistent prices were paid and received than at any previous Brisbane Show. Of course, the general average of quality of the animals offering was superior, and there were more buyers present, and, in general, seasonal conditions have been favourable throughout the State. On the other hand, there was a much larger offering of stud pigs this year, both from local and interstate studs. Prices of from 15 to 29 guineas for selected pigs were a feature of these sales, this, in most instances, being for yearling pigs, though the two highest priced pigs of the show sales were less than nine months old. The breeder securing highest sale average recorded an average of over 20 guineas for his offering. This indicates that there is profit in pigs provided one has the right class to offer.

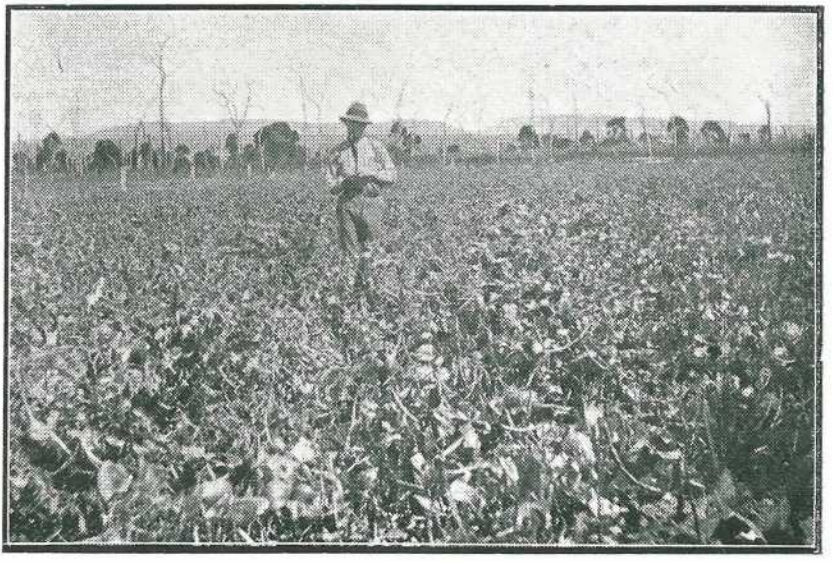

PLATE 65.—COW PEAS GROW IN PROFUSION ON THE ATHERTON TABLELAND.

ROYAL NATIONAL EXHIBITION.

CONVINCING EVIDENCE OF QUEENSLAND'S IMMENSE AGRICULTURAL AND PASTORAL CAPACITY—A STRIKING REFLEX OF THE RICHNESS OF HER FORESTS, FIELDS, AND PASTURES—A PAGEANT OF PROSPERITY AND A TRIUMPH OF ACHIEVEMENT.

The attainment of high standards, under the stimulus of healthy competitive effort, and with a strong incentive to excel, is evident in wonderful results every year at the Brisbane Exhibition.

The Jubilee Show of 1925—it is just fifty years since the Royal National Association held its initial display at Bowen Park—was the most successful of a long series. The general happy social condition of Queensland was reflected in vast daily attendances of eager, well-dressed, and orderly crowds.

Standard stock breeds; principles and practice of modern farming; improvements in agricultural machinery, implements, communication, and transport; and the intricacies of business procedure as applied to primary industry, were all typified or represented.

On show was an extraordinarily fine representation of every breed of stock that thrives on Queensland's broad and generous pastures. In other departments was illustrated every phase of farming, making the whole exhibition comprehensive and complete.

The Show right through was a smooth-running model of thoroughness, an advertisement in brilliant tones and bold relief of vibrant prosperity. It produced plain and convincing evidence that Queensland, so richly endowed in soil and climate, offers, in a greater degree perhaps than any other land, every opportunity to the skill, will, and character of men.

The great agricultural event of Queensland's year was opened officially on 12th August by His Excellency the Governor-General, Lord Forster, in brilliant sunshine amid beautiful and historic surroundings at Bowen Park. The day was typical of Queensland's early spring, genial warmth tempered by a breeze in which there was just a lingering suggestion of wintry chill.

Every day of Show Week enormous crowds gathered around the green arena in which every breed of stock for which Queensland is winning fame and public interest in exhibits, judgments, and awards never seemed to wane.

A happy experience of the week was the meeting with men whose names are known and honoured wherever farmers forgather, whose knowledge and persevering industry were represented so well in stock that would win attention and command commendation in any show ring. All the leading beef and dairy breeds were strongly represented, and visitors from other States were impressed most favourably with the quality of Queensland cattle that came up for judgment and paraded for review.

Fine horses—turf favourites, ponies, pacers, hacks, and draughts—are an attraction at any Queensland show, and the stud and other classes presented this year for the approval of a critical crowd were full of equine quality. Each day the fine Clydesdales provided by the Government for breed improvement were shown and they shared with a magnificent troop of police rides from the Government Remount Station extraordinary popularity.

PLATE 66.—AT THE BRISBANE SHOW.

1. Arrival of His Excellency Lord Forster, Governor-General.
2. The Governor-General officially opens the Show.
3. The Governor-General s Speech being broadcasted.
4. The collection of trophies.
5. Presentation of prizes by Lady Forster.
6. Steele Rudd tells a story.—*Left to right*—Jim Philp (*Courier*); A. H. Davis (*Steele Rudd*); J. Reid (*Q.A.J.*)

See opposite page.]

Among the strongest and best-staged pavilion features were the Court of the Department of Agriculture and Stock and the District and One Man Farm Exhibits.

The display of the Forestry Service was particularly commendable, and provided valuable object lessons in economical forestry to the people in whom is being awakened a distinct forest sense.

The practical modern educational policy of the Government was demonstrated arrestingly both in regional competitive displays and the products of the students of our technical and rural schools. The rural school work generally was admirable, and served as a record of the practical progress that has followed the initiation by the Education Department of a broad-visioned instructional policy.

The absence, through indisposition, from the official functions connected with the Show of His Excellency the State Governor, Sir Matthew Nathan, was generally regretted.

Another remarkable feature was the great display of motor vehicles that filled the John Reid Hall and associated annexes.

The Fruit Section contained a remarkable range of temperate and tropical products, and probably no better collection, in variety and excellence, could be presented in any other country.

Among those present at the official opening ceremony besides the Governor-General and Lady Forster were Hon. W. N. Gillies (Premier) and Mrs. Gillies, Hon. E. G. Theodore (former State Premier) and Mrs. Theodore, Hon. W. Forgan Smith (Minister for Agriculture and Stock), Messrs. E. Graham (Under Secretary), R. Wilson (Assistant Under Secretary), E. G. E. Scriven (former Under Secretary), Ernest Baynes (President, R.N.A.), J. Bain (Secretary, R.N.A.), and H. C. Quodling (Director of Agriculture).

THE AGRICULTURAL COURT.

REPRESENTATION AND REVIEW OF DEPARTMENTAL ACTIVITIES.

This year the Court of the Department of Agriculture and Stock, attractively and artistically arranged, presented many new and striking features. A right atmosphere was created and a harmonious colour scheme added to an appropriate setting of what really was a most practical exposition of the work coming within the scope of the Department. Through their activities and applied energies, so fitly illustrated, officers of the Department are giving signal service to primary producers whose industry is such an important component in the complex social and industrial life of Queensland.

In the Court the observer, the inquirer, and the student were brought into direct touch with Queensland 's great basic industries—Wool, Sugar, Maize, Wheat, Dairying, Cotton, and General Agriculture. To them was presented an opportunity of gaining a close and clear knowledge of the avenues of effort, both in field and laboratory, in which officers of the Department are continuously and efficiently working.

As the Brisbane Exhibition is a microcosm of the State, so the Court of the Department was a representation in miniature of a most important section of the Public Service.

The wool display this year was a striking one, and indicated effectively the work of the Sheep and Wool Instructional Staff.

The activities of the Bureau of Sugar Experiment Stations were well represented. New varieties of cane were exhibited, and the whole display was worthy of the State's greatest agricultural enterprise.

This year's cotton display was less spectacular, but more educational than those of previous years. More attention is being given to cultural methods and this phase was well presented.

The pig section was a new and special feature of the Court, and made a strong appeal to the practical farmer.

The part the Stock Experiment Station at Yeerongpilly takes in the general scheme of service to the stockowner was clearly demonstrated by specimens, cultures, diagrams, and printed informative matter which set out simply the work of that vigorous institution in the investigation and combating of stock diseases.

The Division of Entomology and Vegetable Pathology provided an exhibit that attracted not only those who are interested economically in our insect life, but also the nature student. Life histories of various insects were set out graphically and the whole was illustrative of the intimate relationship of science with agriculture.

The fruit exhibit was a most interesting one and covered as far as practicable the work embraced by the Field Staff of the Fruit Branch.

The "Queensland Agricultural Journal" was also well represented. The "Court of Agriculture" generally was one of the most attractive features of this year's pavilion displays and was fully in accord with the policy of progress and advancement of the State, and served to demonstrate fully the important work of the Department.

In order that each succeeding year's display may indicate the advancement and development taking place within the Department itself, certain changes and additions were made to the Court which represented an improvement in the general design.

The exhibits were prepared by the Instructor in Sheep and Wool (Mr. W. G. Brown); Director and Instructors in Agriculture and Assistant Instructors from the Southern, Central, and Northern Districts (Messrs. H. C. Quodling, A. E. Gibson, C. Clydesdale, C. McKeown, G. B. Brooks, and N. A. R. Pollock); Managers of State Farms at Roma and Gindie; Cotton Specialists and Graders (Colonel Evans, Messrs. Wells, Peters, and Gudge); Instructor in Pig Raising (Mr. E. J. Shelton); Officer in Charge, Stock Experiment Station, Yeerongpilly (Mr. C. Pound); Poultry Expert (Mr. Rumball); Director of the Bureau of Sugar Experiment Stations (Mr. H. T. Easterby); Government Botanist; Director and Instructors in Fruit Culture (Messrs. A. H. Benson, G. Williams, Prest, and A. Thorburn); and the Government Entomologist and Staff (Messrs. H. Tryon, J. L. Froggatt, H. Jarvis, Somerville, and Helmsing). Designs and lay-out arrangements were in the hands of Mr. H. W. Mobsby, F.R.S.A., who set up the Queensland exhibit at Wembley.

THE CENTRAL TROPHY.

The Central Trophy, a terraced structure 30 feet long by 8 feet high, with a width of 12 feet, was utilised for the display of cereals in grain and ear, roots and fibres, tropical and semi-tropical weeds and plants poisonous to stock, agricultural products arranged in sequence with a large number of photographic illustrations, in order to afford the fullest possible information of value.

Maize.

Prominently displayed on the trophy was a highly educative exhibit of maize. Its purpose was to illustrate the work of the Department in the improvement of this all-important cereal, particularly in the production of specific types of grain. The educational section which dealt with a number of important plant characters associated with seed selection was worthy of and received the closest scrutiny. It served to impress growers and others interested in maize-growing with the importance of continuing such useful work by the Department systematically from year to year.

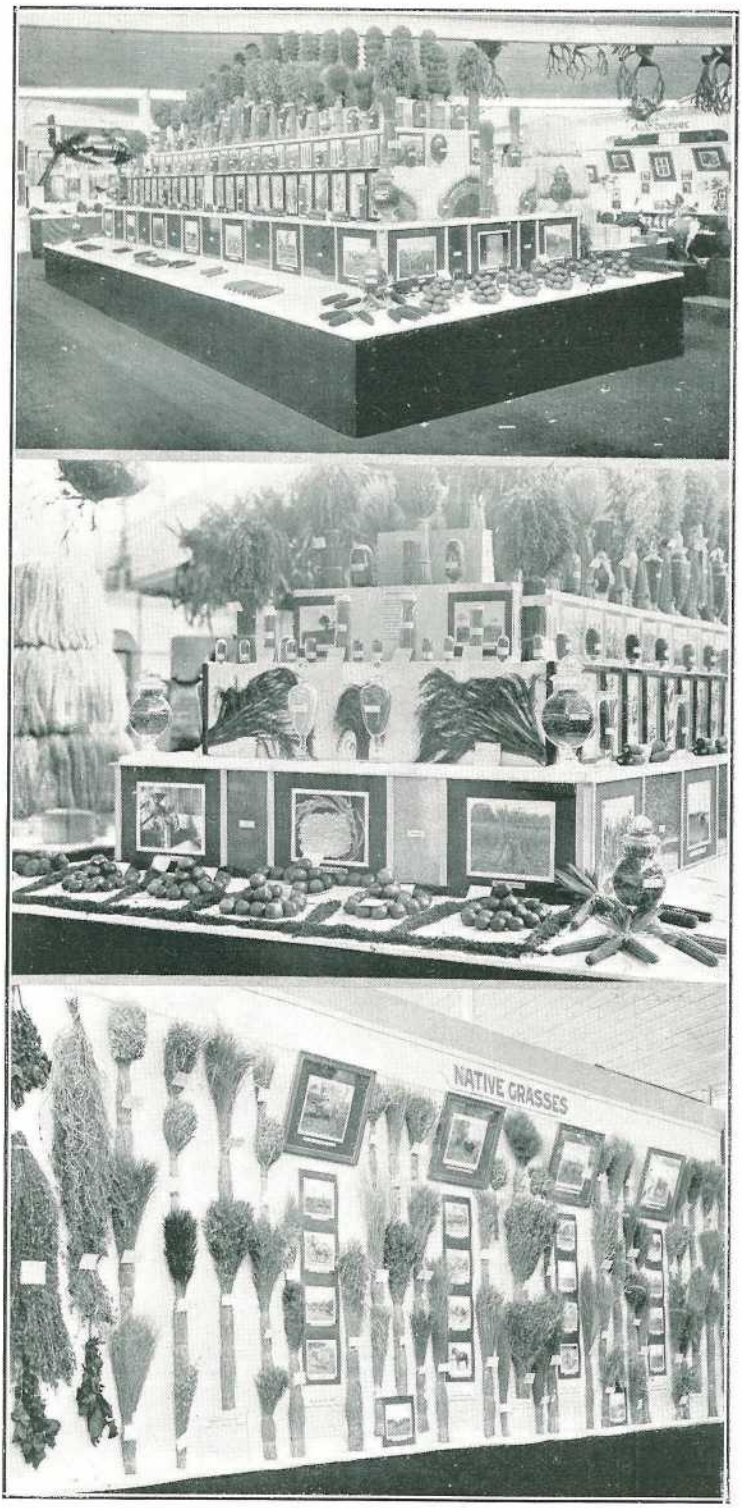

Plate 67.—In the Court of Agriculture.
1. Central Trophy, 2. Display of Wilt-resistant Tomatoes.
3. Panel of Native Grasses.

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PLATE 68.—DISTRICT EXHIBITS.

1. "A" GRADE, WEST MORETON, THE WINNING EXHIBIT; WIDE BAY AND BURNETT, AND NORTH COAST OF NEW SOUTH WALES WERE 2ND AND 3RD RESPECTIVELY.
2. "B" GRADE, KILCOY, 1ST.

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PLATE 69.—DISTRICT EXHIBITS, "A" GRADE.

1. Wide Bay and Burnett. 2. North Coast of New South Wales.

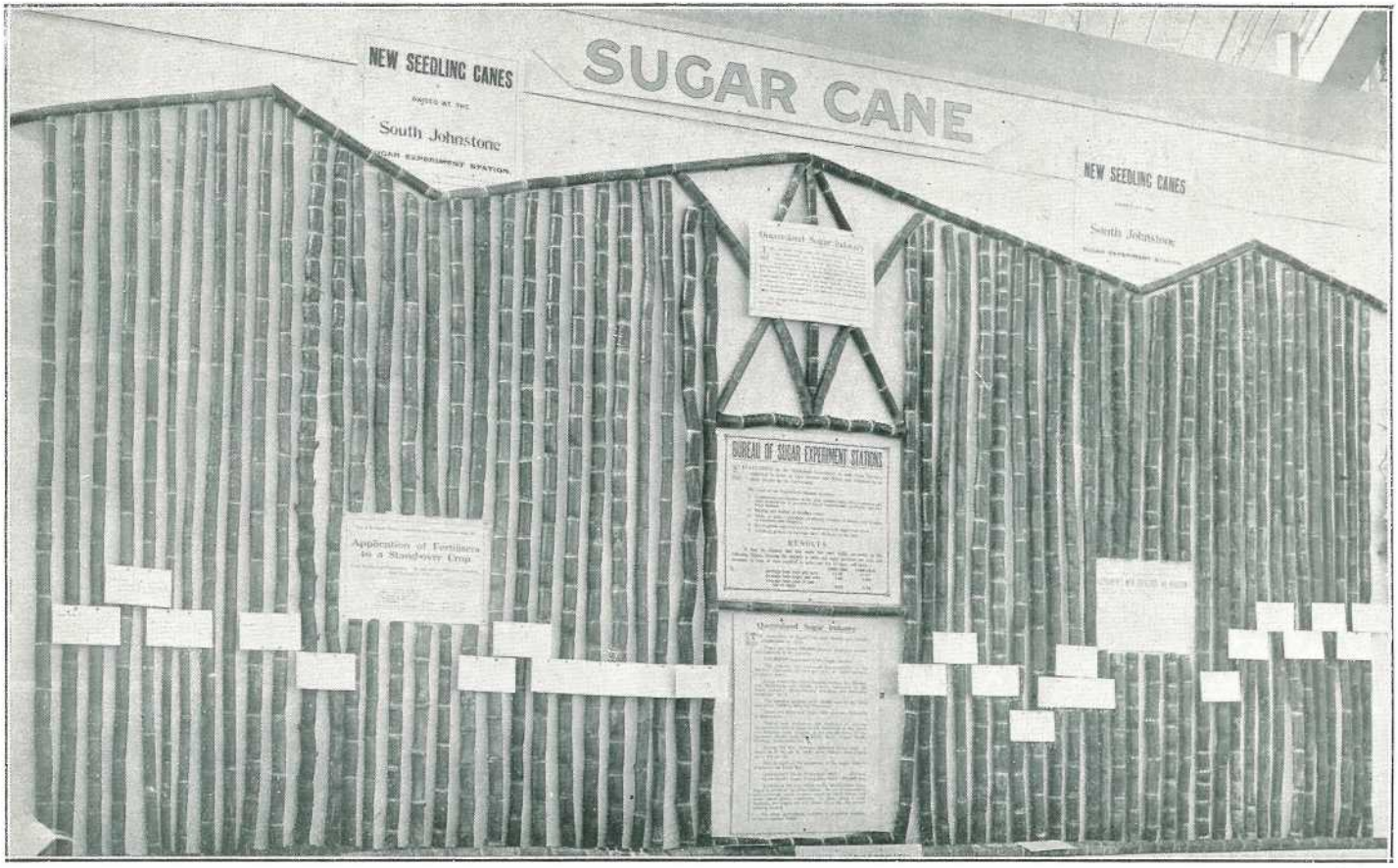

PLATE 70.—A PANEL IN SUGAR CANE—CLASSES AND VARIETIES EXHIBITED BY THE BUREAU OF SUGAR EXPERIMENT STATIONS.

PLATE 71 —1. FIBRE TROPHY IN THE COURT OF AGRICULTURE. 2. THE JOURNAL CORNER—BRENNAN BUTTER BOXES ON LEFT.

Apart from the question of grain types, there is ample evidence of the practical value of this work in increased production resulting from the use of high-producing strains of seed, authentic yields direct from the threshing machine of upwards of 100 bushels per acre having been secured from field crops.

The grower of maize, like the producers of other primary products, is naturally deeply concerned with the factors that make for increased yields, also in any labour-saving device that tends to reduce the cost of production.

Until quite recently the method of harvesting and threshing grain had not shown any reduction in costs; as a matter of fact costs for various reasons were on the increase. Last year, however, the inventive genius of a Queenslander, Mr. George Iland, of Toowoomba, produced a horse-drawn, engine-functioned machine for the complete harvesting and bagging of maize in the field. As the cost of the operation worked out by the purchaser of one of the machines was 2½d. per bushel, it was apparent in districts where the machine can be used to advantage that the maize-grower will now be on a better footing than formerly.

Wheat.

In the two sections of the Court devoted to wheat that on the Central Trophy dealt specifically with the chief commercial varieties, included in which was a selection of several of the better-known Departmental wheats which are coming into favour. These wheats were shown attractively in sheaf and grain.

Wheat-growing as an industry was depicted in photographic and dioramic views that also illustrated the work of the field officers engaged in carrying out fertiliser and propagation trials on privately-owned wheat farms, and the testing also of the rust-resisting and field characteristics of a large number of varieties. In this way the work of the Department is brought into direct touch with, and is designed for, the express purpose of advancing the practical interests of those engaged in wheat farming.

Another interesting section of the Court was a display of the highly-technical work of wheat-breeding carried on by the manager of the State Farm at Roma (Mr. Soutter). In chronological order this exhibit traced the inheritance of certain visible plant characters, and illustrated the effect produced by the cross-pollination of two varieties of wheat. The work of this wheat-breeding station has been carried on for fifteen years, and through its agency some excellent varieties have been brought into cultivation. Striking results indicative of the value of scientific work of this description have already manifested themselves. In this connection it has been possible to transmit the rust-resisting quality of one parent plant to the progeny, even when the other parent of the cross was known to be susceptible to rust.

Broom Millet.

Millet of excellent quality was staged, accompanying which were descriptive notes on the cultivation of the plant and of the preparation of the product for market. This industry is self-contained, and a number of broom factories are working in Brisbane. A reasonably good market is offering here and in the South. It is generally recognised that importation of millet from Europe should be discouraged by every possible means, owing to the risk of bringing in the European corn-borer, an insidious pest which has caused enormous damage through its introduction to America and other countries.

Cassava.

A special exhibit was made of this product. The roots of cassava carry a high percentage of starch (averaging about 25 per cent.), which is the source of the well-known table product tapioca. Much interest has been aroused in Queensland by proposals for its cultivation as a base for power alcohol. The Minister for Agriculture (Hon. W. Forgan Smith) has arranged already with the Plane Creek Central Sugar Mill authorities at Mackay to grow cassava for this purpose. The Instructor in Agriculture for the Central District (Mr. G. B. Brooks) was recently sent to Java to arrange for a supply of cuttings of approved kinds to plant an area of 300 acres near the Plane Creek Mill. The first consignment of 5,000 cuttings

has arrived and has been planted. Everything points to this new enterprise having a favourable start, and as molasses will also be used for the manufacture of power alcohol there is good ground for an optimistic view respecting the production in the near future of an appreciable quantity of spirit for industrial and transport use.

Tropical.

An array of tropical products was staged by the Northern Instructor in Agriculture, Mr. N. A. R. Pollock, who has been experimenting for some time with certain crops to test their economic value. Several varieties of "Upland" rice, imported in the first place from Japan and Java, were shown in sheaf and padi, rice grain in the rough, prior to hulling and polishing.

Soya Beans.

Another product presented to public notice was Soya Beans. Queensland has no commercially-grown oil-producing seeds other than cotton, consequently attention is being given to this very valuable plant. Recently a consignment of approved varieties was imported by the Department of Agriculture from the Bureau of Plant Industry in U.S.A., and field trials are to be undertaken.

Included in the display was an assortment of seeds of a number of leguminous plants, certain varieties of which, notably Mauritius and Velvet Beans, are largely grown in the Northern sugar districts for green-manuring purposes.

Townsville "Lucerne."

A large plant of the so-called Townsville "lucerne" (*Stylosanthes mucronata*) was exhibited. Prior to its introduction and subsequent distribution pastures in the vicinity of Townsville were of indifferent stock-carrying capacity. In recent years a very great improvement has manifested itself in the condition of the cattle running on the town common, and in paddocks to which this plant has spread. Townsville "lucerne" is looked upon more as a wood in other countries, and, even here, is not much sought after by stock until the plant starts to form its seed; at this stage it is rich in flesh-forming substances. It adapts itself also to hard, clay-pan country. Seed has been distributed by the Department to districts where a nutritive fodder plant is likely to improve the native pastures, and it is also being spread by natural means, principally along the railway lines.

QUEENSLAND'S RICH NATURAL PASTURES.

A well-arranged exhibit of native grasses was contributed by the manager of Gindie State Farm, who collected them on the property. Gindie is used as a Stud Farm for the breeding of Beef Shorthorn cattle, Clydesdale and Suffolk Punch horses. A number of photographs of stud stock belonging to this institution were shown amid the grass samples, and served to emphasise the quality and condition of the stock and the grasses on which they are depastured.

Tobacco.

Added interest was given to this section by the models of cigar and pipe tobacco-curing sheds, constructed to scale, in proximity to which were standard samples of both kinds of leaf. Trade requirements are more exacting than formerly and growers, to be successful, must supply a high-quality product, and in doing so may demand a better price. In the Bowen district, cigar leaf tobacco-growing has been carried on for a number of years, and the product is treated for market in Australia. Proper curing houses, in which the temperature may be controlled, are essential. As the manufacturer of pipe tobacco demands bright, aromatic, flue-cured leaf of a certain standard of quality, it follows that present and prospective growers must conform to requirements. Excellent tobacco is also grown in the Texas and Inglewood districts.

English Potatoes.

A collection of potatoes drawn from Departmental Experiment Plots at Townsville was staged for the purpose of illustrating that food crops of this nature are readily grown, in winter, in the Tropics, a circumstance full of significance to growers who are in a position to cater for the Northern trade.

PLATE 72.—MODEL TOBACCO CURING SHEDS IN THE AGRICULTURAL COURT.

PLATE 73.—QUEENSLAND STATE CANNERY PRODUCTS.

PLATE 74.—FRUIT FROM THE REDLANDS, MORETON BAY.

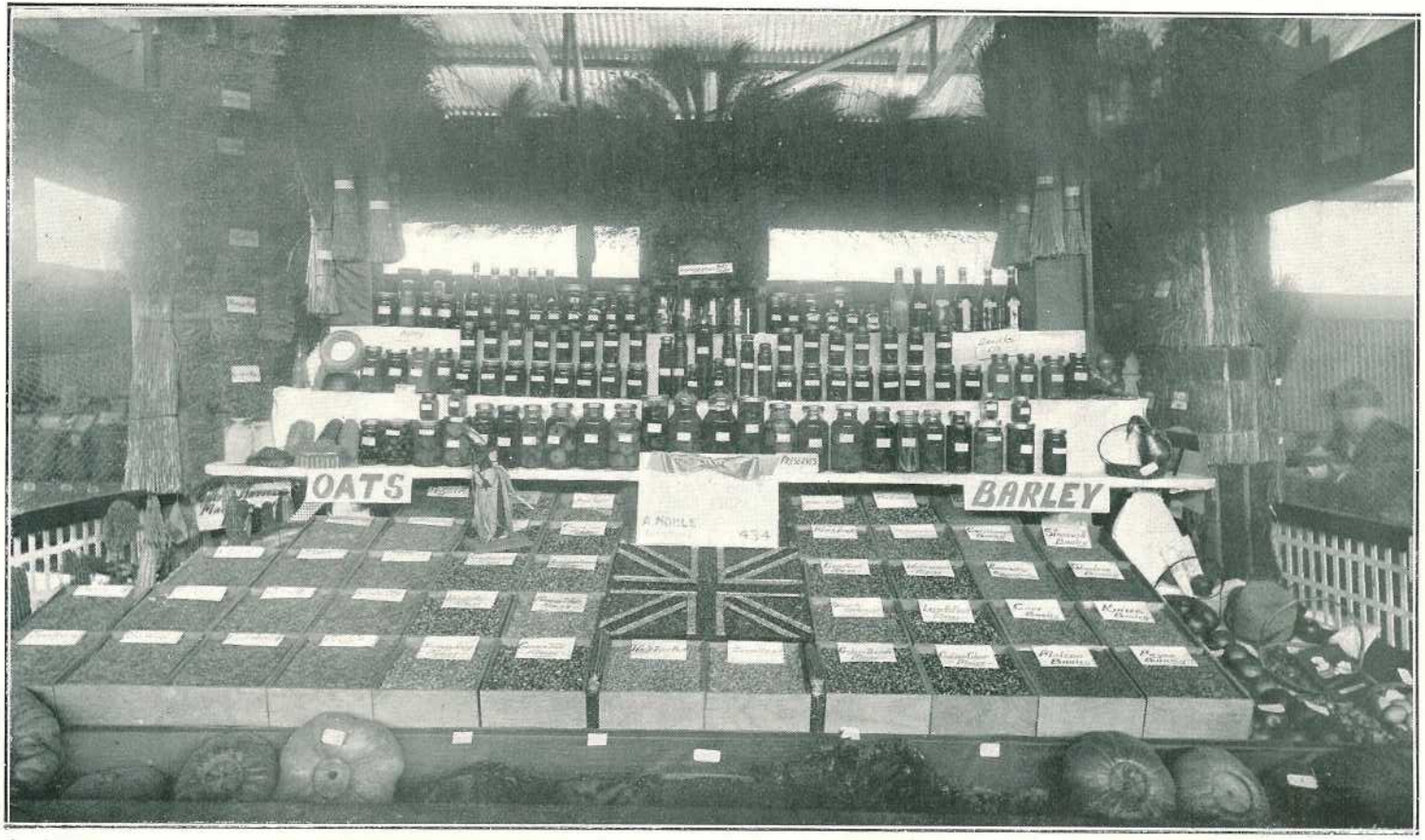

PLATE 75.—THE WINNING DISPLAY IN THE "ONE MAN FARM" COMPETITION.
STAGED BY MR. A. NOBLE, GLEN INNES (N.S.W.).

THE DISTRICT EXHIBITS.

This feature of the show afforded once again an excellent opportunity of studying the productive capabilities of rural Queensland. This year the Northern Districts of New South Wales also sent an exhibit. No fewer than four regional competitors entered for the senior division—including both primary products and manufactures; and four also for the primary products only, thus making up a very fine range, and one which covered the greater part of Southern Queensland, in addition to the North-Eastern corner of the adjoining State. The variety and quality of the products generally commanded admiration, and showed clearly the tremendous opportunities which exist for development both in products and manufactures, if we had the population not only to produce, but also to consume the output of field and factory.

WEST MORETON—FIRST.

(1,194½ points out of a possible 1,558.)

The advantages of energetic team work amongst the agricultural societies of the assigned area, coupled with great development both in primary and secondary industries, was strikingly evident in the West Moreton display. Mr. H. W. Watson again acted as principal organiser, and he was ably supported by the work of the local societies of Ipswich, Gatton, Rosewood, Laidley, Esk, Boonah, Marburg, Toogoolawah, and Lowood. A representative from each of those societies attended the show in Brisbane, thus materially assisting in the orderly and effective arrangement of the exhibits.

The general effect of the display was remarkably good, 76 points being secured out of a possible 80 for "effective arrangement." In dairy produce this collection was beaten only by Northern Rivers (N.S.W.), and then only by a point and a-half. It was equal with Wide Bay and Burnett in "foods," including hams and bacon, canned meats, honey, and bread. Under fruits and vegetables, West Moreton scored well, though not so high in the aggregate as several of the others; but English potatoes formed a strong element, being equalled only by New South Wales and surpassed by none. Tropical fruits were mainly contributed by Marburg. Some clean attractive citrus fruits from Grantham and Esk formed a pleasing feature. Maize and maize products formed an important and attractively arranged element in the display, though wheat, which is not supposed to be a regular product of this area, came out well owing mainly to contributions from the Lockyer and Esk districts. It was in manufactures and trades that West Moreton particularly shone. The advantage enjoyed in possessing such institutions as the Queensland Woollen Company and the various foundries and engineering works, in addition to timber working factories and those engaged in the production of various foodstuffs (stimulated as these industries are by the proximity of large supplies of coal), has no doubt much to do with the strength of this phase of the district exhibit. For manufactured textiles the full quota of points was obtained, and the exhibit in this section was undoubtedly an attractive one. In the section "minerals and building materials," a less commanding position was taken; but timbers from Esk, Boonah, and Yarraman secured 23 points of a possible 25 in that particular section. Tropical products were not as well represented as perhaps they might have been, but weakness in comparison with Wide Bay, for example, was due to the fact that West Moreton is not a sugar growing district, though in most of the included areas cane is grown, principally as fodder. For wines and aerated waters this district scored better than either of the others, gaining in all a total of 20 points out of 25. Tobacco is not an industry bulking at all largely in this district, but the farms were able to contribute cured leaf in sufficient quantity to win 75 per cent. of the maximum points. In fodders, the scoring was high under almost every heading, and this was to have been expected in view of the large output of hay and chaff of all descriptions from the included areas. Wool, both greasy and scoured, formed another fairly strong division, though in this respect the New South Wales display had a decided advantage. Enlarged photographs, with which the walls were adorned, were of excellent quality and secured the maximum points. The central feature in the decorations was a revolving globe of wool bearing, amongst other devices, the slogan, "If it's good, we grow it. If we grow it, it's good."

WIDE BAY AND BURNETT—SECOND.

(1,182 Points.)

The districts included were Maryborough, Pialba, Gympie, Bundaberg, the fertile areas of the Mary Valley and of the Blackall Range, and productive tracts further from the coast such as Gayndah, Kilkivan, Wondai, Murgon, Childers, Degilbo, Nanango, and the various sub-districts of which these towns form the commercial centres. The areas indicated include some of the most productive lands in Southern Queensland, famous for their annual output of sugar, butter, maize, bananas, pineapples, citrus fruits, and possessing at the same time abundant supplies of coal and other minerals, as well as timber. Maryborough, too, is noted for possessing the largest engineering works in the State in Walkers Limited. Bundaberg, in addition to its large foundry, has several sugar mills, including Bingera, Fairymead, Qunaba, and Millaquin, and has also a refinery and distillery. The two large mills in the Isis, and the smaller mills at Gin Gin and Bauple, as well as the Moreton Central Mill at Nambour, are all within the area allotted to the Wide Bay and Burnett, so that the field from which exhibits may be drawn is a rich and varied one. Coming within 13 points of the top score, this district has every reason for congratulation on its splendid showing, and the organiser, Mr. H. Basford, only needs a little more backing from the district societies to enable him to win for his district the coveted premiership. Wide Bay secured equal points with the best in the "food" division, and distanced all in "tropical products." Sugar-cane was represented by fifty-two varieties, all well grown specimens, principally from Bundaberg, Childers, and Nambour. Fresh fruit was another strong class, securing 55 points out of a possible 60, the citrus from several areas forming in itself a very fine exhibit. In grain, though only 2 points short of the winners, Wide Bay was considerably behind Northern Rivers. Maize is, of course, a leading product of some of the included areas, and higher scoring for this cereal might have been expected; the exhibit, nevertheless, was a fine one, chiefly from the South Burnett. On the other hand, wheat, which is not generally regarded as associated with this part of Queensland, was shown in ten varieties, and we learn that the State Wheat Board has recommended the planting of larger areas. Formerly Nanango had a considerable acreage under wheat. Woodwork was well represented, and included joinery from Maryborough. Metal work was an outstanding feature, both in iron and brass, the principal foundry making an instructive display. In minerals and building material 75 per cent. of the possible score was gained. Timbers were less conspicuous than they might have been, but this was compensated by the gold and various mineral specimens from Gympie, Kilkivan, Gayndah, and Biggenden, with coal from the rich seams of Howard. In tropical products, apart from sugar, Wide Bay gained maximum points for rum, coffee, rubber, and vegetable oils, and 20 points (out of the possible 30) for exhibits of cotton. With 114 points for fodders, Wide Bay came next to West Moreton, tieing with the winners in such items as pumpkins and farm seeds, and showing a 9 to 6 superiority in broom millet. In the food section a total of 159 points was gained (the same number as West Moreton), and in honey and confectionery the scoring surpassed that of the winners, though falling somewhat short in other divisions.

NORTH COAST, NEW SOUTH WALES—THIRD.

(1,170 Points.)

It was distinctly pleasing to have Northern New South Wales again represented at Bowen Park, and with the improved communication now being provided in the Kyogle railway regular competition from the Rivers may be expected. With the present difficulties of transport it was distinctly creditable that the organiser, Mr. T. J. Ford, of Grafton, should have fallen short of the top score by only 24 points. The whole was under the control of the North Coast Agricultural Societies' Association, which embraces an area of 100 square miles, and includes the following districts:—The Tweed, Mullumbimby, Bangalow, Alstonville, Coraki, Nimbin, Lismore, Casino, Kyogle, Grafton, Ulmarra, Maclean, Coramba, Bellingen, Dorrigo, Guyra, Glen Innes, and Tenterfield. Thus both coastal and tableland areas were included, and

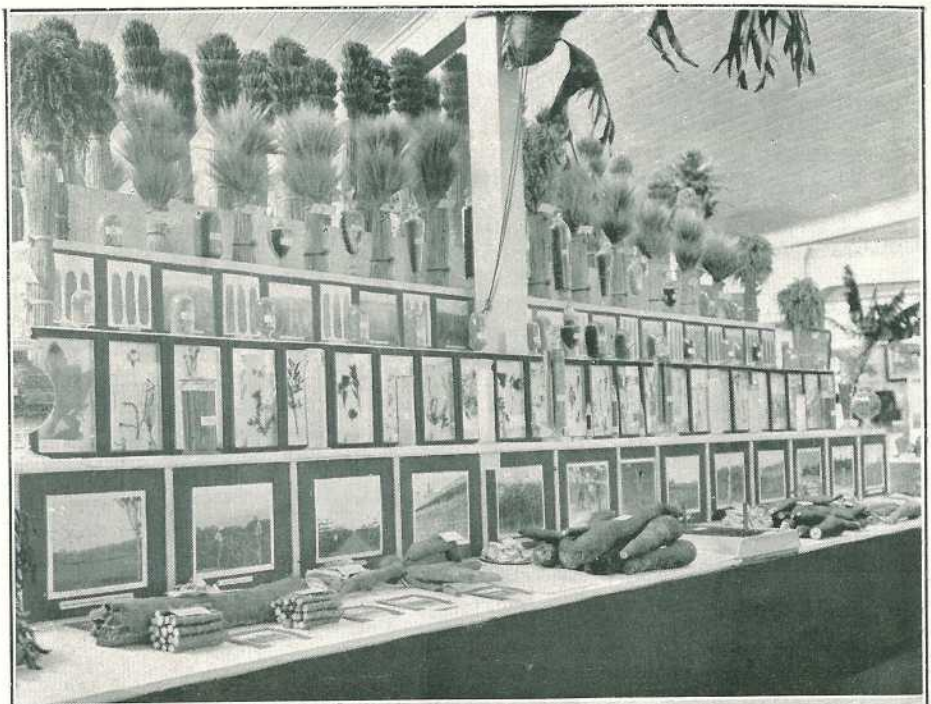

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PLATE 76.—IN THE AGRICULTURAL COURT.

1. Cassava Exhibit (Central Feature). 2. Work of the Fruit Branch illustrated.

Plate 77.—Interested Visitors at the Show.

Left to right—Mrs. E. G. Theodore, Hon. E. G. Theodore (former State Premier), Hon. W. N. Gillies (Premier), Mrs. W. N. Gillies.

the display was a most creditable one, representative of the great primary industries of these districts, and embracing manufactures, though without the advantages of large establishments such as those in Ipswich and Maryborough. The existence, however, of so famous an institution as the North Coast Co-operative Company at Byron Bay led to the expectation that scoring in dairy products would be high, and this was justified by the event, as the figures under each subheading of this section were highest, with the exception of a single point lost on eggs. The noted Guyra and Glen Innes districts, supplemented by exhibits from Dorrigo, are credited with the very fine display of English potatoes, some sixty varieties being shown. Preserved and dried fruits and roots were also conspicuous items under this heading, and a collection of both tropical and temperate climate fruits was attractively displayed. An exhibit of the thin-shelled variety of Queensland nut from Mr. J. B. Waldron, near Murwillumbah, was particularly interesting. In the grain division N.S.W., thanks largely to Glen Innes, led all competitors, obtaining 129 points (possible 150), both wheat and maize securing 94 per cent. of the maximum points. The scoring in tropical products was comparatively low, though higher than that of West Moreton —sugar-cane (from the Richmond), coffee, and cotton making useful contributions. In tobacco, this district exhibit gained first place with 18 points out of 20. Hay and chaff were well represented, and in this division, grasses and their seeds, sorghums, and commercial fibres were conspicuous. In minerals and building materials, some interesting specimens from Glen Innes and the Clarence, and coal from Tyalgum were shown. Interest also centred in samples from a deposit of clay and silica from Dunbible, near Murwillumbah, which is being commercialy utilised in combination with casein from the North Coast Butter Factory in the composition of a cold water paint. In wool this District Exhibit gained an aggregate of 102 points out of a possible 110. The trophy of wool formed a striking feature of the court, and the samples—both greasy and scoured—numbered thirty-six in all. For effective arrangement, New South Wales was second only to West Moreton. The prize of £10 offered by the Royal National Association for the best descriptive booklet was won by New South Wales, the writer being Mr. A. E. Overall.

SOUTH COAST.

(797 Points.)

The area included under this heading is comparatively small, but it embraces some of the finest dairying and fruitgrowing country in this State, and lately it has been extended to include the city of South Brisbane, thus adding materially to its manufacturing resources. The entry was made by the Agricultural and Pastoral Society of Southern Queensland. Mr. W. Laughlin was organiser. With factories in its area like those of Kingston and Beaudesert it is not surprising that South Coast scored well for butter; but the absence of cheese spoiled the aggregate in the dairying section. Hams and bacon also showed up well, and the points gained for bread, biscuits, &c., were only one short of the possible. A notable success was achieved in preserved fruits, jams, &c., a splendid collection gaining the maximum of points under that heading. Among fresh fruits was an excellent display of citrus by Mr. F. Shailer. Woodwork was another very fine exhibit, receiving higher points than those gained by any of the other competitors, and only two short of the maximum. Leather and tinwork were also well represented. In tropical products the South Coast was less successful than might have been expected, but among the sugar-cane exhibits was a fine stool of D.1135 composed of no fewer than forty-nine sticks of cane. The high scoring for preserved fruits was no doubt attributable to the remarkably fine trophy of the products of Hargreaves and Sons, Wynnum. This occupied one corner of the display, and was artificially illuminated, thus showing to the best effect the bright colours and clearness of the marmalade, jams, and jellies. Pineapple and other canned goods were fully displayed, and altogether the trophy was one of which any court might well have been proud. Some well grown vegetables were from Sunnybank, Wellington Point, and Beenleigh, whilst the maize exhibits, which were of creditable quality and variety, were from Beenleigh, Loganlea, and Beaudesert. Wheat, though not a staple product of this area, was shown by growers in the Beenleigh and Beaudesert localities. Mr. P. Hortz, who is well known as a

builder of silos of various sizes and patterns, from reinforced concrete, had sent in models and photos of work already done by him, and specimens of ensilage, and was himself in attendance to give any information required. Atkins' Scale Manufacturing Works, South Brisbane, showed scales of various types, including a portable live pig and sheep weighing contrivance. It is evident that the system of selling pigs on their live weight, as tested at the scales, is creating a demand for a contrivance of this kind.

PRIMARY PRODUCTS ONLY.

This division of the District Competitions, corresponding with what was formerly the "B" grade class, attracted this year as many entries as the "A" grade, and the general result was a very fine display of farm, orchard, and dairy products. Following is a brief review of the several courts:—

KILCOY AND DISTRICT—FIRST.

(585½ Points.)

The nominators in this instance were the Kilcoy Pastoral, Agricultural, and Industrial Society, and the principal organiser, Mr. W. E. Reason. The district represented includes that portion of the Brisbane River watershed embraced in the vicinity of the Stanley River, Kilcoy Creek, Sandy and Sheep Station Creeks, and other tributaries. The display was on the whole very effective, and, as was the case last year, it secured highest points for effective arrangement—namely, 71 out of a possible 80. All the districts scored well in the dairy produce section, but Kilcoy was somewhat behind the others in this respect. Foods, and especially pig products, honey, and confectionery, were well represented, and gave this collection an advantage over all the others, hams and bacon securing 43 points out of the possible 50. Fruits and vegetables, again, was a section in which Kilcoy did particularly well, and notably so in preserved fruits, which scored the possible, dried fruits and preserved and dried vegetables being within a single point of the maximum. In both the fresh and preserved classes, bananas were shown of high quality, and there were also some excellent citrus fruits, for which the district is well adapted in favoured portions. English potatoes comprised about sixteen varieties, and the fresh vegetables, chiefly those grown by Mr. A. Pratt, and particularly the cauliflowers, were very fine. In the grain section, full points were secured for meals, and in maize this collection was ahead of the others, with 80 per cent. of the possible. It is recalled that last year so good was the type of maize included in the Kilcoy collection that students from the Gatton College were sent to this court to study the types of maize shown. Wheat is not an ordinary product of this district, but the samples shown were sufficiently good to secure 40 points out of the 50 allotted to this class. Timber, for which some parts of the district are famed, constituted an interesting exhibit, both in the rough and polished state, exhibiting the beautiful grain of some of the varieties. Tropical products were not a strong feature in any of the collections, but some sugar-cane of excellent quality grown behind the D'Aguilar Range was included in the collection. Also some excellent samples of cotton were shown. Although not scoring highly in minerals, Kilcoy showed some reef and alluvial gold specimens from the old Jimna diggings, as well as copper from the head of Kilcoy Creek. Hay and chaff were shown in variety and of fair quality, but it was not one of the leading scoring lines. In women's work, Kilcoy secured the maximum of points, as well as in school needlework.

NORTHERN DARLING DOWNS—SECOND.

(862 Points.)

The Dalby Agricultural Society undertook the responsibility of this entry, and the work was in the capable hands of Mr. W. Dinneen, of Jandowae, and of Mr. N. C. Hooper, of Bell, as joint organisers. The contributing centres were mainly Bell, Jandowae, Tara, Chinchilla, and Dalby. Unfortunately, parts of this area had suffered both from rain shortage and a plague of mice. For both butter and cheese

PLATE 78.—WHEAT BREEDING ILLUSTRATED IN THE AGRICULTURAL COURT.

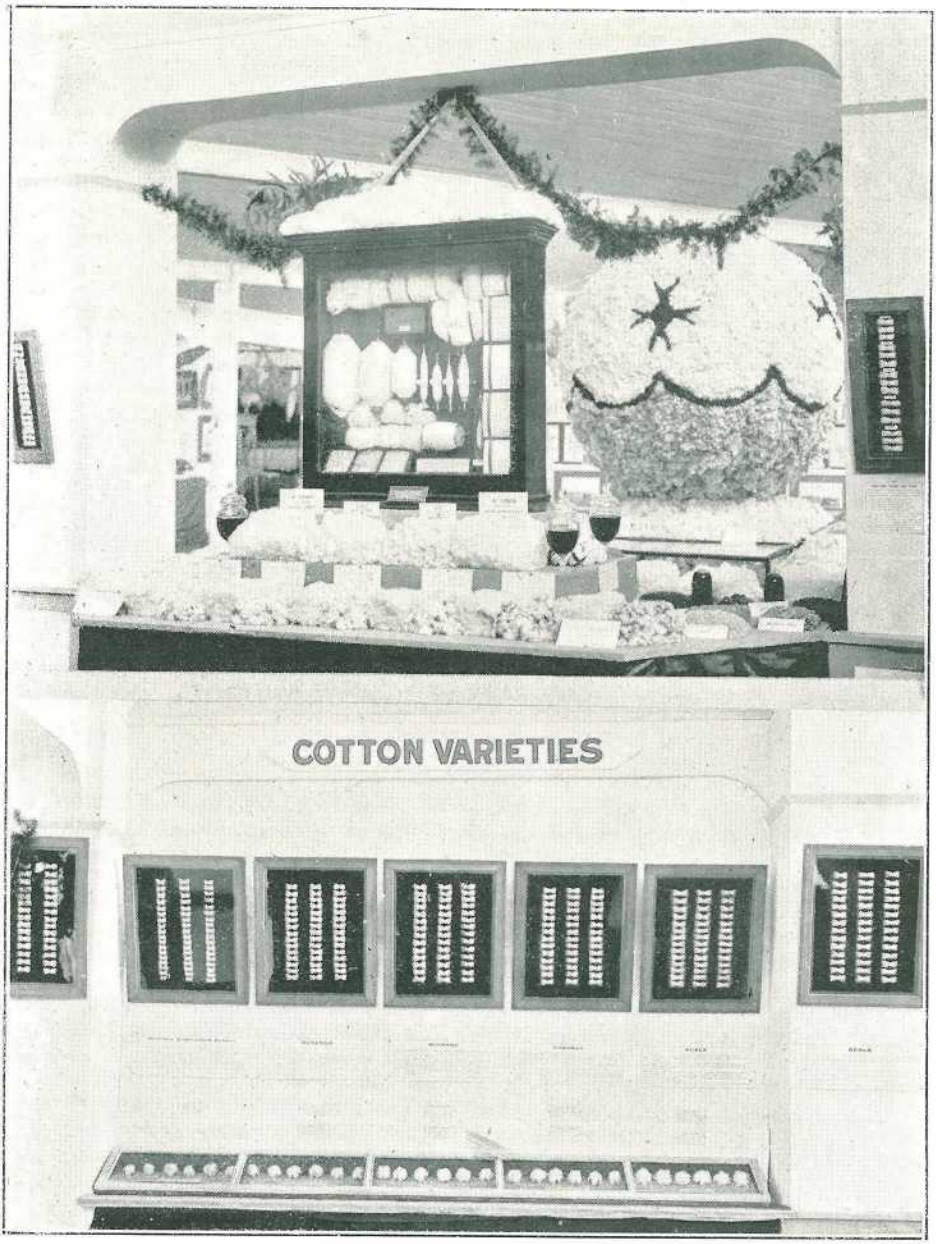


Plate 79.—Instructive Cotton Exhibits—Court of Agriculture.

this exhibit scored highly, the principal factories represented being Dalby for butter, and Moola, Cooranga North, Koondai, and Sunnyvale for cheese. In foods also higher points were secured than by any of the other districts, the leading lines being hams and bacon and lard, and there was a creditable exhibit of honey and by-products from the apiary of J. T. Porter, Tara. Confectionery was another strong class, home-made sweets being contributed by Miss Grant (Dalby) and Mrs. Walton (Cooranga North). Fruits, vegetables, &c., did not score so well as in the case of some of the other districts, but some exceedingly fine citrus was shown from the orchards of the Kaimkillenbun and Tara districts; also there were some excellent preserves, including a great variety of fruits. In the aggregate Northern Downs surpassed all others for grain and by-products, repeating in this respect its victory of last year. Both wheat and maize were shown of excellent quality, with nearly a score of varieties in each case, mainly from Bell and Jandowae areas, whilst the Dalby Mill contributed flour of local make. A collection, which included sixty different varieties of grasses, was also notable. A varied collection of timbers (fifty-two descriptions in all), together with wattle bark, gave Northern Downs a lead in this section. In tropical products this district was at a disadvantage, being quite outside the sugar belt; but in cotton it came level with Nanango, and some good samples were shown. Minerals are not a speciality of this part of Queensland; but there were sufficient to show that the district is not without such resources, and a feature of no little interest was the sample of naturally produced salt obtained by Mr. Dinneen from caves in the Burri Burri district. In pipe tobacco some very excellent samples grown by Mr. J. Sargeant enabled the district to score 15 points out of a possible 20. The hay and chaff section was a particularly successful one, as is not surprising from the reputation of the district, and 114 points placed this collection well ahead of all the others in this division. In both hay and chaff the quality was particularly good. Scoured wool gained the full quota of points, and greasy was but a single point below the maximum. Among the chief contributors were C. Routley (Bowenville), M. Jentz (Jandowae), and J. Haase (Dalby). For enlarged photographs the full scale of points was allowed. Mention should also be made of an excellent exhibit of hides and skins from Jandowae, which secured within a single point of the maximum. The district women and the school children contributed materially to the completeness of the court, though less successful than in some of the others.

NANANGO—THIRD.

(840 Points.)

Nominated by the Nanango Show Society, this district collection was made up of exhibits from farms around Nanango, Broadwater, Yarraman, Blackbutt, Maidenwell, and Tarong. The organiser was Mr. R. H. Robinson. A feature noted in connection with this display was the large number of farms contributing to the various sections. Butter and cheese from the Nanango and Brooklands factories respectively gave assurance of creditable representation in the dairy section. The strongest features otherwise were the cereals and fodder and the minerals (including copper, iron, coal, and quartz and alluvial gold). Citrus fruits, bananas, and pine-apples were of a quality to secure higher points than in any other collection, with the single exception of the Kilcoy district. Wool, both greasy and scoured, was also a very strong feature. Hay and chaff in all the leading varieties gained higher points than any other display except Northern Downs, which must be regarded as distinctly creditable. This division included also some excellent broom millet, for which 8 points (out of a possible 10) were scored. Ladies' needlework and knitting, as well as school children's work, compared very favourably with that shown in other courts, and was beaten only by Kilcoy.

KINGAROY.

(810 Points.)

Mr. J. A. Nystrom, under the ægis of the Kingaroy Show Society, organised this exhibit. Though defeated it was by no means disgraced, and as a demonstration of the resources of the district it had much to commend it. In dairy produce it secured second highest points, the chief contributor in butter being the Kingaroy

factory. Maize, as was to have been expected, proved an outstanding feature, including some twenty varieties, and was attractively displayed. Hams and bacon scored well. Honey and by-products were from the apiary of Mr. C. Dossell. For English potatoes Kingaroy stood highest, the principal varieties being Carmens, Guyra Blues, and Brownell's Beauties. Fresh fruits also scored well, the citrus being particularly good. Fresh vegetables also were a creditable feature. Peanuts were shown in bulk, and of both red and white varieties, and these secured points only one short of the maximum. Timbers indigenous to the district were shown in upwards of forty varieties. In hay and chaff a creditable showing was made, and among the exhibits were specimens of hemp and flax fibres grown in the South Burnett district. The women and children also contributed worthily to the interest and value of a very fine collection.

DAIRY CATTLE.

The numbers of cattle were not so large as in previous years, but this was compensated by the quality of the exhibits. For some three years a children's calf class in each breed has been added to the schedule, to encourage the younger generation in the art of rearing and exhibiting an animal.

Ayrshires.

These were a vast improvement on last year's showing, all being well prepared and in good order. Several previous exhibitors were absent. Mr. Geo. L. Wilson, of Berwick, Victoria (judge), expressed pleasure at the splendid quality paraded before him, and specially mentioned having to place last year's champion cow third this time, although well shown. He stated her vessel had "gone to pieces." Jones Holmes's Blanche of Longlands, now awarded the purple ribbon, was a beautiful roomy cow, full of quality; in fact, it was one of the hardest tasks he had for five years to award the champion, she being a very typical animal, with a good vessel and plenty of constitution.

Although the Ayrshire exhibits did very great credit to their respective owners and breeders, and it seems that the latter have risen to the occasion, it may be hoped that with the reappearance of some of the absent breeders, next year's display will eclipse the present one.

Jerseys.

This popular breed always appeals to the artistic eye. Their clean-cut features, silky shining coats, and their domesticity, all tend to gain them admiration and popularity. This year's display did not come up to the standard of past years. Several of the breeders prominent in former years were absent. Some of the animals were disappointing, more especially in the male classes, which seemed to lack size and constitution. This applies also to the females. Three new exhibitors were Messrs. Chas. Kretchmer, of Chatsworth, Gympie; J. G. Summers, Sefton Stud, Kilkivan; and G. A. Ferguson, Chelsford Stud, Woodhill, who fully justified their appearance by the splendid manner in which the animals were shown and the quality of their exhibits.

Illawarra Milking Shorthorns.

The showing in this breed eclipsed all previous years. The type throughout was very even, although in one or two instances a slight variation was noticeable. The judge, Mr. J. J. Hayter, of Byron Bay, had a very strenuous task. He was more than pleased with the exhibits, and specially mentioned B. O'Connor's champion bull, Brilliant of Oakvale, and E. M. Franklin's champion cow, Peggy 2nd of Fairfield, both true to type and showing great milking qualities. The reds seemed to predominate, but a fine class of roans in the Sires' Progeny Group, owned by A. J. Caswell, called forth much applause when awarded the blue ribbon. This breed had the largest number of ringsiders, who did not forget to applaud any meritorious wins, which, of course, was a great incentive to the judge.

PLATE 80.—HOW QUEENSLAND FARMERS ARE SERVED BY SCIENCE—ECONOMIC ENTOMOLOGY ILLUSTRATED IN THE AGRICULTURAL COURT.

Plate 81.

1. Object lessons from the Bacteriological Laboratory, Stock Experiment Station at Yeerongpilly.

2. Poultry Instructor's work illustrated in the Court of Agriculture.

Guernseys.

Dairymen have not yet fully realised the good qualities of these yellow and white cattle. They possess to a great extent the high-testing qualities of the Jerseys. They give a fine flow of milk, and have also the constitution, and it behoves the fanciers to boost their breed like the supporters of other breeds. They have the animal, and with a systematic advertising scheme many dairymen could be induced to enter into the breeding of the Guernsey. Last year competition was keen among the three breeders, but this year it is to be regretted that splendid team of Mr. A. Cooke, of Maleny, did not have an opportunity of showing its superiority, there being no competition. However, what were shown were of outstanding quality, and the judge (Mr. E. Burton, of Hermitage) was well pleased with them. Mr. Cooke is commended for the manner in which he showed his animals, and he secured the award in all classes except heifer under 3 years, in milk, and bull 2 years and under 3, for which no entry was received. The champion badge for bull was awarded to Milton's Itchen Prince III., a fine type of animal bred by A. Hordern, Sydney, and reserve champion was awarded to Victor of Wollongbar. The champion badge for cow went to a fine roomy animal showing a splendid vessel and vein, with a fine characteristic head—Minnamurra Cherubine, bred by Kinross Bros., Inverell, who also bred the reserve champion, Minnamurra Olga.

Friesians.

This section showed a marked reduction in numbers compared with previous years, and many previous exhibitors did not put in an appearance. It is pleasing to note the success of one of the first-time exhibitors, J. A. Jensen, of Wondai, whilst A. McAlister, of Forest Hill, also gained some ribbons.

The judge, Mr. F. H. Butterfield, was very pleased with the exhibits. Several, he said, were fit to win anywhere, and compared very well with the Southern cattle. The several animals were well shown, and the champion cow, Brown Bros.' Mooroombin Pontiac Girl, was a very typical cow, wonderfully well balanced, with a splendid udder. It was freely remarked during the judging that the judge could pick out the producers, and his awards were eagerly watched by the small number of keenly interested ringside enthusiasts.

HORSES.

There were five competitors for the thoroughbred blue ribbon, including Mr. Yore's Polybius, with his record of three previous wins—1921, 1923, and 1924. He suffered defeat on this occasion, the championship being awarded to Mr. J. H. S. Barnes's Rivoli (by Repartee from Lady Babbie), a beautiful dappled bay and an A.J.C. winner, besides having run second in the Melbourne Cup race, and with otherwise a fine racing record. Mr. E. Steele's Midnight Frolic (imp.), which has raced in Brisbane, was placed second. Concerning Polybius, the judge, Mr. Fanning, of Townsville, remarked that he would have won for remount sires had he been entered in that class. As it was, Midnight Frolic secured the prize. The championship for thoroughbred mares went to Mr. I. J. Moore's Golden Opinion, with Mr. E. G. Blume's Flying Malka second and reserve champion.

Mr. James Sprott, of Winthrop, Talgai West, judged the Clydesdales, and expressed himself as well pleased, especially with the 3 and 2 year olds. W. Frood's British Hope, which was Queensland champion in 1917, was again successful, and he was also winner in the class for sire and two of his progeny. A. Langmore's Carlyle Crystal, bred by the Jondaryan Estates Company, came second, and Mrs. G. N. Watson's Crystal Blaze was third. Mr. Frood was also successful in the 4-year-old class, with W. A Schmike's St. George (bred by Mr. G. Weir, Laidley) second. No fewer than 11 colts came out for the 3-year-old class, and Gavin Elliot's Prospector colt Professor was placed in the lead, winning also the championship for heavy draughts, with British Hope as reserve. A. T. Creswick's Marshal Allenby was second, described as a remarkably fine colt, and bred by the exhibitor at St. Helens, Pittsworth. The Queensland College colt Prosfield was third. For 2-year-olds, Mr. Creswick's entries filled all three places out of a field of nine, all being sired by his stallion, Captain Dale.

Entries in the Clydesdale mare classes were less numerous, but some excellent animals were shown, the winners being those entered by Gavin Elliot, Macfarlane Bros., A. T. Creswick, and W. Frood. The championship for draught mare was won by Mr. G. Elliot, with Lady Meta, winner in the brood mare class, the reserve going to Creswick's Beryl.

The Queensland Agricultural College made a fine non-competitive display with four of the State-owned Clydesdale stallions.

In stud ponies there was a good showing, and Mr. J. A. Rudd's Hafrod Sensation, last year's champion, was again champion Welsh pony stallion, reserve in class pony stallion in harness, first in stallion not exceeding 14 hands (any age), to be driven, and also in the led class for same. The champion pony stallion in harness was Mr. J. Young's Ivanhoe II., winner both in the 12 and 13 hands classes. The champion pony mare was Miss A. Mullen's Gold Top.

The champion trotting stallion was Mr. W. H. Smith's Sparkling Jewel, with Mr. J. Dowridge's King Bells reserve. Trotting mare championship, Mr. A. A. Prior's Cole Bells; reserve, Mr. T. Garrard's Miss Brisbane.

On the opening day a record-breaking effort was successfully made by Mr. J. B. Sheehan's Machine Brick, a bay stallion by Rock Huon out of Gert, for the £400 offered for stud book stallions trotting 1 mile in harness and lowering the record established by Globe Derby, of 2 min. 12¾ sec., in 1922. The course was completed in 2 min. 12 sec.

For the prize of £50 for stud book mares trotting 1 mile in harness and lowering the record of Golden Wilkes in 1923 (2 min. 21 sec.) three entries were received. Mr. M. J. Kenny's Highwood Lass broke once but completed the course in 2 min. 20½ sec., thus breaking the record by ½ sec.

Among the chief events of the Opening Day was the Pony High Jump, for which there were seven entries. The prize was £30, with an additional £25 for any pony breaking the Brisbane record of 6 ft. 10 in., established in 1923. Mr. C. Russell's ten-year-old grey gelding succeeded in topping 6 ft. 11 in., thus establishing a new record.

The Royal National High Jump, one of the chief ring events, proved a highly interesting contest. Mr. L. Judd's Thumbs Up and Mr. J. M. Webster's Hailstorm both cleared 7 ft. 6 in., thus creating a new Queensland record. These owners accordingly divided the extra £100 offered in the event of the record being broken. The Australian record is still held by Mr. W. J. Weir, of Wangaratta, N.S.W., whose horse Musician cleared 7 ft. 10 in. in 1921.

SHEEP.

The sheep exhibits were disappointing and not at all representative of the State's greatest rural industry. The fact that shearing was in full operation on most of the stations was responsible, no doubt, for the paucity of entries in this class. Mr. J. H. Fairfax, Marinya, sent in two Corriedale rams and two ewes, and Mr. S. E. Pullen, of Prairie Plain, showed three Lincoln ewes, two Shropshire rams and three ewes, and three Southdown rams and three ewes. There were, unfortunately, no entries in the twenty-eight merino classes scheduled.

The Corriedales were fine specimens of the breed, one of the rams especially being the ideal of what a Corriedale ought to be—straight and broad in the back, well ribbed up and evenly woolled, big and symmetrical—and his fellow was almost as good. The ewes, too, filled the eye effectively. The Corriedale is a cross obtained by mating Merino rams with Lincoln or Leicester ewes, and is an excellent dual-purpose farmers' sheep, early maturing, hardy, and carrying a heavy fleece of Merino type. They are regarded as very suitable for small graziers near the coast.

PLATE 82.—APPLES FROM STANTHORPE.

PLATE 83.—RESULTS OF THE WORK OF THE DEPARTMENT IN EVOLVING WILT-RESISTANT TOMATOES WERE WELL ILLUSTRATED IN THE BOWEN EXHIBIT.

The Shropshires were good specimens of this attractive breed of mutton sheep, and the Southdowns were excellent examples of this prolific, early-maturing breed. They were well-shaped, and the fleece, though light, was of fine quality. It was specially disappointing to find that Dorset Horns were conspicuous by their absence. This breed deserves much greater attention than it has so far received from those who combine sheep rearing with farming in the coastal districts. No breed will pay better as early lambing sheep, and no lambs mature so early as Dorset Horn crosses, for at three months they are ready for freezing, and are eagerly sought after by butchers. There were no representatives of Border Leicesters or English Leicesters, and the Romney Marsh class attracted no entries. It is to be hoped that at future shows British breeds may be more worthily represented. A good show of these would be a valuable object-lesson to mixed farmers whose holdings are close enough to seaports to allow them to send in lambs for export cheaply and expeditiously.

SILVICULTURE IN OPERATION—JUNGLE TREASURIES.

Through a wicket gate in a white picket fence, beneath the gold-lettered sign of the Queensland Forest Service, the investigating crowds passed along the paths of a forest nursery in the beds of which the seeds and seedlings of future forests were beginning the tree careers which will end for them beyond the sawmills, in all shapes which go to make up the homes of the people of the State.

White picket fences, seedbeds and seedlings, the refreshing greenery of palms and ferns, a black and white gallery of photographs depicting the activities of forestry; and beyond this cool foreground were the contrasting depths in reds and browns of the precious wares in woods which come from the jungle treasuries of Queensland, and give to the forester proper pride in the rich possessions of which he is trustee.

This was the Forestry Court in 1925.

The Story of the Seedling.

In one corner of the little nursery a sign announced "The seed of the hoop pine tree germinating." Visibly green manifestations exhibited themselves upon the soil surface, plumules of *Araucaria Cunninghamii*, unfolding and carrying up on their heads as caps the brown-winged seed vessels in which these future giants of the forests were cradled from the tree tops to the ground. Silval infants, six months the senior of the new fallen seeds, bravely flaunted their green twigs in the beds alongside, and dressing by the right and left in rows stood the still more venerable youngsters destined soon for the plantations which are to become their life-long habitations. "In long trousers—ready for the plantation," said the card beside them, and the long trousers were visible as a tin to encase the tender taproots in a swathing of soft soil, a tubular sheath or cartridge in which the hoop pine treeling leaves the nursery to enter the hard world beyond.

There are at present a million such seedlings in the forest nurseries of the State and each seedling must be attired to its comfort. For unlike the forest babies of the old world, the Queensland treeling grows long taproots so that he may dig in early against the winter droughts, nor depend upon the torrents of summer rains which the torrid sun immediately draws from the surface of the soil. Wise in its day and generation, the Queensland treeling provides for early establishment in a safe and permanent job, and refuses to develop those bunchy fibrous roots which delight the heart of the tree transplanted in European wilds. Since the Queensland tree refuses to accommodate the forester, however, the Queensland forester seeks to accommodate the tree, and accordingly envelops its legs in a 6-inch tube, in which it is transported to the planting side and there released by a pressure of the tube latch which unloads it into the planting hole totally unaware of any abnormal disturbance of its domestic economy. Whereupon it continues to grow in perfect peace and satisfaction, save for a little sunburning. In five years' time in the plantation it will have

reached a greater stature than those denizens of the silvicultural slums which were exhibited beside it for contrast with a placard to announce that their dwarfed and stunted state at the mature age of thirty years was due to their long suppression under the canopy of their grandfather trees, those grandfathers which are yielding their sawdust at the mills to-day to furnish homes for us all.

In a small annexe the making of these tin twists and the placing of the treelings therein were demonstrated.

A Commercial Concern.

The Queensland Forest Service is inclined to be commercial in character. One of its aspirations is to grow two crops at once where only one grew before. In certain moist nooks of the Mary Valley State Forests, experts (and others) declare that very large bananas may be produced to perfection if only the Forest Service would release the land for selection. But bananas have a profitable life of only seven years, after which lantana is often regarded as a rejuvenating succession in the rotation of crops. The Queensland Forest Service spends a certain sum of money annually in lantana eradication from its forests, and has an aversion for lantana accordingly, and it suggests that timber might be preferable upon its forests in lieu of lantana. From India it has derived the Taungya system of silviculture, which consists of combining field crops and tree farming for so long as the field crops may survive the competition of their greater vegetable relatives. Under Taungya, in the Mary Valley Forests, bananas are now being grown experimentally as a seven-year crop, and under the bananas in the second or third year are being planted the beech and maple trees, which at the seventh year will succeed the declining banana investment, and whilst producing timber for the future at the same time will replenish the jungle soil for the future rotation of banana crops at the time when private holdings are exhausted of that pristine and virginal vigour which bananas as an economic crop demand for their development. In a corner of the forest nursery at the Exhibition were seen young pine treelings patiently anticipating in the shadows of the banana suckers their succession to the forest inheritance of which the foreign fruit has despoiled them temporarily for the space of seven years.

A Great Industry.

Upon the walls of the court beside the nursery were arranged photograph upon photograph of forests and forest operations, from that of the forest surveyor who finds and classifies and lays out in logging area and compartment the future State forests, to that of the forest roadmaker, who fells a 4-chain belt of jungle to make and open to the sunshine a logging road with sides clothed with Rhodes grass to provide forage for the logging teams that work upon it. The many and diverse methods of harvesting the timber crop with bullocks and horses, steam tractors, motor trucks, and caterpillars, the sawmills and timberyards, the types of bush and scrub and jungle, which go to make up the timber lands of Queensland, the nurseries and plantations, the natural regeneration operations, and all the other things which build up the composite activity which is known to us as the Queensland Forestry Department, were graphically illustrated.

Our Wealth in Wood.

Beyond these green beginnings of the forest and beyond these black and white representations of the things that are being done in forestry in Queensland, there arose in the centre of the Forestry Court four panelled corners of four quaintly furnished rooms illustrative of the results which may be achieved in native wood in ply cabinets, floorings, and furniture of local production and local manufacture. Here was a waxened hardwood floor, cedar-coloured and ring-sheened, fit for any drawing-room parade, a floor of red satinay, 60,000,000 superficial feet of which are standing in trees upon Fraser Island awaiting a market. Upon this floor, blood-red and brilliantly polished, a suite of furniture of the same handsome wood invited the admiration of the populace. Next door a polished floor of spotted gum, another of rose mahogany, deep red and carpet-like, and still another of rose walnut, unknown as yet to the cabinet and carpenter connoisseurs of Brisbane. And each was divided

PLATE 84.—TRAINING IN HANDICRAFTS—RURAL SCHOLARS' DISPLAY.

PLATE 85.—AN INSTRUCTIONAL EXHIBIT FOR PIG RAISERS.

from each by panelled walls, of figured ply of Medang walnut, silky oak, hoop pine, and maple, each wall of single ply, yet on either face a different timber, so that, with the grooved framing in which they fitted one might have a stout partitioning of silky oak and Medang walnut between rooms, though the partition be but a single sheet of wood. With such material may our future homes be artistically and suitably lined, at costs less than that of the rude, unpainted boards with which our present uncritical generation is so extraordinarily content. The Forest Service is featuring this presentation of home partitioning, of which several modern cottage builders in Brisbane already have taken advantage.

Our Cabinet Timber.

A grey satinash bureau from the Eungella Forest at Mackay, a Rose satinash smoker's cabinet and table, a red siris music cabinet, and a Medang walnut phonograph cabinet are some of the novel contents in timber of these home nooks built from the less known cabinet woods of Queensland.

In a handsome room at the rear of the court, under the coloured beams of an Aladdin lamp, stood a noble dining-room suite in rich red rose mahogany from the Killarney State Forest. This suite was set in a background of gorgeously figured medang walnut plywood panels, red-tinged to conform to the cardinal colour scheme of the room, and overhung by a radiantly-figured frieze of satin-like hoop pine ply. The room was a splendid example of the artistry which our magnificent native timbers inspires in the minds of capable craftsmen.

A 16-foot racing skiff rested high and dry in the final corner of this court of wood and trees, gleaming in its new polish, and proudly aware of itself as a pure blooded, 100 per cent. "dinkum" Queensland creation, made from a few of the trees which grow therein, trees of which in the Universal wood index of the department standing close by there were listed 400 or 500 different sorts in the State. These range from the snow-white hazelwood and aspen of Eungella to the coal-black ebony of the Gulf country, the ivorywood of Imbil, the cedar-like figwood, the cork-like kurrajong, the black ironbox of Mackay, to the red cocobolo of Cooktown, the wood which adorns the handles of the butchers' knives, and which yet may find recreational use upon the bowling greens as a substitute for imported lignum vitæ.

On a finger-thick slat of saffronheart from Atherton, placed in demonstration between two low pedestals, the 9-stone attendant might be persuaded to modestly try his weight in demonstration of the fact that with such a native production a hundredweight of jewfish may be played skilfully by the angler. Or a violin of Coondoo from Cooroy might yield musical tones equal to those of the chosen woods of Europe. Or in a glass cabinet might be descried inlay work in wood in the form of jewel cases, cricket stumps of silver ash, billiard cues of ivorywood and ebony. T squares of blush coondoo, and baseball clubs of waddywood might elsewhere be seen.

In Queensland there are obviously woods rich and beyond compare, and he who sought the forestry court at this year's Exhibition was deeply impressed by the plenitude of the display, and left convinced that efforts are afoot which will ensure to the Queensland of the future an abundance of the material which, in the end, must create for this State a woodworking industry equal in craftmanship and beauty of production to anything which the modern world may anywhere present.

FORTHCOMING SHOWS.

Sept. 2–3 —Esk Bushmen's Carnival.
4–5 —Wynnum.
12—Zillmere
16–17—Imbil.
19—Stephens.
23–24—Gympie.
24–25—Beenleigh.
26—Maroochydore.
Sept. 26—Rocklea
Oct. 1 —Kenilworth.
2–3 —Toombul.
9 —Southport.
10—Enoggera.
16—Nerang.
17—Balmoral.
Nov. 25–26—Pomona.

General Notes.

Queensland Co-operative Bacon Company.

Mr. J. A. Heading, D.C.M., M.M., of Murgon, has been elected chairman of the Queensland Co-operative Bacon Company, Limited, Murarrie. Mr. Heading has been chairman of the Murgon Show Society, and for four years chairman of the Murgon Shire Council. He served with distinction overseas with the A.I.F.

Main Roads Board.

Executive approval has been given to a number of permanent improvements to main roads. These are as follow:—Goomeri-Childers road (Degilbo Shire), estimated cost, £1,488; Goomeri-Gayndah road (Gayndah Shire), £5,060; Gayndah-Binjour-Mundubbera road (Gayndah Shire), £1,359; Murgon-Boat Mountain road (Murgon Shire), £832; Maryborough-Pialba road (Burrum Shire), £3,493; Bundaberg-Gin Gin road (Gooburrum Shire), £5,037; Palmwoods-Montville road (Maroochy Shire), £568; Cairns-Tableland road (Eacham Shire), £9,473; Kingaroy-South Burrandowan road (Kingaroy Shire), £2,757. The latter is a developmental road.

Water for Pigs.

A very important factor in the well-being of pigs is the presence of a supply of good fresh water. And even though the rations of food served out to them may consist to a great extent of sloppy food, a drink of fresh water is relished occasionally and in some circumstances frequently. Pure water does not contribute, as believed by some, too largely to the accumulation of lean where the fattening pig is concerned; as a matter of fact, that pig which when fattening will rise from its bed between meals and partake of a copious draught of water, afterwards returning to its bed to resume its slumbers, is putting the good stuff inside it to the best possible use. Pure water is far the best lubricant for the internal organs when all that is needed is a thirst-quencher. Swill, ad lib., is often the order of the day and night for all that; but there are times when the stomach of the pig wants a cooling wash-out preparatory to a sound substantial meal.

It is always found that there is more contentment and progression doing amongst pigs when a good square meal is supplemented only by pure water in a clean trough that has not been permitted to foster an accumulation of green slime inside, as a result of the retention of stagnant water. Empty the troughs every day, and give the inside of the troughs a good rub round. If the circumstances warrant a meal of swill, let it be a meal, not the continuous supplement to a meal. The absence of food periodically tends to the stimulating of a healthy appetite, but food ever present spoils a healthy appetite, and not infrequently initiates the formation of an abnormal one.

The Udder.

Always prefer the cow that has a large udder carried well forward without hanging in four prominent pouches, and that is covered with fine silky skin and characterised by four sufficiently large and long teats properly placed to balance the udder nicely. Extra large teats and those that are close together are objectionable, while the presence of several additional or supernumerary teats also is objectionable. The udder should be of normal colour, and one quarter should correspond with its mate in shape, size, and colour. Beware of the udder that is dark red or has a purplish hue in part or whole, or that shows one quarter or more greatly enlarged. Be also much afraid of the udder that is "hard as stone and cold." That is a combination that generally spells tuberculosis, and so does the presence of a hard, large mass high up at the back of the udder.

But do not be satisfied with a visual examination of the udder. Sit down and handle every part of it carefully, for hardened masses mean that garget has been present, that milking abilities have been injured, that other attacks may be expected, or that a quarter has been lost through disease. Strip away some milk from each teat in turn. Look at the milk, smell it, taste it, and so make sure that it is normally rich in butter-fat, correct in consistency, and free from all evidence of disease. It would also be well to see the cow milked clean, if possible, and the milk weighed, and to have a butter-fat test made.—"N.U. Farmer and Stockman."

Chamber of Agricultural Societies.

The annual meeting of the Chamber of Agricultural Societies was held at Brisbane in show week, Mr. John Macdonald presiding. The annual report showed a credit balance of £322, in addition to a war loan bond for the sum of £100. The membership of the Chamber now totalled ninety-seven. Mr. J. K. Murray, Principal of the Queensland Agricultural College and High School at Gatton, delivered an address on the work of the College, and urged all delegates to take a keener interest in the work of that institution. The following were elected:—President, Mr. John Macdonald; vice-presidents, Messrs. Ernest Baynes and G. H. Pritchard; hon. treasurer, W. J. Affleck; hon. solicitor, G. Waugh; hon. auditor, Donald Gunn; executive committee, Messrs. R. P. Watson, E. J. Westaway, and E. C. McConnel; hon. secretary, J. Bain. An honorarium of £75 was granted to the secretary and his staff.

The Fruit Industry.

Mr. E. Duffy, with headquarters at Nambour, is now engaged in instructional work in connection with banana cultivation and the combat and control of pests affecting that fruit. The practicability of controlling the weevil borer is being tested on Mr. A. Martin's plantation at Perwillowen, where trials with the fumigants paradichlor., calcium cyanide, and chlorocide, and also with plain traps and traps poisoned with Paris green and arsenate of lead are being made. The method adopted is to select various rows, for some of which new plants have been taken, and in others the suckers have been allowed to succeed the parent tree. Where new plants have been used holes are dug around, and the fumigants placed therein, with a separate row for each chemical. The object is to observe if the gases generated in the ground from these fumigants will kill the larvæ of the weevil. Traps are not used around these plants, but, as a check on results, adjacent rows are surrounded with both poisoned and non-poisoned traps. If the plants treated with the fumigants on reaching bearing stage are free from the presence of the weevil or borer, valuable aid will be obtained to freeing banana growers from a harassing pest. It will be some months before investigations on that point can be concluded. During the winter months the weevils are more or less in a dormant state, so at present it is impossible to state whether the poisoned traps have been successful. It was noticed, however, that after Mr. Duffy had collected borers from each of the rows that more dead were counted from the poisoned traps than those laid near the plants without poison.

Mr. Duffy has asked that an appeal be made to farmers to take strong action and to systematically lay traps during the spring months, when the beetle is more active. When chipping is in progress the soil is disturbed around the banana plants, and with enticing traps there is the surety of large catches of the weevils.

Leaf fungus has been attacking banana plants this season. This does not affect the matured fruit, but where the leaves of young trees have become attacked the trunk decays before the fruit reaches maturity, or else the leaves become shrunken, and owing to the lack of sustenance from the air or earth, and no proper protection for the bunch, only small portions of the fruit are marketable.

Citrus trees show evidence of less resistance to disease, and generally failure to produce a high quality of clean fruit. With the view of demonstrating what could be done by scientific treatment, arrangements have been made with Mr. J. Tennant, of Mapleton, and Mr. C. E. Cooper, of Palmwoods, for experimental plots to be conducted in their respective orchards. The former will be in volcanic soil, and the latter in alluvial land. Fertilisers will be applied according to the nature and requirements of the soils. Mr. R. L. Prest, who is supervising citrus culture generally, will superintend the tests in each place. The trees have been given a severe heading back, and the ground treated with lime. It is also intended to loosen the earth around each tree by the use of explosives, and then to apply various fertilisers.

Pineapples, which enter largely into the fruit production of the North Coast, have been subject for some years to a wilting of foliage, and a generally unsatisfactory condition in many places favourable for their cultivation. Nematodes were suspected of being associated with the trouble. Recent investigations by the senior field officer point unmistakably to the fact that nematodes are mainly responsible. Being a most serious pest, with the reputation of immunity from economic treatment, a further field for experiment is opened.

In order that more attention may be given to the general maintaining of orchards in a clean condition, and the elimination of such as are neglected or deserted—which only serve as a breeding ground for pests—Inspector S. G. Williams will be stationed at Nambour, and work from Elimbah to Cooran, and Mr. S. J. Stephens will take up duty from Cooran to Isis Junction, with headquarters at Gympie.

Cotton Growing in Papua.

Messrs. G. Evans, M.A., C.I.E. (Director of Cotton Culture), and E. Ballard, B.A., F.E.S. (Commonwealth Cotton Entomologist), have left Brisbane for Papua and the Mandated Territory of New Guinea to investigate the possibilities of cotton growing in those countries on behalf of the Commonwealth. They expect to return early in October.

Queensland Students Abroad.

Interesting letters containing graphic pen pictures of their travels and pithy notes on their work have been received by their former laboratory colleagues of the Agricultural Chemistry Branch from Messrs. H. W. Kerr and A. F. Bell, the holders of the travelling scholarships awarded by the Government in connection with the work of the Bureau of Sugar Experiment Stations. Mr. Kerr is now at Wisconsin University, and Mr. Bell has entered on a course at Berkley University, California. Mr. Kerr spent some time in Java and then went on to the Philippines, travelling by way of Singapore and Hong Kong. Thence he went to the Hawaiian Islands, calling at Shanghai and some of the seaports of Japan, including Yohohama and Kobe. His descriptions of the customs of the several countries through which he travelled and observations generally make up a vivid and entertaining narrative. In California Mr. Kerr met Mr. Bell and together they went down through Louisiana and Florida and on to Cuba in fulfilment of the objects of each scholarship. The bright and fresh impressions of these two keen Queensland students make up a very readable record.

Co-operative Egg Selling.

In the course of an article on the above subject, the Melbourne "Leader" points out that Australia is now producing £9,000,000 worth of poultry products annually, and although the exports of eggs from Australia to the London markets have increased from 8,000 dozen eight years ago to 1,500,000 dozen last year, there is still a demand for more, and there is still a surplus here to dispose of.

To get rid of our surplus to the best possible advantage, we must employ the most efficient of salesmen, and organise in such a manner that the goods we offer can compare favourably with the many rivals that are out to capture the overseas market.

The average weight of eggs sent from Denmark to London is 27 oz. to the dozen, at once an indication of the righ standard set up as regards quality. Australia has fallen well below that standard, and a warning note was struck some years ago by experienced poultry farmers when it was seen that the size of the eggs produced was becoming less because of forcing to bring about quantity, and the neglect of breeding only from stock that laid eggs of 2 oz. and over.

Another lesson can be learned from Denmark and Canada. Both countries have shown us the importance of co-operation and loyalty. In New Zealand they have found the man to handle the surplus egg in Mr. J. B. Merrett. What New Zealand has done surely Australia can accomplish. Undoubtedly one of the secrets of the success of the Danes in the egg export business has been that they employ the best men at a good salary, making it worth while for them to put their best into the work. To pay inadequate salaries has long been recognised as an economic blunder.

It is no use sitting back and expecting the Government to assume responsibilities. Producers must co-operate and help themselves to gain results. Buyers must be found when the output increases. It is only when eggs are scarce that buyers will seek for them. If it is impossible to sell all the surplus, then efficient preservation must be organised to avoid loss and waste.

Combined action on the part of the producer is, of course, the biggest factor in achieving a successful export trade, or one that will dispose of the produce in the most profitable market. In Australia, in spite of egg pools and other schemes, it would seem that no system has yet been quite successful. This is because there is a lack of loyalty amongst producers themselves. Unless all co-operate and combine the individual must lose. In Denmark, producers bind themselves to sell all their supplies to the local depôts of the society controlling the trade. If they are discovered selling elsewhere they are expelled, and lose the bulk of their trade. In Western Canada, the controlling society imposes a fine of 7 cents (3½d.) per dozen for all eggs, except those used in the household, which are sold except through the legitimate channels. If Australian producers could combine, co-operate, and enforce loyalty, surplus eggs could be disposed of with as much benefit to poultry farmers as is the case in New Zealand and other producing countries.

Dairying in the Mackay District.

At a recent representative meeting of farmers, held at Mackay, it was decided to form a co-operative dairying association for the district, under the title of the South Kennedy Dairying and Pig Raising Association, and to be run on purely co-operative lines. It was stated that the movement is not in any way antagonistic to the sugar industry, but it is thought that the two can be linked together with benefit alike to the farmers and to the district generally. The Minister for Agriculture (Hon. W. Forgan Smith) is being asked to send the principal dairy instructor to address the farmers on the subject. Steps are being taken to ascertain the number and quality of the dairy stock in the surrounding districts, and it is considered that the Eungella Tableland will constitute an ideal basis for the supply of dairy stock. It is thought also that the feeding of stock will form a profitable revenue for the disposal of molasses. It was agreed to approach the Government to ascertain what concessions would be granted in reduction of freight on stock brought into the district to start the industry. Money was freely offered at the meeting to defray initial expenses, and it was decided that these sums should be credited to the subscribers as a portion of subscription for shares when the time shall arrive.

Disease in Manning River Bananas.

Dr. R. J. Noble, principal assistant biologist for the New South Wales Department of Agriculture, has investigated a disease which has almost wiped out plantain bananas on the Manning River. During the past couple of years whole clumps have been attacked and destroyed, leaving a most offensive smell after the plants rotted down. In a report to the Dumaresq Island branch of the Agricultural Bureau, Dr. Noble says that two species of fusarium fungus and one of bacterium were found. As the disease progresses other organisms appear, and are responsible for the final decay and associated odours. The organism suspected as the cause of the trouble is not comparable to any of the types known to be parasites on bananas in other parts of the world. Present evidence indicates that one species of fusarium fungus is most probably the primary cause of the disease. It is able to enter the plant at any point, although most commonly through the root system. Control measures are not readily applied, since this organism is also able to live on plant refuse in or on soil.

To minimise losses Dr. Noble recommends the destruction of all diseased plants as soon as possible after cutting them out, the disinfection of the axes used before using them on healthy plants, and the selection of resistant stock in affected areas for use in propagation.

Dr. Noble adds that this type of disease may necessitate the abandonment of the diseased areas for long periods up to ten years, but he does not anticipate it will be so bad as that on the Manning. He asks local growers to furnish him with the result of observations on the condition of the disease during the approaching summer.

Staff Changes and Appointments.

Mr. G. D. Daly has been appointed Assistant Bacteriologist, Stock Diseases Experiment Station, Yeerongpilly, as from the 1st July, 1925.

Mr. A. P. Gibson has been appointed Field Assistant, on probation, Bureau of Sugar Experiment Stations, with headquarters at Cairns.

Mr. C. F. McGrath, Dairy Instructor, has been appointed Acting Supervisor of Dairying, Department of Agriculture and Stock, as from 1st September, 1925, to 31st March, 1926.

Mr. T. R. E. Mitchell has been appointed Manager of the State Nursery at Bribie Island.

Acting Sergeant Hugh Tighe and Constables H. W. Horn and C. Harman, of Rosewood, Marlborough, and Calliope respectively, have been appointed Inspectors of Slaughter-houses.

Mr. T. Unwin, Inspector, Diseases in Plants, at Cairns, has been also appointed Inspector of Stock.

Mr. G. W. Jackson has been appointed Inspector, Diseases in Plants Acts, Brisbane.

District Inspectors of Stock have been transferred as follows:—

J. L. Bowman—from Townsville to Roma.

W. R. Holmes—from Hughenden to Townsville.

E. S. Cardell—from Charleville to Hughenden.

E. C. Lake—from Winton to Charleville.

A Northern Sanctuary.

The property known as "Kalamia Plain," at Ayr, has been declared a sanctuary for animals and birds.

Wheat Pool Act.

Regulation 5 under the Wheat Pool Act has been altered to provide for nominations being called for election as Representatives of Wheatgrowers on the Wheat Board for the season 1925-1926.

Wireless Set—Twelve Months' Guarantee.

In the Queensland Pastoral Supplies' advertisement in the last issue it was mentioned, through a clerical error, that their wireless sets carried a guarantee of one month. This should have read "twelve months' guarantee."

Check Weighmen as Inspectors.

A new regulation under "*The Regulation of Sugar Cane Prices Acts*, 1915 *to* 1922," has been approved, giving check weighmen the power of inspection of all weighbridge records of sugar-mills under the jurisdiction of the Regulation of Sugar Cane Prices Acts.

L.P.A.'s in Fruit Districts.

His Excellency the Governor, with the advice of the Executive Council, has approved of certain additional Local Producers' Associations being represented on the Banana, Citrus, and other Fruits Sectional Group Committees, formed under "*The Fruit Marketing Organisation Act of* 1923."

General Levy Limit.

Approval has been granted by the Governor in Council for the Council of Agriculture to make a regulation under "*The Primary Producers' Organisation Acts*, 1922 to 1923," providing that no general levy in respect of the year beginning 1st July, and ending on the 30th June, 1926, shall be based on an estimate to yield a sum exceeding £20,000.

Peanut Board.

The following have been appointed as elected representatives of growers on the Peanut Board:—

Charles Frederick Adermann, Wooroolin;

William Muir, Crawford;

Alfred Skinner Clark, Sandhills; and

Richard Major Wise, Buderim; together with

William O'Mara, Boonara, Goomeri,

who will represent the Council of Agriculture. These members will hold office as from the 1st September, 1925, until the 31st August, 1926.

Cheese Board Election.

Result of the ballot for Producers' Representatives on the Cheese Board:—

Anderson, Henry Thomas (Biddeston)	541
Burton, George (Cambooya)	367
Dare, Thomas (Narko, Cooyar Line)	249
Hansen, Mads Peter (Maclagan)	389
Keefer, Henry (Pittsworth)	537
O'Shea, David Gabriel (Southbrook)	445
Smith, William (Yangan)	248
Tilley, Albert George (Rose Hill, S.W. Railway)	391

As five members only were required, Messrs. Anderson, Keefer, O'Shea, Tilley, and Hansen have therefore been duly elected to the Board. In effect, the old Board has been re-elected. The Board will hold office until 30th June, 1927.

In the Milking Yard.

The milking yard, as well as the approaches and exits, should, if possible, be heavily stoned, in order that a foundation may be obtained which will not break up in wet weather and become a bog, or in dry weather create clouds of dust that are both a nuisance and a menace. Large stones should be laid down first, and on top of these finer metals or coarse river-bed gravel and pebbles. The bigger stones are necessary for a foundation, because after heavy rains small material is trampled into the soil and sinks out of sight, permitting the surface to become a quagmire. Where cattle pass through gateways there is always a crush and a rush, and it is therefore important that such approaches and exits should be dealt with just as carefully as the yards themselves.

The surfaces of all yards and approaches require to be graded to facilitate draining, and should be kept even, in order to prevent the formation of holes that will contain water. On flat country it may be necessary to provide underground drains—that is, trenches dug to a depth of 2 feet and, say, 1 foot wide, and graded to permit the soakage to get away. Filled with stones and rubble, they serve this purpose admirably.

Yards and approaches require constant care, as they are continually being worn by the cattle passing over them. If allowed to fall into disrepair, they soon become in a very bad condition, necessitating a large expenditure of time and labour to bring them back to a satisfactory state again.

The Royal Society of Queensland.

The ordinary monthly meeting of the Society was held in the Geology Lecture Theatre of the University.

Professor H. C. Richards, D.Sc., and Mr. W. H. Bryan, M.Sc., exhibited:

A. Specimens of Brisbane tuff (commercially known as "porphyry"), collected by the exhibitors from Castra, about 12 miles east-south-east of Brisbane. The interest of the exhibits was threefold: 1. They were from a new locality, being considerably east of any previously known outcrops, and measuring 30 feet in thickness. 2. The basal portions contained large angular and sub-angular blocks of rhyolite. 3. Some portions of the tuff contain numerous flattened spherical bodies of varying size but averaging about ½ inch in greatest diameter, and showing when broken a regularly concentric structure.

B. Specimens of the corals *Koninckophyllum inopinatum* Eth. fil, *Lithostrotion* (?) columnare Eth. fil, and *Syringopora syrinx* Eth. fil from the Carboniferous limestone of Lion Creek, Stanwell.

C. Specimens of *Favosites* sp. and *Heliolites* sp. from the limestone quarry at Marmor. *Favosites* sp. had been previously collected by Mr. H. A. Longman from this locality, but is here recorded for the first time, while this constitutes the first record of *Heliolites*. The presence of these two genera fixes the age of the Marmor limestone as at least as old as Devonian, and removes the possibility supported by some geologists of its being Carboniferous.

Mr. H. A. Longman, F.L.S., exhibited (1) fragments (mainly alveolar) of fossil molars forwarded by Mr. R. S. Philp, through Professor Richards, which had been found in a well at Castle Creek, Q., at a depth of 40 feet. These Pleistocene fossils probably represented a new species of *Palorchestes*. (2) A "Liangle" or aboriginal wooden battle-axe with a mucronate tip to the broad end, and carved with figures of snakes, birds, a lizard, and a frog. This elaborate specimen was obtained by Mr. H. A. Craig at Thargomindah, and presented to the Queensland Museum by Sir Matthew Nathan.

Mr. C. T. White, F.L.S., exhibited: (A) Specimens of *Agonis abnormis* (F.v.M.), White and Francis, from trees growing in fair abundance along a small creek at Castra, about 12 miles from Brisbane. The species had not been collected previously in the neighbourhood of Brisbane. (B) Specimens of *Verbesina encelioides*, B. & Hook, f., a sunflower-like plant, a native of North America, which during the past few years has proved to be a troublesome pest in several parts of Southern Queensland.

Mr. W. H. Bryan, M.C., M.Sc., read a paper by himself and Mr. C. H. Massey, entitled "The Geological Range of the Tiaro Series." As a result of their recent field work in the type district, the authors pointed out that the Tiaro series, as at present defined, is there naturally divisible into four series, which they suggested should be called the Graham's Creek Series, the Tiaro Series (in a restricted sense, but including the coal measures), the Myrtle Creek Series, and the Brooweena Series. Professor Richards, Dr. E. O. Marks, and the President took part in the discussion on the paper.

Australian Dairy Council in Brisbane.

A meeting of the Australian Dairy Council was held last month in Brisbane, at which all the States were represented, as well as both the Federal and State Governments. Two members of the State Advisory Board also were present. The chair was taken by Mr. R. Rankin, of Victoria.

Reports were read from British and Continental sources appreciative of the standardisation of Australian butter under the "Kangaroo" brand. The Council determined to maintain the "Kangaroo" standard, and considered the question of a universal system of pasteurisation for cheese making. This subject is to be taken up at the next meeting of the Council. Satisfaction was expressed at the improvement in co-ordination between Commonwealth and State grading and general administration, and the hope was expressed that much more might be yet achieved in the same direction.

The project of establishing an Australian Dairy College, where practical and theoretical studies could be pursued, and where research work could be done, on the lines adopted in Denmark and other dairying countries, was brought forward. Mr. P. J. Carroll, Commonwealth Supervisor of Dairy Exports, is to be asked at an early date to convene a conference of Federal and State experts to draft suggestions on the subject.

A sub-committee was appointed to confer with the Dairy Produce Control Board to consider proposals for co-ordinating the functions of the two bodies.

The work accomplished by the Council is to be tabulated and distributed to producers, together with the outline of a more extended policy which it is proposed to undertake.

Concerning the proposed prohibition of boric acid in butter imported into England, it was held that such action at the present stage of development would be most detrimental to the sale of Australian produce in London, owing to the long period of transport. In the absence of proof that the use of boric acid in the quantities now employed is in any way injurious to health of consumers, it was decided to ask the Commonwealth Government to discuss the matter with the Imperial Government.

The Council unanimously supported a suggestion to secure interstate competition in all competitive exhibitions held annually in the large producing States.

Health authorities of the various States are to be urged to call a conference on food standards at an early date to discuss the suggested reduction of the fat standard for local and interstate butters, so that unanimity may be reached.

It was mentioned that the term for which members of the Dairy Council were elected will expire next month, and an election will be held in each State, in the same manner as previously.

Caring for the Milkers.

Among the important points in the care of a dairy herd is the necessity for keeping the milkers away from weeds. Ordinary food-flavours from such fodders as lucerne, clover, silage, &c., can be removed by aeration and cooling of milk and cream on the farm and pasteurisation at the factory; but strong food-flavours or taints, such as from carrot weed, cannot be got rid of.

As to water, clean, fresh, running water is best, and next to it comes good spring or well water pumped into troughs. Water contained in dams, marshes, or stagnant pools is bad, and is swarming with harmful germ life. Milking cows should be prevented from wading into such places, otherwise they bring the contamination into the milking-yard by the mud which clings to their skins. Those in this state should be brushed and wiped, and have their udders washed before milking. The same applies when they have to wade up to their bellies through muddy yards. If this is not done, the dust from the dried mud falls into the milk bucket, and the dirt on the udder and teats oozes through the milker's fingers and mixes with the milk, which then produces fermented and badly-flavoured cream.

Milk should be well strained. A filter cloth fitted on top of the gauze of the strainer would greatly help in improving the milk. These cloths should be destroyed or thoroughly boiled for twenty minutes before being used again.

Give the cows high, dry ground to camp on. The infections caught in low-lying, swampy ground and stagnant water cause most unclean flavours and smells in cream and butter, and they are also often responsible for fermented cream and sour milk. In wet weather scrape the cows before milking with an iron hoop to prevent drips from falling into the bucket. Milk from sick or diseased cows should not be used for human consumption, or for making butter or cheese. The milk from injured teats should be thrown away. There are periods, too, in the life of the cow when the quality of the milk is affected; so seriously at times as to make it unfit for use.

Be very careful about mammitis. Milk from quarters so affected is not good. Throw it away; or, better, destroy it altogether.

Insect Control by Aeroplane.

The commercial peach crop is the latest to receive treatment by the aeroplane dusting method for controlling insect pests. According to a report received by the Bureau of Entomology of the United States Department of Agriculture from its field station at Fort Valley, Georgia, this process was tried for the first time in March of this year. Aeroplane dusting for cotton fields has been a demonstrated success, and the outcome of this type of control for insects affecting peach trees will be awaited with interest.

It took an hour and fifty-five minutes to dust 10,000 peach trees with a mixture of arsenate of lead and hydrated lime. The time recorded included all trips to the landing field to refill the hopper. A thousand acres of peach trees in Georgia are to be treated by aeroplane during the season. It is expected that this work will yield valuable data on the results, cost of operation, and other points.—"The American Fertiliser."

State Stallions.

Replying to a question in Parliament by Mr. W. Deacon (Cunningham), the Minister for Agriculture and Stock (Hon. W. Forgan Smith) said:—The number of Clydesdale stallions used for the service of mares for the season 1924-1925 was increased from five to eight by the inclusion of two belonging to the department, which were seconded from the State Farms at Gindie and Hermitage respectively. In all, 355 mares were served; the fees earned amounted to £955 10s. The total cost of the stallions during the 1925 season was £1,213, giving an average cost of £151 14s. 2d. for each stallion. The total expenditure to 30th June, 1925, on all stallions was £6,875; total earnings, £1,652. In reply to another question, the Minister stated that the number of the State stallions now alive was five, of which one, however, was no longer fit for service.

A statement concerning the mares served in 1923 showed that the total number served by six stallions was 334; but the owners of thirty-six of these had failed to reply to the department's circular of inquiry since sent out; the number of mares known to be in foal was 152. Mean percentage of foals, 51 per cent. Generally, weather conditions were very dry during this particular season.

Lucerne—Cultivation and Early Mowing.

Lucerne sown in autumn should receive no cultivation until the following spring at earliest. The young plants are tender, and will not stand rough handling. On friable, loose soil especially the effect of cultivation would be to pull many of the plants out, and consequently the harrowing must be light, and should not be attempted until the roots have a firm hold; but after the second cut, particularly on ground that sets hard, the harrow can be used.

The method of keeping early spring weeds in check is to mow frequently. The mower should be put over the crop before any of the weeds have commenced to flower, and the operation should be repeated a month or two afterwards. Two mowings will generally be sufficient. This must not be omitted if weeds are getting a foothold, even if the lucerne is not ready to cut, as the object is to destroy the weeds. If the quantity should warrant it the cut material can be raked for green feed, but if left on the ground it makes a useful mulch.

Once lucerne becomes well established its vigorous growth keeps most weeds in check, but a certain amount of cultivation is necessary. A rigid-tine cultivator is the most suitable implement. The lucerne field should be given a thorough stirring with this early in the summer, and, if necessary, again later in the season. The disc cultivator may be used instead of the rigid-tine cultivator. The discs should be set rather straight. The loosening of the surface allows moisture to percolate to a greater depth, and prevents it from flowing away over the surface. Owing to the depth to which even light showers then penetrate, less loss occurs through evaporation. The splitting of the crowns by the discs encourages tillering, and the crop thickens.

If a rigid-tine cultivator is not available, a spring-tooth cultivator can be used very effectively, and one fitted with special narrow tines is satisfactory on moist ground. The spading harrow is also a useful implement for the cultivation of lucerne fields.

The value of top-dressing established plots of lucerne with superphosphate has frequently been referred to in these notes. The outstanding advantages of such a top-dressing may be summarised as follows:—(1) The green fodder yield is greatly increased; (2) a better-quality product results; (3) the general condition of the stand is built up consequent upon the vigorous growth developed; and (4) the useful life of the stand may be extended, and depleted stands largely restored.

Self-Help in Farming—Join an L.P.A.

"There is not a pot of gold at the end of the legislative rainbow.. There is no magic power in legislation as a panacea for agricultural difficulties—we can have a prosperous agriculture only if the basis upon which it is built is sound. Like the manufacturer, the farmer must study his market and adjust his production to the demands of the consumer. He must adopt the most efficient methods of farming, which yield him maximum net returns for his capital and lay-out. He must improve and standardise the quality of his product in order to command the best market prices. And he must market his products in the most efficient way. The efficient farmer will succeed; the inefficient farmer will ultimately fail."

With this summary of the situation, William M. Jardine, the recently appointed United States Secretary of Agriculture, outlines a plan of action that will be based principally on helping the farmer to help himself.

One of the best means of self-help—or, rather, mutual help—available to farmers in Queensland is membership of a Local Producers' Association.

Grasshopper Control—A Seasonable Reminder.

It is again seasonable to remind farmers as to the protective measures necessary if they would safeguard their crops from grasshopper invasion.

Normally, the first grasshopper swarms hatch in September from eggs laid the previous March and April. They grow gradually, and become winged in November and December. These winged swarms lay eggs in the ground. The eggs hatch in three weeks, and the second hopper swarms appear during December, January, and February, and become winged flying swarms during March and April. These second-winged swarms lay eggs which remain in the ground unhatched until spring (September).

Egg-laying is effected by the swarms in comparatively limited patches of ground, varying from a few square yards up to thousands of square yards, according to the size of the swarm. The swarms, when laying, usually mass together for a day or two on some bare or thinly-grassed lands, and deposit their eggs 1 to 2 inches below the surface. By noting the position of the egg-bed areas it is possible to spray the tiny young hoppers immediately they emerge and before they grow and spread. By organising and spraying these patches of young hoppers within the first three weeks after emerging from the ground, the majority of hoppers can be killed before they do any appreciable damage, and the pest can thus be controlled.

Spraying with arsenite of soda is recommended, and is perfectly harmless to stock under practical field conditions. The formula recommended is:—Arsenite of soda, 1 lb.; treacle, 4 lb.; water, 16 gallons. An important point in mixing is to dissolve the arsenite of soda in a kerosene tin or more of hot water, and to dissolve the treacle in a separate quantity of hot water, allowing both mixtures to cool before bringing them together, when the whole can be made up to the 16 gallons.

The spray should be applied to a strip of grass about 30 feet wide around each swarm, as well as directly on to the hoppers themselves. The spray kills both by direct contact with the bodies of the grasshoppers and by poisoning the grass on which they first feed.

The spray mixture can be carried to the swarms in petrol tins, two in a case, with a hole in the top of each tin sufficiently big to admit the foot of the pump; a large number of tins can thus be carried on a spring-cart, from which the infected ground can be sprayed. Spraying may be light, but it should be done thoroughly, and the spray applied in a fine mist. For this purpose a small bucket pump will be found satisfactory. Twenty-eight pounds of arsenite of soda and 1 cwt. of treacle will make a sufficient quantity of spray to treat 6 acres actually massed with hoppers.

In cultivation paddocks a poison bait made up of 1 lb. arsenite of soda or paris green, 1 lb. molasses or treacle, and 24 lb. bran may be used. Stock must not be permitted where these baits are employed.

United action is essential for success in grasshopper control. The coping with an invasion is a community problem, and should be taken up as such. The best results can be obtained only when every landowner is on the lookout for trouble and is prepared to combat it. Eleventh-hour measures are not so easily carried out, nor are they so effective as those taken in ample time. The best time to destroy the grasshoppers is before they reach maturity, and particularly during the first two or three weeks after hatching. For this reason landowners should watch their fields for the appearance of the insects, and spray the hoppers while they are in the massed state.—"Agricultural and Pastoral Notes," N.S.W. Department of Agriculture.

Queensland Wheat.

The Registrar-General (Mr. G. Porter) supplies the following return showing the result of the wheat crop of Queensland for the season 1924:—

Division.	Grain.		Hay.	
	Ac.	Bush.	Ac.	Tons.
Moreton	273	4,008	3,342	3,996
Wide Bay	748	8,520	422	434
Port Curtis	66	418	238	299
Edgecombe	—	—	2	2
Rockingham ..	10	260	63	49
South-Western ..	—	—	21	14
Central	11	110	56	40
Maranoa	15,060	164,293	1,214	1,309
Downs	172,977	2,602,220	4,099	3,708
Total, 1924 ..	189,145	2,779,829	9,457	9,851
Total, 1923 ..	51,149	243,713	8,714	5,095

Early Ploughing Pays—Southern Experiments with Maize.

Experiments with maize at Grafton Experiment Farm last season again demonstrated the advisability of early ploughing for maize.

Four plots were planted with Leaming maize as follows:—(1) (Check) ploughed in April. (2) Ploughed in June. (3) Ploughed in August. (4) (Check) ploughed in April. On plots (1) and (4), the maize stubble, after being chopped, was ploughed under on 12th April, and this was followed by disc harrowing on 24th April, 30th June, and 17th July. On plot (2) the maize stubble, after being chopped, was ploughed under on 18th June, and the disc harrow followed on 30th June and 17th July. On plot (3) the maize stubble, after being chopped, was ploughed under on 15th August and the disc harrow followed on 5th September. On 6th September the whole experiment area received a harrowing, followed on 11th September by spring-toothing and harrowing. Planting was carried out on 12th September, an excellent germination being obtained throughout. Cultivations in the growing crop consisted of harrowing on 3rd October, cultivation on 29th October, hilling on 11th November, and cultivation on 26th November. All plots received similar treatment from time of planting.

From germination onwards, the August-ploughed plot could easily be distinguished by its yellowish appearance and much less vigorous growth, when compared with the earlier-ploughed plots. Shortly after tasselling the maize in this plot burnt off quickly, and the majority of the cobs harvested were small and light. Practically no difference in growth was noticeable between the April and June plots.

The acre yield based on percentage from the August-ploughed plot was 27 bushels 37 lb.; from the June-ploughed plot it was 45 bushels 23 lb., while the average of the April-ploughed plots was 48 bushels 21 lb. June ploughing, therefore, gave an increase of 17 bushels 42 lb. over August ploughing, and April ploughing an increase of 20 bushels 40 lb. The values of these increases were £2 13s. 3d. and £3 2s. 2d. respectively. The cost of the increase was 2s. 3d. and 4s. 6d., leaving a gain of £2 11s. in the case of June ploughing and of £2 17s. 8d. in the case of April ploughing.

In making this calculation maize was valued at 3s. per bushel, and disc harrowing at 2s. 3d. per acre, the April-ploughed section receiving two additional disc harrowings, and the June-ploughed section one additional.

This season's results are very similar to those obtained last year, and only go to show that early preparation of the land will result in increased yields. When early ploughing is practised the land lies fallow for a few months, and during this period it is possible to conserve a large supply of moisture.

The physical condition of the soil is vastly improved by weathering and by decomposition of stubble, weeds, &c., during such a period of fallow, and a good deal of insoluble plant-food is changed into a more soluble form in which the following maize crop can readily make use of it.

In a season such as that just past, moisture conservation was only of secondary consideration, for good rains fell throughout the growing period. While no doubt this was one of the factors that accounted for the large increase in the winter-ploughed plots, it would appear that the early aeration, sweetening, and weathering down of the soil play a very big part in insuring larger returns.

Citrus Fruits from the Bloomfield River.

Mr. E. G. Olafson, of Ayton, Bloomfield River, N.Q., who is engaged in general farming, has sent us some excellent samples of citrus—mandarins and oranges—from his orchard. They were the produce of seedlings which, in Mr. Olafson's experience, give quicker and better returns in the North. As elsewhere in the State the marketing problem is a real one to Northern fruitgrowers. Fruit is an essential tropical diet, and its regular and sufficient supply at reasonable prices is a matter that should be taken in hand immediately, if we are to improve the conditions of living north of Capricorn.

Dairy Washes—Three Useful Formulæ.

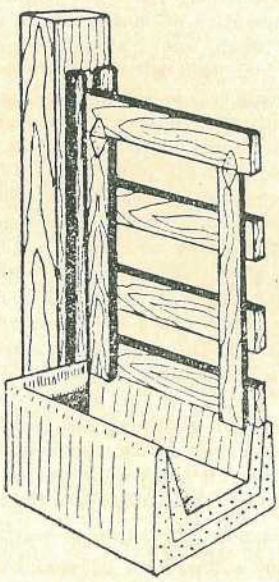
The following wash is used by many dairy farmers, and has been proved satisfactory at Hawkesbury Agricultural College:—Mix air-slaked lime with freshly skimmed milk to a suitable consistency so that it can be applied smoothly with the brush. To each gallon of this cream-like mixture add 1 oz. of ordinary table salt. It is advisable to make just sufficient wash for the day and to use it fresh. This wash dries readily on wooden or iron surfaces. It adheres firmly, does not flake off, and the materials are always at hand on dairy farms.

The following is also said to be a good wash for the walls of dairies:—Slake ½ bushel of quicklime in boiling water, strain through a sieve, and add 2 lb. sulphate of zinc and 1 lb. common salt, dissolved in warm water.

A very satisfactory and easily prepared wash may be made by slaking some lime and adding 1 pint boiled oil (linseed) to every gallon of the wash. Dilute with water to the required consistency.

PIGGERY SWING DOOR.

The principle of the swinging door before the pigtrough so that the pigs can be kept back from the trough while it is being filled is familiar to every pig breeder; but the open construction of door is uncommon. It is suspended from the top bar by strap hinges. The bottom of the door strikes against the outside edge of the trough, which acts as a stop. The trough is of reinforced concrete, about 5 feet in length, and with inside measurements of 7 inches in depth, 10 inches wide at the



top and 8 inches at the bottom. This is reinforced with chicken wire. If desired, the top may be protected by strips of strap iron held down with small bolts set in while the mixture is still soft. The trough was made in a mould of the outside dimensions, and with a smaller trough of the inside dimensions placed upside down in the centre of the mould. A concrete trough is durable, does not get nosed about, and is easily cleaned.—"Australasian."

Answers to Correspondents.

Horse Bleeds from Nose.

Case:—A saddle hack of about ten years old used constantly for mustering cows, stock, &c., with the result that when he has any heavy work he is subject to a snotty nose and continual bleeding from his nostrils. Is this a trouble that can be remedied, and how?

Reply:—Veterinary Surgeon McGown replied:—This complaint is not uncommon in horses, and may be due to several causes, such as rupture of some small blood vessels in the head, polypus, inflammation or ulceration of the nasal mucous membranes. If the trouble is due to the former, complete rest is recommended, as strain through overwork usually brings on bleeding from the nose. A saturated solution of alum should be injected into the nostril, which should afterwards be plugged with cotton wool. If there is any suspicion of a polypus, this ought to be removed, but should only be done by a qualified veterinary surgeon. If inflammation or ulceration be suspected, apply ice to the front of the face. Inject the nostril with the alum solution two or three times daily.

Vaginitis.

Case:—A Hereford cow that dropped her third calf on the 9th May was purchased on the 11th May, and the calf taken from her the following day. She gave about 2½ gallons of milk in twenty-four hours, with a high test until the 21st May. Then, when driving her to the yard it was noticed that she passed from the rectum a quantity of matter about the size of a man's fist. It appeared to be a whitish, semi-transparent phlegm. Two days after she held her milk back, and what milk she gave was slightly tinged pink. On examination, after being left to stand, the cream appeared to be quite good, with a pink tinge still in the milk. The colouring matter did not settle but remained equally distributed in the milk. On the next day the pink tinge was more pronounced and the milk supply fell off still further. On the following day she began to lose condition. She ate and drank very little. She would rush eagerly to a supply of lucerne hay and water, but, after sniffing it, would eat or drink nothing. On the seventh day after sickness was first noticed, the pink tinge was entirely gone from the milk. The nose and eyes were a dark yellow. The udder took on a yellow tinge, with a sort of dry scale which brushed off when rubbed. She was still losing condition. Two days later the yellow tinge spread to the teats, these getting scaly, and there was a discharge of thick, yellow, slimy matter from the nostrils. Three weeks after the first sign of trouble the yellow tinge round the eyes and nose began to disappear, the powdery substance was gone from the udder, and the cow was eating and drinking a little. In a few days more she began to lose all signs of illness and to pick up strength. She came back to a gallon of milk. What was the trouble?

Reply:—Veterinary Surgeon McGown replied: From the symptoms described this animal suffered from a low form of vaginitis, termed 'leuchorrhea.' In treating such cases the vagina should be syringed out twice daily with tepid water, followed with an injection of alum and water. The quantities required are 2 oz. alum to one quart tepid water. The following powder, given once daily as a drench, will have a beneficial effect:—2 drachms powdered sulphate of iron and 4 drachms powdered gentian. This is best given mixed with oatmeal gruel.

Feeding Poddy Calves.

F.E. (Mackay)—

In practice it is difficult to find a substitute upon which calves will thrive as satisfactorily as when fed upon their natural diet (milk). In some cases calves are fed upon skim milk, that is milk from which the cream has been removed. You do not state whether whole or skim milk is available. If skim milk is used it would be advantageous to add 1 to 4 oz. of linseed meal daily to the skim milk. The whole milk would, of course, be a complete ration without any addition, and the calf would require from 8 to 10 lb. of milk per diem.

In the event of there being neither skim nor whole milk available in sufficient quantity, 2 to 4 oz. of linseed meal, together with a similar quantity of maize meal and pollard combined, to which a sufficient quantity of luke warm water is added to make the mixture of the consistency of a very thin gruel, also a little salt in addition, would make a comparatively satisfactory ration.

In every instance the artificial food will be greatly enhanced in value, if a little milk is added, even such a small quantity as a half-pint at each meal.

For the first four weeks the calf should be fed upon a milk diet solely, and the artificial foods introduced gradually, reducing the supply of milk and increasing the artificial food from time to time. Very young calves should be fed three times a day, and as the become stronger, the feeding should be twice daily.

A calf will eat a small quantity of grass at an early age, if available, and care must be taken that the calf has access to a clean grass patch. If kept in a restricted area, the grass will become contaminated by the excreta from the calf.

Piles in Pigs.

L.G.H. (Woolooga)—

The Instructor in Pig Raising (Mr. Shelton) advises that in order to be successful in treating the sick pigs for the trouble referred to it will be necessary to give them a complete change of food and the use of barley meal and skim milk, fed warm, and in small quantities only, about four or five times per day. Prior to this the pigs should be given a good dose of castor oil (say two tablespoonsful to each pig) as a drench in warm milk, the oil to be given two or three hours before the feed during the morning. Protrusion of the rectum (or as it is commonly called "piles") is due to severe constipation or sometimes also to diarrhoea, but in the case of your pigs it would appear to be due to over-feeding, though you do not state the nature of the food given to them. To relieve the condition, the bowels must first be emptied of the bulk of their contents by the use of a purgative; the pigs should then be fed very lightly for a fortnight or so on soft, easily digested, nourishing food. Do not attempt to do more than temporarily satisfy their hunger, but allow them plenty of green lucerne or soft succulent grass or herbage and plenty of drinking water. To relieve the condition of the protruding bowel, the parts should be washed with warm water to which has been added some disinfectant, such as lysol. If the bowel can be replaced in its normal position while the animal is on low diet, it will be found to remain in position much longer than if the pig is on full feed. It might also be possible to temporarily plug up the opening with some cotton wool padding, but this requires constant attention. The animals must, of course, be confined in a very clean sty and should be kept very quiet. The treatment must be preventive to a large extent, and it is impossible to relieve the condition unless strict attention is paid to the diet and supply of food. In future, it is suggested that the pigs be fed along better lines, otherwise there might be a recurrence of the trouble, for there is no "cure-all" for this any more than there is for other diseases to which these animals are subject.

Parasite on Pigs.

W.R.R. (Baffle Creek)—

The Instructor in Pig Raising (Mr. Shelton) advises:—The best preparation I know of for ridding pigs of lice and fleas is a mixture composed of—Benzine, ½ pint; kerosene, ½ pint; fish oil, 7 pints, mixed together and applied as per directions herewith. If fish oil is not available you could use raw linseed oil or crude oil or any other oil available, waste machine or separator oil, &c. It is preferable that the pigs be first washed or hosed over to rid them of accumulations of mud, &c., the lice mixture is then best applied per hand, but if the pigs are not sufficiently quiet the mixture can be sprayed over their neck and back, making certain that the mixture penetrates into the wrinkles along the neck and side, as well as to the inside of the ears, down the hind leg, and in the crevices about the hock. This is comparatively easy when the oil is being applied per hand, but if you obtain a mop and saturate same with the oil you could apply same to practically all the exposed surfaces. At any rate, try spraying the mixture and watch the result.

It is necessary to repeat the treatment in about ten days' time in order to kill off the brood of young lice which will have hatched out from the "nits" or eggs in the interim.

Whitewashing the pens and keeping them free of accumulation of rubbish, cobwebs, &c., will all tend to keeping the piggery free of lice, and regular treatment of infested animals will be found very effective.

Worms in Pigs.

G.H.C. (Atherton)—

You do not mention just what food you are using for your pigs, hence one suspects that they have had access to worm carcases of sheep, cattle, or horses. Worms develop from worm eggs only, they cannot develop from any other source, hence the worms have found their way to your premises either by medium of other diseased beasts, or by wormy pigs from other studs. Doubtless we have something to learn yet in the direction of finding out whether it is possible for worms to develop in pigs as a result of their ingesting the eggs of worms whose hosts are other than domestic animals. For instance, we know that kangaroos, wallabies, foxes, dingoes, &c., are all subject to infestation by a variety of worms, hence it is more than likely your pigs running on new ground along the course of a creek which overflows its banks occasionally may have picked up a number of worm eggs in this way.

This all points to the necessity for absolute cleanliness and for efficiency in management. All new purchases should be carefully quarantined for a period of at least three weeks. The pigyard should be regularly raked and all old corn cores and other accumulations of rubbish be burned to ashes on the spot.

If convenient, dig the yards up, and if the pigs have a run plough this up also and allow it to sweeten and dry. It would be preferable to rearrange your yards and to fence in new ground altogether.

Liming the yards is recommended also, and if new yards are built cultivate the old yards for a year or two before laying them down in grass again.

See that your breeding sows have ample run in the sunshine, and see that the sunshine has access to the pig sties, for it is the most efficient germicide known. Careful attention to the feeding of the pigs and to matters of management generally will help considerably in your clean up.

Disease in Pigs.

H.M. (Peeramon)—

The trouble is probably due to tuberculosis.

Diseases are largely controlled if not prevented entirely by efficient management, which would, of course, include preventive measures, in seeing that no diseased animal is allowed to enter the herd and no foodstuff used about which there is the slightest doubt, without first of all being sterilized by boiling or by other means.

The Instructor in Pig Raising (Mr. Shelton) strongly recommends a thorough clean up of your pig premises, wards, &c. The sties should first of all be carefully overhauled, repaired, and put into the best order possible, then thoroughly washed over with hot limewash, inside and out, and this limewashing should be repeated, say, in three months' time; the floors of the sties should be given special attention to see that they can be kept clean and dry. They should then be sprinkled with air-slacked lime and be swept out regularly, and kept clean at all times. The pigyards should be well raked over and all rubbish, old corn cores, &c., burned to ashes.

If convenient, dig the yards up, and if the pigs have a pig run plough this up also, and allow it to sweeten and dry. It would be preferable to rearrange your yards and to fence in new ground altogether.

Liming the yards is recommended also, and if new yards are arranged for cultivate the old yards for a year or two before laying them down in grass again.

See that your breeding sows have ample run in the sunshine and see that the sunshine has access to the pig sties, for it is the most efficient germicide we have yet discovered.

Careful attention to the feeding of the pigs and to matters of management generally will help considerably in your clean up.

Pigs require ample supplies of green food in addition to milk and maize, such crops as lucerne, rape and barley, saccaline, cow cane, cowpeas, sweet potatoes, &c., being recommended.

Sterility in Sow.

H.B. (Kinleymore)—

It is difficult to advise as to the best treatment in the case of a sow that fails to breed regularly, for there is a variety of causes for sterility in breeding stock. In Mr. Shelton's opinion it does not pay to retain stock which fail to produce satisfactory litters, that is unless the condition is due to the boar and sows being over fat and lethargic and disinclined to do other than eat and sleep.

It is good to note that you have provided a suitable grazing area for your breeding sows, and that the results in this direction have proved satisfactory. It is not desirable in a general way to allow the boar to run with the sows for it is very difficult to keep record of service dates and of anticipated farrowings; then again many animals are knocked about unnecessarily when allowed to run together, this especially so where an active, strong, vigorous sire is being used. It pays much better to keep the boar in a small paddock and to allow the sows to run with him only at the time they are actually ready for service.

You will find that it pays also to feed abundant supplies of green food to your pigs, and to allow them clear drinking water *ad lib.*

"Thick Neck" in Pigs—Mineral Mixtures for Pigs.

F.E.B. (Tarcutta, N.S.W.)—

We have no record of animals having been cured by direct external application of iodine to the affected parts, but satisfactory results have been obtained by its use internally in cases of "thick neck," goitre, hairlessness, and other deficiency troubles.

Treatment, however, goes hand in hand, Mr. Shelton advises, with the use of mineral mixtures which tend to make up the deficiency of bone-forming materials in the food and to supply necessary vitamines. The formula which has proved most successful for this purpose is made up as follows:—

Mix together, common salt	20 lb.
Finely-ground raw bonemeal or steamed bonemeal	40 lb.
Finely-ground high calcium limestone, wood ashes, finely-ground oyster shell or thoroughly air-slacked time	40 lb.

To each 100 lb. of this mixture add 10 lb. of sulphur and from ½ to 1 oz. or more of potassium iodide.

Mix all thoroughly together, place in a clean, dry wooden trough, and place in a position well protected from the weather, where the pigs can have access to it at all times.

Besides the immediate value of giving mineral to pigs, there has been found a cumulative value in the case of breeding stock. For instance, in trials at the Iowa Experiment Station (U.S.A.), the first generation of sows to which minerals were given showed but slight advantage over young sows to which no minerals were given. The second generation showed some positive sign of benefit, chiefly in an increased height and length. In the third generation the advantages were plainly evident in the added increase in weight.

It appeared to the investigators that there is a tendency for the benefits of minerals to become apparent to a greater degree as the generations unfold. It is, of course, wise policy to look ahead in the breeding of all classes of live stock.

Pigs should always have access to good succulent pasture and to young crops, lucerne, rape, &c., on cases where the supply of green food and minerals have both been liberal, the results have been outstanding.

The provision of mineral mixtures certainly has a tendency to check the development of such diseases as rickets, paralyses of the hindquarters, staggers, &c., which in many instances owe their origin to weakness due to improper feeding and lack of minerals.

Trouble with Breeding Sows.

H.H. (Pittsworth)—

Troubles of the nature described running through a herd are most unusual. In addition to preventive treatment, Mr. Shelton strongly advises a thorough clean up of your pig premises, whitewashing with hot limewash the pigsties and outside of troughs, &c. The feed troughs should be scalded out and be placed in the sun to dry and sweeten, while the floors of the pigsties, after being thoroughly scoured, should be sprinkled with air-slacked lime. The yards should be raked, and all rubbish burned; they should be sprinkled with lime also. If possible, dig the yards up, turning over the soil to sweeten and dry.

The provision of a good grazing run for the breeding sows is well worth thought if you have no pig paddocks, and the use of plenty of green fodder and of clean water will add to the comfort and well-being of the animals. It does not, however, pay to retain unsatisfactory breeding stock or sows that fail to produce litters freely, regularly, and of good type and vigour.

Insect Attack on Cabbage Plants.

M. VAN I. (Gladstone)—

You are evidently troubled with some form of leaf-eating insect, and the Entomologist suggests that you try spraying the plants with a solution of arsenate of lead, 3 to 4 lb. of the paste or 1½ lb. to 2 lb. of the powder to 100 gallons of water. If you prefer dusting the poison on, use 1 lb. of the powder to 6 or 7 lb. of dry finely-sifted ashes, and apply before the dew is off the young plants.

Pig Crosses.

H.F.R. (Marburg)—

A series of practical experiments to test various breeds and cross breeds with a view to obtaining informative data thereon is being arranged. These experiments will be conducted on approved farms and with approved pigs in approved localities. The Berkshire-Tamworth cross, for instance, is regarded by most bacon-curers as an ideal pig, maturing to prime bacon weights at from five and a-half to six months old, but there are other crosses well worth trial, such as the Poland-China-Tamworth cross and the Yorkshire-Berkshire. Then there are breeds like the Duroc-Jersey, which is noted for quick growth and early maturity, either in the pure state or when crossed with the Berkshire or similar types.

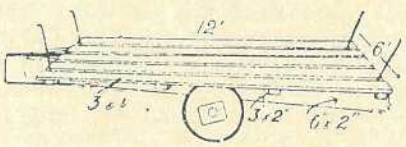
Many farmers claim to be able to produce prime bacon pigs at from five to six months of age. Some even claim to have marketed baconers under five months old, but they do not generally keep reliable records of dates of birth, weaning, and other particulars; hence their statements must be taken for what they are worth. Mr. Shelton advises that if bacon pigs can be successfully marketed *continuously* at around 100 lb. dressed weight, doubtless it will be possible to produce them at around five months old. The matter is one well worth very careful consideration and experiment, for it is an all-important one to the pig farmer.

LESSONS OF THE SHOW—HIGH STANDARDS SET.

The chairman of the Council of the Royal National Association, Mr. W. J. Affleck, at an official Show function, said "he had sat on the council of the Association for almost half his lifetime, and he sometimes wondered whether the pride he had in the Association's achievements and in its progress was more than a proper pride. Yet he had felt that this great Show, staged in their jubilee year, was a wonderful achievement for so young a country. It showed the enterprise of their people, as well as the richness of the State. It showed what standards some of their best producers had reached, and it set standards for all the others. They were very high standards that were set here. This country of theirs differed greatly from most of the other agricultural countries of the world in that the measure of its agricultural production was different. In the thickly settled countries the measure of production was the yield per acre. In this country it would be for many years to come the yield per man; yet to increase the measure of his production, every man must use none but efficient machinery, efficient stock, efficient methods, and efficient labour. That was the great lesson which such a Show as that taught, and the teaching of that lesson alone made all their efforts worth while. It might fly in the face of some of their present-day thought, but that made it more necessary that it should be taught, and that convincingly. His council was deeply grateful to all those who had contributed so much to the success of the Show, to the exhibitors who had done so splendidly, to the public who patronised the Show so well, to the secretary and his staff for their zeal and thoroughness."

THE TILBA TROLLEY.

When green crops are cut for silage there is a great deal of heavy handling, if ordinary drays or waggons are employed for carting. The "Agricultural Gazette" of New South Wales, gives an illustration of a low two-wheeled trolley, which farmers at Tilba, on the South Coast, have evolved. Two wheels of solid wood, from 20 inches to 24 inches high and 5 inches to 6 inches thick, are tyred with old tyring iron, and provided with an axle of 1½-inch iron. On the axle and fastened to it by iron clips, rest two pieces of 6-inch by 2-inch timber, so placed that they are 6 feet apart at the rear end and close together at the front, forming thus a broad V with the sharp end in front, and the axle about half way along the sides. These two heavy timbers, however, do not come quite together at the front. Working between them on a strong swivel bolt is a large iron-shod block of wood which rides on the ground as a sort of slide. To this front block are attached the chains by which



the trolley is drawn. Resting on the 6 by 2 bed pieces is the platform, on which is loaded the fodder. This platform is usually about 12 feet long by 6 feet broad, and it generally consists of a framework of 3 by 2 timber, covered with flooring or 3 by 1 battens. Four corner posts, of 3 by 2, are sometimes bolted, sometimes socketed into the frame to keep the material on the trolley while it is being moved. Sometimes these four corner posts are simply four iron uprights, as in the illustration, sometimes they are missing altogether. The trolley is so constructed that, when it is loaded, it practically balances on the wheels, with not too much weight forward, so that as the horses move forward the front of the swivel block is slightly lifted, though its middle and rear still travel on the ground. If the load is placed too far forward, the swivel block will not lift at all and may carry into ploughed or heavy ground.

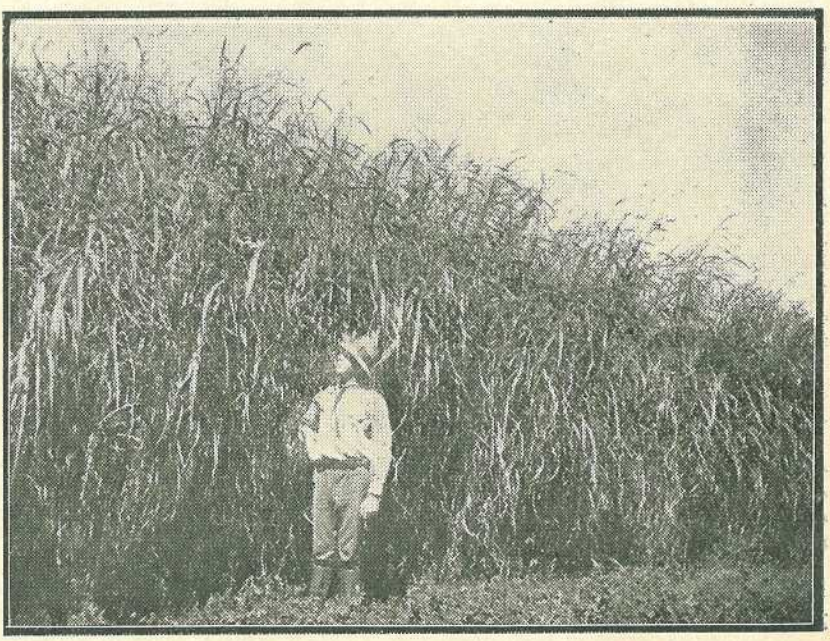


Photo.: N. A. R. Pollock.]

PLATE 86.—ELEPHANT GRASS ON THE ATHERTON TABLELAND

Farm and Garden Notes for October.

Field.—With the advent of warmer weather and the consequent increase in the soil temperature, weeds will make great headway if not checked; therefore our advice for last month holds good with even greater force for the coming month. Earth up any crops which may require it, and keep the soil loose among them. Sow maize, cowpeas, sorghums, millet, panicums, pumpkins, melons, cucumbers, marrows. Plant sweet potatoes, yams, peanuts, arrowroot, tumeric, chicory, and ginger. Coffee plants may be planted out. There are voluminous articles in previous journals giving full instructions how to manage coffee plants, from preparing the ground to harvesting the crop, to which our readers are referred.

Kitchen Garden.—Our notes for this month will not vary much from those for September. Sowings may be made of most vegetables. We would not, however, advise the sowing of cauliflowers, as the hot season fast approaching will have a bad effect on their flowering. French beans, including butter beans, may be sown in all parts of the State. Lima and Madagascar beans should also be sown. Sow the dwarf Lima beans in rows 3 ft. apart with 18 in. between the plants. The kitchen garden should be deeply dug, and the soil reduced to a fine tilth. Give the plants plenty of room, both in sowing and transplanting, otherwise the plants will be drawn and worthless. Thin out melon and cucumber plants. Spraying for fungoid diseases should be attended to, particularly all members of the *Cucurbitaceæ* and *Solanum* families, of which melons and tomatoes are representative examples. Give plenty of water and mulch tomatoes planted out last month. Asparagus beds will require plentiful watering and a good top-dressing of short manure. See our instructions in "Market Gardening," obtainable on application to the Under Secretary, Department of Agriculture and Stock. Rosella seeds may be sown this month. No farm should be without rosellas. They are easily grown, they bear heavily, they make an excellent preserve, and are infinitely preferable to the mulberry for puddings. The bark supplies a splendid tough fibre for tying up plants. The fruit also makes a delicious wine.

Flower Garden.—The flower garden will now be showing the result of the care bestowed upon it during the past two months. The principal work to be done this month is the raking and stirring of the beds, staking, shading, and watering. Annuals may be sown as directed for last month. Plant tuberose, crinum, ismene, amaryllis, pancratium, hermocallis, hippeastrum, dahlias, &c. Water seedlings well after planting, and shade for a few days. Roses should now be in full bloom. Keep free from aphis, and cut off all spent flowers. Get the lawn-mower out and keep the grass down. Hoe the borders well, and trim the grass edges.

Orchard Notes for October.

THE COASTAL DISTRICTS.

October is frequently a dry month over the greater part of Queensland, consequently the advice that has been given in the notes for August and September regarding the necessity of thorough cultivation to retain moisture is again emphasised, as, unless there is an adequate supply of moisture in the soil to meet the trees' requirements, the coming season's crop will be jeopardised, as the young fruit will fail to set.

Thorough cultivation of all orchards, vineyards, and plantations is therefore imperative if the weather is dry, as the soil must be kept in a state of perfect tilth, and no weeds of any kind must be allowed to grow, as they only act as pumps to draw out the moisture from the soil that is required by the trees or fruit-yielding plants. Should the trees show the slightest sign of the want of moisture, they should be given a thorough irrigation if there is any available means of doing so, as it is unwise to allow any fruit trees to suffer for want of water if there is a possibility

of their being supplied with same. Intermittent growth, resulting from the tree or plant being well supplied with moisture at one time and starved at another, results in serious damage, as the vitality is lessened and the tree or plant is not so well able to ward off disease. A strong, healthy, vigorous tree is frequently able to resist disease, whereas when it has become debilitated through neglect, lack of moisture or plant food, it becomes an easy prey to many pests. If an irrigation is given, see that it is a good one and that the ground is soaked; a mere surface watering is often more or less injurious, as it is apt to encourage a false growth which will not last, and also to bring the feeding roots to the surface, where they are not required, as they only die out with a dry spell and are in the way of cultivation. Irrigation should always be followed by cultivation, so as to prevent surface evaporation and thus retain the moisture in the soil.

All newly planted trees should be carefully attended to, and if they show the slightest sign of scale insects or other pests they should receive attention at once. All growth not necessary to form the future tree should be removed, such as any growths on the main stem or main branches that are not required, as if this is done now it will not only save work later on, but will tend to throw the whole strength of the tree into the production of those limbs that will form the permanent framework of the tree. In older trees all water sprouts or other similar unnecessary growth should be removed.

Keep a good lookout for scales hatching out, and treat them before they have become firmly established and are coated with their protective covering as they are very easily killed in their early stages, and consequently much weaker sprays can be used. The best remedies to use for young scales hatching out are those that kill the insects by coming in contact with them, such as miscible oils, which can be applied at a strength of 1 part of oil in 40 parts of spraying material and will do more good than a winter spray of double the strength. In the use of miscible oils or kerosene emulsion, always follow the directions given for the use of these spraying materials, and never apply them to evergreen trees when they are showing signs of distress resulting from a lack of moisture in the soil, as they are then likely to injure the tree, whereas if the tree is in vigorous growth they will do no harm whatever.

All leaf-eating insects should be kept in check by the use of an arsenate of lead spray, taking care to apply it as soon as the damage appears, and not to wait till the crop is ruined. Crops, such as all kinds of cucurbitious plants, tomatoes, and potatoes are often seriously injured by these insects, and the loss occasioned thereby can be prevented by spraying in time. In the case of tomatoes and potatoes, a combined spray of Bordeaux or Burgundy mixture and arsenate of lead should be used, as it will serve the dual purpose of destroying leaf-eating insects and of protecting the plants from the attack of Irish blight.

Grape vines require careful attention, and, if not already sprayed with Bordeaux mixture, no time should be lost in applying this material, as the only reliable method of checking such diseases as anthracnose or black spot and downy mildew is to protect the wood and foliage from the attack of these diseases by providing a spray covering that will destroy any spores that may come in contact with them. The planting of bananas and pineapples can be continued during this month. See that the land is properly prepared and that good healthy suckers only are used. Keep the plantations well worked, and allow no weed growth. Keep a very careful lookout for fruit flies; destroy every mature insect you can, and gather and destroy every fallen fruit. If this is done systematically by all growers early in the season, the subsequent crop of flies will be very materially decreased. See that all fruit sent to market during the month is carefully handled, properly graded, and well packed—not topped, but that the sample right through the case or lot is the same as that of the exposed surface.

GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS.

Much of the matter contained under the heading of "The Coast Districts" applies equally to these parts of the State, as on the spring treatment that the orchard and vineyard receives the succeeding crop of fruit is very largely dependent. All orchards and vineyards must be kept in a state of perfect tilth, and no weed growth of any kind should be allowed. In the Western districts, irrigation should be given whenever necessary, but growers should not depend on irrigation alone, but should combine it with the thorough cultivation of the land so as to form and keep a fine soil mulch that will prevent surface evaporation.

All newly planted trees should be carefully looked after and only permitted to grow the branches required to form the future tree. All others should be removed as soon as they make their appearance. If there is any sign of woolly aphis, peach aphis, or scale insects, or of any fungus diseases on the young trees, these diseases should be dealt with at once by the use of such remedies as black leaf forty, Bordeaux mixture, or a weak oil emulsion. In older trees, similar pests should be systematically fought, as if kept in check at the beginning of the season the crop of fruit will not suffer to any appreciable extent. Where brown rot has been present in previous years, two or more sprayings with Bordeaux mixture can be tried, as they will tend to check other fungus growths, but at the same time the sodium or potassium sulphide sprays are more effectual for this particular disease and should be used in preference when the fruit is nearly full grown. All pear, apple, and quince trees should be sprayed with arsenate of lead—first when the blossom is falling, and at intervals of about three weeks. Spraying for codlin moth is compulsory in the fruit district of Stanthorpe, and wherever pomaceous fruits are grown it must be attended to if this insect is to be kept in check.

In the warmer parts a careful check should be kept for any appearance of the fruit fly, and, should it be found, every effort should be made to trap the mature insect and to gather and destroy any affected fruit. If this is done, there is a good chance of saving the earlier ripening summer fruits, if not the bulk of the crop. Tomato and potato crops will require spraying with Bordeaux mixture, as also will grape vines. Keep a very strict watch on all grape vines, and, if they have not already been treated, don't delay a day in spraying if any sign of an oil spot, the first indication of downy mildew, appears on the top surface of the leaf. Spraying with Bordeaux mixture at once, and following the first spraying up with subsequent sprayings, if necessary, will save the crop, but if this is not done and the season is favourable for the development of the particular fungus causing this disease, growers can rest assured that their grape crop won't take long to harvest.

Where new vineyards have been planted, spraying is also very necessary, as if this is not done the young leaves and growth are apt to be so badly affected that the plant dies.

Photo.: N. A. R. Pollock.]

PLATE 87.—A FINE CROP OF FIELD PEAS ON THE ATHERTON TABLELAND.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S., AND A. K. CHAPMAN.

TIMES OF SUNRISE, SUNSET, AND MOONRISE.

AT WARWICK.

1925.	SEPTEMBER.		OCTOBER.		MOONRISE. SEPT.	MOONRISE. OCT.
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Rises.
					p.m.	p.m.
1	6·7	5·37	5·33	5·51	3 51	4·49
2	6 6	5·38	5 32	5·52	4 58	5 52
3	6·5	5·38	5 31	5 52	6 4	6·51
4	6·4	5·39	5 30	5·53	7 8	7·52
5	6·3	5·39	5 29	5·53	8 10	8 49
6	6·2	5 40	5 28	5·54	9 9	9·46
7	6·1	5·40	5 27	5 54	10 8	10 42
8	6·0	5 41	5 25	5 55	11·4	11·35
9	5·58	5·41	5 24	5·55	11 59	nil
					a.m.	a.m.
10	5·57	5·41	5 23	5·56	nil	12·24
					a.m.	
11	5·56	5·42	5·22	5·56	12·52	1·12
12	5 55	5·42	5·21	5·57	1 43	1 55
13	5·54	5·43	5·20	5·57	2·31	2·34
14	5·53	5 43	5·19	5·58	3·17	3 13
15	5 52	5·44	5 18	5·58	3 59	3 49
16	5 50	5 44	5·17	5·59	4·38	4·26
17	5·49	5·45	5·16	6·0	5·15	5·0
18	5·48	5·45	5·15	6·0	5·50	5 35
19	5·47	5·46	5·14	6·1	6·26	6·15
20	5·46	5 46	5·13	6·1	7 1	6·55
21	5·45	5·46	5·12	6·2	7·38	7·40
22	5 44	5·47	5·11	6 2	8·15	8·29
23	5·42	5 47	5·10	6·3	8·57	9·26
24	5·41	5·48	5·9	6·4	9·43	10·23
25	5·40	5·48	5·8	6·4	10·34	11·27
					p.m.	p.m.
26	5·39	5·49	5·8	6·5	11·30	12·29
					p.m.	
27	5·38	5·49	5·7	6 6	12 31	1·32
28	5 37	5·50	5 6	6·6	1·34	2·35
29	5·36	5·50	5 5	6 7	2·39	3·38
30	5 34	5·51	5·4	6 8	3·45	4·37
31	...	..	5·3	6·9	..	5·36

For places west of Warwick and nearly in the same latitude, 28 degrees 12 minutes S., add 4 minutes for each degree of longitude. For example, at Inglewood, add 4 minutes to the times given above for Warwick; at Goondiwindi, add 8 minutes; at St. George, 14 minutes; at Cunnamulla, 25 minutes; at Thargomindah, 33 minutes; and at Oontoo, 43 minutes.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

Phases of the Moon, Occultations, &c.

The times stated are for Queensland, New South Wales, Victoria, and Tasmania.

3 Sept.	○	Full Moon	5 53 a.m.
10 „	☾	Last Quarter	10 12 a.m.
18 „	●	New Moon	2 12 p.m.
25 „	☽	First Quarter	9 51 p.m.

Perigee, 1st Sept. at 3 54 p.m.
Apogee, 13th „ at 5 12 p.m.
Perigee, 29th „ at 2 48 p.m.

On the 11th September Mercury will be at its greatest distance (about 18 degrees) west of the Sun, rising 44 minutes before the latter. Mars being in conjunction with the Sun on the 13th instant will not be observable during this month. On the 21st, at 3·44 p.m., Venus will apparently be at a distance equal to that of the length of the Southern Cross southwards of the Moon. This should form an interesting daylight spectacle, especially with the aid of a pair of binoculars; good eyes should, however, detect both objects without very much difficulty. Another interesting daylight spectacle will be afforded by Jupiter and the Moon on the 26th, between 5 and 6 p.m., when Jupiter may also be seen a little southward of the Moon without binoculars by persons of keen eyesight. About 8 o'clock on the same evening an occultation by the Moon of a third magnitude star in Saggitarius will occur in Queensland, but not as far South as Sydney.

2 Oct.	○	Full Moon	3 23 p.m.
10 „	☽	Last Quarter	4 34 a.m.
18 „	●	New Moon	4 6 a.m.
25 „	☾	First Quarter	4 38 a.m.

Apogee, 11th October at 11 12 a.m.
Perigee, 25th „ at 10 24 p.m.

On 7th October Mercury will be in conjunction with the sun on the far side of its orbit and invisible until toward the end of the month. On the same day Jupiter will be in quadrature with the sun, and would therefore rise at midday were it not for its greater southern declination making it do so three-quarters of an hour earlier. As the planet Mercury will be in conjunction with the moon on the 18th, Saturn on the 19th, Venus on the 21st, and Jupiter on the 23rd it will be seen that these four planets will extend eastwards at no great distance from one another. Mercury will be apparently in the constellation Virgo, Saturn in Libra, Venus in Scorpio, and Jupiter in Sagittarius. These four planets will follow the sun down to the western horizon in the order shown, and with the exception of Mercury, which will be too near the sun to be visible, will form an interesting spectacle soon after sunset.