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QUEENSLAND AGRICULTURAL JOURNAL

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Event and Comment.

Anzac.

THE fifteenth anniversary of the Epic of Gallipoli, 25th April, was commemorated fitly, amply, and reverently throughout the Commonwealth; and also in those far countries where, with their comrades of New Zealand, Great Britain, and other parts of the Empire, the Australian volunteer soldier won lasting fame. The spirit of that great day was expressed in an inspiring message from Sir John Monash, the Australian Corps Commander, in the course of which he said:—

> Engraved in the heart of every true Australian is the memory of those brave men who, on far-off fields of battle, put the seal on Australia's honour and nationhood with their lives.
>
> With a common impulse, therefore, the people, as a nation, pause each year to pay their tribute of remembrance, and to commemorate, in a spirit of love and gratitude, the heroism and sacrifice of those who did not return. Each year finds this sentiment perhaps deeper and more abiding, because time, which proves all things, confirms the debt we owe to those who fought so valiantly and died so nobly in their country's cause.
>
> Deep as may be the sorrow, there is also the feeling of pride that on Anzac Day fifteen years ago Australians faced their grim baptism of fire, in one of the most hazardous adventures in history, with a dash and daring and abandon of courage that earned them enduring fame against the background of years.
>
> The message of Anzac Day stands out in shining letters. It is courage and fortitude. To-day, when the problems of peace, some of them the aftermath of the war, press so heavily on us as a people, it should be our inspiration. Not only should we follow the precept, but also the example set by our soldiers, who never wavered, but always did their best in a weary war of attrition and endurance. They ended as they started, never thinking of defeat, but only the objective to be won.

The Australian Spirit.

THE spirit of Anzac existed before Gallipoli, but first found adequate expression there. It still existed as the spirit of Australia at all times, through prosperity and stress, through drought, fire, and flood, inspiring the nation with the eternal hope of better things. Those ideas formed the keynote of a fine address by Colonel F. M. de F. Lorenzo, before an Anzac Day audience. The spirit of a nation, he said, was formed usually by centuries of trial, and became the soul of its traditions and an integral part of the life of the people. The spirit of Anzac was not merely the spirit which actuated the troops at Gallipoli to do the seemingly impossible, but a spirit which had existed before the name Anzac was coined. Before Australians achieved feats unprecedented in the history of war the spirit of Anzac had turned impenetrable forest and scrub into farms and deserts into crop lands. It was born in the pioneers, fighting against nature in fire, flood, and drought. Men were ruined in single seasons or single nights, and came up smiling, prepared to "scrap" once more with the almost impregnable forces of nature.

Notwithstanding this record of heroism Australians had not until recent years any really national traditions. Their forefathers had brought with them the traditions of the homeland, and these were accepted because their sons had none of their own. Australia had assisted in various small military campaigns and sent troops to aid Empire causes, but there was no real call for help until 1914. Then 30,000 Australian men of all occupations, professional men and labourers, squatters and shearers, for physique, brains, and initiative unparalleled in the world, embarked for a destination and adventures unknown. They were a magnificent body of men, but still were not the fighting unit they were to become—the pride of the world.

In Egypt, away from their own people and among half a dozen languages, the barriers of State units were broken down, and they became an Australian community, finding their nationality. Though there was no doubt as to the individual bravery of the men, demonstrated in brushes with the military police and in daily climbing of unclimbable pyramids, the question arose as to whether or not they could stand the hell of war. At Gallipoli they achieved the impossible in war by landing, and again by staying until they left of their own accord.

The gibes of lack of discipline among the Australian troops could be hurled back in the faces of those who uttered them. The discipline of Gallipoli was peculiar and exacting. Without marvellous discipline the Gallipoli landing, occupation, and evacuation never could have been achieved.

It was essential that one spirit should actuate all the troops in that campaign, and the spirit of Anzac, which had existed before in Australians without a name, there found its outlet. If all the meritorious deeds of the campaign received their full recognition hardly a man on Gallipoli would have been without some military honour. So common were they that innumerable heroic deeds received no recognition. He had seen a shell land in an ammunition dump. The crew of three were all injured, and the dump caught fire. Two infantrymen rushed over to put the fire out before the dump exploded, and rescued the three injured men. The incident was reported, and only one military medal was allowed as its recognition.

In France the same spirit actuated all other Australian troops. They fought beside the flower of the British Army and against the flower of the Germans, and at no time did the efficiency and fighting prowess of either cause any quickening of their pulse. If they knew they were against the Prussian Guards, they were "on their toes for the fight, and they beat them every time they touched them."

The same spirit, the speaker ended, animated Australia at all times, through all depression and difficulties as well as in prosperity. It was the strength and glory of the nation.

Soil Problems.

THE third annual report of the Council for Scientific and Industrial Research which has just come to hand is a very interesting document. It gives an excellent idea of the scope and value of the investigations of the Council. Regarding soil problems, for instance, we learn that in 1927 the Council entered into a co-operative agreement with the University of Adelaide for investigations to be carried out at the Waite Agricultural Research Institute on soil problems, particularly in the Murray River Valley Irrigation Settlements. The investigations were placed under the control of Professor J. A. Prescott, who was appointed as adviser to the Council on soil problems. This action was taken as a result of the realisation of the importance of greater co-ordination in the investigation of soil problems throughout the Commonwealth.

The development of laboratory technique and the application of modern methods to Australian problems had already become part of the policy of the Department of Agricultural Chemistry of the Waite Institute when action was taken by the Council in 1927 for the study of soil problems in co-operation with that institute. The development of internationally recognised methods under the auspices of the International Society of Soil Science and the creation of the Imperial Bureau of Soil Science have made the present time singularly opportune for securing co-ordination throughout the Commonwealth.

Before similar co-ordination is possible on the field side, much investigation remains to be done, but the work already carried out in the irrigation settlements has enabled a field technique to be developed on a satisfactory basis and will lead the way for similar detailed work in other parts of Australia.

As part of the soil survey work, an aerial photographic survey of the whole of the Renmark Settlement has been carried out by officers of the Royal Australian Air Force with a view to ascertaining whether the known differences of soil types can be identified in the photographs. If so, it is intended to make use of the information thus obtained in completing the survey of the Renmark Settlement.

Possibilities of co-ordination in broader aspects of soil survey work in Queensland have also been explored, but no definite steps have yet been taken.

Tuberculous Milk and Pigs—An Interesting Test.

FOLLOWING on instructions issued by the Minister of Agriculture and Stock, Mr. Walker, the Government Bacteriologist, Mr. C. J. Pound, conducted at the Stock Experiment Station, Yeerongpilly, recently certain experiments with the feeding of tuberculous milk to young pigs.

Six young pigs were obtained and were subjected to the tuberculin test. All of them gave negative results. Three of these pigs were then fed on untreated milk from a known tuberculin cow, while the other three pigs were fed on pasteurised milk from the same cow. Subsequently, the whole six pigs were sent to a bacon factory and slaughtered in the presence of the manager, two meat inspectors, and Mr. Pound. The three pigs fed on the untreated milk all showed tubercular lesions (generalised), while the three pigs fed on pasteurised milk proved perfectly healthy.

Concurrently, Mr. Pound made certain investigations into the matter of the resistance of tubercle bacilli in bacon to the curing process, salting, and smoking. The salting and pickling of meat is generally accredited with great efficacy, but a closer examination reveals that an essential part of the bacon-curing process is the withdrawal of water from the meat, so that any micro-organisms that may be present in, or subsequently conveyed to the flesh, are only prevented from reproduction. Consequently the germs, especially those of a resistent nature like tubercle bacilli, cannot be completely destroyed by these processes.

Freytag has proved that the influence of a concentrated solution of common salt is resisted by tubercle bacilli for three months.

In the Yeerongpilly experiments, which are still in progress, we have so far proved that tubercle bacilli in the lymphatic glands of a pig kept in freshly prepared curing brine retain their vitality and virulence for forty-eight days—i.e., portion of salted tuberculous glands injected into guinea pigs produced tuberculosis.

Smoking dries the surface and impregnates the bacon with traces of acetic acid, formaldehyde, and creosote. Although the two former volatilise from the food, the surface retains some of the creosote. Smoking has only a surface preservative action, and does not reach the interior, so that pathogenic organisms like the tubercle bacilli, which may be present in the lymphatic glands, remain undestroyed and for some considerable time retain their virulence.

I. Forster found that the flesh of a pig affected with tuberculosis contained tubercle bacilli in a state of undiminished vigour after immersion for a month in brine, followed by careful smoking for fourteen days.

Tuberculosis material from pigs condemned for tuberculosis was subjected to the ordinary routine curing process of salting and smoking, the time occupied in the process being approximately seven weeks.

Fifteen days after the completion of the curing process a microscopical examination of these specimens revealed the presence of tubercle bacilli, and the vitality and virulence of these organisms was not noticeably affected by the curing process, for guinea pigs inoculated with this material developed tuberculosis.

It is to be remembered that the Yeerongpilly tests are not necessarily conclusive, and the foregoing is primarily in the nature of a progress report. Experiments are still in progress to ascertain the maximum period that tubercle bacilli will retain their vitality in cured tuberculous bacon.

THE QUEENSLAND SUGAR INDUSTRY.

By H. T. EASTERBY, Director of Sugar Experiment Stations.

PART V.

(b) Review of the Industry since Federation.

(Continued.)

THE question of the best means of carrying on the sugar industry in Queensland and New South Wales by white labour early engaged the attention of the first Commonwealth Parliament, and much thought was devoted to the method. The first thing to be done was to carry out the wishes of Australia generally that the Pacific Island labour should be discontinued. The idea of carrying on the sugar industry by white labour only was at that time in the nature of a huge experiment, and there were plenty of people shouting that it would fail, that no country in the world had ever attempted to grow cane by white labour and no country could. They visaged the complete ruin of the cane sugar industry in Australia, as the result.

The first Act passed by the Commonwealth Government in relation to the sugar industry (and it may be pointed out that there were thirteen Acts from 1901 to 1912) was an Act to provide for the regulation, restriction, and prohibition of labour from the Pacific Islands. It was enacted that no Pacific Island labourer should enter Australia after the 31st March, 1904, and that none should enter before 1904 without a license. During 1902, the entries were to be restricted to not more than three-quarters of the number who returned to their native islands in 1901, and during 1903 to not more than one-half of those who had so returned during 1902. No agreement for island labour was to be made or remain in force after the end of 1906. If any Pacific Islanders were found after the end of 1906 they were to be deported. An amendment to this Act was later passed, which provided that certain Pacific Islanders, such as those that had entered Australia prior to September 1879, or were of extreme age, were married, or who were in possession of freehold land, or those whose lives might be imperilled on landing on the islands, &c., could be granted certificates exempting them from deportation.

The methods for encouraging the canegrowers to employ only white labour were by means of conditions set out in the *Excise Tariff Act of* 1902. An excise of 3s. per cwt. or £3 per ton on manufactured sugar was imposed up till 1st January, 1907, less from the 1st July, 1902, a rebate of 4s. or £2 per ton on all sugar-cane delivered for manufacture in the production of which white labour only had been employed after the 28th February, 1902. The rebate was calculated on cane giving 10 per cent. of sugar, and was equivalent to £2 per ton of sugar. This rebate was to be increased or reduced according to any variation from the standard, and all rebate was to be allowed at the time of delivery of the cane.

While the amount of excise on sugar remained the same, the rebate was abolished in July, 1903, by an Act to provide for a bounty on sugar, which provided for a payment out of consolidated revenue to every grower of sugar-cane in the production of which only white labour had been employed after the 28th February, 1903 (or for a period of twelve months immediately preceding the delivery thereof), on all cane delivered for manufacture. The rate of the bounty was 4s. per ton of cane calculated as in the previous Act—viz., on cane giving 10 per cent. of sugar, and to be increased or reduced according to variation from standard. The regulations to this Act set out that the average sugar-giving contents of cane produced in each district and the consequent rates of bounty per ton of cane should be deemed to be according to the scale below for the year commencing 1st June, 1903, and for every subsequent year till altered:—

Name of District.	Average number of tons of cane to make one ton of sugar.	Average sugar-giving contents of cane.	Rate of Bounty per ton of cane.
		Per cent.	*s.* *d.*
No. 1 District	8·0	12·5	5 0
No. 2 District	8·57	11·66	4 8
No. 3 District	9·22	10·84	4 4
No. 4 District	10·0	10·00	4 0

No. 1 District embraced all that portion of Queensland north of the 19th degree of south latitude—viz., from the Herbert to Mossman.

No. 2 District.—Between 19th and 23rd degrees south latitude, embracing from Townsville to Mackay.

No. 3 District.—Between 23rd and 26th degrees south latitude, from Yeppoon to Tiaro, taking in Bundaberg, Childers, Maryborough, &c.

No. 4 District.—Between 26th degree of south latitude and the border of New South Wales, taking in Gympie, Moreton, Logan, and Albert, &c.

In 1905, in view of the fact that the Act providing for the payment of bounty on sugar was to expire in 1907, proposals were made relating to an extension of same. The then Minister of Trade and Customs for the Commonwealth (Sir William Lyne) made inquiries in connection with further expediting and maturing Federal legislation relating to the placing of the sugar industry of Australia upon a basis of exclusive white labour production. Dr. Maxwell, then Director of Sugar Experiment Stations in Queensland, was asked to reply to certain questions.

The first question was—For what further period does it appear necessary to extend the system of paying bonus on white-grown cane? In his reply to this the Director stated that three years had elapsed since the introduction of the Commonwealth legislation. The total number of canegrowers in Queensland in 1905 was estimated to

be 3,422, and the number of white growers out of this total was 2,681, or 78 per cent. of the whole. Although the number of farmers producing cane grown by white labour had largely increased, yet the figures did not necessarily convey a correct indication of the actual progress that white cane production had made to date, as the crop of 1904 was comprised as under:—

1. Black-grown cane, 947,105 tons, or 71·38 per cent.

2. White-grown cane, 379,884 tons, or 28·62 per cent.

These figures showed that at the end of the third year's operations less than one-third of the sugar production in Queensland was eligible for the bonus, although it was anticipated that the 1905 crop would show a slight increase of over a third.

The increase in the number of white growers had been mainly in the Southern and Central districts, and up to that time only small relative progress had been made in the tropical North. The Central and Southern districts were those of the closest settlement and of the more temperate climatic conditions. The earliest registrations for white-grown cane included farmers on the smallest areas. During the following two years, growers upon somewhat larger areas were able to enter upon conditions of white production. The remaining black-grown sugar areas were in the hands of some 750 large growers in the Northern districts, and by plantation owners in the Southern, or district of Bundaberg.

As to what further period it would be necessary to extend the payment of bonus, it was thought that a period of less than five years would not furnish security to nor induce owners or occupants of the larger areas to undertake the changes in expenditures, such as cutting up their estates and putting up buildings for settlers, that would attach to a conversion from black to white production. An extension for a period of seven years could claim the largest measure of support, providing the greatest security and advantage to all interests concerned.

The second question put was—Should the bonus continue to be paid in its present amount, or are there reasons for a revision? The reply to this was that, as the cost of labour had gone up since 1902, and with the progress of white production white labour would continue to command a higher compensation in the form of wages and better domestic provisions, the existing measure of bonus must, therefore, tend to fall below and not to exceed the cost of substituting white for coloured labour.

In reply to Question 3—Should a reducing scale be adopted with a view to the gradual diminution and extension of the bonus? The reply was that the measure of achievement had not yet been reached that would render the adoption of a reducing scale applicable to the situation at this time. To enforce its adoption prematurely can undo the present success and threaten the future promise that waits upon the experiment.

Question 4—Are there any reasons for a revision of the present rate of import duty? Reply—The measure of protection afforded to the home industry should be that amount which is indispensable to maintain same using the most modern means of producing against the foreign producers. If the measure of protection is raised to enable the home producer to continue to compete by the use of obsolete methods, a tribute is offered to ignorance and stagnation, with no gain to such home producer but at an unwarranted additional cost to the consumer. The present rate of import duty is £6 per ton as compared with the duty of approximately £9 per ton upon foreign sugars entering the United States of America, in which country no excise upon home-grown sugars exists. The present duty, although low, when compared with rates of duty operating in some other countries, appears to be adequate for its purpose.

Question 5—What are the foreseen effects of an increase of the excise duty? Reply—If an increase in the excise with a corresponding increase of bonus is made, it is likely to induce or force an immediate substitution of white for coloured labour in those districts where the natural and economic conditions allow at once of the change.

In concluding his remarks, Dr. Maxwell said:—

> "The undertaking of substituting white for coloured labour and of placing a tropical industry upon a basis of white production constitutes a *great experiment*. The experiment and its execution traverses natural and economic conditions that have to be consulted at every step. So far as the persons engaged in the industry are a factor, if they cannot be induced to aid the experiments by giving it a full and unbiassed trial, means may be proposed to secure their co-operation by pressure. The paramount demand of the experiment is that it shall succeed, and this requires that the fullest details of its nature, of its mode of operation, and of its ultimate probable effects shall be understood; and with these, the greatest patience, discrimination, and care in carrying the experiment out to its end."

As the result of these and other inquiries and the desire of the Commonwealth to hasten, if possible, the substitution of white for coloured labour, the *Sugar Bounty Act of* 1905 was passed. In this Act "white-grown cane" was defined as sugar-cane produced on a white plantation and in the production of which white labour only had been employed. It was provided that after 1st January, 1907, a bounty of 6s. per ton, calculated on cane giving 10 per cent. of sugar, to be increased or decreased according to variation from standard should be paid. The grower was obliged to certify to the rates of wages paid to any labour employed by him other than members of his own family.

An *Excise Tariff Act of* 1905 fixed the excise at 4s. per cwt. as from 1st January, 1907, up till 1911.

By these Acts the excise on sugar was increased, but that produced by white labour received a higher bounty. These rates were equivalent to £4 per ton excise and £3 per ton bounty, and for the respective cane districts worked out as follows:—

Name of District.	Average number of tons of cane to make one ton of sugar.	Average sugar-giving contents of cane.	Rate of bounty per ton of cane.
		Per cent.	s. d.
No. 1 District	8·00	12·5	7 6
No. 2 District	8·57	11·66	7 0
No. 3 District	9·22	10·84	6 6
No. 4 District	10·00	10·00	6 0

This had the effect of still further increasing the proportion of white-grown sugar. By 1908, white labour was producing 87·89 per cent. of the Queensland sugar crop.

Subsequent Acts in relation to the bounty and excise came into force in 1910, but these did not alter the amounts collected as excise or paid as bounty. It had been intended that the excise to be collected and the bounty to be paid in 1911 and 1912 should be two-thirds and one-third of the existing rates, but these clauses in the Sugar Excise and Bounty Acts of 1905 were to be omitted. Further conditions were embodied in the 1910 Sugar Bounty Act as to rates of wages and conditions of employment, setting out that the Minister might withhold the bounty if he found that the rates of wages and conditions of employment, or any of them, were below the standard rates and conditions of employment prescribed by any Commonwealth or State Industrial Authority, or, in the absence of any such standard applicable to the case, were below the standard rates payable and conditions of employment obtainable in the locality in which sugar is grown, or, in the absence of any such standard, are on application by the Minister to the President of the Commonwealth Court of Conciliation and Arbitration declared not to be fair and reasonable by him or by a Judge of the Supreme Court of a State, or any person or persons who compose a State Industrial Authority to whom he might refer the matter.

The question of wages to be paid to white labourers in the industry was one that exercised the Commonwealth Government from 1905 on to the end of the bounty system. In 1907, the Acting Minister for Trade and Customs stated that if the rates paid were not less than those mentioned below the payment of bounty would not be imperilled:—

	Per week and found.
During off season	22s. 6d.
For harvesting	25s.
Boys under 16	10s. to 15s.
Youths from 16 to 18	15s. to £1
Old, infirm, or non-ablebodied workers	15s. to £1

In all cases where employees were not "found," the weekly wage to be 10s. extra.

No deductions for keep from weekly wages to be made on account of wet weather; hours of labour from 50 to 60 per week.

Contract rates to be such as were mutually agreed upon between employers and employees, provided such rates were not less than an equivalent to the weekly rates above mentioned.

In 1912, fresh regulations were issued increasing the minimum rates of wages that had to be paid if bounty were to be claimed. These were as follows:—

	Per week.
Adult Labour—	
With keep	£1 16s.
Without keep	£2 8s.
Youths—	
From 16 to 18 with keep	£1 4s.
Under 16 with keep	£0 16s.

Old, infirm, or non-ablebodied men and full-bred aboriginals, £1 4s. per week with keep.

Hours of labour, 48 per week.

Where remuneration does not include keep, the value of such keep to be considered as 12s. per week; overtime for adults 1s. per hour, and 8d. per hour for youths from 16 to 18 years, and 6d. for youths under 16.

By 1912, practically all the cane was being grown by white labour, and a feeling was being manifested that the industry would be better off under State control than under that of the Commonwealth. This question gave rise to violent discussions and was freely debated for some time. The change over to State control will be dealt with in the next article.

[TO BE CONTINUED.]

Readers are reminded that a cross in the prescribed square on the first page of this "Journal" is an indication that their Subscription —one shilling—for the current year is now due. The "Journal" is free to farmers and the shilling is merely to cover the cost of postage for twelve months. If your copy is marked with a cross please renew your registration now. Fill in the order form on another page of this issue and mail it immediately, with postage stamps or postal note for one shilling, to the Under Secretary, Department of Agriculture and Stock, Brisbane.

Bureau of Sugar Experiment Stations.

ENTOMOLOGICAL HINTS TO CANEGROWERS.

By EDMUND JARVIS.

These monthly hints were first commenced by the writer in November 1923; the present issue—dealing with farming activities for the month of April—being the seventy-seventh publication of such advice notes, which describe the various insect pests of sugar-cane likely to be met with just now, how to recognise same, and approved methods for combating them. In publications of this nature it is impossible to altogether avoid a certain amount of repetition, seeing that many of the species of insects occurring, for example, during the present month of April will probably cause similar injuries to cane a year hence.

The main object aimed at, however, is to jog the memory of our growers at the critical time, when the enemy is likely to be in evidence amongst their crops.

In the case of insidious attacks from those insects which work in the dark, as it were, either in the middle of the sticks or in the basal portion of young shoots of plant or ratoon cane, it is always well to be forewarned of their presence.

Cane Inspection by the Farmer.

Growers would find it a good plan to make periodical visits of inspection throughout their cane-farms. These should be taken systematically, with view to covering, when possible, the entire area under crop. Each block should be inspected at times when the cane is from 1 to 2 feet high, and again when the sticks are 3 to 4 feet high.

During the former early stage of growth a look-out must be kept for "dead-hearts," which, if present in more than 5 per cent. of the stools, should be brought under the notice of the Entomologist at Meringa Experiment Station ('Phone 95, Gordonvale). This advice applies also to discovery during such field inspection of caterpillars eating the young cane-leaves. Any outbreaks of army worm or grass caterpillars can then be dealt with at once by means of special spraying equipment recently procured for such control work.

On the other hand, when the sticks are well advanced or are nearing maturity, such inspection work should be concentrated for the most part on the bottom of the sticks, from 3 to 12 inches above ground level, for evidence of beetle-borer attack. The presence of this weevil is usually betrayed by small elongate holes of varying shape, from $\frac{1}{16}$ inch wide to $\frac{1}{8}$ to $\frac{3}{8}$ inch in length, which are often edged with dusty matter or grains of excreta, &c., of a lighter colour than the surface of the stick, and suggestive of the boring going on inside. In the event of such damage being noticed in 10 per cent. or more of the sticks, the Entomologist should be advised, in order that steps may be taken to stop further invasion of this formidable weevil-borer.

Bacterial Disease of Grubs.

Be on the look-out for dead or dying cane-grubs exhibiting black blotches on the sides of the body or leg-joints.

These will probably be affected by bacterial disease; but, unlike those attacked by Green Muscardine fungus, instead of hardening internally remain quite flaccid, and finally decompose to a black evil-smelling mass. Growers chancing to notice grubs smitten with bacterial disease are urged to communicate at once with the Entomologist at Meringa.

Clean Cultivation Promotes Successful Fumigation of Cane Grubs.

The advice, "Whatever is worth doing is worth doing well," is familiar to all of us, and applies particularly to those cane farmers who neglect to work their soil sufficiently between the rows of cane. In the case of growers who have more land under crop than they can properly manage such neglect is usually due to want of time, which prevents them from working their cane to the best advantage.

Our chief aim, however, should be to gradually bring the first few inches of top soil into an even friable condition, and this can only be achieved by stirring it at frequent intervals, and whenever the surface becomes caked after heavy rain.

On areas liable to become grub-infested, or thought likely to be attacked by this pest, such cultivation is very important, not merely because tending to destroy a small percentage of the eggs and very young grubs, but also on account of the establishment of those level, uniform, and mechanical conditions of soil porosity which are most suitable for successful operation of the various machines used for the fumigation of cane grubs.

Apart from the question of insect control, such repeated aeration of cane land soon causes it to become "sweet," and renders available abundant plant food for young feeding-roots near the surface. Again, by breaking the surface crust evaporation of moisture is prevented by the mulch so formed, while the water rises and remains at the level occupied by the young roots of the cane.

Collecting Grubs of Cane Beetles.

Every grub of the greyback cockchafer collected by you means about twenty-seven grubs less for next season. This useful work should be kept up during ploughing operations, and constant encouragement given to insectivorous birds to pick up grubs, &c.

At present (May) these larvæ are in the second and third stages of development, and may be recognised by the width across the head, being ¼ and ⅜ of an inch respectively.

It is well to remember that this common-sense method of control for cockchafer grubs is believed in other sugar-growing countries to be very beneficial, and practised as a matter of course. The value of dried grubs of this beetle as a fertiliser is about £11 per ton, which is higher than that quoted for those of the European cockchafer.

Indications of Grub Infestation.

Signs of the presence of these insidious larvæ are likely to become noticeable during the latter half of the present month (May), when cane so injured usually assumes a yellowish tinge, which in severe attacks soon turns brown and withered.

Growers must not be too hopeful of escaping grub damage, as such manifestations will probably be delayed this season owing to the beetles having made a late emergence from the ground.

Occurrence of Green Metarrhizium Fungus.

Grubs killed by this vegetable parasite are usually noticed during the months of April to June. When attacked by this fungus the grub, instead of decomposing, retains its ordinary shape, and gradually hardening turns at first white and then olive green. At this stage it is filled with roots of the fungus, and becoming mummified and of cheese-like consistency can be easily broken into pieces.

Growers would do well to collect all such green crusted-looking grubs, crush them into powder, and thoroughly mix this with about 100 times the quantity of moist, finely-sifted soil.

Such spore-laden earth should then be sprinkled as thinly as possible in the plough furrows when cultivating land known to be liable each season to grub infestation.

CANE PRICES—NEW REGULATIONS.

The Governor in Council has approved of an Order in Council cancelling all previous assignments under the Regulation of Sugar Cane Prices Acts, and substituted fresh ones therefor.

Since the passing of the original Regulation of Sugar Cane Prices Act in 1915, there were made certain assignments of land to the various sugar-mills under the jurisdiction of the Central Sugar Cane Prices Board. The effect of the assignment was to entitle the holder of the land assigned to the benefits of awards in existence with respect to the mill which he supplied with sugar-cane.

These assignments were very wide in so far that whole blocks of land were assigned irrespective of the area of that land which was fit to grow cane. In the new assignments action is taken to define the area to which each grower is entitled

to cultivate and harvest annually. Without an assignment no grower is entitled to the benefits of the award or of the peak year scheme—that is, the scheme adopted by the industry and the Government with respect to the quantity of sugar to be included in the No. 1 Pool—that is, to the benefits of the average of the home consumption and export prices. In other words, any grower outside the peak year scheme is entitled to export prices only.

In the *Gazette* notice issuing the assignments the Minister is intimating that any grower may write to the secretary of the Central Sugar Cane Prices Board, Brisbane, so as to reach him not later than the 15th May, 1930, pointing out any error or anomaly in any assignment. If the Central Sugar Cane Prices Board recommends any alteration of the assignments before the 16th June, 1930, steps will be taken to correct the assignments.

The Central Sugar Cane Prices Board, in preparing the new assignments, generally accepted the position as they found it at the time their secretary made his visit to the various districts—that is say, broadly, the areas recommended were restricted to the actual land under cultivation at this time. This being so, the Board's attitude to the lands now assigned may be gauged by the answers to the following questions raised by the secretary of the Cairns Cane Growers' Association, the answers in question being given below. Exceptions to these answers occurred only in cases where the Board, in their recommendation, have deliberately allowed for the bringing in of new land, as, for instance, in the case of a farmer who has bought in recent years and has had no time to take full advantage of the old assignment.

Question (1).—If a grower cannot make up to his total assignment without clearing more land or without using land that was in process of being cleared in 1927, can he make use of such land?

Answer (1).—No.

Question (2).—If a grower had land under cane in 1927 that was not assigned or permitted by a mill in 1927 and his total recommendation is not sufficient to include his older assigned land and this new land, can he leave out some of the older assigned land and include the newer lands?

Answer (2).—No. This position should not arise.

Question (3).—If a recommendation is made in terms of subdivision 2 of portion 167, total 60 acres, yearly harvest 45 acres, and this subdivision consists of a larger area than 60 acres (say 100 acres), can a grower grow cane on any portion of that subdivision if he has more than 60 acres cleared and fit for growing?

Answer (3).—No.

Question (4).—If a grower starting on new land on a farm prior to 1926 finds that portion of the area selected by him for canegrowing is unsuitable, can he clear a similar acreage in substitution instead of going on with the grubbing and stumping of the old portion?

Answer (4).—No.

Question (5).—If portion of a grower's land on which he has been growing cane is washed away by floods, can he bring in an equal area of new land?

Answer (5).—Not without the permission of the Central Sugar Cane Prices Board.

Question (6).—If a grower finds that the original information tendered by him or on his behalf to the secretary of the Central Cane Prices Board in 1927 is erroneous, can he amend it?

Answer (6).—Yes.

The Board has been asked to assign lands to the Mulgrave Mill for the proposed peak year scheme, but as no Local Board has been constituted and none has been asked for by the mill or the growers, the Board is doubtful as to its powers to make such assignment.

The special *Gazette* which contains the new assignments consists of sixty-four pages and contains the assignments of the following sugar-mills:—Cattle Creek, Macknade, Victoria, Childers, Isis, Babinda, Bingera, Fairymead, Farleigh, Gin Gin, Goondi, Hambledon, Inkerman, Kalamia, Maryborough, Marian, Moreton, Mount Bauple, Millaquin, Mourilyan, Pioneer, Plane Creek, Pleystowe, Proserpine, Qunaba, Racecourse, North Eton, South Johnstone, Invicta, Mossman, and Tully.

LOCAL SUGAR-CANE PRICES BOARDS.

Millowners' Representatives, Canegrowers' Representatives, and Chairmen of the various Local Sugar Cane Prices Boards throughout Queensland have been appointed as under:—

Babinda Local Board—
Millowners' Representatives—F. A. Lamont and W. J. Ryan.
Canegrowers' Representatives—D. O. James and S. H. Warner.
Chairman—A. Anderson.

Bingera Local Board—
Millowners' Representatives—B. A. Bourke and Dr. A. Gibson.
Canegrowers' Representatives—N. Poulsen and L. G. Scotney.
Chairman—C. D. O'Brien.

Cattle Creek Local Board—
Millowners' Representatives—P. H. McLean and C. Simonsen.
Canegrowers' Representatives—R. Allen and W. G. Merrill.
Chairman—T. E. Dwyer.

Childers Local Board—
Millowners' Representatives—C. R. Fletcher and M. B. Heath.
Canegrowers' Representatives—J. Broadhurst and J. W. Clayton.
Chairman—H. B. Carney.

Fairymead Local Board—
Millowners' Representatives—E. J. A. Crabtree and E. S. Young.
Canegrowers' Representatives—P. E. Scotney and F. J. Wheeler.
Chairman—C. D. O'Brien.

Farleigh Local Board—
Millowners' Representatives—T. G. Mulherin and J. Smith.
Canegrowers' Representatives—P. Kirwan and N. Manning.
Chairman—M. Gallagher.

Gin Gin Local Board—
Millowners' Representatives—E. N. Annand and C. M. English.
Canegrowers' Representatives—J. Laurison and G. Powell.
Chairman—C. D. O'Brien.

Goondi Local Board—
Millowners' Representatives—R. T. Challinor and D. A. Williams.
Canegrowers' Representatives—W. D. Davies and R. C. Lacaze.
Chairman—A. E. Aitken.

Hambledon Local Board—
Millowners' Representatives—K. L. Cragg and L. M. Smith.
Canegrowers' Representatives—A. W. Browne and F. C. P. Curlewis.
Chairman—A. Anderson.

Inkerman Local Board—
Millowners' Representatives—H. G. Bell and W. Gibson.
Canegrowers' Representatives—S. W. Gibson and F. J. Woods.
Chairman—G. A. Cameron.

Invicta Local Board—
Millowners' Representatives—H. B. Burstall and J. L. Mullins.
Canegrowers' Representatives—P. Hayes and H. F. Hecht.
Chairman—G. A. Cameron.

Isis Local Board—
Millowners' Representatives—A. Adie and J. Alison.
Canegrowers' Representatives—W. M. Duncan and W. G. Sherrington.
Chairman—H. B. Carney.

Kalamia Local Board—
Millowners' Representatives—R. H. Calcutt and G. G. Jerdan.
Canegrowers' Representatives—B. S. Donovan and W. H. Ferguson.
Chairman—G. A. Cameron.

Macknade Local Board—
Millowners' Representatives—A. H. Edwards and J. R. Kerr.
Canegrowers' Representatives—G. Cantamessa and T. J. McMillan.
Chairman—J. A. Murray.

Marian Local Board—
Millowners' Representatives—A. J. Coyne and J. O'Neill.
Canegrowers' Representatives—J. Binstead and E. C. Walz.
Chairman—M. Gallagher.

Maryborough Local Board—
Millowners' Representatives—T. E. Braddock and O. C. Kinne.
Canegrowers' Representatives—F. F. Bertram and H. Doss.
Chairman—J. M. Bracewell.

Mil'aquin Local Board—
Millowners' Representatives—G. S. Moore and E. P. Wyllie.
Canegrowers' Representatives—T. Scotney and G. F. Tesch.
Chairman—C. D. O'Brien.

Moreton Local Board—
Millowners' Representatives—G. Greathead and W. M. Whalley.
Canegrowers' Representatives—W. Kittle and A. E. Williams.
Chairman—S. L. Stormonth.

Mossman Local Board—
Millowners' Representatives—W. H. Crawford and C. H. O'Brien.
Canegrowers' Representatives—R. D. Rex and H. B. Schnitzerling.
Chairman—T. Keleher.

Mount Bauple Local Board—
Millowners' Representatives—T. Beattie and J. C. Flanagan.
Canegrowers' Representatives—R. A. Maike and P. B. Scougall.
Chairman—J. M. Bracewell.

Mouri'yan Local Board—
Millowners' Representatives—L. J. Duffy and R. Sloan.
Canegrowers' Representatives—E. R. Campbell and J. F. McCutcheon.
Chairman—A. E. Aitken.

North Eton Local Board—
Millowners' Representatives—G. Johnson and S. H. Scougall.
Canegrowers' Representatives—G. N. Laws and C. H. C. Ross.
Chairman—T. E. Dwyer.

Pioneer Local Board—
Millowners' Representatives—B. C. J. Martin and C. S. Wynter.
Canegrowers' Representatives—B. S. Donovan and W. C. Smith.
Chairman—G. A. Cameron.

Plane Creek Local Board—
Millowners' Representatives—D. Greetham and J. C. Nicholson.
Canegrowers' Representatives—C. W. Davidson and P. McCowan.
Chairman—M. Gallagher.

Pleystowe Local Board—
Millowners' Representatives—R. Clarke and J. W. Inverarity.
Canegrowers' Representatives—M. W. R. Bowman and C. McKinley.
Chairman—M. Gallagher.

Proserpine Local Board—
Millowners' Representatives—C. C. Dodd and M. R. Gibson.
Canegrowers' Representatives—H. L. Hall and T. G. Mann.
Chairman—C. A. K. Morrison.

Qunaba Local Board—
Millowners' Representatives—G. S. Moore and W. A. Shield.
Canegrowers' Representatives—A. J. Christensen and C. F. Mittelheuser.
Chairman—C. D. O'Brien.

Racecourse Local Board—
Millowners' Representatives—J. M. Gibson and A. S. Hamilton.
Canegrowers' Representatives—A. Turner and T. J. H. Whitcomb.
Chairman—T. E. Dwyer.

South Johnstone Local Board—
Millowners' Representatives—F. Gillan and F. H. Gilmore.
Canegrowers' Representatives—R. G. O. Jones and D. V. Woods.
Chairman—A. E. Aitken.

Tully Local Board—
Millowners' Representatives—G. R. Blair and J. J. Cran.
Canegrowers' Representatives—H. Henry and H. N. Lund.
Chairman—A. E. Aitken.

Victoria Local Board—
Millowners' Representatives—N. R. Dowling and J. R. Kerr.
Canegrowers' Representatives—H. E. Hollins and G. G. Venables.
Chairman—J. A. Murray.

SOME COMMON VEGETABLE PESTS.*

By ROBERT VEITCH, B.Sc., F.E.S., Chief Entomologist.

The Cabbage Aphis.

The so-called cabbage aphis (*Brevicoryne brassicæ* L.) on occasions becomes quite abundant in Queensland cabbage crops, and when it does so it is by no means an easy pest to control. In addition to attacking cabbages it may also commonly be found on cauliflowers, turnips, brussels sprouts, radishes, and kohl-rabies.

Once it has become established in a cabbage crop it is capable of very rapid multiplication if conditions are favourable, and eventually large colonies of this greyish-blue insect can be seen on both the upper and lower surfaces of the leaves of infested plants. Like all aphids this pest lives by sucking the sap of its host plant, and if it is present in large numbers the plants will become seriously stunted and produce obviously sickly, yellowish-looking leaves. In severe infestations, some of the more heavily attacked plants may actually die off.

So far as is known, the life history of this pest has not yet been worked out in detail in Queensland, but some considerable amount of attention has been devoted to it elsewhere, particularly in North America. These investigations have shown that its life history is somewhat complicated, but the details thereof need not be discussed in these notes. Both winged and wingless females occur. The insect is a somewhat pear-shaped, soft-bodied, slow-moving individual, the body being covered with a white waxy bloom.

CONTROL MEASURES.

With respect to control, this is generally attempted by the use of either nicotine sulphate or kerosene emulsion sprays, preference now being given to the former insecticide. When the aphids are actually wet with the spray the result is quite satisfactory, but in practice difficulties exist in its application. The body of the aphis, as already mentioned, is covered with a fine film of wax which renders effective wetting of the insect a matter of some considerable difficulty. Furthermore, the aphids are so protected in their colonies on the leaves that it is frequently difficult to reach all of them with the spray.

Nevertheless, in spite of these adverse factors, spraying with nicotine sulphate, "Black-leaf 40," reduces infestation appreciably, thus allowing the young plants to continue growing. The formula that is generally recommended is ¾ pint of "Black-leaf 40" in 100 gallons of water to which 4 or 5 lb. of soap is added. Kerosene emulsion may be used if nicotine sulphate is not readily available. The preparation of this emulsion has already been dealt with in the chapter devoted to the discussion of insecticides.

Natural enemies play some part in checking this pest in Queensland, and not infrequently the aphis is heavily attacked by small wasp parasites. In spite of the presence of these beneficial insects, however, the aphis, as has been said, quite frequently gets out of hand. In such a

* Reprinted from "Pests and Diseases of Queensland Fruits and Vegetables," by Robert Veitch, B.Sc., F.E.S., and J. H. Simmonds, M.Sc. Published by the Department of Agriculture and Stock, Brisbane.

case spraying must be adopted, and in doing so it is highly desirable to commence operations as soon as there are signs of the aphis becoming unduly abundant.

The Diamond-back Moth.

The diamond-back moth (*Plutella cruciferarum* Zell.) is probably the most serious pest of cabbages in Australia. It is one of a large number of undesirable insect introductions from Europe, where it is well known as a pest not only of cabbages but also of turnips and other crops. It attacks cabbages, cauliflowers, turnips, brussels sprouts, radishes, and horse radishes, as well as some other crops of importance, and it has also been recorded from several garden flowers and from a number of weeds. It has gradually become distributed throughout the world, both in the tropic and the temperate zones. In Queensland it is considered primarily a pest of cabbages.

The very minute eggs are laid on the leaves of the cabbages, and the larvæ or caterpillars hatch out after a brief incubation period. These larvæ feed on the foliage, and eventually the attacked leaves become riddled with holes at the spots where feeding has taken place. The larvæ grow fairly rapidly, and after passing through a series of moults they attain full size when they are slightly less than ½ inch in length. They are green in colour, and are rather slender, active, spindle-shaped caterpillars clad with only a few short bristles. The full-grown larvæ cease feeding, and then pupate on the leaves in very beautiful, silken, lace-like cocoons the strands of which are so loosely woven together that the pupæ can be distinctly seen within. The moths emerge from the pupæ after the usual transformation processes have taken place.

The moth is rather a pretty little greyish-brown species with a wing-spread of about ⅔ inch, the name "diamond-back" having been conferred upon it as a consequence of the appearance the male moth presents when at rest with the wings folded. The pattern of the front wings is such that when they meet on being folded there appears a chain of three diamond-shaped marks. The wing pattern is less definite in the female moth and the same chain effect is not produced. The moth when at rest tilts its wings in a very characteristic fashion.

Control Measures.

Spraying is largely adopted for the control of the diamond-back moth, and a certain measure of success attends this procedure, although it cannot be claimed to be thoroughly effective. Arsenate of lead sprays are used against this pest, but, on account of the possible danger to the consumer, cabbages should not be sprayed with this poison after they have commenced to heart.

Kerosene emulsion has been recommended by some investigators as useful for keeping down infestation in young plants, and nicotine sulphate has been recorded as being similarly successful. Watering the cabbages with very hot water is also said to be a useful procedure, but for obvious reasons it can be adopted only on a relatively small scale. It is claimed that the water can be applied sufficiently hot to kill the caterpillars without appreciably injuring the fleshy foliage. When cabbages are grown commercially it would generally, however, be necessary to employ one of the three insecticides just mentioned, namely, arsenate of lead, nicotine sulphate, or kerosene emulsion. To achieve success, spraying must be repeated several times and must be commenced early in the life of the crop.

Stricter attention to farm hygiene than is sometimes given by cabbage-growers will also be productive of beneficial results. All too often the grower cuts the marketable cabbages, and leaves the useless ones to rot on the ground and to act as breeding grounds for myriads of cabbage moths, which naturally immediately infest any new area he may plant up in the vicinity. Where it is practicable to do so, this source of danger should be eliminated.

The cabbage-grower attempting control along the lines indicated in the preceding paragraphs will obtain some measure of relief, but it must be admitted that the control of this pest is as yet on a somewhat unsatisfactory basis.

The Pumpkin Beetle.

The pumpkin beetle (*Aulacophora olivieri* Guérin) is an important pest of cucurbitaceous plants, and it may very frequently be found in large numbers on the vines, feeding on both the foliage and flowers. It is quite the most serious Queensland insect enemy of pumpkins and allied plants.

It commonly attacks pumpkins, water-melons, rock-melons, cucumbers, and vegetable marrows. On one occasion it was also recorded in New South Wales as a pest of ripening cherries, but such an attack appears to be of a somewhat abnormal nature, and for present purposes it may be regarded exclusively as a pest of cucurbitaceous plants such as those mentioned.

The beetle, which is responsible for the destruction of the flowers and foliage, is a very conspicuous insect measuring about ¼ inch in length, the length being about twice as great as the width. It is orange-yellow in colour with two very distinct large black blotches on each wing-cover. This species is frequently referred to as a ladybird, but it is quite distinct from the ladybird beetles, which are different in outline, being decidedly rounded whereas the pumpkin beetle is definitely elongate in shape. In the leaf-eating ladybird, damage to the foliage is inflicted by both the beetles and their larvæ, but, in the case of the pumpkin beetle, foliage and flower losses are caused by the beetles alone, for their larvæ have been recorded as possessing root-frequenting habits.

CONTROL MEASURES.

With respect to the control of this pest, a certain measure of success may be obtained by spraying or dusting the attacked plants with arsenate of lead. As an alternative to spraying or dusting, the beetles, where numerous, may be collected by shaking them into shallow containers in which a mixture of kerosene and water has been placed. This operation is most successfully performed when the beetles are sluggish and do not readily take to flight on the infested plants being jarred; it should therefore be carried out in the early morning. It is particularly important to destroy any beetles that show up early in the season, and the expenditure of energy involved in the operation will generally be amply repaid if the young plants are periodically carefully examined, and the beetles found associated with them destroyed.

Young plants may be protected from attack if the seedlings are covered with some form of netting which has been stretched over a suitable framework to prevent the beetles gaining access to the seedlings. Such a protective measure, however, is practicable only on a small scale.

It will, nevertheless, tide the seedlings over a very dangerous period when the attack of a few beetles may very seriously injure or even kill the infested plant.

A further control measure that has been suggested by some investigators is to liberally dust the plants with wood ashes or lime, or alternatively with road dust. This procedure is said to act as a satisfactory repellent in outbreaks of ordinary severity.

The Bean Fly.

As a result of the presence of the bean fly (*Agromyza phaseoli* Coq.), the growing of beans in coastal Queensland is often rendered quite unprofitable during the warmer months of the year. Bean plants which may be growing under ideal conditions of soil and climate are all too frequently noticed to be in a far from flourishing condition. The plants may be wilted and stunted, and they may eventually fall over or break off and die.

The unhealthy condition of these plants is in all probability due to the presence of bean-fly infestation, and such a suspicion can be confirmed quite readily by an examination of the stalk of an affected plant. In typically infested plants the stalks will be found to be abnormally swollen in many places, and furthermore they will be seen to be frequently split open where the swellings occur. An examination within the tissue of these swollen fissured areas will usually speedily disclose the presence of the creamy-coloured maggots responsible for the damage. These feed within the tissue of the stalks and produce the effects just described. When full-grown the maggots pupate in the stalks, the pupæ being enclosed within small yellowish-brown puparia. At the end of the pupal period the very insignificant black flies emerge.

Control Measures.

It has been found in practice that the control of this pest is a matter of very considerable difficulty. The use of sprays does not offer any appreciable prospect of success, but eventually a repellent may be found that will justify application with the object of preventing the female fly from laying her eggs on the bean plants. In the meantime, however, the grower of beans must fight this pest by strict attention to market garden hygiene.

The bean-fly population may be appreciably reduced by the prompt destruction of useless infested plants. These should be pulled up and burned, instead of being allowed to remain in the ground to breed out further batches of flies from the maggots and pupæ which they are harbouring. The time devoted to the application of this quite simple control measure will generally be time well spent.

It has also been found that some measure of relief may be obtained by hilling up the plants so that they may have a chance of producing adventitious roots above the injured portions at the base of the stem.

The Onion Thrips.

The only insect pest of onions that commonly comes under the notice of the entomologist in this State is the onion thrips (*Thrips tabaci* Lindeman). This destructive little insect is a relative of the species that is responsible for "rust" in bananas.

The onion thrips is a very delicate yellow or yellowish-brown insect possessing two pairs of characteristically fringed wings and measuring about $\frac{1}{25}$ inch in length. It is practically cosmopolitan, and is a pest of a very wide range of economic plants, although for present purposes it will be considered solely as an enemy of onions.

The adult and nymphal or immature thrips both attack the leaves of the onion plant. They lacerate the surface of the foliage and feed on the plant sap where the surface has been injured. At each point of attack a small white blotch develops, and the whole plant may eventually be covered with these silvery or white blotches. The leaves wilt and fall over, and a reduction in the yield of the crop must obviously be expected when the thrips infestation is severe. The condition produced as a result of the feeding of this pest is often referred to as "white blast."

CONTROL MEASURES.

When the onion crop is infested by this thrips, spraying with nicotine sulphate should be practised. This procedure is generally productive of good results in the case of young crops, but in the older crops satisfactory application of the spray is more difficult, and results are not so good. Spraying with nicotine sulphate is, nevertheless, quite worth while even in the case of older plants. Several applications of the spray are usually necessary in order to produce the desired results.

SOME OBSERVATIONS ON THE *ONCHERCERCUS GIBSONI* IN ITS UNINCAPSULATED FORM IN QUEENSLAND CATTLE.

By J. A. RHEUBEN, Inspector of Stock, Brisbane.

Following on experiments conducted in 1920 at the Stock Experiment Station, Townsville, by Mr. A. McGown, M.R.C.V.S., and the writer, and reported in the Annual Report of the Department of Agriculture and Stock for that year, and observations made from time to time by Dr. R. W. Cilento and the writer, and reported in an article headed "The Possibilities of the Transmission of *Onchercercus Gibsoni*" published in the "Medical Journal of Australia," Vol. 1, No. 16, and the publication by Dr. Heyden of his article, "Observations of the Larvæ of the *Onchercercus Gibsoni*," published on the 3rd March, 1927, the writer was led to inquire into the cause of the presence of these larvæ.

As a result of these investigations I am now able to record that 90 per cent. of the cattle slaughtered for human consumption in the Brisbane metropolitan area are heavily infected with the unincapsulated *Onchercercus Gibsoni* in colonies of males, females, and larvæ.

On 19th February, 1929, Inspector Herbert Hunter of the Stock Department and the writer carried out investigations on twenty-nine head of cattle slaughtered at a private abattoirs at Salisbury, and of these carcasses twenty-eight were infected.

On the 4th April of this year Dr. J. Legg, Mr. G. E. Rogers, and the writer inspected fifty-three carcasses of oxen, all of which proved to be infected.

The principal sites of infection in the forequarters proved to be in the Ligamentum Nuchae and the connective tissue between the trapesius, the illeo, spinalis, and the ceratus magnus muscles.

In the hindquarters, in the connective tissue of the popliteal space the quadraceps femoris, the vastus externis, and the gastronemius muscles and also in the pocket formed by the ligament semi-membranosis at its insertion. On several occasions I have removed from these localities both sexes, the female up to 11 feet in length and males up to 1 foot.

The reason for this article is to show that one of the main seats of infestation by this parasite has not been thus far observed by previous investigations.

My thanks are due to Major A. H. Cory, Chief Inspector of Stock, for his sympathetic assistance given me during my investigations.

At a later date I propose to publish the result of my eleven years' investigations into the life history of this parasite.

SHEEP MAGGOT FLIES.

The Minister for Agriculture and Stock (Mr. Harry F. Walker) has furnished the following memorandum on Sheep Maggot Flies, submitted to him by Mr. J. Carew, Senior Instructor in Sheep and Wool.

MOISTURE on sheep is an attraction to blowflies, and it is also necessary in their development from the larvæ stage to the adult fly. In the event of a sheep dying, blowflies are likely to deposit their eggs or larvæ within a few hours. For the first week or so the carcass usually gives off a considerable amount of moisture, and as the feeding period of the larvæ only lasts from four to six days they can find sufficient moisture about the carcass to pupate, from which they emerge within two weeks. Dry and cold conditions deter their development. The first step to take to control flies is the attention to dead animals or carrion of any description, which may either be destroyed or converted into a trap of destruction by sprinkling arsenic or powder poison dip over, under, and about the medium of infestation.

In accordance with previous observations, their actual numbers did not indicate the intensity of attack, but rather that they worked up to intensive attack by waves.

Each species predominates in the adult stage at definite seasons peculiar to itself, and some of these species indicate that they cause more serious effects than others even when smaller numbers are present.

Since the experiments at Dalmally were discontinued in 1923 very little, if any, progress towards either control or prevention has been made. From about 1925 until last year the blowfly attack has been very light, no doubt owing to the drier conditions, but in some districts, chiefly during the spring of last year, they became very troublesome.

Health of Sheep a Prime Factor in Resistance of Attack.

These years of quiescence left the sheepowners rather careless regarding the protection of their flocks, as the numbers struck did not usually exceed the odd ones that were treated by hand dressing. With the advent of a fair summer rainfall and the gradual increase of the fly, no opportunity should be lost in getting the sheep in such a state as best to resist an attack. This resistance may be assisted in many ways, but the first thing to be considered is the health of the sheep.

Parasites, either internal or external, render the sheep more prone to fly attack. Internal parasites, especially stomach and intestinal worms, are the worst offenders, for when they become troublesome they cause derangement of the digestive organs, resulting in mild to severe scouring according to the severity of attack. This scouring will develop whether the sheep are on a scanty pasture or not, with the result that if flies are present the scouring sheep affords a suitable striking medium.

If the feed is green and plentiful the excreta of the sheep is likely to become soft and adhere to the wool. If a few flies are about after the first rain an increase can be expected, but, by the time they become numerous, if the dags are dry no serious attack can be expected, but should a shower of rain fall and these dags become damp a serious attack may occur. Should the sheep be crutched, shorn, dipped, or jetted beforehand, much trouble is saved and probably no complete estimate of the advantage derived from the operation, whichever it may be, is made. Should the sheep be in half wool or longer when the attack occurs, the quickest way of giving protection is the most satisfactory, for once a sheep is struck other flies are attracted, probably resulting in a severe infestation in a few days. Other sheep in the flock may be struck, but any mustering where clean sheep are brought into contact with those that are blown only encourages further trouble unless the flies are destroyed or the sheep protected.

Jetting or Dipping.

Jetting or dipping suggest themselves, for either of these methods, if properly done, will kill the maggots on the sheep as well as poison many of the flies that are attracted by the moisture in the wool. The two chief points to be considered are to see that the poisoned liquid penetrates to the skin and that it is of the desired strength.

Jetting is performed by forcing the prepared liquid through a nozzle into the crutch of the sheep. The area that should be jetted as a safeguard against the attack of the fly should be over a space extending from above the tail and carried down at each side of it to the crutch, which should take in all the stained portion.

Length of wool or the presence of dags does not matter, provided the mixture is forced to the skin. The long wool will hold more poison, thus giving a greater amount of protection. Sheep that are struck should be jetted without being crutched. When the sheep are returned to their pasture, if time permits those showing distress may be given any further treatment that may be necessary. If the wool is removed, the usual force of jet would be too severe and cause injury, if not death. A hospital paddock should be set aside for all affected sheep; this for two reasons—firstly, to save travelling and hold them in a convenient paddock; and, secondly, once a sheep is struck it is more subject to further attack and is best kept out of the healthy flock.

The Committee of Investigation under the Council for Scientific and Industrial Research, who conducted the experiments at Dalmally, concluded that jetting with

PLATE 72.—A CASE FOR TREATMENT.

a solution consisting of 7 lb. arsenic with an equal quantity of carbonate of soda to 100 gallons of water gave 90 per cent. protection for three months.

The weather at and after jetting is an important factor, but it is regarded that the quantity of arsenic in the wool of the breach is the ingredient giving protection. Many dip mixtures are on the market, those containing arsenic being the most effective in protecting sheep.

The pressure necessary varies according to the length of wool from 160 lb. per square inch for sheep carrying eight months' wool to 60 lb. per square inch for crutched or shorn sheep. Jetting in an ordinary race is not so satisfactory as where the sheep are in a raised race. The upward tendency when applying the jet is a

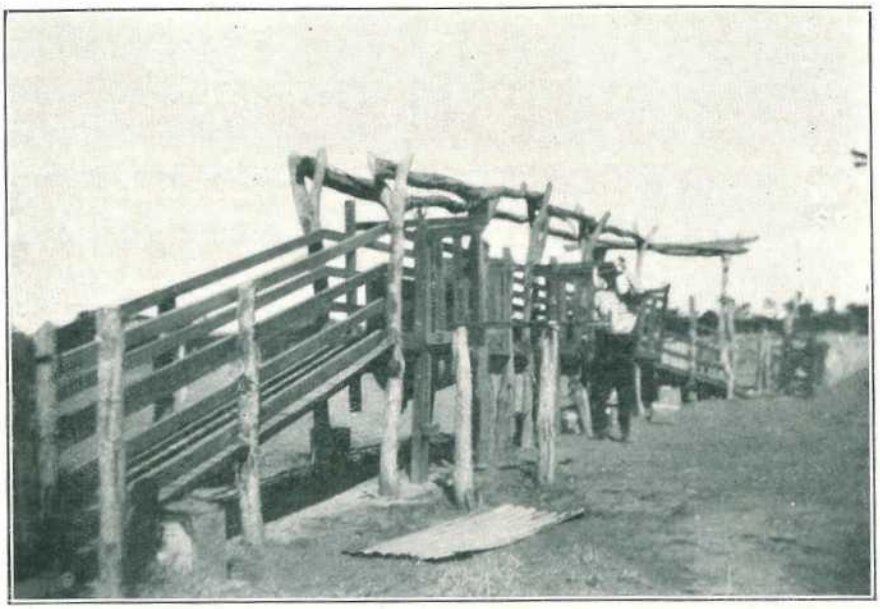

PLATE 73.—JETTING RACE, BARATRIA STATION.
Note hand raised to pull cord in closing swing gate. Total length of race 50 ft., width 16 in., height to 3 ft. 6 in.

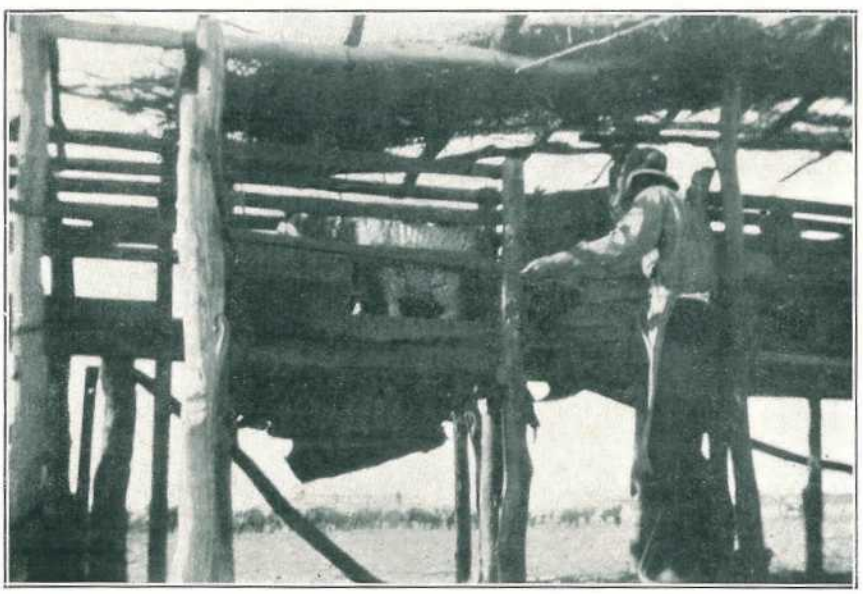

PLATE 74.—JETTING SHEEP AT BARATRIA STATION, 1929.
Note hand on lever to open sliding gate.

decided advantage, besides which the surplus mixture which falls from the wool may be recovered. This, on analysis, loses very little strength. Where small numbers are to be treated a hand-pressure pump will be sufficient, but in dealing with large numbers a power plant is more suitable.

When investigating the blowfly trouble in the Central-West last season the weight of evidence was in favour of jetting.

The Operation in Practice.—A Serviceable Plant.

Mr. Barton, Baratria Station, states that provided the jetting mixture is correct and properly applied, he has every confidence in its being the best means in protecting large flocks of sheep. On Baratria Station there are three elevated races which are the cheapest, simplest, and most economically worked that I have seen in use, and quite as efficient as any other style for thorough application. It is 50 feet in length and 3 feet 6 inches above ground level at the highest point just ahead of where the sheep is jetted. It is fitted with two sliding and one swing gate. This swing gate forms part of the side of the race. When the sheep passes this swinging gate the sliding gate is pushed across the race to hold it while being jetted. When the sheep is jetted the jet operator opens the sliding gate with his left hand by means of a long lever and at the same time opens the swing gate. The jetted sheep, seeing the opening in the race and also the jetted sheep in the yard, moves away and is followed by the next sheep, the sliding gate being pushed back to keep it in position while the swing gate is drawn back across the race by means of a rope by the man whose duty it is to keep the sheep up to the operator. This swing gate holds the next sheep back, and at the same time gives the opening in the side of the race to the operator to work the nozzle, which should be a straight jet.

The race is 16 inches wide inside measurement and is floored with battens 3 inches by 1½ inches spaced ¾ of an inch apart. The uprights in use were 3 by 2 inches hardwood, as were also the sleepers to carry the cross pieces in the race. The race is 14 feet in length, starting at the forcing yard at 6 feet, narrowing down to the race 16 inches wide. Bush timber for uprights would be suitable, as also for sleepers to carry the cross pieces in the race. These latter, as well as the cross pieces in the ramp, could also be split bush timber. While present, Mr. Barton jetted 100 sheep in twenty-five minutes, having four men keeping the sheep up to him.

If jetted sheep are blown the poison in the wool controls the growth and spread of the maggot.

Dipping.

This is another means by which both maggots and flies may be controlled and the sheep protected for several weeks.

The strength of the mixture should be at the rate of 2 lb. arsenic to 2 lb. carbonate of soda per 100 gallons of water when the wool is up to four months' growth. When the wool is longer the strength can be reduced to 1½ lb. at nine months' growth, but the longer the sheep must stay immersed.

Sheep should not be dipped immediately after shearing, but allowed about two weeks for the skin to recover and the cuts to heal. The sheep should not be thirsty or over-heated at the time of dipping. See that they are well drained before being put on the pasture, as the drips falling on the grass may be eaten by those following, which, if in sufficient quantity, would poison them. Fine weather should be selected and all sheep dipped as early as possible in order that they may become fairly dry before night.

Crutching also is an advantage, and to a great extent assists in protecting the sheep, as 90 per cent. are likely to be struck about the crutch. In picking out and crutching the sheep already struck, more harm than good is likely to be done, as mustering clean sheep and bringing them in contact with those that are blown usually causes a further spread of the trouble.

In crutching there is no attempt to deal with the fly, and it often happens that a few weeks after crutching 20 per cent. of the flock will be suffering from a fresh attack. As the maggots develop they do not find sufficient covering in the crutched part, with the result that they spread to the long wool. Their presence in the body wool soon induces flies to move to that part, where further trouble is generated.

If crutching is practised midway between shearings good must result, especially where ewes are treated, as by the time shearing comes on there is a sufficient length of wool to be properly shorn, but if the wool is short it is often missed, with the result that many sheep are turned out prone to a fresh attack at no distant date.

THE FAT LAMB INDUSTRY IN QUEENSLAND.

By J. L. HODGE, Instructor in Sheep and Wool.

THIS is a branch of the sheep industry which has been greatly neglected by the farmers of the State. The opening for very excellent profits is there, not only for farmers, but also for those graziers and pastoralists whose properties happen to be near the railway, or who are so situated that they can handle fat lambs by other means of transport, such as motor transit. The day has arrived when it is not a question if the farmer can run a few sheep, but rather whether he can afford to be without them.

Profitable Returns.

At the present time prices are depressed, but this is a condition in the industry which we have seen before with an ultimate recovery. Up to twelve months ago the prices realised in Brisbane fat stock markets have been most encouraging to the fat lamb grower, prices ranging from 7d. per lb. up as high as 9d. per lb., plus skin values, working out at an average of round about £1 per head.

On these figures the returns should be very profitable to the grower, but even at present prices they should be adequate.

Suitable Fodder Crops.

It is recommended that farmers growing fat lambs for market have some fodder crop. This should be ready when the ewes have lambed. They can then be put on with safety. Wheat, barley, oats, and panicum are all first class for the purpose, and in some cases when the flock is not too large the farmer may harvest a crop.

Attention to the Health of the Flock.

The utmost care should be taken of the health of the breeding flock.

Careful observation will detect the presence of the attacks of the blowfly. Immediate treatment is necessary to maintain the condition of the affected ewe. A letter to the Department of Agriculture and Stock will receive prompt attention and give the necessary treatment in this and other matters.

An early infestation of worms should be early detected, and the drenches recommended by the Department used.

Watch should be maintained, especially in our North Coast lands, for the attacks of scrub ticks. In fact, every care and attention should be given the flock, to which they so readily respond.

A sheep lick to suit the particular conditions of the country and flock may be advisable. In this case it is advisable to get in touch with the Department, so that a lick suitable may be prescribed.

The scientific use of a lick is to supply any proved deficiencies in soil, fodder, or water.

Care should be exercised when feeding sheep on growing lucerne. Hoven is the danger. Accustom the flock to the feed gradually, and in no case allow the flock in the cultivation during wet weather; this for two reasons—safety of the sheep firstly, and preservation of the paddock as a secondary consideration. Keep the flock away from the lucerne until well after sunrise on winter mornings. The lucerne paddock should be securely fenced to ensure the farmer being certain his intentions are carried out.

Foundation Stock.

As a basis of operations, and for the purposes of this article, I would advocate the use of a big, bulky, strong-woolled merino ewe, four to six years old. Younger ewes are not recommended on account of the possible loss in lambing. When discussing the ram to be mated with these ewes, the class of country, rainfall, and other matters must be taken into consideration. In all cases early maturity in the lamb is the object which should be constantly before the farmer.

Where some artificial feed is available, such as lucerne, a lamb should be fit for the market at from four to five months of age.

The utmost care should be taken at marking time to see that the operation is scientifically and cleanly done. The ideal time for marking, where fat lambs are in question, is from a fortnight to three weeks after birth. This gives the lambs every chance to recover and make good the loss entailed in the operation before marketing time.

Utility Sheep.

The Border Leicester-Merino ewe cross lamb is very attractive, being in every way suitable for the trade.

The Corriedale is by many Merino men regarded with some doubt on the ground of his purity. I am not one of those, maintaining that the breed may be regarded as fixed and thus able to reproduce his type. Personally, I regard the Corriedale as a very fine farmer's general utility sheep. He grows a very useful fleece of about 56 count, and crosses with the Merino splendidly.

I think it may be well here to explain what is meant by wool men when talking of a "count" with regard to wool. The simplest way to put it is to say that a "count" in the trade equals a hank. A hank is 560 yards long. A count of, say, 60 multiplied by 560 represents the length of single fibre of wool which can be spun from 1 lb., thus:—

1 lb. wool 60 count.

60 x 560 = 33,600 yards.

The Lincoln sire crossed with the big-framed Merino ewe produces a fine early maturing lamb of great size and weight. The wool cross, too, is not a bad one.

For districts where the rainfall is fairly sure and over 40 inches, especially if the country is low-lying, I am a strong advocate for the Romney Marsh-Merino cross. This sheep in swampy country will literally live and do well where others may be a total failure. The Romney grows a nice bright fleece with more character than the Lincoln, and from a wool point of view crosses splendidly with the Merino. However, the fact should never be lost sight of that in the matter of fat lambs the wool is a secondary consideration.

A cross very popular in parts of South Australia and Victoria is the Shropshire-Merino cross. The resulting lamb from this cross is exceptionally well shaped, and as they say in the trade "the leg sits well on a dish and does not hang over." The wool from the Shrop-Merino cross, however, is not to be highly recommended, being coarse and generally of low value.

Many breeders in the Southern States advocate the use of crossbred ewes mated with a purebred ram, say, Lincoln Merino cross ewe-Lincoln ram, thus giving a three-quarter bred Lincoln lamb. This plan certainly gives a very early maturing lamb, but the difficulty in Queensland is to obtain the good direct cross ewes.

On the whole, taking all things into consideration, and with the material at hand, I would advise the Queensland farmer to start off with the big, roomy, strong-woolled Merino ewe. From this start the farmer may, should he so desire, keep back his ewe lambs for future use in his business. This plan, however, entails weary waiting and the use of more country than the farmer can usually afford.

The better plan, I think, is for the farmer to start off with the Merino ewes indicated, and, when satisfied that they have served their purpose and are becoming unprofitable, to put them on the cultivation, fatten, and sell, buying more ewes of the type required to carry on the business.

Local Conditions.

To return to the sire to be mated with the ewes, many offer, and all have their points. The choice, therefore, should be greatly governed by the class of country and the rainfall generally recorded. For the Darling Downs I recommend the Border Leicester, or the Lincoln, or a Downs breed. All throw early maturing lambs.

Marketing.

It is absolutely essential, if top prices are to be obtained, that the lambs should arrive at the market or at the freezing works with the bloom on them. To achieve this object a very good plan—and one not generally practised in Queensland—is to drive the ewes with the lambs to the trucking yards and do the drafting there. The lambs then arrive at their destination right off the teat, and no great hardship is inflicted on the ewes.

Prospects of the Industry.

With the opening of the Dawson Valley country a good opportunity should present itself to the occupiers of those lands if they are carefully guided and advised in the matter of fat lamb raising, either for the local market or the overseas trade.

A good opportunity also exists for the farmers on the Atherton Tableland, both in the matter of fat lambs and wethers. In many cases it is a common occurrence for fat sheep to come in from the West to the Brisbane market and to be retrucked far away up North to satisfy the desire for mutton.

WEEDS OF QUEENSLAND.

BINDWEED (*Convolvulus arvensis*).

By C. T. WHITE, Government Botanist.

Description.—A slender twiner with long, creeping, white, underground stems any part of which broken off may form a new plant. Leaves alternate on slender stalks of about half an inch, the leaf itself (blade) halbert-shaped with backward pointing lobes at the base or a few of the lower ones more elliptic in outline and without any basal lobes, mostly about an inch long. Flowers white or pink (white on the only Queensland ones seen), bell or broadly funnel shaped, half to an inch across, borne either single or in pairs on a slender stalk (peduncle) in the leaf-axils, the peduncle bearing a couple of minute bracts about two-thirds of the way up. Capsules globular, 2-celled and mostly 4-seeded; seeds dark brown or dull black, irregularly pear-shaped with one side more or less flat, the other rounded, about $\frac{1}{8}$ inch long, the surface roughened with minute but prominent asperities.

Distribution.—A native of Europe now naturalised as a weed in most temperate countries (North America, Australia, New Zealand, &c.). In Queensland so far confined to the Darling Downs.

Common Names.—Bindweed or Field Bindweed are the commonest English names. Bell Bind, Cow Bind, and small-flowered Convolvulus or Morning Glory are other names sometimes given it. In Queensland the term Bell Vine or Bell Bind is generally applied to an allied plant—*Ipomaea plebeia*, somewhat of a pest in a few places, especially in the Lockyer district.

Botanical Name.—Convolvulus from the Latin *convolvo* (*volvi, volutum*) to roll round or entwine; *arvensis* from the Latin *arvum* a ploughed or sown field, in botany mostly used as a specific name of weeds of arable land.

Properties.—Not known to be poisonous or harmful in any way, nor on the other hand to have any economic value.

Eradication.—The Bindweed is one of the worst weed pests so far introduced on to the Downs, and farmers should eradicate it as far as possible on its first appearance. At present it seems to be confined to a few isolated patches but will undoubtedly increase once it gets a fair hold. It produces a large number of underground-running roots. Any part of these roots which is cut by a fork or plough forms a new plant. If the patch is only a small one it is probably better not to disturb the ground but to cut the young shoots and green portion down as they appear. If this is done regularly for a time the underground parts should become exhausted. A weak arsenical solution poured into the patch could be tried, and with this type of plant it may be mentioned that it is generally better to use a large amount of rather weak solution than a small amount of strong. If it is decided to fork the plant out, care should be taken that the underground roots are not carried about the farm and dropped here and there. The weed is a very bad one in Canada and parts of the United States, and the United States Department of Agriculture has issued a cyclostyled circular dealing with its eradication. This says: "The character which makes bindweed so pernicious is the possession of deep-running underground parts from which new plants arise. Even a small piece of the underground growth may develop into a new plant. Care should always be exercised to avoid scattering pieces of bindweed by means of ploughs, cultivators, &c."

Any method for the eradication of bindweed must aim to destroy the underground growth, either by direct removal, which is usually impracticable, by chemical means, or by starvation by means of constantly removing the aboveground green growth. The best methods are:—

(1) *Salting.*—The important feature in controlling bindweed is to eradicate the small patches which first appear in the field. Unless such patches are eradicated, the plant will eventually spread over the entire farm, oftentimes rendering the land valueless. The best method of eradicating patches of bindweed is to apply dry salt at the rate of from $\frac{1}{2}$ to 1 lb. of salt per square foot. If any bindweed plants survive, they should be treated to a second application of salt. The salt kills the bindweed, and makes the soil unproductive for several seasons thereafter, but barren spots in the field are far more desirable than centres of bindweed infestation.

(2) *Cultivation.*—Plant corn or any other clean-cultivated crop in check-rows. Cultivate throughout the growing season of the weed at least every ten days, preferably using the knife or sweep type of cultivator, or, in case these are not

available, use the disc cultivator but never the toothed cultivator. It may be necessary to go over the hills with the handhoe following such cultivation. Two years of this procedure should completely starve out the weed. It is well to follow the next season with a shade crop, such as buckwheat, millet, soy beans, sorghum, alfalfa, or lucerne.

(3) *Fallowing.*—Allow the land to remain fallow for an entire season, clean-cultivating at intervals of about ten days. Two seasons may be necessary to secure complete eradication. Experimental results in western Kansas indicate that large areas of bindweed can be practically eradicated by fallowing the infected land intensively for an entire season, followed by sorghum the next season. A single crop of sorghum thus secured was as heavy as the combined crops for the same period of time on land continuously in sorghum. Sorghum alone did not eradicate the weed.

SUGGESTIONS.

Alfalfa, because of its excellent smothering effect and the frequent cutting this crop receives, is one of the best all-round means of controlling bindweed in sections where alfalfa grows well. Cowpeas, sorghum, millet, soy beans, and buckwheat are also useful as smothering crops, but are rarely as successful as alfalfa. It is well to follow alfalfa with a clean-cultivated crop, such as corn.

Pigs are fond of both the underground and aboveground growth of bindweed. If the land is ploughed it will greatly assist the pigs in removing the underground parts. Sheep pasturing has been found helpful, but is not as useful a method as hog pasturing. Grazing helps to hold bindweed in check, but cannot be depended upon to secure eradication.

The use of chemicals other than salt against bindweed has not been successful except under special conditions, and is not recommended.

Care should be exercised to prevent the introduction of the pest by means of (1) impure seed, especially impure wheat seed, (2) manure—bindweed seed may be contained in the droppings or may enter manure by the addition of bedding containing bindweed seeds—and (3) thrashing outfits—thrashing machines, unless thoroughly cleaned, may carry seeds of bindweed from farm to farm.

Botanical Reference.—Convolvulus arvensis linnaeus Species Plantarum 153. 1753.

WHEN PASTURE FAILS—A WINTER FODDER REMINDER.

No artificial food can compete in cheapness with natural grass, but to rely entirely on pasture is to fail in obtaining the principal advantages from such pastures. The planting of fodder crops to supplement the supply of food afforded by pastures is a wise precaution whatever the district.

In advancing some reasons for the practice on coastal country, an instructor of the New South Wales Department of Agriculture points out that the paspalum pastures make excellent growth during the favourable summer months, but that they do not make much growth during the autumn and winter. Every dairy farmer has experienced the rapid increase in production with the flush of young grass in the spring, and has also experienced the falling off in the autumn whilst there was still an abundance of feed. The rapid increase in the spring is due to the high protein content of the young grass, which equals many of our valuable concentrates. As the grass grows and becomes coarse the protein content becomes very low, with the result that the old grass in the autumn, though abundant, is of poor feeding value. By piecing out the failing grass with green fodder crops, stock can be assured of that amount of feed required to maintain them in a state of greatest efficiency.

Once an animal becomes reduced in flesh, let the owner attempt to bring it up again to its condition of greatest usefulness as a producer, and he will have brought home to him how great his loss has been through sparing the feed. Other things being equal, the animal that consumes the greatest amount of feed gives the best return. It is also clear that if an animal gets only sufficient food for bare subsistence, the farmer gets nothing in return for his feeding. It is the amount in excess of the vital demands of the animal that is devoted by it to the formation of the product, its yield of which is the reason for its place on the farm.

RURAL LIFE IN OTHER LANDS—XII.

By the EDITOR.*

MARKET MEMORIES.

FROM the dawn of civilisation man has always wanted to sell a surplus of the things he produced, whether by a system of exchange, barter, or bargaining. Even among primitive peoples like our own aboriginals some system of inter-tribal trade operates. For instance, long before the coming of the white man to this country there were regular trade routes from one part of the continent to another. Sandalwood, pituri, and pigments for corroboees were, among other substances or commodities, the subjects of barter or exchange.

A Village Market in France.

The scene on pig day in any of the smaller Queensland towns gives some idea of market day in some of the little villages of Europe. There one may see in operation the age-old human activity—as old as agriculture itself—of bartering and bargaining the products of soil and toil.

I remember such a scene at the little old-world French village of Fauquenberques, a quaint little hamlet hidden in the fold of the open chalk downs country back of Hazebrouck, towards the channel coast. From early morning the country people, mostly shod with wooden sabots, had been clattering along the roads to town carrying their produce to market. The older women had retained their quaint peasant costume of stiff linen poke bonnets and other frills and furbelows, and, walking with them, similarly burdened, were the younger women and girls arrayed in short frocks of modern fashion, silk stockings, high-heeled shoes, and other appurtenances of up-to-date flapperdom. The contrast in costumes was most striking, and illustrated, as nothing else could do so effectively, changing times and changing country customs in the old world. The sabots worn by the older women, and the last thing in footwear by their daughters, together with the marked differences in headgear, illustrated the old and the new, the emancipation of the peasant woman, and, if you like, the revolt of modern youth.

The market square in the village soon became a scene of bustling activity. Stalls and booths were erected, and through the whole of the morning the huckstering and the bargaining, the buying and selling went on. The cattle of course were not yarded as at a Queensland sale, but were tethered to any handy post. Around the pig and other small live stock pens most of the men congregated. They were all dressed for the day in their Sunday best, but in their judgment of values, their keen scrutiny of the lots offering, their sage remarks and humorous asides and arguments with the salesman, they were very much like a crowd of farmers the world over. At times one could almost persuade himself that he was back home at a Queensland pig sale. It only wanted a few of the crowd to appear in beaver moles and "Jacky Howe" shirts to complete the parallel; the illusion was only momentary, however, for one could hardly associate rusty black swallow-tail coats and "boxer" hats with a pig sale in, say, Nanango.

A Dutch Cheese Market.

A Dutch cheese market was altogether different, the local customs and conditions, of course, having no points of resemblance. I am speaking of the regular cheese market at Alkmaar, a town in Holland of about 20,000 people, and within about an hour's run by rail from Amsterdam. From the guide book one learnt that its successful resistance to besieging Spaniards, something like three and a-half centuries ago, was one of many heroic episodes in the long fight for national independence. The long twilights there, by the way, as in other parts of Northern Europe were astonishing to an Australian. There one could read a newspaper easily by daylight at ten o'clock. Up in the far north of Scotland one had the same almost uncanny experience of reading by daylight at an hour when home in Queensland one would usually be well into the land of dreams.

At Alkmaar the cheese is delivered by canal on clumsy-looking barges. Looking down into the hold of any of these water wagons one saw shelves piled high with yellow balls of cheese. The method of discharging the cargo was interesting. A man in the boat tossed two cheeses at a time to a mate on shore, who caught them with the ease and grace of Tommy Gorman accepting a pass from the base of a scrum. The cheese balls evidently stand a good deal of knocking about. On the

* In a Radio Talk through 4QG.

canal side they were laid two deep in long, broad rows and covered with a cloth. Cheese was also brought in by carts and trucks, but the boats got the bulk of the traffic.

By the following morning there was at least an acre covered with globular cheeses laid two deep in rows. There seemed enough cheese to feed the world. By nine o'clock buyers were swarming all over the place, men in pants that seemed the forerunner of the widest Oxford bags and otherwise assortedly clad. Each was armed with a butter tester, and throwing back the covering cloth, he picked up a cheese, squeezed it and stabbed it with the tester. He did not taste the cheese, however, merely crumpled it between his thumb and fingers.

When a bargain was struck the principals shook each other's hand most effusively and then porters and weighmen came on the scene. The porters were clad all in white and wore straw hats decked out with ribbons of different colours—each colour on each hat denoting the union or guild to which its wearer belonged. Leather gear over the shoulders was hooked to the handles of long wooden crates, one man in front and another behind, like a military stretcher-bearer. The crated load was then carried into a weighing room where it was placed on a huge set of scales. The weighman, also in the uniform of his union, juggled big iron weights and placed them on the scale until the beam was level. The weight of the load was marked on one of the cheeses with what looked like red raddle or paint. The load was then taken out for delivery. The men carried the load at a stiff-legged trot calling in chorus for the crowd to clear the gangway.

Though the methods seemed rather primitive, the whole market was quickly cleared, and by about eleven o'clock it was almost empty. Export cheese, it was noted, was given a red coat of some substance which, it was said, preserves it in transit.

Holland exports yearly about 80,000 tons of cheese, valued at somewhere about £7,000,000. Dutch exports of butter amount to almost as much, and of milk, either fresh, condensed, or powdered, to about £5,000,000. Hollanders also have established a large business in other dairy products, and well over half a million of Dutch people depend directly on the cow for a living.

It was the Dutch farmer himself, working through his co-operative associations, without waiting for or asking Government assistance, who put the first firm underpinning to the structure of a vast dairying industry in his own country.

Every cheese that is sent to market anywhere in Holland bears an ingenious paper stamp, containing letters, figures, and other symbols, and a statement that means its manufacture and sale is under the supervision of an organisation called the Netherland Cheese Control. By this label every cheese can be traced, if desired, right back to its maker.

[TO BE CONTINUED.]

COLOURATION CHANGES IN BUTTER.

There is a tendency with all stored butter to become deeper in colour on its surface.

The deepening of the surface colour is due to the evaporation of moisture from the surface, which diminishes the number of water droplets, and therefore permits the rays of light to reveal more nearly the natural colour of the butter fat at the surface of the butter.

The deepening of colour in the butter surface is more pronounced in unsalted butter than in butter which is salted in the usual factory procedure.

In salted butter the variation is not so marked. This is due to the affinity of salt for water. As the surface water of the butter evaporates the salt remains, and it draws fresh moisture from surrounding portions of the butter mass, thereby maintaining a more uniform moisture content throughout the butter.

The size of the butter grain and size of the water droplets incorporated in the matter mass has an influence on the uniformity of colour.

Butter manufactured under modern factory conditions, in which the water is thoroughly incorporated in the form of minute droplets, tends to impart stable uniform colour.

REFUSE AS PIG FOOD.

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

An inquirer asks whether waste bread, stale and burnt cakes and pastry and bakery sweepings generally would be an economic food for pigs and worth buying. He also inquires if waste fruit and vegetables from the markets are good feeding stuffs. In reply we would advise the principal difficulty with all waste food products is to determine at what stage they become risky and detrimental. It is hard to place a commercial value on such products, for musty and mouldy cereal products are liable to cause serious digestive disorders, while rotten fruit and decayed vegetable matter may cause sever gastric trouble and even enteritis.

Similarly, there is invariably a good deal of variation in the quality of these products, and bakery and mill sweepings often contain numerous short pieces of string and bagging, paper, mud and dust, and other foreign matter.

I have often seen mill offal sold at 1s. per bag. This offal was not worth even the price of the containers, for the bags were old second-hands and were mostly useless. The "offal" contained hundreds of dead mice and rats, any amount of waste paper and rubbish, musty and mouldy grain, &c., and was distinctly a dangerous food to use, even when boiled. However, apart from all this, clean, dry, and wholesome stale bread, and burnt cakes, &c., are both economical and useful additions to the daily rations of pigs, so are broken biscuits, biscuit meal, &c. These products are best soaked in hot milk or water for some hours before use, but there is no occasion to boil or cook them. The foods recommended for use in conjunction with these include barley meal, maize meal, milk, pollard, greenstuffs, mineral matters, and drinking water. The purchase price of waste bread, cakes, &c. is difficult to determine; 1s. per bag is too much if there is any musty or mouldy stuff included. Possibly if these foods were valued at less than half the price of, say, pollard, it would give a lead in arriving at a valuation, which would indicate that at about £3 per ton or so they would be economical. Their chemical analysis is equally difficult to arrive at, but they are mostly fattening foods and usually carry a fairly high sugar content.

Waste Fruit.

Of waste fruit it could be said that in general it has a very low commercial value as pig food, and if cartage, bags, or cases are charged for it is doubtful if it could be used economically. Pigs will certainly eat waste fruit and appreciate same, but if it has to be paid for and if payment has to be based on quantity it would be well left alone, unless arrangements could be made for delivery at a very low rate, not including cost of cases or cartage.

To the farmer who has waste fruit and who has no other use for this than as pig food, the product can be utilised to advantage, and when balanced with concentrated meals, &c., it is well worth while; but to have a fruit merchant telephone or advise that he has 500 cases of inferior fruit for immediate sale as pig food at 1s. per case, plus cartage costs, say, 1s. per case, the fruit at 2s. per case, inclusive of all decayed, overheated, or otherwise unsuitable material, is not an attractive proposition, and serious consideration should be given to the matter before a decision is arrived at.

It seems unfortunate that this is the case, but it is so, and unless one has sufficient well-grown and developed pigs to consume the fruit to advantage there would be no profit in the transaction, and probably it would result in loss. Much the same may be said in regard to the tons of cabbage leaves, turnip tops, &c., that are carted away from vegetable markets annually. This class of food is quite good if spread over a grazing area where pigs can pick it up at their leisure as a sort of afternoon snack, but if it has to be paid for in hard cash it is difficult to decide on a commercial value that would be payable to both parties.

The stomachs of very young pigs cannot absorb these foods to the same advantage as can breeding sows, hence waste fruit and the like should not be given to young stock; they should have nothing but the very best of milk, meal, &c., plus greenstuff and minerals. Anything likely to cause gastric disorders is distinctly dangerous to young pigs, and equally so to older stock if it is in an advanced state of decomposition.

Pigs that are accustomed to swill food, waste bread, meat, vegetables, fruit, &c., will grow very much better on this food than where the diet is suddenly changed

from, say, milk and meat to a day or two's entire diet of waste fruit, vegetable leaves, &c.

In all cases the pig troughs and feeding floors should be regularly and efficiently cleaned of all accumulations of left-over food, and this waste matter should be burnt or buried, for when it becomes rancid, sour, or highly decomposed it is decidedly dangerous.

In every instance pigs fed on waste food of this description should have ample supplies of drinking water, and all putrescible food should be thoroughly cooked before use to avoid the risks associated with feeding stuff in a raw condition.

SCHOOL OF INSTRUCTION TO PIG FARMERS AT GATTON COLLEGE.

9th to 19th JUNE, 1930.

Attention is called to the annual school of instruction to pig farmers to be held at the Gatton College during the period 9th to 19th June, 1930. These schools have been organised to provide the means whereby farmers, their sons and daughters, desirous of improving their knowledge of pig raising, may come together at a convenient centre for the purpose of meeting one another and of attending practical demonstrations and lecturettes, indoor studies, &c., on every phase of pig raising.

As early application is necessary, it would be well for those interested to get in touch with the Principal of the College so that arrangements may be made in ample time before the date the school opens.

Professor Murray advises that there need be no fear on the part of the farming community with regard to attendance at this school of members of their families, for provision has been made for accommodation, meals, &c., and those attending can be assured their personal wants will not be overlooked. The social side of the life of these schools is a special feature, while before the lecture session begins opportunity is afforded for a free and easy hour for questions and answers, during which questions relative to any branch of agriculture may be asked. At these sessions officers attend who are interested with other branches of college life, such as the Plant Breeder and the Horticulturalist; in fact, question time is one of the most interesting periods of the day for those interested in orcharding, dairying, &c., as well as pig raising.

The evening cinematograph and lantern lectures are also of much interest and value and are much appreciated. As opportunity offers, prominent authorities on agriculture, apart from departmental officials, give addresses.

An added attraction in the school programme is a visit of inspection to bacon factories, for here the various operations associated with the manufacture of pork products are in full swing. Apart from the educational advantages of such a trip, the day's outing is looked forward to with a great deal of interest by those fortunate enough to attend.

The school fees are exceptionally reasonable (£3 8s. 6d. for the fortnight, covering all expenses), and concession fares on the railways are available to those attending. Further particulars may be obtained by writing to the Principal, Queensland Agricultural High School and College, T.P.O., South Gatton, or from the Department of Agriculture and Stock, Brisbane, Queensland.

It might be mentioned that at the College piggery more than 300 pigs are kept. These comprise representatives of the various breeds in Queensland, and they are bred for stud purposes as well as for the production of pork and bacon. An extensive series of experiments in the breeding of pigs has recently been added to the activities of the pig section. These experiments are under the control of the Departments of Public Instruction and Agriculture and Stock, and of the Queensland Pig Industry Committee as representing the various bacon factories.

Considerable interest is being displayed in the results of crossing the various breeds together, and this section should be of considerable interest to those attending the Pig Farmers' School. Several lecturettes will be arranged to indicate just what is being done, for the objective is to test out under farm conditions prolificacy, suitability, early maturity, and economy of production of various types of pigs. The pig section, therefore, is of the greatest educational value, and one in which farmers generally will be interested.

STOCK LICKS AND MINERAL FEEDS REGISTERED FOR 1930.

By FRED. F. COLEMAN, Officer-in-charge Seeds, Stock Foods, Fertilisers, and Pest Destroyers Branch, Department of Agriculture and Stock,

Under the Stock Foods Acts it is provided that the seller must affix to every package a plainly printed label which must clearly certify in the case of stock licks or mineral feeds—

The number of net pounds in the package ;

The distinguishing name or trade mark of the material ;

The name and principal address of the Queensland wholesale seller ; and

The chemical analysis expressed in the following manner :—

The minimum percentage of phosphoric acid (P_2O_5) and the name of the material from which it is derived ;

The minimum percentage of lime when such material has been added ;

The minimum percentage of magnesia, which can best be expressed by giving the actual percentage by weight of the magnesium sulphate present ;

The minimum percentage of iron and the form in which it occurs. This can best be expressed by giving the actual percentage by weight of the material in the form of, say, iron sulphate or iron carbonate ;

The minimum percentage of sulphur as flowers of sulphur or as ground sulphur ;

The maximum percentage of salt (sodium chloride).

Where potassium iodide has been added to the mixture, the number of ounces that would be in one ton.

In all stock licks or mineral feeds to which any mixed, concentrated, or prepared stock food or prescribed by-product has been added, the percentage by weight of such added stock food must be expressed on the label. In other words, if the ingredients of the stock lick include molasses, peanut meal, cocoa meal, bran, or other by-products, the percentage of such material must appear on the label.

The label is also required to give the specific name of each of the original materials or ingredients and the proportion or amount of the foreign ingredients.

It is now provided that bone meal, bone dust, or bone flour under whatever name sold for use in stock licks or for feeding purposes must only be made from bones obtained from animals slaughtered for human consumption, and shall be subjected for at least two hours to a steam heat at a temperature of not less than 250 deg. Fahr., equal to an indicated steam pressure of 30 lb. per square inch, and then ground to such fineness as will permit of all passing through an aperture of one-sixteenth of an inch, and at least 95 per cent. through an aperture of one-twenty-fifth of an inch.

Nauru or Ocean Island phosphate is defined as a mineral phosphate from Nauru or Ocean Island containing not less than 37 per cent. of phosphoric acid (P_2O_5), and ground to such fineness as will permit of all passing through an aperture of one-fortieth of an inch, and at least 95 per cent. through an aperture of one-hundredth of an inch.

The stock licks and mineral feeds registered for the current year are as follows:—

STOCK LICKS AND MINERAL FEEDS.

REGISTERED DURING JANUARY, FEBRUARY, MARCH, 1930, FOR THE YEAR ENDING 31ST DECEMBER, 1930.

Queensland Wholesale Dealer.	Sold under the Name of—	Dealer's Guarantee.		Composed of or Manufactured from—
		Minimum Phosphoric Acid P_2O_5.	Maximum Salt.	
A.C.F. and Shirley's Fertilizers, Ltd., Roma street, Brisbane	Kwik-Lik	14·0	45·0	Ground rock phosphate, sterilised bone meal, salt, magnesium sulphate, flowers of sulphur, sulphate of iron, and molasses
Australian Disinfectant Co., Albert street, Brisbane	Wagstaff's Medicated Stock Salt	..	90·0	Salt, flowers of sulphur, molasses, soda bicarbonate, aloes, flavouring matter, a trace of iron, 4 per cent. of bran, and contains 20 oz. of potassium iodide to the ton
Thos. Borthwick and Sons (Aust.), Ltd., Wharf st., Brisbane	Borthwick's Bomo Poultry Tonic	12·0	35·0	Sterilised bone meal, lime, salt, powdered sulphur, iron, magnesium sulphate, and contains 1½ oz. potassium iodide per 100 lb.
Ditto	Moreton Bonolik for Stock ..	12·0	45·0	Sterilised bone meal, salt, powdered sulphur, iron, magnesium sulphate, and contains 1½ oz. potassium iodide per 100 lb.
Ditto	Moreton Salbolik	8·0	66·0	Sterilised bone meal and salt
Brabant and Co., Charlotte st., Brisbane	Brablick	14·0	42·0	Sterilised bone meal, fine Nauru phosphate, salt, flowers of sulphur, sulphate of iron, magnesium sulphate, molasses, and contains 14 oz. potassium iodide to the ton
Buzacott's (Qld.), Ltd., Adelaide st., Brisbane	"Lix-all" Vitality Stock Lick	10.0	50·0	Salt, bone char, sulphur, sulphate of iron, magnesium sulphate, molasses, 4 per cent. of wheat by-products, and contains 2 oz. potassium iodide to the ton
Dalgety and Co., Ltd., Elizabeth st., Brisbane	Dalco Stock Lick I.	16·5	35·0	Ground rock phosphate, sterilised bone meal, salt, magnesium sulphate, flowers of sulphur, sulphate of iron, molasses, and contains 16 oz. potassium iodide to the ton
Ditto	Prophylactic Blue Cross Stock Lick	..	83·0	Salt, sulphur, magnesium sulphate, ferrous sulphate, sodium bicarbonate, calcium sulphate, and molasses
Denhams Ltd., Roma st., Brisbane	Iodolik—Mineral Supplement for Sheep—Concentrate	24·0	..	Sterilised bone meal, Nauru phosphate, magnesium sulphate, sulphate of iron, flowers of sulphur, peanut meal, molasses, and contains 30 oz. potassium iodide to the ton
Ditto	Iodolik—Mineral Supplement for Sheep—Dry Grass Formula	13·0	30·0	Sterilised bone meal, Nauru phosphate, salt, magnesium sulphate, sulphate of iron, flowers of sulphur, peanut meal, molasses, and contains 20 oz. potassium iodide to the ton
Ditto	Iodolik—Mineral Supplement for Sheep—Green Grass Formula	17·0	32·5	Sterilised bone meal, Nauru phosphate, salt, magnesium sulphate, sulphate of iron, flowers of sulphur, peanut meal, molasses, and contains 20 oz. potassium iodide to the ton
Ditto	Iodolik—Mineral Supplement for Cattle	16·0	32·5	Sterilised bone meal, Nauru phosphate, salt, magnesium sulphate, sulphate of iron, flowers of sulphur, peanut meal, molasses, and contains 20 oz. potassium iodide to the ton
Ditto	Iodolik—Mineral Supplement for Pigs	12·0	15·0	Sterilised bone meal, Nauru phosphate, carbonate of lime, magnesium sulphate, sodium sulphate, flowers of sulphur, sulphate of iron, bicarbonate of soda, salt, charcoal, meat meal, and contains 20 oz. potassium iodide to the ton
A. Victor Leggo and Co., 72 Albert st., Brisbane	Vigoreen (already mixed) for Sheep	1·8	85·0	Salt, whiting, di-calcium phosphate, magnesium sulphate, iron sulphate, ground sulphur, and contains 7 oz. potassium iodide to the ton
Ditto	Vigoreen (Concentrated) ..	10·9	15·0	Salt, whiting, di-calcium phosphate, magnesium sulphate, iron sulphate, ground sulphur, and contains 43 oz. potassium iodide to the ton
Ditto	Dairy Vigoreen	11·5	32·0	Salt, whiting, di-calcium phosphate, magnesium sulphate, iron sulphate, ground sulphur, and contains 7 oz. potassium iodide to the ton
Ditto	Pig Vigoreen	7·3	17·0	Salt, whiting, di-calcium phosphate, magnesium sulphate, iron sulphate, ground sulphur, and contains 7 oz. potassium iodide to the ton

STOCK LICKS AND MINERAL FEEDS—*continued.*

REGISTERED DURING JANUARY, FEBRUARY, MARCH, 1930, FOR THE YEA R ENDING 31ST DECEMBER, 1930—*continued.*

Queensland Wholesale Dealer.	Sold under the Name of—	Dealer's Guarantee.		Composed of or Manufactured from—
		Minimum Phosphoric Acid P_2O_5.	Maximum Salt.	
R. B. Lawson and Co., Stanthorpe..	Guyra Stock Lick	2·9	85·0	Salt, copper sulphate, Nauru phosphate, sterilised bone meal, magnesium sulphate, molasses, Stockholm tar, and contains 6 oz. potassium iodide to the ton
Mactaggart's Co-operative Association, Ltd., 64 Eagle st., Brisbane	Phospho Sheep and Cattle Lick	18·0	50·0	Nauru phosphate, salt, and contains 16 oz. potassium iodide to the ton
New Zealand Loan and Mercantile Agency Co., Eagle st., Brisbane	Cooper's Medico	..	..	Ground sulphur, iron, potassium salts, nicotine, vegetable spices, and tonics
Queensland Pastoral Supplies Ltd., Bowen st., Brisbane	Hibiscus Stock Lick	14·5	40·0	Salt, Nauru phosphate, magnesium sulphate, sulphate of iron, flowers of sulphur, and molasses
Ditto	Hibiscus Iodi ed Stock Lick	14·5	40·0	Salt, Nauru phosphate, magnesium sulphate, sulphate of iron, flowers of sulphur, molasses, and contains 16 oz. potassium iodide to the ton
Ditto	Hibiscus Concentrated Nutrient Stock Lick—Iodised	21·0	..	Nauru phosphate, sulphate of iron, magnesium sulphate, flowers of sulphur, molasses, 18 per cent. of cottonseed meal, and contains 16 oz. potassium iodide per 2,000 lb.
Ditto	Hibiscus Salt Lick Sulphurized	..	97·0	Salt and sulphur
Queensland Primary Producers' Co-operative Association, Ltd., Eagle st., Brisbane	"Lix-all" Vitality Stock Lick	10·0	50·0	Salt, bone char., sulphur, sulphate of iron, magnesium sulphate, molasses, 4 per cent. of wheat by-products, and contains 2 oz. potassium iodide to the ton
Webster and Co., Ltd., Mary st., Brisbane	Vita-Lick Concentrated "D"	11·7	..	Sterilised bone, superphosphate, magnesium sulphate, flowers of sulphur, sulphate of iron, 35 per cent. of rice and cocoa by-products, and contains 16 oz. potassium iodide to the ton
Ditto	Vita-Lick Concentrated "G"	18·5	..	Sterilised bone, superphosphate, magnesium sulphate, flowers of sulphur, sulphate of iron, 15 per cent. of rice and cocoa by-products, and contains 16 oz. potassium iodide to the ton
Ditto	Vita-Lick Mixed "D" ..	2.1	78·0	Salt, sterilised bone, superphosphate magnesium sulphate, flowers of sulphur, iron sulphate, 7 per cent. of rice and cocoa by-products, molasses, and contains 3 oz. potassium iodide to the ton
Ditto	Vita-Lick Mixed "G" ..	3·4	78·0	Salt, sterilised bone, superphosphate, magnesium sulphate, flowers of sulphur, iron sulphate, 3 per cent. of rice and cocoa by-products, molasses, and contains 3 oz. potassium iodide to the ton
Ditto	Special Cattle Lick Concentrated "D"	20·0	..	Sterilised bone, superphosphate, magnesium sulphate, iron sulphate, 15 per cent. of rice and cocoa by-products, and contains 16 oz. potassium iodide to the ton
Ditto	Special Cattle Lick Concentrated "G"	22·0	..	Sterilised bone, superphosphate, iron sulphate, 15 per cent. of rice and cocoa by-products, and contains 16 oz. potassium iodide to the ton
Ditto	Carbofos Medicated Blocks (black)	2·7	82·0	Salt, superphosphate, Nauru phosphate, calcium hydrate, sterilised bone, iron sulphate, and magnesium sulphate
Ditto	Vita-Lick Medicated Blocks (white)	1·5	86·0	Salt, superphosphate, Nauru phosphate, calcium hydrate, iron sulphate, and magnesium sulphate
Ditto	Por-Co-Vite	12·0	35·0	Salt, sterilised bone, carbonate of lime, flowers of sulphur, iron sulphate, magnesium sulphate, and contains 46 oz. potassium iodide to the ton
Ditto	Chic-A-Vite	19·0	..	Sterilised bone, superphosphate, magnesium sulphate, sulphate of iron, flowers of sulphur, 15 per cent. of peanut meal and rice by-products, and contains 16 oz. potassium iodide to the ton

STOCK LICKS AND MINERAL FEEDS—*continued.*

REGISTERED DURING JANUARY, FEBRUARY, MARCH 1930, FOR THE YEAR ENDING 31ST DECEMBER, 1930—*continued.*

Queensland Wholesale Dealer.	Sold under the Name of—	Dealer's Guarantee.		Composed of or Manufactured from—
		Minimum Phosphoric Acid P_2O_5.	Minimum Crude Protein.	
	STERILISED BONE MEAL AND FINELY-GROUND NAURU PHOSPHATES.			
A.C.F. and Shirley's Fertilizers, Ltd., Roma st., Brisbane	Gladstone Sterilised Bone Meal	28·0	17·0	Sterilised bones
Ditto	Zillmere Sterilised Bone Meal	24·0	22·0	ditto
Thos. Borthwick and Sons (Aust.), Ltd., Wharf st., Brisbane	Borthwick's Sterilised Bone Meal	24·0	24·0	ditto
The Poultry Farmers' Co-operative Society, Ltd., Roma st., Brisbane	"Red Comb" Steriiised Bone Meal	24·0	22·0	ditto
A.C.F. and Shirley's Fertilizers, Ltd., Roma st., Brisbane	Shirley's Finely Ground Nauru Phosphate Rock	37·0	..	Nauru and Ocean Island phosphate rock

Brisbane, 31st March, 1930.

FERTILISERS REGISTERED FOR 1930.

By FRED. F. COLEMAN, Officer-in-charge Seeds, Stock Foods, Fertilisers, and Pest Destroyers Branch, Department of Agriculture and Stock,

Under "*The Fertilisers Acts*, 1914 *to* 1916" it is provided that every person who desires to sell fertilisers should before selling or on or before the 31st day of January in each year, fill in an application for license form and enclose therewith the prescribed fee of £1 1s., sending same to the Under Secretary, Department of Agriculture and Stock, Brisbane.

Licenses under the Fertilisers Acts remain in force until the thirty-first day of December of the year of issue.

On or before the thirty-first day of January in each year, every licensed dealer is required to fill in and forward to the Under Secretary, or Officer appointed for that purpose, a Certificate of Registration of Fertilisers, setting out the ingredients of each brand of fertiliser that he is selling or proposes to sell, and the percentage of nitrogen, phosphoric acid, potash, and the forms in which these ingredients respectively occur

On the sale of any fertiliser, the licensed dealer must at the time of sale, or before delivery, give the buyer an invoice certificate.

The invoice certificate should be in the form prescribed by the Acts, and is required to set out the name of the licensed dealer, the name of the purchaser, the weight sold, name of fertiliser, including brands or trade mark if such appear on the bags; also, the chemical analysis stating the percentage of nitrogen, phosphoric acid, potash, and the forms in which they respectively occur. In the case of bone dust, meatworks fertiliser, and Nauru phosphate, the percentage of fine and coarse material must be declared.

Every bag of fertiliser sold must have attached thereto a plainly printed label clearly and truly certifying—

(*a*) The number of net pounds of fertiliser in the bag;

(*b*) The figure, trade mark, or other sign under which the fertiliser is sold;

(*c*) The chemical analysis, stating the percentage of nitrogen, phosphoric acid, and potash, and the forms in which they respectively occur, and the percentage of fine and coarse material, &c., as required by the invoice certificate.

It will, therefore, be noted that the only material difference between the invoice certificate and the printed label is that in the former the total weight of the fertiliser is stated, and in the latter the net number of pounds in the bag to which the label is attached.

The invoice certificate must agree with the Certificate of Registration forwarded to the Department of Agriculture.

A producer within the meaning of the Regulations is—

"Any licensed dealer who, whether as manufacturer, importer, or wholesale dealer, is primarily responsible for putting on the Queensland market any fertiliser, and in the case of a producer whose place of business is not within the State of Queensland, the agent of such producer who is resident in Queensland.

Every producer of fertiliser is required to forward a schedule setting out the following particulars:—

(1) The brand under which the fertiliser is known;

(2) The price per ton of the fertiliser, free on rail at Queensland works, or at Brisbane;

(3) The name and address of the manufacturer or importer of the fertiliser;

(4) The place of manufacture; and

(5) The raw materials from which the fertiliser is manufactured or prepared; and if the fertiliser contains mineral rock phosphate, Nauru phosphate, or any organic material such as leather, hoof, horn, hair, wool, waste, peat, garbage, tankage, or similar material, the percentage by weight thereof, and a statement as to the treatment or process (if any) to which the organic material has been subjected.

Producers of fertilisers are also required to furnish to the Under Secretary or other officer appointed for the purpose, a specimen of the printed label for each fertiliser registered.

It is frequently overlooked that a fertiliser is any substance or compound, produced, or prepared in any manner for *fertilising the soil or supplying nutriment to plants*, also any excrement of animals or any natural substance or natural product which is used for fertilising the soil or supplying nutriment to plants. It will, therefore, be noted that any soil or any natural substance or natural product *claimed to supply nutriment to plants comes under the Fertilisers Acts* and is required to be labelled setting out the percentages of nitrogen, phosphoric acid, and potash.

Cases are on record of soil, sludge, and incinerated town refuse being sold and claimed to be worth from 35s. to £5 per ton at seller's station. The material on analysis was found to vary in value from 10s. 9d. to just over £1. Taking the cost of bags into account and the railway freight on ton lots, it is obvious that such material is not worth the cost of transit.

Recently it was found that quite a large trade was being carried on in the Brisbane suburbs and at Ipswich with material claimed by the vendors to contain secret ingredients. On examination of samples and inspection of the premises it was found that the material principally consisted of stable manure, soil, sawdust, road sweepings, and in one case, about 5 per cent. of an ordinary meatworks fertiliser had been added. Cases are reported from North Queensland where material, the residue products of sugar mills, had been collected and sold at prices quite out of proportion to its nitrogen content. Farmers and other buyers would be well advised never to accept delivery of any material unless it has affixed to every package a plainly printed label setting out the percentages of nitrogen, phosphoric acid, and potash, and the forms in which they occur. The buyer should also receive an invoice certificate setting out the particulars that should appear on the labels. Such certificate is the seller's guarantee as to the quality of the material. In the absence of a label or invoice certificate it is obvious that the buyer should refuse delivery.

FERTILISERS REGISTERED BY PRODUCERS DURING JANUARY, FEBRUARY, MARCH, 1930, FOR THE YEAR ENDING 31ST DECEMBER, 1930.

FERTILISERS CONTAINING NITROGEN ONLY.

Registered by the undermentioned as Producers within the meaning of the Regulations.	Name of Fertiliser.	Producers Guarantee Nitrogen as—	
		Sodium Nitrate.	Ammonium Sulphate.
	Sulphate of Ammonia.		
A.C.F. and Shirley's Fertilizers, Ltd., Roma st., Brisbane	A.C.F. Sulphate of Ammonia	..	20·6
A.C.F. and Shirley's Fertilizers, Ltd., Causeway, Townsville	ditto	..	20·6
Fertiliser Distributers, Ltd., E. S. and A. Bank Chambers, Roma st., Brisbane	Sulphate of Ammonia ..	..	20·6
Webster and Co., Ltd., Mary st., Brisbane	"Crown" Brand Sulphate of Ammonia	..	20·0
	Nitrate of Soda.		
A.C.F. and Shirley's Fertilizers Ltd., Roma st., Brisbane	A.C.F. Nitrate of Soda ..	15·6	..
A.C.F. and Shirley's Fertilizers, Ltd., Causeway, Townsville	ditto	15·6	..

FERTILISERS CONTAINING PHOSPHORIC ACID ONLY.

Registered by the Undermentioned as Producers within the Meaning of the Regulations.	Name of Fertiliser.	Producers' Guarantee.				
		Phosphoric Acid.			Fineness.	
		Water Soluble.	Citrate Soluble.	From Nauru and Ocean Island Phosphate	Fine Material.	Course Material.
	Superphosphate.					
A.C.F. and Shirley's Fertilizers, Ltd., Roma st., Brisbane	Shirley's High Grade Superphosphate	20·5	0·5	..	..	..
A.C.F. and Shirley's Fertilizers, Ltd., Causeway, Townsville	ditto	20·5	0·5	..	..	..
Fertiliser Distributers, Ltd., E. S. and A. Bank Chambers, Roma st., Brisbane	Superphosphate ..	20·5	0·5	..	..	..
Gibbs, Bright, and Co., Queen st., Brisbane	"Sulphide" Superphosphate	20·5	0·5	..	..	..
Webster and Co., Ltd., Mary st., Brisbane	"Crown" Brand Superphosphate	21·0	..	..	..	..
	Basic Super.					
A.C.F. and Shirley's Fertilizers, Ltd., Roma st., Brisbane	Shirley's Basic Super ..	..	17·0	..	..	..
A.C.F. and Shirley's Fertilizers, Ltd., Causeway, Townsville	ditto	..	17·0	..	..	..
Gibbs, Bright, and Co., Queen st., Brisbane	Sulphide Basic Super ..	3·0	15·0	..	..	..
	Phosphate Rock.					
A.C.F. and Shirley's Fertilizers, Ltd., Roma st., Brisbane	Shirley's Ground Phosphate Rock	..	..	37·0	95	5

FERTILISERS CONTAINING POTASH ONLY.

Registered by the Undermentioned as Producers within the meaning of the Regulations.	Name of Fertiliser.	Producers' Guarantee Potash as—	
		Potassium Sulphate	Potassium Chloride.
	Sulphate of Potash.		
A.C.F. and Shirley's Fertilizers, Ltd., Roma st., Brisbane	A.C.F. Sulphate of Potash ..	48	..
A.C.F. and Shirley's Fertilizers, Ltd., Causeway, Townsville	ditto	48	..
Dalgety and C o .Ltd., Elizabeth st., Brisbane ..	"Stork" Brand Sulphate of Potash	48	..
Denhams Ltd., Roma st., Brisbane	Sulphate of Potash	48	..
Gibbs, Bright and Co., Queen st., Brisbane ..	ditto	48·5	..
Webster and Co., Ltd., Mary st., Brisbane	"Crown" Brand Sulphate of Potash	50	..
	Muriate of Potash.		
A.C.F. and Shirley's Fertilizers, Ltd., Roma st., Brisbane	A.C.F. Muriate of Potash ..	..	50
A.C.F. and Shirley's Fertilizers, Ltd., Causeway, Townsville	ditto	..	50
Dalgety and Co., Ltd., Elizabeth st., Brisbane ..	"Stork" Brand Muriate of Potash	..	50
Denhams Ltd., Roma st., Brisbane	Muriate of Potash	..	50
Fertiliser Distributers, Ltd., E. S. and A. Bank Chambers, Roma st., Brisbane	ditto	..	52

FERTILISERS, THE PRODUCT OF BONE MILLS, MEATWORKS, AND BACON FACTORIES.

Registered by the Undermentioned as Producers within the Meaning of the Regulations.	Name of Fertiliser.	Producers' Guarantee.				
		Nitrogen as Blood, Bone, Flesh and Offal.	Phosphoric Acid from Bone.	Fineness.		
				Fine Material.	Coarse Material.	Unspecified Material.
Dried Blood.						
A.C.F. and Shirley's Fertilizers, Ltd., Roma st., Brisbane	Dried Blood	12·0	..	76	21	3
Queensland Meat Export Co., Ltd., Mary st., Brisbane	Q.M.E. Meatworks Dried Blood (Eagle Farm)	12·0	..	56	42	2
Ditto	Q.M.E. Meatworks Dried Blood (Ross River)	12·8	..	71	27	2
Swift Australian Co., Ltd., 181 Eagle st., Brisbane	Dried Blood	12·0	..	70	20	10
Swift Australian Co., Ltd., Townsville	ditto	12·0	..	55	35	10
Bone Dust.						
A.C.F. and Shirley's Fertilizers, Ltd., Roma st., Brisbane	Normanby Bonedust ..	3·6	23·0	60	40	..
Ditto	Runcorn Bonedust ..	3·6	23·0	60	40	..
Ditto	Shirley's Bone Dust ..	3·5	23·5	70	30	..
Denhams Ltd., Roma st., Brisbane ..	Sterilised Bone Flour ..	1·0	30·0	85	15	..
Fertiliser Distributers Ltd., E. S. and A. Bank Chambers, Roma st., Brisbane	FDL Brand Vitalized Bone Meal	3·0	22·0	70	30	..
Swift Australian Co., Ltd., 181 Eagle st., Brisbane	Bone Meal	3·0	24·0	35	65	..
Swift Australian Co., Ltd., Townsville ..	ditto	3·0	24·0	35	65	..
Blood, Bone, Flesh, and Offal.						
A.C.F. and Shirley's Fertilizers, Ltd., Roma st., Brisbane	Blood and Bone	5·0	14·0	65	22	13
Thos. Borthwick and Sons (Aust.), Ltd., Wharf st., Brisbane	Brooklyn Fertilizer ..	6·6	12·1	71	24	..
Queensland Co-operative Bacon Association, Ltd., Murarrie	Atlas Brand Fertiliser ..	6·5	12·2	84	14	2
Queensland Meat Export Co., Ltd., Mary st., Brisbane	Q.M.E. Meatworks Fertilizer Plain Milled (Eagle Farm)	4·6	18·9	71	23	6
Ditto	Q.M.E. Meatworks Fertilizer Mixed Milled (Eagle Farm)	6·7	13·0	44	42	14
Ditto	Q.M.E. Meatworks Fertilizer Plain Milled (Ross River)	5·8	17·2	79	19	2
Swift Australian Co., Ltd., 181 Eagle st., Brisbane	Meatworks Fertiliser ..	5·5	10·0	55	45	..
Swift Australian Co., Ltd., Townsville ..	ditto	5·0	15·0	55	45	..
Webster and Co., Ltd., Mary st., Brisbane	Crown Bone and Offal Mixture	2·7	21·0	68	30	..

MIXED FERTILISERS (MECHANICAL MIXTURES).

Registered by the Undermentioned as Producers within the Meaning of the Regulations.	Name of Fertiliser.	Producers' Guarantee.										
		Nitrogen as—		Phosphoric Acid.				Potash as—		Fineness.		
		Ammonium Sulphate.	Blood, Bone, Flesh, and Offal.	Water Soluble.	Citrate Soluble.	From Bone.	From Rock Phosphate.	Sulphate.	Chloride.	Fine Material.	Coarse Material.	Unspecified Material.
A.C.F. and Shirley's Fertilizers, Ltd., Roma st., Brisbane	A.C.F. No. 1	2·0	3·0	..	..	13·0	..	8·0	..	60	40	..
Ditto	A.C.F. No. 3	3·5	1·5	4·0	..	10·0	..	..	7·0	60	40	..
Ditto	A.C.F. B3	5·5	1·5	4·0	..	6·0	..	..	10·5	60	40	..
Ditto	A.C.F. No. 4	2·0	2·0	2·0	..	9·0	..	12·0	..	60	40	..
Ditto	A.C.F. No. 5	2·0	1·5	5·0	..	7·0	..	..	12·0	60	40	..
Ditto	A.C.F. " Three 6 "	3·75	1·25	5·0	..	7·0	..	4·0	3·0	60	40	..
Ditto	A.C.F. No. 8	..	2·0	5·0	..	12·0	..	9·0	..	60	40	..
Ditto	A.C.F. Threights 8.8.8.	8·0	..	8·0	..	..	..	8·0	..	..	..	..
Ditto	A.C.F. Trinine 9.9.9.	7·6	1·4	..	..	9·0	..	9·0	..	60	40	..
Ditto	A.C.F. No. 12 (Muriate)	4·0	1·5	..	..	8·0	..	..	18·0	60	40	..
Ditto	A.C.F. Badgen Fertilizer	2·0	2·5	3·0	..	9·5	..	12·0	..	60	40	..
Ditto	A.C.F. Bone and Super.	..	1·7	11·0	..	10·0	..	..	..	60	40	..
Ditto	A.C.F. Planting Mixture	..	1·0	14·0	..	3·0	..	..	7·5	60	40	..
Ditto	A.C.F. Kwikgro	2·5	1·5	..	..	14·0	..	7·0	..	90	10	..
Ditto	Shirley's Fertilizer No. 5	3·0	..	12·0	..	..	..	7·0	..	..	..	..
Ditto	Shirley's Fertilizer Q. 5. Mixture	4·0	..	12·0	..	..	..	10·0	..	..	..	..
Ditto	Shirley's Fertilizer No. 8	4·1	..	16·4	..	..	..	..	..	..	..	..
Ditto	Shirley's Fertilizer No. 11	..	..	15·5	..	..	..	4·0	..	..	..	..
Ditto	Shirley's " Bana" Fertilizer	4·0	..	5·0	5·0	..	..	13·0	..	..	..	..
Ditto	Shirley's Howes' Mixture	9·0	..	..	6·0	..	..	11·0	..	..	..	..
Ditto	Shirley's Howes' Mixture (Meatworks Base)	6·5	2·5	..	..	7·0	..	11·0	..	71	26	3
Ditto	Shirley's " Tropic " Fertilizer	1·75	3·25	..	..	12·0	..	10·0	..	75	25	..
A.C.F. and Shirley's Fertilizers, Ltd., Causeway, Townsville	A.C.F. B. 3 Extra	6·0	1·0	3·0	..	3·4	3·6	10·0	..	80	20	..
Ditto	A.C.F. B. 3 Muriate	6·0	1·0	3·0	..	3·4	3·6	..	10·0	80	20	..
Ditto	A.C.F. B. 3 Northern	6·0	1·0	4·5	..	2·0	2·0	..	12·5	80	20	..
Ditto	A.C.F. Trinine 9.9.9.	7·4	1·6	..	..	9·0	..	..	9·0	80	20	..
Ditto	A.C.F. Bone and Super	..	1·7	11·0	..	10·0	..	..	..	60	40	..
Ditto	A.C.F. Howes' Mixture	6·5	2·5	..	..	7·0	..	11·0	..	80	20	..
Ditto	A.C.F. Howes' Mixture (with Muriate of Potash)	6·5	2·5	..	..	7·0	..	..	11·0	80	20	..
Ditto	A.C.F. Magnetic	8·0	1·0	2·0	..	2·0	2·0	12·5	..	80	20	..
Ditto	Shirley's Improved Drill Mixture	3·0	1·0	4·5	..	2·0	5·5	..	13·0	80	20	..
Ditto	Shirley's " Organik" Fertilizer	4·0	1·5	4·5	..	2·5	..	10·0	..	80	20	..

Thos. Borthwick and Sons (Aust.), Ltd., Wharf st., Brisbane	Moreton Fertilizer No. 1	..	4·6	..	..	14·4	..	9·6	..	72	24	..
Ditto	Moreton Fertilizer No. 2	..	..	5·3	..	16·2	..	4·8	..	81	15	..
Ditto	Moreton Fertilizer No. 3	..	2·0	3·4	3·3	10·6	..	7·6	..	80	17	..
Fertiliser Distributers Ltd., E. S. and A. Bank Chambers, Roma st., Brisbane	F.D.L. Mixture No. 3	..	2·0	1·25	2·0	9·5	2·0	..	4·5	80	20	..
Ditto	F.D.L. Mt. Etna No. 4 Fish	..	2·5	2·0	..	13·25	1·0	..	6·5	80	20	..
Ditto	F.D.L. Orchard Mixture No. 5	..	2·0	2·25	..	13·25	1·0	..	8·0	80	20	..
Ditto	F.D.L. Ratoon No. 6	..	4·5	2·0	..	12·25	..	..	10·0	80	20	..
Ditto	F.D.L. Mixture No. 10	..	7·75	1·25	..	7·25	..	..	11·0	80	20	..
Gibbs, Bright, and Co., Queen st., Brisbane	G.F.3. Special Fertilizer	..	7·0	..	9·5	0·5	..	..	10·0	..	..	..
Ditto	Howes' Mixture	..	9·0	..	6·0	..	..	..	11·0	..	..	..
Ditto	S.C. No. 4 Special Fertilizer	..	4·0	..	13·0	..	..	..	8·0	..	..	..
Ditto	Special A1 Cane Fertilizer	..	7·0	..	6·5	..	..	..	7·0	..	..	..
J. C. Hutton Pty., Ltd., Roma st., Brisbane	Hutton's Special Fertiliser	..	..	5·0	3·5	..	11·0	..	..	..	70	22	8
Ditto	Hutton's Special Complete Fertiliser		..	4·5	3·2	..	9·8	..	5·0	..	70	22	8
Webster and Co., Ltd., Mary st., Brisbane	"Crown Brand" Special Complete No. 1		4·0	..	13·5	..	..	..	7·0	..	..	..	..
Ditto	"Crown" Mixture No. 2	..	2·0	2·0	..	..	15·75	..	7·0	..	75	25	..
Ditto	"Crown" Mixture No. 3	..	3·25	2·0	..	..	16·0	..	3·5	..	75	25	..
Ditto	"Crown" Mixture No. 4	..	2·75	2·25	..	..	18·0	..	..	..	75	25	..

SYNTHETIC FERTILISERS.

Registered by the Undermentioned as Producers within the Meaning of the Regulations.	Name of Fertiliser	Producers' Guarantee.	Per cent.
Abel Lemon and Co., Pty., Ltd., Market st., Brisbane	Diammonphos (Floraphos)	Nitrogen	20·0
		Phosphoric Acid, Water Soluble	52·0
Ditto	Floranid	Nitrogen as Urea	46·0
Ditto	Nitrophoska	Nitrogen	16·5
		Phosphoric Acid	16·5
		Potash	21·5

Brisbane, 31st March, 1930.

CLIMATOLOGICAL TABLE—MARCH, 1930.

SUPPLIED BY THE COMMONWEALTH OF AUSTRALIA METEOROLOGICAL BUREAU, BRISBANE.

Districts and Stations.	Atmospheric Pressure. Mean at 9 a.m.	Shade Temperature. Means.		Shade Temperature. Extremes.				Rainfall.	
		Max.	Min.	Max.	Date.	Min.	Date.	Total.	Wet Days.
Coastal.	In.	Deg.	Deg.	Deg.		Deg.		Points.	
Cooktown	29·90	86	76	89	20	72	7,8	1,129	13
Herberton	..	78	62	84	23	52	7	377	10
Rockhampton	30·01	86	68	90	17	65	5	102	10
Brisbane	30·09	81	65	87	19	60	26	285	20
Darling Downs.									
Dalby	30·07	83	59	90	8	54	3,26,27, 30,31	262	5
Stanthorpe		76	55	84	8	46	26	230	10
Toowoomba		75	58	83	17,18	52	5,22	168	12
Mid-interior.									
Georgetown	29·89	91	66	96	17	59	7,23,24	23	2
Longreach	29·96	94	67	100	7	61	20,22	57	2
Mitchell	30·04	87	62	95	7,10	51	24	99	5
Western.									
Burketown	29·89	90	72	96	17,18,24	65	23,24	431	4
Boulia	29·92	97	69	104	10	61	27	30	1
Thargomindah	29·99	92	68	101	9	61	25	..	..

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF MARCH, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALL DURING MARCH 1930 AND 1929, FOR COMPARISON

Divisions and Stations.	Average Rainfall. Mar.	Average Rainfall. No. of Years' Records.	Total Rainfall Mar., 1930.	Total Rainfall Mar., 1929.
North Coast.	In.		In.	In.
Atherton	8·93	29	3·10	8·87
Cairns	18·20	48	14·22	29·66
Cardwell	16·17	58	7·64	25·84
Cooktown	15·32	54	11·42	10·39
Herberton	8·14	43	3·77	10·45
Ingham	15·63	38	18·51	26·25
Innisfail	26·38	49	38·03	26·46
Mossman	17·58	17	14·91	19·93
Townsville	7·56	59	1·02	9·91
Central Coast.				
Ayr	6·90	43	0·66	16·66
Bowen	5·85	59	0·64	7·41
Charters Towers ..	3·92	48	2·51	7·61
Mackay	12·40	59	4·54	11·74
Proserpine	12·65	27	7·01	15·19
St. Lawrence	5·53	59	0·51	1·98
South Coast.				
Biggenden	3·94	31	5·49	2·02
Bundaberg	5·26	47	1·77	2·49
Brisbane	5·71	79	2·85	6·59
Caboolture	7·69	43	4·30	8·53
Childers	4·67	35	1·12	3·02
Crohamhurst ..	11.41	37	7·25	7·36
Esk	4·97	43	2·87	9·53
Gayndah	3·11	59	0·77	1·06
Gympie	6·29	60	3·06	4·18
Kilkivan	3·94	51	1·99	1·22
Maryborough ..	6·09	58	3·05	2·50
South Coast—continued:				
Nambour	9·37	34	7·72	7·57
Nanango	3·50	48	1·42	2·84
Rockhampton ..	4·67	43	1·02	3·67
Woodford	8·07	43	4·00	7·72
Darling Downs.				
Dalby	2·76	60	2·62	4·10
Emu Vale	2·51	34	1·49	4·12
Jimbour	2·62	42	3·18	3·05
Miles	2·73	45	1·60	4·23
Stanthorpe	2·70	57	2·30	3·82
Toowoomba ..	3·85	58	1·68	5·65
Warwick	2·58	65	1·25	4·34
Maranoa.				
Roma	2·66	56	0·25	2·57
State Farms, &c.				
Bungeworgorai ..	1·63	16	0·22	2·23
Gatton College ..	3·25	31	3·56	4·15
Gindie	2·64	31	3·18	2·42
Hermitage	2·28	24	..	4·14
Kairi	8·40	16	2·24	7·88
Mackay Sugar Experiment Station ..	11·51	33	4·39	12·17
Warren	2·68	15	..	3·03

GEORGE G. BOND, Divisional Meteorologist

Answers to Correspondents.

BOTANY.

The following answers have been selected from the outgoing mail of the Government Botanist, Mr. C. T. White, F.L.S.:—

Dawson Valley Plants Identified.

D.H. (Theodore, Dawson Valley).—Your specimens are:—

1. *Panicum globoideum*, Shot Grass, a grass much relished by stock, highly nutritious and one of the best pasture grasses we have. It is well worth propagating on your property.
2. *Aristida* sp., the Three-pronged Spear Grass. The Aristidas or Spear Grasses are only useful as fodders in their very young stages, soon coming into seed and proving unpalatable to stock. Their value as forage is very little.
3. The specimen imperfect, but seems to be *Bryonia laciniosa*, the native Bryony, a poison vine. See pamphlet for further particulars.
4. *Vitis opaca*, a small native grape; not poisonous.
5. *Solanum* sp., a species of Potato Bush. These plants are very common in the average mixed native pasture in Western Queensland, and the green berries of most sorts possess solanine—a poisonous alkaloid—but apparently trouble from them is not very common.
6. *Malvastrum spicatum*, a common weed of the mallow family, of which I have not heard a common name.
7. *Sida corrugata*. The same remarks as apply to No. 6.
8. A plant of the *Chenopodiaceae*, or Salt Bush family; a bigger specimen is required for identification. Plants of this family are not generally regarded as poisonous, and most are recognised as useful fodders.

   Regarding your query about *Agave*, these plants are not known to be poisonous.

   Your letter is being referred back to the Chief Inspector of Stock, Major A. R. Cory, M.R.C.V.S., for further report.

A Native Dodder.

W. (Winton)—

Your specimen proved to be *Cuscuta australis*, a native dodder. The dodders are parasitic plants which soon leave the ground and become wholely parasitic on other plants. One of them is a very bad weed in Queensland and New South Wales on lucerne. The one you send is a native species and is most abundant on the coast. We have had very few specimens from inland parts, but this season, in addition to your specimen, we have received material from Saltern and Longreach, so evidently it is fairly common. It has the power of becoming a bad weed as it attacks cultivated plants as well as native herbage and weeds, though it is most frequently found on the latter. It is not known to be poisonous in any way, though if stock eat it in quantity it might cause mechanical injury by its stringy nature, but on this point we are doubtful.

Panicum palmifolium. Subterranean Clover. Molasses Grass.

J.T. (Yeppoon)—

Your grass specimen is *Panicum palmifolium*, a native of Tropical Asia, cultivated fairly extensively in most warm countries as an ornamental garden species. We do not know that it has any particular value as a fodder, but if you wish to try it out the plant is easily propagated by root division.

The Department does not stock seed of Subterranean Clover, but seed is obtainable through the ordinary commercial channels. We rather doubt, however, if you will have success with this species as far north as Yeppoon and think the best species would be the ordinary White Dutch Clover.

We do not know anybody stocking seed of Molasses Grass, but if you write to Mr. N. A. R. Pollock, Northern Instructor in Agriculture, Townsville, he might be able to put you on to a supply. The grass is grown to a limited extent in northern New South Wales, and if you wrote to Mr. J. N. Whittet, Agrostologist, Department of Agriculture, Sydney, New South Wales, he might be able to give you some information.

Pig Weed.

H.B.R. (Torrens Creek)—

Your specimen is a species of Pig Weed, *Portulacca filifolia*. It is not known to be poisonous, but the Pig Weeds, like many other succulent plants, if eaten in quantity by hungry stock are apt to bloat them severely; death, especially in the cases of travelling stock, sometimes occurring. They are not known, however, to possess any actual poisonous principle, and in fact are generally regarded as useful forage.

Rag Weed.

A.W.F. (West Burleigh)—

Your specimens represent *Ambrosia maritima*, the common Rag Weed, a native of the Mediterranean region naturalised here and there in Australia. We have had it from the neighbourhood of Burleigh and Currumbin as far back as 1915, but it does not seem to become abundant and has spread to no other locality so far as we know. It has, however, a possibility of becoming a bad weed, and on this account should be destroyed.

Panicum adspersum.

INQUIRER (Hughenden)—

The grass is *Panicum adspersum*, a native species of Panic Grass. Like other rather succulent broad-leaved members of the genus Panicum, it is a good fodder and should make excellent hay. The grass was very interesting to us as it was the first specimen we had received from Queensland, though it has been recorded for Central Australia and Northern Territory.

Datura ferox.

R.A.T. (Atherton, N.Q.)—

The specimen is *Datura ferox*, a species of Stramonium or Thorn Apple, naturalised in Queensland for some years past. The only previous locality we had for it, however, was the western Darling Downs, and this apparently is the first time the plant has made its appearance in North Queensland. Like all other members of the genus it is poisonous, and hence should be destroyed as far as possible from paddocks where it makes its appearance.

PEDIGREED STOCK—IMPORTATIONS FROM BRITAIN.

The scheme to encourage the importation of pedigree livestock from the United Kingdom into Australia by an arrangement with the shipping companies to carry the animals freight free, which has been under discussion for some years past, has been finalised, and will remain in operation till 30th September, 1931.

It is applicable only to pedigree breeding cattle, sheep, and swine produced in the British Isles, and purchased by the applicant in and imported from the United Kingdom to Australia. The main points in the scheme are: (1) that the cost of purchase must be borne by the applicant, (2) the shipping companies (with one exception) have agreed to carry the stock freight free, and (3) all other approved incidental expenses (insurance excepted) connected with the transport of the stock from the port of export in the United Kingdom to the port of import in Australia will be shared equally by the applicant, the Commonwealth and State Governments (equally), and the Empire Marketing Board.

The scheme will only apply to animals for which a certificate of full registration by a recognised stud society is furnished, together with the vendor's certificate of breeding and production record (if any), and also a certificate that the animals conform to the registered society's standard in respect of type and soundness.

Applicants must not dispose of any of the stock within a period of two years without the permission of the Minister for Agriculture, and must, at their own expense, keep every animal insured in the joint name of the applicant and the Minister. They must also make the necessary arrangements for shipment and transport, and pay the whole of the expenses, claiming on the Department of Agriculture in their State for reimbursement of the amount due by the Commonwealth and State Governments and the Empire Marketing Board.

General Notes.

Honey Board Election.

The annual election of four members for the Honey Board resulted as follows:—

Robert Victor Woodrow (Woodford)	224 votes.
Henry Edgar Fagg (South Killarney)	218 „
Owen Norman Tanner (Samford)	186 „
John Schutt (Holstein Park, Perthton)	183 „
John Duncan Colin Campbell (Hillview, Beaudesert) ..	64 „
Alexander Roy Brown (Park Ridge)	56 „
Augustus Frederick Spry (Clayfield)	50 „
Charles William Edwards (Greenbank, Kingston)	43 „

All growers owning not less than five hives of bees in movable frames and market the honey and beeswax therefrom were eligible to vote, and three of the present members (Messrs. Woodrow, Fagg, and Schutt) were re-elected. Mr. Pickering did not seek re-election, and his place will be taken by Mr. O. N. Tanner.

Messrs. R. V. Woodrow (Woodford), H. E. Fagg (South Killarney), O. N. Tanner (Samford), J. Schutt (Holstein Park, Perthton), have been appointed members of the Honey Board as from the 16th April, 1930, to 15th April, 1931.

Staff Changes and Appointments.

Mr. C. D. Hogan has been further seconded for duty as Senior Clerk (Accounts), Agricultural Bank, Brisbane, for three months as from 12th March, 1930.

Mr. P. D. Edwards has been appointed Government Representative on the Bulloo Dingo Board.

Mr. A. K. Williams has been appointed a Ranger under the Animals and Birds Acts, at Rockhampton, and Mr. J. E. Jones has been appointed a Temporary Ranger under the abovementioned Acts, with headquarters at Dalby.

The appointments of Messrs. E. R. Boyd and S. E. Pegg as Inspectors under the Dairy Produce Act have been confirmed as from 2nd September and 16th September, 1929, respectively.

Mr. J. C. Sabine, of Stanthorpe Border Gate, has been appointed an Inspector of Stock; Mr. H. B. Ford has been appointed an Inspector of Stock on probation. Mr. P. J. Short has been appointed a Temporary Inspector of Slaughterhouses, at Warwick.

The appointment of Mr. L. R. Macgregor as a Member of the Committee of Direction of Fruit Marketing until the 31st December, 1930, has been cancelled, and in his place Mr. E. Graham, Director of Marketing, or, in his absence, a Deputy to be appointed by the Minister, has been appointed a Member of the Committee of Direction until the 31st December, 1930.

Mr. J. L. F. Foran, Chemist, Stock Experiment Station, Townsville, has been appointed Analyst, Agricultural Chemical Laboratory, Brisbane, as from 1st March, 1930.

Mr. J. C. Pryde has been appointed a Temporary Inspector of Stock at Maryborough for the period from 22nd April, 1930, to 19th May, 1930, in order to relieve Mr. J. Taylor, District Inspector of Stock at Maryborough, who will be on leave for that period.

Acting Sergeant E. M. James, Officer in Charge of Police, South Johnstone, has been appointed an Inspector of Slaughter-houses; the services of Mr. P. J. Short, Temporary Inspector of Slaughter-houses at Warwick, have been continued for the period from 1st April to 30th April, 1930.

Approval has been given to the Queensland Cane Growers' Council to appoint Mr. William McRobbie, of Silkwood, South Johnstone, to be a Member to complete the representation of the South Johnstone Mill Suppliers' Committee.

The appointment of Mr. G. A. Cameron, Police Magistrate, Townsville, as Chairman of the Inkerman, Invicta, Kalamia, and Pioneer Local Sugar Cane Prices Boards has been cancelled, and, in lieu thereof, Mr. T. R. Kennedy, Police Magistrate, Bowen, has been appointed Chairman of those Local Boards.

Mr. J. W. Weir has been appointed a Temporary Ranger under the Animals and Birds Acts at Goondiwindi; and the headquarters of Mr. J. H. Jones, Temporary Ranger at Dalby, have been changed for the present to Mungindi.

Close Season for Ducks.

The present close season for ducks, which commenced on 1st October, 1929, was due to end on the 30th April, 1930. Owing to the proximity of the Easter holidays to this date, is was desired to give sportsmen the opportunity of shooting ducks during these holidays, and consequently an Order in Council has been passed ending the close season for ducks at midnight on the 17th April instead of on the 30th April, 1930. This applies only to No. 1 District for the purposes of the Animals and Birds Acts, as described in an Order in Council of the 27th March, 1930, comprising the southern part of Queensland.

Smuts of Barley—Seed Treatment.

Seed treatment with copper carbonate is not completely effective in the control of smut in oats, apparently because some of the spores are protected by the enclosing husks of the oat grain. Nor, except in the case of Skinless, is the copper carbonate treatment effective in the control of covered smut of barley. Varieties other than that mentioned should be treated by thoroughly sprinkling a heap of the seed with formalin solution (1 pint to 40 gallons water) and covering the wet heap with a bag for four to six hours to allow the vapour of the formalin to penetrate the mass. Sowing should then be carried out soon after treatment in a moist, well-prepared seed-bed.

Where formalin is used, seed should be obtained from clean crops where practicable and sowing should not be made in land infected by the smut.

Fungicide treatments of barley seed infected with loose or flying smut are unsatisfactory. The most practicable method of avoiding this disease is to select seed from crops that are free, which can be most effectively accomplished by growing a seed plot for the production of smut-free seed for the main crop. If seed treatment is to be used the hot-water method is best. The temperature used should be 52 deg. Cent. (126.6 deg. Fah.) and the time of immersion fifteen minutes.—"A. and P. Notes, New South Wales Department of Agriculture."

Government Representation.

The Minister for Agriculture and Stock, the Hon. Harry F. Walker, has announced that, in pursuance of "*The Primary Producers' Organisation and Marketing Acts,* 1926 *to* 1928," he had appointed Mr. E. Graham, Under Secretary, Department of Agriculture and Stock, and Director of Marketing, to be a Member of the following Boards for the periods set out hereunder:—

Board.	Term of Office. From.	To.
Arrowroot	1st April, 1930	14th April, 1931.
Atherton Maize	1st April, 1930	31st March, 1931.
Atherton Pig	1st April, 1930	31st December, 1930.
Butter	1st April, 1930	30th June, 1931.
Broom Millet	1st April, 1930	10th March, 1931.
Canary Seed	1st April, 1930	28th February, 1931.
Cheese	1st April, 1930	31st July, 1930.
Cotton	1st April, 1930	31st December, 1931.
Egg	1st April, 1930	30th April, 1931.
Honey	1st April, 1930	15th April, 1931.
Peanut	1st April, 1930	31st August, 1930.

Mr. Graham has also been appointed a Member of the Queensland Wheat Board until the 31st August next.

As it will be impracticable for Mr. Graham to attend all meetings of the Commodity Boards at the present time, Deputies have been appointed to represent him on those Boards. Mr. H. C. Quodling, Director of Agriculture, will attend meetings of the Wheat Board and the Canary Seed Board; Mr. A. E. Gibson, Senior Instructor in Agriculture, will attend meetings of the Arrowroot, Broom Millet, Honey, and Peanut Boards; Mr. C. McGrath, Supervisor of Dairying, has been chosen as Government Representative on the Butter and Cheese Boards; Mr. C. L. Hassell, Instructor in Agriculture, Atherton, on the Atherton Maize and Atherton Pig Boards; Mr. W. G. Wells, Cotton Specialist, on the Cotton Board; while Mr. P. Rumball, the Poultry Expert, will be the representative on the Egg Board. Although Mr. Graham has had Deputies appointed to attend meetings in his stead, this will not preclude him from giving any assistance that he may render at any time to any of the Commodity Boards that have been constituted in Queensland.

Colour Standards for Tomatoes.

A Regulation providing for colour standards for Tomatoes as "Ripe," "Coloured," or "Green," was passed on the 7th November, 1929. However, since then it has been found impracticable for tomato growers and packers to conform to these standards, and, as a result, a further Regulation has now been passed, rescinding the previous Regulation of the 7th November, 1929, which set up the abovementioned standards.

Pig Levy Regulations.

Additional Regulations have been made under "*The Fruit Marketing Organisation Acts, 1923 to* 1928," relating to a levy on figs. The Regulations are numbered from 179 to 186, and empower the Committee of Direction of Fruit Marketing to make a levy on all figs delivered to canners.

As the present crop of figs was estimated to be much in excess of the quantity that the canners offered to take, a meeting of fig growers decided to institute a levy on themselves that, in consideration of the canners taking an extra 20 tons, they might advertise to help clear this extra quantity. A ballot of fig growers being taken resulted in a majority in favour of the levy, and accordingly the new Regulations have been passed.

The Regulations provide that—

The Committee of Direction is empowered to make a levy on the growers of all figs delivered to canners from 1st January to 30th April, 1930, both inclusive.

The levy shall be on the basis of the net weight of figs delivered by them, and shall be at the rate of £2 per ton, and/or a proportionate part of £2 for each portion of a ton.

The amount of such levy shall be deducted by the Committee of Direction from amounts payable to growers on figs delivered to canners, and levy payable by any growers on figs for which they have already received payment shall be deducted from amounts later payable to such growers. All sums raised by the said levy shall be expended upon advertising in the interests of the fig growers concerned. Any fruit-grower who shall fail to pay the levy shall be guilty of an offence, and be liable to a penalty not exceeding £20, without prejudice to his liability to pay the amount of the levy. The levy shall be deemed to have been made upon the advertisement in at least one paper circulating throughout that part of the State concerned, of a resolution passed by the Committee of Direction of Fruit Marketing.

Profitable Pigs—Can any Other Reader Beat This?

Messrs. Baker Bros., of West Haldon, Greenmount, write:—

In your March issue of the Journal you ask can anyone beat Mr. Nugent's net profit of £5 from pigs for every dairy cow kept. I submit here our net profits from pigs for the last four years.

	£	*s.*	*d.*
1926.—Total milch cows kept on farm, 25.			
Net profit from pigs	229	12	9
1927.—Same number of cows.			
Net profit from pigs	153	15	10
1928.—Same number of cows.			
Net profit from pigs	148	16	5
1929.—Total milch cows kept this year, 27.			
Net profit from pigs	256	3	4

This works out at average for the four years mentioned of £7 14s. 6d. net profit from pigs for every dairy cow kept on our farm or owned by us. We did not purchase any feed for pigs over this period, other than lime and salt, the cost of which was under £2 in all. Pig feed has been grown on the farm.

I do not desire to say anything of our system of feeding more than that it is as near as we can practically follow what Professor Murray, of Queensland Agricultural High School and College, has been teaching for years, and I merely mention this to demonstrate the soundness of Professor Murray's teaching.

If these figures seem doubtful, we invite you or any of your fellow officers to inspect our books. We purchased pigs over the fours years mentioned, and all pigs were sold to Darling Downs Bacon Co.

We enclose herewith sum of 3s. as subscription (renewal) to the Agricultural Journal for the next three years.

Canary Seed Board.

The term of office of the Canary Seed Board constituted in December, 1927, expired on 28th February, 1930. On the 16th January, 1930, notice was given of the intention of the Governor in Council to extend the operation of the Canary Seed Board for a further three years. Opportunity was given to growers to petition against the issuing of an Order in Council extending the operations of the Board, but no petition was received. Consequently, an Order in Council has now been passed extending the operations of the Canary Seed Board for a further period from the 1st March, 1930, to the 28th February, 1933.

Hand Boring Outfit.

A hand-boring plant, useful for locating water has been used with good results at Cowra Experiment Farm, New South Wales. It consists of an ordinary 2-inch wood-boring auger, preferably with a screw point cut-off, and rods of ½-inch or ⅝-inch iron of sufficient length for the required depth. The iron rods comprise one short rod of about 3 ft. 6 in. in length and the remainder about 6 ft. 6 in. or 7 ft. long, each with a close hook at one end and an eye at the other end. Both the hooks and eyes require to be made small enough to pass easily down the 2-inch bore. Any blacksmith can make the rods.

A bar of ⅝-inch iron about 1 ft. 8 in. long is necessary to pass through the eye of the uppermost rod to turn the auger. An eye is also necessary on the auger, so that the rods can be hooked into it.

A commencement is made by boring the auger into the ground, withdrawing it, of course, to raise the earth to the surface, until the eye gets near the ground. The short rod is then attached and boring continued until the eye of it reaches almost to the ground surface. The auger is then withdrawn and one of the long rods attached to it, and boring continued until the eye of the long rod reaches almost to the ground, when the short rod is attached to it and boring continued until another long rod becomes necessary.

Barley Board.

On 23rd January, 1930, the Governor in Council gave notice of intention to make an Order in Council creating a Barley Board for seven years, and called for a petition for a poll to decide whether the Order should be made. A petition was handed in, and accordingly a poll was held on the 17th April, 1930, the result being 117 votes in favour of the setting up of a Barley Board, and 27 against. As the required 60 per cent. majority was procured, an Order in Council has now been made, setting up a Barley Board for a period of seven years. The Order in Council provides:—

1. All barley produced in Queensland for seven years from the date of this Order shall be a commodity under and for the purposes of the Primary Producers' Organisation and Marketing Acts.

2. There is constituted a Board in relation to barley, consisting of two elected representatives of growers and the Director of Marketing; the growers' representatives to be elected annually.

3. The Board shall be a Marketing Board.

4. All persons who, during the twelve months preceding any poll or election held in connection with the said commodity, harvested for sale barley in any part of Queensland, shall be eligible to vote.

5. The whole of the said commodity shall, upon the making of this Order, be divested from the growers thereof and become vested in and become the property of the Board as the owners thereof.

6. The provisions of the Acts are hereby extended to the said commodity and the said Board and all persons, things, and matters concerned.

The question of the constitution of a Barley Board for a period of seven years was submitted to barley growers, and the voting was as follows:—

For	117 votes.
Against	27 „

A ballot for the election of two members on this Board was also taken with this result:—

George Burton (Cambooya)	124 votes.
Michael Coleman (Nobby)	115 „
Harry Obst (Shepperd)	47 „

Are We Practical?

"I came once more on the real Goethe when it struck me in connection with his activities that he could not think of any intellectual employment without practical work side by side with it."—Dr. ALBERT SCHWEITZER.

Young Farmers and the Scrub Bull.

A notable endeavour is being made by an English young farmers' club in the direction of livestock improvement. A "Young Bull Society" has been formed under the auspices of the club, and members are purchasing pedigree bull calves, which are to be brought along for twelve months or so and then shown in competition and offered for sale. It is believed that the scheme will aid largely in the elimination of the "scrub" bull, and will raise the standard of live stock along the countryside.

Atherton Maize Board.

The successful candidates in the recent Atherton Tableland Maize Board election were:—

Harold Henry Collins, Atherton;
Lyall Reginald Crouch, Atherton;
John Gargan, Atherton;
William Bailey, Atherton;
Richard Ernest Moss, Tolga.

Messrs. Collins, Crouch, and Bailey were members of the old Board.

There were twelve candidates. The new Board will hold office for a term of one year as from the 1st April, 1930.

The Royal Society of Queensland.

The Annual Meeting of the Society was held in the Geology Lecture Theatre of the University at 8 p.m. on Monday, 31st March, 1930. The President, Professor J. P. Lowson, occupied the chair, and about sixty members and visitors were present. The Annual Report and Balance-sheet were adopted.

The following officers were elected for 1930:—President, Mr. J. B. Henderson, F.I.C.; Vice-Presidents, Prof. J. P. Lowson, M.A., M.D. (*ex officio*) and Dr. D. A. Herbert; Hon. Secretary, Mr. F. A. Perkins, B.Sc. Agr.; Hon. Librarian, Mr. W. D. Francis; Hon. Treasurer, Mr. E. W. Bick; Hon. Editors, Mr. H. A. Longman, F.L.S., C.M.Z.S., and Dr. W. H. Bryan, M.C.; Hon. Auditor, Prof. H. J. Priestley, M.A.; Members of Council, Dr. R. W. Cilento, Dr. T. G. H. Jones, Mr. J. A. Just, M.I.M.E., Prof. H. C. Richards, D.Sc., and Mr. C. T. White.

The following were proposed for ordinary membership:—Mr. A. J. Stoney, B.E.E., proposed by Dr. Herbert and Mr. Perkins; Dr. J. M. Roe, proposed by Mr. Buhot and Mr. Perkins; Mr. E. M. Shepherd, B.E., proposed by Mr. E. J. Wood and Mr. Perkins. Messrs. D. O. Atherton and H. K. Lewcock, M.Sc., were unanimously elected ordinary members of the Society.

The President moved and Prof. Richards seconded the following motion, which was carried unanimously:—"That a message be sent to Sir Douglas Mawson, Capt. Davis, Prof. Harvey Johnston, and the rest of their party congratulating them on their safe return and the wonderful work achieved."

Prof. J. P. Lowson delivered his Presidential Address, entitled "Recent Psychology." On the motion of Prof. Goddard, seconded by Prof. Scott Fletcher, a vote of thanks was accorded the retiring President for his address. Prof. H. C. Richards and Mr. H. Longman expressed the Society's appreciation of the presence of His Excellency the Governor.

The Minister for Agriculture.

Thus the "Queensland Producer" of 2nd April:—

"This journal has at various times in the past, particularly when Mr. Walker was in opposition, deemed it desirable to call in question certain actions of Mr. Walker. We reserve to ourselves the right to express opinions with respect to the attitude of any public man in relation to agricultural organisation. We feel bound to say, however, that since Mr. Walker became Minister for Agriculture he has certainly made good. He has gone out of his way to get down to bedrock as to what the producers' problems really are. He has made himself most approachable and has been prepared to listen to suggestions and also to statements by producers' representatives of their difficulties, and he has done so with the utmost patience and consideration. Mr. Walker has been working very long hours and has certainly devoted himself to the cause of the farmers of Queensland.

"He has also taken a very big view of the possibilities of the development of Queensland agriculture, and his Wheat Agreement Scheme, designed to bring about increased production of wheat, was a masterpiece, and brought about harmony between the Wheat Board and the millers where formerly there was discontent and continual strife. His attitude in establishing the Banana Industry Protection Board was a big move. His broadminded action in collaborating with the Hon. F. M. Forde in a big forward step to develop the cotton industry is typical of the way in which Mr. Walker sheds the political aspects for wider national point of view."

Native Birds—Variation of Open Season.

Orders in Council have been issued under "*The Animals and Birds Acts*, 1921 *to* 1924," providing for a variation of the open season for certain native birds in Queensland. For this purpose the State has been divided into three districts, instead of two as hitherto. The Southern District (No. 1) comprises the pastoral districts of Moreton, Darling Downs, Wide Bay, Burnett, Maranoa, Warrego, Gregory South, and that portion of Leichhardt south of the 25th parallel of south latitude. The Central District (No. 2) consists of the pastoral districts of Port Curtis, South Kennedy, and Gregory North, that portion of Leichhardt north of the 25th parallel of south latitude, and that portion of Mitchell south of the 22nd parallel of south latitude. The Northern District (No. 3) comprises the pastoral districts of Cook, Burke, and North Kennedy, and that portion of Mitchell north of the 22nd parallel of south latitude.

In pursuance of an Order in Council issued on 27th March, the open season will extend from the 1st May to the 30th September in the Southern District, from the 1st July to the 30th November in the Central District, and from the 1st June to the 31st October in the Northern District, in respect of the following birds:—

Brush or Scrub Turkey;
Budgerigah or Shell Parrot;
Bustard or Plain Turkey;
Bald Coot, Swamp-hen, or Redbill;
Black Moor-hen or Water-hen;
Cockatoo Parrot or Quarrion;
Dotterel, all species excepting Sand Dotterels;
Emu;
Goose and Duck, all species excluding Black Swan;
King Parrot;
Long-billed Cockatoo or Corella;
Lorikeets or Honey Parrots;
Native Hen;
Pigeon and Dove, all wild species except "Squatter," "Whampoo," and "Nutmeg";
Plover, all species excepting Golden Plover;
Quail, all species;
Redwing Parrot;
Ring-neck Parrot;
True Coot.

Sportsmen in Southern Queensland are specially requested to note that the variation involves the postponement of the opening of the season for the birds mentioned, until the 1st May next.

No variation has been made in respect of those native birds or animals which are totally protected throughout the State.

The Master Stockman.

With glad acclaim and bearing garlands bright and wreaths of bay
We sing the glories of the fecund fields where herdsmen-shepherds hold their gentle sway!
In pastures green, by running brooks; in bosky dells, in grassy nooks,
The distant mellow jangling of sweet bells proclaims the peaceful paths
Of lowing herds and fleecy flocks, the gifts supreme of husbandry.

Blessed be the land on which they graze! And blessed those who guide them on their ways!
Wielders of power that verges on the infinite itself!
Dreamers of dreams who live to see their dreams come true!
Workers of miracles in a world that's all their own!
Keepers of keys to life's most hidden mysteries!
Let kings and lords of lesser human realms make way!
While all the nations from the depths of grateful hearts
Unite to crown the master stockman master of the art of arts!

—A.H.S., in "The New Breeder's Gazette," Chicago.

Chinchilla Rabbit Skin Values.

An extract from Bulletin No. 5, Department of Industries and Commerce, New Zealand, containing a summary of the finance, trade, and industries of the Dominion for the quarter and year ended 31st December last, has been brought under the notice of the Minister for Agriculture and Stock (Mr. H. F. Walker).

In this summary it is noted that the prices of Chinchilla rabbit skins have fallen to a considerable extent, together with the prices of other furs. At a sale in London during the period under review, when only 18,000 skins were sold out of 40,000 offered by the Hudson's Bay Company, prices realised for the quantity sold were as follows:—

Firsts	1s. 5d. to 3s. each.
Seconds	6d. to 1s. 6d. each.
Thirds	6d. to 9d. each.

The Mininster drew attention to the fact that this confirmed information recently supplied to him by the Agent-General in London, and which has already appeared in the Press.

Larry.

(To the late Larry Doyle, Stock Inspector, a man among men.)

The outback tracks where the mobs go through,
Where spinifex wither and spoil;
The dusty plains where gidyeas grew,
Were friends of Larry Doyle,
Where a man's size job is done each day,
And the law of the plain is old;
Not every man, as Doyle, could say,
"Honour was dearer than gold."

Though death came quick in his splendid year,
And we are poor with his loss;
Many a man will stay a tear,
Where a mother bears her cross.
"They oft die young, the Gods must take,"
E'er life has fashioned her coil,
But Oh, we are proud for the outback's sake,
There are men, "Real men like Doyle."

—James M Matheson, Mount Isa, in the "Cloncurry News."

The late Mr. Lawrence P. Doyle, Inspector of Stock at Mount Isa, in the far nor'-west of the State, was accidentally drowned in flood waters while attempting to cross Lagoon Creek, near Mount Isa, on 4th February last. He was a promising and valued officer of this Department. —Ed.

The Farmer's Intelligence.

Although the world's oldest industry, the cultivation of the land is even now treated with indifference by a section of the public, which—forgetful of the fact that without the farmer it could not exist—regards the tiller of the soil as an inferior being, deficient in all those qualities of business, thrift, and application of which it believes itself to be the sole possessor. That this was not always the case is clear from the works of some of the greatest writers of ancient times, all of whom gave to agriculture the first place among the professions of man.

Virgil, one of the greatest poets of all time, regarded the art of husbandry as of so much importance as to devote the best of all his wonderful poems to the description of its various branches; Ovid extolled the joys of country life, and the Greek historian Herodotus has left records that tell the methods employed by the ancient Egyptians in rendering their country the granary of the world.

These writers gave to the farmer the credit of being the possessor of more than average intelligence and skill, qualities without which the modern agriculturist would long ago have failed to hold his own in the markets of the world.—"Live Stock Journal" (England).

Czech Women and Farming.

"Back to the land" has been a slogan in various countries for many years, but nowhere has this cry been heard with such enthusiasm that it has become a national creed as in the prosperous Bohemian Republic of Czechoslovakia, which came into existence after the World War, when the Austrian Empire was split up into small independent States. Men and women, young and old, are trained to take its cultivation seriously. In towns and countryside schools have opened where women as well as men may acquire practical knowledge in everything which pertains to farming. No woman shirks this training, whether she is the daughter of a farmer or a millionaire. All workers on the land are encouraged to spend their spare time in making not only beautiful embroideries, but glass objects, furniture, kitchen utensils, and pottery. Ten thousand crowns are given away every year in prizes. The rural population in Czechoslovakia has preserved the artistic traditions of their forefathers, and peasants, especially of old Bohemia, have preserved and developed the art which made them famous in the past.

Scientific Literature—A Commonwealth Catalogue.

Workers in all branches of science, in agriculture, in medicine, in the technical and other fields are always handicapped by the difficulties of obtaining the literature necessary for their work. It is manifestly impossible for the private worker to accumulate for himself a library adequate to his needs. The worker in departments or institutions, although in a better position, has constant need to refer to libraries other than his own in order to be able to keep abreast with the literature in his subject.

In Australia, investigators are particularly handicapped by difficulties inevitable in a country where technical libraries are relatively few and distances between them often very great. While these disabilities cannot be completely remedied, they can be considerably reduced by making readily available a catalogue of the contents of these libraries. A publication of this description enables the worker to locate without waste of time the literature that he requires.

Insofar as periodicals are concerned, and it is periodicals that are of paramount importance to the average worker, a catalogue designed to serve this purpose has now been published by the Commonwealth Council for Scientific and Industrial Research. This catalogue, which has been prepared under the editorship of Mr. E. R. Pitt of the Melbourne Public Library, includes periodicals (in all languages) of a scientific and technical nature and also the publications issued serially by Government departments, institutions, and societies in all countries. In all, 132 Australian libraries have been catalogued. Included in these are the public libraries, the parliamentary libraries, and the libraries of Government departments, of the universities, the scientific societies, and institutions in each State.

A copy of this catalogue will be found invaluable not only on the shelves of all libraries but also to medical men, technical chemists, engineers, architects, veterinarians, and those engaged in agricultural research, in public health and sanitation matters, and to all classes of builders and manufacturers. Throughout the preparation of the catalogue special attention has been paid to Australian publications, and it will therefore serve as a record of all periodicals of a scientific and technical nature that have been published in Australia.

Neglect of Farm Implements.

The formation of a society for the prevention of neglect of farm implements was suggested by Mr. Hugh B. McFadzean, in the course of an address which he gave to the members of the Glasgow and West of Scotland Agricultural Discussion Society on the subject of "The Care of Farm Implements." Mr. McFadzean advocated "houses for implements," so as to prevent weather decay when the implements were not in use. Another essential was the periodical application of good quality paint, which alone could combat the destructive power of corrosion, especially of steel work. In conclusion, he said that the farmer in these days required to use modern machinery, and to keep it in first-class condition. All implements should be carefully overhauled, cleaned, and oiled before being brought into use.

On Buying a Herd.

It is of great importance that every animal destined to be kept in the herd for breeding purposes should have passed the tuberculin test, and whilst it sometimes has happened that an animal has passed the test on one occasion and reacted on another, an owner should, so far as possible, endeavour to make sure on the point ere using such animal, be it male or female, for breeding purposes.

Every breed of cattle possesses its own distinctive features, and although such may be more or less subdivided, there nevertheless is, broadly speaking, a distinctiveness in type in every breed which is as near the ideal as has yet been reached, and at which every breeder should at least aim as his objective.

Whilst in some ways it is an advantage to commence with a young bull and some heifers, there is, on the other hand, a good deal to be said in favour of trying to get hold of a bull which has already done good work in a herd, and also of some cows which likewise have proved their worth as breeders. Having acquired the nucleus of a herd, it is up to the owner to keep in mind the particular type of animal he favours, and to endeavour, so far as possible, not only to stick to such type, but to try and improve on it.—WINDYCUSS, in the "Live Stock Journal" (England).

Decrease in Swine Fever (also called Hog Cholera) in the United States of America.

Hog cholera is less prevalent and has resulted in fewer losses during 1929 than ever before in the history of records by the United States Department of Agriculture, according to Dr. U. G. Houck, associate chief of the Bureau of Animal Husbandry, who has just released a summary of information assembled from thirty-one States.

In only four States—Indiana, Michigan, Nebraska, and Ohio—is hog cholera more prevalent than last year, the lowest loss period up to the current year, Dr. Houck's report shows. Little change in the situation this year is announced for Colorado, Kentucky, North Carolina, Texas, Illinois, Tenessee, Mississippi, and Wisconsin. Less cholera prevails in Alabama, California, Georgia, Kansas, Maryland, Oklahoma, West Virginia, Arkansas, Iowa, Florida, Idaho, Louisiana, Missouri, South Carolina, Utah, Oregon, South Dakota, Virginia, and Washington.

Though the improvement in all but three States is slight, Oklahoma reports a reduction of 50 per cent., Louisiana 40 per cent., and Idaho 30 per cent.

"The hog situation in general," Dr. Houck said, "seems to be somewhat better than last year. According to our information there has been a considerable increase this year over last year in the amount of immunisation against hog cholera in fifteen of the thirty-one States. There was an appreciable difference in nine States, and seven States report less immunisation than last year."

Dr. Houck spoke of the report from Idaho stating that most of the swine fever of recent months occurred on farms where unimmunised animals had been purchased at public sale grounds. A mid-western veterinarian explained that occasional "breaks" of the serum usually happened when "too little attention is given to the condition of the herd immediately prior to immunisation," the result of giving virus to animals not in fit condition to receive it. In such cases losses often were severe.

Dr. Houck quoted the report of a Nebraska swine observer to the effect that vendors of swine remedies had become increasingly prevalent during the past few years in that State, and that in many cases such agents had caused owners of sick herds to put off securing competent veterinary assistance until too late to save their pigs. In other cases the remedies sold by the agents had actually caused illness. The same observer recommended use of the McLean county system of sanitation approved by the Department of Agriculture, feeding of balanced rations, and employment of a competent veterinarian when disease appeared in the herd.

The Citrus Crop—Harvesting Hints.

The harvesting of early varieties of citrus fruits in early districts will commence in May, and growers would be well advised to have everything in readiness for handling the fruit. The picking boxes should be thoroughly overhauled and cleaned and any loose boards on the cases should be securely fastened and protruding nails removed. To secure the best results, it is necessary to keep the skin of the orange in a sound condition—free from abrasions and punctures.

When sizing machines are used, they should be thoroughly examined and any necessary adjustments made. The advent of the sizing machine has done much to assist the grower, and those who have not yet installed a sizing machine in their packing shed should do so without delay. Hand sizing is a slow, costly, and inaccurate way of carrying out the work. Sizing by machines is much more economical.

Noogoora Burr Poisonous for Stock.

Recent experimental work undertaken at Glenfield Veterinary Research Station for the Poison Plants Committee of the Council for Scientific and Industrial Research has demonstrated that Noogoora burr plants are poisonous for stock, but only at an extremely early stage of growth.

The plant as it comes through the ground shows two primary leaves or cotyledons. Their appearance is followed by the development of a stalk and the usual leaf growth. The only stage found to be poisonous has been the cotyledonary stage, and that stage when the plant shows only two leaves and still has the cotyledons attached. The cotyledons soon wither away, and the plants tested after they have disappeared have not been found to be harmful.

Pigs are most susceptible, calves coming next. Sheep may also be poisoned, but are not so susceptible as either calves or pigs.

"Bloom."

Looking at the question of bloom from the showyard standard, a person is occasionally pulled up by someone who asks, "Are judges not generally inclined to lay undue stress on bloom or finish for the time being? Do they always take sufficient account of breeding, character, and the main run of properties which are greater debtors to blood and Nature than to the hands of trainers?" A plain "Yes" or "No" is not enough of a reply to such queries as these. Just as in the showyard itself, one must not be hustled round the subject. A qualified negative to the first and a less qualified affirmative to the second are fair sets-off.

A capable judge will not lose sight of breeding or character. He may go slightly out of his way—in the case of young female animals, for instance—to show his appreciation of discreet feeding; but why should anyone expect him to be generous to the owner of any animal which carries dirt or poverty, or a combination of both, into the ring?—"Live Stock Journal" (England).

Right Type of Pig—American Method of Educating Farmers.

With the object of impressing upon pig raisers the necessity of producing a type of pig that is in favour packers in the Middle West of the United States recently exhibited a carload of pigs at the leading shows of the type and finish that best meet their demands.

These pigs weighed about 200 lb. and carried a medium finish, that is to say, the fat on their backs would probably be from 1½ to 2½ inches in depth with a smooth covering of fat over the shoulders, sides, and hams. The pigs showed excellent quality, as was shown by the smoothness in body and conformation, with hair that was smooth and not curly. The bone was of medium size and of good quality.

With a balance between the shoulders and hams, with no falling away along the sides, these pigs had sides that were smooth and fairly deep, with considerable widths of back and loin, although the backs and loins were not so wide as the backs and loins of pigs that were common fifteen years ago. They were rather longer pigs, however, and the jowls were not heavy.

Pig raisers were advised that in order to produce pigs of this kind when finished it would probably be best to begin with a pig that was smooth, of good quality, and having considerable length, with enough depth and width to have a well-balanced pig when at a marketable weight.

The Duroc-Jersey Pig.

In a recent communication from the American Duroc Association, the well-known American "Red" pig, the Duroc-Jersey, is spoken of in highly appreciative terms as—

"The Duroc, the world's supreme hog."

"The breed that has stood every test and proven superior in Pork Production."

"The breed that outweighs other breeds at every age."

In the 1927 National Swine Show, the Duroc winners in every class outweighed their competitors of other breeds. The average weight of the 80 head winning in all ten classes was 38.2 lb. heavier than their nearest competitor and 176.6 lb. heavier than the lightest breed shown. In the 1928 National Show, the Grand Champion boar was a junior yearling weighing 862 lb., the heaviest junior ever shown at a world's Show.

Win in Feeding Contests.—A Pig Club boy won grand champion in the International Junior Feeding Contest for 1928 with a Duroc barrow. In the California Live Stock and Baby Beef Show in 1928, a Pig Club boy won grand champion with a Duroc barrow.

Win in Ton Litter and Herd Contests.—More Duroc litters have won in Ton Litter State Contests than litters of any other breed. The record of 4,925 lb. in 180 days from a Duroc litter, challenges the world.

In the Colorado State Herd Production Contest in 1928, Duroc herds took first, second, and third prizes. The first prize herd sows each produced 1,889.3 lb. of pork in one litter, one litter reaching 2,592 lb.

THE JOURNAL APPRECIATED.

A Geebung farmer writes (3rd April, 1930):—"I very much appreciate the Journal and have taken it for years. I have also recommended it to other farmers round about my former home at Proserpine. Since coming south to live I have continued that practical advocacy of its usefulness to the man on the land."

Butter Equivalents in Milk and Cream.

The amount of milk required to produce 1 lb. of butter depends upon the fat content of the milk. The butter-fat content of milk varies, the average test being 3.8 per cent. Since .85 lb. of milk fat is sufficient to make 1 lb. of butter it will require approximately 22.4 lb. of milk of a 3.8 per cent. fat to produce .85 lb. of milk fat or its equivalent, 1 lb. butter.

The following indicates the varying amounts required according to the test of the milk:—

25.8 lb. milk testing 3.3 per cent. fat will make 1 lb. butter.
23.7 lb. milk testing 3.6 per cent. fat will make 1 lb. butter.
22.4 lb. milk testing 3.8 per cent. fat will make 1 lb. butter.
21.8 lb. milk testing 3.9 per cent. fat will make 1 lb. butter.

The amount of cream required to make 1 lb. of butter depends upon the fat content of the cream produced in the process of separation.

The cream screw of the separator bowl can be regulated to produce a cream of a desired fat content.

"*The Dairy Produce Act of* 1920" provides that cream delivered to a butter factory during the period April to September, inclusive, shall contain not less than 34 per centum of fat, and that delivered during the period October to March, inclusive, shall contain not less than 38 per centum of fat.

The following indicates the varying amount of cream required according to the test of the cream:—

2.5 lb. cream testing 34 per cent. fat will make 1 lb. butter.
2.24 lb. cream testing 38 per cent. fat will make 1 lb. butter.
2.12 lb. cream testing 40 per cent. fat will make 1 lb. butter.

In Favour of Berkshires.

Writing in his usual informative style, Mr. Norman Williams, a prominent and successful breeder of Berkshire pigs at Wilmot, Tasmania, states that in his opinion we have, in Australia, some of the finest stud pigs in the world, pigs of a quality that would compare with the best in any country, and equally productive, although we could do with further introductions of fresh blood with which to build up and strengthen existing and fresh studs. He states he has recently purchased from Mr. Luke Williams, of Moonah, Tasmania, the winner of the Berkshire Societies' Cup (British), Plumpton Prince, a Berkshire boar of high quality and modern type. He also secured Tarooma Marquis, a champion stud boar; this boar is producing the best pigs Mr. Williams ever bred, fine shoulders, great quality, and perfect type. He sired the winning boar under nine months at Melbourne Show. This boar has sired as many as eight show pigs in one litter from well-bred, good quality pigs.

Moisture in Butter.

Shrinkage occurs when butter is held in storage for several weeks or longer, and is due to loss of water content, chiefly by evaporation. The shrinkage due to evaporation of moisture is influenced by the distribution of the moisture content of the butter. Uniform distribution of the water in the butter is obtained by giving the butter the correct amount of working. When the water is not thoroughly mixed with the fat the loss through leakage and evaporation is increased. When the moisture and fat are so thoroughly worked together that the moisture droplets are finely divided and thoroughly encased in fat the shrinkage is decreased. The object in working butter is to control and evenly distribute the moisture and to prevent mottles and streakiness in butter to which salt has been added. Butter manufactured under modern dairy factory conditions will be firm enough in body to allow of its being sufficiently worked to incorporate the moisture without injury to the body, texture, and general character of a first-grade product.

Pigs and Poetry Appeal to Him.

Thus the "Livestock Bulletin" (Sydney):—

No one would suspect that under the strictly utilitarian exterior of Mr. E. J. Shelton, Queensland's senior instructor in pig raising, lies a soul for poetry. Give Mr. Shelton but half a chance, and he will pour into one's ear a glowing account of some sow that has done her duty nobly by raising a litter of seventeen and doing them well. He will talk of ton litters and Durocs, and tuberculosis of the throat, and paralysis, and of all the little parasites that infest the intestines of pigs, both large and small, but one will not hear a word of poetry from him.

When he writes to us, however, he generally slips into the envelope a verse or two, neatly typed out, that has appealed to him, and never are these verses about pigs. Here is one that came a day or two ago:—

"To every man there openeth
A Way, and Ways, and a Way,
And the high soul climbs the High Way,
And the low soul gropes the Low;
And in between, on the misty flats,
The rest drift to and fro;
But to every man there openeth,
A High Way and a Low,
And every man decideth
The Way his soul shall go."

—John Oxenham.

It seemed to us as we read that verse that it put into words Mr. Shelton's philosophy, and the philosophy of every man who tries to leave a herd, or a farm, or a flock, better than he found it. The man who sets himself to build a herd that will average 400 lb. fat a year, or a herd of pigs that will make a large and steady gain, is the man who climbs the High Way. The man who says that "dairyin' don't pay no how" gropes along the Low Way.

Mr. Shelton, eager to learn what the other side of the world is doing to make pig raising more profitable, is off to England shortly. Everyone who knows the enthusiastic fellow will wish him well on his adventure. He has decided which way his soul shall go.

Watering the Horse.—Dangers of Impurity.

Horses require anything from 5 to 15 gallons of water a day, the quantity depending on the temperature and the amount of work performed. The water should be as pure as possible, clear in appearance, and free from taste, colour, or smell. Pure water is just as essential to a horse as it is to a man, and it is a mistake to suppose that a horse can drink badly contaminated water with impunity. Water obtained from pools or shallow wells, contaminated with surface drainage, or containing decomposing organic matter, frequently causes diarrhœa, and generally predisposes to colic. Water that contains a large amount of sediment should not be given, as the sediment causes a mechanical irritation of the mucous membrane of the stomach and intestines—i.e., sand colic. When at rest in the stable, water should be given three times a day, and should invariably be given previous to feeding.

This latter point is of considerable practical importance. A horse's stomach is small in proportion to the animal's size, and water does not remain in it, but passes through the stomach and small bowel to the cæcum, or water-gut. If water is given after feeding, besides weakening the digestive juices, a considerable portion of the food in the stomach and small intestines will be washed out in an undigested state, and indigestion and colic may result. Water in small quantities can be given within an hour or so from the completion of feeding, if desired.

After a long journey, a good plan is to water a mile or so before the journey's end, and take the horse slowly in afterwards. This prevents chills and colic, due to the ingestion of a large quantity of water when in an exhausted state. An animal after prolonged exertion or fast work has his system depleted of fluid. He will not eat sufficiently until his thirst has been satisfied; therefore the water should come first, and while the animal is still warm is the best time to give it. After standing, the body temperature falls, and to give cold water freely then is only to intensify the effect of the cold water on the system.

The Australian Soldier—The Man that He Was.

A flood of war "literature" has been let loose on the reading public of the Old Country by malicious and commercial-minded "base-wallahs" who evidently stick at nothing in their exploitation of all kinds of filth and nastiness; and also in their efforts to slander the Australian soldier. What sort of man was the Digger, anyhow? This is how Captain Bean viewed the young countryman of the Commonwealth in "The Official History of Australia in the War of 1914-18":—

All through the war the light horseman tried things by the light of his strong common sense. On a hard-riding advance, when victory depended upon speed, and speed upon a supply of horse-feed, he did not hesitate to help himself to any grain or other fodder possessed by the natives of the country. Orders forbidding such conduct might have been couched in the strongest terms; but when it was a choice between failure through loss of horses, and success to be achieved by the commandeering of fodder, he did not hesitate to flout authority. He dismissed such incidents from his mind with the scornful thought that a General Staff which could not settle trifling affairs of that sort with the natives was not fit for its job, and rode on happy because the bulging nosebag ensured an evening meal for his beloved waler.

The light horseman, with all his unconventional ways and his occasional forcefulness, was at heart distinguished by shyness and reserve. The young Australian countryman leads a simple and peaceful life. He bears himself modestly. One of the first horsemen of the world, and breeding the world's best horses of their kind, he indulges himself in no distinctive horseman's attire. He has none of that picturesque flashness which cowboys of Western America and the Canadian Northwest of a generation ago inherited from the Spanish pioneers of the Pacific slope. A felt slouch hat, a shirt with the sleeves rolled to the elbows, long trousers not particularly made for riding, boots, and very gentle spurs make up his everyday dress. He rides, as a rule, in a plain English hunting saddle, and carries neither lasso nor revolver. A temperate man, his one excess is a harmless celebration at the annual races or agricultural show, or on an occasional visit to the capital city of his State; even then the impelling force is the bursting strength of his youth rather than any disposition for strong drink or unwholesome excitement. Men of all young English countries engage in these occasional sprees, which were in fact a stronger feature of the early pioneering days, when most of the settlers were of British birth, than they are among the native-born. The young countryman of the Commonwealth is neither a hard nor a regular drinker, but, when his rare holiday comes, he engages whole-heartedly in a joyous demonstration. On occasion he did this at Cairo, and at other places abroad, and his high spirits and forceful, but

as a rule quite harmless, carnivals sometimes led to misunderstanding in the minds of men who did not know the native wholesomeness of his life at home. Any study of the slender "crime" sheets of the light horseman throws a sure light upon his character. The worst offence discoverable there (with the exceptions inevitable in a body of many thousands of men) is that of occasional physical violence, of blows struck in anger. But those tell-tale sheets are clean of all morbid or unmanly offences, and remarkably free from charges of desertion, cowardice, or disobedience to orders in action.

Pigs for Export—Types Required for British Pork Market.

Although Australia does not export pork to Great Britain, it would appear that the present is an opportune time for experiments in this direction, provided the right type of pig is available to meet the demand of the public. Apparently the British farmers have not been able to fill the requirements, as loins of pork are being placed on the market from the United States.

Mr. S. Pulham, one of the leading London butchers, who frequently addresses farmers' meetings upon the needs of the markets, speaking at Guildford (England) recently, said that the crosses he favoured were the Large White and the Middle White and the Large White and the Berkshire. Above all (he said), the demand was lean meat and a wide and thick loin, and for the London trade a pig was required that weighed 80 lb. Irish farmers had not been so lax as English in the production of pork. When the embargo was put on, some enthusiastic salesmen at Smithfield went to Holland, and obtained Dutch slaughtermen and feeders and took them to Ireland, and during the last three years they had produced a large percentage of the pigs sold at Smithfield. Farmers would rather have a uniform price year in and year out, and if they could produce pigs profitably at 9d. or 10d. per lb. the butchers could make a reasonable profit out of it.

Preventing Sterility in Pigs.

Sterility in pigs is difficult to cure, but most forms of it can be prevented by proper management, says a contemporary, and the following points are important:—

(1) Fertility is heritable, therefore always select breeding stock from large litters.

(2) Breeding sows must have more protein and calcium than fattening stock in order to build up flesh and bone in their young. The important sources of supply of these are meat and protein meal, milk, and leguminous pastures.

(3) Exercise is essential for regular production.

(4) Show condition sometimes causes sterility, but this is when the pigs are over-fat and lack exercise.

(5) Exposure in winter will delay breeding.

(6) Contagious abortion is spread through infected afterbirth, dead piglings, and discharge contaminating the food, water, and bedding.

(7) The sow which has aborted is a danger to the herd, and should be separated and fattened.

(8) A common disease causing sterility is septic inflammation of the uterus. This usually causes a slight dirty white discharge. It is waste of time to try and treat such cases.

Co-operative Buying—Profitable Enterprise of Taree Farmers.

Discussing at a recent gathering at Dungog the subject of co-operative buying of farm requirements, the president of the Central North Coast Branches of the Agricultural Bureau of New South Wales deprecated the old principle of "take what I give you for what you sell, and pay what I ask you for what you have to buy," observing that in view of the decreasing margin of profit it was more than ever advisable for the farmer to consider the advantages of the pool system of buying. Farmers realised that they bought too dearly and sold too cheaply, said the speaker, but they seemed unready to accept new methods of selling and to be content to continue to buy in the old way small quantities from the middleman. Interesting details were given of the operations of the Taree Sub-district Council of the Bureau, which was registered as a trading society under the Act.

Although the society had come into existence at a bad time, said Mr. Richardson, just after the floods of February, 1929, there was a turnover of £600 during the first six months. Maize at that time was costing 24s. 6d. a bag locally, but when the society's supplies came forward from Queensland it was possible to sell

for 18s. a bag. The opposition then brought down their price to 17s. 9d. for ten-bag lots, and the society responded by quoting at the same figure for single bags. Fertiliser was sold at 9s. 6d., as compared with 12s. 6d. per bag in quantity locally; lucerne seed at 2s. as compared with 2s. 6d. The same advantage in prices applied to wheat and oats, but in the absence of a shed it was at first only possible to buy in truck lots, which had to be unloaded quickly to prevent charge for demurrage. At the suggestion of the local railway authorities, it was decided to build their own shed, one with a floor space of 24 by 16 feet being erected. In less than three months this had had to be doubled in size, and it had again been found too small.

During the six months ended December, 1929, the cash takings had been £4,800, and the following goods were handled:—1,200 bags maize; 600 bags chaff (sold at 7s. as against 10s. locally); 1,800 bags bran, pollard, and feed; 500 bags seed potatoes (from Crookwell, sold at a price which meant a saving of 7s. to 8s. per bag); 1,250 bags fertiliser. Six trucks of rice had also been bought as feed for pigs and poultry. Fencing wire was sold by the society at a price 4s. 6d. lower than down town, and though farming implements had to be sold at the manufacturers' price, the advantage came back to members in the form of bonus. Insurance was handled, and cream cans were also sold at a saving. When in due course the potato crop was harvested, the society handled the product for its members. When the price was down to £7 per ton in Sydney, £9 10s. had been obtained at Narrabri. There were local growers who were not satisfied with this; these, holding back, had had to accept £4 10s.

They were thus securing goods and selling them direct and cutting out the middleman, said Mr. Richardson. Their membership consisted only of actual farmers, and was constantly growing.

Congratulating the speaker on his address and Taree farmers on their enterprise, the Director of Agriculture (New South Wales), Mr. A. H. E. McDonald, said there was no doubt that the farmer was the loser by not looking after certain jobs himself.

The World's Live Stock.

Which country has the greatest number of live stock? According to the figures of the last complete year in all the countries for the purposes of comparison, there are 146,580,718 in British India, as against 67,835,000 in Russia, 55,681,000 in the United States of America, and 37,064,850 in the Argentine. In sheep Russia leads by 120,237,000, with 108,864,805 (Australia) second. Pigs are most plentiful in the United States with 60,200,000 (U.S.A.), Germany next with 22,800,318. The figures for Great Britain and Ireland are 12,230,042 cattle and 28,328,409 sheep.

Dingo Destruction.

The return of operations of Dingo Boards throughout the State for the year 1929 has now been made available to the Minister of Agriculture and Stock (Mr. H. F. Walker). Under existing legislation the eradication of the dingo and fox is undertaken by thirty-six boards, who make a levy on stockowners to meet estimated expenditure incurred in the payment of bonus for the destruction of these pests and for any administrative expenses.

Since the inception of legislation in 1877 dealing with dingo and marsupial destruction, approximately 1,040,000 dingo scalps have been paid for by boards, and the bonus payments have totalled about £1,200,000. Government assistance has been granted to the boards in the form of an endowment totalling over £350,000. During the year 1929 approximately 30,000 dingo scalps and 14,000 fox scalps were paid for.

The Minister, although pleased to call attention to the effective operations of the various boards, is concerned at the expenses of administration incurred. He is of opinion that in certain instances these expenses are out of all proportion to the volume of dingo destruction, but wishes it to be distinctly understood that this does not apply to every board in the State. It is noted that last year the administrative expenses of the boards totalled approximately £9,000. A case can be cited in one district where the expenses of administration reached a total of £1 9s. 8d. for each dingo scalp secured, and this excluded the bonus payment on the scalp of 15s. In the case of six other boards the administrative expenses, apart from the bonus payment, exceeded 10s. for each dingo scalp paid for.

Doubtless, the Minister added, this matter will be given serious consideration by the commission of inquiry which it is proposed to appoint to deal with the eradication of animal pests.

The Home and the Garden.

OUR BABIES.

Under this heading a series of short articles by the Medical and Nursing Staff of the Queensland Baby Clinics, dealing with the welfare and care of babies, has been planned in the hope of maintaining their health, increasing their happiness, and decreasing the number of avoidable cases of infant mortality.

OUR CHILDREN'S TEETH.

Primitive man has always had good teeth. He still has. The teeth of civilised man have not been so good. During the last century his teeth have been getting rapidly worse, and now in Australia we have the worst teeth that the world has ever seen. There has been nothing inevitable about this; it has all resulted from want of care based on want of knowledge. The condition of his teeth is civilised man's own fault, or the fault of his mother, or more rightly, I think, the fault of those who should have instructed the mothers how to look after their children's teeth.

Evils of Early Neglect.

For the most of the harm is done in infancy and childhood. As a people we expend a considerable sum of money on our teeth, but it is mostly spent much too late to obtain the best results. Nothing done in later life can fully repair the damage caused by neglect in these early years. We can easily see for ourselves how many young men and women have very visible gold-scarred teeth. If we could examine their back teeth, we should find that these were still worse, and many are even wearing plates with artificial dentures. Going still further back our Medical Inspectors have found that on entering school about six years of age only about one child in ten has teeth without defects, and many have very serious defects. We are, therefore, dealing with a national problem.

Children Should Never be Allowed to Suffer Toothache.

It must not be supposed that bad teeth are merely a local and unimportant trouble. Tooth-ache, from which children should never be allowed to suffer, is not the only result. Abscesses of the teeth, which are common among our children, may have serious effects on their general health. But the most serious consequences occur in later life, and comprise such a long list of chronic and crippling diseases that to enumerate them would be to write the headlines of a medical treatise dealing with the whole human body. Bad teeth and good health are, on a large scale, incompatible. A child with defective teeth is not getting the best start in life.

What Should be Done.

We must be brief, and lengthy explanations would be here out of place. Let us be severely practical, and give no more than a concise outline of what should be done, so simple that it can be understood by all parents, sufficiently broad to deal thoroughly with this great evil, and yet (at least for the most part) not beyond the power of most parents of intelligence and good will.

(1) At six years of age the trouble has, as a rule, already been there for one, two, or three years. Therefore, all mothers should carefully watch their children's teeth, and not forget all about them after they are two years old. Every child should have his teeth inspected by a dentist before he is four years old and once a year after that. Mothers should know that the first permanent teeth appear behind the milk teeth at six years of age. These are the most important teeth in the mouth; they are intended to last a lifetime, and often they are damaged at the very start. A skilful dentist will preserve them.

(2) At three years of age the child should be taught how to brush his teeth gently, as advised in the Queensland Mothers' Book. The object of brushing is to clean the teeth from particles of food. We do not advise the use of any tooth-paste or tooth-powder.

(3) The milk teeth are formed before birth, and depend on the health and food of the mother. This is a matter for ante-natal care. The permanent teeth are formed in the jaws during the first three years of life, and of these the first year is most important. Therefore every effort should be made to keep the baby on the breast so that he may have the best food possible. If, unfortunately, he has to be partly or wholly artificially fed the greatest care must be taken, and the mothers should always have skilled advice. This she may get at a Baby Clinic. A poorly nourished or sickly baby may attain good health in later years, but his permanent teeth may have been irretrievably spoilt.

(4) Mothers must learn that human teeth were made for hard biting, and without hard biting the child cannot grow strong teeth. At nine months old the baby should be taught to bite a finger of hard-baked bread. He soon learns to bite it, and not to try to swallow big lumps. Hard-baked bread is nicer and more digestible than soft bread and much better for children. It is a sad thing to see small children fed entirely with soft stuff, until at three years old some have such poor teeth that they cannot eat a crust.

(5) Most important is the way children are fed. Teeth decay because soft particles of bread, cake, biscuits, and such things lodge in and between the teeth and gradually destroy their hard covering. Consequently, children who are fed with these things between meals cannot have good teeth, for their teeth are never free from these particles. At their meals children should have a little fruit, raw or cooked, to finish up with, or some acid jam on their bread and butter, or lemon or other acid drinks. Children like all these things, and they excite a flow of saliva which washes away these food particles. Brushing the teeth after meals is also useful.

(6) All fruits contain sugar. Sugar in small quantities not only makes food nice, but is itself a valuable food. Chewing sticks of sugar-cane is one of the best ways of strengthening teeth. But we have formed the habit of giving concentrated sugar which forms a sticky deposit on the teeth and destroys them. Soft sweetmeats such as chocolate creams are the most destructive of all. Those silly people who give children sweets to please themselves, are not true friends of children.

Simple Rules Requiring Resolution in Observance.

These rules for strengthening and preserving children's teeth are really very simple. But the mother who tries to follow them will find many lions in her path. They are habit, custom, indifference, foolish traditions, silly sentimentalism, commercial enterprise, bold advertisements, shop window displays, bad example, and many more. To fight these will require some resolution.

WHITEWASH ON THE FARM—A USEFUL FORMULA.

Whitewash has a wide application to farm use, and deserves a much greater popularity than it at present enjoys. Its ingredients are inexpensive and readily obtained, it is not difficult to make, and it is easy to apply. In addition to these advantages it protects the surfaces to which it is applied, brightens up dark interiors, and is sanitary. Whitewash may be coloured, provided that light tints and shades are used and that the pigments are not affected by lime. Among such are yellow ochre, raw and burnt umber, and raw and burnt sienna.

The surface to be whitewashed should be just as clean as one that is to be painted, and it is a first essential to good results that all dirt, dust, grease, and scaly material be removed before there is any attempt to apply the wash. This implies a liberal use of scrapers and stiff brushes. When the cleaning is finished and the surface dusted, it is well to dampen it slightly just before applying the wash.

The following formula is recommended by the Supervising Architect of the New South Wales Department of Agriculture:—

Obtain, if possible, large pieces of fresh lump lime, place them in a very large bucket or other suitable container, and into this pour hot water. Cold water will do, but hot water is better as it hastens the slaking. The lime will start to boil and break up. Keep it covered all the time with about half an inch of water. This is important, for if whilst the lime is slaking it is allowed to rise up above the water in a dry powder it will "curdle," a condition tolerated only by inexperienced and indifferent workmen. Before the lime commences to boil fiercely, add tallow or common fat in the proportion of about 1 to 2 lb. to 7 lb. of lump lime. This makes a good binder which will prevent the wash from rubbing off. If desired, a little yellow ochre may also be added, which will give a cream or buff tint according to the quantity used. When the lime is thoroughly slaked it should be stirred and sufficient water added to make it a little heavier than, say, milk, after which it should be strained and, if desired, may be applied whilst hot.

KITCHEN GARDEN.

Cabbage, cauliflower, and lettuce may be planted out as they become large enough. Plant asparagus and rhubarb in well-prepared beds in rows. In planting rhubarb it will probably be found more profitable to buy the crowns than to grow them from seed, and the same remark applies to asparagus.

Sow cabbage, red cabbage, peas, lettuce, broad beans, carrots, radish, turnip, beet, leeks, and herbs of various kinds, such as sage, thyme, mint, &c. Eschalots, if ready, may be transplanted; and in cool districts horse radish can be set out.

The earlier sowings of all root crops should now be ready to thin out, if this has not been already attended to.

Keep down the weeds among the growing crops by a free use of the hoe and cultivator.

The weather is generally dry at this time of the year, so the more thorough the cultivation the better for the crops.

Tomatoes intended to be planted out when the weather gets warmer may be sown towards the end of the month in a frame where the young plants will be protected from frost.

A REMINDER TO ONION GROWERS.

Onion seed growers should, by this, have gone through their selected onions with the object of picking out the best keepers for the production of seed. The bulk of these onions should have been selected, previous to storing, for early maturity and variety characteristics. At the final selection bulbs that are soft or prematurely shooting, or those showing any indication of being bad keepers, or that are diseased, should be discarded.

The bulbs should be planted in rows at least 3 feet apart and spaced 2 feet apart in the rows. A handy position well protected from the boisterous winter winds should be selected for the growing of onion seed.

FLOWER GARDEN.

No time is now to be lost, for many kinds of plants need to be planted out early to have the opportunity of rooting and gathering strength in the cool, moist spring-time to prepare them for the trial of heat they must endure later on. Do not put your labour on poor soil. Raise only the best varieties of plants in the garden; it costs no more to raise good varieties than poor ones. Prune closely all the hybrid perpetual roses; and tie up, without pruning, to trellis or stakes the climbing and tea-scented varieties, if not already done. These and other shrubs may still be planted. See where a new tree or shrub can be planted; get these in position; then they will give you abundance of spring bloom. Renovate and make lawns, and plant all kinds of edging. Finish all pruning. Divide the roots of chrysanthemums, perennial phlox, and all other hardy clumps; and cuttings of all the summer bedding plants may be propagated.

Sow first lots, in small quantities, of hardy and half-hardy annuals, biennials, and perennials, some of which are better raised in boxes and transplanted into the open ground. Many of this class can, however, be successfully raised in the open if the weather is favourable. Antirrhinum, carnation, picotees, dianthus, hollyhock, larkspur, pansy, petunia, *Phlox Drummondi*, stocks, wallflower and zinnias, &c., may be sown either in boxes or open beds. Mignonette is best sown where it is intended to remain. Dahlia roots may be taken up and placed in a shady situation out of doors, plant bulbs such as anemones, ranunculus, fresias, snowflakes, ixias, watsonias, iris, narcissus, daffodil, &c. The Queensland climate is not suitable for tulips.

To grow these plants successfully it is only necessary to thoroughly dig the ground over to a depth of not less than 12 inches, and incorporate with it a good dressing of well-decayed manure, which is most effectively done by a second digging; the surface should be raked over smoothly so as to remove all stones and clods, thus reducing it to a fine tilth. The seed can then be sown in lines or patches as desired, the greatest care being taken not to cover deeply; a covering of not more than three times the diameter of larger seeds, and a light sprinkling of fine soil over small seeds, being all that is necessary. A slight mulching of well-decayed manure and a watering with a fine-rosed can will complete the operation. If the weather prove favourable, the young seedlings will usually make their appearance in a week or ten days; thin out so as to leave the plants (if in the border) at least 4 to 6 inches apart.

Farm Notes for June.

FIELD.—Winter has set in, and frosts will already have been experienced in some of the more exposed districts of the Maranoa and Darling Downs. Hence insect pests will to a great extent cease from troubling, and weeds will also be no serious drawback to cultivation. Wheat sowing should now be in full swing, and in connection with this important operation should be emphasised the necessity of at all times treating seed wheat by means of fungicides prior to sowing. Full directions for "pickling" wheat by copper carbonate treatment are available on application to the Department of Agriculture, Brisbane. Land intended for the production of early summer crops may now receive its preliminary preparation, and every opportunity taken advantage of to conserve moisture in the form of rainfall where experienced; more particularly so where it is intended to plant potatoes or early maize. Where frosts are not to be feared the planting of potatoes may take place in mid-July; but August is the recognised month for this operation. Arrowroot will be nearly ready for digging, but we would not advise taking up the bulbs until the frosts of July have occurred. Take up sweet potatoes, yams, and ginger. Should there be a heavy crop, and consequently a glut in the market, sweet potatoes may be kept by storing them under cover and in a cool place in dry sand, taking care that they are thoroughly ripe before digging. The ripeness may be known by the milky juice of a broken tuber remaining white when dry. Should the juice turn dark, the potato is unripe, and will rot or dry up and shrivel in the sandpit. Before pitting, spread the tubers out in a dry barn, or in the open if the weather be fine. In pitting them or storing them in hills, lay them on a thick layer of sand; then pour dry sand over them till all the crevices are filled and a layer of sand is formed above them; then put down another layer of tubers, and repeat the process until the hill is of the requisite size, and finally cover with either straw or fresh hay. The sand excludes the air, and the potatoes will keep right through the winter. In tropical Queensland the bulk of the coffee crop should be off by the end of July. Yams may be unearthed. Sugar-cane cutting may be commenced. Keep the cultivator moving amongst the pineapples. Gather all ripe bananas.

Cotton crops are now fast approaching the final stage of harvesting. Growers are advised that all bales and bags should be legibly branded with the owners' initials. In this matter the consignor is usually most careless, causing much delay and trouble in identifying parcels, which are frequently received minus address labels.

Orchard Notes for June.

THE COASTAL DISTRICTS.

The remarks that have appeared in these notes for the past two months apply in a great measure to June as well, as the advice that has been given regarding the handling, grading, packing, and marketing of the citrus crop still holds good. As the weather gets cooler the losses due to the ravages of fruit flies decrease, as these insects cannot stand cold weather, and consequently there is only an odd one about. The absence of flies does not, however, permit of any relaxation in the care that must be taken with the fruit, even though there may be many less injured fruit, owing to the absence of fruit-fly puncture, as there is always a percentage of damaged fruit which is liable to speck, which must be picked out from all consignments before they are sent to the Southern States if a satisfactory return is to be expected. If the weather is dry, citrus orchards must be kept in a good state of tilth, otherwise the trees may get a setback. Old worn-out trees can be dug out and burnt; be sure, however, to see that they *are* worn out, as many an old and apparently useless tree can be brought round and made to bear good crops, provided the trunk and main roots are still sound, even though the top of the tree is more or less dead. The whole of the top of the tree should be cut off and only the trunk and such sound main limbs left as are required to make a new head. The earth should be taken away from around the collar of the tree, and the main roots exposed, any dead roots being cut away and removed. The whole of the tree above ground and the main roots should then be dressed with a strong lime sulphur wash or Bordeaux paste. The main roots should be exposed for some time, not opened up and filled in at once. Young orchards

can be set out now, provided the ground is in good order. Don't make the mistake of planting the trees in improperly prepared land—it is far better to wait till the land is ready, and you can rest assured it will pay to do so in the long run.

When planting, see that the centre of the hole is slightly higher than the sides, so that the roots, when spread out, will have a downward, not an upward, tendency; set the tree at as nearly as possible the same depth as it was when growing in the nursery, cut off all broken or bruised roots, and spread those that remain evenly, and cover them with fine top soil. If the land is dry the tree should then be given a good watering, and when the water has soaked in the hole can be filled up with dry soil. This is far better than watering the tree after the soil has been placed round it and the hole filled up. Custard apples will be ripening more slowly as the nights get colder. If the weather becomes unduly cold, or if immature fruit is sent South, the fruit is apt to turn black and be of no value. This can easily be overcome by subjecting the fruit to artificial heat, as is done in the case of bananas, during the cooler part of the year, when it will ripen up properly and develop its flavour. Grade custard apples carefully, and pack in cases holding a single layer of fruit only for the Southern markets.

Pineapples, when at all likely to be injured by frost, should be protected by a thin covering of bush hay or similar material. The plantation should be kept well worked and free from weeds, and slow-acting manure, such as bonedust or island phosphates, can be applied now. Lime can also be applied when necessary. The fruit takes longer to mature at this time of the year, consequently it can be allowed to remain on the plant till partly coloured before gathering for the Southern markets, or can be fully coloured for local use.

Banana plantations must be kept worked and free from weeds, especially if the weather is dry, as a severe check to the plants now means small fruit later on. Bananas should be allowed to become full before the fruit is cut, as they will carry all right at this time of the year; in fact, there is more danger of their being injured by cold when passing through New England by train than there is of their ripening up too quickly.

Bear in mind the advice given with regard to the handling, grading, and packing of the fruit. It will pay you to do so. Land intended for planting with bananas or pineapples during the spring should be got ready now.

Strawberries require constant attention, and, unless there is a regular and abundant rainfall, they should be watered regularly. In fact, in normal seasons an adequate supply of water is essential, as the plants soon suffer from dry weather or strong, cold westerly winds. Where not already done, vineyards should be cleaned up ready for pruning—it is, however, too early to prune or to plant out new vineyards.

THE GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS.

All kinds of deciduous fruit trees are now ready for pruning, and this is the principal work of the month in the orchards of the Granite Belt area. Don't be frightened to thin out young trees properly, or to cut back hard—many good trees are ruined by insufficient or bad pruning during the first three years. If you do not know how to prune, do not touch your trees, but get practical advice and instructions from one or other of the Departmental officers stationed in the district. In old orchards do not have too much bearing wood; cut out severely, especially in the case of peaches, or you are likely to get a quantity of small unsaleable fruit. There are far too many useless and unprofitable fruit trees in the Granite Belt area, which are nothing more or less than breeding-grounds for pests, such as fruit fly, and are a menace to the district. Now is the time to get rid of them. If such trees are old and worn out, take them out and burn them, but if they are still vigorous, cut all the tops off and work them over with better varieties in the coming season—apples by grafting in spring and peaches and other stone fruits by budding on to young growth in summer. Planting can start now, where the land is ready and the trees are to hand, as early planted trees become well established before spring, and thus get a good start. Be very careful what you plant. Stick to varieties of proved merit, and few at that, and give so-called novelties and inferior sorts a wide berth. Take the advice of old growers, and do not waste time experimenting with sorts that have probably been tested in the district and turned down years ago. When land is intended for planting this season, see that it is well prepared and well sweetened before the trees are put in, as young trees seldom make a good start when planted in sour and badly prepared land.

Slowly acting manures—such as bonedust, meatworks manure, or island phosphates—can be applied now, as they are not liable to be washed out of the soil, and they will be available for the use of the trees when they start growth in spring. Lime can also be applied where required. Badly drained land should be attended to, as no fruit trees will thrive with stagnant water lying round their roots.

On the Downs and Tableland all kinds of fruit trees can be pruned now, and vines can be pruned also in any district where there is no danger from late frosts, and where this can be done the prunings should be gathered and burnt, and the vineyard ploughed up and well worked to reduce the soil to a good state of tilth, so that should rain come it will absorb all that falls and the moisture can be kept in the soil by cultivation subsequently.

Citrus fruits will be at their best in the Western districts. The trees should be watered if they show signs of distress, otherwise all that is necessary is to keep the surface of the land well worked. All main-crop lemons should be cut by this time, as, if allowed to remain longer on the tree, they only become overgrown and are more suitable for the manufacture of peel, whereas if cut and eased now they will keep in good order so that they can be used during the hot weather.

QUEENSLAND SHOW DATES, 1930.

Mitchell: 7th and 8th May.
Mundubbera: 7th and 8th May.
Boonah: 7th and 8th May.
Murgon: 8th to 10th May.
Blackall: 13th to 15th May.
Roma: 13th and 14th May.
Goomeri: 14th and 15th May.
Gayndah: 14th and 15th May.
Wallumbilla: 20th and 21st May.
Ipswich: 20th to 23rd May.
Springsure: 21st and 22nd May.
Kilkivan. 21st and 22nd May.
Biggenden: 22nd and 23rd May.
Maryborough: 27th to 30th May.
Emerald: 28th and 29th May.
Toogoolawah: 30th and 31st May.
Marburg: 3rd June.
Childers: 3rd and 4th June.
Gin Gin: 5th to 7th June.
Bundaberg: 12th to 14th June.
Lowood: 13th and 14th June.
Miriam Vale: 16th and 17th June.
Gladstone: 18th and 19th June.
Mount Larcom: 20th and 21st June.
Rockhampton: 25th to 28th June.
Pine Rivers: 27th and 28th June.
Mackay: 1st to 3rd July.
Kilcoy: 3rd and 4th July.
Gatton: 9th and 10th July.
Woodford: 10th and 11th July.
Townsville: 8th to 10th July.
Cleveland: 12th July.
Barcaldine: 15th and 16th July.
Charters Towers: 16th and 17th July.
Caboolture: 17th and 18th July.
Rosewood: 18th and 19th July.
Ithaca: 19th July.
Laidley: 23rd and 24th July.
Nambour: 23rd and 24th July.
Esk: 25th and 26th July.
Ayr: 25th and 26th July.
Maleny: 30th and 31st July.
Royal National. 11th to 16th August.
Crow's Nest: 27th and 28th August.
Imbil: 3rd and 4th September.
Malanda: 5th and 6th September.
Gympie: 10th and 11th September.
Redcliffe: 12th and 13th September.
Beenleigh: 19th and 20th September.
Rocklea: 27th September.
Kenilworth: 27th September.

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ASTRONOMICAL DATA FOR QUEENSLAND.

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

TIMES OF SUNRISE, SUNSET, AND MOONRISE.

AT WARWICK.

	May, 1930.		June, 1930.		MOONRISE. May, 1930.	June. 1930.
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Rises.
					a.m.	a.m.
1	6.21	5.17	6.39	5.2	8.33	10.29
2	6.21	5.17	6.39	5.2	9.36	11.19
3	6.22	5.16	6.40	5.2	10.40	11.59
						p.m.
4	6.22	5.16	6.40	5.1	11.41	12.36
					p.m.	
5	6.23	5.15	6.41	5.1	12.35	1.8
6	6.23	5.14	6.41	5.1	1.21	1.40
7	6.24	5.14	6.42	5.1	1.57	2.12
8	6.25	5.13	6.42	5.0	2.32	2.46
9	6.25	5.13	6.42	5.0	3.6	3.21
10	6.26	5.12	6.43	5.0	3.38	4.3
11	6.27	5.11	6.43	5.0	4.10	4.51
12	6.27	5.11	6.43	5.0	4.45	5.52
13	6.28	5.10	6.43	5.0	5.23	6.35
14	6.28	5.10	6.44	5.0	6.9	7.30
15	6.29	5.9	6.44	5.0	6.58	8.25
16	6.30	5.8	6.44	5.0	7.50	9.20
17	6.30	5.8	6.44	5.1	8.44	10.15
18	6.31	5.7	6.45	5.1	9.39	11.9
19	6.31	5.7	6.45	5.1	10.35	...
						a.m.
20	6.32	5.6	6.45	5.1	11.31	12.1
21	6.33	5.6	6.45	5.2	...	12.55
					a.m.	
22	6.33	5.5	6.46	5.2	12.11	1.47
23	6.34	5.5	6.46	5.2	1.18	2.51
24	6.35	5.4	6.46	5.2	2.12	3.56
25	6.35	5.4	6.46	5.3	3.8	5.1
26	6.36	5.3	6.46	5.3	4.6	6.9
27	6.36	5.3	6.47	5.3	5.8	7.16
28	6.37	5.2	6.47	5.3	6.16	8.17
29	6.38	5.2	6.47	5.3	7.22	9.13
30	6.38	5.1	6.47	5.3	8.29	9.55
31	6.39	5.1	...	...	9.32	...

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 somewhat 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.

6 May	☾ First Quarter	2	53 a.m.
13 ,,	○ Full Moon	3	29 a.m.
21 ,,	☽ Last Quarter	2	21 a.m.
28 ,,	● New Moon	3	36 p.m.

Perigee, 5th May, at 4.48 a.m.
Apogee, 19th May, at 5.54 p.m.
Perigee, 31st May, at 3.36 p.m.

On the 13th the Moon will occult Delta Scorpii, magnitude 2·7. The times at which the star will disappear and reappear will depend upon the position of the observer and be earlier in the south than in the north of Queensland, generally speaking. The brightness of the full Moon will make telescope or binoculars necessary. Between extreme positions in the south-east and north-west observers should be ready to watch the Moon approaching the star from the west as much as three hours before midnight.

On the 16th the Moon will be passing above Saturn at a distance of 6 degrees, the length of the Southern Cross, about 2 a.m.; the position in the sky being about north-north-east.

Venus will be passing from west to east of Jupiter apparently at a distance of nearly three diameters of the Moon to the north. When visible they will be low down in the east-north-east, near daybreak.

On the 20th Mercury will be passing from the east to the west side of the Sun at a distance of rather more than the diameter of the Moon.

When the Moon passes Mars on the 25th at midday, they will be over in the north-west and may be visible with slight optical aid, if the eyes are well screened from the Sun.

Mercury will set at 6.17 p.m. on the 1st and on the 15th only 25 minutes after the Sun.

Venus will set at 6.28 p.m. on the 1st and at 6.41 p.m. on the 15th.

Mars will rise at 3.40 a.m. on the 1st and at 3.35 a.m. on the 15th.

Jupiter will set at 7.35 p.m. on the 1st and at 6.53 p.m. on the 15th.

Saturn will rise at 9.17 p.m. on the 1st and at 8.20 p.m. on the 15th.

4 June	☾ First Quarter	7	56 a.m.
11 ,,	○ Full Moon	4	12 p.m.
19 ,,	☽ Last Quarter	7	0 p.m.
26 ,,	● New Moon	11	47 p.m.

Apogee, 16th June, at 10.54 a.m.
Perigee, 28th June, at 1.18 p.m.

Mercury will reach its greatest distance, 23 degrees west of the Sun, on the 15th, when it will be visible in the east shortly before sunrise.

Jupiter will be behind the disc of the Sun on the 20th, but at a distance of 483 million miles. If the Moon were in the place of the Sun an occultation would occur. In the case of the Sun no times of disappearance and reappearance can possibly be noted.