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PART I.

Event and Comment.

Pigs and Piggeries.

DURING recent months the Minister for Agriculture and Stock (Hon. H. F. Walker) has been engaged in co-operation with the various organisations concerned in an endeavour to improve the position of farmers who are producing and marketing pigs as a regular business. In the past the Department has not been supplied regularly with complete information relative to the pigs and piggeries on individual farms, and as this information is a first requirement in any progressive extension work, Mr. Walker has arranged for regular inspection of pigs and piggeries by dairy and stock inspectors who are stationed at convenient centres throughout the State. Under this scheme more than 2,000 inspections have already been carried out and reported on monthly. On receipt of the reports, they are checked by officers of the Dairy and Pig Raising Branches, and, where necessary, suitable action is taken to follow up the work of the inspectors. For the guidance of departmental officers whose duty it is to carry out these inspections, a set of instructions was circulated, and has since been published for general information. For the time being, it is thought that these instructions, in conjunction with the provisions of the Stock Diseases and Dairy Produce Acts, will suffice to ensure the necessary control, and it is hoped that no further amendments to existing legislation will be required, for the desire is that piggeries should be improved along the lines indicated without arbitrary enforcement of the law. In cases where pigs are undoubtedly suffering from the effects of improper accommodation and feeding, the owners will be expected—in fact, directed—to amend their methods of management, and effect necessary improvements.

The instructions issued cover the following points:—Sufficient covering to be provided at each piggery to protect pigs from exposure to rain or the direct rays of the sun. Where pigs are paddocked, effective shelter sheds must be provided.

Each sty, yard, or paddock must be of sufficient size to accommodate suitably the pigs kept therein, and, as far as practicable, be kept always in a clean and sanitary condition. Suitable feeding places must be provided, and sties or shelter sheds must be drained sufficiently to ensure reasonable cleanliness and dryness. Pigs confined in sties or yards must be fed from troughs. The enclosures must be floored with concrete or other material impervious to moisture. Pigs must always have access to a sufficient supply of clean drinking water. It is advisable for all sties to be limewashed, say, at least every six months. Pigs must not be permitted to have access to impure water, nor be fed on fermented, unsound, decayed, or unwholesome food. Conveyances for the transport of pigs during the summer months must be provided with a cover to protect the animals from the direct rays of the sun.

It is observed with satisfaction that the scheme is working well and is regarded favourably by the producers who have evinced a strong desire to co-operate with officers of the Department and to conform with instructions where their issue is necessary.

Improvement in Pork Prices.

AN upswing in pork prices was one of the brighter experiences of the month's market movements. One of the principal selling firms advises that at the mid-June sales at Enoggera buyers attended in full force. They included representatives of three meatworks as well as several of the carcass butchers and bacon-curers. Prime light pork went to 5½d. per lb., while medium weight pork realised 4½d. to 4¾d., and baconers 4½d. per lb., and in some instances better. Bacon pig prices have advanced to 4½d. per lb. at the bacon factories, with corresponding increases for other than prime weights—90 to 120 lb. dressed. These prices are, of course, for prime quality sorts only; all other grades remain at the lower levels.

Fruitful Stanthorpe.

STANTHORPE fruitgrowers as a whole may congratulate themselves on the results of the past season, which was one of progress on the Granite Belt. The crop of fruit and vegetables was not so large as in the previous year, but quality production and freedom from fly and other pests ensured the realisation of comparatively satisfactory prices. The district is prosperous, and good orchards and vineyards are not for sale. Considerable improvement in farm management is evident in every direction. Green manuring is increasingly practised, and some very fine crops of peas have enriched the soil this autumn. Both spraying and pruning are now carried out more carefully and intelligently, and the working over of non-commercial varieties gradually but surely proceeded with, due to the instruction and assistance of the Department of Agriculture and Stock. In a report to the Minister (Hon. H. F. Walker), Mr. H. St. J. Pratt, Instructor in Fruit Culture, advises that the eradication of neglected fruit trees on abandoned orchards is proceeding steadily. The enlarged powers under the Diseases in Plants Act have been of considerable help in this direction.

The overseas export trade has developed remarkably during the last three years. A start was made in this direction in the 1928-29 season, when 155 cases of apples were sent to Eastern Asia. In the 1929-30 season the quota was raised to 2,200 cases, and that quantity was more than doubled last season, when over 5,000 cases, mainly apples, were exported to England, New Zealand, Canada; also Sourabaya, Singapore, and other ports in the Malayan Archipelago. Pears, grapes, and plums were also included in these overseas consignments. This export trade should in the next few years prove of immense value to Stanthorpe. The quality of the temperate fruits produced on the granite country has attained a high standard, and Stanthorpe growers with their earlier seasonal advantage should be able to obtain the full benefit of their geographical position as compared with that of producers in the Southern States.

Methods of pruning of grapes have improved considerably, and more intelligent spraying is being practised. Grapegrowers are keenly alive to the risk of disease, and new vineyards are being planted with resistant stock. All the grapes exported to New Zealand, Canada, and Eastern Asia this year arrived in good condition and realised quite satisfactory prices. Those markets will be tested still further next season. The marketing by shortsighted growers of immature grapes with little or no sugar content is reported. This practice must cease if the interests of the industry are to be conserved.

Improved Fruit Packing.

THE packing house erected last year at The Summit as an experiment has now passed that stage, and its success has again demonstrated the necessity of such equipment in every convenient centre. The Summit packing house has already proved of considerable benefit to its suppliers. Its pack, attractively labelled, is in keen demand in Brisbane, and is becoming more favourably known and appreciated in outside country centres. From The Summit 2,770 bushels of apples were exported to England, Sourabaya, and Singapore, where they were sold at satisfactory prices. This total will probably be at least doubled next season.

A Bright Outlook.

THE Stanthorpe and The Summit shows this year were an excellent advertisement of the productivity of the Granite Belt. Growers co-operated enthusiastically, and the result was that the fruit and vegetables were better in range, numbers, and especially in quality than ever before in local history.

The consignment of immature fruit is at the present time probably the greatest difficulty with which the district has to contend, and it is hoped that a special effort will be made to remedy this form of unintelligent marketing during the coming season. The outlook in the Stanthorpe district is really brighter than it has ever been, for it has been proved beyond doubt that the Granite Belt can produce fruit of an excellent quality, suitable not only for the Australian trade but also for overseas markets. The success of the export trade reduces the risk of over-production, and, given good seasons, each year should be marked by a steady expansion in all directions.

The Fur Industry.

INQUIRIES have been received recently by the Federal Government as to the possibilities of the extension of the angora and chinchilla fur industry in the Commonwealth. Owing to Australia's limited experience in breeding the requisite types of rabbits in captivity, it is impossible to state with any degree of certainty the prospects, especially in view, at the present time, of the very serious price decline in fur overseas. Generally speaking, very little headway has been made recently in the States of the Commonwealth in this industry, but more definite efforts have been made in Tasmania and New South Wales to place the industry on a commercial footing. This embryo enterprise has suffered, perhaps, like most new industries in that the small producers interesting themselves started off on unsound lines by using inferior and the wrong type of stock. It is understood, however, that the undesirable class of rabbit is being gradually culled, and the industry, though in a very small way, is on a sounder basis than hitherto. An association has recently been formed in Sydney with the object of improving and developing the standard of the rabbit used. With a view of testing the overseas market, a small parcel of angora wool was shipped recently to London for early sale. It is considered that when the industry has been stabilised chinchilla pelts may have a fair market locally. The limited market overseas, the increase in production by other countries without a corresponding increase in demand, and the heavy price decline, are certainly not at present encouraging factors.

THE QUEENSLAND SUGAR INDUSTRY.

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

PART XVI.

(c) Mills and Milling Work—*continued.*

IN reviewing the history of the earlier sugar-mills we left the 1888 Royal Commission of inquiry as to the severe depression then existing in the sugar industry, at the Lower Burdekin. Having finished there, they next proceeded to Mackay.

Mackay.

The first sugar-mill inquired into was the Racecourse Central Mill, and Mr. Thomas Pearce, the Chairman of Directors, gave evidence. He said the mill had been erected by the Racecourse Central Sugar Mill Company through a loan obtained by the Government, to be repaid at the rate of 8 per cent. annually, the Government holding a mortgage over all the properties. Asked whether it was not one of the conditions that black labour was not to be employed, witness said "Yes, the ninth clause says—'That I will employ labourers of European extraction and none others in and about the cultivation, carting, and cutting of the cane.' There was nothing in the Articles of Association as to black labour." The mill had been ready for crushing the last season, but as only a little cane was offering, their engineer had told them that if they crushed they would sustain a loss of £200 to £300. The interest had not been paid for reasons explained to the Government; as there had been no crushing it would have involved a terrible loss. The directors were only employing a secretary at that time, and paid him £130 a year. The present season had been such that there was very little prospect of a crushing unless they bought cane. No black labour was being employed. The original cost in Glasgow of the mill was £9,897, and the total cost including erection and buildings, about £19,000. He thought the central mill system would eventually be a success, but he did not think it could be carried on by white labour, because it did not pay. The grower was to receive 8s. a ton for cane, but that was not a payable price; it was assumed that at 20 tons per acre it would just pay for the labour. They had been having adverse seasons and many of the settlers had to hunt kangaroos for food. They required about 5 miles of tramway, but had no money; there would be another 300 acres grown if there were means of bringing in the cane. Other directors of the mill were examined, one of whom said that if the farmers who had previously signed the conditions to get a central mill were now asked to sign, they would not do so.

North Eton Central Mill was next taken, and Mr. George Ironsides, Chairman of Directors, gave evidence to the effect that he, with others, had undertaken to grow cane entirely by white labour. He had 200 acres under cane, the yield being an average of 20 tons per acre. He was of opinion that cane could be grown by white labour. In 1888 they had crushed 1,400 tons of cane and had made 100 tons of sugar. It was a very bad crop. They would need to make 1,200 to 1,500 tons of sugar to pay interest and working expenses. They had not paid any interest yet, but they had not received all the money from the Govern-

ment. The total cost of the mill up to the present had been about £20,000. He could not, nor could the secretary, give them an estimate of the working expenses for the year, although it had been gone into many a time. There were twenty shareholders in the company, but they were prepared to buy cane from other growers at 13s. per ton. They did not ask whether such cane was grown by white or black labour. Their own shareholders only got 10s. a ton. The Government had promised to lend £25,000 in all. They employed two officers, the manager and the secretary. The manager received £300 a year and the secretary £100, so big salaries were not paid at that time. The witness said they got about £14 per ton for first sugar and the men employed in the mill got £1 a week, but the engine-driver got 30s. a week and the sugar-boilers £3 a week. About forty-five men were employed in the mill during crushing. The mill wanted about 10 miles of tramway, which would cost about £5,000. Witness was convinced that given good seasons the North Eton Mill would pay, and they could grow the cane exclusively with white labour. Another witness said the mill was too big and had been shoved on to the shareholders.

The next Mackay mill taken was Meadowlands. Mr. W. H. Hyne stated that the name of the estate was "Meadowlands and Balmoral," the total area being 1,437 acres, of which 320 acres were under cultivation. He had crushed cane from 200 acres last year, which was his own production, and that had yielded 250 tons of sugar; but he had also purchased about 1,800 tons of cane from adjoining farmers, paying 13s. a ton for the cane. He fed his horses with the molasses. There were £50,000 of capital invested in the estate, but it returned no interest last year. At one time he made £10,000 a year out of it, but since 1883 it had commenced to fail. *The expenses last year had been £5,500. He employed Europeans and kanakas in the field, one European to four kanakas, but the European jibbed on field work. He considered field work injured the health of Europeans; great strong men came as ploughmen, and in six months they were as thin as possible. They eat as much as they can and seemed to grow weak, their health was affected by eating beef, but after the first twelve months they got acclimatised. They came out from home with big full-moon faces and after twelve months he had been ashamed to see them. The depression was caused through unnecessary legislation making kanaka labour too dear, and the low price of sugar also affected it. He was not prepared to grow cane with white labour, and could not get along with black, unless he could get it cheaper.

The Commission then dealt with Palmyra, and the owner, Mr. Hugh McCready, gave evidence. The total area of the estate was about 626 acres, 470 being under cultivation. Last year he had crushed 320 acres of his own cane and 70 from adjoining growers. His total output of sugar was 192 tons and 8,000 gallons of molasses; some of this was sold to distillers and some used for horse feed. Twenty thousand pounds was invested in the estate and he had made a loss of £1,560 last year, but it had returned interest in previous years at about 6½ per cent. on the capital invested. The working expenses were between £4,000 and £6,000. He employed Europeans to do all work in connection with ploughs and implements, and kanakas to do weeding, trashing, hoeing, and cane-cutting. Indirectly he gave employment to a large number of white men; there was no other industry in Mackay to create employment for white people outside the sugar industry. He had tried

the best white labour for light work in the field, bringing them specially from Scotland, but they simply would not do it, shammed sickness and tried all sorts of dodges to get out of it, so that he had been very glad to cancel their agreements and let them go.

Walter Trueman Paget gave evidence as to Ninderoo Mill. The estate contained 1,410 acres, of which 700 were under cane. The cane from 549 acres was cut in the 1888 season, from which 310 tons of sugar and 7,500 gallons of molasses had been made, the latter being fed to stock. The sum of £65,000 had been invested, but no interest had been returned in 1888. The plantation had returned interest in some of the previous years. The working expenses in 1888 had been £10,221, and their loss, including depreciation on machinery and buildings, was £7,321. He preferred kanakas for field work; European labour had been very unsatisfactory in the field. The machinery, freight, erection, and buildings for the mill had cost £24,000. The machinery was manufactured in Glasgow and Derby, the coolers and tanks in Mackay. The cost of the annual overhaul was from £400 to £500. Witness was of opinion that to combat the depression in the industry the continuance of kanaka labour must be assured. They worked the mill as well as they could. He had not a triple effect, but had steam evaporators. They paid 10s. a ton for cane and had paid up to 14s. They did not get as much cane as they required. In 1883 to 1885 they had paid away £9,000 for cane. In 1888 they had only paid £78 15s. The reason farmers gave him for not growing more cane was that coloured labour was dear and cane low in price.

These were all the witnesses in connection with the Mackay mills that were examined.

Rockhampton.

The Commission then proceeded to Rockhampton and examined the liquidator of the Yeppoon Sugar Company. He gave evidence that there were 2,000 acres of land in the estate, of which 700 were under sugar. They had crushed last year the cane from 475 acres, and had made about 330 tons of sugar. The total capital of the company was £40,000, of which £24,000 had been subscribed; the balance was overdraft advanced by the Bank of New South Wales. Their total expenditure for 1887 was £10,137. They paid the bank at the rate of £1,500 a year, but no interest was paid. The bank foreclosed. The machinery cost £6,840. They made very good white sugar, which realised top price. The capacity of the mill was from 1,000 to 1,500 tons of sugar. Five hundred tons was the largest they had made; they started in June and finished before December; they did not work continuously, as they had to stop several times for want of water and labour. He considered that if they had to find white labour they could not carry on at all. They received about £16 or £18 for their sugars—that was the average. The present year, 1889, they would average £20. When they first started they got £30 a ton and it had gradually come down to £17. The directors would not continue to go any further, and the property was to be sold. In the event of its not being sold, the bank would not carry it on in the uncertainty then ruling. The former chairman of the Yeppoon Sugar Company said the principal cause of their not being able to carry on was the bad season in 1888. As far as the Pandora Mill was concerned it was wound up two or three years ago owing to insufficient capital and bad seasons.

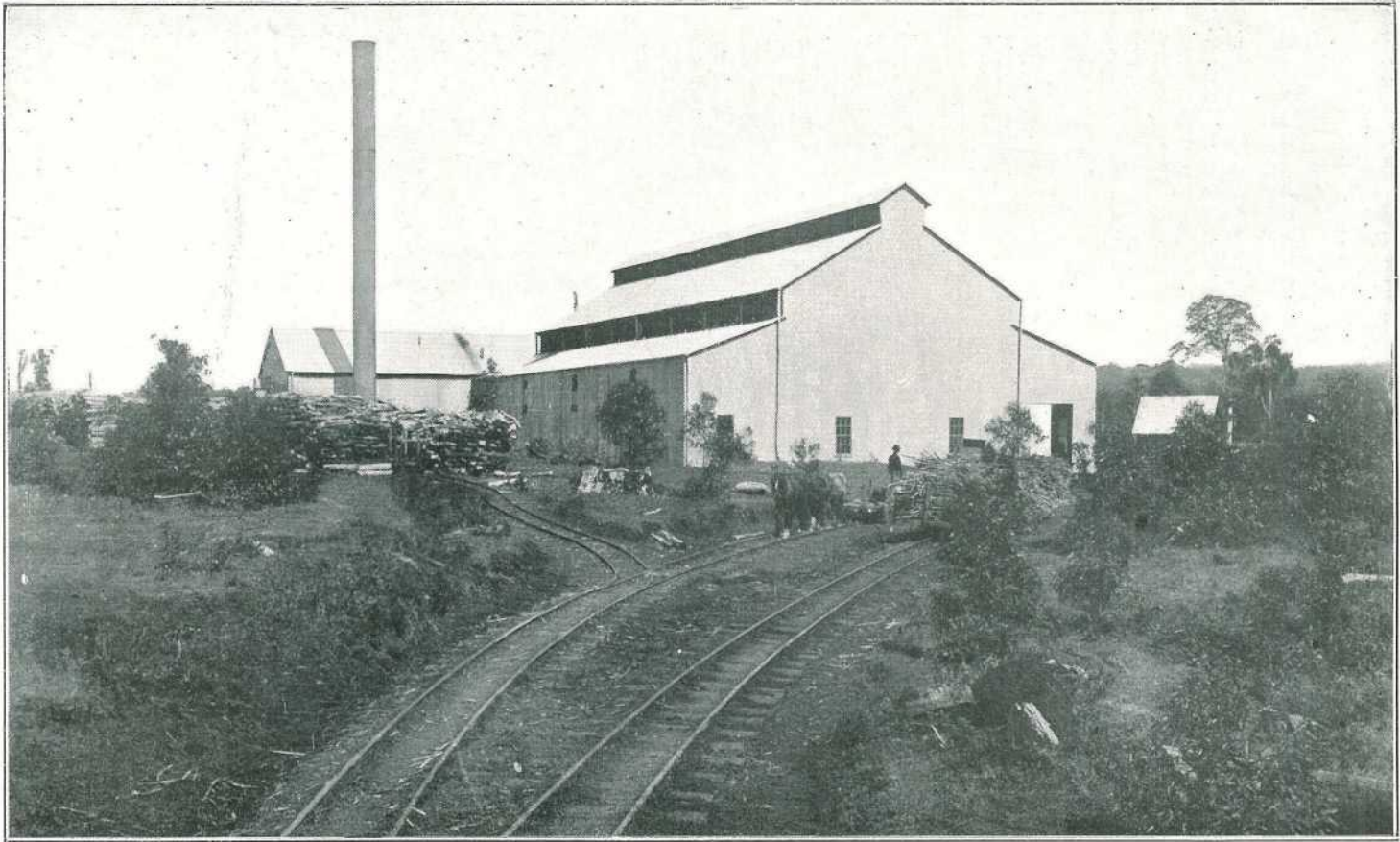


PLATE 1.—MORETON CENTRAL MILL, NAMBOUR, IN THE 'NINETIES.

William Broom said he was the original founder of the Yeppoon Sugar Plantation and commenced sugar cultivation in 1878, and still had a large interest in the place, but had been a heavy loser. If the plantation was not sold the unfortunates, of whom he was one, who had guaranteed about £16,000, would have to carry it on in the best way they could. He considered the mill and machinery had cost about £20,000. The manager of the Yeppoon Mill condemned white labour in no unmeasured terms; he said he would not invest a fig of tobacco in any plantation that employed white men; it was too unstable, and they had no command over it. He did not believe in central mills; they could have them where they liked, he did not care where, but they would not succeed with white labour unless they had a scrub like they had on the Johnstone and had a lot of farmers with big families growing cane and making slaves of their boys and girls. If in 1890 the importation of kanakas was going to stop, who on God's earth was going into the sugar industry with that hanging over them? The sugar industry would collapse.

Bundaberg.

Proceeding down the coast the next sugar centre visited was Bundaberg. Mr. M. Duffy examined, said he commenced business in 1878, and there were then just two mills working in the district, the average turnout being about 500 tons per annum in good seasons. When he retired from business in 1888, the output was 20,000 tons. The total tonnage of imports and exports for Bundaberg from April, 1878, to 1879 was 6,314 tons, while the total from April, 1887, to 1888 was 38,152 tons, not including imports of coal, which was 14,000 tons—Millaquin alone using about 13,000 tons. Continuing, he said he considered the sugar industry was in a precarious condition, there was no market in Queensland for the sugar produced, and it had to be sent to Sydney, Melbourne, and other places where it had to compete with other countries where they had the advantage of cheap labour in manufacture. That and the uncertainty of the labour question prevented banks and other firms financing plantations. The sugar industry had increased with great rapidity in Bundaberg; other businesses such as timber and maize had stood still. Before Millaquin had been established about eight years ago the very best land in the Woongarra Scrub was offered to him at £3 per acre; you could not buy the same land now at £30 per acre. When he arrived, there were only 300 people in Bundaberg, in 1888 there were 4,000 Europeans. He purchased an allotment in Bourbong street when Millaquin started, for £350; the actual value now (1889) was £4,000 to £5,000 without the buildings. If the sugar industry failed it would mean the collapse of the town, for there was nothing else to support it; the value of the export of sugar in 1888 was £300,000, which was six times the value of the whole of the exports put together.

Mr. F. L. Nott, of Windermere Plantation, gave evidence that the total area of the estate was about 1,500 acres, 670 being under cane. Last season he had crushed cane from 400 acres, and had sent 650 tons of juice to Millaquin, and had made 350 tons of sugar. This was a very heavy yield; it was all two or three-year old cane, every stick of it. This was the first season they had made sugar, and nothing had been done with the molasses, but they expected a distillery to be erected. About £50,000 had been invested in the estate; it did not return any interest in 1888 because they had just put in another crushing mill. If that had not been done they would have got about 10 per cent. The

working expenses in 1888 were about £8,000. They paid from £6 to £18 a year for coloured labour, with rations. European labour was very unsatisfactory in the field. There was a certain amount of labour in the field that the white man was not able to do. Kanakas would have to be employed in planting, weeding, chipping, trashing, and cutting. The machinery had been made principally in Maryborough, and had cost £15,000.

John Cran stated he was interested in the Millaquin Refinery, and in the year 1888 had manufactured 6,933 tons of sugar. The refinery had cost from £150,000 to £160,000. The expenses in 1887 had been about £60,000 for working expenses only, and did not include the amount paid for juice. They employed about 170 white men and about thirty-two Polynesians; the latter were time-expired boys who received 10s. a week and rations. The cost of the total overhaul at the refinery was from £2,000 to £3,000, the whole of such work being done by Europeans. The refinery had suffered very much from the depression due to competition with bounty-fed sugars from Continental countries, the great cost of labour in Queensland as compared with other sugar-growing countries, and they had also suffered very much from drought during the last five or six years. If some system of reciprocity could be introduced that would protect Queensland sugar against outside competition it would be a good thing, and the Queensland Government should encourage and assist the industry in every possible way by the inauguration of a scheme of irrigation similar to that so successfully carried out in America—that he considered the most important of all. If anything happened to the industry it would be very serious, and be absolute ruin to a great many; the sugar refinery rested altogether on the sugar industry, also the prosperity of Bundaberg to a very large extent indeed. He knew of no other crop that yielded the same return. They were proposing to build a juice mill in the Isis district—a very large scrub, some of it very rich. They did not have enough cane to keep their Yengarie Refinery employed fully during the season and could not support it for want of a large amount of cane. If they turned out 2,000 tons of sugar there would be a loss, whereas if they turned out 5,000 tons they would have a gain because the expenses of management and a lot of other charges were just the same.

They bought juice in Bundaberg; some cane would give 70 per cent. of juice, and another lot would only give 50 per cent. They had a complete system of piping for bringing juice from the various crushing mills to the refinery, pretty nearly 20 miles of pipe underground. The cane was crushed at the various plantations and the juice thus extracted is mixed with lime so as to preserve it. They mix the juice at the plantations, and take its density and pay the planters for the juice according to its density. It is then pumped through the pipes to the factory by force pumps. The farthest distance they had to pump from a crushing mill to the refinery was about 7 miles. They had reservoir tanks capable of holding 100,000 gallons, and during the crushing season these tanks were filled continuously; they worked the juice as fast as it came through and kept as little on hand as possible. The factory gave a large amount of employment to hands outside, and a very considerable number of farmers depended on Millaquin. They used about 14,000 tons of coal and 5,000 tons of limestone. They intended sending the juice by rail from their crushing plant in the Isis to Yengarie, and so would give employment to the Government railway.

Maryborough.

The Maryborough district was next on the list. Evidence was given concerning various small mills at Urangan and other parts of the district. Robert Cran, manager of Yengarie Refinery, stated he purchased juice from surrounding growers on the Mary River, and the juice was brought in by pipes or barges. Last year (1888) they had manufactured about 1,500 tons of sugar. About twenty-five canegrowers supplied juice. There were £100,000 invested in the refinery. Frosts destroyed a great deal of the cane.

A witness named Damm, examined at Pialba, said all the mills thereabout were not fitted for the manufacture of sugar at the price sugar then was. He had grown sugar and it was agreed that he should get 13s. per ton for 10 per cent. density. The millowner tested with a saccharimeter, but before doing so he used to mix the juice with rubbish, and so the instrument would not rise and only showed 5 per cent. If he had allowed it to settle it would have shown more. He was humbugged and only got 7s. a ton.

Southern Districts.

After leaving Maryborough, Thomas Laurence Smith, who died this present year (1931), was examined. He had a mill in the Rosewood Scrub at that time called Woodlands Plantation. This mill was afterwards known as the Marburg Mill. He had 1,200 acres of which 250 were under cane in 1888, but they did not crush owing to the dry season. He had invested about £20,000 to £25,000 in the mill, distillery, cane, and fencing. He had not got any interest on the money yet. In 1887 they made about 270 tons of sugar and 1,300 gallons of rum. They utilised all their molasses by making rum, and there was a good market. He employed niggers. He could get white labour, but it was no use when you did get it. One or two farmers grew cane for him; sometimes they would bring it to the mill and at other times they would not. He had a few white men in the mill and paid them the ordinary labourer's wage—viz., 4s. a day with no rations, but quarters found. When he started the plantation he got £22 for a low ration sugar. Now he had to sell refined sugar for £15 a ton. His mill could turn out 4 tons of sugar per day. He had shown farmers they could make £12 an acre by growing cane and only £6 an acre by growing maize. They were Germans, and they would not believe him.

A number of people interested in the small southern mills were also examined on the general lines indicated above, and a summary of these mills will be given, to avoid going into too much detail.

Mount Cotton Plantation.—Owner, H. Heinemann; output of sugar, 190 tons; amount invested, £5,000.

Eagleby Co-operative.—Output of sugar, 67 tons; cost of mill, £4,000.

Beenleigh Plantation.—Used to get £28 to £32 per ton for sugar, now only got £15 10s. Commenced to grow sugar-cane in 1866. In 1869 the yield was 4 tons of sugar per acre; the average now was about 2½ tons. It took 14 to 15 tons of cane to 1 ton of sugar. £9,000 was invested, but they had now gone out of growing sugar.

It was stated in evidence that there were at one time a number of plantations about Beenleigh and Logan, but they had nearly all closed down. Junction Mill, Stegelitz, Otmoor, Rockholme, Helensvale, and a few others were still going. Other mills mentioned were Gramzow, Ageston, Ebenezer, and Norwell.

Brisbane.

At Brisbane, Edward William Knox, general manager of the Colonial Sugar Refining Company, stated the company owned three mills in Queensland—viz., Homebush, Victoria, and Goondi—which comprised about 38,000 acres. The total capital invested independent of interest on the outlay was £624,000. The whole of the sugar they made in Queensland was taken to Sydney, Melbourne, or Auckland. They paid £5 a ton duty in Sydney, and worked in bond and paid duty as it was taken out of the refinery. The company could afford to pay a much higher price for cane in New South Wales, as there was no excise duty. The largest quantity produced in one year in New South Wales was about one-half of the consumption of the colony. Asked if the diffusion process had been tried by the company, Mr. Knox said they had put down a plant for that purpose in New South Wales, and personally he was of opinion that the process would be universally adopted for the manufacture of sugar from cane where cheap fuel and a good supply of water could be obtained. Their working had only been experimental, but they were convinced that a larger quantity of sugar could be extracted from the cane by diffusion than by any other process, and he believed that the larger quantity of sugar would pay for the larger quantity of fuel when the cost of coal would not exceed from 25s. to 30s. a ton. Diffusion, however, could only be adopted at factories as now arranged by the expenditure of a large sum of money, and under present circumstances it would be out of the question to invest any additional capital in Queensland factories. The sugar industry was more depressed in Queensland than in other sugar-producing countries, because the cost of production was higher. They could produce sugar cheaper in Fiji, but the cane was not so sweet. Sugar had fallen from £10 to £12 a ton in Australia since 1884. At the present moment (1889) there was in Queensland ample machinery to manufacture a much larger crop. In Germany the yield of sugar from beets had been increased and cost of working lessened. In 1887, the yield of sugar throughout Germany was 1 ton of 88 per cent. net titre to 7.4 tons of beet. If the present Act (Abolition of Kanakas) was not repealed they would close two of their mills in Queensland, and the other would follow. They could find employment for the machinery either in Fiji or New South Wales. They were not prepared at that time to invest more capital in Queensland, owing to the uncertainty as to the supply of labour. Questioned as to the mills, Mr. Knox said there was double crushing at all their mills; they macerated the cane and all their work was carried out under chemical supervision. Speaking roughly, they obtained about three-fourths of the obtainable sugar from the cane. They put the molasses on their fields.

Abstract of Report of Commission.

In the report of two of the Commissioners, Messrs. King and Cowley, they state that the total area of land in Queensland on 31st December, 1888, under sugar-cane was 51,815 acres, which was one-fourth of the entire area cultivated in the colony. They estimated the capital invested in the sugar industry was about £5,000,000 sterling, the machinery alone representing a value of £1,000,000, while the annual expenditure was scarcely less than £800,000, and the value of the sugar exported was about £800,000. The number of Europeans employed was between 2,000 and 3,000, and the total number more or less directly interested, and

whose livelihood almost depended on it, could not be less than double that number. Seventy per cent. of the immigrants were engaged for the plantations and the number of Polynesians would be about 6,000. The wages of these amount to about £50,000 per annum, and of Europeans, not including managers, to £200,000. In the districts north of Rockhampton the farmers' produce is almost entirely consumed by the plantations, the number of horses that are being worked being enormous, averaging in many instances over a hundred on a single plantation. The effect of the depression had already been felt in the timber, iron, foundry, and shipping trades, sugar being the only article of agricultural produce of which any appreciable quantity is exported from the colony. The results of the Commission's researches fully justified its appointment and gave unmistakable evidence of a serious depression in the industry, and the necessity of immediately adopting measures for its relief. The most northerly plantation was that at Weary Bay in the Cook district (Bloomfield). That, after an expenditure of £100,000, was about to be abandoned. The only plantation in the Port Douglas district had ceased operations; Hop Wah at Cairns was abandoned, Pyramid Plantation was in the hands of a mortgagee, the pioneers having to relinquish it after spending £130,000.

On the Johnstone River there are four plantations, on one the mortgagee has foreclosed but is still carrying on, the others are not paying expenses though they are replete with every appliance for economical working. The Herbert River plantations are in no better condition; Gairloch has been sold and closed. The others failed to give any return on the capital invested. On the Burdekin delta there are three plantations, and there was another on which £200,000 had been expended but it was now closed. At Mackay there were twenty-two plantations with mills and two Government central mills. Evidence went to show that in no single instance either amongst farmers or planters was a profit being made, all being carried out at a loss. The town of Mackay was most seriously depressed in its trade and general business. In 1887, £284,829 worth of sugar was exported, and in 1888 this had fallen to £112,540 worth. At Rockhampton there is only one plantation (Yeppoon) now in existence. The Yeppoon Plantation was in liquidation and sold for £10,500, although £40,000 had been expended on it. At Bundaberg, affairs were somewhat different, there being forty plantations, twenty-two manufacturing plants, fourteen crushing mills, and one sugar refinery. This district showed evidence of a certain amount of prosperity and it was shown that in twelve instances interest ranging from 2 to 11 per cent. was paid on capital invested. In all other cases more or less loss was the result. The depression at Maryborough was most marked. In the Logan district it was found that many of the older plantations were abandoned, but some of the smaller were still in existence and growing cane; in some cases profitably, and in others affording the owners only a bare subsistence. We consider that the depression in the sugar industry is not attributable to the ignorance and incapacity of the planters as a body. They have shown on the contrary great enterprise. There was no doubt, however, that a large number of planters were seriously embarrassed. Since 1883, sugar of all classes had fallen in price fully 50 per cent., and there is no doubt that this fall, which was likely to be permanent, had been the principal cause of the depression of the sugar industry in Queensland; that is to say that if sugar had maintained its price the plantations would have well paid their owners instead of ruining them.

With reference to the question "Can sugar be grown in Queensland without black labour?" the colony must be divided into two sections—north and south. In the northern districts there was absolute unanimity that white men could not cultivate cane. In the districts south of Townsville, a different condition exists; here white labourers can do the work without such great danger to life or health, but they dislike the hand work in the field so much that they will not willingly undertake it. From the evidence laid before the Commission, it is concluded that sugar cannot be grown profitably, at least for export, without the employment for hand labour in the field of a class of labour cheaper and more suited for the work than white labour. The Commission went on to recommend that negotiations should be opened with the colonies of Victoria and South Australia for the purpose of ascertaining on what terms and conditions those colonies would admit Queensland sugars duty free, and they declared it was their opinion that if all coloured labour were withdrawn from the plantations the extinction of the sugar industry must speedily follow; and they therefore recommended that the introduction of Polynesian labour be permitted to continue, at all events for some years longer than the period then limited.

The opinion of the Chairman of the Commission, Mr. W. H. Groom, M.L.A., was expressed in a minority report. After traversing the conditions of the industry and the mills, he said that one of the suggested remedies for discussion, namely the extension of the Pacific Island Labourers Act for a further period of five years, opened up a very grave question of public policy, and a large majority of members had been returned to Parliament pledged to oppose the introduction of coloured labour and put a stop to its further introduction as early as possible. Those engaged in the sugar industry, therefore, asked the Parliament of the country to reverse its decision arrived at after mature deliberation on the part of the great body of the electors. The verdict of the electors was unquestionably adverse to the revival of the coloured labour question, and it was felt that a time would come when coloured labour would cease and all the industries of the country would be conducted entirely by white labour. Should Federation come about, the further admission into any colony of Asiatic or coloured races was definitely settled, because it would mean the exclusion of all such races. On the other hand if the question "Is Queensland able to do without the sugar industry except on the basis of a white population?" is answered in the affirmative, then undoubtedly a very large portion of the coast districts in the North would not be populated, at all events for a long time to come.

In Mr. Groom's opinion the causes of the depression in the sugar industry were—

- (a) The unnecessarily large areas held by planters compared with the small area actually cultivated and the consequent payment of interest on the large unproductive area.
- (b) The erection of mills quite disproportionate to the area of cane under cultivation.
- (c) Sudden and continuous fall in the price of sugar arising from the keen competition of sugar produced from beetroot.
- (d) Financial embarrassment of many planters owing to their working on borrowed capital bearing a high rate of interest.

[TO BE CONTINUED.]

Bureau of Sugar Experiment Stations.

SUGAR-CANE TECHNOLOGISTS.

PORTO RICO CONFERENCE.

The Vice-Chairman of the Queensland Section of the International Society of Sugar-cane Technologists (Mr. H. T. Easterby) has been advised by the General Chairman of the Society (Dr. F. W. Zerban) that the Fourth Conference of the International Society will be held at San Juan, Porto Rico, in March, 1932. The meeting itself will last about one week, and will be followed by another week of excursions to plantations and other points of interest.

The Third Congress held, in Soerabaja, Java, was attended by delegates from fourteen different countries, and it is expected that the next one will be even more truly international in scope. Official invitations will be sent out during the summer.

There will be one or two meetings at which problems of general interest will be taken up, and then the Congress will divide into several sections, each one under a separate chairman, to discuss the various special branches of sugar technology, such as—

- Protective sugar-cane quarantine,
- Insect pests of sugar-cane,
- Diseases of sugar-cane,
- Varieties, including propagation and selection,
- Cultivation and field operations,
- Description and identification of the original cane varieties,
- Soils,
- Irrigation and drainage,
- Technique of field experiments,
- Factory operation and chemical control,
- Uniformity in reporting factory data,
- Forestry.

The technical committees having charge of these various subjects are to present at the meeting reports on progress made in their particular fields since the last Congress. These reports will be supplemented by brief individual papers relevant to the topics under discussion.

ENTOMOLOGICAL HINTS TO CANEGROWERS.

By EDMUND JARVIS.

A REMINDER.

The first of our monthly series of Entomological Notes of advice to canegrowers was published in November of 1923, and since that date these hints regarding the identification of common insects attacking cane, their probable times of occurrence, and approved methods of controlling their activities, have appeared regularly month by month in the "Queensland Agricultural Journal" and other periodicals.

The original purpose of the writer was to remind farmers of their responsibilities with regard to taking personal action against insects damaging their crops. Such attempts, if undertaken at the right time, will go far towards minimising the extent of injuries inflicted by our more serious cane insects, and would not trespass unduly upon the daily work of a cane farm.

Knowledge is power, and to be in a state of preparedness with regard to fighting those pests which are able, if unchecked, to cause material financial losses, should certainly give one a feeling of security when considering the possibilities of grub-infestation during the coming season. Thus, at the present time, it is advisable to look ahead and lay in adequate supplies of soil fumigants and other insecticides, in order to be ready to combat at an hour's notice the ravages of cane grubs, army worms, &c.

Be on the Lookout for Moth-Borer Damage.

During the next three months evidence of the presence of caterpillars of *Phragmatiphila truncata* Walk. will be noticed in localities where this moth usually occurs.

The tops of cane sticks nearing maturity are sometimes tunnelled, such injury resulting in many cases in death and browning of the unfolding central leaves.

These so-called "dead-hearts," which soon attract attention, are sometimes mistaken for evidence of fungus attack, but upon cutting through an affected cane-top one finds tunnels containing excreta, &c., that if opened up will be seen to harbour a smooth pinkish-yellow caterpillar about 1 inch long which, upon exposure to the light, wriggles vigorously and tries to fall to the ground. The basal and central portions of cane sticks are frequently tunnelled by this borer, such injuries, however, generally escaping notice unless severe enough to bring about discolouration of the heart-leaves.

The young shoots of plant and ratoon cane are most often attacked, and, as these are killed, "dead-hearts" soon become numerous throughout a plantation, and seldom fail to attract the grower's notice.

In cases where about 10 per cent. of stools happen to be affected, all shoots carrying "dead-hearts" should be cut out just below the injury and either crushed or burnt to destroy the caterpillars or pupæ of same which may be in the central tunnel.

Instances of severe infestation of this moth-borer should be brought under the notice of the Entomologist at Meringa.

Fighting the Weevil-Borer.

Watch the growth of cane on river flats where these beetles are likely to occur, and, if discovering evidence of the presence of this pest, communicate at once with the Entomologist at Meringa.

NUT CULTIVATION.

The Secretary for Agriculture and Stock, Mr. H. F. Walker, drew attention recently to the possibilities of nut growing as an adjunct to ordinary farming operations. The industry is as yet undeveloped, but judging from the numerous inquiries lately coming to hand for information as to cultural methods and sources of supply of plants, there is every prospect of a definite expansion. Judging further from the demand from overseas, there is on top of our own extensive absorption a good market in other countries, so there need not be (at least for a number of years) any fear of over-production. It is highly probable that the demand will greatly increase when it becomes more generally known what a highly concentrated, valuable, and healthful food the nut really is.

In this connection, it is interesting to quote the following from Dr. Morris's book on "Nut Growing":—

"Nuts furnish proteins of such fine quality that they supply the elements necessary to render more complete the proteins of cereals and other vegetable foods. They are free from such waste products as uric acid, urea, and carnine. Further than that they are nearly aseptic and free from bacteria of putrefaction at the time when they are eaten.

"One pound of walnut meats equals in food value 5 lb. of eggs, 9½ lb. of milk, or 4 lb. of beef loin. Each acre of walnut trees in full bearing will produce every year food approximating 2,500 lb. of beef, 3,500 quarts of milk, or 1½ tons of mutton."

The Queensland nut is also receiving more attention as an article of commerce, and already its cultivation is extending in California and other countries.

If you like this issue of the Journal, kindly bring it under the notice of a neighbour who is not already a subscriber. To the man on the land it is free. All that he is asked to do is to complete the Order Form on another page and send it to the Under Secretary, Department of Agriculture and Stock, together with a shilling postal note, or its value in postage stamps, to cover postage for twelve months.

COBWEB OR PINK DISEASE OF CITRUS.

By J. H. SIMMONDS, M.Sc., Plant Pathologist.

COBWEB or pink disease is a malady which has appeared rather extensively in some orchards of the coastal districts during the rainy seasons of the last few years. The disease is one which, if taken in time, need never cause serious loss, but which, if neglected, may easily do so. The following notes should enable growers to quickly recognise the disease and take the necessary precautions for its control.

Pink disease is not restricted to Queensland, but occurs widely distributed throughout most tropical and subtropical countries. It is found, for instance, in India, Ceylon, Java, West Africa, and the West Indies.

The cause of the disease is a fungous parasite (*Corticium salmonicolor*). This fungus is able to attack many different hosts, including among others such crops as rubber, cocoa, coffee, tea, mango, and citrus. In Queensland it has only been recorded in connection with the orange and mandarin.

Symptoms.

The grower is usually first informed of the presence of the disease on seeing the leaves on one or more branches wilting and turning brown. A somewhat similar effect might be expected from borer attack, but in the case of pink disease an examination of the affected region will reveal the presence of an area of grey or somewhat silvery growth extending over the bark of the affected branch near where it joins healthy wood. (Plate 2.) This growth consists of the mycelium or vegetative stage of the fungus.

In the early stages of the disease delicate cobweb-like threads are formed which extend out over the bark from the original point of infection up and down the branch. When not numerous it is difficult for the unaccustomed eye to pick them up. Some little distance back from their apex these threads usually become more numerous and aggregated together, so that they may finally form a thin silvery-grey web completely covering the bark.

At first the fungus is entirely superficial in its growth, but eventually at some little distance back from the advancing margin the fungus commences to penetrate the bark and woody tissue of the plant, with the result that death of that section of the branch attacked occurs and the foliage of the outer portions consequently wilts. The fungus then gradually extends down the tree from the smaller to larger limbs, and if not checked in time may even reach the main trunk. Gumming is sometimes associated with the disease.

On old lesions the cobweb formation often becomes patchy and somewhat indistinct. However, another manifestation of the disease, known as the sterile pustule stage, may put in an appearance. This usually develops on the branch as it begins to dry out, and shows as small light-brown or faintly pink pustules of not more than one-thirty-second of an inch in height which burst through the bark over the affected region in more or less longitudinal rows. (Plate 3, fig. 1.)

No special function in the life history of the fungus can be attributed to these pustules, which merely consist of masses of aggregated or somewhat fused fungal threads. The presence of this stage is often of value in the ready diagnosis of old lesions.

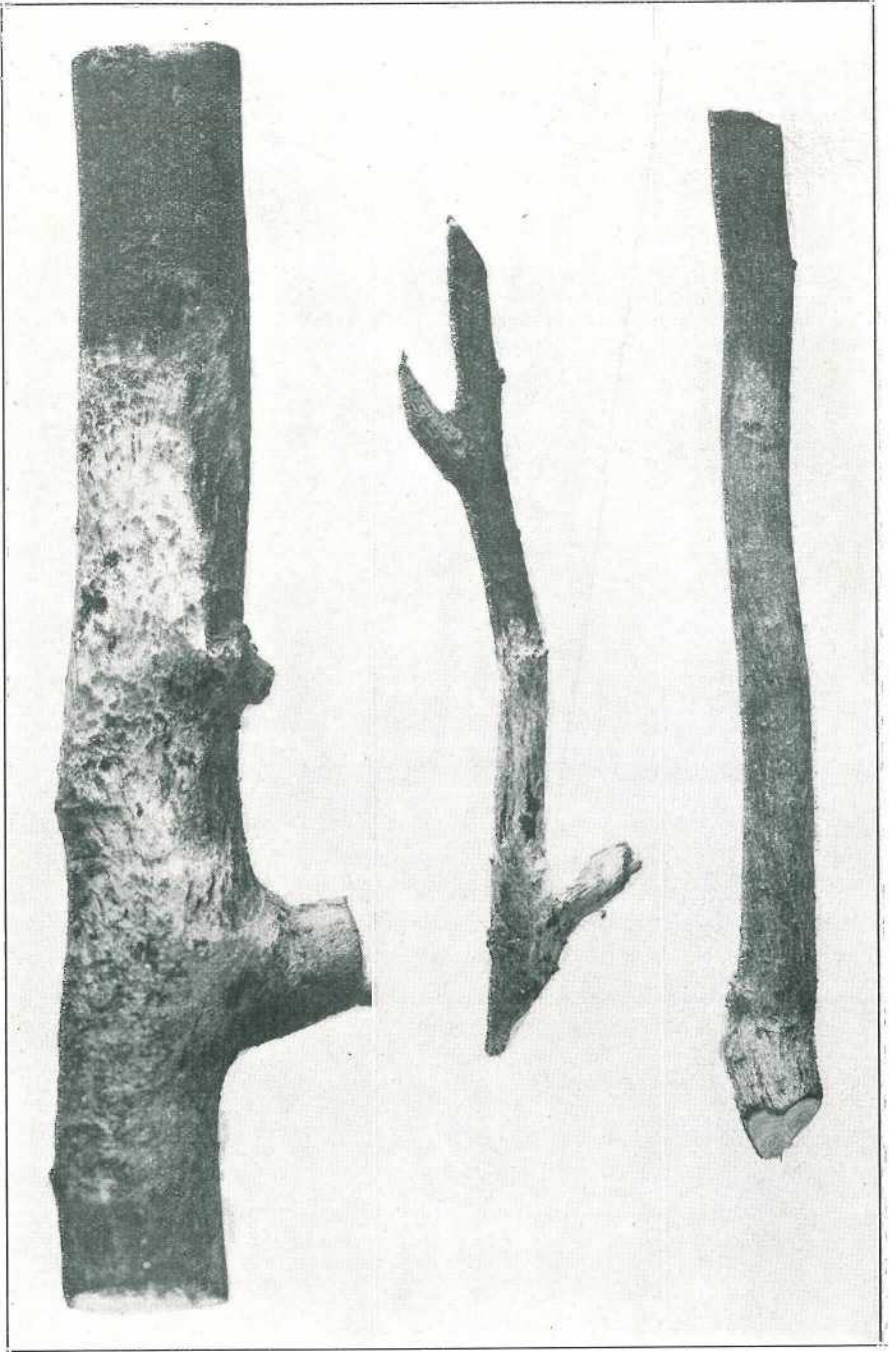


PLATE 2.—THE COBWEB STAGE OF PINK DISEASE ON ORANGE BRANCHES.

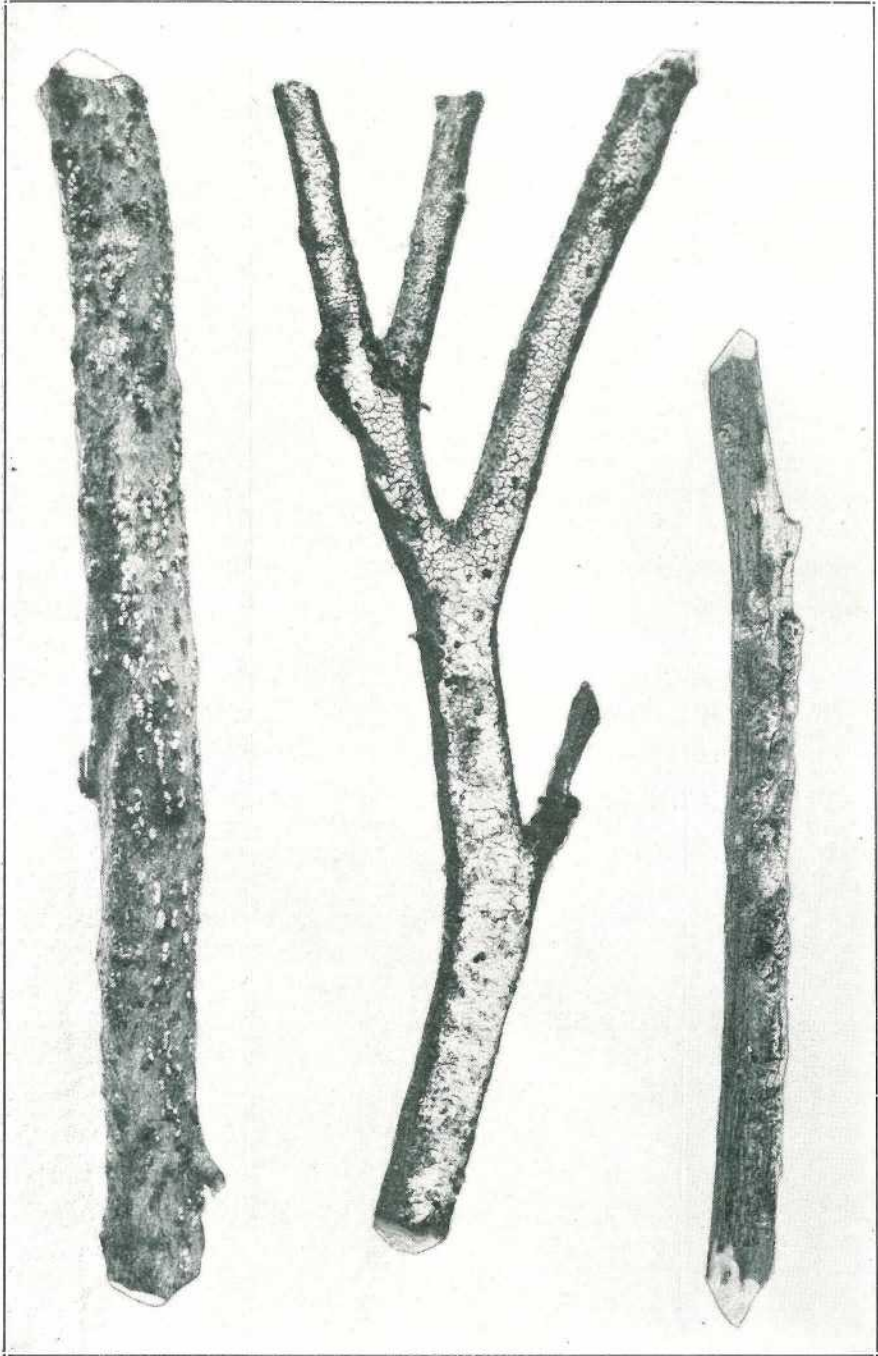


Fig. 1.

Fig. 2.

Fig. 3.

PLATE 3.—*Corticium salmonicolor* ON ORANGE BRANCHES.

Fig. 1.—Sterile pustuli stage.

Fig. 2.—*Corticium* stage.

Fig. 3.—Necator stage.

The most conspicuous and readily recognisable form of the disease is assumed during the fruiting stage of the fungus. It appears as a conspicuous salmon-pink encrustation covering the under surface of the dead branches. (Plate 3, fig. 2.) This only develops on the lower shaded and damp sides of the branches, and when looked at from the upper surface may be completely obscured. During wet weather the pink encrustation presents a comparatively smooth, felt-like appearance covering most of the bark irregularities. Afterwards as this dries cracks develop, with the formation of numerous small rectangular scales. In structure, this crust is formed of closely interwoven fungus threads. Certain special cells on the outer surface develop four peg-like projections, from which are developed delicate clear rounded spores. These serve as one means by which the disease is spread throughout an orchard. It is this stage which has led to the name of pink disease being applied to this trouble, but since the spider web-like appearance first described is often the only form met with in Queensland, the name of cobweb disease is also given.

The fungus has another method of bearing spores and so reproducing itself. This is known as the Necator stage. It is not very commonly found under Queensland conditions, but when it appears takes the form of orange-red eruptions through the bark, not unlike the sterile pustule stage except in their colour and somewhat larger size. From their surface numerous irregular cells are produced, which act as spores and serve to distribute the disease when washed or blown on to healthy branches where conditions are suitable to their development. (Plate 3, fig. 3.)

Control.

The essential factor in controlling this disease is not to delay treatment until it is too late. The fungus usually first infects a relatively small branch, but if unchecked will gradually work down to successively larger limbs until, as has been observed in some cases, the entire side of a tree may be lost.

1. Keep a careful watch during the rainy season for the appearance of dead or wilting branches. Examine carefully to see if cobweb disease or insect borer is present. If the former, remove the branch at least 18 inches below the last point at which the fungus or discoloured bark can be seen. This precaution is necessary, as the fine extending threads can be easily missed, and it is essential that none are left on the tree.

It is not advisable to merely scrape or paint the bark of affected regions, as the fungus in the majority of cases grows within the tissue only to reappear later.

2. Paint the cut end and about 18 inches back with tar. The tree should then be examined at subsequent intervals to make sure that complete eradication has been achieved, otherwise the process will have to be continued.

3. Any affected wood should be burnt.

4. If the orchard has been neglected so that the disease is present in its spore-bearing stages, protection may be afforded by covering the branches with Bordeaux mixture (6:4:40) to which a resin sticker has been added. This spray should be on the trees during the wet season when spreading of the disease takes place. It is, however, unwise to allow conditions to become such that spraying is necessary since Bordeaux mixture is liable to aid in an increase in scale infestation by destroying the useful fungi which parasitise these insects.

DISEASES OF THE PIG.*

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

[Continued from the June issue.]

PART VI.

In the preparation of information dealing with Diseases of the Pig, an endeavour has been made to describe in the simplest language possible the various conditions, abnormal and otherwise, associated with the incidence or appearance of disease in swine. The suggested preventive measures and methods of treatment are such as may be successfully carried out by any careful farmer, excepting only in cases where the services of a qualified veterinarian are advised, and in these cases the best methods to follow will be suggested on the spot by the surgeon himself.

The pig is notoriously a bad patient and a difficult animal to handle when indisposed, hence great stress has been laid throughout this treatise on the necessity of preventive measures, for prevention is not only much better than cure, but is invariably less costly and a great deal more satisfactory.

In dealing with methods of treatment and the engagement of qualified aid, it has been realised there are numerous difficulties in the way, because Departmental officers or practising veterinarians are not always immediately available in town or country districts. Again, therefore, we stress that prevention is better than cure, and we might even qualify this further by adding prevention is more necessary than cure.

Mr. Shelton's bulletin, representing as it does much labour and the fruits of careful study and observation, is a welcome contribution to current pig literature.—EDITOR.

COMMON DISEASES—A USEFUL CHART.

SOUND breeding stock, plenty of wholesome food, comfortable and clean accommodation, and good management are the best preventives of disease in pigs. Prevention is always better than cure, and the removal of possible causes, if at all possible, is the first step in the control of disease.

Disease, Nature and Causes.	Symptoms.	Prevention and Treatment.
<i>Abortion.</i> —The premature birth of the fetus, due to injuries, exposure to cold, use of mouldy food; infection of the breeding organs by septic germs is also a frequent cause.	The expulsion of the foetal pigs, which is sometimes preceded by a discharge.	Comfortable and clean conditions, quiet handling and good food help to prevent abortion. Affected sow should be isolated and the uterus flooded with a solution of 20 grains of permanganate of potash to 1 gallon of water to be followed by a douche of 1 teaspoonful of salt to 1 pint of water for five days.

* The typescript and illustrations of the Farmers' Bulletin on Diseases of the Pig have been submitted to the Chief Inspector of Stock, Major A. H. Cory, M.R.C.V.S., Department of Agriculture and Stock, Brisbane, Queensland.

Copies of the Bulletin when completed may be had gratis on application to the Under Secretary, Department of Agriculture and Stock, Brisbane, Queensland.

In the compilation of this paper the writings of recognised authorities in other States and other parts of the world have been drawn on, and the assistance thus received, also that freely given by other Departmental officers, is acknowledged gratefully.

Disease, Nature and Causes.	Symptoms.	Prevention and Treatment.
<i>Bronchitis</i> is an inflammation of the bronchial tubes, the actual causes being germs, worms or dust; predisposing causes are damp, dusty, and insanitary conditions.	A persistent cough and slight fever with a progressive unthrifty appearance.	Provide sanitary and comfortable accommodation, use clean bedding in cold weather, give nourishing and laxative diet—milk, green food, and a little meal. Molasses helps to keep the bowels open. One dessertspoonful of Epsom salts with equal amounts of sulphur in the molasses daily for three days for every 100 lb. body weight is advised.
<i>Indigestion</i> .—A digestive disorder caused by improper feeding, coarse fibrous foods, weak washy swill or foods in a decaying or mouldy condition.	Loss of appetite, constipation or diarrhoea; tucked up appearance in the belly.	See that troughs are clean, change the food to rectify the fault, and give in the food a dose of castor oil, 1 or 2 ounces of oil to each 100 lb. weight of pig. Use light nourishing foods in well-balanced rations.
<i>Inflammation of the Udder</i> .—A disease of the udder, caused through injuries, or through suckers not relieving the sow of her milk.	Udder is hot, hard, and painful; sow refuses to allow pigs to suck.	Remove cause when possible, apply hot water fomentos to udder, massage the udder, using olive oil; give 2 ounces of castor oil in food. The massage of the udder is important. Use only light laxative foods and compel sow to take regular exercise.
<i>Intestinal Worms</i> .—Several species of worms are found in stomach and intestines. Large round worms (<i>Ascarids</i> .) are most common.	General debility, scouring, failure to make satisfactory gains in weight. The worms may be seen in the droppings and on post mortem examination.	Chief control measure is strict sanitation. Provide fresh pastures. Remove droppings and rubbish, clean troughs frequently, fill up all bog holes. Feed pigs on a laxative diet. Starve infested pigs for one day, then give in a small feed of milk half-a-teaspoonful of turpentine and 2 tablespoonfuls of castor oil for each 50 lb. weight of pig. Repeat a fortnight later. Worm capsules may be used in the treatment of these parasites.
<i>Kidney Worms</i> are an internal parasite which gain entrance through the mouth when pigs eat from unclean troughs and floors. They affect kidneys, liver, and other organs of the body.	General debility, pig tucked up in the belly, sometimes a staggering gait, general unthriftiness of the animals and failure to make satisfactory growth.	Eggs of worms are passed out with urine and the embryos hatching from the eggs are eaten by pigs. Sanitation is the chief control measure, administration of medicine is not recommended as these worms are not removed by medicine once embedded in organs of the body. Fill up mud holes, clean troughs frequently, and provide a rotation of grazing paddocks.
<i>Lousiness</i> .—Infestation by the common hog louse (<i>Hæmatopinus suis</i>) which is a blood-sucking parasite of the skin.	Pig rubs against posts. Skin irritated and may be scurfy and sore. Lice and nits may be seen on skin and hair.	Spray or wash pigs with a mixture composed of half-a-pint benzine, half-a-pint kerosene and 7 pints of waste oil; repeat application in three days and then one week after. Apply petroleum jelly or cocoanut oil to the skin. Provide a rubbing post around which is wrapped a strong bag firmly fixed and soaked in oil.

Disease, Nature and Causes.	Symptoms.	Prevention and Treatment.
<i>Mange</i> .—An infection of the skin, caused by the tiny mange mite burrowing into the tissues.	Irritation and scurfing of the skin. A reddened appearance not unlike severe sunburn.	Wash pigs thoroughly with a weak solution of coal tar disinfectant, then apply oil or sulphur ointment to the skin. Give more nourishing food and clean up the piggery by spraying with coal tar disinfectant solution all wood work and floors.
<i>Necrotic Enteritis</i> .—A serious disease caused by a germ which affects the lining membranes of the intestine and is responsible for the resultant inflammation.	Loss of appetite, increased thirst, fever, arching of back, diarrhoea; death usually occurs in a few days.	Prevention lies in clean and comfortable quarters and good, wholesome food; isolate affected pigs, destroy those that are seriously affected. Clean up and disinfect piggery. Change food to a light, nourishing diet.
<i>Paralysis of Hind-quarters</i> . — Cause often obscure and may be rheumatism, constipation, accident, kidney worms, lack of or deficiency in essential food elements.	Paralysis may be preceded by a wobbly gait and "marking time" with the hind feet, or it may be sudden. Pig eventually loses control of hind-quarters, and drags the hind legs.	Remove any visible cause; correct any faults in feeding; feed plenty of green food and minerals, do not overfeed with maize. Allow pigs to graze in paddocks. When pigs are affected have them slaughtered under inspection at an abattoir or bacon factory, and follow the advice given by the official carrying out the examination.
<i>Piles</i> .—Protrusion of the rectum, caused through constipation and bad feeding. Over-feeding on milk products like buttermilk and whey is often responsible.	Constant straining, resulting in portion of the rectum protruding out past the anus. This is a very objectionable and serious complaint.	Isolate affected pig. Remove cause and give doses of castor oil. Wash protruding part in a weak disinfectant solution. Apply olive oil. Manipulate it back into place with the hands, reduce ration for a few days. If ration is cut down pig makes a good recovery if only 2 inches protrude.
<i>Pneumonia</i> . — Infection of the lungs by germs following exposure to cold, damp, and draughty conditions, and other predisposing causes such as lack of nourishing food and defective sanitation.	Loss of appetite, difficult breathing, coughing, nasal discharge, fever, and is specially noted by short jerky breathing and lack of appetite.	Provide clean and comfortable accommodation and bedding in sheds in cold or wet weather. Prevent draughts on pigs when camped in shed, run pigs in lots of less than 12. Isolate affected pigs, give a light nourishing diet such as whole milk. Destroy badly affected animals. Disinfect pens and troughs.
<i>Poisoning</i> —Due to eating arsenic, common salt, and other chemical poisons. Poisonous plants and weeds are also often responsible for fatalities.	Staggering gait, vomiting, abdominal pains, diarrhoea. Death sometimes sudden, sometimes there is a lingering illness.	Find cause of poisoning and remove it. Give purge of Epsom salts or castor oil. If the poison is known, give an antidote—antidote for arsenic is the anti-arsenic drench. Send specimens of suspected poisons, plants, or weeds for identification and when posting send a complete report to the Department of Agriculture and Stock, Brisbane.

Disease, Nature and Causes.	Symptoms.	Prevention and Treatment.
<i>Rheumatism</i> .—An affection of the muscles, caused through pigs lying on cold damp floors.	Intermittent lameness, swelling of joints, soreness of muscles.	Dry and comfortable sheds with a good sleeping floor; cement floors should be covered with wood. Use also clean straw bedding, particularly in cold and wet weather.
<i>Rickets</i> .—A disease of the bones of young animals, due to a deficiency of essential food nutrients, and to other causes such as neglected breeding, in-breeding	Hard swellings at joints of bones, Malformation of bones, staggering gait. Pigs affected are usually stunted in growth and make but little headway.	Allow pigs to graze on good pasture in clean paddocks. Do not feed too much maize or other concentrated grain foods. Always include some legume crop, such as lucerne, in the ration. Give pigs a supply of mineral food, such as charcoal, ashes, bone meal, and lime. Well-balanced rations in liberal supply with plenty of clean drinking water is very necessary.
<i>Diarrhœa, White or Yellow Scours</i> .—Common in young pigs suckling the sow. Due to over-feeding, bad foods, insanitary conditions, cold draughty sties; too liberal feeding of the sow is often the predisposing cause.	Frequent discharge of watery fœces of a strong smelling characteristic odour; pigs lose condition and fall away; deaths often result.	Clean up piggery and troughs, reduce sow's food supply considerably for several days; give the sow and affected pigs a dose of castor oil and add lime water to the food. Careful feeding is essential, clean up thoroughly, disinfect sties and floors, remove to clean pens and use plenty of clean, dry bedding.
<i>Sore Mouth or Bull-nose</i> .—A disease of young pigs caused by a germ and always associated with filth.	Swellings and sores on the nose and mouth, and general un-thriftiness.	Clean up piggery and troughs, and use a disinfectant; allow sunrays to get into the shed and trough. Dip the pig's nose into a solution of premanganate of potash. This solution is prejudicial to eyesight as it destroys the cement substance of the cornea.
<i>Cannibalism — Sows eating their Young</i> .—Caused through nervous excitement or the lack of some essential food element. It is sometimes hereditary and indicates a nervous temper.	Sows eat young pigs soon after they are born. It is usual for a sow to eat her afterbirth if she is permitted so to do, but it is unwise to allow her to have access to it.	Give pregnant sows good grazing, such as lucerne; give them protein rich foods such as milk, meat meal, or lucerne. Handle sow quietly at farrowing time. It is usually advisable to butcher a sow that has once eaten her young. Properly balanced rations in limited supply at farrowing time is essential; correct methods of management are advised especially at this time.
<i>Tuberculosis</i> .—A contagious disease caused by a germ.	Symptoms in the early stages are practically nil, in the advanced stages wasting of the body. Many pigs that are condemned show no external symptoms at all.	Pasteurise all milk products before feeding to pigs. Do not feed portions of diseased carcasses to pigs. Boil all meat before feeding to pigs. Disinfect troughs frequently, keep pigs in large, clean, and dry quarters. Destroy all pigs suspected of being tubercular. Get in touch with the Department of Agriculture and Stock immediately for advice as to how to proceed.

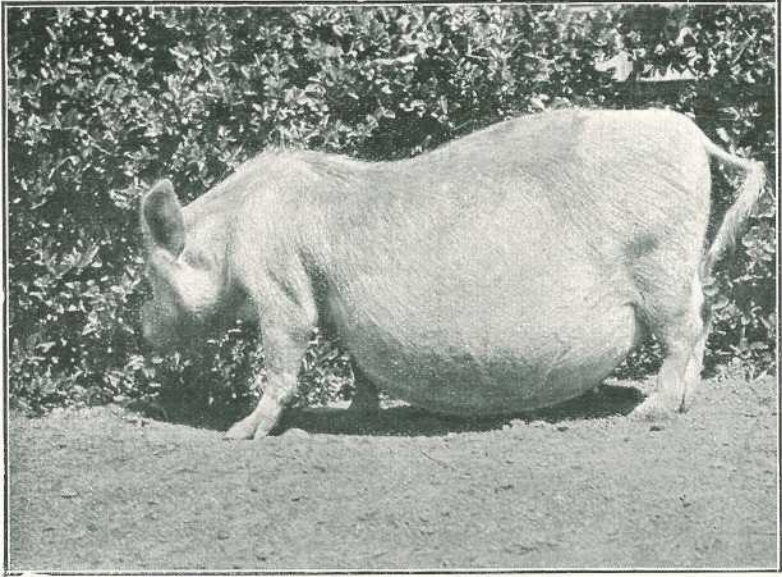


PLATE 4 (Fig. 1).

This middle Yorkshire Sow suffered from an uncommon disease, Dropsy of the Womb. She had a long and painful illness and finally succumbed. It is difficult to locate the cause of such a disease and still more difficult to effect a cure.

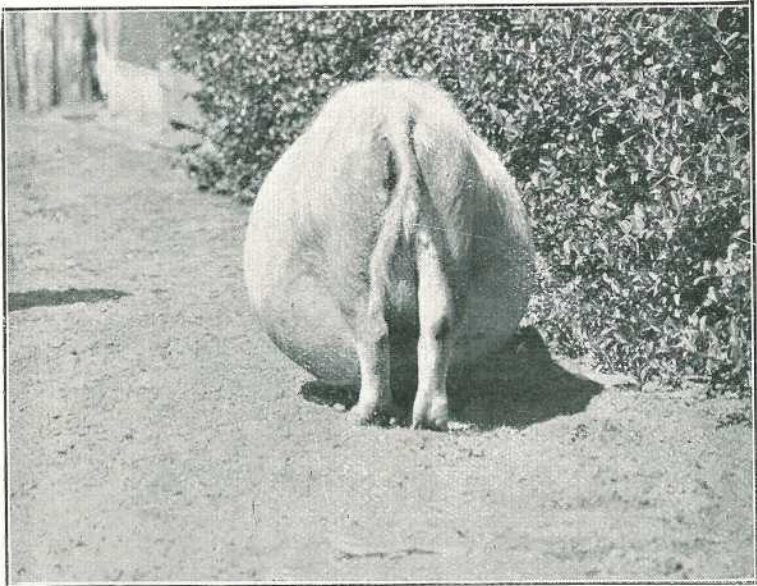


PLATE 5 (Fig. 2).

Another illustration of the sow shown in (Fig. 2). About 16 gallons of evil-smelling fluid was obtained from her abdominal cavity when the post mortem examination was conducted.

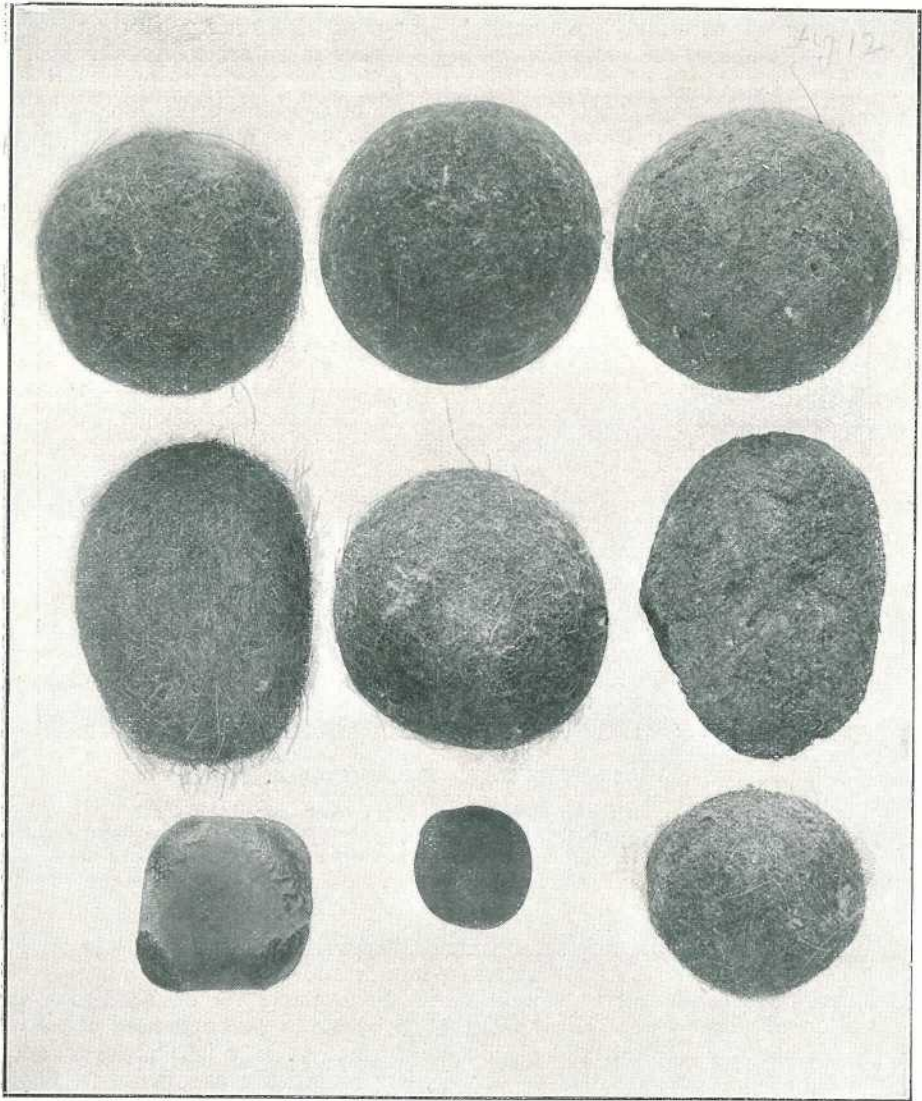


PLATE 6 (Fig. 3).—HAIR BALLS FROM STOMACHS OF PIGS AND CATTLE.

These hair balls, technically known as Trichobezoars are composed of fibrous matter, wool, hair and a certain amount of earthy matter. The top row were each about as large as a tennis ball, the middle row, from the stomachs of pigs (one or more in each), were about the size of a large oval cake of toilet soap, while the lower row varied from the size of a golf ball to slightly larger. The two to the left in the lower row were very light and were composed of earthy matter compacted together. Strangely enough the presence of these hair balls in the stomach does not appear to affect the general health of the animal. Hair balls are often found much larger than those illustrated.

It will be noted that no reference is made in this chart to such diseases as swine fever (often referred to as hog cholera), foot and mouth disease, or to other diseases responsible for losses in countries overseas. Fortunately, Queensland is particularly free from these diseases, but an ever-watchful eye is necessary if we are to remain free. Fortunately, quarantine regulations are sufficiently strict to protect the industry and check the introduction of diseased animals, but much remains to be done in the way of sanitation, improved methods of feeding, housing, and selection of breeding stock to place the industry on a permanently satisfactory basis.

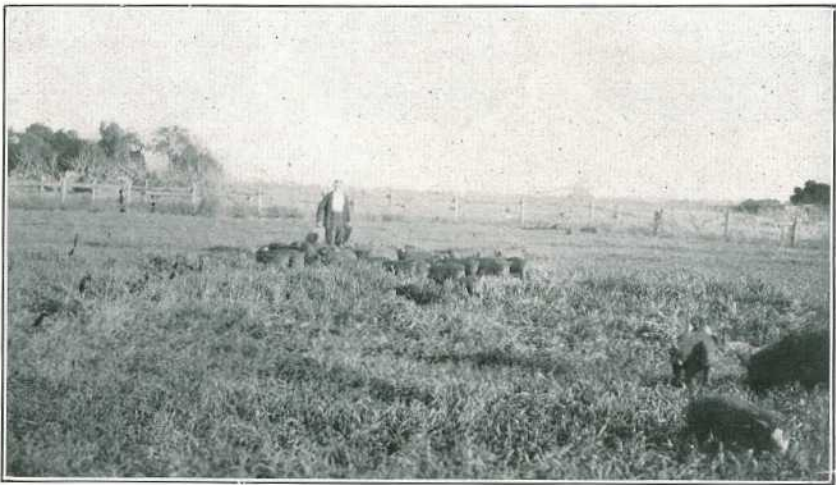


PLATE 7 (Fig. 4).—PIGS IN CLOVER.

Pigs kept under conditions such as these have every possible chance to "make good." Liberal feeding on succulent pasture plus concentrated foods and clean comfortable accommodation are necessary for success in the raising of live stock.

As this chart is necessarily much abbreviated and incomplete, and does not include every known disease and is intended merely as a guide, further advice should be sought from the Department of Agriculture and Stock, either from Head Office at Brisbane or through field officers in the country, so that the required information may be obtained and suitable action taken to clear up diseases as quickly as possible. The Department has a liberal supply of printed matter available free upon application to the Under Secretary, Department of Agriculture and Stock, Brisbane, Queensland. Departmental officers will visit farmers where such visits can be conveniently arranged. Application should be made by letter if the services of an officer is desired.

POULTRY DISEASES.—II.

By P. RUMBALL, Poultry Expert.

On account of occasional heavy mortality among poultry flocks, and consequent economic loss, it is becoming more and more necessary to study and apply measures of disease control. Ever increasing competition and the need of keeping costs down to bedrock makes it imperative for poultry raisers to do everything possible to keep their fowls and runs free from disease and the conditions that create or add to the risks of the business. The loss of a few birds now and again might not be regarded as very serious, but in the aggregate such losses mean much to the industry as a whole.

In these notes, Mr. Rumball discusses ordinary poultry disorders in a practical way, and his views are therefore commended to our readers.—
EDITOR.

APOPLEXY.

Cause.—The rupture of a blood vessel resulting in a clot of blood pressing on the brain substance, due to strain in laying (particularly with over-fat birds), injury to head, fright, and excessive use of over-stimulating food. Sometimes noticed with males at time of mating.

Symptoms.—The bird may be found dead under the roost. In most cases the symptoms are of short duration. The patient is seen to stagger and fall about, sometimes moving in a circle or backwards, pupils dilated. The trouble may be accompanied by convulsive movements of the limbs.

Treatment.—Keep the birds in good physical condition and cull rigidly over-fat birds and those that have a tendency to darken in comb, particularly when being handled.

BUMBLE FOOT.

Cause.—Collection of pus in foot may be due to a thorn or bruise. At times the trouble becomes prevalent in runs where the pus-forming organisms are present in extensive numbers, and also where the ground is rough. Bumble foot is more pronounced among Leghorns than any other variety of poultry in this State.

Symptoms.—Swellings noticed between toes and on the sole of the foot. The swelling may also extend partly up the shank. As the trouble advances the bird may become very lame and diarrhœa may set in.

Treatment.—In the early stages the painting of the swelling with iodine daily for a week may effect a cure. With advanced cases it may be necessary to follow the treatment by lancing and removing the collection of hardened pus, painting inside the wound with iodine and bandaging the foot.

BOTULISM.

Cause.—Poisoning due to an organism known as *Bacillus Botulinus*, found in spoiled food, liberating a toxin that affects the nervous system. There are several varieties of the organism.

Symptoms.—There is great prostration. At an early period the birds are inclined to mope about, but as the disease organism multiplies in the intestines there is an increase in the toxin given off, with the result that birds may be sprawled about the yard and unable to move.

Treatment.—Clean up any spoiled food, as well as dead birds, putrifying vegetable matter, &c., and administer Epsom salts at the rate of 1 lb. to each 100 birds. Burn all stock that have died from the trouble.

CANKER.

There are four forms of canker.

1. Small patches inside the mouth. This does not appear to spread to any extent from bird to bird, and causes little ill effect upon the patient.

2. A thick mass which penetrates deeply. This form is usually fatal and before death the bird becomes very emaciated. Advanced cases have been discovered in the flock and the disease does not appear to be highly contagious.

3. Canker may be noticed in the eye causing it to swell as in roup, but there is no discharge from the nostril. This is due to the invasion by a foreign body, and when this is removed the trouble subsides. Canker in the eye is frequently associated with the eye worm.

4. Chicken-pox canker.—This form is associated with chicken-pox. There is a discharge from the nose and frequently a swelling in the face. The trouble is highly contagious and spreads through the medium of the drinking and feeding vessels. The canker may extend to the windpipe or block the cleft in the roof of the mouth causing the bird to breathe through its open beak.

Treatment consists in removing the growth with a small smooth splinter of wood and painting the part with iodine or dusting lightly with powdered bluestone. Medication of the drinking water is desirable if the trouble is extensive in order to prevent as far as possible carriers spreading the disease. For this purpose copper sulphate (bluestone) will be found most effective. A stock solution should be kept on hand and used at the rate of $\frac{1}{2}$ pint to every 4 gallons of drinking water. To make the stock solution, dissolve 4 ounces of bluestone in 1 gallon of water. This should be kept in an earthenware vessel or bottle. Care should be exercised in the use of bluestone as it is a poison. The quantity recommended should never be exceeded.

CONTAGIOUS CATARRH.

Contagious catarrh with its complications is one of the most widespread contagious diseases met with in poultry. It is caused by an ultra-microscopical or invisible organism. Some outbreaks are very mild, while others are very virulent. In many cases the disease organism is on the premises and its presence is only manifested when depressing conditions, such as wet, chilly, changeable weather, over-crowded, draughty, or insanitary houses, worm-infested stock, incorrect feeding, render birds more susceptible to outbreaks. The disease usually attacks young stock, but old birds are not exempt.

The mildest form is usually shown by a watery eye, one or both, and a discharge from the nostrils. After a few days this discharge thickens and one or both eyes are swollen. Where the disease is very virulent, in the early stages the eye is much inflamed, and as it advances the head becomes swollen, due to the collection of mucous in the orbital or ocular sinus or space. This swelling forces the mouth to be continually held open. There may or may not be diphtheric lesions in the throat or mouth. In order to clear its eye of the obstruction the bird wipes its head on its wing, shakes its head, coughs, and frequently scratches its eye.

Treatment.—There is generally fever which causes the birds to drink excessively, and as birds dribble when drinking the water becomes fouled. Owing to the contagious nature of the disease the water vessels can be considered one of the principal methods by which the trouble is spread from bird to bird, and to avoid this, medicating the drinking water should be practised. Copper sulphate (bluestone) is both economical and effective when used as advised for the prevention of canker.

Birds severely affected should be destroyed, and treatment only practised on cases which are mild or in the early stages. The disease being of a contagious nature, however, any birds kept for treatment should be isolated and the premises they came from thoroughly cleansed.

A teaspoonful of oil (cotton seed) containing three drops each of kerosene and eucalyptus oil could be administered daily to each bird. Eyes and nose treated by syobbing or by means of a syringe or small machine oilcan with either—

- (1) Equal quantities of hydrogen peroxide and water;
- (2) Ten grains of silver nitrate to the ounce of water; or
- (3) Bluestone as recommended for medication of drinking water.

When eyes are much inflamed a few drops of a 10 per cent. solution of argyrol placed in them daily will be found very effective.

Any lesions in the throat could be painted with tincture of iodine or dusted lightly with powdered bluestone.

Preventive measures, however, should be adopted. Avoid the causes mentioned which predispose birds to infection. Use only sound and healthy breeding stock, and exercise due care when bringing fresh birds on to your premises.

CONGESTION OF LUNGS.

Cause.—Chills and exposure, especially in the case of moulting and young birds. Improper feeding and lack of exercise render stock more susceptible.

Symptoms.—The bird is sleepy and breathes rapidly, and in many cases with difficulty. Comb usually dark in colour. Post mortem examination reveals the

lung engorged with blood. This is due to the contraction of the blood vessels of the outer portions of the body forcing larger quantities to the internal organs. The disease usually runs a rapid course, and birds may be found dead in the pen that a few hours previous gave no indications of sickness. Death is due to asphyxiation owing to the inability to get enough air into the lungs.

Treatment.—No action apart from making the quarters as comfortable as possible appears to be economic.

CROP BOUND.

Cause.—Collection of fibrous material in crop, blocking the passage into the stomach or proventriculus. This collection may be straw, grass, or, in some cases, impaction has been due to twine used for binding hay. Birds that have been confined for some time and then given their liberty in runs in which the grass is long and coarse gorge themselves, with the result of crop binding.

Symptoms.—The crop is noticed to be distended, and on handling a definite hardness is felt. If the trouble is of a few days' standing there is a sour smell from the mouth and the bird may be more or less dark in comb and commence losing weight.

Treatment.—Make a slit in the middle upper part of the crop about an inch or more in length. Remove contents with the aid of a spoon handle or some other similar instrument, and sew up. Before sewing make sure that the passage into the proventriculus is clear. Sew the crop first and then the outer skin. A needle and white thread is all that is needed for the work, but it should be passed through the disinfectant that should be used for bathing the wound.

CROP PENDULOUS.

Occasionally birds are noticed with a large crop which is not firm. This is known as a pendulous crop, and is due to the weakening of the crop muscles resultant from errors in feeding, &c. The trouble is not serious, but if it inconveniences a valuable bird a sufficient area of crop could be removed. After the operation feed the bird sparingly for about a week.

CONSTIPATION.

Cause.—Lack of exercise, lack of green feed, heavy grain feeding, and digestive disorders.

Symptoms.—It will be noticed that the droppings are hard and firm and scanty, and to pass them the birds have to strain.

Treatment.—Give Epsom salts at the rate of 1 ounce to the gallon of drinking water, and feed green feed and other laxative foods.

DISTENDED ABDOMEN.

Hens with distended abdomens are not an uncommon feature in many poultry yards, and when such hens are noticed the cause should be ascertained, as this condition generally is not indicative of high production.

There are several causes of distended abdomen, and they may be grouped under two headings—viz., physical conditions and diseased conditions.

Physical Conditions of Enlargement.—Under physical conditions may be classed birds which are carrying an excessive quantity of internal fat. This fat is situated in a layer around the bowel or soft portion of the abdomen, frequently being an inch or more in thickness. Birds in this condition also have much fat upon the intestines and connective tissues, and this, together with the thick layer referred to, causes that swollen or distended appearance. This condition can easily be ascertained upon handling. The bird will be exceptionally heavy, and the thickened wall of the abdomen can be felt.

Another class of bird which comes under the heading of physical conditions is the bird in which there has been partial rupture of the membranes which hold the intestines in position. This ruptured condition allows the intestines to rest upon the soft portion of the abdomen, giving it that distended appearance. This condition is termed "down behind" and is easily ascertained by handling, the abdomen being soft and yielding, and by gentle pressure with the forefinger on one side and the thumb on the other the intestines can be felt.

This condition is more frequently met with in birds which are very short in the breast bone, and occasionally in excessively fat birds. The dragging and constant brushing with the legs against the abdomen often causes the formation of small

abscesses, but apart from that the constant irritation is sufficient to retard production. The evil of the short breastboned bird has probably been accentuated by breeders selecting birds which show great length of distance between the end of the pelvic bones and the end of the breastbone in their search for capacity, forgetting that in measuring the distance or depth of a bird on these lines, the angle on which the measurement is taken upon a short breastboned bird is greater than one with a relatively long breast, while the true depth may be the same. While the internal organs are held in position by membranes, and are not naturally dependent upon the framework of the body for support, in cases of fright, particularly when the hen is in full lay, the framework does act in this direction.

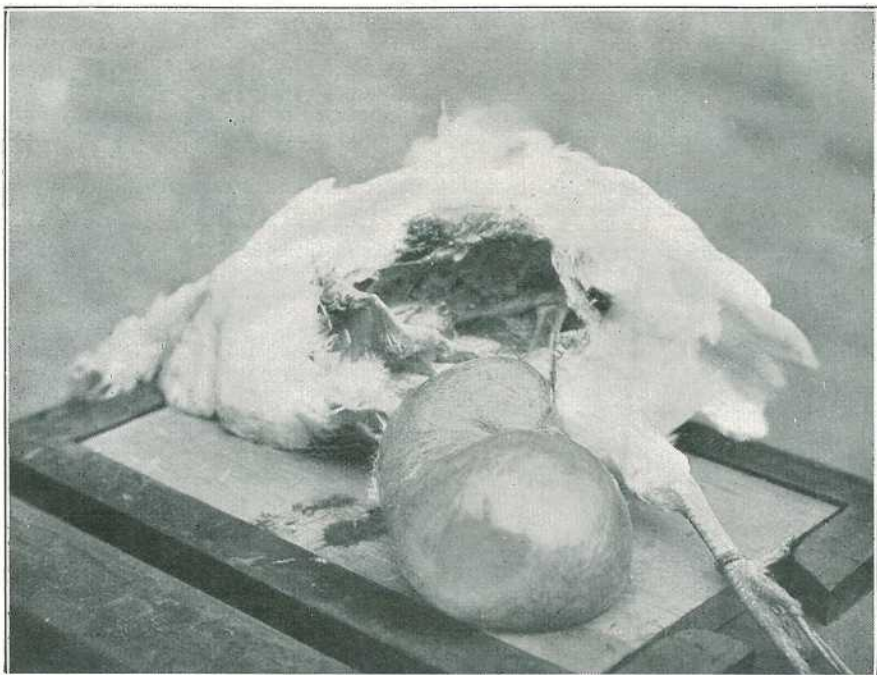


PLATE 8.—LARGE CYST IN WHITE LEGHORN HEN.

Note seat of attachment.

There is yet another class of bird which could be treated with under physical conditions, and that is one in which there has been a rupture or derangement of the reproductive organs. There are two principal forms of this trouble, one as illustrated and another where a distinct rupture occurs in the oviduct, allowing the individual egg to fall through into the abdomen. The condition of the oviduct as is illustrated is undoubtedly due to an egg becoming broken in the lower portion of the oviduct. This broken egg, by causing local inflammation, has prevented the eggs which followed from being laid, with the consequent packing up as illustrated. This condition, as will be noticed from the illustration, took some considerable time to form and externally the bird showed no signs of distress, looking all that a good layer should, the swelling of the abdomen being the only indication of possible trouble. If an examination had not been made the bird would not have been culled out, the oviduct becoming still more enlarged, possibly rupturing and allowing the mass of egg matter to fall into the abdominal cavity. Examination would indicate, when gentle pressure was exerted, a hardened mass, enabling the poultry-keeper to eliminate still another unprofitable bird.

Enlargement Due to Diseased Conditions.—There are two primary diseased conditions responsible for the enlargement of the abdomen—namely, abdominal dropsy and cystic diseases. With either of these troubles the hens affected will usually stand more erect than normally, and in advanced stages may be as upright as a runner duck. They become disinclined to move about, and when action is forced on them the comb becomes more or less dark in colour, and they experience

difficulty in breathing due to the pressure of fluid or cysts on the air sacs. In both cases the abdomen becomes very much enlarged and feels like a bladder of fluid. When pressed gently in one place there will be greater undulation in another, indicative of the presence of fluid. Judging from the abdomen alone it is difficult to distinguish dropsy from cystic trouble, but the breeder may be guided to a large extent by the condition of the bird. With abdominal trouble the bird generally becomes thin and emaciated, while the bird with cystic trouble is usually in good condition, particularly if the cyst is not of long duration. Dropsy is due to chronic inflammation of the liver or peritoneum, and the carcass is unfit for consumption. It is more frequent in old birds, particularly those that have been heavy layers, and in many cases it may be associated with internal tumours.



PLATE 9.—IMPACTION OF OVIDUCT.

Australorp hen, indicating how eggs and egg material may collect in the oviduct when the bird is egg-bound.

Cystic troubles are not infrequent in poultry. For every case of fluid due to dropsy coming under the notice of the writer there have been twenty or more due to cystic troubles. The seats of the cysts commonly met are in two distinct positions—namely, on the ovary and near the upper portion of the cloaca.

Cysts on the ovary vary considerably in formation. In some cases ovaries have been noticed in a general cystic condition, the cysts varying in size from a pea to that of an exceptionally large egg, and in others there has been but one large cyst similar to that illustrated in Plate 8. Ovarian cysts are probably due to the degeneration of certain cells. Poultry-keepers, however, need not be alarmed if one or two birds are found affected in their flocks, as no cases of general infection are known in this State.

Plate 8 shows a cystic formation situated at the upper portion of the cloaca. This is the seat of the majority of cysts coming under the writer's notice. They attain enormous dimensions, the one illustrated holding a little more than $1\frac{1}{2}$ pints of fluid.

Birds can be operated on for the removal of cysts, but the low value of the individual hen hardly warrants the labour involved. Breeders, however, who desire to remove cysts should take action before the cyst becomes too large, as when it is in this condition it is difficult to make an incision in the walls of the abdomen without puncturing the cyst. To operate, make an incision about 2 inches in length on the side of the bird, where the wall of the abdomen is thin. An effort can then be made to get a small portion of the cyst out. This now forms a neck in the cyst and with slight pressure upon the abdomen some of the fluid can be forced into that portion of the cyst outside, then more of the cyst withdrawn, and the process repeated until the whole of the cyst is removed from the abdominal cavity. The attachment between the cyst and the body can then be severed, the wound sewn up, and the operation is then completed. It will, however, be understood that all of this work should be performed under hygienic conditions. Operations have been performed on birds with cysts and their laying has not been interfered with, but in these cases the cysts were caught in the early stage.

[TO BE CONTINUED.]

A JOURNAL OF GREAT VALUE.

A Beaudesert farmer writes: "Your Journal, which I have been receiving for the past twenty years, I find of great value to the man on the land."

A Maroochydore producer: "Your Journal is much appreciated."

Two Home Hill caae growers: "The Journal is doing yeoman service in the best interests of the man on the land."

A Mungallala farmer: "I find the Journal of great assistance."



PLATE 10.—BANANA GROVE AT BAFFLE CREEK.

A corner of Mr. C. W. Gurski's garden.

DAIRY FODDER PLOTS.

By A. E. GIBSON, Instructor in Agriculture, and C. S. CLYDESDALE, Assistant Instructor in Agriculture.

The subjoined notes have already appeared in the Journal (Part IV., Vol. XXVII.), and are reprinted in response to numerous requests from readers in several districts in the State. They are of particular interest and value at the present time.—Ed.

THE majority of farmers engaged in dairying do not appear to realise the advantages to be gained by the growing of crops to supplement pastures to tide their stock over the leaner months of the year.

With the object of introducing the system throughout the Northern, Central, and Southern coastal districts, where reliance is usually placed on Paspalum, Rhodes, and other grasses, certain crop trials were instituted by the Department of Agriculture and Stock to determine the best single crops or crop mixtures for the purpose, and to demonstrate also that the methods, as practised, are not out of reach or too elaborate for the dairy farmer to undertake.

In Southern Queensland the undermentioned farmers co-operated in carrying out trials with Dairy Fodder Plots during the past season:—A. Hulse, Yandina, North Coast line; F. C. Burton, Bridges, North Coast line; and J. B. Stephens, Nindooimbah Estate, Beaudesert.

The soil on Mr. Hulse's farm is a deep, alluvial type of dark-grey loam, fairly rich in humus, which has been under crop, principally maize, for several years. That on Mr. Burton's farm is a deep, light-red coloured, sandy loam, which has been under sugar-cane for a number of years, and, consequently, somewhat deficient in available plant food. Mr. Stephens's property is composed of rich, black, alluvial soil, situated on the banks of the Albert River, and is practically new ground, having produced only two crops, subsequent to which it was fallowed during the Summer months.

No fertilisers were used on this occasion on any of the plots.

The rainfall recorded at Yandina Railway Station, which is $\frac{3}{4}$ mile from Mr. Hulse's, and 3 miles from Mr. Burton's property, was—

Month.	Points.	No. of Wet Days.
March	1,059	9
April	1,110	10
May	357	5
June	716	11
July	643	6
August	183	1
September	172	5

The rainfall for Beaudesert was—

Month.	Points.	No. of Wet Days.
March	487	13
April	453	13
May	213	11
June	792	9
July	652	6
August	31	2
September	205	12

Cultivation.—At Yandina the land occupied by plots was ploughed late in February, to a depth of 8 in., immediately after the removal of a crop of maize (grain), but turned up in a very rough condition; and later on, in March, was cross-ploughed and, prior to planting, was reduced to a fine tilth by means of the disc-cultivator, followed by the harrows.

At Bridges the land was ploughed and harrowed in March, and cross-ploughed and harrowed in May; these operations resulted in an excellent seed-bed.



PLATE 11.—PRINCE WHEAT AND VETCHES AT MR. A. HULSE'S FARM, YANDINA.



PLATE 12.—PRINCE WHEAT AND VETCHES AT MR. F. E. BURTON'S FARM,
BRIDGES, N. C. LINE.

The plot at Nindooimbah was fallowed during the Summer, and before planting was again ploughed, thus making a perfect seed-bed.

Sowing.—The heavy rain experienced in March and April delayed planting operations. The soil was not dry enough to plant until 16th May, which, under the circumstances, was rather too late to expect early supplies of Winter fodder.

At all plots the usual local practice of broadcast sowing was followed, seed drills being unavailable. When used in mixtures, peas and vetches were sown first and "disked" in, the cereals being sown on the disked surface—once harrowed, and then rolled.

The majority of the plots made rapid progress, particularly the early-maturing varieties.

Description and Varieties on North Coast.—The two varieties of wheat experimented with—"Prince" and "Patriot"—appear to be suitable for the coastal districts, being practically free from rust, and made excellent growth. When harvested, they averaged 5 ft. in height.

Ruakura and Algerian oats suffered considerable damage owing to excessively wet weather, causing them to lodge, and to be badly affected by rust. They reached a height of 3 ft. at time of harvesting.

Skinless barley suffered badly from the effects of rust, which appeared when the crops were 2 ft. high, in the "shot blade" stage.

Cape barley did fairly well, and when harvested averaged 4 ft. in height, producing a large amount of foliage, and showing only slight indications of rust.

Rye made quick growth, looked remarkably well throughout the growing season, and, when harvested, averaged 5 ft. in height.

In all plots the field peas did remarkably well, making vigorous growth throughout, and, when harvested, averaged 4 ft. 6 in. in height.

Vetches, which are usually rather slow in growth, produced a fair amount of foliage, and, when harvested, averaged 4 ft. in height.

Plots at Nindooimbah.—Throughout the plots, peas and vetches were considerably overgrown by the other cereals used, thus affecting the subsequent yields of fodder. The varieties of wheat—"Prince" and "Patriot"—made excellent growth, stooling well, and having but slight indications of rust. Although they were knocked about considerably by wind and rain prior to harvesting, they did not suffer any serious damage.

[The varieties of wheat mentioned in the foregoing (Prince and Patriot) are now somewhat difficult, if not impossible, to obtain, but Warren and Warchief—two well-known wheats at present in use throughout the wheat-growing areas of Queensland—may with confidence be recommended as substitutes.

Similarly, Sunrise oats may be substituted for Ruakura, a variety of oats not always readily obtainable.—Ed.]

Skinless and Cape Barley.—During the early stages of growth, these varieties suffered damage from excessive rains, which caused them to lodge; opportunity was taken to make a first cutting, this being effected ten weeks from the date when the young plants first appeared above the ground. A subsequent cutting was made at a later date, details of which appear in tabulated form. Cape Barley made most remarkable growth, but that of "skinless," subsequent to the first cutting, was somewhat thin.

Ruakura and Algerian Oats.—The former, being much the earlier of the two varieties, stooled well, and resulted in a much heavier growth. Later on, however, it showed an inclination to lodge, and to rust. The Algerian oats were somewhat later in maturing, but stooled well; this crop also showed an inclination to lodge, and a susceptibility to rust.

Rye.—Owing to its early-maturing habits and favourable conditions, the rye made rapid growth, and was harvested on 13th August, averaging 5 ft. in height at the time.

By using a little judgment in selecting the right varieties to grow, and getting the first sowing in, say, towards the end of March or April, a plentiful supply of green fodder should be available from early August until practically the end of October, by which time the Spring growth in pastures should be well advanced.

In all plots, each of which contained one-tenth of an acre—

Wheat was sown at the rate of 60 lb. per acre.

Barley was sown at the rate of 50 lb. per acre.

Oats were sown at the rate of 40 lb. per acre.

Rye was sown at the rate of 60 lb. per acre.

Field peas were sown at the rate of 30 lb. per acre.

Vetches were sown at the rate of 20 lb. per acre.

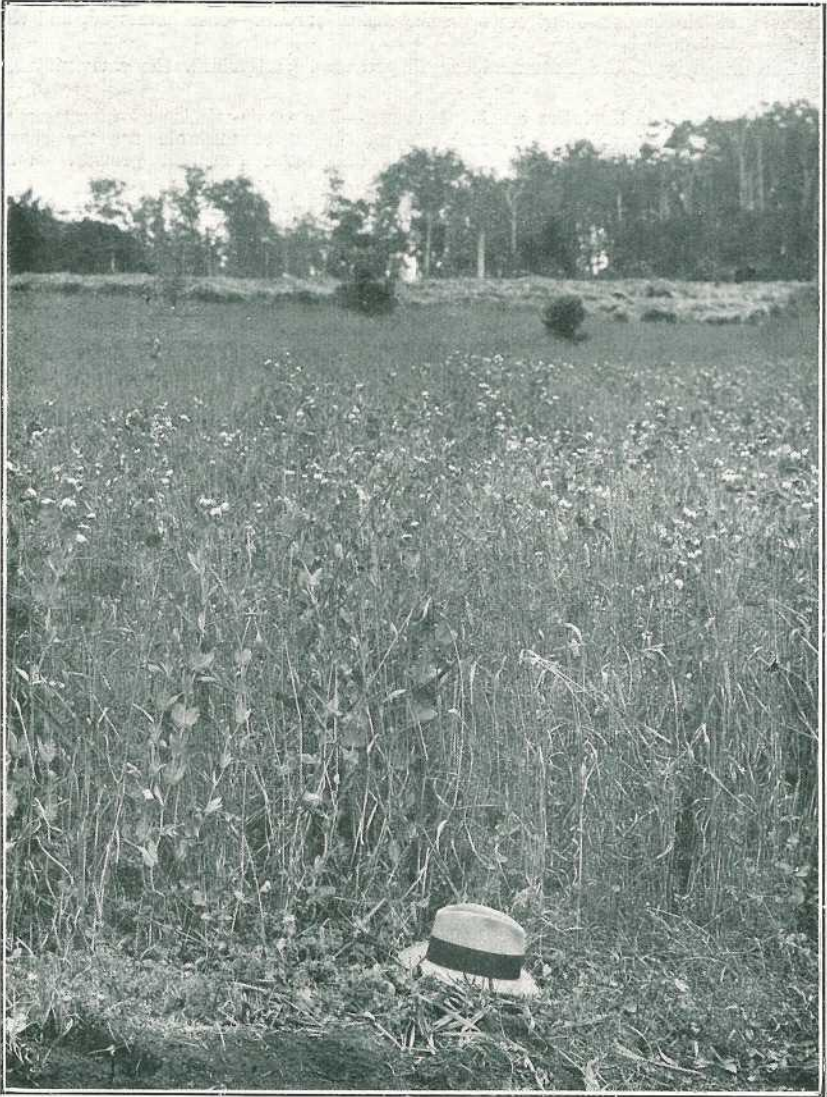


PLATE 13.—PATRIOT WHEAT AND FIELD PEAS AT MR. F. E. BURTON'S FARM,
BRIDGES, N. C. LINE.

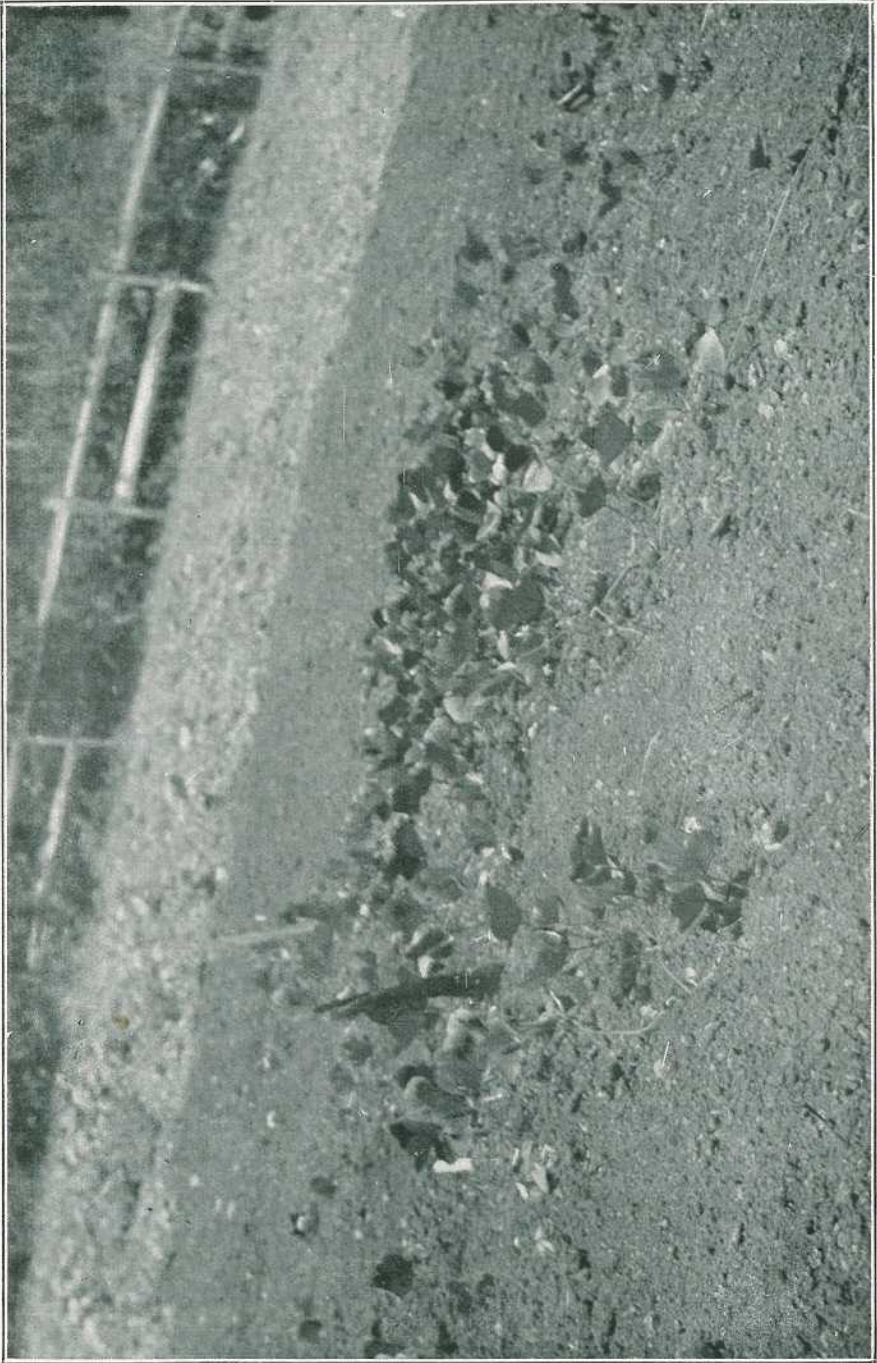


PLATE 14.—KUDZU VINE (TODDER PLANT), AT MR. H. M. McMARTIN'S FARM, PULLEN VALE.

RESULTS.

Varieties.	YIELDS PER ACRE OF GREEN FODDER.											
	A. Hulse, Yandina.				F. G. Burton, Bridges.				J. B. Stephens, Nindooimbah.			
	T.	C.	Q.	LB.	T.	C.	Q.	LB.	T.	C.	Q.	LB.
Prince wheat and peas	16	16	2	12	2	14	0	2	13	10	0	10
Prince wheat and vetches	10	16	0	8	6	1	2	4	11	17	2	20
Patriot wheat and peas	16	4	0	12	9	2	0	0	14	0	3	16
Patriot wheat and vetches	11	6	3	4	2	0	2	1	12	18	1	26
Rye and peas	10	16	0	8	5	5	1	9	14	11	2	22
Rye and vetches	7	11	1	0	Destroyed by wallabies				16	4	0	22
Cape barley and peas	12	3	0	9	10	16	0	8	13	10	0	10
Cape barley and vetches	7	11	1	0	2	19	1	19	(two cuttings)			0
Skinless barley and peas	11	6	3	14	Destroyed by wallabies				5	18	3	10
Skinless barley and vetches	5	13	1	21	Destroyed by wallabies				5	2	2	15
Ruakura oats and peas	9	9	0	7	4	3	2	25	18	18	0	14
Ruakura oats and vetches	7	11	1	0	Destroyed by wallabies				17	16	2	2
Algerian oats and peas	8	18	1	1	3	6	0	19	9	3	2	18
Algerian oats and vetches	6	15	0	5	Destroyed by wallabies				9	14	1	24

The yield generally on Mr. F. G. Burton's plots were reduced by the depredations of wallabies.

PLOTS AT TOOGOLAWAH.

For some years the Department of Agriculture has endeavoured to interest dairymen and stockowners generally in the matter of fodder provision for their herds during those periods when, by reason of the lack of succulence in the natural pastures, yields from their herds have been considerably lessened, and, in some cases, even reduced within measurable distance of vanishing point.

The practice of arranging with interested farmers to carry out trials designed and supervised by officers of the Department, has met with a good deal of success. The results to date have clearly shown that by early and careful preparation, heavy returns are readily available of rich, succulent, milk-producing fodders, and that a continuity of this class of food can in normal seasons be kept up to tide milch cows over periods during which their productivity is affected by the gradual depression, induced in each animal's system, by being called upon to make use of rough grasses of low nutritive value, at a time when weather conditions were at their worst.

Ocular evidence has shown that improved milk supplies and a correspondingly improved return from the factory is inducement enough for other neighbouring farmers to profit by the example of the one who first adopted the system of growing crops regularly, for his dairy stock—actually, on a farm, an inexpensive method of maintaining an income.

In the present crop trials carried out on Mr. T. Coleman's property at Toogoolawah, no fertilisers of any kind were used. The plots were situated on well-prepared alluvial soil near Cressbrook Creek, which had been under cultivation for a number of years.

The plots were sown on 31st March, 1925, and were harvested for yield-computing purposes on 30th July, 1925, consequently each yield submitted represents four months' growth of fodder, and judged on this basis may be considered as highly satisfactory.

A more vigorous growth was noticeable in the case of Florence wheat and peas or tares and the Skinless barley with a similar mixture, both of which were well out in ear and rapidly maturing; rye had made a dense growth in both instances, but only a few heads were to be seen, and probably a further three or four weeks would be

required to bring it to a similar state of maturity to that obtained by the Florence wheat at date of harvesting. The following yields were recorded:—

	Per acre.			
	Tons.	cwt.	qr.	lb.
Florence wheat and peas	7	14	1	4
Cape barley and peas	9	11	1	0
Skinless barley and peas	10	15	1	0
Rye and peas	8	10	1	12
Algerian oats and peas	8	3	3	20
Canary seed and peas	11	8	0	24
Florence wheat and tares	7	4	2	16
Cape barley and tares	9	0	0	0
Skinless barley and tares	11	1	3	4
Rye and tares	12	13	3	20
Algerian oats and tares	10	15	1	12
Canary seed and tares	8	10	1	12



PLATE 15.

FLORENCE WHEAT AND TARES. Yield—7 tons 4 cwt. 2 qr. 16 lb. per acre.

In view of the fact that some of the plots might be regarded as too immature for the purpose of obtaining the maximum yield, further weighings for comparative purposes were made on the 24th August, with the following results:—

	Per acre.			
	Tons.	cwt.	qr.	lb.
Algerian oats and peas	11	9	3	12
Rye and peas	8	13	2	8
Canary seed and peas	7	17	2	0
Algerian oats and tares	13	19	2	6
Rye and tares	9	9	2	16
Canary seed and tares	13	14	3	8

When selecting fodders for the test, cognisance was taken of their respective periods of maturity so that a continuity in the supply of green fodder might be kept up. Obviously the grower by using judgment in the matter of arranging for succession sowings should readily be able to maintain his supplies, and in this way ensure a more regular state of productivity in his herd.

Observations made respecting the period of development of the different crops were as follows:—Florence wheat and Dun field peas were ready for use earlier than any other single crop or combination, followed by crops in the order named: Florence wheat and tares, Skinless barley and peas, Cape barley and peas, Skinless barley and tares, Cape barley and tares, Rye and peas, Rye and tares, Algerian oats and peas, Algerian barley and tares, Canary seed and peas, Canary seed and tares.

Observations made indicate that it is advisable when arranging for mixtures of crops to confine the sowing of peas to the early-maturing cereals—Florence wheat, Skinless and Cape barley—as the peas begin to lose weight as they approach maturity.

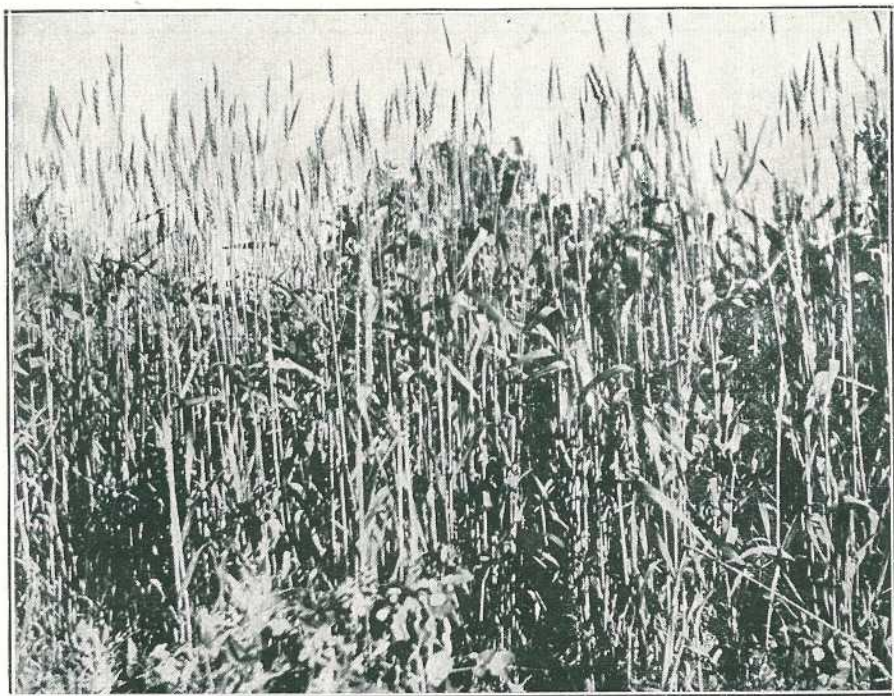


PLATE 16.

FLORENCE WHEAT AND DUN FIELD PEAS. Yield—7 tons 14 cwt. 1 qr. 4 lb. per acre.

Tares on the other hand have a longer growing period and retain their succulence better than the field peas, consequently they are more suitable for use with Algerian oats, Canary seed, and Rye.

To those dairymen who are interested in maintaining supplies to their respective factories throughout the winter period, the following quantities are recommended for use in connection with the above class of fodders:—

Wheat 30 lb., Dun field peas or Black Tares 20 lb.

Barley 40 lb., Dun field peas or Black Tares 20 lb.

Rye 30 lb., Dun field peas or Black Tares 20 lb.

Oats 30 lb., Dun field peas or Black Tares 20 lb.

Canary seed 10 lb., Dun field peas or Black Tares 20 lb.

DRY SEASONS—A COUNTERING FIELD CAMPAIGN.

The loss of national wealth to this State brought about by periods of drought cannot be accurately estimated by figures—but their effects are undoubtedly far-reaching. If action can be taken over certain areas whereby increased production can be brought about, it naturally follows that dry periods are robbed to some extent of their devastating influences and the loss to the State as a whole is decreased. A policy of this kind is naturally educative in its character to all, but when certain sections are dealt with it becomes more particularly of value to those directly interested, and this is increased when illustrations are given for the purpose of proving the policy advocated.

For some time past the Department of Agriculture and Stock has interested itself in increased production of dairy and allied products, and with this object in view has initiated a series of fodder trials in various districts for the purpose of pointing out that if means are adopted for the annual provision of fodder crops for dairy stock and pig raising, the fluctuations which have in the past taken place in the supply of these products will be considerably reduced if not entirely removed.



PLATE 17.

CAPE BARLEY (in short blade stage) AND DUN FIELD PEAS.
Yield—9 tons 11 cwt. 1 qr. per acre.

During the past few months the losses to dairymen and others, brought about by lessened production resultant of the dry period experienced, amounts to a considerable value, and attention is drawn to the fact that these can be considerably reduced by adopting the policy of careful soil preparation and the sowing of crops calculated to fill the void caused by the absence or decreased supplies of natural grasses and herbage.

It was with such an object that dairy and pig fodder trials were established on the farms of Messrs. F. W. Thiedeke and Peel Caswell, of Beaudesert and Wangalpong respectively, and results obtained so far from portions of these plots

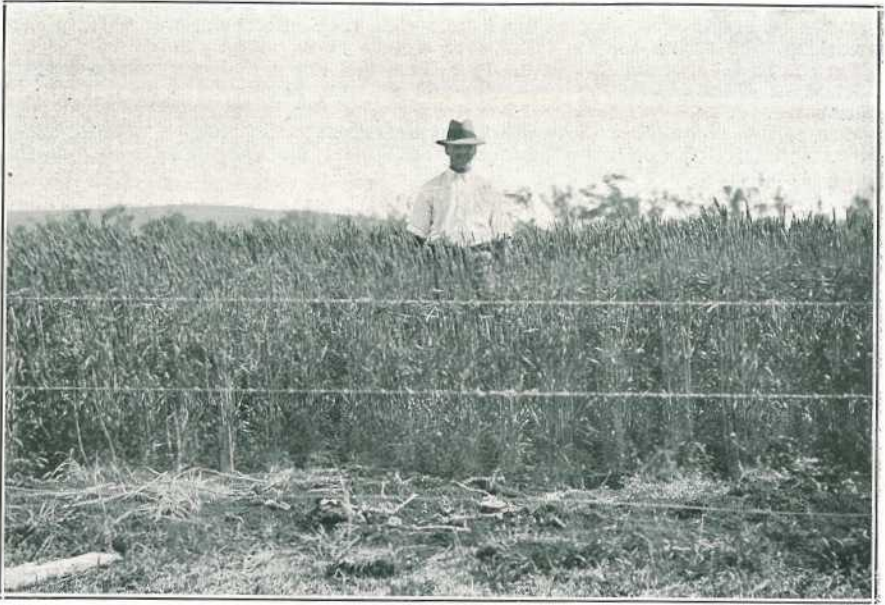


PLATE 18.—PEAS AND PILOT WHEAT AT BEAUDESERT.
Weight 10 tons 17 cwt. 2 qr. 19 lb. per acre.

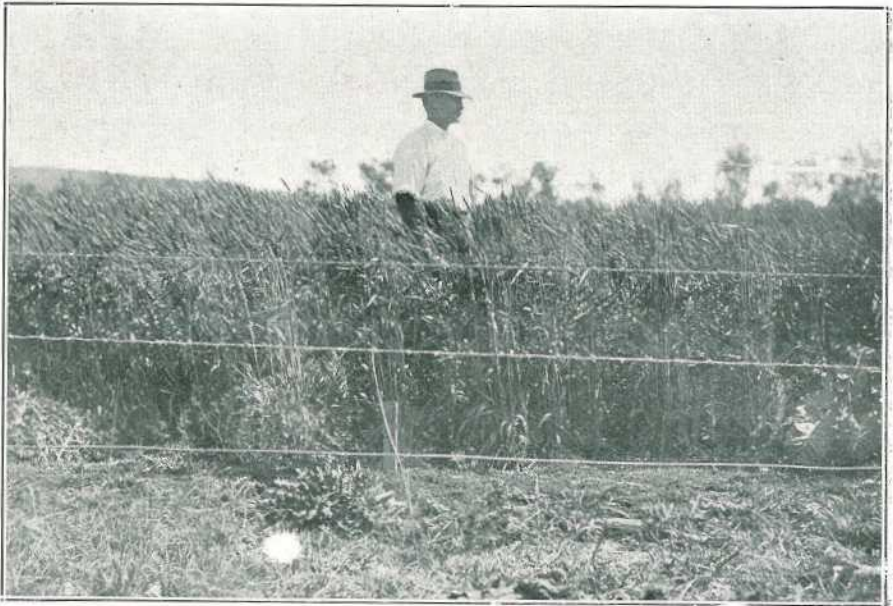


PLATE 19.—PEAS AND FLORIDA WHEAT AT BEAUDESERT.
Weight—11 tons 17 cwt. 2 qr. 20 lb. per acre.

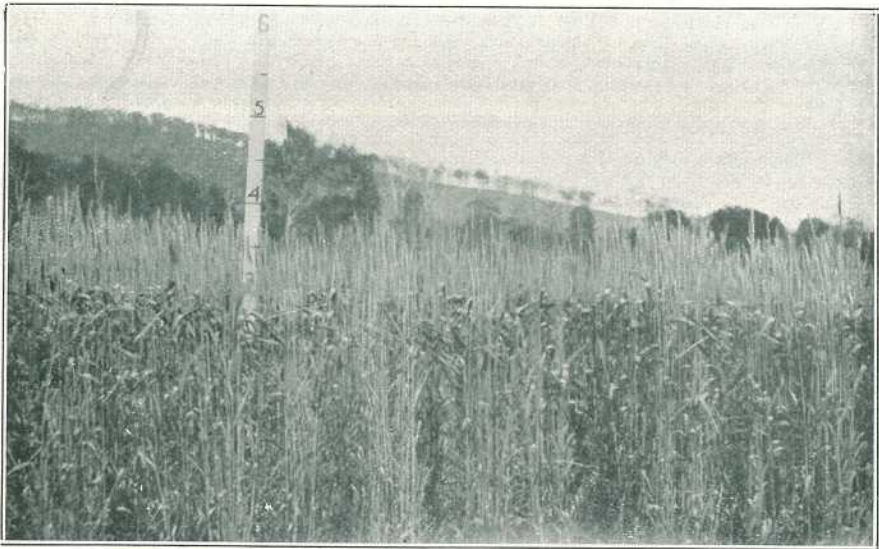


PLATE 20.—PILOT WHEAT AND PEAS AT P. CASWELL'S, WANGALPONG
(FODDER PLOTS).

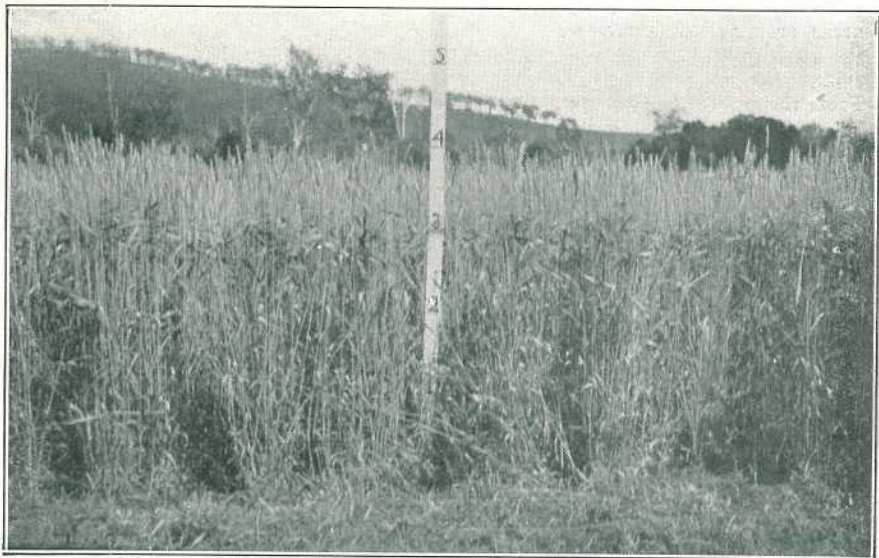


PLATE 21.—FLORIDA WHEAT AND VETCHES AT P. CASWELL'S, WANGALPONG
(FODDER PLOTS).

have proved the soundness of the principle involved. Both farmers are capable agriculturists whose methods of cultivation leave little to be desired, and who are fully seized of the importance of fallowing and thoroughly preparing their land prior to seeding operations. The results obtained on the comparatively low rainfall experienced at Wangalpong speak for themselves; and whilst the soil at Beaudesert is of a heavier nature than that met with in parts of the Canungra Valley, the heavier rainfall experienced more than compensated for the difference in soils and their moisture-retaining qualities.

The plots were planted on the 9th and 10th June at Mr. Thiedeke's at Beaudesert, whilst those at Mr. Caswell's, at Wangalpong, were planted on the 12th and 14th of June, rainfall experienced between the 9th June and 23rd September (the date of harvesting) at Mr. Thiedeke's being 3.66 inchs, but it must be noted that a fall of 1.06 inches was experienced on 7th June, two days prior to planting. At Mr. Caswell's the rainfall received between the 12th June and 24th September totalled .91, the previous rains to that date being 1.25 inches, registered on 14th and 17th May.

The following weights of green fodder were recorded:—

	Mr. F. W. Thiedeke, Beaudesert.				Mr. P. Caswell, Wangaipong.			
	Tons	cwt.	qr.	lb.	Tons	cwt.	qr.	lb.
Florida wheat and peas ..	11	17	2	20	7	6	1	22
Florida wheat and tares ..	10	8	3	13	7	4	0	5
Pilot wheat and peas ..	10	13	2	19	8	5	2	17
Pilot wheat and tares ..	10	4	0	7	6	12	0	5
Skinless barley and peas ..	11	8	0	8	6	4	3	10
Skinless barley and tares ..	4	16	0	3	7	1	2	16
Cape barley and peas ..	6	2	1	21	4	18	1	20
Cape barley and tares ..	9	7	1	1	4	16	0	3
Rye and peas ..	5	15	0	27	4	16	1	20
Rye and tares ..	8	0	3	11	3	7	0	25

The varieties of wheats used in the trials were Pilot, a Bunge-Florence crossbred, and Florida, a Bobs-Florence crossbred, both of which were raised at Roma State Farm. These varieties made excellent growth, and were remarkably even throughout the trials. At the time of harvesting both varieties were in the flowering stage, averaging 3 feet 6 inches in height.

At Wangalpong both Pilot and Florida showed signs of flag-rust, but at Beaudesert no signs of rust were apparent. This was probably due to local conditions and to the fact that humidity in the Canungra Valley is greater than in the more open areas around Beaudesert.

Cape Barley.—This crop made fair growth and when harvested was in the shot-blade stage—the height averaging 1 foot 9 inches of good healthy growth. From the general appearance of the crop a later cutting will give a heavier yield.

Skinless Barley was a clean and attractive crop, averaging 3 feet in height, which had made a remarkable growth of foliage. When harvested the grain was in the soft dough stage.

Rye.—In each case this crop made rapid growth, and was in the flowering stage when harvested, averaging 3 feet in height. Generally speaking, growth was somewhat on the thin side, and heavier quantities of this cereal should be sown when the season is somewhat advanced, as it was in this particular instance.

Field Peas in all plots made fair average growth of 1 foot 6 inches in height. When harvested they showed signs of wilting, thus reducing the weight per acre that under other conditions would have been recorded.

Vetches, usually rather slow in maturing when compared with peas, made favourable growth.

The pig fodder plots were not sufficiently far advanced in growth on 23rd September to justify their harvesting, consequently this matter was deferred till 24th November, but during this period a further rainfall of 3.26 points was received and recorded as follows:—25th September, 32 points; 28th September, 166 points; 16th October, 46 points; 25th October, 9 points; 16th November, 73 points; total, 326 points.

As a result increased growth was in evidence compared with that shown on the occasion of the previous visit.

As in the case with the dairy plots, Mr. Caswell had given careful attention to the cultivation of the various fodders, and an entire absence of weed growths was noticeable.

The various yields recorded can be regarded as valuable illustrations of what can be accomplished by careful and systematic cultivation of crops that are suited for purposes of economic pig-feeding and can be produced at little cost to the grower.

The following are the yields recorded:—

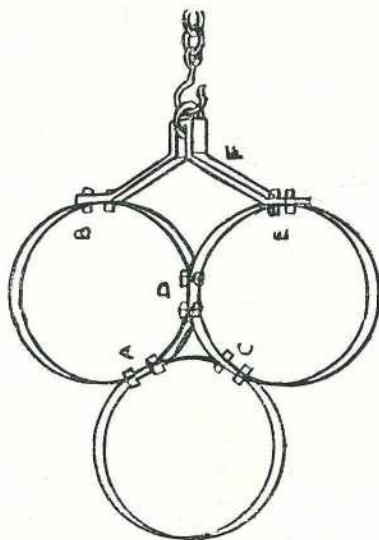
	Per acre.			
	Tons	cwt.	qr.	lb.
Thousand Headed kale	11	15	3	3
Dwarf Essex rape	6	9	2	16
Yellow Globe mangels	29	8	1	20
Long Red mangels	23	19	2	12
Purple Top Swede turnips	14	18	0	27
Elephant Swede turnips	12	13	3	18
Sugar beet	17	6	2	12
White Belgian carrots	12	13	3	18

The Dwarf Essex rape suffered somewhat from the attacks of Aphis, whilst the foliage of the Swede turnip was subjected to the attentions of the Rutherglen Bug; otherwise the crops were excellent in every respect.

LAND LEVELLER FROM OLD TYRES.

"I wonder if many of your readers know what an excellent clod-crusher and leveller three old wagon wheel bands or tyres will make?" asks a correspondent of the "Farmers' Weekly" (South Africa). There are generally some lying about most farms, or which otherwise could be had for a few shillings from the nearest blacksmith. They are put together in an hour by any handy man as below.

All that is required are three old wagon wheel bands, ten short, stout bolts, and a piece of, say 1½-in. by ½-in. flat iron to which to hitch the bands. The length of iron required for the hitch will vary somewhat, according to the diameter of the tyres used. It must be given an upward bend to allow the implement to run flat when travelling.



If a large leveller is wanted, hind-wheel bands are used; if smaller, front-wheel bands.

This leveller is an excellent clod-crusher, as being heavy the clods are rolled in front of it till they are pulverised. Being rigid and broad, the leveller does not sink into the hollows on the land, but shears off the bumps and automatically deposits the soil in the hollows. Going over the land twice with this implement leaves the land perfectly smooth, without those bumps and hollows so annoying in irrigation.



Photo: F. W. Thiel.]

PLATE 22.—HON. R. M. KING, DEPUTY PREMIER, AND ACTING MINISTER FOR AGRICULTURE AND STOCK.

Mr. King, Deputy Premier, Minister for Works and Education, and Acting Minister for Agriculture and Stock, is a native of Brisbane, being a son of the late T. M. King, I.S.O., who at different stages of his career was Auditor-General and Commissioner for Railways. Mr. King was educated at the Brisbane Grammar School, at which he was a scholarship-holder. After leaving school, he took up the study of law, and was admitted as a solicitor of the Supreme Court in 1893. He has been practising his profession ever since, and is a member of the firm of King and Gill, of Brisbane. In 1920 he was elected to represent the Logan in the State Legislature. When the National and Country Party sections came together on a common policy, Mr. King was elected deputy to his leader, Hon. A. E. Moore.

His chief hobby is yachting, but in his younger days he was well known on the cricket and football fields. Tennis and golf also claim him as a devotee.

BLOWFLY IN SHEEP.

By J. CAREW, Senior Instructor in Sheep and Wool.

WITH the advent of a fair summer rainfall and the gradual increase of the fly, no opportunity should be lost in getting the sheep fit for the resistance of any attack. In accordance with previous observations, their actual numbers do not indicate the intensity of infestation, but rather that they work up to intensive attacks by waves. Each species predominates in the adult stage at definite periods 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.

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 wool and 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



PLATE 23.—A CASE FOR TREATMENT.

estimate of the advantage derived from the operation, whichever it may be, is realised. 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 Dripping.

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 a solution consisting of 7 lb. arsenic with an equal quantity of carbonate of soda (washing soda) boiled in a small quantity of water until thoroughly dissolved and then made up to 100 gallons of mixture 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 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, many well-known makes being on the market. Recently I inspected a new type in operation which seemed to possess the necessary power in a small, simple, compact, light handling outfit made by Marine Engines (Queensland) Limited, which should prove a happy medium between the hand and heavy power outfits now in use.

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

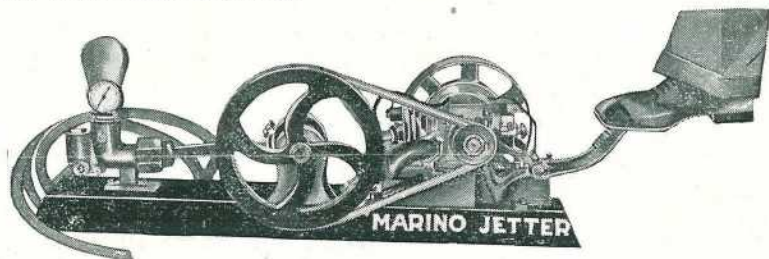


PLATE 24.—A SERVICEABLE JETTING PLANT.

A small, simple, compact, light-handling outfit which can be carried conveniently on the running board of a car. Its base area is 3 feet by 8½ inches and height about 13 inches. Its price complete is just under £50.



PLATE 25.—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.

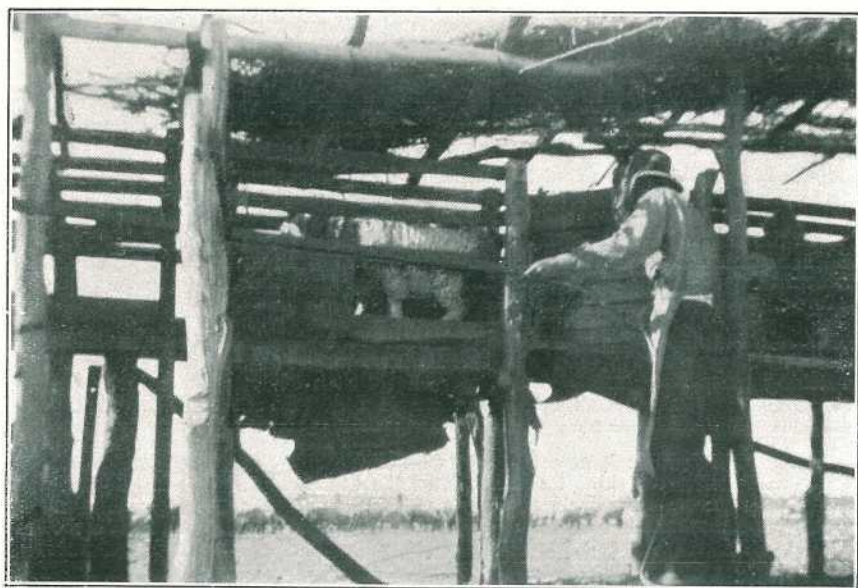


PLATE 26.—JETTING SHEEP AT BARATRIA STATION, 1929.

Note hand on lever to open sliding gate.

The Operation in Practice—A Serviceable Race.

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.

This jetting race has since been improved by reducing its length and fitting the jetting side with sacks fitted to run on two wires which are moved in two sections when working back along the race, the jetting being done between the two sections.

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.

PASSION FRUIT CULTURE.

Issued by the FRUIT BRANCH, Department of Agriculture and Stock.

THE *Passiflora* family is of wide distribution throughout coastal Queensland, indigenous varieties being found from the South to the far North. None of these, however, produce fruit which could be classed as edible. *Passiflora* and *Tacsonias* were originally listed separately, but are now included under the former heading. Thirty-six species which have edible fruits are enumerated by Mr. P. J. Wester in the February (1931) issue of the "American Chamber of Commerce Journal," who remarks: "Here lies a tremendous virgin field open to the plant-breeder to effect new flavour combinations, enlarge the fruits, reduce the seediness, improve shipping qualities, and extend the cultivatable range of the passion fruits." Two varieties, *Passiflora amethystina* and *P. laurifolia* (both producing hard-shelled fruit of most excellent quality, though the latter in sparse quantity on account of it being more tropical) existed in Southern Queensland some forty years ago, and appear to have been almost forgotten. Both of these varieties, particularly the latter, are considered to be almost or entirely immune to the disease known as "leaf spot" which causes such heavy losses with the common variety, *P. edulis*.

All passion fruits are climbers, and the varieties above referred to are either semi-tropical or tropical, and require a well-drained, friable, rich sandy loam soil to be grown to the best advantage; but the common passion fruit can be grown on comparatively poor soils that are naturally well drained, provided they are systematically manured, well cultivated, and are not subject to severe frosts. Stagnant water at the roots is fatal, and very heavy soils should not be selected.

As with all other fruits the land should be thoroughly prepared prior to planting, so as to reduce it to a state of perfect tilth, and provide the right soil conditions in which to start the young plants. This is a matter of very great importance, and one that does not receive the attention it should, as not only passion fruit but all other fruits are frequently planted in land that is very far from being in good order, and which should have received much more care and attention in order to enable it to produce healthy vigorous plants that will yield payable returns.

Passiflora edulis—Passion Fruit.

This variety is the one that is most commonly grown, not only in Queensland, but throughout Australia. There are at least three types, the large fruited or "giant" passion fruit, sometimes called "Mexican," which attains a size of over 2 inches in diameter, the common type which averages about 1½ inches in diameter, also a yellow-coloured variety. The former, though a larger and more showy fruit, is somewhat disappointing, as it is frequently a shy bearer and the fruit does not contain as large a percentage of pulp as the common type, which is the best all-round commercial fruit. The best fruit has a very dark purple skin, which is filled with an orange-coloured pulp in which the seeds are imbedded. The pulp is slightly sub-acid and possesses a very distinctive agreeable flavour, so that when used as an ingredient of a fruit salad it imparts its characteristic flavour to it, and the salad is greatly improved thereby.

The plant is easily propagated from seed, all that is necessary being to select perfect fruit, fully matured, from a perfectly healthy plant that is free from leaf, root, vine, or fruit affection of any kind. The pulp, when removed from the fruit, should be placed in a tub or suitable vessel, and be covered with water, the mass being then allowed to ferment long enough to free the seeds from the pulp, when they should be strained off, well washed, and dried. Prior to planting, the seed should be soaked overnight by placing it in the bottom of a basin and pouring hot water, at a temperature of 180 deg. over it, and allowing it to remain until the following morning. If early spring-ripened fruit is selected and the seed is planted as soon as ready, good strong plants will be available for summer planting, but, if plants are wanted for early spring planting, the seed must be sown the previous autumn. The seed should be sown in a specially prepared seed-bed in soil of a light, free nature, containing a quantity of leaf mould or humus—a good potting soil—and the young plants should be sheltered from the sun and judiciously watered should the soil become dry. When the seedlings are about 1 foot high or larger they should be planted out in the permanent position, taking care to keep them moist so that they will not dry out.

Prior to planting, the land is marked off in rows not less than 10 feet apart. A trellis consisting of good fencing posts, placed 15 feet apart in the row, is erected along the row, the posts being set with their width across, not in the



PLATE 27.—THE LARGE-FRUITED GRANADILLA.

Carrying specimens 9 in. x 17 in. circumference, grown by Mr. J. C. Brünnich, in his garden at Stanley Terrace, Taringa, near Brisbane.

direction of the row. The posts should be about 8 inches wide by 3 inches thick by 6 feet 6 inches long, and be set 20 inches in the ground. The end posts must be much heavier, sunk much deeper in the soil, and well strutted as they have to act as strainers, and prevent the wires that are attached to the top of the posts from sagging when they have to carry a heavy growth of vines. Two No. 8 galvanised wires are firmly fixed to the top of the posts, one on each side, so that when in position they form two parallel lines, 8 inches apart, on which the vines are trained. The young plants are planted midway between the posts, right under the wires, and are tied to a light stick or other temporary support till they reach the height of the wires, when they are topped and two main lateral stems are allowed to develop, all other lateral growths on the main stem from the ground to the wire being removed. The two main laterals are then trained on to the wires, and when they meet those of the adjacent plants their growth is stopped by pinching back the terminal growth, which causes secondary laterals on which fruit is borne to be thrown out all along the main lateral. These secondary laterals, if left alone, throw out further laterals and these again in turn make more lateral growth, with the result that a very dense and tangled growth of vines is produced from which it is hard to separate the primary and secondary laterals and which, owing to its dense habit of growth, is frequently prone to be attacked by disease. Systematic pruning is, therefore, desirable—first to keep the plants healthy, secondly to produce strong new lateral growth on which good fruit will be grown, and thirdly to bring in the crop at different periods of the year, so as to get a better distribution of the crop instead of a glut at one time and a scarcity at another. When an autumn or winter crop is desired the main summer crop must be sacrificed. This is done by pruning the vines right back to the secondary laterals when they are showing their blossoms for the summer crop, and this will have the effect of throwing out a new growth which will blossom at a later period. A word of warning is, however, necessary; don't prune hard back in dry weather—you will probably kill the plants if you do so—but wait till the ground has had a good soaking, when the plants will throw out a fresh growth very quickly and will not be permanently injured. A good dressing of quick-acting manure at this time will be found beneficial and materially increase the following crop.

Mr. Brünnich, in the publication "Complete Fertilisers for Farm and Orchards, recommends the following manure for passion fruit:—

"Use per acre, in accordance with the richness of the soil, a mixture of—
1 to 2 cwt. nitrate of soda; 4 to 8 cwt. blood and bone manure; 1 to 2 cwt. superphosphate; 1 to 2 cwt. sulphate of potash. A top-dressing of 1 cwt. of nitrate of soda in spring will be found beneficial."

This is a complete manure rich in organic and inorganic nitrogen, citrate and water soluble phosphoric acid as well as potash, and should not only act quickly but be fairly lasting in its effect.

The passion fruit is liable to be attacked by several different pests and diseases, of which the leaf disease is by far the most serious. This disease has only made its presence felt during recent years, and is of an obscure nature. It attacks every part of the plant above ground—the flowers, leaves, and laterals. The latter are killed by a small portion of the stem becoming affected to such an extent that it dies and all the rest of the lateral that is beyond the part attacked shrivels and dies, frequently when it is covered with fully grown but immature fruit which shrivels up. This affection has received the careful attention of the Vegetable Pathologist, and the result being the discovery of a new fungus controllable by Bordeaux mixture. Red spiders and spinning mites frequently injure the leaves and young laterals. These pests can be kept in check by spraying with sulphide washes or dusting with finely-ground sulphur.

Scale insects of various kinds also attack the wood, leaves, and fruit, generally where plants are grown under adverse conditions. These may be kept in check by systematic spraying, but can only be effectual when the vines are systematically pruned, as when grown in a dense mass the spraying material used has little chance to come in contact with the majority of the insects.

Nematodes injure the roots, particularly in light soils, and an application of cyanogas to the soil prior to planting will temporarily eliminate the pest from treated soil. The material is best applied when ploughing by being lightly distributed along the bottom of each furrow immediately prior to its being covered. A simple attachment may be fitted to the plough to allow the cyanogas to fall immediately in front of the falling earth which is being turned by the mould board. When a small area has been treated a heavy roller should be passed over the surface to close the soil and delay the escape of the gas fumes. The addition of nitrogen to

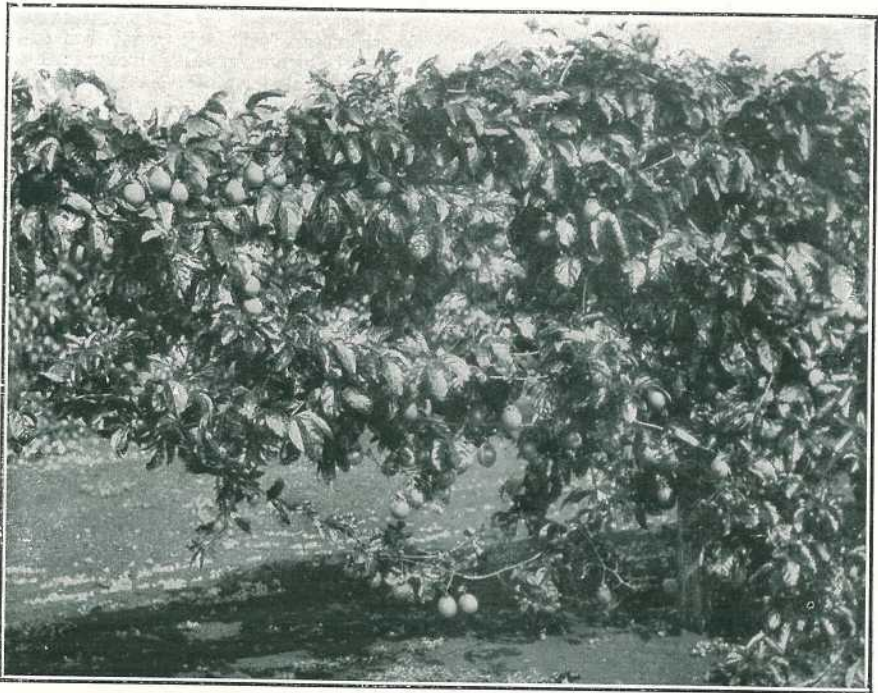
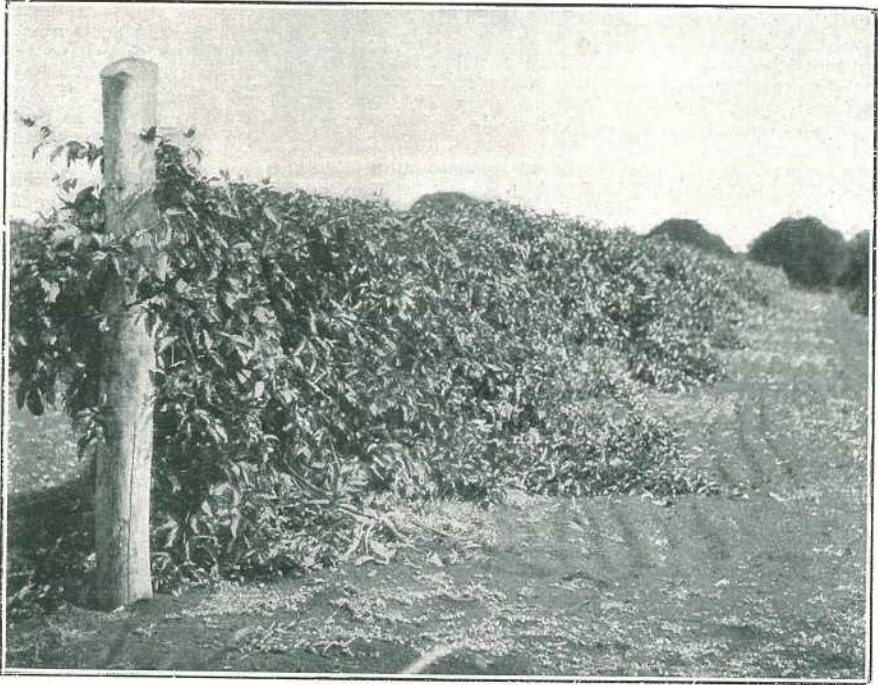


PLATE 28.—PASSION FRUIT, REDLAND BAY, SHOWING METHOD OF TRELLISING, AND PART OF A VINE IN FRUIT.

the soil also militates against the effect of the pest. Light dressings of nitrate of soda or sulphate of ammonia at intervals of not more than three months are recommended. The quantity for each dressing (February, May, August, and November) in light soils should be at the rate of about 1 cwt. per acre. In medium and heavy soils this quantity may be reduced by one-half.

Fruit fly also attacks the fruit, as does also the sucking bug. The latter sometimes causes a heavy loss, as the punctured fruit either drops or if it remains on the vine becomes hard and woody. This bug is very fond of the red prickly cucumber, commonly known as the "Cape or African Cucumber," and if this is used as a trap, a large number of the bugs can be caught and destroyed.

When fruit fly is troublesome, trapping with Harvey's fruit fly lure as soon as the first sign of the fly's presence is seen, or with the following lure originating with Mr. H. Jarvis (Entomologist)—1 teaspoonful synthetic Vanilla, 1 tablespoonful Scrubb's ammonia, and 1½ pints of water—and systematically attending to the traps will result in the destruction of large numbers of female flies, and thus reduce the loss they would cause were they allowed to lay their eggs in the immature fruit whilst the skin is still soft and before it becomes so hard that the fly cannot pierce it. Ordinary glass fly traps, placed not more than 30 feet apart, are recommended, and the renewal of the lure contained in these every three days is desirable.

Passiflora quadrangularis—Granadilla.

The granadilla is a tropical fruit that is better suited to the northern than to the southern part of this State, though excellent examples of the larger type of granadilla—"Macrocarpa"—can be produced in the coastal districts both to the south and north of Brisbane, provided the situation is a warm one, free from frost and well protected. The *macrocarpa*, as its name signifies, is a very large type of granadilla, the fruit frequently weighing several pounds. The seed cavity is small for the size of the fruit, and is surrounded by a thick layer of whitish flesh which has no distinctive flavour, but which, when flavoured with lemon or other suitable flavouring, is used for pies. It is not as a rule a heavy bearer, and must be grown on a horizontal (not lateral) trellis.

The Northern Granadilla—*quadrangularis*—is a smaller fruit of a somewhat irregular, oblong shape, about 4 to 4½ inches in diameter. The pulp cavity is large and is filled with large seeds surrounded with a pale yellow pulp of exceptionally high flavour when the fruit is fully ripe, which is known by the outer fleshy covering becoming soft, and the skin, instead of being a pale green, turns a dull yellowish-green colour. This variety when fully ripe is one of the highest flavoured tropical fruits, and eaten either alone or used in combination with the papaw, pineapple, banana, and the juice of a lemon or lime to form a fruit salad, it is very hard to beat. Unfortunately, it does not carry well and consequently can only be obtained in perfect condition where grown. The granadilla requires a deep, well-drained, rich loamy soil to be grown to perfection, and it does best when trained to an overhead trellis (as shown in illustration herewith, which was taken recently at Taringa, near Brisbane, and gives a good idea of its habit of growth). Similar manuring to that recommended in the case of the common passion fruit will be found beneficial.

Passiflora laurifolia, "Bell Apple."

The Bell Apple is practically unknown in this State, though its fruit is quite equal to that of the previously mentioned varieties. It is a handsome and vigorous climber, and is more valuable for covering unsightly edifices or for ornamental purposes than for fruit production, and its cultivation for the latter purpose is not recommended. Without hand fertilising it carries but few fruit in the South, but would probably be much more productive in the tropics.

Passiflora ligularis, Mexican Passion Fruit.

May be eliminated from the list. The pulp is almost flavourless beyond a trace of sugar, and the appearance of the fruit is not attractive.

Passiflora mollissima, the Banana-shaped Passion Fruit.

The fruit of this variety is used as a substitute for the genuine passion fruit, which the pulp somewhat resembles, also the seeds. The latter are in excessive quantity, whilst that of the pulp is correspondingly reduced. The vine is hardy and of very free growth, but cannot be recommended for planting for commercial purposes.

CLIMATOLOGICAL TABLE—MAY, 1931.

SUPPLIED BY THE COMMONWEALTH OF AUSTRALIA METEOROLOGICAL BUREAU, BRISBANE.

Districts and Stations.	Atmospheric Pressure. Mean at 9 a.m.	SHADE TEMPERATURE.						RAINFALL.	
		Means.		Extremes.				Total.	Wet Days.
		Max.	Min.	Max.	Date.	Min.	Date.		
<i>Coastal.</i>	In.	Deg.	Deg.	Deg.	2, 4, 5	Deg.		Points.	
Cooktown	30.00	84	73	87		65	1	132	12
Herberton .. .. .	..	75	58	82	13	41	31	154	9
Rockhampton	30.11	80	62	87	1, 5, 14	46	30	205	9
Brisbane	30.16	74	59	82	5	48	30	220	12
<i>Darling Downs.</i>									
Dalby	30.18	74	51	82	2, 12	35	30, 31	125	6
Stanthorpe .. .. .	..	67	46	75	2	31	16, 19, 20	361	14
Toowoomba .. .. .	..	67	50	76	4	35	16	284	12
<i>Mid interior.</i>									
Georgetown	30.00	90	66	95	12	47	29	Nil	..
Longreach	30.08	81	55	92	13	36	29	74	5
Mitchell	30.14	74	50	86	13	34	30	184	4
<i>Western.</i>									
Burketown	30.01	87	66	92	14, 19	51	30	4	1
Boulia	30.07	82	56	99	6, 13	39	28	77	4
Thargomindah	30.13	70	54	88	6	41	29, 31	281	10

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF MAY, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALL DURING MAY, 1931, AND 1930 FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	May.	No. of Years' Records.	May, 1931.	May, 1930.		May.	No. of Years' Records.	May, 1931.	May, 1930.
<i>North Coast.</i>	In.		In.	In.	<i>South Coast—</i>	In.		In.	In.
Atherton	1.95	30	2.05	3.77	Nambour	4.81	35	4.52	8.87
Cairns	4.35	49	4.04	6.07	Nanango	1.51	49	2.66	3.47
Cardwell	3.50	59	4.34	6.52	Rockhampton	1.48	44	2.05	4.78
Cooktown	2.87	55	1.56	4.52	Woodford	2.96	44	2.53	9.04
Herberton	1.59	44	1.54	2.48					
Ingham	3.36	39	3.99	7.85	<i>Darling Downs.</i>				
Innisfail	12.26	50	7.10	22.91	Dalby	1.30	61	1.25	2.21
Mossman Mill	3.50	18	2.29	6.49	Emu Vale	1.13	35	3.46	2.39
Townsville	1.31	60	0.49	4.48	Jimbou	1.20	43	1.19	2.21
					Miles	1.50	46	1.35	3.22
<i>Central Coast.</i>					Stanthorpe	1.85	58	3.61	2.84
Ayr	1.10	44	1.31	3.00	Toowoomba	2.19	59	2.84	5.50
Bowen	1.32	60	0.80	5.73	Warwick	1.54	66	3.48	2.86
Charters Towers	0.80	49	0.09	3.75					
Mackay	3.74	60	2.56	7.92	<i>Maranoa.</i>				
Proserpine	4.28	28	2.84	5.87	Roma	1.42	57	1.37	1.97
St. Lawrence	1.78	60	0.67	5.96					
<i>South Coast.</i>									
Biggenden	1.72	32	2.04	2.34	<i>State Farms, &c.</i>				
Bundaberg	2.63	48	4.39	3.37	Bungewongorai	0.83	17	1.42	2.00
Brisbane	2.82	80	2.20	7.98	Gatton College	1.52	36	1.07	3.25
Caboolture	2.90	44	3.44	8.38	Gindie	0.95	32	0	3.76
Childers	2.13	36	3.20	3.16	Hermitage	1.17	25	3.56	2.52
Crohamhurst	5.02	38	2.32	15.58	Kairi	1.84	17	1.23	4.50
Esk	2.01	44	1.36	5.27	Mackay Sugar Experiment Station	3.29	34	1.60	7.88
Gayndah	1.57	60	1.93	5.90					
Gympie	2.88	61	3.12	4.42					
Kilkivan	1.84	52	2.29	4.14					
Maryborough	3.09	59	2.46	5.66					

GEORGE G. BOND, Divisional Meteorologist.

PACKING HOUSES AND THEIR EQUIPMENT.

By JAS. H. GREGORY, Instructor in Fruit Packing.

PACKING SHEDS.

THE fruitgrowing areas in some districts of Queensland being widely scattered makes it in some cases impossible for central packing sheds to be established, so it is felt that a few words on packing houses and their layout, with accessories used, would be of assistance to many growers desiring to erect their own packing sheds. The writer, whilst visiting growers, has often noticed the inefficient method of handling a fruit crop, no effort being made to decrease the time required for casemaking, packing, and despatching, by the use of packing-shed accessories. Growers, when asked why they do not have this or that, complain of the cost, forgetting that the increased speed and easier handling will soon save the cost of packing and casemaking benches, conveyors, &c., at the same time making the work easier and more pleasurable. In this article a description of how to make some of the accessories and their approximate cost is given. As far as sizing machines are concerned no designs of home-made articles are given, as growers have a wide choice of commercially manufactured machines which are reasonably cheap, whilst many have their own home-made product which can easily be adapted to the layout of a packing shed.

Packing Shed Layout.

In dealing with packing sheds it is essential to study economy of working. This is attained by having the work going or flowing in one direction through the shed, so that the packers and floorman nailing down and despatching do not get in each others way; receiving and having fruit stacked in places to permit as short a distance possible of carriage to sizing machines or packing bins; gravity conveyors to carry cased fruit to lidding press or trucks. A study of the two packing-shed layouts submitted will help to show how the work is conducted to obtain these results.

The design of the large shed (Fig. 1) is suitable for the handling of an output of 2,000 to 3,000 cases per week if fruit can be loaded daily on rail. The cost of the plant would be approximately—

	£	s.	d.
Sizer and elevator conveyor	120	0	0
Gravity conveyors	35	0	0*
Engine	30	0	0
Casemakers' bench	1	0	0
Packing benches	12	0	0
Labelling table	1	0	0
Office fittings	5	0	0
Nailing-down press	15	15	0
Total	219	15	0

This plant is suitable for small co-operative companies and central district packing houses. The cost of the building would be in the vicinity of £450 if built of galvanized iron.

The smaller shed illustrated (Fig. 2) is very suitable for the average grower, allowing easy handling of 250 cases a day. If the grower has not the capital to expend in gravity conveyors and nailing-down press (approximate cost, £25) a good nailing-down stand is made by laying two pieces of 3 by 2 or other suitable timber on the floor for nailing down upon. These battens permit the bottom of the cases to bulge when the lid is placed in position and nailed. As will be seen by examining the diagram the same principle of continuity from the reception of the fruit to its despatch is followed as in the larger shed. Cost of plant (approximate):—

	£	s.	d.
Sizing machine	35	0	0
Packing benches	4	0	0
Casemakers' bench	1	0	0
Total	40	0	0

It will be seen the plant required in the packing shed is confined to casemaking bench, packing stands, sizer, and accessories for casemaking and packing. A description of how to make these will help the home carpenter.

* (30-ft. conveyor and two 90-deg. curves.)

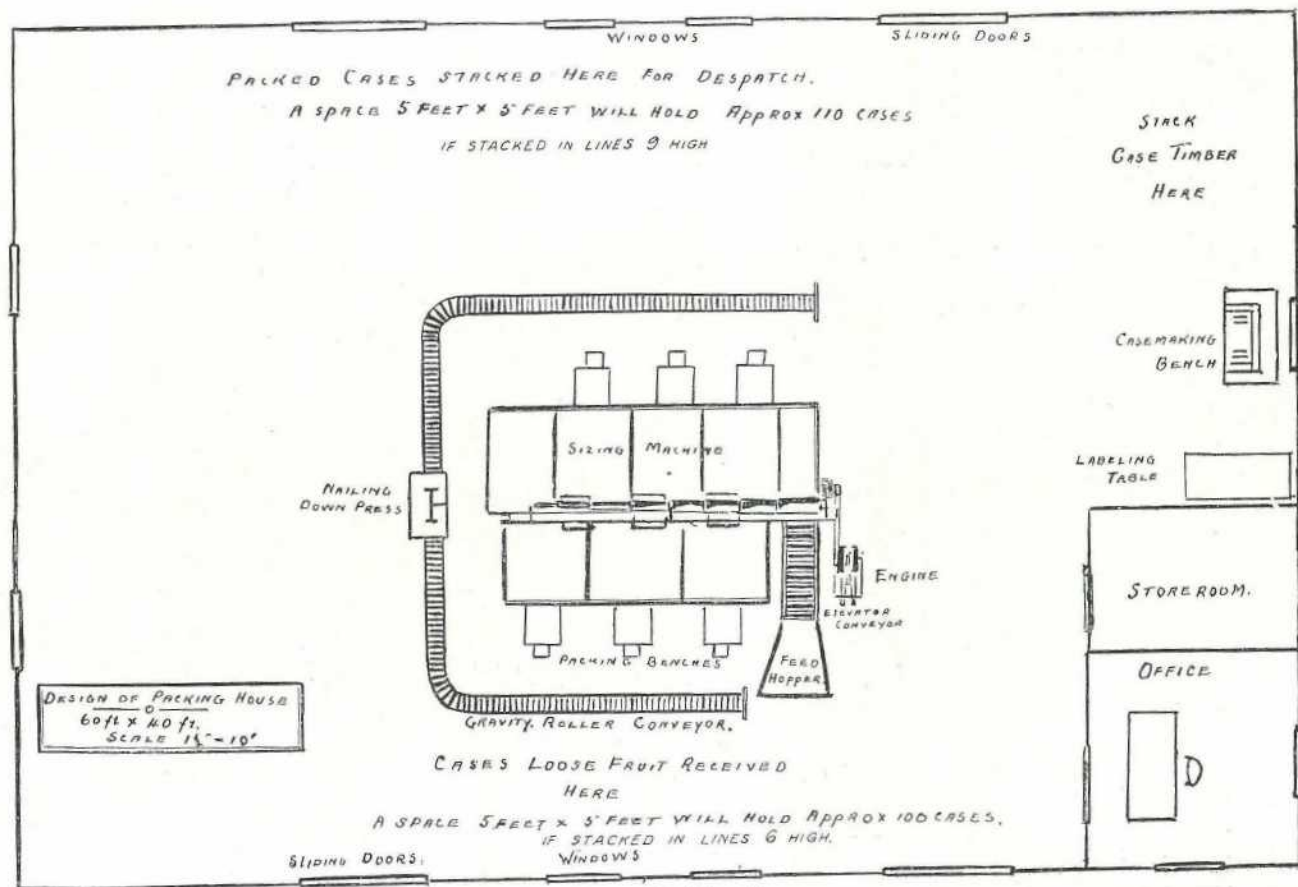


PLATE 29 (Fig. 1).

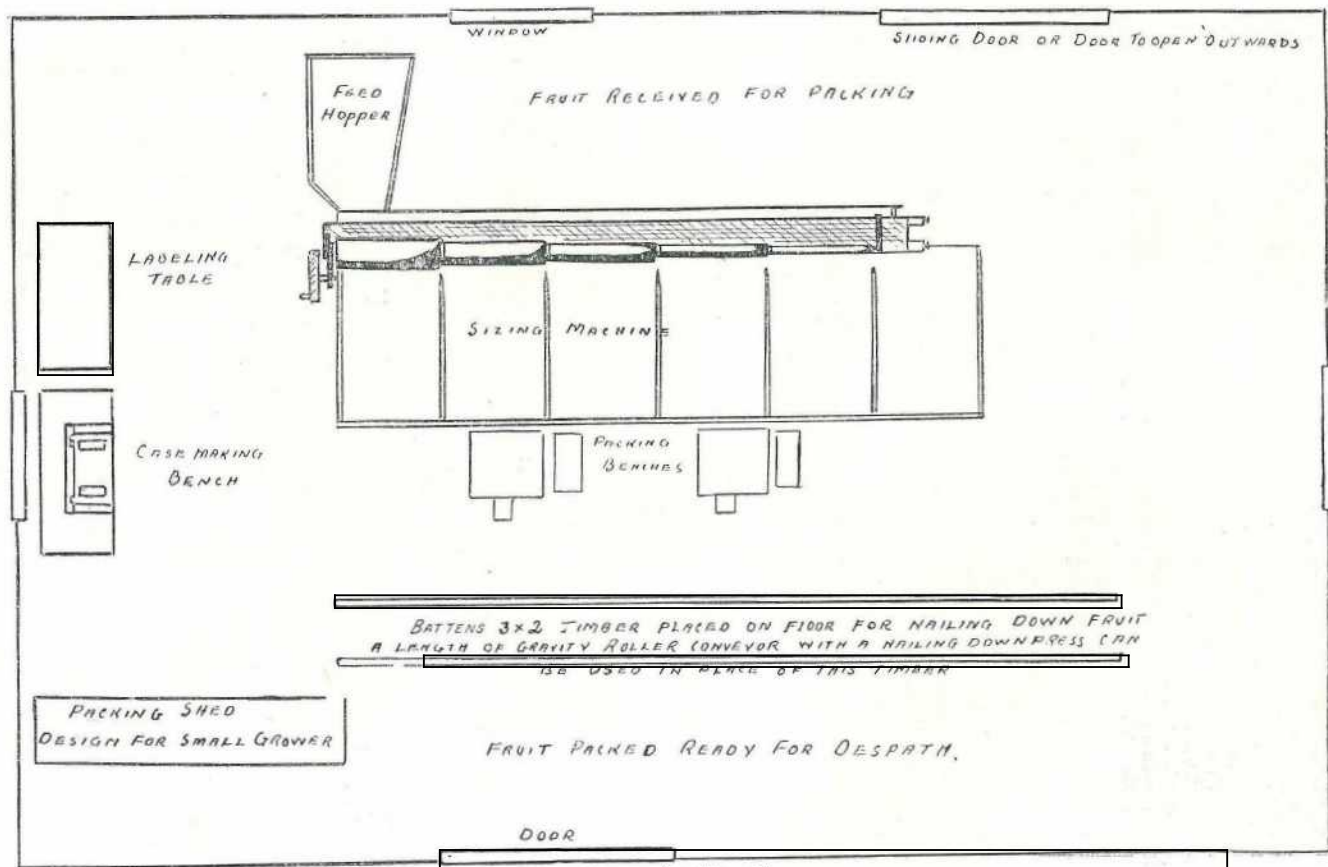


PLATE 30 (Fig. 2).

Casemaking Bench.

The cost of timber is approximately £1, and the price will be repaid many times during a season by the increased output and with the advantage of a better-made box. The illustration (Fig. 3) shows the complete bench made to take cases without a partition, whilst (Fig. 4) is the top of the bench which would replace the top of (Fig. 3) if the bench was to be used for making cases with a partition. Cases are always measured by the internal dimensions, so it is necessary to always take care that the inside length of the case corresponds to the distance between the notches in the back stop (A) (Figs. 3 and 4). Some growers use a tree stump for a bench. This is quite a good base for a bench and will do excellent work by adding just the bench stops to the top of the stump. When placing the legs on the bench it is necessary to attach them as nearly as possible under the slots that hold the case ends. This gives a solid base for nailing.

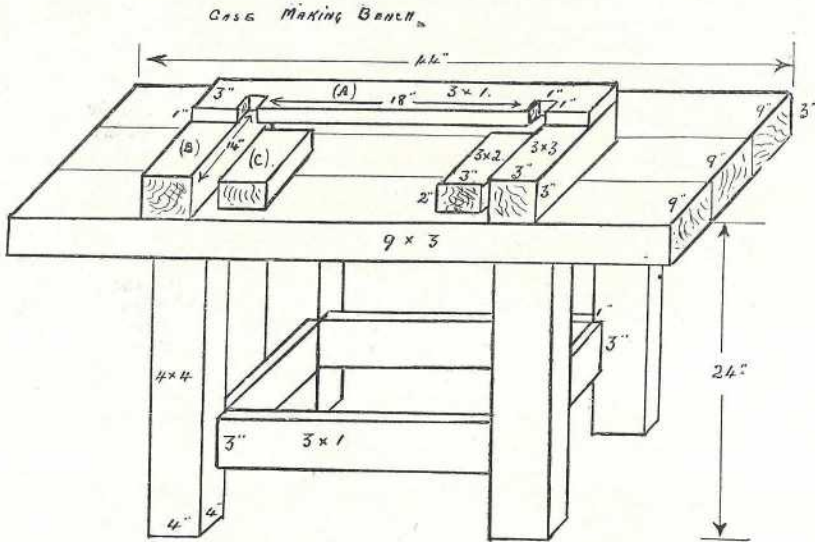


PLATE 31 (Fig. 3).—CASEMAKING BENCH FOR MAKING AUSTRALIAN DUMP, CANADIAN STANDARD, BUSHEL AND HALF-BUSHEL CASES, AND OTHER FRUIT CASES, 18 INCHES IN LENGTH, INSIDE DIMENSIONS.

Specifications.

Length .. 44 inches	Timber.—Legs .. 4" x 4"
Height .. 24 inches from floor	Stops—Outside .. 3" x 3" (B)
Width .. 27 inches	Inside .. 3" x 2" (C)
	Back .. 3" x 1" (A)
	Top .. 9" x 3"
	Stays .. 3" x 1"

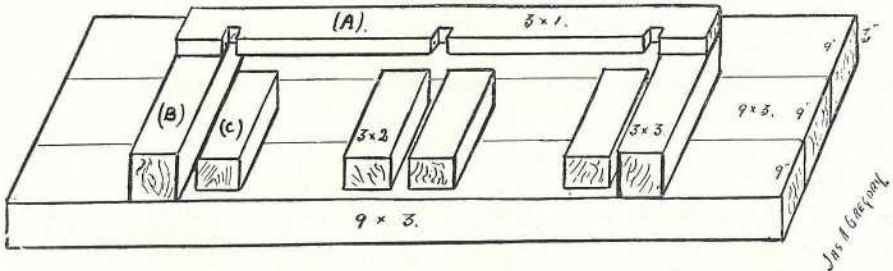


PLATE 32 (Fig. 4).—CASEMAKING BENCH FOR LONG BUSHEL CASES OR OTHER CASES WITH A PARTITION.

Case Makers' Nail Comb.

As a help to casemakers a nail comb (Fig. 5) for picking nails up with the heads in one direction will be found useful. The comb is made of a heavy piece of galvanized iron turned to clip on to the end of the nail box with a number of knitting needles soldered to the iron. The knitting needles are placed so that nails will slide between them easily, without dropping through, and remaining suspended by their heads in the comb. A comb containing sixteen needles is a handy size for working, and will hold enough to make ten to fifteen cases. The needles are best placed with the ends shaped in a circular manner, the centre needles projecting about 6 inches and the side needles 5 inches. The comb is used by scraping or pushing it through the top of a box of nails. The cost of the comb is the price of four sets of knitting needles, and the necessary solder (approximate cost 2s. 6d. in most country districts).

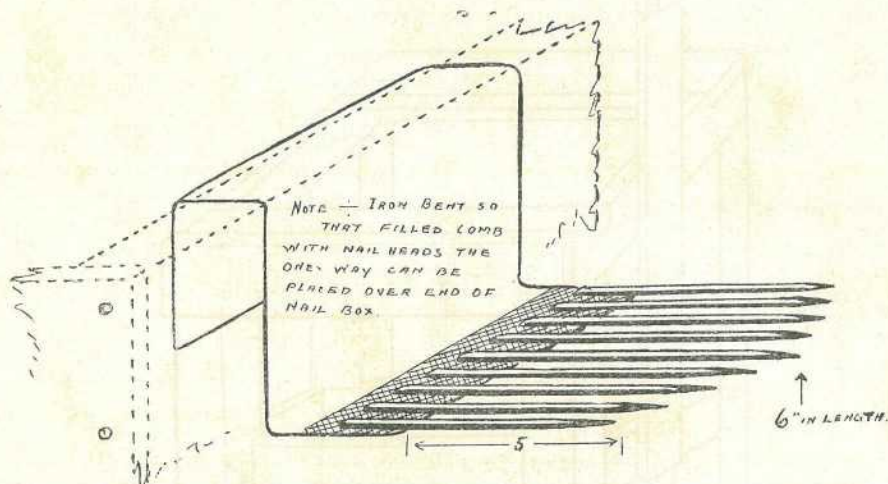


PLATE 33 (Fig. 5).—CASEMAKER'S COMB.
Made of Galvanised Iron and Knitting Needles.

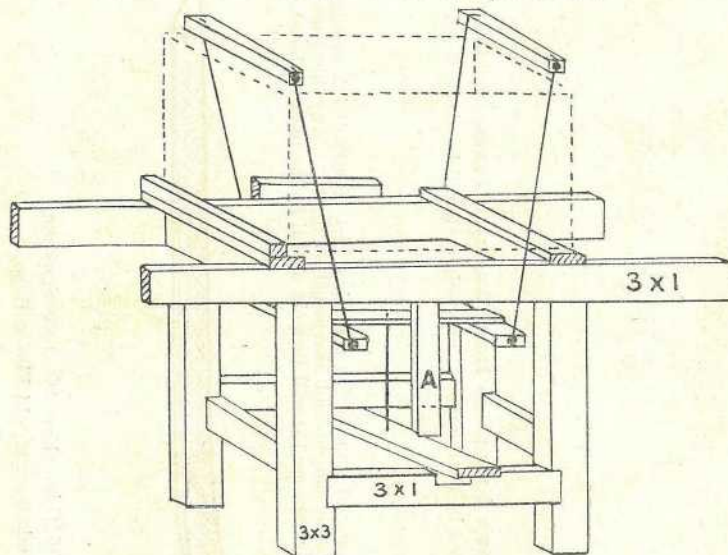
Fruit Packing Bench.

Packing is a tiring work and a job that cannot be done properly, as some packers think, by sitting down. Many growers make no effort to make packing easy, and often condemn packing fruit such as tomatoes as too hard, simply because they endeavour to pack with their case level and have difficulty in getting the fruit to remain in place. This difficulty can be overcome by building the packing stand illustrated in Fig. 6 with one end of the case higher than the other. With this stand packing is done from one end of the case and not from the side. This allows the tilt on the case to keep the fruit in position without the packer having to hold it in with one hand as when packing from the side, thus leaving both of the packer's hands free for working. The packing stand illustrated is for use when wrapping fruit, but with fruit such as tomatoes, passion fruit, or other unwrapped fruit it is not necessary to attach the tray for holding the wrapping paper. The paper-holder is best made to take the largest sized paper used in wrapping citrus and deciduous fruits. If made 4 inches deep at the back and 2 inches deep in front, with the front cut out in the centre as illustrated, a large quantity of paper can be held in the holder. The paper-holder should be placed at the height most suitable for the comfort of the packer. The packing needle illustrated in Fig. 7 is a useful addition to the packing bench, with paper-holder.

Spring Board for the Comfort of the Packer.

Illustrated with the packing stand is an easily made accessory to ensure comfort and ease for a long day's packing. Standing on a hard cement or wooden floor all day whilst packing is very hard on most packers, particularly female operatives. Nearing the end of the day a packer's output for the last couple of hours is often

Dotted lines show case in position.

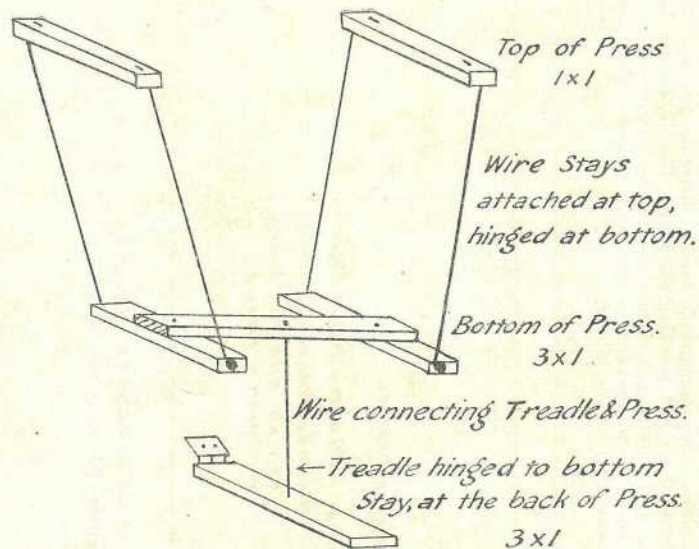


CASE LIDDING PRESS.

Specifications.

Length	..	4 feet
Width	..	12½ inches
Height	..	2 feet
Timber—Legs		3" x 3"
Frame		3" x 1"

(A) This is a board hinged to the top rest, bearing on the treadle and holding down the lid whilst nailing, thus making it unnecessary to keep pressure on the treadle with the foot.



PRESS WITH FRAMEWORK REMOVED.

Length of wires 19 inches for standard case.
Length of bottom wire 12 inches.

PLATE 37 (Fig. 9).

holding the weight. The sliding portion should be filed square to enable it to slide through the supporting plate. A phonograph needle fitted in the end of the needle portion is an improvement on just pointing the wire. The needle can be fitted by drilling and soldering or by putting a thread on the end with a set nut. The weight is made of lead, and needs to be about 6 ounces in weight. The cost of this accessory is practically only that of the labour.

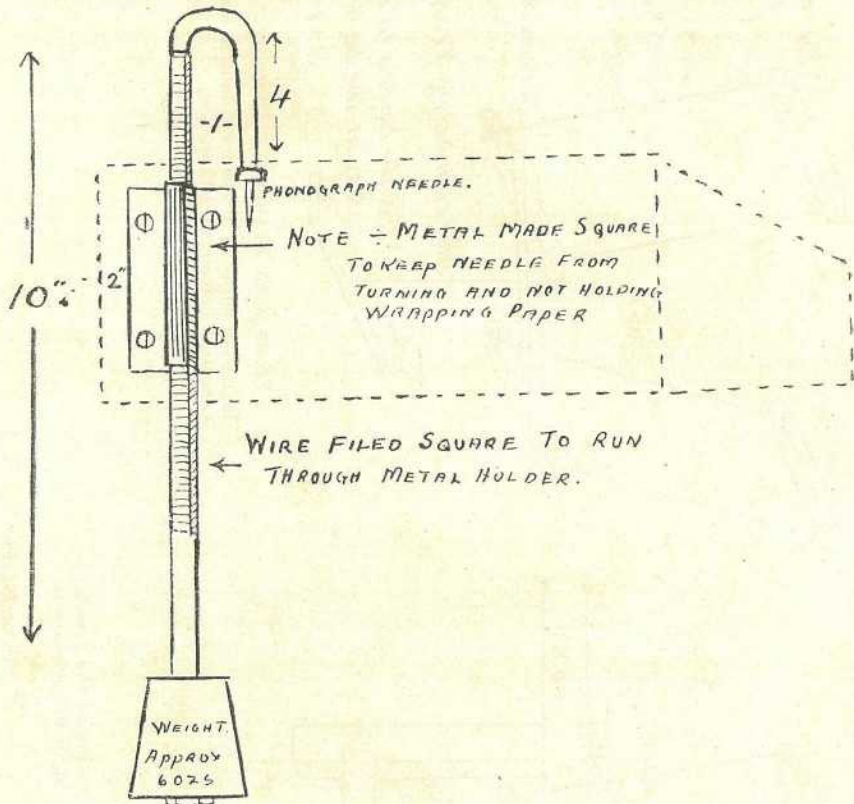


PLATE 35 (Fig. 7).—PACKER'S NEEDLE TO HOLD WRAPPING PAPER IN POSITION. The paper holder is represented by dotted lines. The weight should be about 6 ounces.

Case End Scraper.

A cheap and efficient case-end scraper for removing dirt or stencil ink smudges can be made out of an old file shaped and sharpened (Fig. 8). Any blacksmith will make this tool for a few pence, and it will be most useful in the packing house.

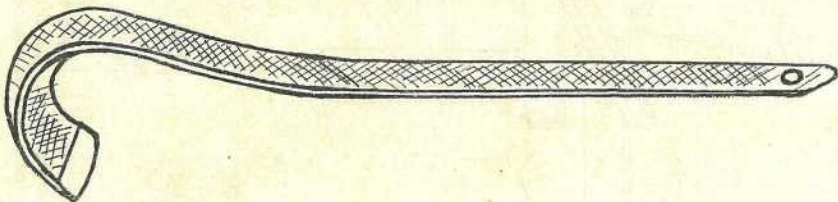


PLATE 36 (Fig. 8).—CASE END SCRAPER.
Made from an old File or Rasp.

curtailed through aching legs and back. This can be largely overcome if not entirely eliminated by the use of a spring board to stand upon (Fig. 6). Made from timber surrounding bales of wrapping paper the cost is nil, but the expenditure of a few pence on 6 feet of 6 by $\frac{1}{2}$ inch timber for the top and 3 feet of 2 by 2 inch for the two battens at the ends will soon be repaid by the extra comfort and efficiency given. The cost of the packing stand and spring board should not exceed 40s. complete.

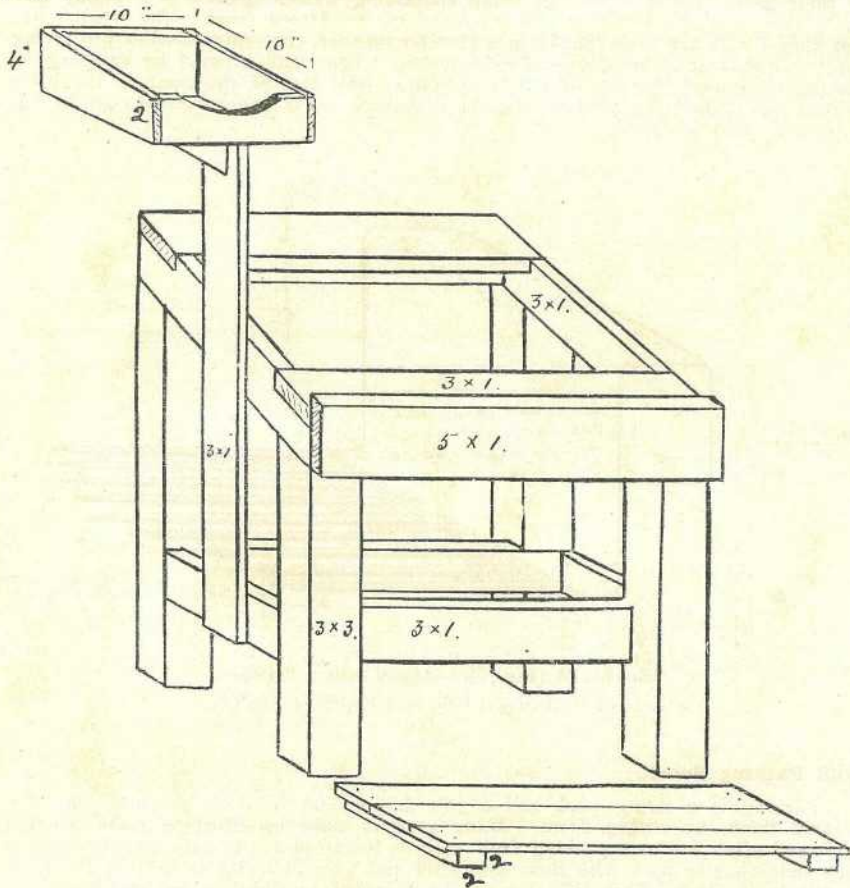


PLATE 34 (Fig. 6).—FRUIT PACKING BENCH AND SPRING BOARD.

Specifications.

Height in front	22"
Height at back	27"
Depth from front to back	18"
Size of Paper Tray	10" x 10" Inside Dimensions
Legs	3" x 3"
Stays	3" x 1"
Front board	5' x 1"

Wrapping Paper Needle Holder.

This is a useful accessory, and when used in conjunction with the wrapping-paper holder will be found to be a good insurance against paper wastage through wind, &c. Simple to make out of a small sheet of heavy galvanized iron, copper, or brass cut and bent to the required shape to allow the needle to slide up and down through it. The needle is made of a 15-inch length of a heavy gauge galvanized or fencing wire, turned over 4 inches from one end and pointed to make the needle. The turn should be made to allow about 1 inch between the needle and the sliding portion

Fruit Case Lidding Press.

No packing shed should be without this accessory. Whilst there are many excellent presses on the market, some growers may prefer to make their own. The cost of the timber and materials for the press is about 10s. The materials necessary are 8 feet of 3 by 3 for the legs, 28 feet of 3 by 1, two bolts 3 inches long, and four 1½-inch screws with washers to match. Two-inch nails will be found long enough. The short lengths of wire required for the press vary in length according to the case used, and require to be made of heavy-gauge wire. The short lengths of 2 by 1 and 1 by 1 timber required for the stops and press (see Fig. 9) can be cut from a piece of 3 by 1 ripped down. It is necessary to allow about 4 inches clearance of the top of the press above the case to allow for variations of the height of the fruit in the case, and the amount of bulge required on the lid when nailing down. A close examination of the illustrations will show how to build the press. The wires are attached to the pressing stays by drilling the wood with two holes about 1 inch apart and bending the wire to fit. Care should be taken to see that the end of the wire does not project through and damage the lids when pressing. The bottom end of the wire is attached to the stays by the 1½-inch screws and washers, an eye being formed by carefully bending the wire to fit around the screws. It is necessary to have the wire hinged in this way to enable the pressure stays to be brought easily over the lid of the case. The ends of the two pieces of wood placed across the frame, on which to stand each end of the case when attaching the lid, should be allowed to project on either side and be shaped to stop the wires from falling flat over either end of the frame. This saves a lot of reaching for the press when operating.

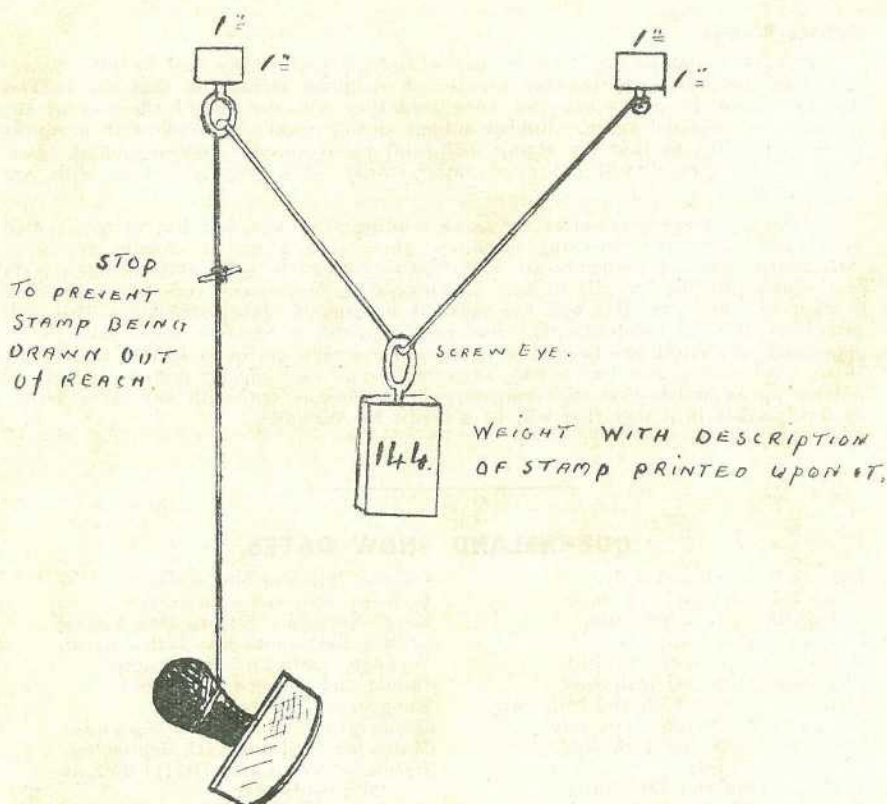


PLATE 38 (Fig. 10).—METHOD OF ATTACHING RUBBER STAMPS TO HANG OVER PACKING BENCHES.

Stencils.

Stencils are another necessity in the packing house, a grower needing sets of stencils for all varieties of fruit, sizes, and packing counts used; also a stencil plate with his name and full address as follows:—

J. SMITH,
Stanthorpe,
Queensland,
Australia.

This is necessary when a grower is going to export. A spare sheet of light gauge zinc, out of which stencils can be cut with a pocket knife, is a handy standby for emergencies.

A good inkpot to use for stenciling is easily made out of the bottom of a kerosene tin and a handful of cotton waste, a block of stencil ink, and the necessary water to saturate it without having any surplus. A block of stencil ink used this way, will go many times as far as when used on a board as is the general practice.

Paste for Labels.

Growers using labels will find that ordinary flour paste is quite satisfactory for attaching labels. The addition of a small quantity of alum or bluestone will assist in keeping the paste indefinitely. Care should be taken to keep paste with bluestone added in enamel or porcelain containers only, as bluestone will soon corrode tinware.

Rubber Stamps.

If rubber stamps are used instead of stencil plates they can be placed over the sizing machines and packing benches on weighted strings, so that the packers will have them in easy reach and when used they will rise out of the way of the packer until required again. Rubber stamps should always be made with a convex face (Fig. 10), so that the stamp will print easily on the wooden end of cases. If made flat stamps will not print satisfactorily when slightly uneven ends are encountered.

Other necessary accessories for those sending fruit where it has to be handled more than once are wire-tying machines which save a lot of damage to cases. Corrugated case-end fasteners are also useful, repairs to split ends being quickly and neatly effected by this means. A time-saving implement for those who have a trade in small case lots and use tacks is a magazine label attacher. This will attach a label in one-tenth the time required with a hammer and tacks. The accessories described are necessary to all growers who desire to handle their fruit in as quick and economical a way as possible, and they should materially help in putting up an article that will compete, both inside and out, with any other article on any market in a way that will be a credit to Australia.

QUEENSLAND SHOW DATES.

Kilecy: 2nd and 3rd July.	Cairns: 29th and 30th July.
Home Hill: 3rd and 4th July.	Maleny: 29th and 30th July.
Townsville: 7th to 9th July.	Royal National: 10th to 15th August.
Gatton: 8th and 9th July.	Crow's Nest: 26th and 27th August.
Woodford: 9th and 10th July.	Wynnum: 28th and 29th August.
Cleveland: 10th and 11th July.	Imbil: 2nd and 3rd September.
Charters Towers: 15th and 16th July.	Enoggera: 12th September.
Caboolture: 16th and 17th July.	Beenleigh: 18th and 19th September.
Rosewood: 17th and 18th July.	Malanda: 23rd and 24th September.
Ithaca: 18th July.	Brisbane River Camp Draft: 25th and 26th September.
Laidley: 22nd and 23rd July.	Rocklea: 26th September.
Nambour: 22nd and 23rd July.	Kenilworth: 26th September.
Esk: 24th and 25th July.	Southport: 3rd October.
Ayr: 24th and 25th July.	Nerang: 9th October.
Mount Gravatt: 25th July.	Evelyn Tableland: 9th and 10th October.
Bowen: 29th and 30th July.	

PISE' CONSTRUCTION OF FARM BUILDINGS.

By Officers of the Department of Agriculture.

IN many country districts, especially when far removed from the railway, it is difficult, and often very expensive, to obtain usual building materials, such as bricks, cement, iron, and even sawn timber. In such cases it is useful to know how to utilise to advantage a material that can be found almost anywhere, and which costs nothing except the necessary labour to procure it. Earth can be used in several ways for walls, and if properly manipulated generally affords satisfaction. One method of using earth, adopted largely in Mexico and South American States, is that known as Adobe (pronounced doby), which is really nothing more than sun-dried bricks, or blocks made of earth and clay and allowed to remain before use a sufficient time for them to become thoroughly hard. This material has been used in that form for hundreds of years in the countries named, and buildings still exist in good order after 200 years' exposure to the elements. There is, however, more labour in handling Adobe than in the more modern method of pisé construction. In the latter case one handling is sufficient, as there is no waiting for the bricks to dry before using in the wall, pisé being built *in situ*; drying is not therefore necessary. But even when using pisé it is an advantage to have a few blocks of Adobe handy for use in difficult positions, such as corners, fireplace openings, &c. Another useful method is known as Pug, or a mixture of chopped straw and mud, or, in some cases, long straw or grass may be used, thoroughly mixed with well-wetted earth in a hole in the ground; for mixing, a long fork or hoe is used, but if on a large scale, horse or some mechanical power should be available. No special appliances are required for this method of construction, as the material, after preparation, is simply laid on in successive layers about 12 in. or 18 in. thick, keeping them as upright and true as possible. The walls are then trimmed down by the spade or other suitable tools, and made all of one thickness and perfectly true and perpendicular. As the material is put together in a fairly wet condition, there is a certain amount of shrinkage, but it consolidates into a very hard mass and becomes very durable—warm in winter and cool in summer. The general wallwork can be done with unskilled labour, with proper supervision, but a skilled tradesman is necessary to cut out or trim up openings for doors and windows, and to keep the angles plumb. Very good and durable buildings can be erected on this system in the back country.

Ant-bed should prove an excellent material in districts where it is available in any quantity.

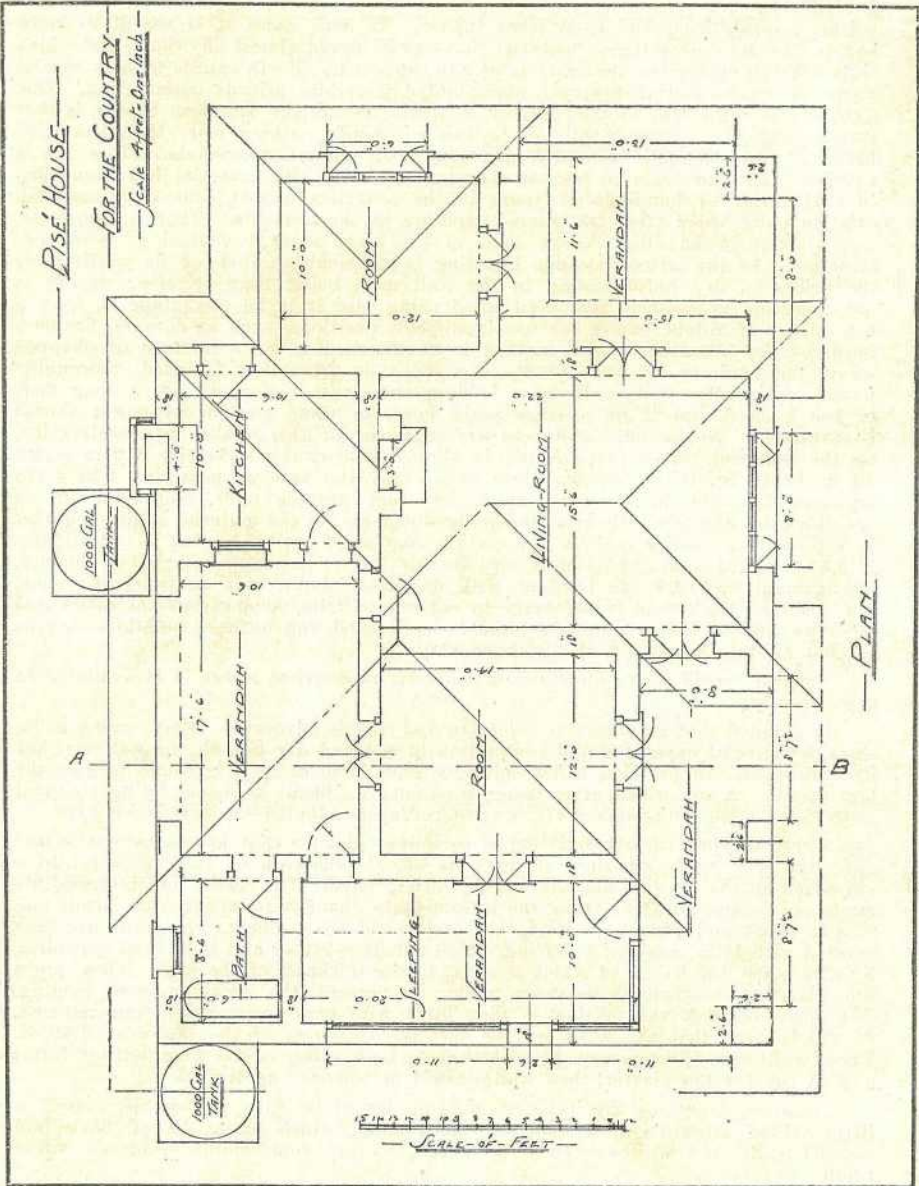
It is noted that an admixture of earth and clay is advocated. Clay, owing to its characteristics of expansion and contraction in wet and dry periods, respectively, has its drawbacks. In practice, a fine soil, free from sand or clay, is found to give the best results. A soil which, after being dried out, is difficult to reduce by agricultural methods to a fine tilth—unless crushing or rolling is adopted—is a desirable type.

Another type of earth building is somewhat akin to that known as wattle and dab, but very much superior. It consists of a framework of saplings set into a sill adzed on the top side and laid on the level ground. The corner and intermediate studs are framed into the sides, the intermediate about 3 ft. apart, with heads and sills to doors and windows. Both the outside and the inside of the studs are then covered with 1½-in. mesh wire netting, which is held together and kept from spreading by wire loops, the length of which is equal to the thickness of the wall. These loops are placed at sufficient distances apart to prevent the netting from bulging. The space between the netting is then filled with very moist earth and rammed. It will be seen that the walls will be just the thickness of the saplings or studs. These walls can, if necessary, be plastered on both sides, as the wire netting forms a good key for the plaster, then whitewashed or coloured as desired.

In some situations this type of building would be very serviceable, and if a little skilled attention were paid to the roofing, which might be of bark laid symmetrically and whitewashed or coloured, a very comfortable residence would result.

The type of structure, however, to which attention is specially directed, and to which the following specification refers, is that known as pisé, which combines all the good qualities of the others and may be erected by any person in the bush who is handy with tools and can use the level and plumb bob.

The accompanying drawings are intended to illustrate a house of this character, and, in order that the process of building same may be thoroughly understood, the specification is written in plain language, avoiding technicalities as far as possible.



Where heavy rains are experienced, a modification of the roof system may be desirable, in order to give the walls greater protection from the elements. The bungalow-type of roof, with wide, overhanging eaves, lends itself excellently to pisé construction.

Plant and Materials.

Before commencing operations, the builder should provide himself with moulds for the walls, rammers, and other necessary articles, as he cannot perform good and durable work without them. The plant required will depend on the number of men employed, and, as three is the minimum number to perform the work economically, the following will be necessary:—A horse and dray or some other means of transporting the material to the building, two wooden rammers, two plasterers' wood floats, two straight boxes or moulds, two angle boxes, some short lengths of light wood for blocking up the ends of boxes, a supply of sawn scantling of different sizes, some $\frac{3}{4}$ -in. bolts, nuts and washers, gauge rods, shovels, spades, a watering can, buckets, tank or barrel for water, and some other articles which will be necessary as the work proceeds.

Foundations.

After collecting the plant and fixing the site, the first thing to do is to prepare the foundations. To do this the building must be accurately set out and the correct position and thickness of all walls pegged out, the pegs being put in about 3 ft. outside the intersection of walls, so that they are not disturbed when excavating the footings. It may be well to point out that, in setting out buildings perfectly square with walls at right angles, a good-sized square is necessary, which can be easily made by anyone out of long battens or flooring boards. The correct angle is assured by measuring one side 6 ft., the other side 8 ft., with the hypotenuse or diagonal between the above points exactly 10 ft., or any multiple of the same.

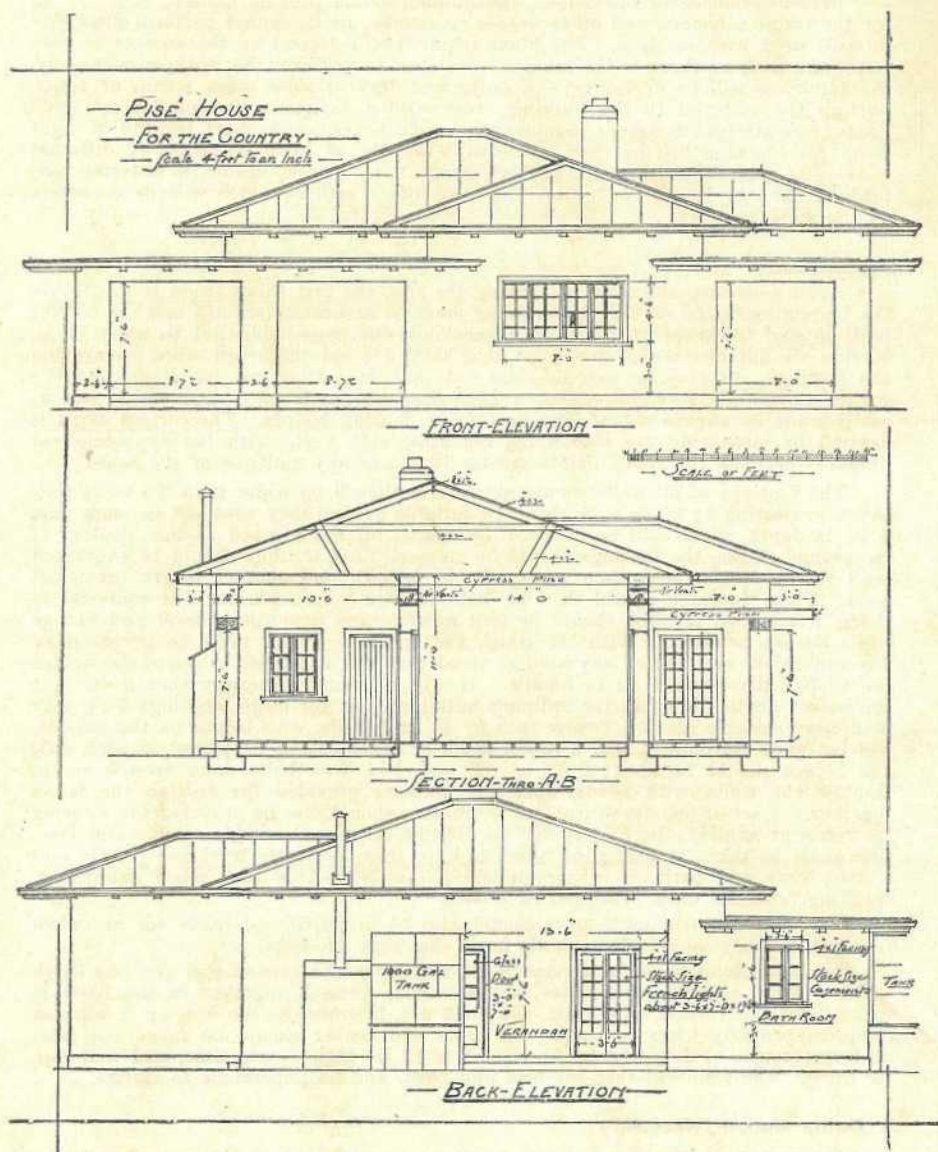
The footings of all walls should not be less than 9 in. wider than the walls they carry, projecting $4\frac{1}{2}$ in. on each side. In suitable ground they need not be more than 4 in. in depth, which will be obtained by taking off the top sod to that depth. If the ground slopes, the footings should be stepped; that is, they should be excavated level for short distances, then a step should be left, and another length taken out level. These footings should then be well watered before placing any material in them; when filled in, they should be well rammed and made quite level and flat on top. Before proceeding with the walls, the boxes or mould must be prepared of any convenient size and of any kind of wood that will not twist or warp, the lighter the timber the easier it is to handle. It will be found generally that 2 ft. is a convenient depth for boxes for ordinary buildings, but for large buildings 3 ft. may be a more suitable depth. Twelve inch by $1\frac{1}{2}$ in. boards, with ledges on the outside, will be found convenient, and a broad ledge or brace should be placed at each end. The ledges should be about 2 ft. apart, and $\frac{1}{2}$ -in. iron bolts, long enough to go through the walls, with heads, nuts and washers provided for bolting the boxes together. A set of one dozen iron angle-brackets should also be provided for securing the boxes at angles, otherwise it will be difficult to keep the angles plumb and true. Care must be taken in fixing the boxes to have them perfectly level and plumb, and a little time and patience in accomplishing this will often save much annoyance, resulting from the walls being out of plumb.

The door and window frames should also be prepared and ready for use when required, as they should all be built in as the work proceeds.

The next thing to do is to remove the turf from the ground and give the earth a fairly good soaking with water, so that when pressed together in the hand it will adhere and form a solid mass. It must not, however, be too wet, or it will not compress properly when rammed. All roots and timber should be taken out, also all large stones. Fill in the boxes from 6 to 12 in. high at one time, and well ram the same. The wall will then set firm and hard, and be impervious to storms.

A Damp Course Necessary.

The provisions of a damp course must not be neglected, as the ground moisture will gradually rise by capillary attraction, and cause discomfort in the rooms. This will probably not be noticed for a long time after completion, but as the earth is always more or less damp, sooner or later, unless prevented by some means, its effects will be seen and felt. In brick and stone buildings special damp-proof courses are built in, just below the ground floor level; and in pisé construction a good damp course may be formed by building in the wall, for its whole width, just above the ground line, a sheet of malthoid (1 ply), which will be thoroughly effective. This should be carried through all door and french light openings, and lapped 6 in. at joints.



General Specifications.

All door and window openings should be boxed up carefully as near as possible to the finished sizes, so that little or no patching up will be required.

Cypress pine plugs should be built in all door and window jambs, heads and sills, as shown on detail drawings. These are necessary for securing frames and linings, and to a large extent will make subsequent plugging unnecessary.

All openings should have good Cypress pine lintels, having at least 1 ft. bearing on the walls at each end, those over verandah openings to be whole logs adzed on the underside, resting 18 in. on the wall at each end, each face of the same to have stout nails driven in a few inches apart, which will form a key for a plaster cover. The faces of these lintels may be lined with Cypress pine, or they may be covered with cement compo, or lime plaster with a small quantity of cow's hair mixed in same; the nails before mentioned will form a key to hold it to the timber, and, when floated off with a wood float and finished with the pisé wall, will be durable and effective.

In districts where cement can be conveniently obtained, the heads and sills of ordinary openings could be made of cement concrete in the proportion of six parts gravel, containing a good proportion of sand, and one part of cement. These could be reinforced and made very strong by inserting in same a few strands of barbed wire turned over at the ends so as to prevent them drawing out.

The fireplace should be faced with brick or concrete, the hearth laid with cement, and the chimney built either of brickwork with a 9-in. flue or of concrete with a 9-in. drain pipe built in for the flue, finished on top with a flue pipe projecting about 6 in. above a bevelled cap.

All the pisé walls—both sides—should be lightly sprinkled with water and worked over with the wood float, using screeds where any straightening is required.

The top plates should be secured in position on the walls, as shown in detail drawing.

Openings to be left in all walls for ventilation just below the ceiling line, by building in boxes specially prepared and of suitable sizes, ventilators to be not less than 2 ft. 6 in. by 1 ft. 6 in., and to be placed generally over doors and windows.

Build in woodplugs 4 in. by 2 in. and the thickness of the walls at intervals of 3 ft. for securing skirtings, dados, picture rails, architraves, &c.

CARPENTER AND JOINER.

Joists to be of 5 in. by 2 in. Cypress pine resting on 4 in. by 2 in. plates on the walls and on piers where the bearing exceeds 10 ft. Joists to be spaced 18 in. apart, centre to centre; verandah floors to be laid with a fall outwards of 1½ in. where exposed to the weather.

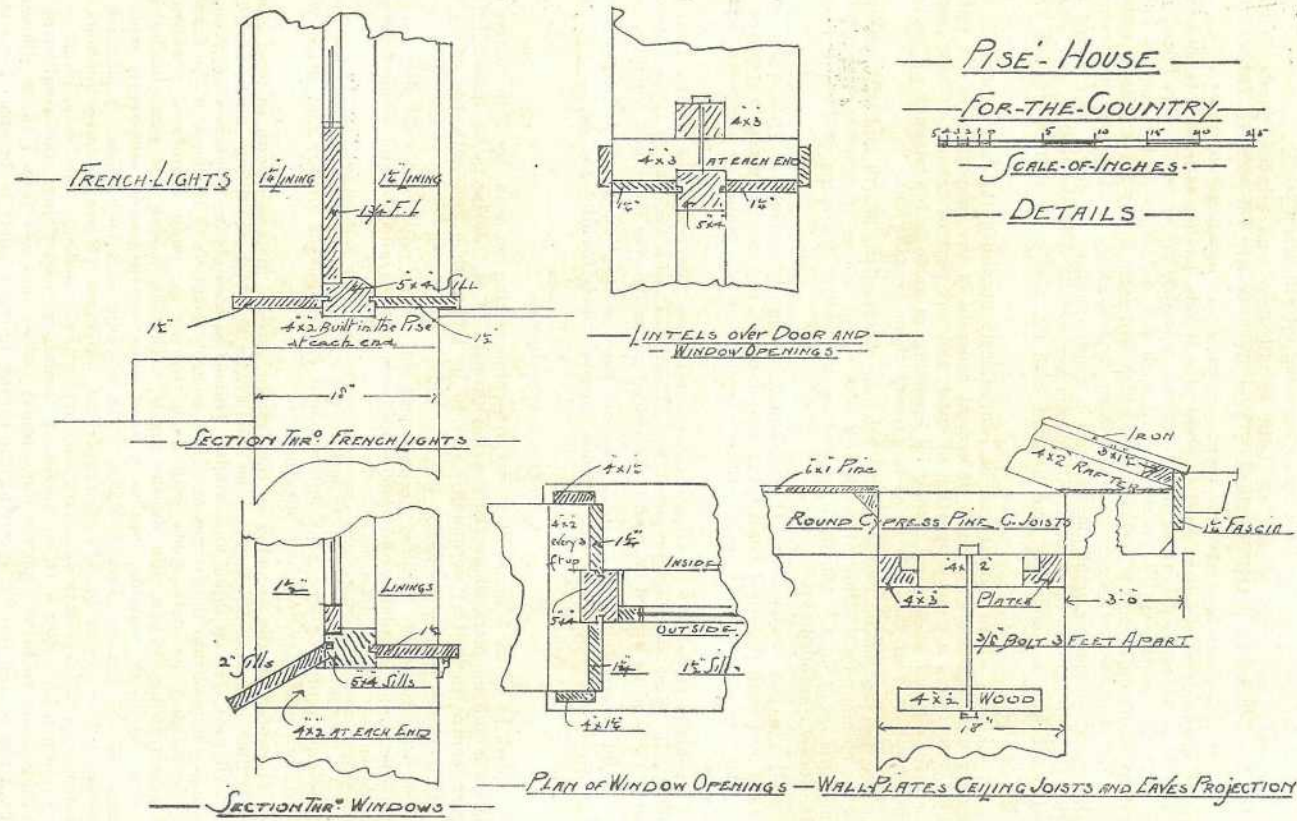
Provide ready for building in, and mark the correct position for all plugs, stays, and braces, also all plates, and provide and carefully fix all door and window frames as shown on detail drawing.

All door and french light frames to be 5 in. by 4 in. solid Cypress pine, with heads and weathered and sunk sills grooved for tongue of linings and fitted with stops, &c., necessary for door hanging.

If preferred, the grooving in the frames may be dispensed with in most cases, and a fillet nailed on the back of the solid frame to which the lining can be nailed.

All door, french light, and window frames to have 1½-in. Cypress pine wrought linings, tongued into the frames or nailed securely to fillets at the back of the frames, to be finished on both sides with 4 in. by 1½ in. plain chamfered architrave. Windows to have 1½-in. sills on the inside, with 2-in. nosing and scotia under and a 2-in. sill on the outside, laid to a bevel with returned ends, sufficiently wide to carry the architrave. French lights to have 1½-in. sills both sides, in addition to the solid 5 in. by 4 in. sill of the frame. Window frames to have mullions, as shown, with all necessary stops for casements. Four inch by 2 in. wood plugs to be built into walls every 3 ft. in height of opening to nail linings and architraves to. Ceiling joists to be of Cypress pine, round timber, not less than 7 in. in diameter, adzed flat on the top for receiving the ceiling linings; joists to be spaced not more than 3 ft. centres, and to be notched into wallplates, and extend 3 ft. over the face of wall, the ends of same to be cut off true to line for fascia board, and cut slightly back below the fascia.

Ceiling joists of verandahs to be similar to the above, trimmed into each other where necessary, and spaced not more than 3 ft. apart, centre to centre.



Rafters, collars, and braces to be 4 in. by 2 in. sawn Cypress, spaced to suit the ceiling joists, bevel cut where necessary, and securely nailed. Ridge to be 8 in. by 1½ in., eaves fascia dressed 7 in. by 1½ in., battens 3 in. by 1½ in., spaced so as to have not less than three battens under every sheet. Batten up valleys and hips with an extra thickness at eaves.

Lay all floors with 6 in. x 1 in. grooved-and-tongued Cypress pine flooring, well cramped up, and nailed with two nails to each joist and dressed off at completion.

Ceilings and soffits of eaves to be lined on top of ceiling joists with 6 in. by 1 in. t. and g. Cypress pine, with scotias and fillets at all angles.

Build in walls plugs for nailing skirtings, chair rails, picture rails, &c., at suitable distances apart, plugs to be of such size as to be completely covered by the timber work to which they are nailed.

Fix round inside walls of all rooms 6 in. by 1 in. chamfered skirting, scribed to the floor and to architraves.

Fix 4 in. by 1½ in. chair rail, chamfered on edge, round the walls of living room, bedrooms and kitchen, and 2 in. by 1½ in. pictures rail round the same rooms.

Build the stove recess in kitchen, as shown on drawings, with 3 in. by 2 in. studs, lined with iron on the outside, and finished as shown, with cement hearth. Two small lights to be built in recess, fitted with 1½ in. rebated frames with 16 oz. sheet glass, and hung on pivots with cords for opening same and suitable fasteners.

Frame for outside wall of sleeping verandah with 4 in. by 3 in. studs on a 4 in. by 2 in. bottom sill and capping piece, with a 6 in. by 2 in. weathered and throated sill projecting 2 in. from the face of the wall, and a 4 in. by 2 in. top plate. Studs and mullions to run through from bottom to top, and checked into head. Panels below openings to be filled in, either with 4 in. by 1 in. g. and t. Cypress pine or with fibro-cement sheeting ¼ in. thick, and secured in position with fillet on both sides.

Fix 12 in. by 1½ in. mantel shelf and jambs to kitchen fireplace, and a pine mantel and jambs to the living room.

Fix 50 ft. super of 12 in. by 1 in. shelves in kitchen, on brackets properly secured to wall plugs.

Provide and fix tank-stands, where shown, with hardwood or Cypress pine stumps, and hardwood joists, and 6 in. by 1½ in. sheeting.

French lights to be 3 ft. 6 in. by 7 ft. by 1½ in. pine with moulded and rebated bars 1 in. thick, double hung with 4 in. butts, and fitted with two bolts on the inside, and rebated mortise locks with brass or oak furniture.

Doors in kitchen to be 1½ in., framed and ledged and filled in with 1 in. g. t. and v.-jointed pine, hung with 4 in. butts and fitted with 6 in. rim locks with brass furniture.

Door from living room to back verandah to be 1½ in. framed with moulded, rebated and glazed panels hung with 4-in butts and fitted with rim lock as before.

Other doors to be 1½ in. four panelled pine, hung as before, and fitted with 6 in. rim locks with brass furniture.

All windows throughout to have 1½ in. pine casements with moulded and rebated bars 1 in. thick, glazed with 16 oz. sheet glass, well sprigged, puttied and back puttied, hung with 3 in. butts and fitted with bronze casement fasteners and 4 in. bolts. All casements, where possible, to be hung to open outwards.

All doors and windows throughout to be fitted with stops the necessary widths and thickness required.

Fix bronze hooks in suitable position for fastening back french lights and doors.

Fix in each room over door and window openings lattice work ventilators made with openings 1 in. square, 2 ft. 6 in. by 1 ft. 6 in., and provide all necessary stops and linings to same.

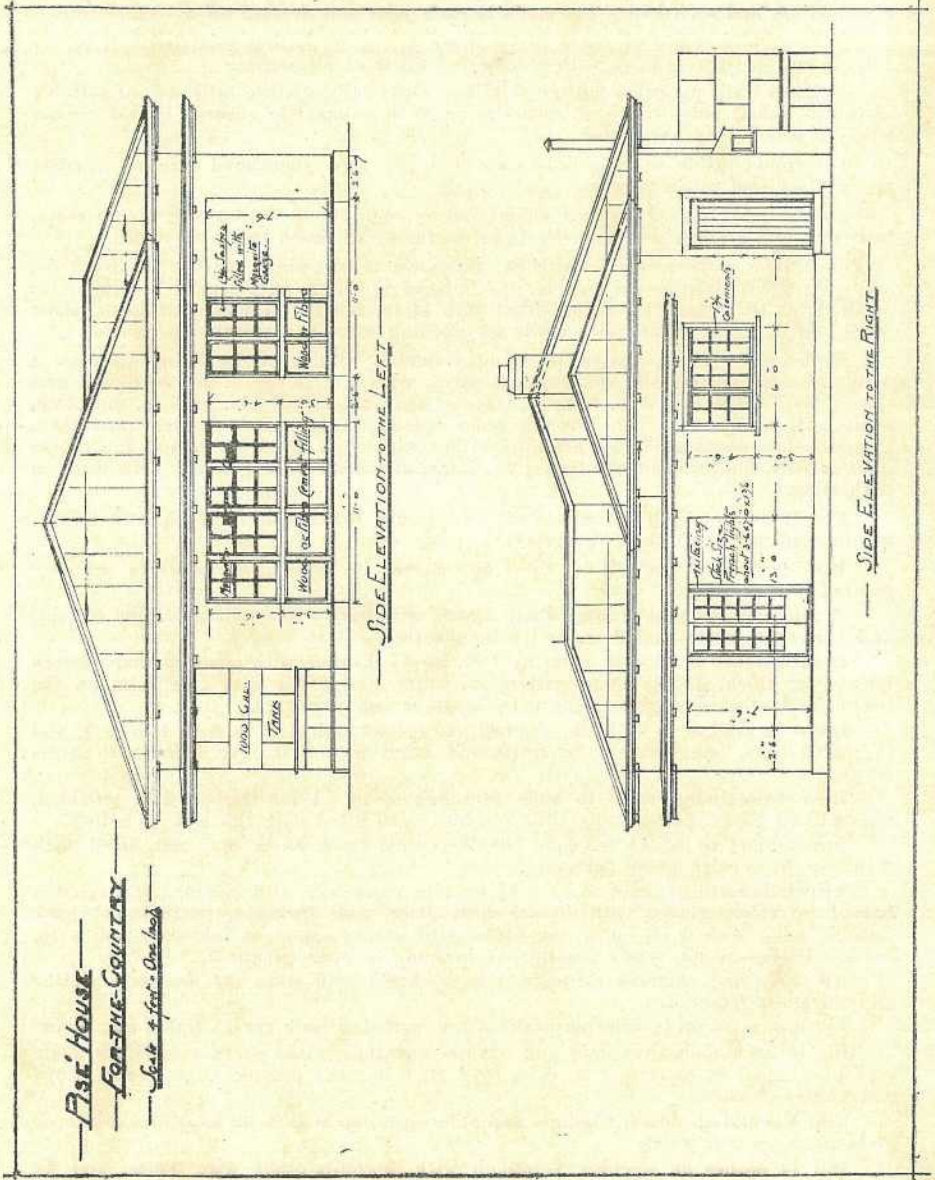
Finish round all doors, windows and other openings with 4 in. by 1 in. chamfered architraves on both sides.

Fill in sashes on sleeping verandah with mosquito-proof wire gauze, and fix same with stops on both sides, well secured.

These sashes may be made with bars 1 in. thick, moulded on the outside, but left flush at the backs, so that the mosquito-proof gauze will pass over the bars and be secured with a stop planted on the back.

Provide and fix, where pointed out, one dozen bronze hat and coat hooks on 5 in. by 1 in. chamfered rails, and provide and fix in kitchen one dozen cup hooks.

Do all the work necessary to complete this branch in a satisfactory manner.



PLUMBER.

Roof of verandahs to be covered with 2-ply malthoid, laid as instructed by the selling agents, on close boarding provided and fixed by the carpenter, turned up against walls, properly flashed, and joints cemented as instructed by agents, to be left perfectly sound, weatherproof, and satisfactory.

Five inch by 4 in. galvanised-iron spouting to be fixed to all eaves, on brackets as required, with soldered points, stop ends and angles. Water to be conducted to the tanks with all necessary 3 in. down pipes.

Other roofs than the above to be covered with 26-gauge galvanised iron, approved brand, laid with 1½ in. corrugation at sides and 6 in. at ends. Valleys to be laid as shown, with 24-gauge plain iron; cover hips and ridges with 24-gauge 16 in. wide, lead-headed nails to be used throughout.

Provide and fix two 1,000-gallon tanks, with mosquito-proof hoppers and frog-proof overflows, fitted with cleansing plugs and lever taps.

Provide and fix a 5 ft. 6 in. galvanised-iron corrugated bath, with waste plug and chain. Connect a 2½ in. waste pipe to same, and convey it to a suitable position outside to be approved.

Provide and fix over same shower bucket with rose and lever tap cords, pulleys and block for hoisting and lowering.

Cover inside walls of bathroom up to a height of 5 ft. with small corrugated galvanised-iron sheeting, with roll on top.

Provide and fix a stove in kitchen, value £ net cost; fix stove piping, and carry up same above roof, flashed where necessary.

PAINTER.

Knot, stop, rub down and properly prepare all wood and iron work for painting which is usually painted, such as eaves, gutters, down pipes, fascias, outside doors, and windows. All the above woodwork to be painted three coats approved colours with approved linseed oil and white lead, ironwork to have two coats only.

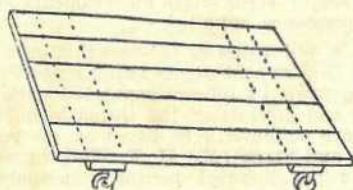
Inside doors and windows, skirtings, picture rails, chair rails, &c., to have two coats of best approved varnish.

All outside walls to be twice coated with limewash containing half a pint of raw linseed oil to each gallon, and inside walls to be coated with limewash as above, but coloured by the addition of any suitable dry colours.

For a better painting job, a coating of the exterior walls with boiled oil in which pigments of the desired shade of colour have been mixed, is advised. The boiled oil forms a distinct skin, which in itself is a protection. Inside walls may be coloured with cold-water paints, of which many beautiful shades are on the market.

DOLLY FOR THE SHED.

When any great number of bales of produce have to be moved, it becomes a heavy and tiresome job. To render some of this work easier, a dolly, as shown in the sketch, can easily be constructed from odds and ends. Build a small plank platform of boards, say the length of the general run of bales to be moved, and



cleat them solidly from underneath with stout boards. Fasten four roller-bearing castors, one near the end of each cleat. Wheels from a pair of old roller skates will answer the purpose equally well.—'New Zealand Farmer.'

THE BUFFALO FLY.

MINISTERIAL STATEMENT.

The Deputy Premier (Mr. R. M. King), in referring recently to the official announcement of the Federal Government on the Buffalo Fly menace, disclaimed any knowledge of a statement made by the Queensland Government that the existence of the fly had been ignored by the Commonwealth authorities prior to 1930.

The Queensland Government, apprehending the danger of the introduction of the fly into this State from territory under the jurisdiction of the Commonwealth Government, requested that Government, as far back as 1927, to make every effort to bring the pest under control and prevent its extension into Queensland. Efforts made, if any, were obviously futile, and the pest spread into this State and was located in the extreme north-western corner in 1928.

Had the Commonwealth Government, when appealed to in 1927, taken action to create a buffer area within their territory, as was suggested by the Queensland authorities, the progress of the fly to the border would probably have been stopped, and the present unfortunate position, so far as it affects this State, would not have arisen.

A Queensland Quarantine.

The suggestion that the Queensland authorities are inactive in dealing with the menace was scouted by the Acting Premier. Quarantine restrictions were imposed within the infested or suspected area in 1929. This area approximated 6,000 square miles, not 60,000 square miles as appears in the statement of the Federal Government. From time to time since the establishment of this quarantine area, the State Government has made efforts to secure the co-operation of the Commonwealth Government in any definite measures which could be taken to control the pest, but without result.

Co-operation with the Commonwealth.

Mr. Moore stated that his Government was quite prepared to co-operate with the Commonwealth in any measures taken to arrest the progress of the fly, but apparently the Commonwealth Government was not anxious to definitely co-operate in any scheme which provided for the establishment of buffer areas or the evacuation of infested territory in this State.

A passage from Dr. Gilruth's conclusions, to the effect that "known means of coping with the pest are mostly futile and all quite impractical in Australia's infested area" is illuminating. Apparently in his opinion the utilisation of the services of a natural enemy, which it is assumed is the alternative, would only result in the diminution of the numbers of the pest. If these conclusions are correct the State Government would certainly not be justified in expending an enormous amount of money on the attempted control of this pest without reviewing the matter from every angle in the light of experience gained elsewhere.

Why, continued Mr. King, should Queensland be called upon to bear this expense when the source of the trouble emanated from Commonwealth territory, and should, therefore, be dealt with as a national matter.

A point was made of the fact that in 1924 the State Government declined to co-operate with the Commonwealth Government to the extent of £1,000 on a £1 for £1 basis to carry out investigations into the pest. At this period the fly was some hundreds of miles from the Queensland border, and only the Commonwealth and West Australian Governments were directly interested.

When Queensland was desperately fighting to prevent an extension of the tick pest and expended large sums of money in doing so, no suggestion was made that the Commonwealth Government or other State Governments should come to the rescue, nor was any financial assistance supplied.

The Prime Minister is well aware of the fact that both the Commonwealth Government and the Queensland Government are awaiting reports on a survey of the infested area, which is now being made by officers connected with the Council for Scientific and Industrial Research and officials of the Queensland Department of Agriculture and Stock, and that future action will be based on the results of this survey. The Minister for Agriculture and Stock (Mr. H. F. Walker), realising the importance of this problem, is now in the infested territory, accompanied by officials of his Department, as he is desirous of securing first-hand information which could be placed at the disposal of the Government.

The allegation that press propaganda had been indulged in for the purpose of attempting to place the blame for the Buffalo Fly position on the Federal Government was referred to by Mr. King as not worthy of serious comment.

The position is plain to all who are vitally interested in the menace, which in its extension from Federal territory to other portions of the Commonwealth now presents a national problem of vital interest to the whole of Australia.

Referring to the allegation that no reply was sent by the Premier to the Commonwealth Government's offer in its letter of 3rd April to negotiate as to the proportion of the expenses it would be equitable to charge to that Government, Mr. King pointed out that on the 18th April the Premier, in a telegram to the Prime Minister, offered to confer with the Minister for Home Affairs either in Sydney or Melbourne while he was in the South attending a meeting of the Loan Council the following week. Although Mr. Moore made every endeavour to arrange a meeting with one of the Federal Ministers on the matter, he met with no success in securing the desired conference.

BLACKLEG.

LIKE anthrax, blackleg is a stationary infective disease confined to certain pastures or districts. It is spread more or less over all the world, preferring damp marshy soils, also in hilly country. Like anthrax it is a spore-bearing bacillus, but it is anaerobic (that is just the opposite to anthrax). It lives and thrives only where free oxygen is excluded. The germ enters the system by minute cuts on the surface of the body, probably through the alimentary tract. As a rule, only cattle between the ages of three months and two years are attacked, such attacks being very exceptional with older cattle. The disease also sometimes attacks sheep, and sheep of any age may become affected. One attack, if followed by recovery, confers absolute immunity to the disease. It seems that most other domestic animals and man are immune. The flesh of cattle affected with blackleg can be consumed by man, dog, or pig without ill effects. Such is not so with anthrax.

Symptoms.

The course is very rapid; death occurs in one and a-half to three days. The disease is characterised by a rapidly increasing swelling of the skin tissue, &c. (which crackles on being touched), high temperature, lameness, &c.

The swelling of quarter ill (in rare cases it does not occur) may appear on different parts of the body. It is chiefly confined to one or more of the great muscular masses (rump, shoulder, neck). It never appears below the knee or hock. The swelling is at first small and painful, it rapidly enlarges to an enormous size, crackles and gurgles when the hand is rubbed over it, and feels as if the tissue is full of air. The central part of the swelling becomes cold, dried up, and dead looking. If cut into with a knife it is painless, and a dark and frothy fluid runs away and smells like rancid tallow. The lymph glands in the neighbourhood are greatly swollen and can be easily felt under the skin. The animal shows all the general symptoms of a sick animal—its appetite is dull, breathing is rapid, &c., lameness is present if a limb is affected, and is usually excessive, and at first sight one concludes that the animal has a broken leg. There is great lameness and stiffness and the limb is dragged.

Post Mortem.

The skin covering the swellings of quarter ill changes to a dry condition of gangrene. The subcutaneous tissue is infiltrated with blood and contains gas bubbles, which escape if the tumour is cut. The muscles beneath are dirty brown, blackish dark red, or dark yellow. They are friable and rich in fluid, and if cut the greasy, frothy, tarry blood runs away and has a rancid smell. The lymph glands of the part are swollen and full of watery blood, and the spores and bacilli are abundantly present. Other parts of the system may appear normal or may show hæmorrhage into the tissue; the spleen is normal; the blood generally appears normal and readily clots.

Treatment.

In the majority of cases the animal is either dead or too far gone when discovered. In any case as a general principle treating the affected animal is useless, being expensive and in most cases unavailing. The proper thing to do in this twentieth century of modern medicine is not to cure disease, but to prevent it. The way to prevent disease is by using "Blackleg Aggressin" and other medicine specially made for the same purpose. This Blackleg Aggressin is prepared in Australia wholly with Australian industry; every particle from the microbes, calves, boxes, labels, &c., are made in Australia. The Aggressin is prepared in two forms—viz., (1) liquid form, (2) solid form. Both are highly efficient, as also are other vaccines made with the same object, and equally successful in their results.

AGRICULTURE ON THE AIR.**RADIO LECTURES ON RURAL SUBJECTS.**

ARRANGEMENTS have been completed with the Australian Broadcasting Company for the regular delivery of radio lectures from Station 4QG, Brisbane, by officers of the Department of Agriculture and Stock.

On Tuesdays and Thursdays of each week, as from 23rd July, a fifteen minutes' talk, commencing at 7.30 p.m., will be given on subjects of especial interest to farmers.

Following is the full list of lectures already arranged, and readers will observe the comprehensive field in the science and practice of agriculture, animal husbandry, and rural economics covered by the subjects chosen:—

SCHEDULE OF LECTURES

BY OFFICERS OF THE DEPARTMENT OF AGRICULTURE AND STOCK.
RADIO STATION 4QG, BRISBANE (AUSTRALIAN BROADCASTING COMPANY).

- Thursday, 23rd July, 1931—"Agriculture—Ancient and Modern." J. F. F. Reid, Editor, "Queensland Agricultural Journal."
- Tuesday, 28th July, 1931—"The Importance of Dairying." C. F. McGrath, Supervisor of Dairying.
- Thursday, 30th July, 1931—"Irish Blight of Tomatoes and Potatoes." R. B. Morwood, M.Sc., Assistant Plant Pathologist.
- Tuesday, 4th August, 1931—"Citrus Melanose." L. F. Mandelson, B.Sc., Assistant Plant Pathologist.
- Thursday, 6th August, 1931—"Harvesting and Marketing Queensland Citrus Crop." J. Gregory, Instructor in Fruit Packing.
- Tuesday, 11th August, 1931—"Brisbane Ram Sales and the Sheep and Wool Show Exhibit." J. Carew, Senior Instructor in Sheep and Wool.
- Tuesday, 18th August, 1931—"Wattles or Acacias." C. T. White, Government Botanist.
- Thursday, 20th August, 1931—"The World's Breakfast Bacon." E. J. Shelton, H.D.A., Senior Instructor in Pig Raising.
- Tuesday, 25th August, 1931—"Marketing Eggs." P. Rumball, Poultry Expert.
- Thursday, 27th August, 1931—"Tuberculosis in Farm Animals." C. J. Pound, Government Bacteriologist.
- Tuesday, 1st September, 1931—"Economic Entomology." Robert Veitch, B.Sc., Chief Entomologist.
- Thursday, 3rd September, 1931—"Cane Cultivation." Dr. H. W. Kerr, M.Sc., Ph.D., Sugar Soil Chemist.
- Tuesday, 8th September, 1931—"The Outlook for the Pastoral Industry." J. L. Hodge, Instructor in Sheep and Wool.
- Thursday, 10th September, 1931—"Buffalo Fly." F. H. S. Roberts, M.Sc., Entomologist.
- Tuesday, 15th September, 1931—"Orchards and Fruit Gardens." W. J. Ross, Senior Instructor in Fruit Culture.
- Thursday, 17th September, 1931—"Meat Hygiene—Its History and Development." H. G. Cheeseman, Senior Slaughtering Inspector.
- Tuesday, 22nd September, 1931—"Sugar Cane Diseases." A. F. Bell, Plant Pathologist.
- Thursday, 24th September, 1931—"The Preparation and Use of Vaccine in the Treatment of Contagious Mammitis in Dairy Cows." St. G. Thorn, Assistant Bacteriologist.
- Tuesday, 29th September, 1931—"Travelling Stock by Road, Rail, and Sea." W. C. Carmody, District Inspector of Stock.
- Thursday, 1st October, 1931—"Cut Worms and Army Worms." J. A. Weddell, Assistant Entomologist.
- Tuesday, 6th October, 1931—"Flag Smut of Wheat." R. B. Morwood, M.Sc., Assistant Plant Pathologist.
- Thursday, 8th October, 1931—"The Care of Growing Poultry." J. J. McLachlan, Poultry Inspector.
- Tuesday, 13th October, 1931—"A Poultry Mite Infesting Dwellings." F. H. S. Roberts, M.Sc., Entomologist.

- Thursday, 15th October, 1931—"Red Stripe or Top Rot in Sugar Cane." W. Cottrell Dormer, B.Sc.Agric., Assistant Pathologist.
- Tuesday, 20th October, 1931—"Cotton Cultivation." R. W. Peters, Cotton Experimentalist.
- Thursday, 22nd October, 1931—"Care of Cow after Calving." J. A. Rudd, L.V.Sc., Government Veterinary Surgeon.
- Tuesday, 27th October, 1931—"Plant Growth and Nutrition." H. Barnes, Instructor in Fruit Growing.
- Thursday, 29th October, 1931—"Stock Feeds and Feeding." E. H. Gurney, Senior Analyst.
- Tuesday, 3rd November, 1931—"Queensland's Official Poultry Stud." P. Rumball, Poultry Expert.
- Thursday, 5th November, 1931—"Producer and Consumer in the Pork Products Campaign." E. J. Shelton, H.D.A., Senior Instructor in Pig Raising.
- Tuesday, 10th November, 1931—"Timber Borers in Houses." Robert Veitch, B.Sc., Chief Entomologist.
- Thursday, 12th November, 1931—"Fruit Fly." J. A. Weddell, Assistant Entomologist.
- Tuesday, 17th November, 1931—"Diseases and Insect Pests of Cotton." R. W. Peters, Cotton Experimentalist.
- Thursday, 19th November, 1931—"The Scrubs or Rain Forests of Australia." W. D. Francis, Assistant Botanist.
- Tuesday, 24th November, 1931—"Soft Fruit Packing—Its Troubles and How to Overcome Them." J. Gregory, Instructor in Fruit Packing.
- Thursday, 26th November, 1931—"The Pastoral Industry and Research Work." J. L. Hodge, Instructor in Sheep and Wool.
- Tuesday, 1st December, 1931—"The Value of Bird Life." W. D. Wilson, Ranger, Animals and Birds Acts.
- Thursday, 3rd December, 1931—"The Production of Clean Milk." O. St. J. Kent, B.Sc., Analyst.
- Tuesday, 8th December, 1931—"The Calf—Care in Health and Disease." J. A. Rudd, L.V.Sc., Government Veterinary Surgeon.
- Thursday, 10th December, 1931—"Water Blister of Pineapples." L. F. Mandelson, B.Sc., Assistant Plant Pathologist.
- Tuesday, 15th December, 1931—"Influence of Butter Grading on the Industry." G. H. E. Heers, Senior Grader.
- Thursday, 17th December, 1931—"Cattle Tick Eradication Problems." C. J. Pound, Government Bacteriologist.
- Tuesday, 22nd December, 1931—"The Origin of the Angora Rabbit—Its Wool as an Article of Commerce." J. W. Munro.
- Tuesday, 12th January, 1932—"Propagating Fruit Trees." W. J. Ross, Senior Instructor in Fruit Culture.
- Thursday, 14th January, 1932—"Eucalypts or Gum Trees." C. T. White, Government Botanist.
- Tuesday, 19th January, 1932—"Why Dairy Association Pays Differ." G. B. Gallwey, A.F.I.A., Inspector of Accounts.
- Thursday, 21st January, 1932—"Prospects for Fat Lamb Production in Queensland." J. Carew, Senior Instructor in Sheep and Wool.
- Tuesday, 26th January, 1932—"Fertilization of Sugar Cane." Dr. H. W. Kerr, M.Sc., Ph.D., Sugar Soil Chemist.
- Thursday, 28th January, 1932—"Selection and Origin of New Varieties of Plants." H. Barnes, Instructor in Fruit Culture.
- Tuesday, 2nd February, 1932—"Biological Control of Pests." Robert Veitch, B.Sc., Chief Entomologist.
- Thursday, 4th February, 1932—"Tick Fever and How Protection is Afforded." St. G. Thorn, Assistant Bacteriologist.
- Tuesday, 9th February, 1932—"Malnutrition on Some Sheep Areas in Queensland." J. L. Hodge, Instructor in Sheep and Wool.
- Thursday, 11th February, 1932—"The Culling of Poultry." J. J. McLachlan, Poultry Inspector.
- Tuesday, 16th February, 1932—"Soils and Fertilizers." E. H. Gurney, Senior Analyst.

- Thursday, 18th February, 1932—"Mammitis." J. A. Rudd, L.V.Sc., Government Veterinary Surgeon.
- Tuesday, 23rd February, 1932—"Weather and Climatic Effects on Soils." W. J. Ross, Senior Instructor in Fruit Culture.
- Thursday, 25th February, 1932—"Cotton Classing and Grading." W. G. Wells, Cotton Specialist.
- Tuesday, 1st March, 1932—"Cotton Experimental Work." W. G. Wells, Cotton Specialist.
- Thursday, 3rd March, 1932—"The Farmer and His Market." J. F. F. Reid, Editor, "Queensland Agricultural Journal."
- Tuesday, 8th March, 1932—"The Honey Bee." H. Hacker, Entomologist.
- Thursday, 10th March, 1932—"Eradication of Disease in Pigs." J. A. Rudd, L.V.Sc., Government Veterinary Surgeon.

STRAWBERRY CULTURE.

EXPERIMENTS AT PALMWOODS.

The Director of Fruit Culture, Mr. George Williams, has received the subjoined report (29th May, 1931) from Mr. E. L. Prest, Instructor in Fruit Culture, on the strawberry experimental plot at Palmwoods.

MAIN attention is being concentrated on the Aurie variety. The plants were secured from Montville with a view to obtaining a superior strain to replace those under cultivation generally in the district. They are forming fine plants and all budding freely, and at present appear a very fine nucleus from which to secure a good selection.

Phenomenals, which are gaining popularity in the district, are also under trial; plants were obtained from Buderim and Eudlo. The Buderim plants are large and well formed, giving great promise for suitable selection. Eudlo plants are also looking very well.

In addition to these main varieties a number of other varieties are being tested.

Aird's Variety.—This is an unknown variety secured from Mr. Aird, Woombye.

Cresswell, King Edward, and Wilba, secured from the Lawnton Acclimatisation Gardens, are growing strongly.

Spackman's Seedling.—A very vigorous growing seedling submitted by Messrs. Spackman Brothers should prove of value if it fruits as well as it grows.

Mr. Holland's cross between a Marguerite and Phenomenal is also included. These plants were received very late in the season and are consequently rather backward.

Manurial Trials.

Artificial manuring trials are also being carried out, the fertilizer being donated by A.C.F. and Shirleys Fertilizers Limited. Block A is receiving dressings of Q 5 fertilizer, and block B is receiving dressings of A.C.F. 4.

To date the plot is singularly free from disease. At one period aphids made its appearance, but was effectively checked by an application of Neco Dust. Azurine dustings have been carried out as a preventive against fungi troubles.

TO SUBSCRIBERS—IMPORTANT.

Several subscriptions have been received recently under cover of unsigned letters. Obviously, in the circumstances, it is impossible to send the journal to the subscribers concerned.

It is most important that every subscriber's name and address should be written plainly, preferably in block letters, in order to avoid mistakes in addresses and delay in despatch.

OBITUARY.

The subjoined obituary notices are published with profound regret.

MR. R. G. RIDGWAY.

Mr. R. G. Ridgway, who was well known as the Metropolitan Inspector of Dairies, of the Department of Agriculture and Stock, died suddenly on 12th June. He was 67 years of age. Mr. Ridgway joined the Department in 1905, and throughout his service was attached to the dairy section. Mr. Ridgway was an efficient officer and the deep respect in which he was held by his fellow officers and a wide circle of friends was shown by the large attendance at his graveside. He had one son killed in action in the war, and is survived by his widow and grown-up family.

MR. J. T. TOD.

Knocked down by a motor car at Toowoomba on Thursday night, 11th June, Mr. J. T. Tod, Chairman of the State Wheat Board, died at Toowoomba on the following Monday, without having regained consciousness. Ever the friend and champion of the primary producer, Mr. Tod's passing at the age of 54 is an irreparable loss to the farming community which he so long and faithfully served.

Being a farmer himself no one more fully realised the difficulties with which the man on the land was faced, and with self-sacrificing devotion he set about to try and improve conditions by organised marketing. It will be remembered in this connection that Mr. Tod was a prominent member of the Council of Agriculture when that body was formed.

Born in England of Scottish parentage, the late Mr. Tod came out as a young man to his uncle, Mr. Fred Reid, of Balikera, Maitland district, New South Wales. After undergoing a course of training at Hawkesbury Agricultural College, he selected a block of land on the Goomburra Estate, Darling Downs. There Mr. Tod carried on dairying and wheat-growing, and in both was equally successful. He also secured land at Goondiwindi. Always a lover of high-class dairy stock and a sound judge of quality he did much to assist in the improvement of the dairy herds of his district.

Among his manifold activities he was an energetic and valued member of several marketing boards.

Mr. Tod became a member of the State Wheat Board for the Clifton-Allora district in a by-election in January, 1929, and in August of the same year he was re-elected unopposed. At the usual election in September, 1929, he was elevated to the position of chairman, and was again returned unopposed in September, 1930, when he was reappointed chairman for a period of two years.

Mr. Tod was also closely associated with the manufacturing side of dairying as a director of the Warwick Co-operative Dairy Association, Allora, of which company he was chairman for several terms. He occupied the position of president of the Co-operative Dairy Companies' Association of Queensland for about fifteen years, and was a member of the Australian Stabilisation Committee (Queensland section), and as a delegate from Queensland he frequently took a leading part in important conferences connected with the dairying industry in Australia.

When the Local Producers' Associations were initiated he took a keen interest in their organisation, with the result that prior to the abolition of the district councils he became chairman of the Darling Downs District Council.

The late Mr. Tod married Miss L. Hogarth, third daughter of the late Mr. and Mrs. William Hogarth, of Balgownie. He is survived by his widow, four sons, and three daughters. Mr. Tod was a man of sterling character and outstanding ability, besides being possessed of a great fund of tact and natural courtesy which won him many friends.

Queensland primary producers have lost one of their best friends, and one of their best and soundest advisers as the result of the untimely death of Mr. Tod.

An immense concourse at his interment in the Toowoomba Cemetery on 16th June included representatives of the Government, Department of Agriculture and Stock, and every section of the community.

MR. JOHN JOSEPH FANNING.

The death of Mr. John Joseph Fanning, late business manager of the National Mutual Life Association of Australasia Company, Limited, in Queensland, occurred suddenly at his residence, at Auchenflower, on 14th June. The late Mr. Fanning, who was well known and highly esteemed in the business community of Brisbane, was fifty-seven years of age, and was born at Kingstown, Ireland. He came to Australia with his parents when he was about eight years of age, and they settled at Bowen. As a youth he entered the service of the National Mutual Life Association at Townsville, and travelled extensively in North Queensland on behalf of his company. He was one of the best-known men in Queensland, and for the greater part of his life was closely connected with the horse and cattle industries of the State. He was for a long period the manager for North Queensland of the National Mutual Life Association, coming to Brisbane three years ago as the new business manager of the association. With a popularity that extended all over the State and throughout the Commonwealth, the news of Mr. Fanning's death came as a shock to all those who knew him. For many years he was a judge in the horse section of the Royal National Agricultural and Industrial Association of Queensland, of which he was a member, and had judged at most of the principal shows in Australia. In connection with his business affairs, the late Mr. Fanning had many trips to the East. He was also closely associated with the export of cattle to the East, and of horses to India.

A large and representative gathering of citizens assembled at the graveside to pay a last tribute of respect. He is survived by his widow and ten children, to whom the sympathy of the whole community is extended.

COLD STORAGE OF GRAPES.

THE Minister for Agriculture and Stock, Mr. H. F. Walker, has received the following report on experiments conducted by Mr. Jas. H. Gregory, Instructor in Fruit Packing, in the cold storage of grapes from the Stanthorpe district. The objects of the experiments were to determine—

- (1) The suitability of particular varieties for storing and keeping for lengthy periods with a view to perhaps extending the season for marketing locally and exporting.
- (2) The length of time possible for safe storing to enable exporting to be a satisfactory proposition.
- (3) The best method of packing for commercial use locally and abroad.

The grapes were held in storage for varying periods, and were treated exactly as a grower's consignment would be treated. The main varieties, Waltham Cross, Black Muscats, Gordo Blanco, Red Hanifont, Flame Tokay, Red Malaga, Cervant, Gros Coleman, and Purple Cornichon, were used. One case of each of these varieties was packed in sulphite paper and woodwool. The three-quarter bushel case was used, the bunches being wrapped in the sulphite paper and nested in the woodwool.

Contents of Cases.

The average weight of fruit in this container when packed in paper and woodwool was approximately 15 lb., 1½ lb. of woodwool being required as packing. One case of each variety was also packed in granulated cork, each case containing approximately 25 lb. of fruit, using 1½ kerosene tins of cork to the case. No definite weight can be given of the cork, as, with two different kinds used, a kerosene tin weighed 4 lb. with one lot and only 2½ lb. with the other.

Packing and Storage Period.

The first shipment of grapes was packed at Glen Aplin on 4th March, Black Muscats and Waltham Cross being the varieties, being placed in store on 6th March. Inspections made on the 17th and 30th March showed the fruit to be in excellent condition, but an inspection on 17th April showed only three of the cases to be in good order, the case of Black Muscats packed in sulphite paper and woodwool

showing signs of deterioration. These cases were removed from store on 25th April, after seven weeks storage, and held for three days. At the end of this period the cases packed in cork were in excellent order, and were sold, realising 9s. per case. The Muscats packed with woodwool showed a percentage of waste due to the attack of moulds, whilst the Waltham Cross were in excellent order.

The second shipment of grapes, comprising Gros Coleman and Flame Tokay, was packed on 27th March, being placed in storage on 30th March. The Flame Tokay were sweated for three days. Unfortunately, the Gros Coleman were picked only four days after heavy rain, which necessitated extensive trimming to eliminate ring splitting and cracked berries. These were removed from storage on 30th April, after four weeks, in an unsaleable condition, although the wrapped fruit was in a much better condition than that packed in cork. The case of Flame Tokay packed in woodwool and paper was also removed at this time as it was showing signs of reaching its limit of storing. These were placed on the market, but, owing to the small quantity in the case, it was impossible to find a buyer. The remaining case of Flame Tokay packed in cork was held in storage seven weeks, until 18th May, and was removed in excellent condition, realising 10s. on the open market.

The last consignment of eleven cases, comprising the varieties Gordo Blanco, Cervant, Red Malaga, Red Hanifont, Waltham Cross, and Purple Cornichon, was packed on 31st March, placed in storage on 2nd April, and found in good order when inspected on 8th May. The Purple Cornichon and Waltham Cross were taken from the same consignment as that sent to Canada, and were used as a check on the results of the shipment. These grapes were all removed from the cold stores on 18th May, after being kept for a period of six weeks.

Effectiveness of Different Packing, and Prices Realised.

Gordo Blanco in woodwool wasty and unsaleable; in cork in good order, but realised only 6s. per case on the market. Cervant in woodwool were wasty in the tight bunches, showing about 10 per cent. wastage; in cork in perfect order; but only realised 6s. on the market, which was surprising as their condition was so fine; a good bunch taken from the woodwool pack kept in excellent order for ten days. Red Malaga, packed in woodwool, in good condition, only an occasional berry being at all damaged; in cork the condition of the fruit was excellent, realising 10s. on the market. Red Hanifont in woodwool showed waste, having a tendency to mould around the stalk; approximately 15 per cent. waste. Red Hanifont in cork, a few berries being slightly wasty, realised 10s. on the market. Waltham Cross in woodwool showed a small percentage of waste; the grapes also had a tendency to go bladdery. This was the only variety to develop this fault; the cork packing showed a small percentage of wasty berries, but realised 12s. on the market. Purple Cornichon in woodwool and sulphite paper looked as good as the day they were picked, showing the bloom to perfection, but when sent to the market were not sold owing to the small quantity in the case; in cork the fruit was in good order and realised 12s. per case.

From these results it appears that grapes can be successfully exported from Queensland to most parts of the world. Shipments successfully sent during the season to Canada, New Zealand, and the East give added support to this.

Possible Time for Safe Storage.

It appears from this experiment that the length of time for keeping the different varieties, if carefully trimmed and handled, is as follows:—

Purple Cornichon	Seven to eight weeks.
Flame Tokay	Seven to eight weeks.
Red Malaga	Seven to eight weeks.
Cervant	Seven to eight weeks.
Black Muscats	Five to six weeks.
Waltham Cross	Five to six weeks.
Red Hanifont	Four to five weeks.
Gordo Blanco	Three to four weeks.
Gros Coleman	Three to four weeks.

It would certainly be possible to keep the harder varieties, such as Purple Cornichon, Flame Tokay, and Malaga, for a longer period than eight weeks, but each additional week would increase the chance of waste and would also make it harder to hold the fruit long enough for handling and marketing after the storage process had been stopped.

Commercial Possibilities of Different Methods of Packing.

The results from the two methods of packing were inconclusive as to keeping qualities, the harder type of grape appearing to keep and open in better condition in the woodwool and sulphite paper, whilst the softer varieties kept better in granulated cork. Waltham Cross in cork showed a slight browning of the skin, which was not noticeable in the woodwool pack. From the marketing in Brisbane viewpoint the cork is the only method the buyers appear to want, the woodwool pack being unsaleable. Reports received on the Canadian shipment showed that both types of packing carried well, but it is pointed out that there is not enough fruit in the woodwool package. This would also reflect on shipping charges, as only 15 lb. of fruit would be carried in woodwool for the same price as 25 lb. in cork, shipping freights being on the basis of capacity. The cost of packing a case in cork was approximately 1s. 6d. for cork to pack 25 lb., whilst woodwool and sulphite paper costs 4d. for 15 lb. of fruit. This does not include the cost of the case. Any gain in the cost of packing is offset by the increased cost of extra cases needed. Taking the cost of a case as 1s., it would cost 2s. 6d. for 25 lb. fruit in cork and 1s. 4d. for 15 lb. fruit in woodwool, which would mean every 150 lb. fruit in cork would cost 15s. against 13s. 4d. in woodwool and sulphite paper. As there does not appear to be any gain in price for the better appearance of fruit in woodwool the packing of fruit in cork must still be the accepted method as it means less handling.

Quality of Fruit after Storage.

A feature of the fruit after its removal from storage was the apparent absence of any loss in flavour and eating quality.

Condition of Stalks after Storage.

Observations of the stalk and clinging power of the berries after storage showed different results with some varieties when shaken gently to test the power to hang on the bunch.

Black Muscats.—Stalks brown and dry; a tendency for berries to drop off.

Gordo Blanco.—Stalks brown, and berries loose and falling easily.

Red Hanifont.—Stalks brown, and odd berries falling.

Flame Tokay.—Stalks brown and dry, berries when falling having a short length of stalk attached to the fruit; the stems breaking from the bunch.

Red Malaga.—Stalks brown and dry; keep well attached to the bunch.

Cervant.—Stalks brown and dry, but fruit remains well attached to the bunch.

Waltham Cross.—The main stalks were browned, but the berry stalks were still green; fruit stays on the bunches.

Gros Coleman.—Stalks brown and dry, and berries became easily detached from the bunch.

Purple Cornichon.—Stalks brown; berries hanging well on the bunch, but breaking off easily where attached to the stalk if roughly handled.

As the weather conditions in the Stanthorpe district, owing to the prevalence of storms, were not favourable to the long storage of grapes, the results are very satisfactory.

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.

The Young Farmer.

LESSONS IN PIG RAISING.—I.

(Prepared by the Department of Agriculture and Stock, Brisbane, Queensland.)

THE PIG AS A PORK-PRODUCING MACHINE.

THE pig, in its natural state, is an omnivorous animal found in several countries on jungle and forest land, and obtaining its food in the form of succulent roots and herbage, fruits, insects, and small animal life, and the dead carcasses of large animals. The wild pig frequents shady and swampy areas where it can obtain comfort in hot weather as the peculiar structure of a pig's skin does not allow free perspiration by means of which the bodies of most animals are cooled.

Typical wild pigs are variable in size; are mostly stunted and ill-shaped with coarse gristly forequarters, strong bristly greyish-coloured hair, a very long snout, long, sharp tusks protruding from the mouth, and with a fierce temper. They are voracious, greedy feeders, breaking into crops and stores of food, and become a real nuisance to settlers in newly settled districts. Their immense appetites and slow growth render them quite unprofitable in comparison with domestic pigs. The wild pigs of Australia are not original wild strains, but are the descendants of domestic pigs which have escaped into the scrub and forest and have reverted to a wild type.

The modern domestic pig has been developed during the past century or more from the best of the wild strains available in England, America, China, and Italy, and by careful breeding, feeding, housing, and selection has been brought to a very high standard as regards breeding, appearance, growth, and development. When these improved conditions of breeding, feeding, and management are properly used, we find the pig a very profitable machine for utilising numerous farm products to produce a very saleable product in the form of pig meats such as pork, bacon, and ham.

Wherever improved pigs are kept and are given careful attention, hygienic surroundings, and ample good food, they are profitable animals and useful additions to the farm, but to get the greatest efficiency from the pig as a pork producing machine, it must be the correct type of pig and we must give it the best conditions of food and accommodation, and manage it in such a way that it will not be hindered in its growth by parasites or diseases; then the pig must be marketed to the best advantage, paying attention to the exact requirements of the consumer, and in order to ascertain the degree of efficiency in the business of pork production, exact and full records must be kept of every operation and a summary made.

The aim of each farmer and Pig Club member is to raise one or more pigs to a certain stage of growth and to treat them as pork producing machines, which should be run with the highest possible efficiency, and in order to achieve this objective the pig raiser should study every phase of his work and then apply his knowledge to his project so that he will benefit financially from the project, and so that he will be a wiser pig raiser and a more useful citizen when he has finished his job. Later lessons treat with some detail the factors which influence the success of the pig-raising business, and their careful study is earnestly recommended. Note that many useful and informative pamphlets may be obtained from the Department of Agriculture and Stock, Brisbane. Write for some of this literature.

Questions.

- (1) In what countries were wild pigs common, and what were the food those pigs ate?
- (2) How were domestic pigs developed and brought up to their high standard?
- (3) Why are pigs kept on our farms, and why should they be given careful attention?
- (4) Where can you obtain further information on the business of pig raising?

GESTATION CHART FOR BREEDING SOWS.

Jan.	Date of Farrowing	Feb.	Date of Farrowing	March.	Date of Farrowing	April.	Date of Farrowing	May.	Date of Farrowing	June.	Date of Farrowing	July.	Date of Farrowing	Aug.	Date of Farrowing	Sept.	Date of Farrowing	Oct.	Date of Farrowing	Nov.	Date of Farrowing	Dec.	Date of Farrowing
1	22 April	1	23 May	1	20 June	1	21 July	1	20 Aug.	1	20 Sept.	1	20 Oct.	1	20 Nov.	1	21 Dec.	1	20 Jan.	1	20 Feb.	1	22 Mar.
2	23 "	2	24 "	2	21 "	2	22 "	2	21 "	2	21 "	2	21 "	2	21 "	2	22 "	2	21 "	2	21 "	2	23 "
3	24 "	3	25 "	3	22 "	3	23 "	3	22 "	3	22 "	3	22 "	3	22 "	3	23 "	3	22 "	3	22 "	3	24 "
4	25 "	4	26 "	4	23 "	4	24 "	4	23 "	4	23 "	4	23 "	4	23 "	4	24 "	4	23 "	4	23 "	4	25 "
5	26 "	5	27 "	5	24 "	5	25 "	5	24 "	5	24 "	5	24 "	5	24 "	5	25 "	5	24 "	5	24 "	5	26 "
6	27 "	6	28 "	6	25 "	6	26 "	6	25 "	6	25 "	6	25 "	6	25 "	6	26 "	6	25 "	6	25 "	6	27 "
7	28 "	7	29 "	7	26 "	7	27 "	7	26 "	7	26 "	7	26 "	7	26 "	7	27 "	7	26 "	7	26 "	7	28 "
8	29 "	8	30 "	8	27 "	8	28 "	8	27 "	8	27 "	8	27 "	8	27 "	8	28 "	8	27 "	8	27 "	8	29 "
9	30 "	9	31 "	9	28 "	9	29 "	9	28 "	9	28 "	9	28 "	9	28 "	9	29 "	9	28 "	9	28 "	9	30 "
10	1 May	10	1 June	10	29 "	10	30 "	10	29 "	10	29 "	10	29 "	10	29 "	10	30 "	10	29 "	10	1 Mar.	10	31 "
11	2 "	11	2 "	11	30 "	11	31 "	11	30 "	11	30 "	11	30 "	11	30 "	11	31 "	11	30 "	11	2 "	11	1 April
12	3 "	12	3 "	12	1 July	12	1 Aug.	12	31 "	12	1 Oct.	12	31 "	12	1 Dec.	12	1 Jan.	12	31 "	12	3 "	12	2 "
13	4 "	13	4 "	13	2 "	13	2 "	13	1 Sept.	13	2 "	13	1 Nov.	13	2 "	13	2 "	13	1 Feb.	13	4 "	13	3 "
14	5 "	14	5 "	14	3 "	14	3 "	14	2 "	14	3 "	14	2 "	14	3 "	14	3 "	14	2 "	14	5 "	14	4 "
15	6 "	15	6 "	15	4 "	15	4 "	15	3 "	15	4 "	15	3 "	15	4 "	15	4 "	15	3 "	15	6 "	15	5 "
16	7 "	16	7 "	16	5 "	16	5 "	16	4 "	16	5 "	16	4 "	16	5 "	16	5 "	16	4 "	16	7 "	16	6 "
17	8 "	17	8 "	17	6 "	17	6 "	17	5 "	17	6 "	17	5 "	17	6 "	17	6 "	17	5 "	17	8 "	17	7 "
18	9 "	18	9 "	18	7 "	18	7 "	18	6 "	18	7 "	18	6 "	18	7 "	18	7 "	18	6 "	18	9 "	18	8 "
19	10 "	19	10 "	19	8 "	19	8 "	19	7 "	19	8 "	19	7 "	19	8 "	19	8 "	19	7 "	19	10 "	19	9 "
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22	13 "	22	13 "	22	11 "	22	11 "	22	10 "	22	11 "	22	10 "	22	11 "	22	11 "	22	10 "	22	13 "	22	12 "
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25	16 "	25	16 "	25	14 "	25	14 "	25	13 "	25	14 "	25	13 "	25	14 "	25	14 "	25	13 "	25	16 "	25	15 "
26	17 "	26	17 "	26	15 "	26	15 "	26	14 "	26	15 "	26	14 "	26	15 "	26	15 "	26	14 "	26	17 "	26	16 "
27	18 "	27	18 "	27	16 "	27	16 "	27	15 "	27	16 "	27	15 "	27	16 "	27	16 "	27	15 "	27	18 "	27	17 "
28	19 "	28	19 "	28	17 "	28	17 "	28	16 "	28	17 "	28	16 "	28	17 "	28	17 "	28	16 "	28	19 "	28	18 "
29	20 "	—	—	29	18 "	29	18 "	29	17 "	29	18 "	29	17 "	29	18 "	29	18 "	29	17 "	29	20 "	29	19 "
30	21 "	—	—	30	19 "	30	19 "	30	18 "	30	19 "	30	18 "	30	19 "	30	19 "	30	18 "	30	21 "	30	20 "
31	22 "	—	—	31	20 "	—	—	31	19 "	—	—	31	19 "	31	20 "	—	—	31	19 "	31	22 "	31	21 "

NOTE.—Black figures in above table indicate date of service.

This chart presents in an instructive form figures relating to the gestation period of brood sows. For example, a sow mated to the boar on 1st January is due to farrow on 22nd April; a sow mated on 1st July is due on 20th October. The chart should be preserved for future reference by breeders of all classes of pigs. The normal period of gestation, *i.e.*, the period from the time of conception to the birth of the young pigs, is 112 days, this period is sometimes remembered as roughly three months three weeks three days, or 16 weeks. With very young sows the period is sometimes of shorter duration, and instances are on record where young sows have farrowed at from 100 to 103 days after becoming pregnant; on the other hand, old sows in abnormal condition have been known to carry their young for more than 140 days.—E. J. SHELTON, H.D.A., Senior Instructor in Pig Raising.

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.:—

Variegated Thistle.

F.A.C. (Brisbane)—

Variegated Thistle, *Silybum Marianum*.—This plant is very common in parts of the Darling Downs and New South Wales. Generally speaking we seem to have little trouble with it in Queensland, but below the Border it has been reported to have caused death among stock, particularly cattle, on several occasions. The symptoms given seem to be those of prussic acid poisoning; that is, the stock generally die suddenly and no outstanding symptoms are ever shown. Post-mortem examination also reveals nothing diagnostic. Mr. Max Henry, New South Wales Government Veterinary Surgeon, has reported that in some cases a distinctly inflamed condition of the stomach and intestine is evident. Analysis, however, as carried out by chemists both here and in the Southern States, has so far failed to detect with certainty the presence of a prussic-acid-yielding glucoside. Paddock stock, as a general rule, do not seem to be greatly troubled, most of the losses occurring with travelling animals.

Tea-Tree Oil.

E.C. (Biggenden)—

Your specimens of leaves of the Tea-tree from Degilbo Creek were handed to Dr. Jones at the University, who is making a study of the essential oil from Queensland plants. He states that the oil, so far as can be judged from the small specimens obtained, showed no differences from that of the River Tea-tree, *Melaleuca bracteata*.

Giant Couch.

H.C.B. (Coolum, Yandina)—

The specimen of grass is *Brachiaria mutica*, more commonly known in Queensland as *Panicum muticum* or Giant Couch. This grass is very extensively planted in parts of Queensland from Rockhampton northwards, but is less common in the more southern parts of the State. In some parts of North Queensland, such as the Daintree River and the moister and more tropical parts of the Atherton Tableland, it is the principal dairy grass relished by stock, and with a very high reputation as a fodder. We should say it is one of the best grasses you could plant on your particular class of country.

Hairy Indigo.

P.K. (Yandina)—

Your specimen is Hairy Indigo, *Indigofera hirsuta*, a weed very common in coastal Queensland and not known to possess any harmful properties. It has been reported as a useful forage though we cannot say that we have ever seen stock eat it, or at least not to any extent.

Sorghums.

O.L.H. (Atherton)—

It is rather hard to tell species of sorghum from seed-heads alone, the chief difference being in the root system, but we have little doubt that the one you send is *Sorghum laxiflorum*, a native of Africa now naturalised, and very abundant in coastal Queensland. *Sorghum laxiflorum*, *Sorghum sudanense*, the Sudan Grass, and *Sorghum halepense*, Johnson Grass, are very similar in general appearance, but can be immediately distinguished one from the other by their peculiar root systems. *Sorghum laxiflorum* is a large perennial species forming a compact root base with numerous buds coming up therefrom. *Sorghum sudanense* is typically an annual species though biennial strains have, of course, been developed. Johnson Grass is immediately distinguished by the possession of long white underground runners.

Trees on Macpherson Range. Books on Forestry.

J.K. (Macpherson Range)—The specimens represent—

- (1) *Guilfoylia monostylis*. A small tree moderately common in the MacPherson Range scrubs of south-eastern Queensland. I have never seen it reach a large size, and I do not know that the wood has any commercial value. It is sometimes known as *Cadellia monostylis*, but the former is preferable.
- (2) Leaflet only, but I should say is *Euroschinus falcatus*, a tree known by various local names in Queensland, including Donnelly's Cedar (the one you give it) and Ribbon Wood. The wood warps very badly, though I think it has been cut in Queensland to a limited extent.

In reply to your queries regarding books on forest trees, "Elementary Text-book of Australian Forest Botany" (by C. T. White, F.L.S.) would hardly enable you to identify the trees growing in your scrubs as it is purely a text-book and deals with the correct use of botanical terms and so forth. It was primarily prepared for use by students of the Australian Forestry School. The best book for you to get would be "Australian Rain-forest Trees," by W. D. Francis. This is profusely illustrated, and we think you would find practically all the scrub trees of your locality in it. The price is 10s. 6d., plus postage. It is published by the Council for Scientific and Industrial Research, but is obtainable through any bookseller. Barker's Book Stores, Brisbane, have copies.

Cotton Industry.

"INTERESTED" (Brisbane)—

- (1) The cotton-growing areas of Queensland, generally speaking, lie along the slopes, and medium alluvial loamy flats of the valleys of the eastern watershed of the Great Dividing Range from north of Beaudesert in the South to the Fitzroy River and areas adjacent in the North, and lying behind the coastal ranges from Brisbane to Gladstone, and thence north to Rockhampton. This covers an area of some 400 miles long by 50 to 150 miles wide. In this area the following cotton districts are included:—Lockyer, Brisbane Valley, South, Central, and Upper Burnett, and the Central district, including Dawson Valley, Callide Valley, and areas around Rockhampton.
- (2) The Commonwealth Government is giving a bounty on seed cotton, per lb., on a graduated scale as follows:—1931, 1½d. per lb. seed cotton; 1932, 1½d.; 1933, 1d.; 1934, ¾d.; 1935, ½d.; 1936, ¼d.

Prices of Buttermilk.

Replying to an inquiry recently on the approximate value at the rate of 1,000 gallons for buttermilk from butter factories, mention was made of the fact that there is no standard value for the product named or for whey or skim milk, as everything depends upon local conditions of supply and delivery. We know of one case in which the purchaser pays 11s. per 1,000, and secured 1,200 gallons for every 1,000 paid for, but has to cart the milk 2 miles in tanks on a horse-drawn vehicle. Another purchaser pays 16s. per 1,000 gallons, and has milk pumped direct to tanks at his piggeries. His supply is based on 300 gallons of buttermilk to every ton of butter manufactured. Other purchasers pay 20s. per 1,000 gallons, and have the milk delivered, and have as part of their contract to dispose of the waste water from the factory. Probably about 15s. per 1,000 gallons would be a satisfactory price to pay where the milk was delivered per pipe line on to the property.

Journal Subscriptions.

A Correspondent (Gunnewin, via Roma)—

Your subscription—postal note for 1s.—has been received, but your covering letter is unsigned. Please send full name.

A Correspondent (Wooroolin)—

A postal note for 2s. has been received, but no name and address was attached to the covering letter. Please rectify the omission as soon as possible to enable us to place your name on our mailing list.

General Notes.

Queensland's Royal Show

The offices of the Royal National Association, Courier Building, Brisbane, are now the scene of considerable activity in connection with the forthcoming Royal National Show, to be held at Bowen Park, from 10th to 15th August. Exhibitors in all sections are strongly urged to lodge their entries at once and thereby avoid the personal inconvenience of the usual last moment rush.

For the benefit of those who cannot conveniently call during ordinary business hours the offices of the Association will remain open for the lodgment of entries for the dog and poultry sections until 8.30 p.m. on Friday and Monday nights, 3rd and 6th July, respectively.

Entries in all main sections of the Show, including horses and cattle, positively close on Monday, 6th July.

There is still time to write or telephone for copy of the Prize Schedule. Send your entries along and help to break new records at the 1931 Royal National Show.

Staff Changes and Appointments.

Mr. William Freeman, of Bribie Island, has been appointed an Honorary Ranger under the Animals and Birds Acts.

Messrs. H. Lambert, H. J. Rollston, and J. Macfie have been appointed Assistant Inspecting Cane Testers for the forthcoming sugar season, with headquarters at Cairns, Mackay, and Bundaberg, respectively.

The following have been appointed Cane Testers for the forthcoming sugar season at the mills mentioned in each case:—Miss J. O'Flynn (Babinda), Mr. L. Chadwick (Cattle Creek), Miss J. Orr (Farleigh), Mr. T. Herbert (Gin Gin), Mr. V. F. Worthington (Inkerman), Miss E. Christsen (Invicta), Mr. T. F. Brown (Kalamia), Mr. W. J. Mason (Marian), Mr. P. H. Compton (Maryborough), Mr. L. G. F. Holbach (Mossman), Mr. W. Ahern (Mourilyan), Mr. T. V. Breen (Mulgrave), Mr. F. C. J. Jorss (Pioneer), Mr. L. C. Home (Plane Creek), Mr. W. J. Richardson (Proserpine), Mr. H. Jensen (South Johnstone), and Miss H. T. Smith (Tully).

The following have been appointed Assistant Cane Testers for the forthcoming sugar season at the mills mentioned in each case:—Miss D. Bowder (Inkerman), Mr. T. F. Corbett (Babinda), Mr. St. C. G. Fanning (Pioneer), Mr. C. H. Humphreys (Kalamia), Miss C. Humphreys (Proserpine), Miss C. Knight (Raccourse), Miss M. A. Syle (Tully), Miss A. Mullin (Plane Creek), Miss E. Mullin (Bingera), Miss A. Murray (Farleigh), Mrs. M. Nally (Maryborough), Miss M. Orr (Moreton), Miss T. Payne (Marian), Miss H. Rowe (Millaquin), Mr. G. Tait (Marian), Mr. D. Walton (Plane Creek), Mr. H. T. Whiteher (Pleystowe), Miss M. C. Whittle (Pleystowe), Miss M. A. Morris (Invicta).

The following have been appointed Cane Testers for the forthcoming sugar season at the mills mentioned in each case:—Mrs. K. Dunton (Bingera), Miss A. B. Levy (Fairymead), Miss D. Maries (Isis), Mr. F. W. Trulson (Marian), Mr. H. C. Jorgensen (Millaquin), Mr. C. J. Boast (Moreton), Mr. T. D. Cullen (North Eton), Miss I. Palmer (Pleystowe), Miss N. Walsh (Qunaba), Mr. J. C. D. Casey (Raccourse), Mr. J. Howard (Rocky Point), Mr. G. Tait (Mount Bauple).

Miss M. Orr, Assistant Cane Tester, has been transferred from Moreton to Marian Mill, and Miss V. Page has been appointed Assistant Cane Tester at Moreton Mill for the forthcoming sugar season.

The resignation of Mr. W. J. Mason as Cane Tester at Marian Mill has been accepted.

A Stock Question.

In a case recently heard in the Supreme Court, Brisbane, the question was raised as to which was the "off" and which the "near" side of cattle. Under the Brands Act these terms are defined clearly. The "off" side is the right-hand side of the animal and the "near" side is the left-hand side. This applies to horses, cattle, sheep, swine, camels, and goats. Therefore, a horse is mounted from the "near" or left-hand side, and cows generally are milked on the "off" or right-hand side.

Northern Sanctuaries.

The Deputy Governor, acting for and on behalf of His Excellency the Governor, in Council, has approved of the issue of an Order in Council declaring Salton Lake Paddock, Reedy Brook Holding, Ingham, the property of Mr. James H. Anyon, a sanctuary under the Animals and Birds Acts, in which it shall be unlawful for any person to take or kill any animal or bird.

State Wheat Board Election, District No. 4.

Nominations will be received by the Returning Officer, Department of Agriculture and Stock, Brisbane, until noon on the 18th July, 1931, for election as representative of wheat growers of District No. 4 for appointment to the State Wheat Board until the 31st August, 1932. Each nomination is to be signed by at least ten wheat-growers who delivered to the Board wheat harvested during any of the 1927-28, 1928-29, or 1929-30 seasons, who reside in the old (1921) Cunningham electorate (with the exception of the Warwick and Killarney Divisions).

The representative shall be a grower of wheat who delivered to the Board wheat harvested during any of the above seasons.

Fruit and Vegetables Act.

Up to the present, the Fruit and Vegetables Act has applied to apples, apricots, bananas, cherries, currants, custard apples, figs, gooseberries, cape gooseberries, grapes, grape fruit, loquats, lemons, mangoes, nectarines, oranges, passion-fruit, peaches, pears, persimmons, pineapples, plums, quinces, or tomatoes as fruits. The Deputy Governor in Council has now declared strawberries also to be fruit for the purposes of the Act, and, in future, the provisions of the Act will apply to strawberries as well as the abovementioned fruits.

The Deputy Governor (Hon. Sir James Blair, C.J.), acting for His Excellency the Governor, has approved of the issue of a Regulation under "*The Fruit and Vegetables Act of 1927*" prescribing the method of packing strawberries. The Regulation provides that when strawberries are marketed in punnets, the name and address of the packer must be marked legibly and durably on both the top side and the end of the bottom half of the punnet in block letters of not less than three-sixteenths of an inch in height. Penalties for a breach of this Regulation are £2 for a first offence, and not less than £2 nor more than £20 for a second or subsequent offence.

Dry Farming.

Mr. W. J. Mearns, an old subscriber, writes:—Cultivation is the science which is necessary for the advancement of all the conditions under which we live. Our minds require cultivation so that we may be able to understand the very complex conditions of modern life. Before we are able to put forth a supreme effort to excel in feats of bodily strength we must undergo a process of physical culture. Man's knowledge of the fundamental laws which govern nature qualifies him to make conditions suitable to get the best results. The law which governs nature is immutable. Man's efforts can strain her conditions, but left to herself Nature will soon revert to the primary conditions which govern her. What we want to deal with is land culture in its different phases. Dry farming, in my opinion, is the most efficient method by which Mother Earth can be made to yield to us her best results. The soil contains all the elements necessary for plant life, the wonderful chemical changes which take place by the breaking-up of organic and inorganic elements by the action of gases which are dissolved and distributed by water in the form of rain are well known. The results of dry farming are most evident when the system is applied to soil washed down from higher altitudes, and that makes up our river flats. On such soil the capillary system is most apparent. That system is really a network of hollow rods that reach far down into the subsoil and by which moisture and plant food are brought from the lower depths to the surface. This system operates from the bottom upward, and the roots of plants tap those "arteries" which contain the elements of their life. To prevent loss of moisture the surface should be kept cultivated to a depth of 2 to 3 inches. This action breaks the tops of the rods thereby preventing loss. The longer and oftener this work is continued the better, especially during prolonged dry spells. By thorough and constant surface cultivation good crops may be produced even in periods of scanty rainfall. That has been my own experience in many years of farming with, I may justly claim, substantial success.

Comparative Feeding Values.

Hay, silage, and mangels are all characterised by much variation in their respective feeding values, and thus any exact statement of the comparative value of the three feeds is not feasible. Chemical analysis as a means of ascertaining the relative feeding values is quite insufficient, because of the operation of such factors as palatability, which are not indicated by analysis. As a result of live stock feeding trials, Amos, of Cambridge, states that 1 lb. of 25 per cent. silage equals 2 lb. of roots, and 1 lb. of hay equals 3 lb. of silage. Results obtained by Rae in Hertfordshire, Sheehy at Athenry, and Drew at Glasnevin, in a general way confirm the figures given by Amos. Advice has been received from many reliable sources that stock thrive exceptionally well on silage. So persistently has this been reported that one is forced to the conclusion that silage has some specially valuable feeding quality or qualities, the nature of which is not yet fully understood.—Fields Division, New Zealand Department of Agriculture.

Fruit Marketing—The C.O.D.

The Governor in Council has to-day approved of the issue of Regulations under "The Fruit Marketing Organisation Acts, 1923 to 1930," amending various regulations now existing under such Acts.

Certain of the amendments provide for the tenure of office of the Committee of Direction and the various Sectional Group Committees to be extended to two years in lieu of one as previously. This move is made from the point of view of economy, and it is also considered that it will result in a continuity of policy being preserved.

Other amendments merely clarify the procedure in respect to the holding of elections for the Sectional Group Committees and correct certain anomalies which now exist.

Power is also given to the Sectional Group Committees to recall their representative or representatives on the Committee of Direction, if necessary. Provision is made for the voting power of a member on the Committee of Direction when only one representative has been elected by a Sectional Group Committee, or when in the instance of two representatives of a Sectional Group Committee one only of such representatives is present at any meeting of the Committee of Direction.

The Royal Society of Queensland.

The Ordinary Monthly Meeting of the Royal Society was held in the Geology Lecture Theatre of the University on Monday, 25th May. The President, Dr. D. A. Herbert, was in the chair. Miss E. Duncan, B.Sc., Dr. J. G. Drew, and Mr. N. Fisher, B.Sc., were elected unanimously to membership.

Dr. Lockhart Gibson exhibited the inflorescence of a papaw plant, which had been cut back in youth. The inflorescence also bore young fruit. In addition to male and female flowers, the plant bore flowers, exhibiting stages intermediate between the male and females. It is sometimes claimed that male plants of this species can be converted into females by cutting back before the flowering period. The exhibitor remarked upon the occurrence of hermaphroditism in human beings. The President, Mr. Bick, Dr. E. O. Marks, and Mr. W. H. Parker, a visitor, commented upon the exhibit.

Dr. T. G. H. Jones read a paper by himself and Mr. M. White, M.Sc., entitled "Essential Oils from the Queensland Flora: *Agonis Luehmanni* Bailey."

Agonis Luehmanni is known only to occur on the tops of some of the Glass House Mountains. The yield of oil was .25 per cent. Constituents of the oil proved to be principally pinene 60 per cent., ocimene, aromadendrene, sesquiterpene alcohol, and a small amount of a crystalline yellow solid. The result is in contrast with that from *Agonis abnormis*, the oil of which consists primarily of sesquiterpenes.

Dr. T. G. H. Jones gave a short lecture on "Essential Oils." The lecture dealt with the general properties of essential oils and the methods of extracting them. The primary method was that of distillation in steam, but for perfumery extraction with suitable solvents was frequently resorted to. This yielded better perfumes. The steps necessary in the general examination of essential oils were then discussed, particularly the determination of important physical and chemical constants. Reference was then made to the essential oils from Australian plants, particularly those from the eucalypts. The theory of Smith and Baker, connecting leaf venation and chemical constituents, and the possible evolution of the eucalypts was finally dealt with.

The President, Mr. Bennett, Dr. E. O. Marks, Mr. Francis, and Dr. Lockhart Gibson took part in the discussion which ensued.

A Lesson from California.

By initiating a personal movement to use more wool members of California Woolgrowers' Association have set an example to producers in other parts of the world. The slogan adopted at the last annual convention was "Make this a Wool Christmas," and one of the ways in which it was carried out was by local associations having special blankets manufactured and distributed to members at slightly above cost. By this means the consumption of wool was materially increased.

Banana Marketing.

The Governor in Council has to-day approved of the issue of an Order in Council declaring that all bananas produced in Queensland during the period from the 6th June, 1931, to the 31st December, 1934, shall be acquired by the Committee of Direction of Fruit Marketing, as the owners thereof.

A Regulation was issued recently empowering the Committee of Direction to take a ballot of all banana-growers in the State to decide whether or not the whole of the bananas produced in Queensland until the 31st December, 1934, should be so acquired by the Committee of Direction. The ballot closed on Monday, 1st June last, 61 per cent. of the votes polled being in favour of the acquisition by the Committee of Direction.

Early Importations of Jersey Cattle.

In the course of a recent conversation, Mr. James Sargent, of Jandowae (who came originally from Tasmania) stated that in the year 1872 or 1873 an article appeared in an issue of the Hobart "Mercury" in which reference was made to the first introduction of Jersey cattle into Australia. These cattle came direct from Jersey Island, stated Mr. Sargent, the importer being a Mr. Hopkins, a very wealthy man who built a large vessel named the "Nautilus" in which he sailed round the world and brought back to Tasmania from Jersey Island the cattle referred to. Following these initial introductions stock were sold to mainland buyers, and thus they were introduced here and were shown at Royal Shows both in Tasmania and on the mainland. The shipments naturally created great interest. Mr. Sargent, who was then seventeen years old (he is now seventy-six years old) remembers distinctly the references being to the fact that the importations of 1872 were the first of the Jersey breed to enter Australia. He thinks the Hobart "Mercury" would be able to hunt up from its original records the details of breeding and other particulars of the cattle. He referred to a publication entitled "Jersey Cattle in Australia" as giving much information re these early importations.

Australian Apples in England.

It is very gratifying, said Mr. Parker Moloney, Commonwealth Minister for Markets, recently, to learn that Australia has carried off by far the greater number of prizes in the apple classes at the spring section of the Imperial Fruit Show. Indeed, the name of every exporting State which submitted entries appears in the schedule of prize winners. Although, said the Minister, the Press cables refer to the limited number of entries from the Southern Hemisphere, Australia this year considerably increased her representation in that thirty-three entries participated against twelve of last year.

This spring show was inaugurated in 1930 so as to make special provision to meet circumstances surrounding the seasonal production of fruit in the Southern Hemisphere, at the time of the year which is the direct opposite to the producing countries in the Northern Hemisphere. The range of classes in the show this year was considerably enlarged, there being last year only two classes in the overseas section—viz., one for five cases of dessert and another for five cases of culinary apples. This year separate classes are provided for some of the principal export varieties from Australia, New Zealand, and South Africa. The two classes for dessert and culinary apples were included this year, and the entries judged will eventually be compared with the English and Canadian entries at the Annual Imperial Fruit Show held in the autumn. In these particular classes the first prize is £50, the second £30, and third £10. In addition to the cash prizes in the other classes special prizes are offered by some of the main fruit-importing firms in the United Kingdom.

"I compliment those growers," said the Minister, "who have not only been so interested to take special care and trouble to see that Australia was adequately represented at this show, but who also have upheld our best traditions by winning so many prizes in the various sections."

The Pig Without a Tail.

A pig without a tail or with no more than a stumpy apology for that decorative finish to its anatomy is a depressing sight. Actually it ought not to make much difference to the animal itself or to its value whether it has a good or a bad one, or no tail at all, but the fact remains that it does. That at least is the case with pedigree pigs, where appearance counts for a good deal. But it may be said, perhaps, that there is an especial value in the pig's tail in that it indicates the physical and mental condition of the animal to which it belongs. If a pig has no tail you cannot tell so easily whether the owner of it is a happy pig or the reverse, and contentment of mind and body is a very important matter where pigs are concerned. If a pig droops its tail, allowing it to hang limply, you know at once that it is not happy; if, on the other hand, it carries its tail gaily in a nice curly fashion you know that all is well. Little pigs often lose their tails in cold weather through bad circulation caused by wet and cold. If their tails become dirty and dragged they may drop off. Even a strictly commercial pig looks better with a tail than without one. Let us take care, then, that its appearance is not marred by losing this ornament. A little oil rubbed on the tails of small pigs from time to time during the first few weeks of their existence will prevent dirt from adhering, and will encourage circulation to the very tip. Keep your little pigs dry and warm and their tails oiled, and you need have little fear that any caudal calamity will happen to them.—“Live Stock Journal.”

Pigs and Sunlight.

In recent years no farm animal has received greater attention than the pig. Much has been done in the direction of improving our various breeds and types, methods of feeding have been closely studied, and experiments without number have been made in regard to different systems of general treatment. Yet in spite of all this there still appears to be room for further improvement in the all-important matter of the pig's dwelling.

The first axiom in pig-keeping is that if pigs are to do well, and to pay their way, they must be housed under comfortable conditions. Judging, however, by what one still sees in every part of the country, it seems to be evident that the importance of housing the pig under the best possible conditions is still a long way from being universally recognised.

The general idea still appears to be that almost any sort of sty will do for a pig—any place, however damp, dark or draughty, is good enough. Even where sties have been well built, with sound walls, roofs and floors, and with a due regard to avoiding the more common causes of discomfort, there is often room for improvement. The very best and most comfortable of sties almost invariably fail in one particular—the admission of sunlight.

To the pig—especially to the young pig—the health-giving rays of the sun are of the greatest possible importance. Pigs are sun-loving animals, and it is only on rare occasions during the summer that they can have too much of the sun. In winter, whether the sun is actually shining or not, every ray of light is valuable.

The Limitations of Drugs.

“Of all the genuine methods which have as their object the prevention of disease,” states a New South Wales departmental publication, “the administration of drugs is, widely speaking, of least value.” Yet perhaps most stockowners incline to this form of health insurance, and in many cases there is a credulity which is responsible for much waste of money and possibly loss of stock.

“Some little while ago attention was drawn to the excessive claims which are made on behalf of particular remedies for stock diseases,” observes the Chief Veterinary Surgeon of the New South Wales Department of Agriculture in a current report. “A very good instance has been recently noted in which a drug was claimed to possess the power to destroy all parasites and all germs in an animal. It is difficult to understand why such claims as this are made when it is realised how difficult it is to obtain a drug that will effectively destroy any germ in the body, and that there is a great deal of difference in the efficiency of any particular drug against any two parasites. It would be thought that more moderate statements would carry greater weight with thinking men. Take for instance, cancer in cattle. There is no known drug which when administered by the mouth will cure cancer, and yet one sees claims made for drugs that they will cure any disease in cattle, and apparently stockowners are impressed by such claims.”

Drugs play their part in the control of disease, but the basis of health in stock is good feeding and proper housing and management.

Slaughter of Calves.

Whilst the Licensing of Bulls Bill (Imperial Parliament) was being discussed recently by the Northallerton (England) Farmers' Union, the chairman, Mr. R. Bosomworth, made a striking indictment of dairymen. He argued that it would be much better than passing this Bill to prohibit the slaughter of calves until they weighed 200 lb. It was scandalous that a few-days-old calves should be slaughtered, and he pointed out that the principal offenders in this respect were the milk producers. It was nearly as bad as the Chicago scandal, where it was found that tinned chicken was really calves that had never lived.

Manuring Land.

Organic manure is by no means plentiful, hence the need for putting available supplies to the best possible use. On heavy land horse manure is the most valuable, because it improves drainage by breaking up the soil particles, while cow manure is best for light land because it contains and conserves moisture. Sheep and pig manure is also valuable, but is colder and more concentrated, and for this reason is not applied in such large quantities. Whether light or heavy land, however, never turn down a load of manure because it does not happen to be the correct sort. The addition of some vegetable refuse will help to supply humus, or sowing and digging in a green crop will be valuable. The manure should be applied and dug in when obtained if the land is vacant. If there is a crop on it the manure can be spread between the rows, or it will have to be stacked till required. As a general rule the best way is to apply the manure as obtained, never mind whether fresh or not. Any rain that falls washes the manurial part into the soil and is not wasted, as is often the case when it is stacked. Some time must elapse after the manure is added to the soil before it becomes available as plant food, and for this reason it is best dug in during winter and the ground allowed to lie until spring before the crop is planted. In small gardens, however, it is a case of manure, dig, and crop with little or no waiting period. In such cases, if the manure is applied as a top-dressing to a crop when about half-grown it will become partly decomposed when the time comes for digging, and when dug into the soil will not lay so light and puffy as if fresh. When using fresh manure as a top-dressing amongst crops, it is advisable to scatter a little powdered naphthalene and salt, in the proportions of four of salt to one of naphthalene, on the manure to prevent it becoming a breeding-place for slugs.—“New Zealand Farmer.”

Winter Digging.

To get the most out of the soil it is essential that it should be well worked. During the spring and summer the time is taken up with planting and hoeing, and the digging gets missed. The best time to work the ground is during winter. The weather is cooler and the soil moist, consequently the work is not so laborious, and, in addition, the rains cause the soil to settle down and consolidate before the time comes for seeding or planting. If digging the plot ordinarily, take out a trench one spit deep, and wheel the soil to the far end of the plot. Throw the top spit of the second into the first trench and so proceed across the plot. Keep the trench open while digging and thrust the spade blade downwards to its full length in doing the work. It is little use turning up the plot merely 4 or 5 inches deep. Throw up the clods as roughly as possible, leaving the action of frost, sun, air, and rain to break them up during the winter. Do not bury such weeds as docks, bird-weed, thistles, and couch grass. Gather them up into an old tin whilst digging and burn them as soon as they are dry. If they are thrown on top of upturned soil they will not die, and often will live and thrive again. If the plot is to be trenched, stretch the garden line across the plot, marking out a space 2 or 3 feet wide. Take out the soil a spit deep and wheel to the other end for filling in the last trench. Break up the subsoil in the bottom of the trench with a fork or pick-axe, adding plenty of straw manure or decaying vegetable matter to lighten the soil, forking it well in. Mark out with the garden line another width, as before, and throw the top spit of soil into the first trench. Then break up the subsoil, adding manure, &c., and proceed across the plot, leaving the top layer as rough as possible to let the frost penetrate the soil to destroy insect pests. Do not tramp about on a heavy clay soil any more than can be helped, especially if it is wet. It greatly improves the plot to give lime at the rate of 20 lb. to 28 lb. per rod. Apply the lime as evenly as possible, break up any unbroken clods, and fork the lime well in, leaving the land afterwards until the crops are ready for sowing in the spring. If trenching might take more time than can be spared, throw the plot into ridges, leaving them rough for the winter. If an artificial manure is needed for digging in with winter digging, basic slag, 4 oz. per square yard, is one of the best for producing good results on next season's crop.

Cow with a Wooden Leg.

Miss Margaret Penrose, a New South Wales country woman, has a wooden-legged Jersey cow that has dropped five living calves. As a heifer she suffered a broken leg, and later was presented to Miss Penrose, who prevailed on her brother to cut it off. Then, with the aid of her father, Miss Penrose made a wooden leg for her charge, and the animal has managed very well with it.

Vice in the Horse.

It is quite true that an expert horseman will often subdue the most refractory of horses, but they are always liable to revert to vicious habits again if they pass into the hands of inexperienced or incompetent horsemen. One of the worst vices in a horse is kicking, whether in stable or at work. We have seen a vicious mare kick the foredoor of a cart to matchwood and smash both shafts. We have seen her, too, throw her hind leg over the pole, when yoked to a mower, and sit down on it, breaking it under her weight. Go she would not, but kept her tail switching round and round.

It is possible to subdue such an animal for the moment with a drug, and it was often done by crafty dealers in order to effect a ready sale. But drugging is to be avoided. Unless other means are successful it is best to get rid of an animal of the kind at once. There is a market for such, but the price is low.

A Kicker.—A kicker is a dangerous animal, and since it can hardly ever be broken of the vice its absence is preferable to its presence on the farm stud. The old dodge of suspending a small log behind a kicker in the stable and letting it exhaust itself is sometimes effective in reducing the propensity. Often it fails.

Biters are also a source of danger, but except when feeding them corn or when grooming they can be kept under control.

The plan of thrusting a rotten egg or a putrid frog into the teeth of a biter has often been effective.

A rearer in harness may only be mastered by being kept at hard work and rather lightly fed. All intractable horses should be stinted in their feed of grain. The rearer may sometimes be cured by breaking a bottle of cold water over its head. A good douche of cold water is the more effective when the animal is well heated. Straps can be applied to check rearing.

Kindliness and coaxing will invariably be found more effective than harsh or hasty treatment. In almost every case of nervousness or timidity, as in shying, the remedy lies in kindliness, though a firm hand must be held. Strive to gain the confidence of the horse, and the animal will go with you almost anywhere and face any danger.

The Shying Horse.—Shying is not a vice, but rather a temperamental defect, which the animal cannot help. It has no evil intent, it just becomes startled, as by the flutter of a bird, the rustle of leaves, the swaying of a branch in the wind, or the sudden appearance of any unfamiliar being or object. It is futile to whip a horse for shying. Instead of allaying his fears, it only increases his alarm, in which case he may suddenly bolt, with disastrous consequences.

A firm hand must be kept on the reins, and the animal coaxed to advance. The best plan is doubtless to take the horse by the head, pat him on the neck, show him there is no danger, and he will soon get over his alarm.

Horses given to shying should never (while at work) be left standing at the end of the field while the driver goes some distance away on an errand.

If coupled with a staid old horse there may be little risk of the nervous animal bolting on being startled by bird or animal, or even a piece of paper drifting in the wind.

A shying horse is generally the most susceptible to fright or panic when driven alone. Therefore, it is best to hitch the animal to the yoke with a steady-going easy-minded horse. Horses, like men, become crusty or peevish when out of sorts or when weary and exhausted. Hence before we blame the animal we ought to consider first whether we ourselves are not the more blameworthy in any respect in the matter of feeding and general management. Do we always see that the harness, especially the collar, is not irksome to wear? An ill-fitting collar may cause a young horse a deal of discomfort and suffering, and may be a contributory factor in jibbing, rearing, or other undesirable habits.

Don't overload or drive young horses too hard.—'Live Stock Journal,' England.

Home-Made Leather from Cow Hide.

Mr. H. Cleland, Inspector of Stock, Wanganui, mentions in the "New Zealand Journal of Agriculture" that he has observed a good sample of home-made white leather at a farm in his district from which the farmer was making his own bridles, reins, poll straps, &c. The cow hide was cured by the following process:—Take one full bucket of burnt lime mixed with enough water to cover hide in a barrel or large milkean. Soak hide for ten days, turning frequently; then take out, spread on floor (concrete for preference), hair side up, and scrape off hair. After taking off all hair, soak for two or three days in a bucketful of bran with water to cover; this will clean up the hide. Next soak for ten days in a solution of 10 lb. salt, 10 lb. ground alum, and 1 oz. oxalic acid, mixing the materials together with sufficient water to cover, and turning the hide frequently. Then tack hide on wall and stretch it as tight as possible. When dry it is fit to use.

Tractor Repairs.

Tractors deteriorate more because of rust, dirt, poor adjustment, and abuse than they do from actual use on the farm, according to a study of factory repair records. This fact leads a New Jersey extension service agricultural engineer to recommend a careful checking, cleaning, and adjustment of the tractor as a preventive of trouble. The following of such a plan, he points out, will result in a longer life and better operation of the tractor.

"Winter is the ideal time for the overhauling and reconditioning," he explains. "Necessary replacements may be obtained at leisure and without interfering with farm operations, as is the case when repairs must be made in the field during the rush season.

"If possible, the crank case of the tractor should be removed and thoroughly cleaned of all sludge and caked oil. Bearings may then be examined for condition, and necessary replacements made. Modern construction often prohibits tightening of connecting rod bearings, and, therefore, necessitates entire replacement of the rod.

"The oil filter should be thoroughly cleaned out and the element renewed. The air filter, whether of the dry or the wet type, will need a thorough cleaning. Magneto breaker points should be smoothed with a contact file, or, if badly pitted, replaced. Readjustments of points to the opening recommended in the tractor instruction book should follow. Clean and adjust spark plugs and replace plugs that are badly pitted. Worm plugs, even though they may fire the charge, are wasteful of power, and their replacement is good economy.

"Frequently it is advisable to remove the front wheels, wash the bearings with kerosene, replace the felt packing washers, and repack with new grease. The transmission units, also, will be benefited with draining out the grease, flushing with kerosene, and refilling with new lubricant."

Cream—Factors Affecting Composition.

The variations that occur in the composition of cream are chiefly the result of its treatment. They are mainly caused by—

- (1) The speed at which the separator bowl is turned.
- (2) The rate at which milk is allowed to flow into the bowl.
- (3) The position of the cream screw in the hood of the bowl.
- (4) The temperature at which the milk is separated.
- (5) The condition of the milk to be separated.
- (6) Mechanical efficiency of the separator.

If the speed is too high the cream is thicker and the test higher; if the speed is low the reverse is the case. An even speed at the specified rate should be maintained.

The faster the milk is allowed to flow into the separator the thinner the cream will be, and the lower the test. Each machine should be fitted with a tinned metal float, which, placed in the top cover, fits into the outlet of the milk vat and regulates an even flow of milk into the bowl.

If the cream screw is turned inwards the cream becomes thicker; if turned outwards the opposite effect is obtained, and the test becomes lower.

Using an excessive quantity of skim-milk or water to flush out the machine when finishing separating will reduce the fat percentage in the cream.

Milk should be separated at about blood-heat—i.e., 90 to 100 deg. Fahr.

A Formula for Whitewash.

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." 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.

Food Value of Wholemeal.

The virtues of whole wheat and some means of utilising it formed the subject of a recent talk over the air by the Assistant Organiser of the New South Wales Agricultural Bureau. The food value of wholemeal was greatly superior to that of the refined white article, pointed out the speaker, and on economic grounds, therefore, its use was to be preferred. The home-ground product was especially recommended, a point to be noted by housewives in wheatgrowing communities. While the total amount of grain so diverted from the market might not be very substantial, prevailing wheat prices would seem to constitute a reason for meeting domestic requirements from the farm rather than from the store.

The main reason why wholemeal had not come into more general use, said the speaker, was because white bread had been easy to obtain. We had cultivated such a taste for it, and had grown so to look on it as part of our everyday life, that retailers had hesitated to attempt to displace it with the more nutritious though perhaps slightly less attractive wholemeal product. Those people, however, who had cultivated a taste for the latter eventually preferred it and found that it had properties distinctly conducive to health.

As its keeping qualities were not as high as those of white flour, the home-ground article was especially to be recommended. A small coffee mill or a modern meat-mincing machine with fine adjustment might be used for grinding, while mills specially for the purpose were procurable at quite a small cost, but the ordinary grain crushing machines used on the farm could be availed of with quite satisfactory results. Two crushings were generally necessary to reduce the meal to the required degree of fineness.

Good porridge meal could also be made from whole wheat; this need not be so finely ground as that used for wholemeal flour. It was advisable, however, to soak the porridge meal for twelve hours or longer in water to which a little salt had been added. If it was considered that the bran in either the porridge meal or the flour detracted from the appearance of the finished article or that it was difficult to digest it could be removed by sifting, but for persons of normal constitution this should not be necessary. The varieties of wheat recommended for the making of bread, biscuits, and porridge were Canberra, Waratah, Federation, Marshall's No. 3, Petatz Surprise, and Nabawa.

The housewife who had never used the wholemeal product might perhaps be a little disappointed with the results obtained at first, but after a little experimenting satisfaction was almost sure to be achieved. In order to cultivate a taste for wholemeal in the diet it might be as well to begin with to use white flour with the addition of only a little of the wholemeal, gradually increasing the proportion of the latter.

A RECIPE FOR WHOLEMEAL BREAD.

It is satisfactory to learn that interest in wholemeal cooking is gradually increasing. In response to the demand for "something new" in the way of recipes, some attractive ways of utilising this wholesome product will be published in next week's issue of these notes. Meanwhile the following recipe is given for wholemeal bread without yeast:—

Two cups white flour, two cups wholemeal flour, one teaspoon salt, two teaspoons cream of tartar, one teaspoon carbonate of soda, one tablespoon treacle dissolved in a cup of hot water. Mix all dry ingredients together, add a cup of milk to the water and treacle, and mix whole to a soft dough. Place in a covered tin and bake in a moderate oven for almost an hour, making sure that the centre is cooked.

The Farmer and His Money.

There came to us in the course of the month "The Ever Ready Farmers' and Graziers' Complete Account Book," one of the most useful publications of its kind that we have seen. It provides a simplified and complete method of keeping farm accounts, so simple, in fact, that any intelligent schoolboy could with its assistance do the job of tallying income and outgo, and making a permanent and easily checked record of every farm operation. No one enjoys filling up an income tax return, but with this system of account keeping the compilation of tax information is a very simple and accurate undertaking. In fact, under present conditions one could hardly imagine a more useful book, or one in which the various items could be set out more clearly and easily to understand. The book should prove an immense convenience, for it enables any farmer to not only fill up his income tax form accurately, but also to do that very necessary thing—keep a watchful eye on all his operations and every penny of his income and expenditure. From it, he can learn at a glance how he stands and what his general financial position is. The book is obviously the result of great care and study in its compilation. It is complete without being bulky, and makes a complicated operation delightfully simple.

Its thoroughness can be gauged from the fact that the thumb-nail index system of record covers every item associated with the land, carrying right through into a special section which enables taxation returns to be made up by merely adding totals. In his comment on it, Mr. H. E. Flower, Secretary to the Queensland Primary Producers' Co-operative Association Limited, a man of wide country banking experience, says: "Prepared on simple and sound lines—an asset when dealing with financial affairs with the banks, and one that can be thoroughly recommended to anyone faced with the problem of taxation returns." The book is stiff bound, measures 10 inches by 12 inches, and covers five years' operations in its 320 pages. Its cost is three guineas.

Show Ring Manners.

At almost every stock show incidents occur which demonstrate the fact that exhibitors have paid little or no attention to the cultivation of manners in their stock. At the last Pukekohe Show, to take one example out of many, the judge of the Jersey classes, Mr. Jones, of Bell Block, had occasion to complain that a number of young stock—bulls and heifers—showed no evidence of having received any real schooling.

There is something repulsive in the spectacle of a young animal being dragged along by the neck—with the whites of its eyes standing out in affright or from sheer stubbornness—or of being prodded in the rear to force it into any required position.

When big classes are presented to the judge his preliminary inspection is made with the animals on parade, and if they have not been taught to lead properly the stock suffer an immediate and severe handicap. When a beast moves in a distracted condition, or proceeds jerkily, it is not to be wondered at if the judge is immediately and perhaps unconsciously prejudiced against it. If the animal is huddled up, or keeps continuously straining at its halter, it is impossible to form a quick judgment of its merits. The top line, let us say, is a very important point in show stock, and nothing displays that quality so convincingly as well-balanced movements in marching on parade.

It takes time, stock sense, and patience to train a young animal to lead properly. But apart from the show ring itself, it is time well spent, for the acquisition is worth a great deal to the owner later on in the ordinary management of the herd. In the show ring good manners are a definite asset, and without them an exhibit has much less chance of being placed amongst the bunch that is provisionally selected, and from which the final choice is to be made. An easy composure and a ready obedience to halter guidance immediately predispose most judges in favour of the animals possessing those virtues.

In the case of heifers especially the handling and training they receive during a painstaking schooling stand them in good stead in after life in the dairy herd. The training not only makes for the thrift of the animal itself, but enormously eases the task of those who are responsible for its future profit and well-being. For these reasons alone intending exhibitors should see to it that the manners of their stock are rendered as nearly perfect as possible. The benefits accruing will not only be realised in the daily advantages on the farm, but their prospects of success in the show ring will be vastly enhanced.—"New Zealand Farm and Stock Journal."

Australians on Gallipoli—Ian Hamilton's Tribute.

General Sir Ian Hamilton (Commander of the British Forces at Gallipoli in 1915), addressing the Anzac Fellowship of Women, at Australia House, said that the significance of Anzac Day had not dwindled as the years passed. There was a larger crowd at the cenotaph than ever before. Some good came even from war, for without Gallipoli, where the Anzacs formed the most magnificent contingent of men on whom the world had ever set eyes, other countries would never have known the fighting qualities of those who were born beneath the Southern Cross.

Sump Oil for Killing Lice on Pigs.

A friend at Norfolk Island writes that as he has noticed our references to the destruction of lice on pigs by the use of various mixtures, he thought it would be of interest to make known a method which he finds satisfactory.

He advises that he has met with great success by using the waste oil from the sump of his motor car or lorry, this oil being mixed with a small quantity of kerosene and freely applied to the skin of the pigs infested with lice. Many farmers have cars or trucks nowadays and when changing their oil they will find the old oil most useful for freeing his pigs from these blood-sucking parasites. This oil is not so useful for white pigs, as it stains their coats and skin and makes them look unsightly, but is excellent for black, red, or dark spotted pigs. It is a cheap and effective remedy.

Mothers of Men.

In memory of his mother, "his guiding star," Sir Thomas Lipton has given £10,000 for the poor mothers and children of Glasgow. Men who have done big things, who achieve success, who contribute to the world's thought or action, are almost invariably ready to acknowledge openly and generously their debt to their mothers, says an exchange. Men like Edison and Ford have done so. And why not? Every man, whether he becomes a humble clerk or a world-famous general, a chimney-sweep, or a philosopher, owes more than he can calculate to his mother. The loss of a mother in the early years of a boy's or girl's life is always, in some degree, irreparable. It is mothers who safeguard the future. They deserve the recognition of that fact. It is generally all the recognition they get. They do not appear—as mothers—in honour lists, and no flags are flown for them. But their work, their devotion, and their sacrifice are endless and immeasurable. Every man would be all the better if he offered a toast of thankfulness to his mother, or her memory, now and then. No man can say of his life and success, "Alone I did it."—*"Brisbane Courier."*

Preparing Land for Maize.

The initial ploughing is the most important operation in the preparation of the soil for maize, and on its thoroughness depends to a large extent the yield of the subsequent crop. Under most conditions this first ploughing should take place in the autumn or early winter. It is almost an invariable rule that, other things being equal, the land that has been given the longest preparation or fallow gives the best returns. Despite this fact, much of our maize land is still left unploughed during the winter months.

Land ploughed at the period indicated and left in the rough state during the winter is greatly benefited by the mellowing action of frosts, and is open to receive the winter rains, both of which penetrate more deeply into the soil and subsoil. This, with the greater aeration of the soil, materially improves the soil's chemical and physical character, especially if the ploughing be deep and thorough.

Where undulating land is left unploughed during the winter, much of the rainfall is lost by running off the hard surface. Most of this could be conserved if the land were deeply ploughed and left rough. On hillsides and where the winter rains are excessive it may be found advisable to plough the land in autumn and plant a cover crop like peas, clover, or rape to cover the ground during the winter and prevent erosion of the soil. In all cases where hillside land is cultivated it is preferable to plough and plant across the slope of the hills in order to save the soil from washing.

On flat lands that drain poorly recourse may often be had to ploughing the ground in narrow strips about 8 feet or 12 feet wide, on which two or three rows of maize are planted, with a "dead" furrow or open drain between each strip to carry off the surplus moisture.

Bacon for Bliss.

The Dunmow (Essex) custom of awarding a fitch of bacon to couples testifying to a year of unruffled happiness was at one time a solemn business. Who instituted it is not known; why he did so was still more mysterious. Some writers blame Lord Fitzwalter in the reign of Henry III. He is said to have decreed that "whatever married man did not repent of his marriage, or quarrel with his wife in a year and a day after it, should go to his priory and demand the bacon, on his swearing to the truth, kneeling on two stones in the churchyard."

Bacon, of course, may have been a priceless household commodity in the thirteenth century.

A Smart Answer.

It is said that order is one of heaven's first laws and a necessity in life.

Billy had become the proud owner of a pig for his pig club contest and insisted (as was quite right) on feeding and caring for it himself. After a few weeks' work his father noticed that the animal was not as fat as he thought it should be, so he remarked to Bill, "Look here, young feller, me lad, you are not feeding your pig enough, it doesn't seem to be fattening at all." "I don't want him to fatten yet," answered Billy, "I'm waiting until he gets as long as I want him, then I'll begin to widen him out."

Citrus Packing Points.

Exercise extreme care in handling.

Place fruit carefully in picking bags.

Carefully transfer fruit from picking bag to box.

See that the box has no protruding nails or splinters.

Do not jolt the fruit over rough roads.

Grade carefully for size and quality.

See that the sizing machine is functioning properly.

Use a clean case.

Pack neatly and tightly, but do not squeeze or jam fruit into boxes.

Stack cases on sides.

Stock Poisoning—The Effects of Cyanide of Potassium.

The Chief Veterinary Surgeon of the New South Wales Department of Agriculture (Mr. Max Henry), discussing the poisoning of animals with cyanide of potassium, says that the ingestion of cyanides in mortal doses leads to rapid death by cardiac arrest, although a death from cyanides may not be so rapid as would be the case if the pure drug were administered. It would depend upon the rate of decomposition of the cyanide in the stomach. Where death is somewhat delayed there is first a stimulant action of short duration.

The main symptoms noted in experiments at Glenfield Research Station were—(1) Very deep but regular respiration, usually occurring within two minutes of administration; (2) rapid and rather embarrassed respiration, usually occurring within five to ten minutes after administration; (3) salivation; (4) loss of power in the limbs, particularly the hindquarters, occurring in from seven to fifteen minutes after administration; (5) convulsive struggles while lying on the side, and may be respiration in great spasms; (6) gasping, respiration, and death in fifteen to fifty minutes.

In some of the cases at Glenfield there was a bluish coloration, but this was not regularly present. On most post mortem examinations it was found that the lesions varied to a considerable extent. In some cases the pathological changes seemed to be almost absent. The congestion of the lungs present in some cases was absent in others. At times there were some congestion of the mucosa of the gastro intestinal canal, at other times there was a generalised splanchnic congestion.

Regarding exposed baits and the suggestion that slower action might occur if the drug were weakened, Mr. Max Henry says experiments carried out indicated that small doses of cyanides given at regular intervals did not cause death unless the doses were given at such short intervals that the animals accumulated a lethal amount in the system, when the effect was the same as with an ordinary lethal dose. Cyanides, he adds, are rapidly eliminated from the system and do not have accumulative effect.

Protein Concentrates for Pigs.

Writing in regard to the use of protein concentrates in the feeding of pigs, Mr. S. E. Smith, a prominent farmer, of Hopevale, Bajool, Central Queensland, advises that since he has been including a proportion of protein concentrates and mineral matter in the food given to his pigs, he has been able to get his stock away at least one month earlier than was the case prior to the inclusion of these very necessary, flesh, bone, and blood-forming units to the food. His experience should be of interest to farmers who are having difficulty in getting their stock away at a reasonable age and weight.

The use of such foods, plus abundant supplies of green food, and fresh drinking water is always advised.

Points in Lamb Marking.

The main consideration in lamb-marking, apart from the prevention of actual mortality, is the avoidance of any decided check in the growth of the lamb. Lambs should be marked as early as possible so long as they are healthy and active; if the operation is left too long there is more chance of a setback from loss of blood. The operation should be performed in the morning so that the lamb will have the bulk of the day in which to find its mother. If it is left until late in the day losses are likely to occur, especially if the night is cold.

The sheep should be mustered some time before the operations commence and the lambs allowed to settle down. There should be no rushing about, and dogs should be used as little as possible, as deaths from hemorrhage are very common when lambs are marked in an excited and overheated condition.

Cleanliness is vital in lamb-marking—heavy losses from various infections take place annually through sheepowners' failure to recognise this fact. The knife used for docking and tailing calls for special attention. The most suitable type has the blade and handle all in one piece, but in any case it should be as plain and as sharp as possible, since germs may be harboured in joints or corners and even in cracks in the blade or in slight irregularities in the cutting edge. Prior to the commencement of the operations the knife should be boiled, and it should be carried to the yards in the liquid in which it was boiled. Throughout the marking the knife should be dipped as frequently as possible in a carbolic solution or other disinfectant; and whenever it is out of the operator's hand it should be allowed to remain in the disinfectant.

Dirty yards are a breeding ground for various dangerous organisms, and the choice of the site for the operation is therefore important. It should be perfectly dry and well away from dust and dirt so as to minimise the risk of losses from lockjaw and blood-poisoning, and if the flock is not too large it is best to use temporary yards made of movable hurdles of wire-netting and stakes, in a fresh paddock each year. With large flocks this is perhaps impracticable, and the following treatment of the yards is recommended:—Remove the surface soil of the yards to a depth of about 6 inches, and place it in a heap, where it should be thoroughly mixed with quick-lime; then saturate the fresh surface exposed with a strong solution of non-poisonous sheep dip.

In addition to the above precautionary measure it is essential to adopt some means of preventing the germs of disease from gaining entrance into the flesh-cuts made in the scrotum and tail. As the yards, although the main, are not the only source of infection, it is recommended that wounds of the scrotum and tail be either smeared with tar or dressed with carbolised oil (1 part of carbolic acid to 12 parts of oil) before the lamb is released after the operation. This is most important.

Lambs dead of tetanus or other of the inoculable diseases commonly contracted during marking, if not destroyed, form fresh centres of infection by absorption of the micro-organism by the earth. All carcasses should therefore be destroyed by burning.

When marking lambs in temporary yards or in a corner of a paddock, care must be taken that the ewes are not allowed to spread too far in the paddock before the lambs are released. Although it is inadvisable to keep the ewes and marked lambs in a yard for any length of time after marking, a little shepherding of the flock in the paddock will repay the owner by ensuring that the lamb obtains a drink of milk as soon as possible after the operation. Very often it is found that a number of lambs which are possibly more seriously affected by the operation will hang about the gates of the yard, and if the ewes are not kept handy for at least a little while these lambs will probably become isolated and lost.—*A. and P. Notes, New South Wales Department of Agriculture.*

Freak Pigs.

Following on a report of freak pigs in different parts of the world, it is of interest to note, that, on a recent visit to the Mount Alford district, in Queensland, Mr. Shelton, Senior Instructor in Pig Raising, saw a young pig with only three legs; one of the forelegs was missing altogether and the pig was able to move about with a reasonable degree of certainty, although, at time of inspection, he was but two or three days old and was one of a litter of twelve, owned by Mr. McNulty, a prominent farmer in that district. So interested were the residents that the pig was exhibited at Mount Alford Pig Club.

The Pig's Appetite.

The pig is a greedy feeder if he is healthy and active, but is a poor feeder if he is sick or indisposed. His appetite varies in accordance with his bodily spirits, and while in normal health he requires but little attention—when he is ill he is a very bad patient. His diet constitutes one of the most important factors concerned with the success attendant upon his production. He must eat large quantities of food to be able to grow and develop satisfactorily, and he must be able to assimilate his food properly in order to extract all the nutriment as it passes through his body. His health and rate of growth depends upon the character of the food given, while the quality of the food will be reflected in the quality of the flesh produced. If soft, oily food is fed, like an excess of peanuts, soft, oily pork will result; if bulky but poor quality food is given (like diluted buttermilk) a soft, flabby pork will result that will not set properly on slaughter. If rancid high-smelling food is used, the resultant pork will be of inferior flavour, while if his food is too dry and coarse digestive troubles ensue and his general health and well-being will be disturbed.

Milk provides a complete food for young life both human and animal, but when, say, skim milk is diluted with 50 per cent. of water it becomes useless as a food. One often notices farmers diluting whey and expecting good results. Whey in itself is purely sweetened water with a low food value and is not as useful as a pig food as is skim milk (undiluted). The chemical content of milk indicates its value in providing the wherewithal to build up healthy flesh for it has a good sugar and fat content, its nitrogenous content builds up flesh, while its mineral content supplies the necessary elements for making of bone and muscle. If milk is used, therefore, it must be of good quality and in liberal supply. Root crops like sweet potatoes need to be sound and of good quality.

Too many farmers refuse to give these to the pigs until they become rotten, and it is often the case with pumpkins, the pigs only get them when they are decaying and, of course, they are then of little or no value for pig food.

Good food, in liberal supply, at regular intervals, is necessary in order to strengthen the animal's body and enable it to make satisfactory growth.

Export of Pork.

In view of the prominence being given to the possibilities of the export of frozen pork, it is well to understand the position in so far as it relates to this grade of stock.

Porkers are pigs weighing from 80 lb. to 100 lb. live weight, and dressing out at from 65 lb. to 75 lb. or 80 lb. weight at about four and a-half to four and three-quarter months old. Porkers should be ready for market before they are five months of age if they are well fed and cared for, though numbers of porkers at five and six months of age reach the markets every year, these pigs being slow growing and not as profitable as they ought to be, though in actual practice they are often looked upon as being quite profitable.

There are three grades known, respectively, as light (50 lb. to 60 lb. dressed), medium (60 lb. to 75 lb. dressed), and heavy (75 lb. to 95 lb. dressed). Porkers usually realise from 36s. to 46s. each, at which price they should be profitable if farm-grown foods, plus a supply of concentrated meals and minerals, are being utilised, and if seasonal conditions favour rapid growth and early maturity.

At present numerous breeds and crosses are proving satisfactory, and there has been no special inquiry for any particular breed or cross, but the business is an extremely important one, and one that breeders should be keenly interested in, for as competition and supply increases the buyers will become more particular, and then only properly graded even lines of pigs will be considered.

Inspection by Commonwealth meat inspectors is very strict, and only the very best grades of porkers have any hope of being accepted for export. In consequence the percentage of rejects is very high, and these are also less profitable than they ought to be. It behoves pig breeders to be up and doing in regard to the export trade.

Treat the Stock with Kindness.

When farm animals, accustomed to kindness, have confidence in their master, both man and beast are spared many a wearing chase, says an Irish contemporary. Time and trouble in gathering them, or in removing them from place to place on the farm, are nothing compared with the labour and the time occupied in dealing with wild, timid, unhandled cattle; whilst the expenditure of food to bring to equal condition the beast that starts at every sight or sound, rises to prepare for escape on the approach of man, and is always on the look-out for disturbance, and the one that lies still, sleepily chewing its cud, never for one moment occupied with any kind of fear, is considerably greater in the case of the former than of the latter.

Pig Feeding Experiments.

One of the most up to date and progressive institutions in the world is the Harper-Adams College and Pig Feeding Experimental Station in Great Britain. Established in 1925-6 as a part of a co-ordinated scheme in experimental research it has been productive of much good in fostering the co-operative spirit between such institutions as the Animal Nutrition Research Institutes at Cambridge and Aberdeen respectively. Its primary object is to undertake co-operative experiments with the other centres included in the scheme of feeding problems which are undergoing more extensive study at the two research institutes. The experiments are mostly of an indoor nature, but are carried out on strictly practical lines. Principal Charles Crowther, M.A., Ph.D., indicates that extensive pig feeding experiments are in progress and that during recent years extensive additions have been made to the accommodation and plant to enable the work to be carried out more efficiently.

The Farm Horse.

Discussing the value of horses in economical farm production, Mr. E. B. Comans, honorary secretary of the New South Wales Section of the Commonwealth Clydesdale Horse Society, in a paper read at a recent farmers' gathering, referred to the growing demand for draught stock as a result of the prevailing adverse conditions and to the possibilities of horse-breeding.

Mr. Comans warned farmers against the haphazard methods of breeding that had been followed in the "good days" and urged more discrimination in the selection of breeding stock and more care in regard to the feeding of the young stock. As a means of ensuring the breeding of horses on the best lines some thought must be given to the selection of a stallion or stallions for a district. It was essential that entires free from hereditary unsoundness and of recognised pure breeding only should be used for stud purposes. It might not be possible for any one farmer to raise horses enough on his own farm to warrant him keeping an outstanding sire on the place, and the fee required might be too high for ordinary farm mares. Horse-raising had been most successful when only a comparatively few brood mares were kept on one farm and the mares were worked or kept well exercised and handled in such a way that both mare and foal could be given sufficient individual attention. Losses appeared to increase when a large number of mares were kept on the one place. If a mare was kept idle throughout the year and did not work, other than raise a foal, production costs were increased. A small number of mares under more direct control were more likely to give better returns than a large number which could not receive proper attention.

The Clydesdale type predominated in most districts, said Mr. Comans, and it should be the aim to improve on that type, which could be done only by persistently using the same breed. In this way only could the standard of the draught horse be raised, and it should be the object of every breeder to keep on "grading up" his horses, and by the use of purebred sires eventually to breed up to purebred standard.

In recent years some of the wheat-growing districts of New South Wales had built up a name for the standard of their draught stock, particularly Mudgee, Wyalong, Ariah Park, and Culcairn, whilst the Hawkesbury district (Windsor-Richmond) had again shown a disposition to become a centre for good stock. An extension of breeding on similar lines was required. What had been done in those districts it was possible for other districts to achieve. It was very simple and amounted to the use of purebred, sound, and prepotent stallions. In each instance the results had been achieved by the efforts of an enthusiast who had taken a good stallion into those districts. The farmers supported him, and for years past they had continued to support him, with the consequence that those districts stood high to-day in the standard of their horse stock.

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.

DANGERS UNTHOUGHT OF.

AMONG the diseases which are spread by germs distributed in the air by coughing are measles and whooping cough. They differ from the "common cold" in the lifelong protection which follows an attack, for second attacks are almost unknown. The infection is very certain, and very few escape. Children who have not suffered from them before become infected by their schoolmates or playfellows, and then take the disease home to their younger brothers and sisters. The younger the child the more serious the disease. Fortunately babies rarely contract measles; during the first year of life they inherit some natural protection. Unfortunately with whooping cough this is not so. The youngest and feeblest infant catches the disease.

Common Colds.

"Common colds" and influenza, which vary from the most trivial to the most fatal diseases, give very little and short protection. We may suffer from them repeatedly. They are spread mostly by adult carriers, and infections are most likely in crowded halls, such as picture shows, especially if these are ill ventilated. To take babies and young children to these entertainments is to expose them to dangers of which some mothers seem unconscious. For instance, not long ago a dance was held in a country township. Wrapped in blankets under the chairs lay babies, their nerves jangled with noises, their breathing partly choked by dust, inhaling whatever disease germs might be present in a mixed assemblage. It grieves us that dogs, cats, and kookaburras show more sense in the care of their young ones than do some human mothers.

Transference of Disease Germs.

In diphtheria and scarlet fever there is often no cough, and infection is not conveyed with the same certainty. It depends mostly on the transference of disease germs from the secretions of the mouth and nose by means of children's fingers. The infection is most often received from carriers or very mild cases, not from those who are evidently sick. We may say, as a rule, of any small child, that if its saliva were the colour of ink, its hands, face, clothes, and toys would be inkstained, and so would those of its playmates. It is therefore easy to understand how disease germs are conveyed from one to another. There are very good reasons for believing that other very serious diseases—meningitis, inflammation of the brain, and infantile paralysis—are spread in exactly the same way.

Dangerous Habits.

The baby in his first year, of course, puts his fingers into his mouth, but this is no danger to others, for, though he may receive infection in this way, he is himself free from disease germs until infected. But when he begins to run about with others he becomes a possible carrier, more dangerous each year as he grows older. Not until he has been some years at school does the ridicule and rough discipline of his fellows break him of his dangerous habits, and not then always completely, for we may frequently see relics of them in fully grown-up people. All this should be altered. Even in the first year the mother should see that finger-sucking does not become a habit. As soon as the child toddles, she should train him to keep his hands clean and dry from spittle and mucus. This is dangerous and harmful dirt though invisible. The visible dirt, which sticks to healthy little hands and faces is, in comparison, quite a harmless thing.

Dangers are not the least little bit lessened by being unthought of. So long as we break one of the laws of health, so long will Nature continue to exact her punishment. The fault is ours; it is our children whom she punishes.

THE COUNTRY WOMAN.

By arrangement with the Domestic Science and Technical Services of the Department of Public Instruction, information of especial interest to country women is published regularly under this heading.

SIMPLE COOKING.

IRISH STEW.

Materials—1 lb. neck chops or 1 lb. steak; $\frac{1}{2}$ lb. onions; 1 lb. potatoes; 1 table-spoonful flour; salt; pepper; 1 pint of cold water.

Utensils—Board; knife; bowl; cloth; saucepan; meat dish.

Method—

1. Wipe the meat; trim chops or cut steak into pieces; roll pieces in flour, pepper, and salt.
2. Put meat into a saucepan with water.
3. When the water boils, skim off fat and scum.
4. Wash and prepare the vegetables.
5. Slice the onion and cut potatoes into halves.
6. Put onions and seasoning on the meat.
7. Place the potatoes on the top.
8. Cook gently for $2\frac{1}{2}$ hours.
9. Add more water if required.
10. Place the meat on a hot dish.
11. Put potatoes round it.
12. Pour gravy over the meat.

SODA LOAF.

Materials— $\frac{1}{2}$ lb. flour; $\frac{1}{2}$ teaspoonful carbonate of soda; 1 teaspoonful cream of tartar; 1 teaspoonful dripping; $\frac{3}{4}$ cup milk; $\frac{1}{2}$ teaspoonful salt.

Utensils—Bowl; sieve; cup; brush; tin; cloth; board.

Method—

1. Sieve all dry ingredients into a bowl.
2. Rub dripping through with tips of fingers.
3. Add milk; make into a dry dough.
4. Form into a loaf; brush over with milk.
5. Bake in a hot oven for half an hour; wrap up in a clean cloth.

BOILED BEANS.

Materials— $\frac{1}{2}$ lb. beans; $1\frac{1}{2}$ pints of boiling water; $\frac{1}{2}$ teaspoonful salt; $\frac{1}{4}$ teaspoonful carbonate of soda; 1 teaspoonful butter.

Utensils—Bowl; saucepan; knife; vegetable dish.

Method—

1. Wash beans.
2. Remove sides and ends; slice finely.
3. Put into a saucepan of boiling water.
4. Add salt and soda; boil 10 minutes.
5. Strain; add butter and pepper; mix well; serve.

STEWED PRUNES.

Materials— $\frac{1}{2}$ lb. prunes; 1 cup water; 1 table-spoonful sugar.

Utensils—Basin; saucepan; spoon; glass dish.

Method—

1. Wash prunes; soak them over-night in a little water; strain.
2. Put strained water into a saucepan.
3. Pour in prunes.
4. Cook gently till tender; add sugar; boil up; allow to cool.
5. Lift prunes out; place in a glass dish.
6. Strain juice over prunes.

Note.—Other dried fruits may be cooked similarly.

BOILED EGGS.

Material—1 egg.

Utensils—Saucepan; egg cup.

Method—

1. Put saucepan of water on fire; when boiling, add egg.
2. Boil for 3 minutes.

SCRAMBLED EGG.

Materials—1 egg; 1 tablespoonful milk; $\frac{1}{4}$ teaspoonful chopped parsley; 1 pinch salt; 1 pinch pepper; piece of buttered toast.

Utensils—Saucepan; wooden spoon; knife.

Method—

1. Put milk into a saucepan; break egg into it.
2. Add salt, parsley, and pepper.
3. Place on fire; stir well for 2 minutes.
4. Place on buttered toast.

SAUSAGE ROLLS.

Materials— $\frac{1}{2}$ lb. mince meat; salt and pepper; 1 dessertspoonful flour. For pastry: $\frac{1}{4}$ lb. flour; $\frac{1}{4}$ teaspoonful salt; $\frac{1}{4}$ lb. dripping; $\frac{1}{2}$ cup water; 1 teaspoonful baking-powder; 1 teaspoonful milk for brushing over.

Utensils—Saucepan; bowl; sieve; brush; tin.

Pastry.

Method—

1. Sieve all dry ingredients into a bowl.
2. Rub dripping through with tips of fingers.
3. Add water; make into dry dough.
4. Knead; roll out; cut off edges; cut into squares.
5. Place meat at one end of each square; roll up.
6. Mark; brush over with milk.
7. Bake in a hot oven 20 minutes.

Meat.

1. Mince meat; put it into a saucepan.
 2. Add salt, pepper, and flour.
 3. Place on fire; cook till brown, stirring well.
- Quantities sufficient for 1 dozen rolls.

Note.—In most recipes, when possible, butter may be used instead of dripping or lard.

MADEIRA CAKE.

Materials— $\frac{1}{4}$ lb. dripping; $\frac{1}{4}$ lb. sugar; 3 eggs; 5 oz. flour; 1 teaspoonful baking-powder.

Utensils—Bowl; basin; sieve; wooden spoon; spoon; cake tin.

Method—

1. Put dripping and sugar into a bowl.
2. Beat till creamy.
3. Add eggs one by one, beating all the time.
4. Add flour sifted with baking-powder.
5. Put mixture into a well-greased tin.
6. Bake in a moderate oven for 1 hour.

Note.—A few drops of vanilla may be added after the flour.

CLARIFIED FAT.

Materials— $\frac{1}{2}$ lb. mixed fat or suet; $\frac{1}{2}$ pint water.

Utensils—Iron saucepan; iron spoon.

Method—

1. Remove any small pieces of meat from the fat.
2. Cut the fat into pieces, about 1 inch square.
3. Place in an old iron saucepan.
4. Add water; cook for half an hour with lid on.
5. Remove lid and stir frequently till all the water has evaporated.
6. Continue cooking and stirring till the fat is melted and looks like clear oil.
7. Strain, pressing the pieces well to extract all the fat.
8. Allow it to get cold; it should then be hard and white.

PEA SOUP.

Materials—6 oz. peas; 2 onions; 1 turnip; 1 carrot; 5 pints water; 2 tablespoonfuls flour; 2 dessertspoonfuls mint; bacon bones or rind; beef bones; pepper; 1 dessertspoonful salt; 2 slices toast.

Utensils—Saucepan; basin; spoon; knife; sieve; cup.

Method—

1. Wash peas and soak them over-night in cold water.
2. Put peas and water into a large saucepan; add bacon rind, salt, and water.
3. Remove the fat from bones; chop them up small and put them into saucepan.
4. Bring the contents of the saucepan slowly to the boil.
5. Peel or scrape, wash, and cut up the vegetables.
6. Put vegetables and spices into the saucepan; boil slowly for 3 hours.
7. Rub through a coarse sieve or colander.
8. Return to saucepan; bring to the boil.
9. Blend flour smoothly with cold water.
10. Stir into the soup and boil slowly for 3 minutes; add chopped or powdered mint.
11. Serve in hot soup tureen with small cubes of toast.

LAUNDRY WORK.

1. The washing day should be early in the week. Tuesday is a suitable day, because preparation may be made on Monday.

2. The boiler fire should be made ready before washing day; cinders and ashes should be removed, and the flue cleaned. Water must be put into the boiler before the fire is lighted. After use, the inside of the boiler should be cleaned and carefully dried.

3. An early start should be made to avoid heat and to take advantage of the morning sun for drying clothes.

4. Have soap jelly, blue, soda, and all necessaries at hand.

5. Clothes and articles used by sick persons should be disinfected before they are washed.

6. To disinfect clothes they should be soaked for several hours in cold water to which disinfectants, such as carbolic acid, phenyl, or kero, have been added.

7. Stains caused by paint, ink, fruit, mildew, ironrust, tea, coffee, or cocoa must be removed before clothes are soaked, because—

(a) Stains are more easily removed when fresh.

(b) Most stains are fixed by soap.

8. Chemicals or other substances used to remove stains must be washed out from fabrics quickly by repeated rinsing, otherwise the materials may be destroyed.

9. All articles except stockings and very dirty garments should be mended before being washed.

10. Rain water is best for laundry work, because it is soft. Soft water dissolves soap rapidly and produces a lather.

11. Hard water is wasteful because much soap must be used; it may be made soft by boiling, or by adding soda, borax, or ammonia.

12. Soaking or steeping is necessary in washing clothes; it loosens dirt and makes it easy to remove, without injuring fabrics by rubbing.

White clothes should be soaked in warm water to which has been added melted soap, soda, or borax. If possible allow clothes to soak over night.

13. Soiled parts, such as neckbands and wristbands, should be rubbed with soap in the soaking water.

14. Table linen should not be soaked with bed or body linen.

15. Table linen should be slightly stiffened with starch; the starch may be added to the rinsing water.

16. Soda or washing powder must be used to remove dirt from dusters; if coloured, they should be rinsed finally in water to which salt has been added.

17. Water to which ammonia has been added is used for washing silk, flannel, and woollen garments; it should never be used for coloured articles.

18. To 6 gallons of water add $\frac{1}{4}$ pint of soap jelly and 2 tablespoonfuls of liquid ammonia.

19. Ammonia should be kept in bottles with glass stoppers and great care must be exercised in its use.

LIST OF LAUNDRY UTENSILS.

Mangle.	Clothes-line
Set ferro-concrete tubs, or 3 galvanised iron tubs.	Props.
Washing boiler.	Enamelled basin.
Wringing machine.	Dipper.
Linen basket.	Scrubbing brush.
Clothes basket.	Bag for boiling small articles.
Drainer.	Knife.
Iron bucket.	Wooden spoon.
Washing board.	Copper stick.
Saucepan.	Pegs.

Note.—Utensils should be cleaned every week.

To Clean a Copper.

1. Remove water from copper.
2. Scrub sides and bottom, using sand soap or ashes.
3. Dry thoroughly.

To Clean and Oil a Mangle.

1. Oil tension screw, wheels, and working parts.
2. Wipe away superfluous oil and dust all metal parts.
3. Wipe rollers with a damp cloth.
4. Dry thoroughly.

To Make Soap Jelly.

Method—

1. Shred soap into a saucepan.
2. Cover with hot water.
3. Let stand for ten minutes.
4. Place over fire; stir till dissolved.

To Make a Blue Bag.

Method—

1. Place ball of blue in centre of flannel.
2. Cover with calico.
3. Tie tightly.

Materials—

Pieces 4 inches by 4 inches of white flannel and white calico; 6 inches white tape or cord.

To Make Blue Water.

Method—

1. Partly fill tub with water.
2. Dip the blue in its bag into the water; let it soak for half a minute.
3. Squeeze the blue bag; repeat till water held in the palm of the hand is slightly blue.

To Make Boiled Starch.

Method—

1. Put on a kettle of water to boil.
2. Place starch in an earthenware basin.
3. Mix it with cold water till starch is smooth.
4. Rub soap on hands in the blended starch till a lather is formed.
5. Stir starch well with an iron spoon.
6. Pour in boiling water, stirring well till starch becomes clear.
7. Dissolve borax in one tablespoonful of boiling water.
8. Mix it with starch.

Materials—

2 oz. or 2 tablespoonfuls starch; 4 tablespoonfuls cold water; enough soap to make a good lather; 1 quart of boiling water; $\frac{1}{2}$ teaspoonful borax.

Note.—If starch is not required at once it should be covered to prevent a skin forming on top.

To Make Cold Starch (1.).*Materials—*

1 tablespoonful of starch.
4 drops of turpentine, $\frac{1}{2}$ teaspoonful butter, or a piece of wax candle.
 $\frac{1}{2}$ teaspoonful borax.
 $\frac{1}{2}$ pint of cold water.

Method—

1. Mix the starch to a smooth paste with a little of the cold water.
2. Drop in the turpentine, butter, or wax.
3. Add the borax, previously dissolved in hot water.
4. Add remainder of cold water.

Stir well each time before use, as the starch sinks to the bottom. If the starch is good it settles into a solid cake.

Cold starch is always better if made a short time before it is needed; the standing softens the starch grains; they burst and swell when the heat of the iron is applied, entering the material and giving it the required stiffness.

To Make Cold Starch (2.).

1. Put starch into a bowl; add 3 cups of water; mix well.
2. Put borax, glycerine, and 3 cups of water into a saucepan; bring to the boil.
3. Add the boiling mixture to the blended starch; stir well; strain.

Materials—

6 cups water; 1 cup starch; 2 oz. lump borax; 1 teaspoonful glycerine.

REMOVAL OF STAINS.**Tea, Coffee, or Cocoa.***Method—*

1. Spread the stained part over a basin.
2. Rub well with powdered borax.
3. Pour boiling water through.
4. Soak the article in clean water.

Ink.*Method—*

- (a)
 1. Wet the stained material with peroxide of hydrogen.
 2. Allow the wet part to dry; repeat till the stain is removed.

FRUIT PRESERVING.

Fruits are composed of water, sugar, gum, acid, pectose, ethers, and essential oils.

The agreeable qualities of fruits depend upon—

1. The proportion of soluble matter mixed with tough fibrous matter.
2. The proportion in which sugar, gum, and pectose are mixed with acid.
3. The aroma, fragrance, or perfume due to ethers alone, or to ethers combined with essential oils.

Peaches, some plums, strawberries, mulberries, custard apples, and similar fruits contain a large amount of soluble matter; some kinds of mangoes are stringy because they contain a large proportion of insoluble matter.

Peaches and apricots carry a small amount of sugar in comparison with the free acid they contain; the acid, however, is not perceptible on account of the large

proportion of gum and pectose in these fruits. Gooseberries and currants (white, red, and black) are very acid because they contain relatively small amounts of gum and pectose.

Citrus fruits owe their aroma and flavour to ethers combined with essential oils.

When the juice of fruit is boiled with sugar the pectose in the presence of acid causes it to jelly; pectose is at its best for this purpose when the fruit is just ripe or immediately before it ripens.

Fruit-juice will not jelly—

1. If the fruit is over-ripe.
2. If the juice has fermented.
3. If the juice is boiled too long with the sugar.

Pectose produces pectin only in the presence of acid; hence if fruits which contain little acid are used to make jelly—

- (a) They must be made into jelly before they are ripe, or
- (b) They must have acid fruits mixed with them, or
- (c) They must have lemon juice, cream of tartar, or tartaric acid added to them.

To Preserve Fruit or Other Food.

1. Fruit, food, utensils, and jars must be sterilised by being brought to a temperature of 212 deg. Fahr.
2. Moisture must be removed by some drying process.
3. A preservative must be used.
4. The jars, cans, or other receptacles in which the food is to be kept must be sealed.

PRESERVATION OF FRUITS AND VEGETABLES GROWN IN QUEENSLAND.

Queensland Fruits and Vegetables suitable for Jam or Marmalade.

Note.—Those suitable for Jelly as well are *italicised*.

Fruit.	Time of Year in Season.
<i>Apple</i>	December to March.
Apricot	December and January.
Blackberry	
Cape Gooseberry	Practically all the year.
Cherry	November.
Choco	January to August.
Citron	April to September.
<i>Cucumber</i>	
<i>Cumquat</i>	April to September.
Damson	December to February.
Fig	November to March.
Gramma	From January to June.
Granadilla	Practically all the year in the North; heaviest crop, June to September.
<i>Grape</i>	December to March.
Greengage	December to February.
<i>Guava, Red</i>	January to February.
<i>Guava, Yellow</i>	January to March.
<i>Guava, White</i>	January to March.
<i>Jujube (China Apple)</i>	June and July.
<i>Kei Apple</i>	Autumn.
<i>Lemon</i>	March to September.
Lilly-pilly	June and July.
<i>Lime</i>	March to September.
Loquat	Early Spring.
Mandarin	April to September.
Mango	September to March.
Melon, Rock	Summer.
<i>Mint</i>	

Queensland Fruits and Vegetables suitable for Jam or Marmalade—continued.

Fruit.	Time of Year in Season.
Mulberry	Early Summer.
Nectarine	December and January.
Orange, Seville	May to September.
Orange, Sweet	March to December.
Passion Fruit	Summer and Winter crop.
Papaw	Heaviest early Summer.
Peach	December to March.
Pear	January and February.
Persimmon	December to May.
Pie-melon	Summer; melons should be stored for two or three months before use.
Pineapple	All the year; main crop Spring and January-February.
Plum	See Greengage.
Plum, Burdekin	June to August.
Pomelo	See Orange.
Prickly-pear	
Pumpkin	See Gramma.
Quince	February to March.
Rhubarb	Winter and Spring.
Rosella	February to April.
Shaddock	See Orange.
Strawberry	June to December.
Tomato	All the year.
Vegetable Marrow	Spring and Summer.

Queensland Fruits and Vegetables suitable for Sauces, Chutney, &c.

Fruit and Vegetables.	Time of Year in Season.
Artichokes	Autumn.
Beans, String	All the year.
Beetroot	All the year.
Cabbage	All the year.
Capsicum	Summer and Autumn.
Cauliflower	Early Spring.
Celery	Winter and Spring.
Chili	See Capsicum.
Cucumber	All the year.
Gherkins	All the year.
Horse-radish	All the year.
Mint	All the year.
Mushrooms	Whenever there is suitable rain.
Nasturtium	May to October.
Olive	February and March.
Onion	Main crop, December and later.
Soy	Would ripen January and February.
Walnut	December.

Queensland Fruits, &c., suitable for Drying and Storing.

Fruit.	Time of Year in Season.
Almond	February .
Banana	All the year.
Cocoanuts	All the year.
Date	Not grown commercially.
Queensland Nut	Late Autumn and Winter.
Peas	Spring.
Beans	Summer and Autumn.

TIMES DURING WHICH CERTAIN FRUITS AND VEGETABLES MAY BE TREATED.

January and February.—Grape jam; Isabella grape jam; grape jelly; grape and apple jelly; grape and lemon jelly; grape syrup; preserved grapes; damson jam; damson sauce; damson butter; preserved damsons.

January to April.—Guava jelly.

February and March.—Quince jam; quince jelly; quince marmalade; preserved quinces; preserved mandarins; limejuice cordial; nut butter; banana chutney; noyau.

March and April.—Tomato jam; tomato sauce; green tomato chutney.

March to June.—Preserved pears; choko jam; prickly-pear jelly, pickled chokoes.

March to August.—Bush lemon jelly; bush lemon marmalade; lemon cheese.

March to September.—Marmalades: Seville or bitter oranges, sweet orange, lemon, grape fruit, shaddock, citron.

April and May (in North Queensland all the year).—Rosella jam; rosella jelly; rosella pickle; dried rosellas.

April to October.—Pickled beetroot, cauliflower, cucumber, chokoes, gherkins, onions; red cabbage; mixed pickles, piccalilli.

April to November.—Preserved cumquats; cumquat marmalade; lime jelly; candied lemon peel.

May to September.—Stuffed oranges in syrup; orange slices in syrup.

June and July.—Burdekin plum jelly; jujube apple jelly.

July and August.—Melon and ginger jam; melon and lemon jam; melon and orange jelly; melon and tomato jam; mock ginger; pie-melon chutney; pumpkin or gramma jam; vegetable marrow jam.

July to November.—Strawberry jam; strawberry conserve; strawberry syrup.

August and September.—Cape gooseberry jam.

September.—Loquat jam; loquat jelly.

September to April.—Smooth-leaved pineapple jam, preserved pineapples, crystallised pineapples.

November.—Cherry jam; crystallised cherries; granadilla jam; pickled walnuts.

November to February.—Apricot jam; dried apricots, peaches or plums; dried apricot jam; preserved apricots, peaches, nectarines, or plums; crystallised apricots; plum jam; peach jam; peach conserve; plum sauce; macedoine of fruit; passion fruit jam; fruit mince meat.

November to March.—Preserved mangoes; mango chutney; mango sauce.

November to April.—Papaw and apple jam; papaw and pineapple jam; preserved papaw; papaw chutney.

December to February.—Apple jelly; apple ginger; apple marmalade; preserved apples; Brazilian cherry jelly; rhubarb and apple jam; Kei apple jelly.

December to March.—Fig jam.

FLOWER GARDEN.

All the roses should have been pruned some time ago, but do not forget to look over them occasionally, and encourage them in the way they should go by rubbing off any shoots which tend to grow towards the centre. Where there is a fine young shoot growing in the right direction, cut off the old parent branch which it will replace. If this work is done gradually, it will save a great deal of hacking and sawing when next pruning season arrives. Trim and repair the lawns. Plant out antirrhinums (snapdragons), pansies, hollyhocks, verbenas, petunias, &c. Sow zinnias, amaranthus, balsam, chrysanthemum, marigolds, cosmos, coxcombs, phloxes, sweet peas, lupins; and plant gladiolus, tuberose, amaryllis, pancratium, ismene, erinums, belladonna, lily, and other bulbs. In the case of dahlias, however, it will be better to place them in some warm, moist spot, where they will start gently and be ready to plant out in a month or two. It must be remembered that this is the driest of our months. During thirty-eight years the average number of rainy days in August was seven, and the mean average rainfall 2.63 in., and for September 2.07, increasing gradually to a rainfall of 7.69 in. in February.

POULTRY ON THE FARM.

THE care of poultry on the farm is usually left to the women folk, and they look on the return from eggs as a source of pin money. As a rule the hens have to shift for a living, picking up what scraps they can get hold of, and perhaps get a feed of grain in the evenings. The average flock of fowls on a farm is usually a very mixed lot; here and there one finds the exception in a flock of purebred birds, well looked after and paying a handsome return to the owner.

The up-to-date farmer and his sons long ago decided to head his herd with a purebred sire; and only the best bred animals available are used on the farm. Why not follow their example and introduce to the poultry flock a purebred utility bird, or purchase some purebred day-old chicks and thus eventually own a flock of fowls to be proud of? It is unwise to keep more than one variety of fowls, and once your mind is made up as to what variety to keep, stick to it. If Leghorns or Orpingtons, or any other sort, stick to it. You will always do better with one breed than with two.

A question well worth considering is first crosses. Certain crosses make excellent table birds, and lay as many eggs as the purebred birds; the young cockerels always fetch a much higher price than the cockerels of the lighter breeds.

To get a handsome return for your poultry, proper methods of feeding should be adopted. The up-to-date poultry keeper finds that the only way to make poultry pay is to feed a balanced ration—that is, a certain amount of food daily which contains all that is necessary to keep each bird in perfect health, also to give her the necessary materials for egg production. A flock of good quality utility stock should give an average of 180 eggs per bird per annum; many flocks average much higher than this. Birds laying 180 every year would show a handsome profit after providing for the cost of food. Let us consider the profit on feeding 100 birds fed on a prepared laying mash, such as Denham's "X.L.N.T." which is specially prepared for fowls on free range and not confined to intensive houses. One hundred birds would require 12½ lb. of this mash daily, costing 7s. per week; the birds on free range will pick up during the day any amount of green stuff and would only require about 2 oz. of grain before going to their roost; a plentiful supply of clean water in a shady place must be provided, and shell grit must always be available. The return from 100 birds laying on an average 180 eggs each per annum, selling at an average price of 1s. per dozen, works out at £1 10s. per week. Is there anything on the farm that yields anything like so handsome a return for money spent on feed? A net profit of £1 3s. a week over cost of the laying mash would help to get the many things so much needed in the household, and the pleasure derived from keeping such a flock of birds is inestimable. Denhams Limited—manufacturers of the famous "D in diamond" Laying Mash, and "X.L.N.T." Laying Mash invite you to call and see the care used in the manufacture of all their stock foods, and any problem in connection with the care and feeding of live stock will receive their careful attention.

FLOWERING SHRUBS.

Lagerstroemia indica varieties.—There are many beautiful forms of this shrub on the market, and the finest varieties have been raised in Queensland—*L. Matthewsii* and *L. Earesiana*; the colours of both are lilac, but *Matthewsii* is the darker shade. The heads of bloom of both varieties attained a length of about 24 in., and the individual flowers are a couple of inches across. The plant may be grown in any small garden, and the size may be kept at the will of the gardener. Specimens growing in Brisbane range from a few feet high to 20 feet.

The plant stands severe trimming; in fact, it stands the knife so well that it can be grown almost any height by being cut back in July every year, like a grape vine. One of the finest specimens of *L. Matthewsii* can be seen growing on the river side of the Customs House garden. Plants are easily raised from cuttings taken from the previous year's wood and planted during July and August. Also plants well established may be purchased at any of the nurserymen's stores.

Gardenias.—In the earlier days of Brisbane there were few gardens without a gardenia; now they are rarely seen. *G. Thunbergii* is one of the varieties that should be grown. The flowers are pure white, exquisitely scented, and the foliage of all the varieties are a glossy green. These plants are not too fond of pruning, and should be allowed to grow in their own way. *Gardenia florida* is mostly grown

for florists' use, the flowers being perfect in form and not having the heavy perfume of the other varieties. All the gardenia family are subject to scale diseases, but are easily kept clean by occasional sprayings with boiler water that has plenty of soap in solution. The plants never attain any size, so are very useful in small gardens.

Oleander.—In the northern part of the State these plants flourish, and are much admired by visitors from the Southern States and overseas.

The plants attain a fair size if not kept within bounds. In some of our northern towns it is quite common to see plants 20 to 30 feet high, and of many colours. The plants are grown in Brisbane, but by a few only, yet they grow just as well here as in the North. The smaller growing varieties should be more extensively grown, and the pink "Carnea," white "Madonna," and carmine "Delphine" are all good old varieties.

When growing the plants in small gardens it is necessary from their earliest stages of growth to keep them well headed back, the young wood of the previous year being the flowering wood.

Lantana.—The small varieties of lantana are not in common with the pest scattered all over Queensland, and are very beautiful when trained as hedges or shrubs. The tangerine-coloured variety and the canary-yellow variety are the two usually grown in Southern Queensland. Splendid specimens of these are growing in the Botanic and Museum gardens. The plants flower for nine months of the year, and will grow in almost any soil and will stand fairly hard conditions.

LANDSCAPE GARDENING.

The landscape gardener must possess a good deal of artistic taste, as he deals with the landscape and its improvement. Should alterations be necessary, they must be carried out in as natural a manner as possible, and they must be in unison with the surrounding country. Any existing natural features may be made the most of.

If trees shut out a desirable view, they may with care be removed. Tree thinning also becomes necessary when some are spoiling others. It is better to have one good specimen than several poor ones. When tree planting, the gardener must look forward, and consider their size when maturity is reached.

Broad stretches of lawn may be broken up with shrubs or specimen trees, or beds of flowers. The character of the soil and the situation must be taken into consideration when planting. It is of no use to plant trees or shrubs that are not likely to succeed, and if doubtful ones are included they must be in positions where they can be easily replaced should they fail. The character of the dwelling must also be taken into consideration.

Vista making is an important part of landscape gardening, and to carry it out the various points of vantage have to be ascertained and their values determined. The outline of the landscape from the various vantage points must be undulating, not straight or unbroken, and though special hues in greenery may be made the most of, they must not be repeated until the eye wearies of them.

Paths should be as few as possible, and each should be made for some definite purpose. They should run in bold but graceful curves, especially when made of gravel.

If summer houses are included they should not stand out aggressively, and they should be covered with creepers as quickly as possible.

PROPAGATION BY CUTTINGS AND LEAVES.

The herbaceous character and free-growing nature of the majority of plants that are used for summer bedding renders their propagation easy. Large numbers of plants are required in as short a time as possible, and without the expenditure of much time or labour, and unless a plant is easily propagated it is of little value in the bedding department.

Autumn propagation is preferred for the more robust of these plants, cuttings at that time being both plentiful and vigorous and the season favourable for the quick production of roots. If the necessary preparation of beds, boxes, and soil has been

attended to, the whole of the cuttings may be put in during autumn and rooted before the cold weather comes. It may be laid down as a general rule that all stout, free-growing cuttings prefer a strong loamy soil, while those of a more delicate nature and that have fewer roots are safest when planted in light sandy soil containing a large proportion of leaf mould.

The cuttings should be planted firmly, in rows about 6 inches apart, and should receive a good watering as soon as planted, after which they will require little attention beyond the removal of dead leaves and a sprinkling of water overhead should the weather be dry. As soon as rooted, or at least before the approach of the cold, wet weather, they should be placed in boxes, pans, or pots, in which they are to winter. For smaller quantities it will be found best to plant the cuttings in shallow boxes, in which they may be allowed to remain until the spring.

Pentstemons, phloxes, pinks, antirrhinums, and a host of other bedding plants of robust constitution may be increased in the autumn in this way. Boxes are most convenient for these purposes. The bottom should be pierced with several holes an inch or more in diameter, and covered with an inch of ashes or crocks as drainage, the box being then filled with sandy soil, using loam, leaf mould, or whatever mixture the nature of the cuttings would require.

Under certain conditions buds are formed on the leaves of a large number of plants, such buds being called adventitious, to distinguish them from the stem or normal buds, which are found on all plants, and which are borne in the axils of the leaves. It is supposed that the leaves of a very large proportion of plants possess this power to develop extraordinary buds, and that their failing to do so when tested by the gardener is due to improper treatment rather than to absolute impotence in the leaf itself.

It is, however, only in a few cases that leaf-cuttings are resorted to for purposes of propagation. Such plants as begonias, gloxinias, and a few others of more or less succulent nature are the only ones for the increase of which leaf-cuttings are employed. Numerous other plants have proved capable of propagation by this means, some of them being not at all succulent-leaved, while on the other hand, plants of excessive succulence have proved unable to form buds when tested in the same way. In some cases where leaf-cuttings have been tried, roots were freely developed but no bud was formed. Camellias may be mentioned as plants whose leaves root freely but do not develop buds, although left in the propagating house for several years.

Where it is desirable that a new plant should be propagated as abundantly and as rapidly as possible, it will be found often advantageous to place the leaves that are removed from stem cuttings in the propagating frame and treat as advised below. To anyone acquainted with the nature of the following list of plants, it will be apparent that no rule can be laid down for the guidance of the cultivator, either when based on the texture of the leaves or the nature of the plants. Begonias, cianthus, gesnera, gloxinia, hoya, liliun, watereress, and many others may be propagated by means of leaves or portions of leaves.

Turning now to the plants that are usually increased from cuttings made of leaves, a word may be said on the treatment such leaves require, and the best time of the year for the operation. Gloxinias may be dealt with all times of the year when leaves are available, the most favourable period being autumn. Well-matured leaves should be selected, avoiding those in which the yellowness of decay has appeared. The leaf-stalk may be severed at any point, it being unnecessary to secure them with heel or portion of the stem. The blade may then be divided longitudinally, so that a large leaf would form about half a dozen cuttings. It is, however, better when the blade is cut into sections, each section having a portion of the midrib attached to its base.

Some prefer severing the midrib into about a dozen pieces, leaving the blade intact. In this way a plant is obtained from each portion of the midrib, bulbils being developed on the lower end of each. Where the latter plan is adopted the whole leaf must be pegged on to a pan of sandy soil. If the leaf is divided up into smaller pieces, pots may be used, filling the pots half-full of drainage, and the other half with a light sandy soil. Into this the cuttings must be placed obliquely, so that whilst held firmly in the soil their bases are only a little below the surface. A frame in a propagating house will be the most suitable place for the cuttings till rooted. In a small bush-house a position on a shelf would answer equally well for gloxinia cuttings.

Begonias may be treated as suggested for gloxinias; or, if to be propagated on a large scale, a frame containing cocoanut fibre may be used, pegging the begonia leaves on to the fibre.

Reference may be made to the reproductive nature of some fern fronds, especially the aspidiums, nephrodiums, aspidiums, the fronds of which usually bear buds, which eventually form plants. The requirements of such leaves, when wanted for propagating purposes, are very much the same as those of the plants themselves.

The scales which form liliun bulbs may be used for propagation, as if fresh when gathered and placed in sandy soil they root and form small bulbs capable of growing into large plants. All these exceptional ways of obtaining a stock of plants are only resorted to in exceptional cases; they are chiefly of physiological interest, showing as they do how nature has provided plants with auxiliary powers for their reproduction, which are held in reserve till called upon by the failure of the normal proper means to fulfil the functions of increase or reproduction.

CLIMBING ROSES.

By S. B. WATKINS, President, Horticultural Society of Queensland.

AMONG climbing roses are included all roses other than the typical dwarf varieties, which are the most usual kinds found in our gardens. In the broadest sense of the term, then, the following classes are covered:—Normal climbers and the climbing sports of many well known dwarf varieties; climbing multiflora and certain extra vigorous sports from the dwarf multifloras; the wichurianas and ramblers; and certain rose species and closely related forms. Among this great array we have roses for almost every purpose outside the every-day garden dwarfs. Roses to put over trellises, arches, and pergolas; roses to cover fences, banks, and stumps; roses to run over dead trees and unsightly objects; roses to make bold splashes of colour in landscape work and impressive masses in odd corners. With such a variety at command, it would be possible by careful selection and judicious planting to develop a rose garden akin to the famous bougainvillea gardens of Mr. Thomas, at Indooroopilly.

The usual criticism levelled at the climbing rose is the question of room required for its development. This criticism is well founded in certain cases, but there are many climbers which can be grown successfully in any garden if careful selection and thoughtful treatment be given to the problem. Again, rosarians oftentimes object to climbers being shy in bloom and spasmodic in effect. Here again much can be done to overcome this fault. On the other hand, place against these objections the following advantages and the climbing rose will surely have claim to more consideration than is usual:

Firstly, climbers need less attention than dwarfs. They grow under much less favourable conditions of soil and situation; they withstand adversity more easily, particularly drought, and they resist disease better than the dwarf varieties. Their blooms are always more perfect in form and larger in size, for which reasons they are worthy of the best attention of exhibitors. Among climbers, blooms of every type are to be had from perfect singles in every shade through the derivatives to the most perfect of exhibition types. Cluster roses and polyantha types are also very common and in many cases the heads of bloom are enormous.

Many weak dwarf varieties have sported climbers of much greater relative vigour than their dwarf parents, as, for example, climbing Mrs. W. J. Grant (Belle Seibrecht), climbing Liberty, climbing Madame Edouard Herriot, and climbing Madame Segond Weber. In these cases it is better to select the climbers and treat as dwarfs by shortening back the heavy growths and inducing lateral growth with its resulting bloom.

In a few cases the climbing sports of weak dwarfs have inherited in some unknown way an extra vigorous constitution and are comparable in strength to the normal climbers. Such is the case with Perle des Jardines, Sunburst, Devoniensis, Mrs. Aaron Ward, and Paul Lede, besides many sports from the Pernetiana roses.

Mention of the climbing sports of Pernetiana roses is of particular interest to Queenslanders. This family of roses is not at home under Queensland conditions. In practically every case these roses are weak growers, much subject to "die back." Some will remember the delight with which Dame Edith Helen was hailed. More potent have been the regrets which have followed the course of "die back" in this rose, until to-day very few can boast of any real success with it. To-day, many dwarf pernetianas have sported climbing forms, and it is gratifying to find that the inherent weakness of the parent seems to have disappeared. I have climbing Madame Edouard Herriot treated as a dwarf. Climbing Los Angeles, climbing

Souvenir de George Pernet, climbing Souvenir de Claudius Pernet, climbing Golden Emblem, and climbing William Kordes, and they are at present healthy vigorous climbers, and in cases where blooms have been produced they have been of very fine quality.

Training the Climber.

The training of climbing roses is of great importance, particularly with respect to obtaining an adequate supply of blooms. Where growing the less vigorous climbers as dwarfs, it is necessary to encourage first lateral growth, as this is the growth on these roses which produces the blooms. By topping back the main shoots to about one-third of their ultimate length, lateral growth is encouraged and blooms will develop. Roses which can be so treated are climbing Liberty, climbing Geo. Schwartz, climbing Mrs. W. J. Grant or Belle Seibrecht, climbing La France, climbing Madame S. Weber, climbing Madame Edouard Herriot, climbing Chateau de Clos Vougeot, and climbing Hoosier Beauty.

In the case of the more vigorous climbers the blooms usually form on the second laterals, and the treatment given should encourage this growth. The long vigorous sappy basal shoots should be trained into as nearly a horizontal position as possible, care being taken not to break them from their base. These shoots may attain a length of from 12 to 20 feet or more. They require topping back to about two-thirds their mature length and securely fastening as close to the ground as possible. Very soon the first laterals will develop from the top eyes and these can be trained outwards and upwards at about 30 to 45 degrees to the main stem, and in their turn topped back to about half their maximum length, depending upon the structure against which they are grown. The blooms will develop upon the next growths, which are the second laterals, and the treatment advised will do much to encourage the development of this blooming wood. The art of securing blooms on climbing roses of this type consists in a suppression of the primary and first lateral growths to encourage good second laterals. Subsequent basal growth can be either tied down if room permits, or excised if the plant is carrying sufficient wood; judicious stopping is required with climbers, otherwise they will develop heavy growth and little bloom. It must be remembered that the majority of climbers in this section need about two to three years to establish the wood from which the real blooms come. Once established the rose will bloom periodically, and it is only necessary to cut the blooms close to the point where they leave the first laterals, and further blooms will develop in their turn.

If a high trellis, say, 6 to 7 feet, is used, or an extension above the usual fence height is constructed, a variation may be made. The heavy basal growths may be carried towards the top at an angle of 45 degrees and securely tied, with the necessary topping depending upon the proportions of the structure. First laterals may be tied securely in a horizontal position as they develop and shortened according to one's taste. Subsequent growths produce the blooms and by establishing a sound foundation of primary and secondary growths the blooms will develop in their turn.

Roses best treated in the way advised are:—Miss Marion Manifold, Countess of Stradbroke, climbing Madame Segond Weber, climbing Sunburst, climbing Madame Abel Chatenay, climbing Columbia, climbing Laurent Carle, climbing Lady Hillingdon, climbing Ophelia, climbing Radianee, climbing Golden Ophelia, climbing Mrs. H. Stevens, Sachsengruss, climbing General MacArthur, Souvenir de L. Viennot, climbing Perle des Jardines, climbing Irish Fireflame, climbing J. J. L. Mock, climbing Mrs. Aaron Ward, and several others found in the climbing lists.

Of those mentioned, I consider climbing Laurent Carle, Mrs. M. Manifold, climbing Columbia, climbing Madame Abel Chatenay, climbing Madame S. Weber, climbing Sunburst, climbing Mrs. H. Stevens, climbing Ophelia, climbing General MacArthur, and Sachsengruss are all worthy of interest.

Among the normal climbing varieties are a number of roses whose vigour defies all attempts to keep them within reasonable bounds. Such varieties should not be grown in small gardens without some knowledge concerning them. I refer particularly to climbing White Mamon Cochet, climbing Mamon Cochet (less vigorous than the white sport), Lady Waterlow, Black Boy, climbing Mrs. G. Sawyer, and climbing Devoniensis. The only place to grow these varieties is out in the open where they have plenty of room to develop. Any attempts at checking their robust habit is resented by these varieties, and they reply by pushing their growth even more strongly than before. Left to themselves they develop into very large bushes and carry in their own time hundreds of blooms which make them a striking feature in landscape gardening.

Covering Arches, Trellises, and Pergolas.

In covering arches, trellises, and pergolas, many people make mistakes in the selection of suitable roses for this purpose. The general class of climbing rose is not a suitable subject. Firstly, the absence of foliage on the lower parts of the growth is a disadvantage, and again these roses develop a growth which is not suitable to the purpose. As already mentioned, normal climbers require a definite treatment to secure success. The heavy growths require to be tied down and the structures referred to do not suit this requirement. Moreover, the lack of flexibility of the canes is against any considerable degree of intertwining. Fortunately, among the climbing Multiflora and Wichuriana classes are roses suitable to this purpose. One of the best is a German variety, Tausendschon (Thousand Beauties) sent out by Schmidt in 1906. This rose is a beautiful deep pink when it opens in the cold weather, but in Queensland it is usually paler; but even with this bleaching the rose remains a gem. It clothes itself from base to top with good foliage, and its canes and subsidiary growths can be trained perfectly to the structure on which it is growing. Mrs. F. W. Flight is another lovely pink variety suitable to this purpose, and produces the largest truss of any cluster rose I know. The Beacon also is a fine red variety suitable in this class.

In cases where trellises are very long or where lattice work on a house requires a good covering, the Wichuriana roses serve the purpose. Their extra long canes can be twisted in all directions and into all shapes. Whilst there are many people who favour the well-known Wichuriana, Dorothy Perkins, it has a number of disadvantages. It is not always certain in bloom, it mildews, and as a result loses its foliage, and it requires much patience and perseverance to train it as the long canes grow quickly. Varieties much more suitable are to be found in the following selection:—

American Pillar, a beautiful single pink with a white eye not nearly as rampant as many of this class, and more easily trained. It requires time to establish itself.

Excelsa, a rather vigorous variety carrying huge heads of a beautiful bright red colour. It is sure to bloom every year and is a very desirable variety in every way.

Heart of Gold, a moderate grower with an unusual coloured blossom. It is a deep crimson single rose with a white eye relieved by a beautiful aureole of deep golden yellow stamens, hence its name.

De France, a robust Wichuriana of recent introduction giving large trusses of a good red colour.

Romeo, the best of all in my experience, but almost too rampant for general purposes. It is a fine, deep-red flower in huge free clusters. It is most suitable where room is no object, on a bank or slope or over an old stump or tree.

These varieties, together with others of this class, are suitable for covering such unsightly objects as banks of rock, old dead trees, and difficult slopes. They can also be used to create bold masses in the garden and, in my own case, I have Romeo on a flat trellis which is about 3 feet off the ground and some 400 feet square. The long canes lie flat on this structure, and in this position they carry their beautiful blooms well above the foliage as a carpet of glowing red (a rather thorny, rough carpet). This method of training has the one disadvantage that the blooms are difficult to pick, and much ingenuity is required to reach the blooms. In creating further bold masses, many of the species or closely related varieties are deserving of attention. Among these stands Mermaid, a hybrid of Rosa Bracteata. This rose is an extra vigorous, extra thorny variety which is best left entirely to itself. Its deep yellow, single flowers are borne in clusters and, though only lasting a day, individually the clusters are effective for over a week, as individual blooms open each day. Moreover, the fallen petals leave a halo of yellow stamens which in no way detract from the beauty of the cluster. A vase of these clusters lasts many days, as the unopen buds develop in water just as well as on the tree. In this class are the Cherokee roses (*Rosa Laevigata*) known under the names of Sinica Alba, Sinica Anemone, and Romona. These develop into large, massive bushes under our conditions, and are covered completely by their respective blooms in the spring of each year. Then they are a sight never to be forgotten.

In conclusion, I would like to comment briefly on extra large bush roses, which are usually classified as climbers. The outstanding variety here is climbing Madame Cecil Brunner, which grown in the open develops into a large, symmetrical bush and, in its time, carries huge sprays of the most perfect miniature roses. It is a gem, and does very well when left to itself. Another rose which may be grown as a large bush is the Wichuriana, Dr. Huey. It does not possess the long, flexible canes

of its class, but develops long, arching canes which form the foundation for subsequent growth. This growth clothes itself with a profusion of deep, rich, red, semi-single roses of rare beauty. Paul's Scarlet Climber behaves similarly, and is a fine sight when covered with its bright scarlet bloom.

ONION BED.

It may be looking well ahead, but the onion bed for the next season should be prepared now. Onions require a deep soil—one where the roots can go well down; at the same time it should be firm. The consequence is that if trenching or deep digging is done, it should be done so that the ground can settle and get consolidated before the crop is planted or sown in spring. A good soil is required, but a soil heavily manured with stable manure will produce a large, bulky, but soft bulb that does not keep well. Potash is one ingredient that is absolutely necessary, and for this reason all ashes from wood and rubbish heaps should be scattered on the ground where the onion bed is to be. This can be done during the winter, as the soil holds the potash and does not leach out, as is the case with nitrogen.

KITCHEN GARDEN.

Nearly all spring and summer crops can now be planted. Here is a list of seeds and roots to be sown which will keep the market gardeners busy for some time: Carrots, parsnips, turnip, beet, lettuce, endive, salsify, radish, rhubarb, asparagus, Jerusalem artichoke, French beans, runner beans of all kinds, peas, parsley, tomato, egg-plant, sea-kale, cucumber, melon, pumpkin, globe artichokes. Set out any cabbage plants and kohlrabi that are ready. Towards the end of the month plant out tomatoes, melons, cucumbers, &c., which have been raised under cover. Support peas by sticks or wire-netting. Pinch off the tops of broad beans as they come into flower to make the beans set. Plough or dig up old cauliflower and cabbage beds, and let them lie in the rough for a month before replanting, so that the soil may get the benefit of the sun and air. Top-dressing, where vegetables have been planted out with fine stable manure, has a most beneficial effect on their growth, as it furnishes a mulch as well as supplies of plant food.

TRANSPLANTING FRUIT TREES.

The transplanting of partially developed fruit trees is seldom attempted on account of the risk of failure and the trouble entailed in endeavouring to retain sufficient fibrous roots to ensure a reasonable prospect of success. Trees up to five or six years old, where subject to the necessary preliminary treatment, can not only be removed without risk of failure, but transported satisfactorily over long distances. It will be recognised that the sustenance of the plant is absorbed by the small or fibrous roots in the immediate vicinity of their terminals, and by inducing a profusion of these within a short radius of the stem the chances of failure are practically nil. A profusion of small roots may be ensured by cutting through at the desired distance from the stem (15 to 24 inches, according to the size of the tree) all roots to a depth of 18 inches. In so doing a trench is made around the tree, and the ends of roots carefully pared if the cutting has not been "clean." The trench is then refilled with soil containing a good supply of humus, and in about three months' time the original root ends will have developed a good supply of fibres. At the time of removal these are not interfered with more than can be avoided, the necessary excavation for removing the tree from its original position and severance of any lower roots being made beyond the terminals of the young root growth. The head of a large tree should be materially shortened at the time of removal. The cutting of roots in the first instance should be performed when the tree is in a dormant state; in the case of citrus, conditions are generally favourable about March. Tropical varieties handled in this manner can be removed at almost any time after sufficient roots have formed and hardened, and may be first treated at any time of the year at the period known as "between growths."—GEO. WILLIAMS, Director of Fruit Culture.

Farm Notes for August.

Land which has been lying fallow in readiness for early spring sowing should now be receiving its final cultivation prior to seeding operations. Potato-planting will be in full swing this month, and in connection with this crop the prevention of fungoid diseases calls for special attention. Seed potatoes, if possible, should be selected from localities which are free from disease; they should be well sprouted, and, if possible, should not exceed 2 oz. in weight. Seed potatoes of this size are more economical to use than those large enough to necessitate cutting. If, however, none but large-sized seed are procurable, the tubers should be cut so that at least two well-developed eyes are left. The cut surfaces require to be well dusted with slacked lime, or wood ashes, as soon as possible after cutting. Where it is necessary to take action to prevent possible infection by fungoid disease, the dipping of potatoes in a solution of 1 pint of 40 per cent. formalin to 15 gallons of water, and immersing for one hour, will be found effective. Bags intended for the subsequent conveyance of tubers to the paddock should also be treated and thoroughly dried. After dipping, spread out the potatoes and thoroughly dry them before rebagging. Where the tubers are cut, the dipping is, of course, carried out prior to cutting.

Arrowroot, yams, ginger, and sugar-cane may be planted this month in localities where all danger from frosts is over.

Maize may be sown as a catch crop, providing, of course, that sufficient soil moisture is available.

Sweet-potato cuttings may also be planted out towards the end of the month.

Weeds will now begin to assert themselves with the advent of warmer weather; consequently cultivators and harrows should be kept going to keep down weed growths in growing crops and on land lying fallow, as well as on that in course of preparation for such crops as sorghums, millets, or panicums, maize, and summer-growing crops generally.

Tobacco seed may be sown on previously burnt and well prepared seed-beds.

Orchard Notes for August.

THE COASTAL DISTRICTS.

The bulk of citrus fruits, with the exception of late ripening varieties, will now have been marketed, and cultural operations, pruning, spraying, &c., should be receiving attention. Where trees show indication of impaired vigour, pruning should be heavy, both in respect of thinning and shortening branches. Where trees are vigorous and healthy a light thinning only will be necessary, except in the case of the Glen Retreat Mandarin, which in coastal lands is invariably disposed to produce a profusion of branches with consequent overproduction and weakening of the constitution of the tree in addition to the fruit being small and not of the best quality. Where white louse is present on the main stem (where it almost invariably makes its first appearance) or branches, spraying with lime sulphur solution in the proportion of one part of the concentrate to ten parts of water after the centre of the tree has been opened up by pruning will be found most beneficial.

In dealing with trees which show signs of failing, investigation should be made near the ground level for indications of collar rot, and in the North Coast district particularly, for the presence of the weevil root-borer which may attack the roots in the vicinity of the thin bases or at some feet distant. A very light application of paradichlor. buried a few inches under the soil in circles around the tree and the surface tamped firm is considered efficacious in destroying the pest. The distance between the circles (shallow openings connected throughout) should not be more than 18 inches. It may be necessary to repeat the application at three to four weeks' intervals.

Spraying with Bordeaux mixture is desirable as it will, if properly applied, destroy the spores of various fungi later attacking both foliage and fruit.

Where for any reason healthy trees of vigorous constitution are unprofitable they should now be headed back—in fact, the whole of the top removed, leaving only a few selected "arms" of previous branches, all other branches being cut clean away at their base. Three or four main arms, whose length will vary from 2 to 4 feet according to the size of the tree, will form the future head of the tree, and from

these numerous shoots will originate; these shoots in turn are reduced according to circumstances, usually from two to five on each arm, and given fair attention they will be in a fit condition to receive selected buds from a prolific tree by next autumn. It is advisable when the shoots intended for budding have attained a length of about 6 inches to nip off their terminals for the purpose of stiffening their growth, otherwise they are liable to be blown off by winds. All branches or parts removed in pruning should be carefully collected and burned. Applications against pests and disease could hardly be satisfactory if the material for reinfestation is available throughout the orchard.

Working the land is essential, and disc implements give best results. Before ploughing it is advisable to apply the necessary fertiliser, not just around the trees beneath their branches, but over the whole orchard, the feeding roots mainly extending beyond the extremities of the branches. The depth to which ploughing should be effected will depend on the nature of the soil and its original preparation. Where the subsoil is of a permeable nature, or has been broken up in the first instance, ploughing could be much deeper than on land where due consideration had not been given to this practice. It will also be noted that among some of our light loams that fertility is confined to a shallow depth, where it would be futile to persist in deep ploughing to force the roots into a subsoil from which they could derive but little sustenance. Following upon ploughing, the soil should be further treated until finely broken; the implement necessary will depend upon the constituency of the soil. Generally a good harrow will meet all requirements. On the completion of ploughing between rows an open furrow should not be left on the border or margin, but two or three furrows should be turned back to fill this and the whole then worked sufficiently to leave an even surface throughout the orchard. Except for the purpose of turning in fertilizer or green manure, a good type of disc cultivator can be substituted for the plough and will give at least an equal result.

The planting of trees may be continued and with the exception of custard apples (which should be left until the end of August) should be expedited. The attention of citrus growers should be confined mainly to good varieties like Jaffa and Siletta, with a lesser quantity of late Valencia. The preserving of orange juice will very materially assist in the absorption of our crop, and the fact that the trees develop much more rapidly in this State than in Southern producing regions is distinctly in our favour; also our fruit contains a much higher sugar content. This, however, is not to be accepted as an invitation to continue the practice of sending immature fruit to the Southern markets.

Grape vines should be pruned, and where cuttings for planting are required these should be selected, trimmed, and heeled in slightly damp soil. Canes intended for cuttings should not be allowed to lie about and dry out, but treated the day they are severed from the plant. Cuttings are frequently made of excessive length. Ten to twelve inches is a fair length, allowing for insertion in the soil to admit of the top bud with a short section of the internode to protrude. Growth is only desired from the upper or exposed bud.

THE GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS.

All pruning other than that applied to peaches and varieties which are late in coming into growth should be completed this month, and the planting of young trees, if not already done, should no longer be delayed. Early planting is preferred, the sooner after the fall of leaves the better. The time is opportune (when there is indication of the buds swelling) to work over (where the stock is reasonably vigorous) unprofitable trees. Strap grafting, as advised by the local field officers, is the most satisfactory method of top-working deciduous trees.

The pruning of vines should be postponed as long as circumstances permit, and these can only be gauged on actual observation as they are subject to much variation.

Late spraying against San José scale where present should be applied with an efficient oil emulsion before any growth appears. Each particular brand has its advocates. Where the scale is persistent, a 2 per cent. solution of Volck may be applied subsequent to the appearance of foliage. Both of these sprays are efficacious against peach or other aphid at a much reduced strength. One per cent. has given satisfactory results. The usual winter working of the land is essential for the retention of moisture and aeration of the soil, but in shallow soils in which many orchards are planted deep working is most detrimental. The matter of seedling stocks for apples and the inferior plants frequently received from Southern nurseries prompts a query as to how many seeds have been stratified for spring planting, and if any effort is being made towards raising a local supply of nursery stock.

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. MOONRISE.

Date.	July, 1931.		August, 1931.		July, 1931.	Aug., 1931.
	Rises.	Sets.	Rises.	Sets.	Rises.	Rises.
1	6.48	5.3	6.38	5.18	p.m. 6.9	p.m. 7.47
2	6.48	5.3	6.38	5.18	7.7	8.38
3	6.48	5.3	6.37	5.19	8.4	9.30
4	6.48	5.3	6.37	5.19	8.3	10.21
5	6.48	5.4	6.36	5.20	9.55	11.15
6	6.48	5.4	6.35	5.20	10.50	...
7	6.48	5.4	6.35	5.21	11.37	12.11
8	6.48	5.4	6.34	5.22	...	1.8
9	6.47	5.5	6.33	5.22	a.m. 12.29	2.7
10	6.47	5.5	6.32	5.23	1.24	3.5
11	6.47	5.6	6.31	5.23	2.22	4.7
12	6.47	5.7	6.30	5.24	3.22	5.5
13	6.46	5.7	6.29	5.24	4.22	5.58
14	6.46	5.8	6.28	5.25	5.22	6.45
15	6.46	5.9	6.27	5.25	6.23	7.23
16	6.46	5.9	6.26	5.25	7.19	7.53
17	6.45	5.10	6.26	5.26	8.8	8.23
18	6.45	5.10	6.25	5.27	8.50	9.7
19	6.45	5.11	6.24	5.27	9.25	9.41
20	6.44	5.11	6.23	5.28	9.59	10.19
21	6.44	5.12	6.22	5.28	10.32	11.6
22	6.44	5.12	6.21	5.29	11.5	11.57
23	6.43	5.13	6.20	5.29	11.43	12.54
24	6.43	5.13	6.19	5.30	p.m. 12.22	1.52
25	6.42	5.14	6.18	5.30	1.9	2.50
26	6.42	5.14	6.17	5.31	2.3	3.47
27	6.41	5.15	6.16	5.31	3.1	4.47
28	6.41	5.15	6.15	5.32	3.58	5.43
29	6.40	5.16	6.14	5.33	4.56	6.32
30	6.40	5.16	6.13	5.33	5.46	7.25
31	6.39	5.17	6.12	5.34	6.39	8.15

Phases of the Moon, Occultations, &c.

8 July	)	Last Quarter	9 51 a.m.
15 "	☉	New Moon	10 50 p.m.
22 "	☾	First Quarter	3 16 p.m.
29 "	☾	Full Moon	10 47 p.m.

Apogee, 7th July, at 12.30 a.m.

Perigee, 18th July, at 10.24 p.m.

On the 28th, about 6 p.m., the apparently very close proximity of Mercury to the bright star Regulus in Leo, above the western horizon, will form a very interesting spectacle for all observers with or without telescope or field glasses. The combination of a planet with a fixed star of the first magnitude is uncommon, and will afford a fine opportunity to make sure of the elusive planet Mercury.

On the 1st of July Mercury will set 5 minutes later than the Sun, and 1 hour 12 minutes later on the 15th, at Warwick.

Venus will rise at 5.45 a.m. on the 1st, and at 5.38 a.m. on the 15th.

Mars will rise at 10.32 a.m., and set at 9.53 p.m. on the 1st; on the 15th it will rise at 9.58 a.m. and set at 9.35 p.m.

Jupiter will rise at 8.3 a.m. and set at 6.26 p.m. on the 1st; on the 15th it will rise at 7.20 a.m. and set at 5.36 p.m.

Saturn will rise at 6.3 p.m. and set at 7.38 a.m. on the 1st; on the 15th it will rise at 5.1 p.m. and set at 6.40 a.m.

The Southern Cross will be erect about 5 p.m. on 15th July, and will reach the horizontal position, represented by III. on the clock face, about 11 p.m.

An article on "The Usefulness of the Southern Cross," with a diagram, was published in the "Queenslander," 14th May.

7 Aug.	)	Last Quarter	2 28 a.m.
14 "	☉	New Moon	6 27 a.m.
20 "	☾	First Quarter	9 36 p.m.
28 "	☾	Full Moon	1 10 p.m.

Apogee, 3rd August, 5.48 p.m., and
31st August, 7.24 a.m.

Perigee, 15th August, 7.54 p.m.

After sunset, on 1st August, the two brightest objects to first become visible near the western horizon will be Regulus and Mercury. Regulus will disappear at 6.54, then Mercury at 7.17. Neptune will also be in the immediate neighbourhood, or apparently so, but will require optical aid to make it visible. Mercury will be passing from west to east of a line joining the Earth and Neptune in the early morning of the 2nd.

If it were not for their nearness to the Sun the two brightest planets, Venus and Jupiter, would appear to be very close together, especially before sunrise on the 7th. These two planets will be up all day, and, setting shortly before the Sun, will be entirely absent from the evening sky. By the end of the month these planets will be widely separated by an apparent distance not far short of four times the length of the Southern Cross; Jupiter will then be the finest morning star.

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.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]