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THE GREAT SOLAR ECLIPSE.

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Written especially for the "Queensland Agricultural Journal."

All dwellers upon the land, and especially those who seldom or never see a picture show, should look forward to and make every possible preparation to observe the Great Solar Eclipse which will occur in the afternoon of Thursday, 21st September. Of all the grand phenomena of Nature none exceeds the magnificent spectacle which a total eclipse of the sun affords. It will be only in certain parts of Australia, of which Queensland in its southern portion will have a large share, that the full grandeur of totality will be observable; but more or less of the eclipse of the sun will be seen from every part of our island continent where the sky in the direction of the sun is free from clouds.

The places in Queensland where totality will occur—that is, where the moon will entirely cover every bit of the sun's face—lie between Beaudesert and Grafton on the east coast, and between Beetoota and Oontoo in the south-west. Whether the inhabitants of these two western towns will actually get the full effects of totality or, like Southport and Glen Innes, will have merely a very near approach to it, is somewhat doubtful. It will be of much interest if careful observations are made at both these western towns to enable this point to be decided. If the last scrap of the sun's brilliant surface disappears, there will be a momentary chance of seeing some of the great red prominences which occasionally leap out for many thousands of miles, and even the corona which extends much further from the sun, either completely surrounding it or noticeable in wide bands or streaks varying considerably at different total eclipses. At such places as Stanthorpe, St. George, Coongoola, Toompine, and the north-east corner of Durham Downs, the total phase will last for about three minutes, and the grandest features of the eclipse should be very well seen if favourable weather conditions prevail.

Those persons who are situated north of a line which can be drawn on a map through Beaudesert and Beetoota, or south of a line through Grafton and Oontoo, should go a few miles further south or north, as the case may be, to get well into the path of totality—a belt of land about 115 miles wide, between the two lastmentioned lines. Midway between them, on the central line which runs through Casino on the east coast and passes westwards about 4 miles south of Stanthorpe and the same distance north of Goondiwindi and south of Coongoola, will indicate the best positions for viewing the great phenomenon.

Heights, such as Stanthorpe affords, where there is a wide view of the landscape westwards and eastwards, form the best positions from which observers may see the great weird shadow cast by the moon rush towards them at a great speed. Then it will be quite safe to look up at the sun without coloured or smoked glass, which, however, should be provided to watch the first indication of the moon's encroachment. This will be about 3 o'clock in the afternoon; then for a little more than an hour it will

be interesting to notice through coloured (red and green combined) or smoked glass, the round face of the sun undergo the changes in shape which are presented by the moon each month between its phases from full to new, and vice versa for an hour or more after totality. More or less of this will be noticeable all over Australia, but to a very limited extent in far north-east or south-west. Only within, and perhaps near, the path of totality, will the strange shadow-bands be seen to flit over the landscape a little before totality takes place.

In the favoured zone, observers (men, women, and children—none should lose this splendid opportunity) should be careful to prevent their eyes being too much affected by glare so as to make them incapable of seeing the corona which can be seen to the best advantage by those who remain blindfolded for a few minutes beforehand. In his splendid popular work on astronomy, "The Story of the Heavens," the late Sir Robert Ball mentions that when the sky is clear during a total eclipse of the sun, the moon appears of an inky darkness, not like a screen, but like the huge black ball that it really is.

The sun and the moon are apparently about the same size. A threepenny piece held out at arm's length is apparently bigger than either, but Sir Robert Ball tells us that if the sun were cut up into a million pieces, each would be larger than the earth, and that "if the earth were cut into fifty pieces all equally large, then one of those pieces rolled into a globe would equal the size of the moon." Therefore the sun is more than 50,000,000 times the size of the moon. The comparative nearness of the moon to the earth and the enormous distance (fortunately) of the sun, of course, account for the apparent similarity in size. When, however, the eclipse takes place at the time of our spring equinox, the moon will look bigger than the sun, because it will be in that part of its slightly elliptical orbit, which brings it in perigee.

Thus a combination of favourable circumstances will give this occasion more than ordinary value for scientific purposes: one of which is to obtain for a second time a test of the correctness of Einstein's Relativity Theory of Gravitation. On the last occasion, when the apparent positions of stars which seemed to be nearly in a line with the sun during a total eclipse in 1919 were compared with positions photographed after the sun had moved from that position, sufficient evidence was afforded to fairly prove that Einstein is right. The rigid exactions of science make this second test one of considerable importance for that purpose alone. There are other reasons, such as obtaining more information on the nature of the sun's corona. Mrs. Todd, in her famous little book on Total Eclipses of the Sun, says, "It is told of the late Professor Snell, of Amherst College, that he once asked for a definition of the solar corona from a member of his class in Astronomy, who after a good deal of hesitation, and feeling desperately on the brink of utter failure, plunged into the statement that he *did* know what the corona was, but had forgotten. 'What an incalculable loss to science!' said the Professor, with characteristic humour; 'the only man who ever knew what the sun's corona is, and he has forgotten!' "

Although as an average there are about seventy total eclipses of the sun in a hundred years, their infrequency at any particular place, such as London, is remarkable, a period of over eight centuries having elapsed without one. Yet at the small island, Blanquilla, in the Carribean Sea, south of the Leeward Islands, two total eclipses were visible in the short space of three years, and it is probable that the total solar eclipse of 10th September, 1923, will be seen there also; in any case it will be visible as a very fine eclipse of the sun. So that it will be seen that eclipses, like kisses, go by favour.

During the total phase of our coming eclipse, which there is some reason to expect will be a *dark* one, the planets Saturn, Mercury, Jupiter, and Venus will be visible on the eastern side of the sun, Saturn being nearest (within two diameters of the moon), Mercury and Jupiter rather close together, but about as far from Saturn as it will be from the sun; then Venus, the most brilliant, about as far from Jupiter. Only those situated within the path of totality will be likely to see all these.

THE PHYSIOGRAPHY OF NORTHERN AUSTRALIA.—I.

BY DR. H. I. JENSEN, Geological Survey, Brisbane.

In this contribution I propose to give my own observations on Soils and Physiography in Queensland, and to Supplement observations made by myself and colleagues, Messrs. Gray and Winters, in the Northern Territory.

THE NORTHERN TERRITORY.

LITERATURE DEALING WITH N.T. PHYSIOGRAPHY.

1. Memoir No. 1, Advisory Council of Science and Industry, entitled, "The Australian Environment," by Dr. Griffith Taylor.

2. Bulletin No. 10 of The Northern Territory, published by the Commonwealth Department of Home and Territories, "Geological Report on the Darwin Mining District, the McArthur District, in the Barkly Tablelands," by Dr. Dr. H. I. Jensen, Chief Geologist.

3. Bulletin No. 14 (of the N.T.), "Report on the Country between Pine Creek and Tanami," by Dr. Jensen; "Reconnaissance of North West Arnheimland," by G. J. Gray, B.E., BSc.; "Observations on the Country between Pine Creek and Newcastle Waters," by R. J. Winters, F.G.S.

4. Bulletin No. 16 (of the N.T.), "The Geology of the Waggaman Province," by Dr. H. I. Jensen, G. J. Gray, and R. J. Winters.

5. Bulletin No. 19 (of the N.T.), "Report on the Geology of the Agicondi Province," by Dr. H. I. Jensen.

Much information briefly descriptive of Territory Physiography can be obtained from the foregoing.

The following are the principal points to be noted:—

1. The Northern Territory is a peneplain elevated in the Cainozoic period. Elevation commenced after the deposition of the Cretaceo-Eocene belemnite bearing beds. It has been a slow movement and persists even to the present day, except in the extreme north-east corner of the Territory, the English Company Islands, and the Carpentaria coast from Cape Wilberforce to Cape Gray.

2. The Northern Territory has undergone no compressional earth movements since the early Palæozoic period. Even Cambrian rocks are but slightly folded. Movements have been of the vertical, isostatic type. Late Palæozoic (Permo-Carboniferous) and Mesozoic rocks have been laid down during periods of marine transgression.

3. Evidences of Cainozoic uplift are obtained in the form of raised beaches on the west coast, in Tertiary beds and raised beaches on the north coast, and in raised beaches and in the advance of belar (*Casuarina glauca?*) over the mangroves (*Rhizophora* species) on the Gulf of Carpentaria coast south of Blue Mud Bay. Evidence of uplift can also be got in the nature of the river channels. The rivers are cutting down and in many places show distinct terraces. In places great canons have been cut, as in the case of the Upper Katherine and the McArthur Rivers, between Borroloola and McArthur Station. The principal rivers prior to the uplift and during the early stages of the uplift flowed north, but the present day principal drainage direction is east and west. Great river captures have been effected.

4. Climatically and in vegetation the Territory can be divided into three zones—

(A) *Coastal Plain.*—Sedimentary rocks and metamorphics alike on this zone capped with laterite, which is disintegrating owing to increasing moisture of climate. Rainfall, 45 to 65 inches in heavy tropical falls during wet months. Country lightly timbered with *Eucalyptus grandifolia, E. papuana, E. miniata, E. tetradonta, E. terminalis* and numerous species of *Acacia* (*A. auricaliformis, A. holosericla,* &c.), *Grevillea, Hakea, Careya* (cockatoo apple), *Buchanania, Gardenia, Eugenia, Alstonia,* &c. The soils are mostly very poor, and covered in the wet season with a dense growth of innutritious reed-like grasses, which should make good paper pulp, and grow to a height of from 6 to 14 feet. Whiteant (termite) nests abound, and in patches are of the "magnetic" variety—that is, flat structures elongated in the magnetic north-south direction. Tea Tree (*melaleuca*) swamps are abundant. The coast is fringed with mangrove (*Rhizophora,* &c.).

(B) *The Hill Country* usually from 100 to 200 miles from the coast but hugging the coast closer in the north-west and west. The metamorphic rocks and granites are dissected into rough hills, on many of which occur cappings (mesas) of table sandstone. These mesas are often capped with laterite which was once co-extensive with the coastal laterites. The rainfall ranges from 20 to 45 inches per annum. The vegetation consists of stunted forest in which *Eucalyptus alba* is a prominent member. Besides *Eucalyptus alba,* we have *E. Foelschiana, E. Spenceriana, E. latifolia, E. grandifolia, E. phœnicia, E. tetradonta, E. miniata, E. setosa, E. clavigera, E. dichromophloia, E. houseana, E. microtheca, E. ptycophylla,* and *E. melanophloia.* (This species has the character of a box except in the Wandi district, where is it an ironbark.*) We have also ironwood (*Erythrophloem Laboucherii*), *Calythrix, Verticordia, Acacia Bidwilli, Acacia holosericia, A. tumida, A. latifolia,* and many other

*Mr. J. H. Maiden, who is monographing the genus Eucalyptus, writes me that he is making a new species of this ironbark.

wattles. This belt is, however, typically the poplar gum (*E. alba*) belt, since on all alluvial flats *E. alba* is dominant. Stringybark (*E. tetradonta*) is typical principally of the most sandy, poor soils. A common wood in very sandy country is also quinine (*Petalostigma quadriloculare*), kapok (Bombax malabaricum (?).)

The soils are mostly poor. The grasses are better than on the coast, but cannot be called good feed for stock. "Magnetic" white ant nests are not met with, but the termite nests are of large size.

As we pass over on to the interior slopes the mesas of sandstone become clad with lancewood (*Acacia deratoxylon*), and belts if pine (*Callitris calcarata*).

(c) *Inland Areas.*—These areas are roughly divisible into—

(*a*) Plains, with rich black soils of limestone derivation and covered with Mitchell and Flinders grass, blue grass and blue bush. No forest trees are seen at all over large areas, but where trees occur the dominant timber is Bauhinia. Nutwood (*Grevillea gibbosa* (?)) belts also occur, also patches of *Eucalyptus pruinosa,* and along the watercourses mulga (*Acacia aneura*), gidyea (*Acacia cambagei*), and gutta-percha (*Excaccaria parvifolia*). Right in the midst of the blacksoil plains an occasional clump of whitewood (*Alstonia constricta* (?)) may be met with.

The plains country is the pick of the Territory from the pastoralists' viewpoint, but suface waters are scarce, although on the coastal fall most of the Victoria River basin is climatically and physiographically a part of the "Inland Area."

(*b*) *Desert Country.*—This is the local name for wooded poor country, such as occurs on sandstone, metamorphic, and granite areas. The grasses are useless for stock. The principal stock feed in the "desert" belts is bush, the leaves of hakea, capparis, &c. Occasional permanent billabongs are found, whereas the plains are destitute of natural waters, and rely on the subartesian.

The vegetation is a mixture of desert gum, mallee, wattle (*acacia*), wild orange (*capparis sp.*), emubush, beefwood (*hakea*), quinine (*petalostigma*), and other dry country genera.

The Eucalypts met with are solely of the desert type—*E. aspera, E. eudesmioides, E. pyriformis, E. oleosa* (?), *E. gamophylla, E. salmonophloia* (?), *E. macrocarpa, E. peltata, E. tetragona, E. salubris, E. odontocarpa, E. ptychocarpa,* and so on. In the Victoria River Country, West Australian types occur; in the Barkly Tableland, Queensland types.

White ant nests occur only in the desert areas. Flies are bad on the plains in the wet season.

The Coastal and Hill Country is tick infested, but the inland country is tick free.

A much fuller description of the country, and of the vegetation is given in a paper written by the writer in 1916, but which is still unpublished, as I left the Federal Government service soon after, and the report was too long and detailed to expect a scientific society to print. Besides a large number of maps illustrating the physiography were necessary, and I have not had time or the facilities since to finish this work.

5. The extreme north-east of the Territory is a subsiding area, as shown in Bulletin No. 10 of the Northern Territory.

6. The climate of the Territory seems to be growing wetter, as evidenced by the erosion and disintegration of the laterites.

7. The Territory is essentially a mining and pastoral country. It is unsuited for agriculture even with irrigation. The soils of the Coast and Hill Belts are too poor and the inland soils too heavy, and in any case the engineering difficulties in the way of irrigation are almost insuperable, especially to obtain a water supply.

8. The inland flora is very rich in essential oils which may in time be the source of a payable industry. The coastal grasses should be useful for paper pulp manufacture. Spinifex (*Triodia*) is the most abundant grass on the desert country. Poison bush (*Gastrolobium*) occurs in patches. Rolypoly (*Salsola*) is also a common herb. Many of the acacias, grevilleas, and hakeas are extremely spinose—the leaves terminating in a sharp horny point. Setose leaves characterise many of the Eucalypts, and angular branches and grooved seedpods are also common features of the inland flora.

[TO BE CONTINUED.]

SUGAR: FIELD REPORTS.

The Southern Field Assistant (Mr. J. C. Murray) reports under date 11th August, 1922, as follows:—

In the course of the month the districts of Bundaberg (Woongarra and Barolin), Bingera, Gin Gin, Bucca, Avondale, Fairymead, and Childers have been visited.

Woongarra.—The crops here have improved greatly during the last month. A fair amount of cultivation is at present being done, in preparation for the spring planting. Growers should have successful strikes, for the soil is now in a moist condition. Provided deep cultivation takes place there should be enough moisture in the ground to last some months without rain. Of the staple varieties, probably 1900 Seedling is looking the best. Other canes showing well are H.Q. 285, H.Q. 426, Badila, E.K. 1, Shahjahanpur No. 10, Q. 970, Q. 1098, and Q. 813. There is a great need for the growers to show a continued and intelligent interest in the different cane varieties, as there is always the danger that the canes upon which they are depending will become diseased, or otherwise deteriorate. Each farmer should have a small plot set apart for experiments with fertilisers and different canes, on what he considers a piece of soil typical of the rest of his farm. Absolutely conclusive results would follow, and if on raising his cane varieties he found one particularly suited for his farm, he could gradually work it in to the main areas as a change, if not to entirely displace one of his staple varieties.

On the Woongarra soils growers are advised to use green maize as well as cowpea and Mauritius bean for green manuring. Even if allowed to mature, maize is a very beneficial rotation crop.

Barolin.—On this area the cane has greatly improved during the last couple of months. The farmers have some good crops to cut now, whereas about mid-autumn their chances looked very ordinary indeed. A few frosts have occurred here lately, but owing to the increased resistance of the cane and the moist nature of the soil, these did very little damage. Still, frosts may come again here when conditions are not so favourable, and growers are advised to observe their cane carefully with a view to determining which are the most resistant. The Shahjahanpur No. 10 is recommended to the farmers in this respect, this cane lately showing considerable promise where careful plant selection has been studied. Another variety that should do well on the Barolin soil as a spring plant crop is E.K. 1. It is probable here than early spring planting generally would be the most favourable for the growers. Careful consideration should be given by growers to fertilisation of these soils. Green manures that should be beneficial are cowpea, Mauritius beans, Soya beans, velvet bean, and maize. Should ratoons be shy, a light dressing of sulphate of ammonia or nitrate of soda would be beneficial.

Bingera.—The cane in this district looks very well. Growers are going to take off some heavy crops as, in common with other districts, the tonnages have greatly increased during the last six weeks.

Canes presenting a good appearance are D. 1135, 1900 Seedling, N.G. 16, Q. 813, Malagache, and D. 156.

The young plant cane looks very healthy, and should make good growth during the ensuing months. There appears to be a marked absence of parasites that inhabit the soil, also fungoid or bacterial parasites. This is no doubt due, in the latter cases, to careful plant selection, and in the former instance to checking by thorough cultivation. Positive fertilising results are being obtained by the use of meatworks manures, ½ ton of bonedust per acre giving satisfactory results.

Gin Gin.—The farmers generally express themselves as satisfied with their prospects. The cane has responded wonderfully since the beginning of April. The farm drains and creeks are all running strongly, and everything indicates a good supply of sub-surface moisture to draw from during spring if the farmers can reach it by deep cultivation.

Varieties at present looking well are Black Innis, 1900 Seedling, and D. 1135. These three canes, especially the two latter ones, are the staple varieties, but the Demerara cane is rapidly losing its vigour. Growers should concentrate on experimenting with other varieties to displace this cane, for a period at least. In this respect it is recommended that they try Q. 813, E.K. 1, E.K. 28, and Q. 970. All these may be obtained at the distribution periods at the Bundaberg Sugar Experiment Station on application, if available Black Innis is a variety that is doing well on the high forest loams, growing to good length and early maturity. More green manuring is being done now on the Gin Gin areas than hitherto. As an instance of

the depth of soil found on typical Gin Gin farms, one farmer is sinking a well at present and has already gone through 30 feet of pure volcanic soil. Water is expected at about 45 feet.

The importance of plant selection as a method of combating disease and preventing deterioration is again impressed upon the farmers.

Bucca.—A brief visit was made to Bucca in the course of the month. The cane here looks very healthy, and good tonnages should result. New land is being broken up and planted, as well as areas that have not been cultivated for a number of years. On soils such as these, that have been used only for grazing, methodical green manuring should be undertaken. Lime is essential now on most of the Bucca land; in fact, practically all the land on this section of the Kolan River would have its texture improved and a greater availability of potash would be created by liming.

The growers are recommended to obtain and experiment with varieties such as E.K. 1, E.K. 2, E.K. 28, H.Q. 285, and Q. 970.

Avondale.—An outstanding feature of the crops here is the healthy and heavy crop of D. 1135. If some of this cane growing on the light loams at Avondale could be used as plants on the volcanic soils, it would probably show great improvement. The farmers here are busy cutting.

Uba cane is giving good tonnages, and the results of this variety are satisfactory. Two other canes looking well here are Q. 813 and D. 1135 Sport.

Nut grass is not causing any serious concern here, the growers tending the cane carefully until a certain age, when it defeats this noxious weed.

The borer parasite has practically disappeared; very few growers complain of any infestation.

Fairymead.—The cane looks remarkably well, with healthy top indicating the absence of leaf disease or fungoid parasites. Crushing is at present proceeding satisfactorily. Owing to the completeness of the plantation equipment, good cultivation is always carried out, powerful tractors making the disturbing of the soil to considerable depth an easy matter. The company is also doing good work with a tractor of the caterpillar type at Springhill. This machine travels at the rate of about three miles per hour, and gets over a lot of ground.

Varieties giving good results at Fairymead at present are Uba and D. 1135, these two canes being the staple varieties. Some very good samples of H.Q. 283 are at present coming to the mill from Mr. Scotney's farm at Moorlands, a variety that the company intends to partially plant on their land at Childers.

Childers.—Good tonnages of cane are in evidence, the growers expecting a small reduction on the original estimate. 1900 Seedling and D. 1135 are the canes most frequently met with, but on some farms Q. 1098, 813, 907, N.G. 87, and H.Q. 77 are making a good showing. Very little disease is noticeable in the cane at present, and the grub is not expected to cause much loss during the coming year.

The growers are advised to practise changing of plants as much as possible, because this has proved, as the result of visiting hundreds of farms in Queensland, to be effective in maintaining a cane variety true to type and resistant to disease, provided careful selection is carried out. Fertilising is being carried out fairly generally in the Childers district. From an analysis of a typical scrub loam soil it woud appear that a fertiliser consisting of 300 lb. sulphate of ammonia, 100 lb. potash, and 300 lb. bone meal per acre could be used to advantage. Dressings of sulphate of ammonia and nitrate of ammonia would probably be beneficial to backward ratoons. Good results have been obtained by a grower at North Isis by using 3½ cwt. bonedust per acre. This grower is increasing his application to 5 cwt. per acre. At present there is a great need in the Childers district for deeper cultivation, as there is a hard pan of earth formed on an average of about 10 inches below the surface which needs breaking. The mills are now in full swing with an adequate supply of efficient labour. No industrial disputes have arisen of any moment.

The Northern Field Assistant (Mr. E. H. Osborn) reports under date 8th August, 1922, as follows:—

Innisfail.—Upon my arrival in this district the weather conditions were unfavourable, as the rain then falling was accompanied by extremely cold winds. A fine spell set in early in the month, and harvesting operations were once again in full swing. Among the areas visited, some remarkably fine 17-months-old Badila was seen upon Mr. H. T. Stone's Daradgee farm. This land has not been under crop for a considerable time, and consists of a reddish to yellowish volcanic soil.

One of his paddocks is probably cutting at the rate of 55-60 tons of the acre, and in it is a Badila stool of twenty-six sticks showing nearly 8 feet of cane.

On Mr. C. McGowan's Daradgee farm some fine samples of cane of the newer varieties were seen.

Of these, H.Q. 458, E.K. 1, N.G. 16, and Q. 813 all show splendid growth for their age of 9 months. Mr. McGowan has gone to a great deal of trouble with his variety plant, and their vigorous growth reflects great credit upon him. In nearby paddocks consisting of heavier soils he is using both earth and burnt lime, and speaks well of the results.

Grubs have done very little damage to Daragee so far this year, but borers were noticed in several scattered places. On Upper Daradgee probably some 7,000 tons of cane from new land will be handled by the mill this year. The land was formerly growing bananas, and the higher portions of each farm consist of red volcanic, whilst some fine alluvial flats fronting the river form the balance. The ground has been stumped and is now under the plough. This group of farms looks particularly well, and some splendid Badila is being cut upon them.

Mourilyan.—The cane generally seems rather on the light side, the result, doubtless, of too much continuous wet last year, and the dry spell that was experienced during the growing months of the year. Not many grubs were noticed, but borers were fairly evident. A fair quantity of manure is being used in this particular district. Unfortunately the excessive cost of lime makes its use nearly prohibitive to farmers.

South Johnstone.—As in the surrounding districts, the crops generally were inclined to be on the light side, but in parts some fine cane was noticed, especially some of the red-soil farms.

On Mr. Callow's farm at Japoon some of the varieties from the Experiment Station were comparing more than favourably with the local canes. The varieties in point were E.K. 28, H. 109, and H.Q. 458. The latter looked extremely well in this particular soil (stiff clayey alluvial). Applications for new varieties to the Experiment Station are very numerous.

The most grub-affected part is the 17-mile. Here they have done a fair amount of damage on several farms, but unfortunately borers are much more in evidence all through the district than in any former year. As previously mentioned. the chief cane grown is Badila, and the borers have attacked standover, plants, and first ratoons most impartially, and have practically done the same amount of damage to cane grown on the clayey alluvial flats as to that upon the red volcanic soils. Again, it cannot be emphasised too strongly how very important it is to use none but perfectly healthy plants free from borers, when planting. Any grower who is careless in this respect is only courting trouble.

Lower Burdekin.—Owing to the very light fall of rain in March, April, and May, totalling 1.28 in., the prospects of a large crop for 1922 were unfortunately dispelled. At the end of June and early in July, rain totalling 2.69 inches fell, and prospects brightened. Fresh life was put into the growing crops, and a large area of land was got ready for an early planting.

The several mills, four in number, were in full swing. Quite a lot of building was in progress, and not many unemployed seemed to be about.

Kalamia.—Although a portion of the first cane sent in to this mill was very low in density, it is steadily improving. Some of the cane looks very well, notably some green Goru (24B) from Mr. C. Butterworth's irrigated farm. This should be cutting at the rate of about 45 tons to the acre. Unfortunately the grubs seem to be extending their operations considerably. Last year where they were only in one or two isolated patches on the south-eastern side of Plantation Creek, they have now covered a far larger area on that side, and also are to be seen upon the opposite side of the creek. Probably the recent very dry spell has enabled the grubs to do more damage than in an average season. So far very few borers have been observed.

Pioneer.—As in most of the local mills a fair proportion of the early-cut cane sent in to Pioneer was very low in density, but at time of writing it is improving considerably. Some good-looking cane is going through the rollers, namely B. 208, Red and Green Goru, and Badila. All through the Pioneer area a lot of land is being prepared for planting, and in several places some really good young plant cane was seen, notably at Dick's Bank, upon Mr. J. N. Pringle's farm.

At the Lower Burdekin Show the cane exhibits were remarkably fine. An interesting feature of the cane section was a total of twenty-four varieties of cane shown by Mr. Jas. Mackersie, in his very fine one-man farm exhibit.

"In the c.c.s. tests the awards were—

Owner.	Variety.	C.C.S. Weight of Cane (3 Sticks.)		Pounds c.c.s. in Cane.	Place.
	BADILA, H.Q 426, or B 208.				
Todd Bros.	Badila ..	15·8	28 lb.	4·42	First
Pringle, J. N.	B. 208 ..	17·8	23 ,,	4·09	Second
	OTHER VARIETIES.				
Todd Bros.	H.Q. 458 ..	1·32	38 lb.	5·01	First
Wellington, H. A.	M. 1900 ..	13·6	28 ,,	3·80	Second

Home Hill.—The distribution of plants from the experimental plot on the State Farm was carried out on the 26th instant. The varieties most asked for were M.Q. 1 (Mowbray Seedling), Hybrid No. 1, E.K. 28, and H. 109, whilst Q. 813, Q. 970, and Q. 903, 7 R. 428, and NG. 103 were wanted in smaller quantities. A very big demand for Tableland Badila is also being supplied from the station, the growers in this locality favouring this variety.

Giru (Haughton Valley).—A day was spent in this prosperous little centre, and it was quite noticeable how much it had gone ahead since my last visit. Unfortunately, having no irrigation system, it has suffered severely from the recent dry spell, the rainfall to date being as follows:—

January	6.99
February	17.19
March	2.75
April	.35
May	.23
June	.66
July	2.02
	30.19

Grubs are also much more numerous and more scattered than last year.

The growers who have used arsenic are still of the opinion that its use is beneficial. The most consistent advocate of its use is Mr. R. Wight. It will be remembered that in cane planted in 1920 he used poison at the rate of 40 lb. to the acre. Subsequently he cut a 38-ton crop off this block, although his other cane was badly grub-affected. He is now planting, and after covering the plant with a little soil, adds a dressing at the rate of 65 lb. of arsenic to the acre and then fills in the remainder of the soil. As all the farms here are unirrigated the grubs soon make their presence known in a dry season like the present. In the opinion of competent authorities, it would be advisable to form a pest fund for collecting beetles and grubs in any of the places that are suffering from such a pest, as although undoubtedly expensive, it certainly keeps the damage down. Several tractors were noticed at work in this area. The mill is said to be doing very good work, and although the density has been low, just now it is improving. A good area of young plant cane was observed, but, generally speaking, it was striking very slowly.

CANE PEST COMBAT AND CONTROL.

The following report (dated 15th August, 1922) has been received by the Director of Sugar Experiment Stations from the Entomologist (Mr. E. Jarvis) at Meringa, near Cairns:—

VISIT TO SOUTH JOHNSTONE.

A trip was made to this district on the 17th instant, with the objects of (1) investigating certain diseases of cane reported as occurring in the vicinity of the Johnstone River; (2) studying the insect pests of cane; and (3) fixing on suitable spots for liberation in the near future of tachinid fly parasites to combat the weevil-borer *Rhabdocnemis obscurus* Boisd., which on some plantations is doing a lot of damage.

On the whole the cane at South Johnstone was found to be particularly free from fungus or bacterial diseases, which have at times during prolonged wet weather occasioned serious losses in the Burdekin and other sugar centres.

Badila appear to be the variety mostly grown here, and certainly thrives luxuriously on the best classes of red soil.

The cane inspector (Mr. McCartney) drew my attention, for instance, to a block of plant Badila on which many stools carried from fifteen to nineteen sticks, 6 to 8 feet in length, and from 1½ to 2 inches thick. I desire to thank Mr. James Cran, Mr. P. H. McWalters, and Mr. A. C. Brackenburg for assistance rendered during my visit.

The following cane affections were noticed; all of them being of minor economic importance:—

(1) *Form of Dead Heart.*—About 5 per cent. of the cane on a small block of Badila planted last August was affected by a curious disease characterised by death or non-development of the central shoot, followed by an abnormal growth of the top buds, which varied from 6 to 12 inches in length. The inner surface of the upper leaf-sheaths was intensely red, although the leaves, for the most part, were of normal appearance. In some cases the central core yielded to a slight pull, when the basal portion was seen to be decayed and maladorous. Longitudinal sections of canes showed central discolouration of the terminal portion, but no gumming of any kind, and the rotting base of the dead heart, which was often situated 2 inches or more above the top core of the stick, presented the appearance of having in the first instance been broken transversely as a result of mechanical injury of some kind. A hollow space of an inch or more sometimes occurred behind this decayed end, while the lower portion of the dead heart, although not in any way decomposed, showed irregular patches and lines of red when sectioned lengthwise. It was noticed that one of the internodes, about 9 inches from the top of canes having this disease, was shorter than those immediately above and below it—an indication, perhaps, that growth had been checked at that particular point. A transverse section through this short internode revealed the presence of a decayed, brownish-yellow, core-like spot, or small cavity, about 4 mm. in diameter, with paler suffused margins, situated near the centre of the stalk, and extending about 1 inch in a longitudinal direction. In some cases the surrounding vascular bundles were also discoloured, appearing as watery yellowish-brown spots in cross-section. Possibly the central shoot may have been affected at this stage of growth, and resulted in a gradual development of dead heart later on. No indications of the occurrence either of moth-borers or leaf-eating insects were noticed. Examination of some of the diseased tissue taken from the decayed core occurring in the short internode showed that bacteria were absent.

(2) *Cane Rust* (*Uredo Kuhnii*) occurred in places, but very sparingly.

(3) *Eye Spot Disease* (*Cerospora sacchari*) associated with plants having dead hearts, but was not an invariable accompaniment of this affection, and occurred mostly on the older leaves.

(4) *Red Rot* (*Colletotrichum falcatum*).—Canes exhibiting this well-known disease were observable on some of the trucks. Fortunately injuries due to this fungus can be reduced to a minimum if care be taken to reject when planting any sets showing red discolouration at the cut ends.

(5) *Bunchy-top.*—A few isolated examples of this curious abnormal development of the upper leaves were observed among stools of Badila cane.

CANE BORER AT SOUTH JOHNSTONE.

The weevil-borer *Rhabdocnemis obscurus* Boisd. is causing much damage on some of the cane lands at South Johnstone, and during my visit to the district suitable spots for liberation in the near future of the tachinid fly parasite *Ceromasia sphenophori* were selected. It is hoped that the activities of this parasite may ultimately relieve the situation, although it is, of course, within the bounds of possibility that natural enemies or climatic influences may prove serious obstacles to its successful establishment. Long-continued damp conditions induced by the heavy rainfall might, for instance, enable the entomogenous fungus (*Empusa* sp.) to flourish through the wetter months of the year, in which case it would be likely to operate as a severe check on the increase of these useful parasites. The various species of 'jumping spiders,' and the ever-present black ant *Pheidole megacephala*, found commonly in our cane fields, will doubtless destroy a certain percentage of the flies, but losses from attacks of insect enemies are usually of minor importance compared to those brought about by vegetable parasites. However, we naturally hope for the best, and it may easily happen that the tachinid flies, after liberation, will spread rapidly and do good control work.

BACTERIAL DISEASES OF GRUBS.

On 12th June three grubs exhibiting a pinkish discoloration were collected from cane furrows at Meringa and kept under observation. Eleven days later one of these had developed a bacterial disease (B2), the internal organs of the grub having for the most part disappeared and been replaced by a blackish fluid. When held against a strong light the abdominal regions of the body were seen to be partially hollow, and the skin slightly distended by the action of internal gasses. Smears taken from this grub swarmed with motile rod-shaped bacteria, occurring generally in pairs, but often in chains of from three to five. Attempts to infect healthy grubs with this bacillus have not, so far, proved successful.

Grubs attacked by another form of bacterial disease (B3) (*coccobacillus* sp. (?)) the symptoms of which resembled those produced by *Coccobacillus nigrofasciens*, were obtained this month, smears taken and cultures made, slices of potato being used as a medium. Healthy grubs inoculated with this disease developed all the characteristic external signs of blackening around the spiracles after twenty-four hours, and succumbed within three to five days. The rod-shaped organism responsible for this disease differs from that of the preceding (B2) in being proportionately longer and occurring almost invariably in pairs. Grubs affected by it emit an exceedingly offensive odour.

A third cane-grub, displaying dull red patches on the sides of the body, and which had apparently died of some bacterial malady, was found upon examination to harbour multitudes of the *Coccobacillus* No. (B3), and another species, *Micrococcus* sp. (?) (B7). Colonies formed by the latter on slices of potato were of a decided red colour, while those derived from (B3) were creamy-yellow. Healthy grubs inoculated with the red bacillus (B7) remained normal, but Mr. Cottrell-Dormer, Assistant Entomologist, discovered that when they were inoculated with the two bacilli, mixed together in water, the virulence and activity of the *Coccobacillus* (B3) was greatly increased, and that grubs so treated died in about twenty-four hours.

We hope to find some simple and practical method of infecting cane-grubs with some suitable bacterial disease. This interesting phase of grub control has hitherto received little or no attention in Queensland, but nevertheless presents possibilities which should not be overlooked.

SOIL FUMIGANT FOR GRUBS.

Laboratory and preliminary field experiments with a certain soil fumigant gave very encouraging results, and a special report was published on same.

AN EFFICIENT SOIL-FUMIGANT FOR CANE GRUBS.

The following special report (dated 11th August, 1922) has been received from the Entomologist at Meringa (Mr. Edmund Jarvis) by the Director of the Bureau of Sugar Experiment Stations:—

In recent reports mention has been made from time to time of experimentation in connection with fumigants suitable for injection in a dry form, the ideal aimed at being discovery, if possible, of some substance that can be easily applied during the course of cultural operations, which is harmless to handle, and which possesses deterrent or killing properties of an enduring nature.

Many promising substances have been investigated here during the past six months, comprising various pungent oils and certain deadly poisons. The latter were combined in some cases with suitable chemical compounds in order that they might be handled with safety during field operations.

Several of these preparations yielded excellent results against caged grubs in our insectary, but when tested in the open did not altogether realise expectations. Nevertheless, some of them are considered good enough to warrant further study, and we hope to ultimately devise satisfactory methods of applying these deterrents in the field.

You will, however, be interested to learn that recent experiments here with a fumigant—the properties of which were first investigated by the writer seven years ago, whilst at Gordonvale (*see* "Queensland Agricultural Journal," June, 1915, p. 262) have given the best results so far obtained, both in laboratory and field work.

This substance, which is one of the halogen derivatives, known commercially as dichlorbenzole (para-dichlorobenzene), is said to be obtained by passing chlorine into benzine containing iodine or molybdenum pentachloride until a sample of the resultant fluid will partly crystallise on cooling.

The ultimate chemical derived, after washing and distillation, takes the form of irregular semi-transparent crystalline nodules of somewhat oily appearance, possessing a penetrating but not unpleasant odour very like that of ordinary benzine.

INITIAL EXPERIMENTATION.

As a preliminary test at Gordonvale laboratory in 1915, six grubs were confined in a cage holding 54 cubic inches of sifted soil, with which had been mixed 15 grains of the deterrent (1 oz. to 1 cubic foot). After two and a-half days all larvæ were dead and partially rotten. This experiment was repeated on three subsequent occasions, with similar results. Eighteen large grubs were then placed in an open cage containing 1 cubic foot of unsifted soil, infected with ½ oz. of coarsely crushed dichlorbenzole; and thirty-six hours later three had succumbed and the remainder were lying motionless as though paralysed, all dying in less than a fortnight. Tests were then applied to determine the effect on larvæ of isolated injections of the chemical in crushed form administered at various depths, and these trials proving satisfactory, it was decided to experiment in the open. A plot of ground was accordingly prepared on 3rd April, 1915, by being dug 9 inches deep, allowed to settle for a few days, and treated with a single line of ¼ oz. injections placed 1 foot apart, and 5 inches below the surface. Grubs of the grey-back cane-beetle were then buried in the soil at various distances from the chemical, each larva being confined in a specially designed cage, that whilst preventing extended movement in a horizontal direction allowed it to descend vertically to a depth of 9 inches or to ascend to within 1 inch of the surface, and at the same time ensured continuous natural conditions with respect to drainage, moisture, temperature, &c. Examined on the 12th instant (nine days later), the soil was found more or less impregnated with the odour of the deterrent to a distance of 1 foot on each side of injections. Larvæ placed at distances of 6 to 8 inches were dead and partially decomposed, those at 9 inches, dying, but able to move convulsively, and those 1 foot away alive and apparently normal. Grubs situated 9 inches from the chemical succumbed on the 18th instant (after fifteen days), whilst those 1 foot distant, and control specimens, continued unaffected throughout the experiment.

This test was repeated later, with practically identical results, and further trials, in which the injections were reduced to 80 grains, placed 1 foot 6 inches apart, also proved satisfactory.

Experiments conducted at Meringa last April in a field of first ratoons of D. 1135 proved just as successful as those carried out by the writer in 1915. Four stools were treated with doses varying from 2 to 8 scruples, placed 5 inches below the surface, and 2 to 5 inches from the cane sticks. When examined a week later all grubs within about 8 inches of the chemical were dead, while the odour had strongly impregnated the soil to a distance of about 9 inches on all sides of the 4 to 6 scruple injections. During the preceding fortnight the weather had been dry, but two days before making the experiment 0.06 inches of rain fell, and during the course of the experiment 0.12 inches. The soil was fairly damp throughout the week.

RATE OF EVAPORATION.

With reference to the rate of evaporation of dichlorbenzole, I observed that in dry weather, a quarter of an ounce (left fifteen days underground at a depth of 7 inches during an average temperature of 69 degrees Fahr.) lost nearly half its weight, but did not actually disappear until the end of six weeks. Under wet conditions both evaporation and soil infection were retarded.

Investigations being conducted at the present time in very damp closely packed soil, in a field of first ratoons, have shown that injections of 4 drachms lost half a drachm during a period of eighteen days, from which we may gather that under such conditions evaporation would continue during a space of about four months.

It is worth noting, however, that the deterrent odour remains in the ground long after all traces of its origin have vanished.

Soil under cane stools treated 5th March, 1915, was found strongly infected on 8th May, three weeks after complete evaporation, from which we may reasonably assume that a limited area of such contaminated soil—comprising, say, a strip at least a foot wide—would continue repellent until the odour became less decided.

METHODS OF APPLICATION.

Dichlorbenzole would prove an ideal fumigant for plant cane, as it could simply be put in the furrows with sets when planting, and if applied during November or December the odour would have ample time to penetrate and render the soil on each side of stools distasteful to the beetles and deter them from ovipositing in ground thus contaminated.

In the event of eggs being deposited near the plants, this fumigant would certainly kill any grubs that might hatch from them.

In seasons when it is possible to plant very early, a crop could be assured by using dichlorbenzole, even though the cane were planted on an area infested by grubs, at a time of year when they were doing their worst damage. The fumigant, however, would prevent them from touching the sets, and not only kill all that happened to occur in the immediate vicinity, but also protect the soil from further invasion until grubs had ceased feeding and all danger was over.

For application to ratoon crops the chemical could either be injected in the form of balls of the desired weight, or these be dropped at suitable intervals in a furrow made close against the line of stools to be treated. The best time for such application would be during December or January, before the cane got too high, the result being that all first and second stage grubs arising from eggs deposited in November and December would be killed before they were able to work appreciable damage.

COST OF APPLICATION.

During 1915 the price of dichlorbenzole was stated to be about 6d. per lb., but owing to its being manufactured only in Germany it was not easily procurable during the late war.

On the 16th of last June, however, I wrote to Berlin, inquiring the present price in bulk quantity, &c., and ordering enough of the chemical to enable us to carry out a field demonstration during the coming grub season.

Assuming the price to be 6d. per lb., it would cost less than £2 to treat one acre of cane with ½-oz. injections, but this is a matter which will need to be determined later.

Unlike arsenical and other poisonous preparations, dichlorbenzole possesses the great advantage of being harmless and clean to handle, while the odour arising from it is not in any way objectionable.

In no instance has experimentation with this fumigant been followed by noticeable injury to the growing cane plants. Sets of Badila planted immediately over injections made in open ground at the laboratory have rooted in the contaminated soil, and at the present time the growth above ground appears quite normal.

Apropos of the foregoing, the Agricultural Chemist (Mr. J. C. Brünnich) comments as follows:—

About 30 years ago I had good results in the Mackay district by fumigation of the cane stools in the field with bisulphate of carbon for the destruction of cane grubs. I at once saw the possibilities of using this new chemical for the same purpose, as it has great advantages over the former. Bisulphide of carbon (commercial) has a very disagreeable smell, is highly inflammable, evaporates very rapidly, and its vapours form explosive mixtures with air. Dichlorobenzene (para) has a not-unpleasant aromatic odour, is absolutely non-inflammable, evaporates very slowly, and is also practically non-poisonous to man.

I wrote to the "Agfa" company, mentioning the probable extensive use of the chemical for the killing of cane grubs, and, although, according to a notice printed on the labels, the export of this chemical to foreign countries was not permitted, they sent me two 7-lb. tins, free of charge, for experimenting, which were landed here just about the time war broke out. One of these tins I handed to Mr. Easterby, the Superintendent of Sugar Experiment Stations, and Mr. Jarvis, under his direction, made the first experiments, reported in June, 1915.

The present price of the pure chemical is 3s. per lb., but I have no doubt that a cruder product would be quite as efficient, and should be produced at greatly reduced cost. This chemical is invaluable for the destruction of moths, silverfish, and weevils in grain in confined spaces, and for the latter purpose it has the advantage over bisulphide of carbon, which hitherto was the only efficient remedy against grain weevils, that it does not appear to injure the germinating power of the seeds so treated. Experiments to prove this fact have been in progress for some considerable time at the seed laboratory. The odour of the chemical is very persistent, and if grain fumigated with it is fed to fowls, the eggs have a distinct flavour of the chemical.

OIL FROM SHALE.

In various parts of the world, including Australia, there are deposits of shale from which it is possible to distil oil on a commercial basis. An improvement on the usual process has just been introduced by a British engineer. The shale is powdered and heated until it is just about to give off vapour. It is then mixed in a retort with hot sand, which thus raises it to the temperature required for complete carbonisation, but does not raise it beyond the point at which all the volatile constituents will be distilled off. Tests made of this process show that no clinkering of the material takes place.

A SUMMARY OF SOME EXPERIMENTS CARRIED OUT BY THE BUREAU OF SUGAR EXPERIMENT STATIONS.—IV.

By H. T. EASTERBY, Director.

The first article of this series, in the course of which Mr. Easterby discussed deep cultivation experiments and tabulated comparative crop results from subsoiled and non-subsoiled fields, was published in the May journal. The second instalment was an account of the results of irrigation experiments and the action of irrigation and manures upon the density and purity of sugar juices, and appeared in the June issue. The third instalment, treating of experiments in fertilisation, appeared in the August journal.—Ed.

In 1905 experiments for determining the most suitable distances between the plants in the row and the widths of the cane rows were laid down. These comprised ten separate plots, and were as under:—

Date of Planting.	Variety Used.	Width between the Rows.	Width between the Plants in the Row. (Three eyes to each plant.)
April, 1905	N.G. 40	5 feet ..	Continuous cane
April, 1905	ditto	5 feet ..	6 inches
April, 1905	ditto	5 feet ..	12 inches
April, 1905	ditto	5 feet ..	18 inches
April, 1905	ditto	5 feet ..	24 inches
April, 1905	ditto	5 feet ..	36 inches
April, 1905	N.G. 24A	4 feet ..	6 inches
April, 1905	ditto	5 feet ..	6 inches
April, 1905	ditto	6 feet ..	6 inches
April, 1905	ditto	7 feet ..	6 inches

Before furnishing the analytical data and crop results from these experiments, two tables are given which set forth the number of plants per acre, the number of eyes per acre, and the weight of seed per acre, in the two series of tests now under discussion. The first series deals with the number of plants in the row, the distance between the rows in this series being uniformly 5 feet; and under the heading of "Weight of seed used per acre" it is seen that, while one continuous stick in the row used 2½ tons of seed per acre, the other extreme of 36 inches between the plants in the row used only half a ton of seed per acre. In the second series it is also shown that a distance between the rows of 4 feet used 1 ton 18 cwt. of seed per acre, while the distance of 7 feet between the rows used 1 ton 2 cwt. per acre. These data require to be kept in mind when the crop results are dealt with in a later place.

DISTANCE EXPERIMENTS.

CANE PLANTS USED PER ACRE.

FIRST SERIES.

Distance between the Plants.	Number of Plants per Acre.	Number of Eyes per Acre.	Weight of Seed used per Acre.
			Tons cwt.
1. Continuous stick in the row ..	Continuous stick ..	34,848	2 10
2. Plants 6 inches apart	6,969	20,907	1 10
3. Plants 12 inches apart	4,976	14,927	1 2
4. Plants 18 inches apart	3,867	11,601	0 16
5. Plants 24 inches apart	3,168	9,504	0 14
6. Plants 36 inches apart	2,323	6,969	0 10

SECOND SERIES.

Distance between the Rows.	No. of Plants per Acre.	No. of Eyes per Acre.	Weight of Seed used per Acre.
			Tons cwt.
1. 4 feet apart	8,712	26,136	1 18
2. 5 feet apart	6,969	20,907	1 10
3. 6 feet apart	5,808	17,424	1 4
4. 7 feet apart	4,978	14,934	1 2

The plant crop of the above experiment was harvested in September, 1906. The analytical data is given below:—

ANALYSES OF PLANT CANE IN THE DISTANCE EXPERIMENTS, SEPTEMBER, 1906.

FIRST SERIES.

Variety of Cane.	Distance between the Plots.	Date of Analysis.	Age of Cane.	Density of Juice (Brix).	Sucrose in Juice.	Glucose in Juice.	Purity of Juice.	Fibre in Cane.	Sucrose in Cane.
N. Guinea 40 ..	Continuous stick in the row	27-9-06	17 mths.	16·6	15·03	·67	90·5	10·16	13·50
N. Guinea 40 ..	Plants 6 inches apart	27-9-06	ditto ..	16·5	14·74	·68	89·3	11·29	13·07
N. Guinea 40 ..	Plants 12 inches apart	27-9-06	ditto ..	17·0	15·62	·62	91·8	10·59	13·96
N. Guinea 40 ..	Plants 18 inches apart	27-9-06	ditto ..	18·2	16·97	·46	93·2	10·57	15·17
N. Guinea 40 ..	Plants 24 inches apart	27-9-06	ditto ..	17·0	15·16	·78	89·1	9·86	13·66
N. Guinea 40 ..	Plants 36 inches apart	27-9-06	ditto ..	19·0	17·59	·47	92·5	10·74	15·70

SECOND SERIES.

Variety of Cane.	Distance between the Rows.	Date of Analysis.	Age of Cane.	Density of Juice (Brix).	Sucrose in Juice.	Glucose in Juice.	Purity of Juice.	Fibre in Cane.	Sucrose in Cane.
N. Guinea 24A	4 feet	27-9-06	17 mths.	18·7	16·88	·57	90·2	10·41	15·12
N. Guinea 24A	5 feet	27-9-06	ditto ..	19·5	18·30	·36	93·8	10·25	16·42
N. Guinea 24A	6 feet	27-9-06	ditto ..	19·3	18·00	·37	93·2	10·30	16·14
N. Guinea 24A	7 feet	27-9-06	ditto ..	19·6	18·27	·41	93·2	10·04	16·43

Before discussing the actual crop results, attention is called to the analytical data furnished in the analyses of the two series. In the analyses of the first series it is noted that there is an increased density, on the whole, in the canes that were planted the greater distance apart in the rows. For example, the density of the juice from the "continuous stick" plot was 16.6 Brix., while the density from the plot where the plants were 36 inches apart in the row was 19.0 Brix. The density, however, is not strictly progressive with the distance apart between the plants in the row. Special reference is made to the following matter:—The cane in these experiments was seventeen months old when cut; this is known as a "long crop." This age of the crop allowed time for all the younger canes resulting from the suckers to reach maturity, and this enabled a higher density and purity to be obtained. This was facilitated by the greater distance between the stools or plants in the row, permitting the sunlight, which is the chief maturing agent, to effect its work. Thick standing crops, particularly if they are heavy enough to go down and lie upon the ground, thus excluding to a greater extent the air and the sun, are very generally lower in density and purity of the juice. Soils, however, have also some influence in this respect.

The analytical data in the second series tend to confirm the observations that have been made relating to the first series. It is noted that the density and purity of the juice from the cane planted in rows 4 feet apart are the lowest, while the density and purity from the rows planted 7 feet apart are the highest, although the difference in quality between the different plantings is not very high.

The crop results from the two series were as follows:—

CROP RESULTS OF THE DISTANCE EXPERIMENTS, PLANT CANE, 1906.

FIRST SERIES.

Distance between the Plants in the Row.	Name of Variety.	Age of Cane.	Number of Canes per Acre.	Average Weight of the Sticks in lbs.	Weight of Cane per Acre in English tons.	Yield of Sugar per Acre in English tons.
1. Continuous stick in the row	N.G. 40..	17 mths.	28,749	4·3	56·4	7·6
2. Plants 6 inches aaprt	N.G. 40..	ditto ..	32,016	3·8	55·7	7·2
3. Plants 12 inches apart	N.G. 40..	ditto ..	30,927	3·7	51·4	7·1
4. Plants 18 inches apart	N.G. 40..	ditto ..	33,105	3·3	49·5	7·5
5. Plants 24 inches apart	N.G. 40..	ditto ..	32,670	3·4	50·2	6·8
6. Plants 36 inches apart	N.G. 40..	ditto ..	33,541	3·0	44·9	7·0

SECOND SERIES.

Distance between the Rows.	Name of Variety.	Age of Cane.	Number of Canes per Acre.	Average Weight of the Sticks in lbs.	Weight of Cane per Acre in English tons.	Yield of Sugar per Acre in English tons.
1. 4 feet apart ..	N.G. 24A	17 mths.	24,502	6·8	75·3	11·3
2. 5 feet apart ..	N.G. 24A	ditto ..	24,393	5·8	63·5	10·4
3. 6 feet apart ..	N.G. 24A	ditto ..	25,591	5·1	58·8	9·4
4. 7 feet apart ..	N.G. 24A	ditto ..	24,734	4·9	55·1	9·0

In discussing the actual crop results of these experiments, very noteworthy observations have to be made.

In the first series it is shown that one continuous stick planted in the row, also the plants only 6 inches apart in the row, gave over 11 tons of cane per acre more than where the plants were placed 36 inches apart in the row. Yet, when reference

is carried back to the table showing the amount of seed used per acre in planting, these results show that for the extra 2 tons of cane used per acre in planting an additional 11 tons of cane per acre were obtained as the crop result.

In the crop results of the second series, the first startling result is that the cane from the rows planted 4 feet apart gave 20 tons per acre more cane than was obtained from the rows 7 feet apart, and it is noted that the gradation is regular and progressive along the line of the different widths between the rows which the experiments represented. It is not only in the weight of cane per acre but also in the yield of sugar per acre that it is shown that the thicker planting has given such notably bigger results; the cane from the rows 4 feet apart yielded 11½ tons of sugar per acre, while the cane from the rows 7 feet apart yielded 9 tons of sugar per acre, or 2½ tons per acre less.

The differences in the results between the first series and the second series are very noteworthy. The data set forth indicate that the variation in difference between the rows has a much more definite bearing upon the crop results than the variation in distance between the plants in the row.

The different nature of soils and differences in climatic conditions can also have an influence upon the settlement of this question. For example, in the Northern districts, with heavy rainfalls and moist conditions, the small distance between the rows may not be so advisable. Again, in the south, where droughts can be long and furious, a small distance between the rows can quickly exhaust the moisture content of the soil, so that the crop cannot reach anything like maturity; while, if the rows were 6 feet apart, the moisture content may be enough to bring a lower weight of cane to a condition fit for cutting. As an illustration of this it may be stated, in connection with the maize crop, that when a drought has been imminent and actually coming on, farmers have been advised to cut out every other row so that the remaining row could get the advantage of the total moisture in the soil, and this has resulted in bringing a half-crop to maturity; whereas had the whole crop remained upon the ground not an ear of corn would have been formed on any of it. These facts show how many and how intricate are the conditions and factors which relate to the question of planting. In the Mackay district specially, where these experiments were carried out and where the soil conditions and rainfall are relatively uniform and favourable to the cane crop, there is no doubt that a very reliable guidance will be found in the results of the experiments.

In leaving the discussion of the planting experiments, as set forth in the tables of the first and second series, it must be explained that two varieties of cane were used. In the first series, New Guinea No. 40 was used in the tests; in the second series, variety New Guinea No. 24A was used. The latter variety is very superior, both as a cropper and as a sugar yielder, to the New Guinea No. 40, and the behaviour of the two varieties in these distance experiments corresponds almost exactly to their behaviour in all other experiments in which they have been used.

It is not proposed to give the results of the first, second, and third ratoon crops separately, but to total them with the plant crops. The results of the ratoon crops followed very closely those of the plant crop.

The total results of these experiments now follow:—

TOTAL RESULTS OF THE DISTANCE EXPERIMENTS: COVERING PLANT, FIRST, SECOND, AND THIRD RATOON CROPS, 1906-1909.

FIRST SERIES.

Distance between the Plants in the Row.	Name of Variety.	Total Cane per Acre, English Tons (4 crops).	Total Sugar per Acre in Pounds (4 crops).	Total Sugar per Acre, English tons (4 crops).
1. Continuous stick in the row	N.G. 40 ..	201·6	63,113	28·1
2. Plants 6 inches apart ..	N.G. 40 ..	198·8	62,214	27·7
3. Plants 12 inches apart ..	N.G. 40 ..	186·2	58,328	26·0
4. Plants 18 inches apart ..	N.G. 40 ..	166·0	56,619	25·2
5. Plants 24 inches apart ..	N.G. 40 ..	177·7	57,157	25·5
6. Plants 36 inches apart ..	N.G. 40 ..	152·1	51,285	22·8

Photo: Dept. Agriculture and Stock.]

PLATE 16.—SUGAR EXPERIMENT STATION, BUNDABERG.

SECOND SERIES.

Distance between the Rows.	Name of Variety.	Total Cane per Acre, English tons (4 crops).	Total Sugar per Acre in Pounds (4 crops).	Total Sugar per Acre, English tons (4 crops).
1. 4 feet apart	N.G. 24A ..	246·2	86,392	38·5
2. 5 feet apart	N.G. 26A ..	208·4	75,514	33·6
3. 6 feet apart	N.G. 24A ..	190·8	65,447	29·1
4. 7 feet apart	N.G. 24A ..	181·0	64,452	28·7

SUMMARY.

From this table final and definite conclusions must be made, and the advantage to be derived from wide and narrow planting, and using more or less seed per acre, will be found. Commencing by taking the first series, we find that the total cane and sugar per acre produced by the four crops shows us that the plot in which the sets were placed continuously in rows 5 feet apart has produced—

First.—An increase above the yield from plants placed 6 inches apart in the row amounting to 2 8/10 tons of cane and 8 cwt. of sugar per acre, for an expenditure of 20 cwt. more seed per acre;

Second.—An increase above the yield from plants placed 12 inches apart in the row amounting to 15 4/10 tons of cane and 2 1/10 tons of sugar per acre, for an expenditure of 28 cwt. more seed per acre;

Third.—An increase above the yield from plants placed 18 inches apart in the row amounting to 35 6/10 tons of cane and 2 9/10 tons of sugar per acre, for an expenditure of 34 cwt. more seed per acre;

Fourth.—An increase above the yield from plants placed 24 inches apart in the row amounting to 23 9/10 tons of cane and 2 6/10 tons of sugar per acre, for an expenditure of 36 cwt. more seed per acre; and

Fifth.—An increase above the yield from plants placed 36 inches apart in the row amounting to 49½ tons of cane and 5 3/10 tons of sugar per acre, for an expenditure of 40 cwt. more seed per acre.

Note.—All rows in above series were 5 feet apart.

This series was somewhat upset by the irregular behaviour of Plot No. 4, where the plants were placed 18 inches apart. This was thought to be due to the depredations of pests. In other respects the results are very conclusive.

When we consider the results from the second series, it must be remembered that a superior variety of cane was here used. This series has from the beginning given more uniform and striking results. The total crop yields from the plant and three ratoons may be summarised as follows:—

The cane planted in rows 4 feet apart has produced:—

First.—An increase above the yield from the cane planted in rows 5 feet apart amounting to 37 8/10 tons of cane and 4 9/10 tons of sugar per acre, for an expenditure of 8 cwt. more seed per acre;

Second.—An increase above the yield from cane planted in rows 6 feet apart amounting to 55 4/10 tons of cane and 9 4/10 tons of sugar per acre, for an expenditure of 14 cwt. more seed per acre; and

Third.—An increase above the yield from cane planted in rows 7 feet apart amounting to 65 2/10 tons of cane and 9 8/10 tons of sugar per acre, for an expenditure of 16 cwt. more seed per acre.

It is therefore evident, on comparing the two series, that the variation in distance between the rows has a far more important bearing on the yield than the variation of the plants in the rows, while at the same time the expenditure of seed is not nearly so large.

The conclusions which may be safely drawn from these experiments at Mackay are, therefore:—

First.—Plants with three eyes, placed 6 inches apart in the row, or even closer, is found to be the best method of planting the sets in the row.

Second.—Any increase in distance between the rows exceeding 5 feet is likely to result in a low weight of cane and yield of sugar per acre, while 4 feet between the rows has been found to result in a considerable increase both of cane and sugar.

It must, however, be carefully borne in mind that these experiments must be considered as applicable only to the Mackay district in normal years. In the North, with its heavy rainfalls and moist, humid conditions, thick planting may not be at all advisable, while south of Mackay, where droughts are not uncommon, a wider distance, providing more moisture for the cane, may be imperative.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF JULY IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING JULY 1922, AND 1921, FOR COMPARISON.

Divisions and Stations.	Average Rainfall.		Total Rainfall.		Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	July.	No. of Years' Records.	July, 1922.	July, 1921.		July.	No. of Years' Records.	July, 1922.	July, 1921.
North Coast.	In.		In.	In.	*South Coast*—continued:	In.		In.	In.
Atherton	0·90	21	2·24	1·24					
Cairns	1·61	40	2·50	1·64	Nambour	2·72	26	3·45	6·66
Cardwell	1·46	50	2·05	2·49	Nanango	1·77	40	2·53	3·52
Cooktown	1·00	46	0·55	1·19	Rockhampton ...	1·50	35	3·20	5·81
Herberton	0·69	35	2·21	2·40	Woodford	2·52	35	2·66	5·37
Ingham	1·64	30	2·20	3·64					
Innisfail	4·77	41	3·55	7·33					
Mossman	1·54	14	2·34	1·28	*Darling Downs.*				
Townsville	0·58	51	1·48	3·45					
					Dalby	1·82	52	1·81	3·30
Central Coast.					Emu Vale... ...	1·60	26	2·50	5·77
					Jimbour	1·71	34	1·67	2·04
Ayr	0·68	35	2·10	5·68	Miles	1·80	37	0·95	2·25
Bowen	0·95	51	2·40	2·77	Stanthorpe ...	2·06	49	3·30	8·07
Charters Towers ...	0·59	40	3·99	2·85	Toowoomba ...	2·06	50	3·55	5·33
Mackay	1·70	51	4·66	7·19	Warwick	1·83	57	3·08	6·32
Proserpine	1·41	19	2·50	8·08					
St. Lawrence ...	1·26	51	3·83	4·45	*Maranoa.*				
South Coast.					Roma	1·53	48	0·72	6·88
Biggenden	1·31	23	2·58	2·62					
Bundaberg	1·92	39	3·33	2·88	*State Farms, &c.*				
Brisbane	2·31	71	4·68	6·14					
Childers	1·67	27	2·59	3·93	Bungeworgorai ...	1·88	8	0·54	7·05
Crohamhurst ...	2·94	30	3·26	7·85	Gatton College ...	1·44	23	2·12	4·12
Esk	2·00	35	2·89	4·24	Gindie	1·14	23	0·73	2·85
Gayndah	1·49	51	3·16	2·78	Hermitage ...	1·80	16	2·96	6·37
Gympie	2·17	52	2·64	5·40	Kairi	1·19	8	2·73	1·73
Glasshouse M'tains	2·41	14	...	6·62	Sugar Experiment				
Kilkivan	1·70	43	2·21	2·22	Station, Mackay	1·51	25	4·37	6·97
Maryborough ...	1·95	51	2·47	3·46	Warren	1·27	8	2·50	5·42

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for July this year, and for the same period of 1921, having been compiled from telegraphic reports, are subject to revision.

GEORGE E. BOND,
State Meteorologist.

THE HUMAN MACHINE ON THE LAND.

Following are extracts, continued from the August Journal, from an interesting contribution to "The Journal of the Ministry of Agriculture" (U.K.), by W. J. Malden. Presenting a new view of "farm labour as farm athletics" they will be appreciated.

TRAINING IN FARM LABOUR IS EASY.

However, training in farm labour is a very simple thing, and is capable of being taught easily and systematically. That amongst older men, there would be opposition to this there is no doubt, and many who have tried to inculcate fresh methods have met a resistance which has caused them to discontinue their efforts, as they have found that sometimes it is better to carry out a bad method well than a good method badly.

In systematising work I have followed closely the practices in the more strenuous sports. No matter what the physical work or sport, no one commences to do it in the right way, whether it is handling a golf club or a scythe, and unless the proper way is shown little skill is obtained. It has to be remembered that a man is a machine—the most wonderful machine in the world—capable of doing any work performed by the most intricate machinery. He is superior to farm animals because they are horizontal machines capable of doing work only in a straight line forward or backward. Man is a hinged vertical machine not only doing this, but able to stoop and lift heavy weights vertically, which a horse cannot do. Also he has lateral action; by a heave from his hips and a shoulder jerk, he can pitch a sack of wheat sideways some feet clear of himself. He also has linked action through the arms by which he gets arm swing in association with body swing, and so can use a scythe or an axe, and throw heavy bodies from side to side by hand grip. Again, when using a tool he can get an up and down action from arms and body, as in pumping or threshing with a flail. He can also pull with the arms, using body weight. He can utilise the back swing over the hips, together with the leg drive, as in rowing, hoeing, or tug-of-war. He can lift upwards as in digging, or pitch sheaves, or swing a long hedging bill. In fact there is practically no action or combined action he cannot perform. His hinges at the ankle, knee, hips, shoulders, wrists, and fingers are under the influence of muscles and tendons, which flex and give rise to powerful actions, which are often assisted by dead weight, and their proper use takes advantage of leverages; moreover, with tools in hand a man finds leverage from these as well as from outside conditions. We do not think of ourselves as machines until we go in for sports; yet a skilled athlete is but an expert artisan in an unproductive calling. A man with skilled training takes little out of himself as compared with one untrained. It is the same in all farm work; brute strength is helpful, but a weaker man who has got the knack can beat the unskilled any and every time, just as an old man who is skilled is worth more on a farm than a young one unskilled.

"Putting one's back into work" means much more than mere exertion: it means using one's force and dead weight to the best advantage. The greater part of all heavy work should be done by the back and legs through leverage and momentum obtained through the joints or hinges, and to a large extent these are obtained merely by skill in actuating them, viz., learning how to apply them to the best advantage. The arms and hands are convenient means through which the power is transmitted to tools, they give 'finish' of work, and add to celerity. Knack is merely a proper co-ordination of mind and muscle brought to the position where effort is not needed to work them together; but one may have a bad knack so it is necessary to learn the correct method of working.

When the best method of working is decided upon, it will be found that it comprises a certain number of actions to complete an operation; and these actions will be repeated in the same sequence in each operation. I have analysed the various operations into individual actions, eliminated the wasteful ones, and taught the others separately. Next they are run together and operation is linked to operation. As these are repeated there must be an easy connection between them making a series of smooth movements each similar, but necessary for continuous work. We see it in mowing, hoeing (when done in the proper manner), digging, axe work, planting cabbages, &c. Finally, the human machine tunes itself up to a speed compatible with endurance through an average working day.

NEED FOR INTELLIGENT OBSERVATION.

However, the human machine should be made to bring its intelligence to bear, to realise its powers, and the mechanical forces within it. The simplest laws of mechanics must be followed. These can be taught very simply and quickly by simple illustration. It may be mentioned that little effective work can be done with the legs straight and rigid. The body and legs must relax, otherwise the rocking and rolling actions obtainable about the hinges or joints at the hips, knee and ankle, so necessary to give effect to body swing, either fore and aft or laterally, cannot be obtained. They give an opportunity to take advantage of good footwork and stance

—two of the first essentials, as they afford the opportunity to make use of momentum, and to regain equilibrium, without which rythmical actions will not be maintained.

Then, again, relaxation is needed to allow the body to go down to the squat or crouch to do any work where stooping is required, and to do it without a backache—as in cabbage planting. The body must always have an easy balance or poise, or it will be overbalanced, so that power is lost and a proper sequence of actions cannot be taken. It is not necessary to go near to a man to see if he is working properly; it is shown as soon as he can be clearly seen. Sufficient proof is afforded by the fact that a man keeps time with himself throughout his work. It may be clearly seen whether a man works inside his work, or uses a tight grip where he should use the running hand, or uses the ham knuckle jerk in lifting a sheaf on to a wagon or rick, or is using his body leverage and not merely an arm lift or swing. Whether he understands the simple laws of levers as applied to the mechanism of his own body, has some knowledge of a suitable line of draught, realises the advantage of using his reach, has a notion of timing an action or values the effect of wrist work and other points, is discernible to anyone who has a proper knowledge of skilled workmanship.

SIMPLE INSTRUCTION.

By simple demonstration all these are easy to teach to the old or young. It is so simple that it can be taught to children of almost any age, and could be taught in any village school playground; moreover, a boy leaving school at fourteen could be trained thus in many necessary forms of work, and be skilled in work, whereas otherwise he would go on to a farm without skill, and often by working where poor skill prevails, even after a lifetime on it would remain inefficient.

That strength is not the ruling influence in effective working I recently demonstrated through a cinematograph film showing girls after three months' training doing very varied work, including most of the heaviest done on the farm. By the proper application of their powers they were able to work without undue fatigue, they got the knack of doing the work in the most effective manner, and they worked with perfect rhythm.

It may be taken as a pretty safe axiom that if dung is loaded and spread by long handled forks, if hoeing is done by dub-headed hoes instead of swan necks, and if hedges are trimmed back with short (one handed) swaps or fagging hooks, then the standard of work generally is a low one, whilst the absence of cabbages in a stock-raising district is pretty good evidence that the men have not learned to stoop without making their backs ache. Yet nothing is easier than transplanting done skilfully. With a proper stoop there is no need for backache. In many districts there is not a man who can plant 2,000 cabbages a day, yet after short training they are able to do it, and find it easy to plant 5,000. Where this is done the crop is cheaper and more reliable than any other form of root-growing.

In view of the large number of persons who have come on to the land wholly unskilled, with little likelihood of training whereby they will become skilled, whether they come as workmen, small holders, men from the services, allotment holders, who are spending energy with small results, one cannot fail to see the low efficiency on the land. Boys come to the land as stop gaps with no knowledge, skill, or incentive to work. They think that a fixed wage now will see them through life, but without skill it will not. Any training or incentive to skill is sorely needed to restore and maintain craftsmanship in agricultural labour. It is necessary if the land is to be kept under cultivation. The significance of this is obvious.

QUEENSLAND TREES.

By C. T. WHITE, F.L.S., Government Botanist, and W. D. FRANCIS, Assistant Botanist.

No. 14.

PENNANTIA CUNNINGHAMII.

This species, which abounds in the scrubs of Eastern Australia from Illawarra, New South Wales, to D'Aguilar Range (Mount Glorious), Queensland, attains a height of about 80 feet and a barrel diameter of 3 feet. The barrel is often irregular or angular in cross-section, crooked, and leaning to one side; so-called sucker (coppice) shoots are often frequent on the barrels. The bark is grey or brown in colour, and often somewhat scaly. When cut it is seen to be reddish-brown in colour and measures ¼ inch thick on a tree with a barrel diameter of 3 feet. Mr. Kruger, Wood Technologist of the Forestry Department, informs us that the wood is likely to become valuable, as it promises to be an excellent substitute for English beech; he recommends its use for planes, brush-backs, &c. Hitherto the timber has been regarded as almost useless. We have noticed that the trees are very abundant in certain parts of the scrubs in the ranges eastward of Emu Vale, in the Killarney District.

Photo by the Authors.]

PLATE 17.—PENNANTIA CUNNINGHAMII.
A specimen in the Ranges eastward of Emu Vale.

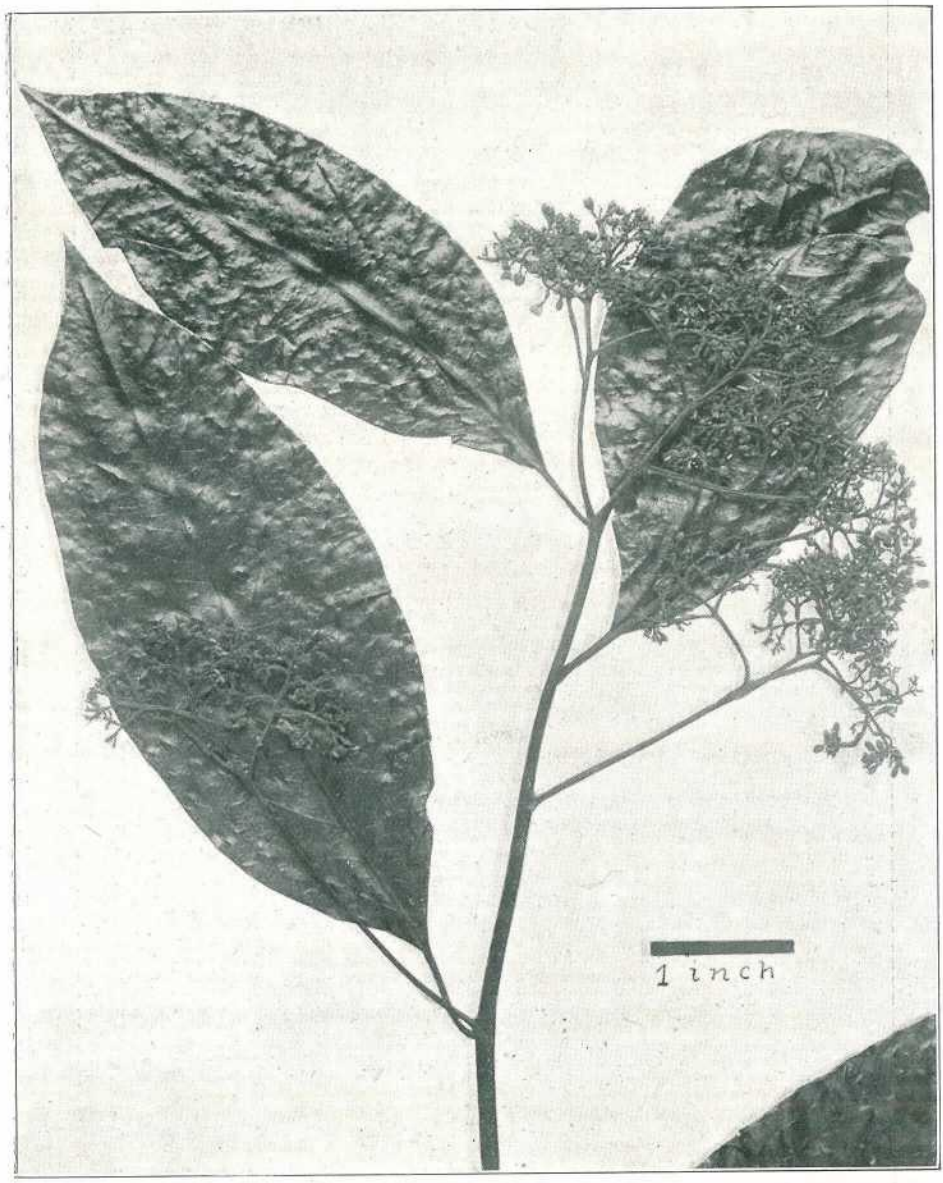

Photo : Dept. Agriculture and Stock.]

PLATE 18.—PENNANTIA CUNNINGHAMII. FLOWERING TWIG.

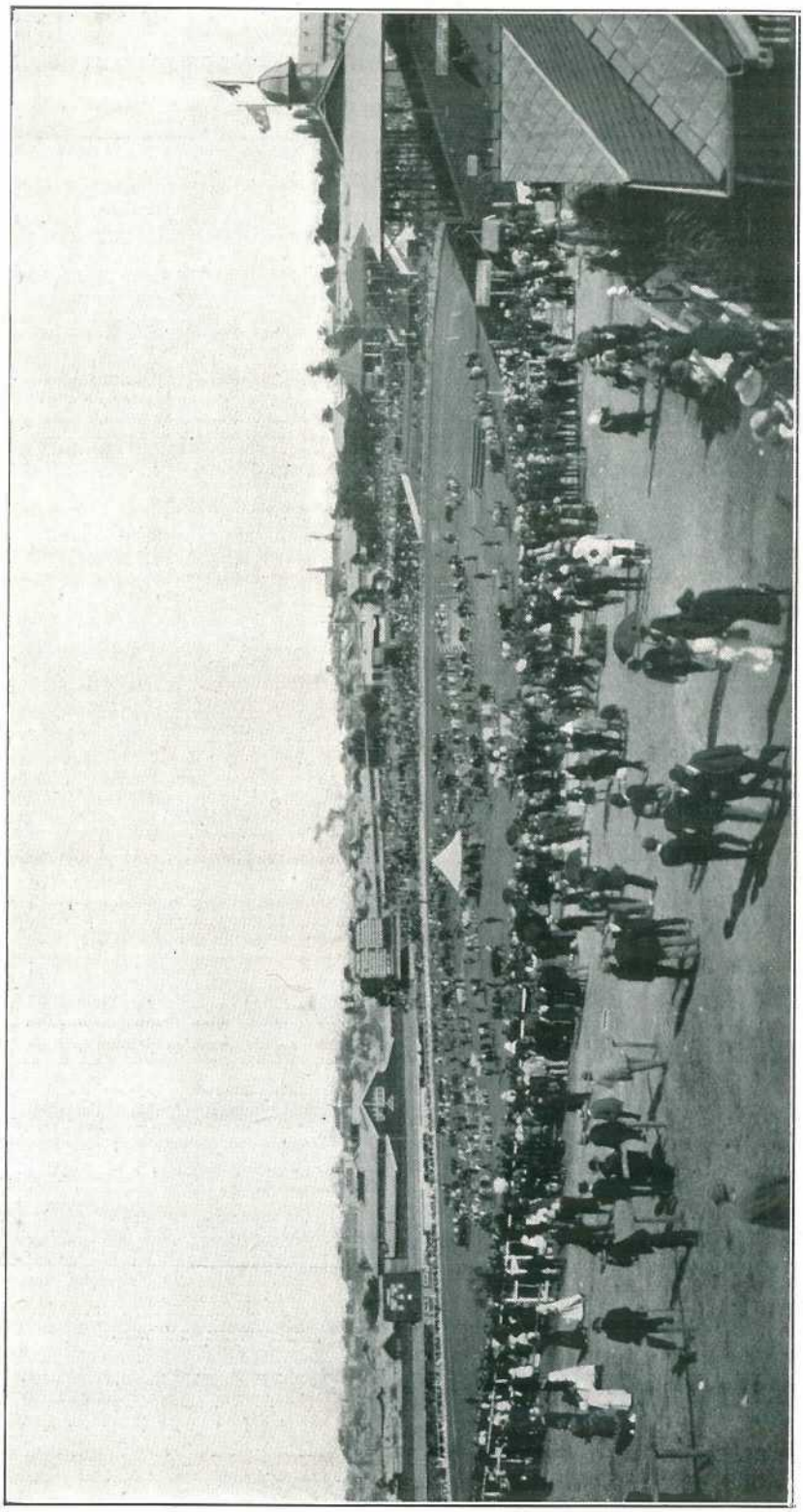

Photo : Dept. Agriculture and Stock.] PLATE 19.—THE GRAND PARADE, ROYAL NATIONAL EXHIBITION, BRISBANE, 1922.

ROYAL NATIONAL EXHIBITION.

Perfect weather, typical Queensland days, favoured the 1922 Exhibition of the Royal National Association. The Show was a pageant of prosperity, a small-scale representation of the rural richness of a great State, and a triumph of organisation and achievement.

This year the Court of the Department of Agriculture and Stock, attractively and artistically set out, presented many new features. The quadrangular court, with its various exhibits and trophies, showed a striking uniformity of arrangement; and the harmony of the colour scheme, between the soft rendering in shades of grey and ivory white, relieved with maroon, and the blending of the natural shades of green of the palms, staghorns, ferns, and festoons, appealed irresistibly to æsthetic taste.

A presentation of exhibits in a right atmosphere was in itself a fitting prelude to what really was a most practical exposition of the work coming within the scope of the Department. Through their activities and applied interests—so fitly illustrated—its officers render signal service to that large body of producers who are the mainstay of the complex social and industrial life of this great State.

In the Court the observer, the inquirer, and the student were brought into immediate touch with several of Queensland's chief industries—sugar, wool, maize, wheat, cotton, and general agriculture. To them was presented an opportunity for gaining a clear and close insight into certain branches of work, both practical and scientific, engaging the attention of the members of the staff of the Department. As the Brisbane Show is a microcosm of the State, so the Departmental Court is a microcosm of a most important section of the Public Service.

The work of the Bureau of Sugar Experiment Stations found representation in a display of a number of new canes which are under test for the purpose of determining the best commercial varieties for different districts. Some excellent samples of sugar-cane from Banana Pocket, Proserpine district, were also exhibited to illustrate what this rich and fertile locality is capable of producing.

The wool display, with its attractive samples drawn principally from clips sent in to the Wool Branch for classification and sale, was made primarily for the purpose of bringing the work of this section of the Department before small flockmasters, and was indicative also of what is being done by the Sheep and Wool instructional staff.

The part taken by the Stock Experiment Station at Yeerongpilly in the general scheme for the enlightenment of the stock owner was clearly demonstrated by specimens, cultures, diagrams, and printed educational matter connected with the work of a vigorous institution which plays no mean part in the investigation and combating of the tick fever and other problems which harass and at times menace the live-stock industry.

A completeness was given to these two lastmentioned sections by the display of a striking collection of grasses by the Government Botanist, which, on account of their great variety, natural richness, and abundance in good seasons, afford unmistakable proof of the fact that the State possesses an inheritance worth millions of pounds sterling per annum to the stock owners—a heritage which obviously deserves more consideration than it has yet received.

In the comprehensive trophy devoted to General Agriculture prominence was given to maize, and to the methods adopted by the Department in the highly technical and effective work of seed improvement.

What seed selection will do in the matter of increased production and in the standardisation of types of grain, was exemplified in the wide range of exhibits staged. The application of these principles of selection have found practical expression in Departmental crop demonstration areas, and it was shown on the one hand that in a season when the average yield of maize for the State did not exceed 20 bushels per acre, 117 bushels per acre were harvested from prolific strains of selected seed grown under field conditions.

Work of this character, carried as it is into the realms of sound agricultural practice, cannot be otherwise than most helpful to the maizegrower and to the industry generally. The fact that high-yielding strains of seed are available, and are being added to and improved, should engender a feeling of optimism for a future which holds out the promise of increased returns for time and labour spent in production.

A special section was devoted to wheat. It is only within the last few seasons that this most important cereal has attained such distinction as a crop for Queensland, and in many localities it is used for the dual purpose of fodder and grain—fodder, primarily, for the production of milk and for sheep-raising, and grain as the chief support for the industrial life of the community.

It is generally conceded that the existing scheme for the co-operative marketing of wheat under the pool system has done much to place the industry on its present firm footing.

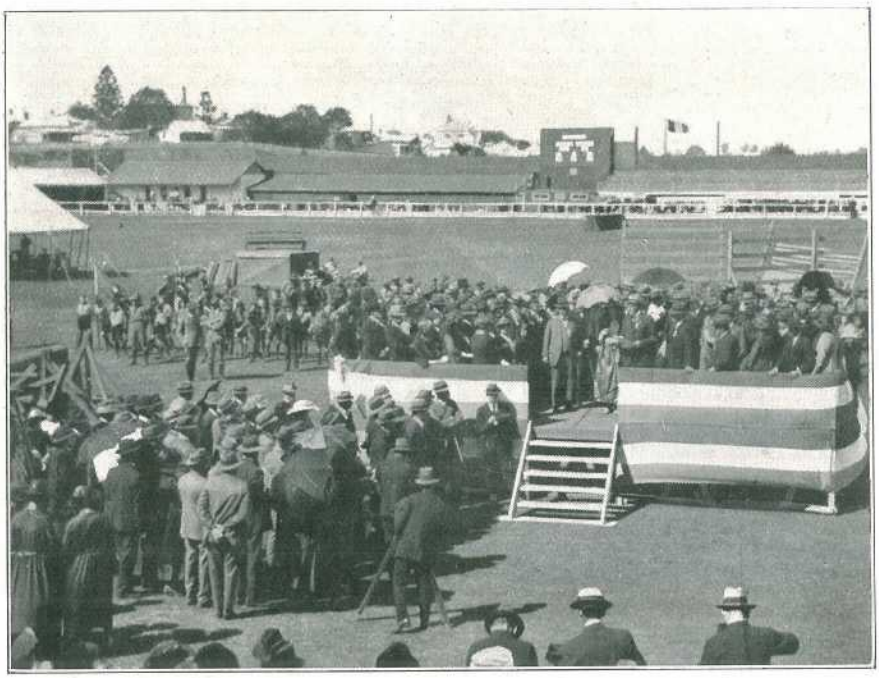

Photo : Dept. Agriculture and Stock.]

PLATE 20.—THE OPENING CEREMONY, ROYAL NATIONAL EXHIBITION, BRISBANE, 1922. HIS EXCELLENCY LORD FORSTER, GOVERNOR-GENERAL, ADDRESSING THE ASSEMBLAGE.

Another and most important reason for this improved position is that better and more reliable varieties of wheat are now in cultivation. There is less danger from rust than formerly, and the milling qualities of the grain have also been much improved.

For many years—practically a quarter of a century—the Agricultural Department has directed effort to the improvement of existing varieties. As a result, many excellent wheats were produced and brought into cultivation. Crossbreeding and selection, and the highly technical work in the evolution of new varieties, has been carried out for a number of years at the Roma State Farm. This is correlated with the work of the field staff. An interesting illustration of what has been accomplished was on exhibition, and a fine collection of new crossbred wheats from the Wheat Breeding Farm and demonstration plot areas were also staged.

Details of the scheme for the "Improvement and Classification of Existing Varieties of Wheat," which was recently brought forward by the Department and approved of by the Advisory Committee of Agricultural Council and the Wheat Board, were set out in detail on the wheat trophy, for the express purpose of disseminating information to growers interested in the subject. Effect has already been given to the scheme, which has been put on a practical working basis.

The display by the Pure Seeds Branch of the Department was of a most instructive character, and covered concisely the purity and germination of seeds, commercial seeds and seeds of poisonous plants, and demonstrated clearly the part played by the Department of Agriculture in protecting the interests of farmers.

Another informative feature was an exhibit prepared by the Government Botanist, which proved to be of absorbing interest and concern to stockowners and primary producers generally. This exhibit was made up of mounted specimens of well-known edible shrubs with which Queensland is particularly well endowed, also a number of specimens of plants reputed to be poisonous to stock.

The branch of the Department controlled by the Entomologist and Vegetable Pathologist illustrated graphically the life histories of various insects. Another section dealt exhaustively with the Banana Beetle Borer and its depredations.

The *Queensland Agricultural Journal* was represented in the departmental display, and a branch office was located in the Court for the enrolment of new subscribers, and for the convenience of inquirers on agricultural subjects, and matters relating generally to departmental activities.

A new feature introduced into the Departmental Court this year was an extensive and finely grouped display of secondary products from the State Cannery, in which prominence was given to a comprehensive assortment of fruits, jams, preserves, and sauces. The "get up" of this display provided convincing evidence of the expertness of the State Cannery staff in the preparation of products for market, and was worthy of commendation by the most exacting commercial critic.

DEPARTMENTAL COURT EXHIBITS.

SUGAR EXPERIMENT STATIONS.

The Bundaberg Sugar Experiment Station exhibited a number of new varieties, many of them being seedling canes raised in Queensland, Hawaii, Mauritius, India, and Java. Full descriptions of these appeared upon the cards attached to the canes, which also gave their commercial cane sugar content. Many of these canes are at present undergoing chemical and field tests, while others have passed the probationary period, and are being distributed to canegrowers. Of these the most successful so far have been Queensland 813, 970, 1098, Java E.K. 1, E.K. 28, India Shahjahenpur No. 1, Hawaii 146 and 227. These, however, only comprise a small portion of the canes which have been distributed from the Sugar Experiment Stations in the course of the past twenty years. Prior distributions include such well-known canes as Badila and the Corus, which are very largely grown in North Queensland. One of the principal objects of the Experiment Station is the constant introduction of new varieties and their commercial testing. Before any variety is allowed to leave the Experiment Station it is subjected to chemical and commercial trials through plant, first ratoon, and second ratoon crops. Each variety is tested not fewer than four times during the sugar season, so that records are obtained which afford farmers and millowners information as to whether canes are early or late, and as to whether their sugar contents are sufficiently high to warrant their adoption. This is combined with agricultural trials on the field, so that it may be determined whether such variety is a good cropper. It is further rigorously watched for evidence of disease, and no affected cane is allowed to go into distribution. When a variety has passed this trial it is carefully examined and packed before being sent to growers living at a distance from the Station. Farmers close at hand are permitted to visit the local

Photo : Dept. Agriculture and Stock.]

PLATE 21.—THE JOURNAL CORNER, COURT OF THE DEPARTMENT OF AGRICULTURE AND STOCK.

Photo : Dept. Agriculture and Stock.]

PLATE 23.—PURE SEEDS BUREAU DISPLAY, COURT OF THE DEPARTMENT OF AGRICULTURE AND STOCK.

Photo: Dept. Agriculture and Stock.]

PLATE 22.—A VIEW OF THE COURT OF THE DEPARTMENT OF AGRICULTURE AND STOCK

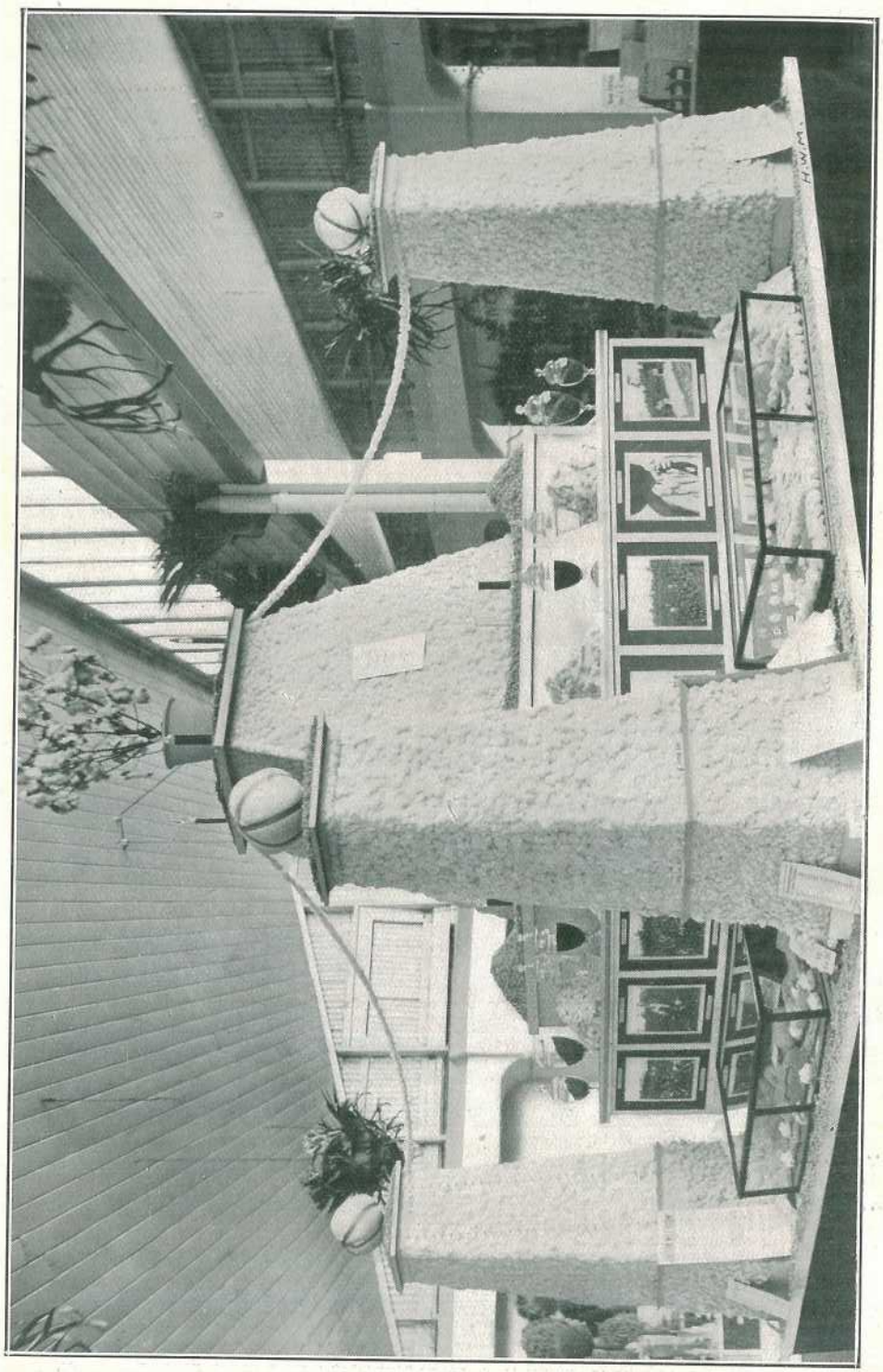

Photo: Dept. Agriculture and Stock.]

PLATE 24.—CENTRAL COTTON TROPHY, COURT OF THE DEPARTMENT OF AGRICULTURE AND STOCK.

Station and remove any variety selected for distribution. All canes are distributed free to canegrowers. Worthless varieties are discarded.

Information of this kind could only be secured by growers and millers at the cost of much time and money, and the rejection of many useless canes by the mills would obviously be accompanied by severe loss to the growers.

As an adjunct to the work described the Experiment Station at Innisfail is now raising cane from seed.

Work at the Experiment Stations also comprise the study of soils, cultivation, and fertilising. It is sought to introduce improved methods of cultivation, liming, fertilising, rotation of crops, and conservation of moisture; and growers are taught the principles of cultivation and business methods by visits to the Experiment Stations, and by lectures and addresses delivered in the several sugar districts, and by bulletins. It may be claimed that this work has been highly successful as the following figures will show:—

INCREASE IN CANE AND SUGAR PRODUCED PER ACRE AND DECREASE IN TONS OF CANE REQUIRED TO MAKE ONE TON OF SUGAR.

Period.	Average tons of Cane per Acre.	Average tons Sugar per Acre.	Average tons of Cane to one ton of Sugar.
1899–1908	14·76	1·60	9·20
1909–1918	17·37	1·99	8·68

The Sugar Experiment Stations analyse soils free for canegrowers, and advise, by personal interview or by letter, on the requirements of the soil in the way of application of lime where necessary, green manuring, and fertilisers, and the treatment of the land by proper cultivation. Cane samples are also tested free of charge, so that growers may know the best time at which to cut their cane. Field officers also move around among farmers giving advice on cultural operations.

Investigation and research work in connection with the sugar-cane's most serious pest—the grub— is now being carried out by the Bureau of Sugar Experiment Stations in a systematic manner, and numerous bulletins have been issued upon the subject. The Entomological Laboratories are situated at Meringa, near Cairns, which is the centre of the worst grub-infested region in North Queensland. The work now undertaken includes:—

Morphological study of reproductive organs of beetles, with relation to the period of ovipositing and the number of eggs produced.

Morphological study of the fungus parasites.

Breeding of the various local parasitic and predaceous insects in cages.

Introduction and breeding of beetle parasites from other countries.

Experimental methods for the rapid multiplication and wide distributon of our fungus parasites.

Introduction of bacterial and fungus enemies of the beetles from other countries.

A further study of various light-traps for the beetles.

A further study of repellents.

Field and Laboratory experiments in the use of poisons for grubs.

Field experiments to determine the relation of fertilisers to resistance; using green manure, stable manure, meatworks' refuse, nitrate of soda, and other substances.

The work of the Sugar Experiment Stations, therefore, in relation to its promotion of the agricultural welfare of Queensland in connection with the sugar industry cannot be over estimated. When it is considered that this industry is the greatest agricultural one in Queensland, with an estimated yield this year of 285,000 tons of sugar, computed to be of the value of over £9,000,000, it can be seen how highly necessary it is that it should be assisted and encouraged in every possible way.

Apart from its economic value, it has a supreme national significance and has already proved a valuable factor in peopling the North. According to the last census the increase in population in the last ten years of the Herbert Electoral Division was 19.4 per cent., or 14,929 persons—a greater increase numerically than in any other part of the Commonwealth.

THE A.S.P.A. COURT.

The main portion of the task of fittingly representing Queensland's foremost agricultural industry was allotted to the Australian Sugar Producers' Association. Text and picture illustrated the importance to our economic life of this great staple, and incidentally strongly emphasised its political significance in respect to our effective peopling of the North.

A series of photographs in careful sequence enabled one to follow the story of sugar from the planting of the cane to its final emergence as a marketable commodity. The several phases of the great industry, a combination of agriculture and manufacture, were strikingly depicted, and they conveyed a lesson in economical co-operation by the evidence of the value of sugar and its by-products to other business enterprises. The educational value of the exhibits in this Court was immense. The connection, for instance, between cane and power alcohol was shown by interesting stages, and the comprehensive nature of the Court and telling texts panelled appropriately conveyed convincingly to the public the high value of an industry around which cities, towns, and thriving districts have been built. The facts and figures displayed provided much room for thought and stimulated support for an industry that has become a corner stone of the White Australia policy. As an example it was shown that 15,000 tons of raw sugar, valued at £1,365,000, will pass over the Cairns wharves this season. Then a vista opened up of extended fields of vibrant industry, the roots of which strike deeply into the soil of Queensland canefields, and the branches of which spread widely through shipping, manufacturing, and commercial spheres. Follow the raw product to the mill, thence to the refinery, on to the market, to its ultimate absorption into other industries, and one gains an idea of what the engineering and machinery trades and the manufacturing and distributing interests owe to Queensland sugar. When all this is considered, besides the canegrowers' gaining their living direct from the land, and the thousands of workers—white Australians—employed in harvesting and handling the products of the sugar and allied enterprises, the economic importance of the sugar industry is understood.

COTTON.

The revival of cotton-growing in Queensland has opened up a wide and alluring vista of prospective prosperity arising from our vast reserves of untouched fields. Already the bright promise of the present revival has stimulated a strong interest in the textile trade, and the more optimistic have already pictured Queensland not only as the cotton State of the Commonwealth, but the new home of a thriving textile industry.

At the Exhibition the Department of Agriculture and Stock and the Australian Cotton-growing Association served efficiently a wide public interest. In the departmental Court a striking central trophy, the work and design of Mr. H. W. Mobsby, F.R.S.A., typified a coming Queensland industry and symbolised the wealth that will roll in fleecy billows from the linters and looms of Queensland cotton gins and spinning mills when the forces of field and factory have been allied and applied to the establishment and advancement of a new and great Australian industry.

A small cotton gin at work attracted an interested crowd, and the operation of separating lint from seed was watched with marked attention. Probably no other crop has "caught on" so quickly with the Queensland farmer as cotton, as it represents a cash return within six months of planting the seed. Under the existing guarantee system, returns have often exceeded £35 per acre gross.

Already, with only a few thousand acres under cotton, a sum of £90,000 sterling has been paid to growers for their crop. To date, sufficient seed has been supplied to plant over 65,000 acres, representing a prospective increase in the area to be put under crop this year of approximately 60,000 acres.

The existing arrangement, entitling growers to an advance of 5½d. per lb. for seed cotton until 30th June next year, has been extended by the Government in the form of a guarantee for a further period of three years from the 1st August, 1923, to the 31st July, 1926. For the first year of the new guarantee period—that is, from 1st August, 1923, to 31st July, 1924—the advance will be arranged on a sliding scale basis in accordance with the grade of cotton, with a maximum price of 5½d. per lb. for seed cotton of good quality free from disease and of 1¼-inch staple. The details of the advance during the remainder of the extended period—namely, two years—will

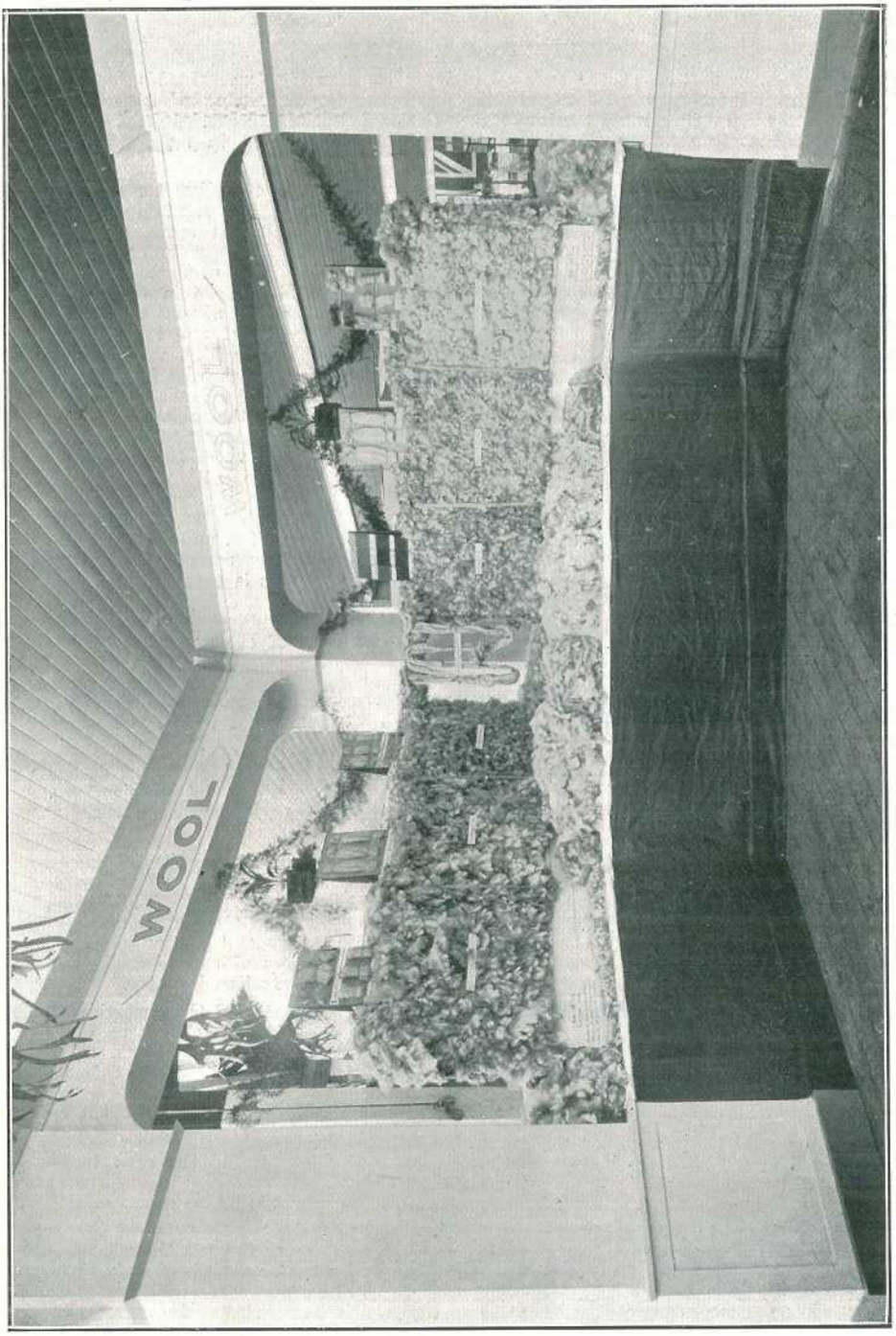

Photo: Dept. Agriculture and Stock.]

PLATE 25.—WOOL EXHIBIT, COURT OF THE DEPARTMENT OF AGRICULTURE AND STOCK.

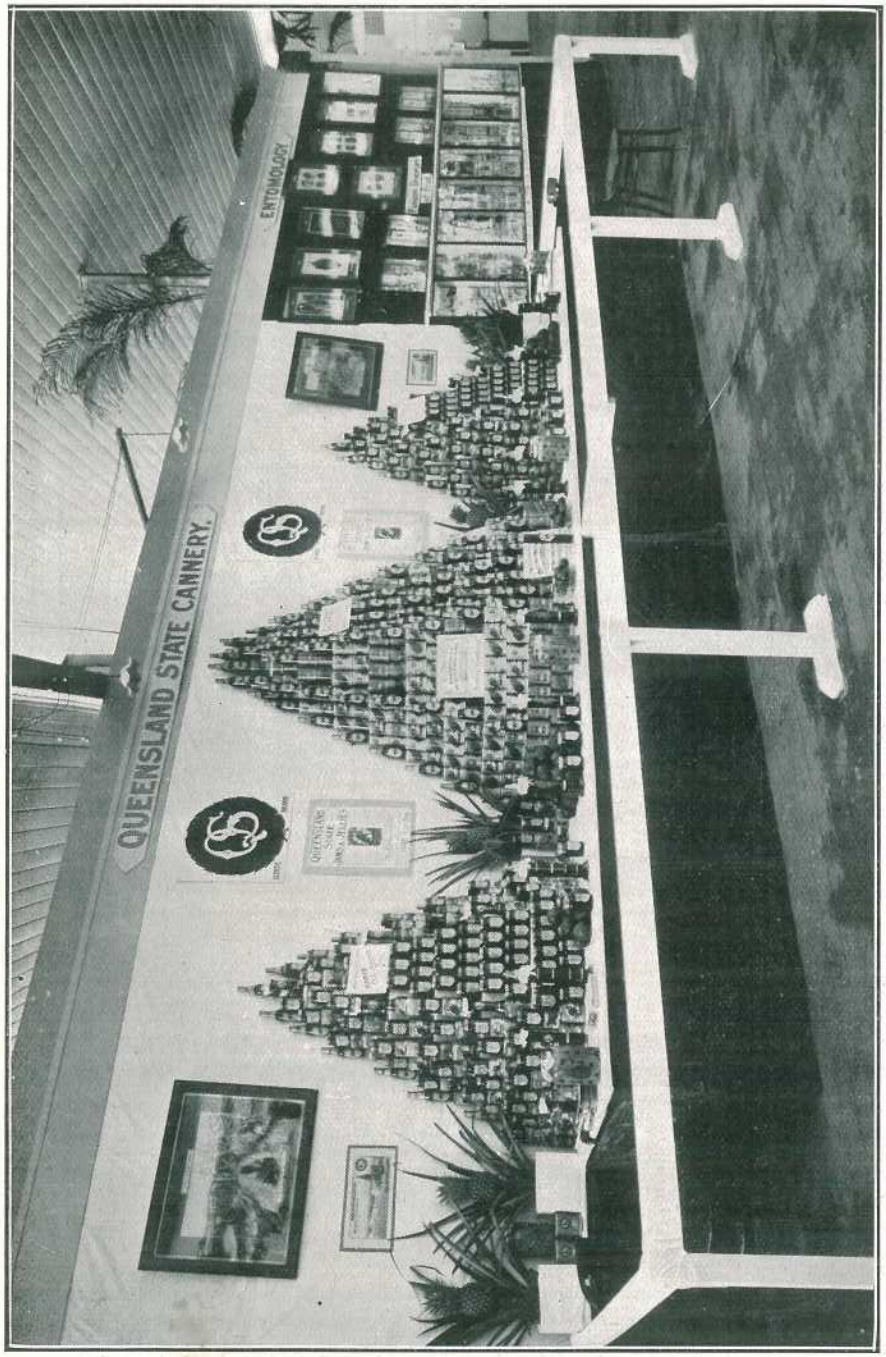

Photo: Dept. Agriculture and Stock.]

PLATE 26.—THE STATE CANNERY DISPLAY, COURT OF THE DEPARTMENT OF AGRICULTURE AND STOCK.

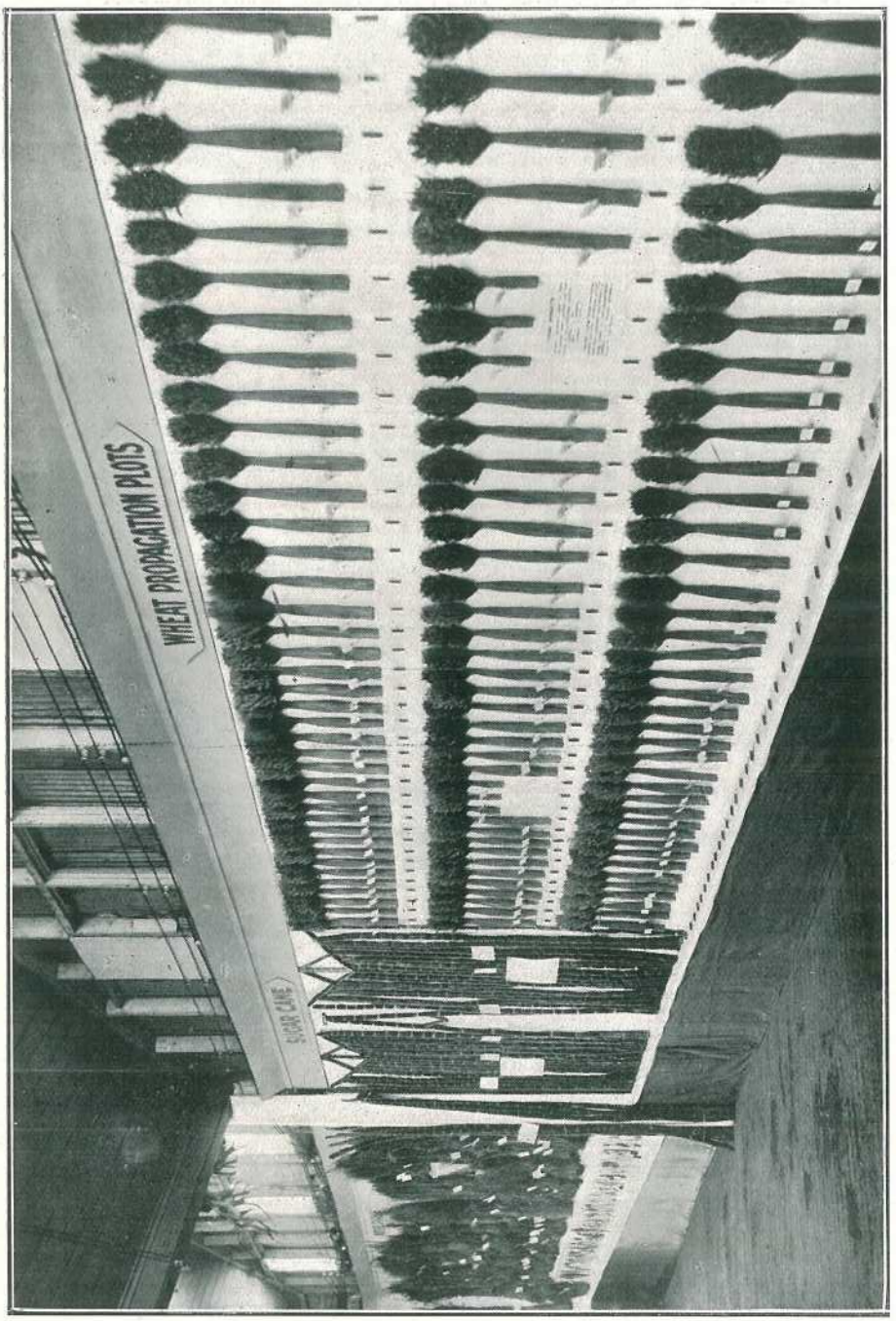

Photo : Dept. Agriculture and Stock.]

PLATE 27.—PANELS OF WHEAT, SUGAR CANE, AND GRASSES, COURT OF THE DEPARTMENT OF AGRICULTURE AND STOCK.

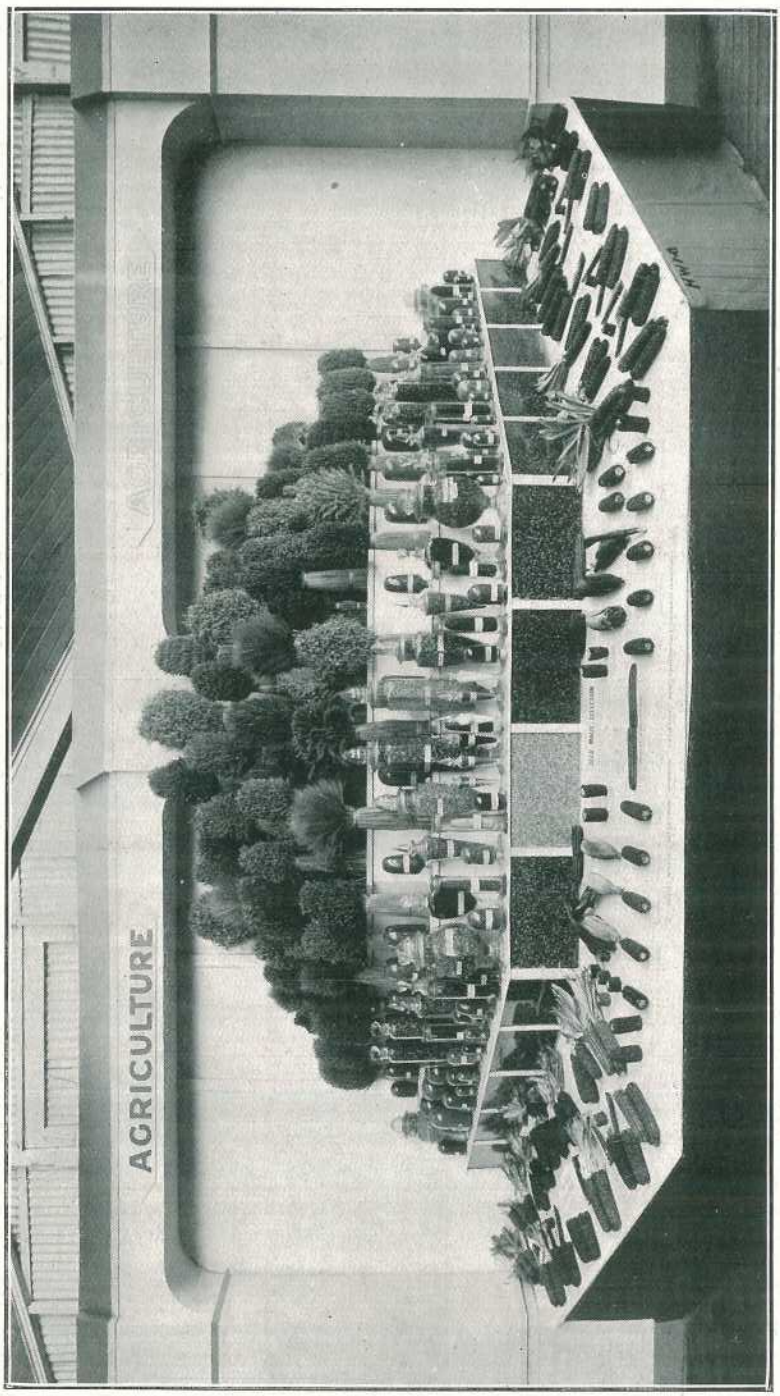

Photo: Dept. Agriculture and Stock.]

PLATE 28.—GRAIN EXHIBIT, COURT OF THE DEPARTMENT OF AGRICULTURE AND STOCK.

be determined later. A condition is made that the seed must be procured from the Department of Agriculture.

The activities of the Australian Cotton-Growing Association, and the establishment of up-to-date ginning plants to deal with the crop, have had an excellent effect also in placing this industry on a solid foundation.

THE FRUIT DISPLAY.

Dominating the fruit display was the fine central trophy and its supporting array of orchard products, which formed the non-competitive collection shown by the Southern Queensland Fruit Growers' Society. The society provides a striking example of the benefits of organisation as applied to fruit production and distribution, and the wonderful display of fruit from sub-tropical gardens and the temperate Granite Belt was attractive evidence of its well-directed activities. Represented in the collection were Montville, Mapleton, Perwillowen, Nambour, Bli Bli, Yandina, Woombye, Palmwoods, Elimbah, Ormiston, Cleveland, Manly, and Wellington Point. The Blackall Range generally sent some of its choicest citrus products from its peaceful, picturesque, and profitable groves; the North Coast contribution was made up largely of pineapples and bananas; and the South Coast was creditably represented by strawberries and custard apples. The pineapples and papaws were large, the largest of the latter weighing 12 lb., while many of the former were as big as melons. In conjunction with the meritorious exhibit of the S.Q.F.S. was a demonstration of a patent fruit-grader. The Summit (Stanthorpe District) Fruit-Growers' Association sent an excellent collection of apples, which headed the honour list in their classes.

THE BOONAH RURAL SCHOOL.

Established only two and a-half years ago, the Boonah Rural School by its remarkably fine display showed evidence of wonderful progress, controlled enthusiasm, latent and developed skill, and the team-work spirit. The versatility of the pupils in design and craftsmanship was a revelation of the adaptability of the young Australian. The aim of the school is to turn out boys and girls well equipped with

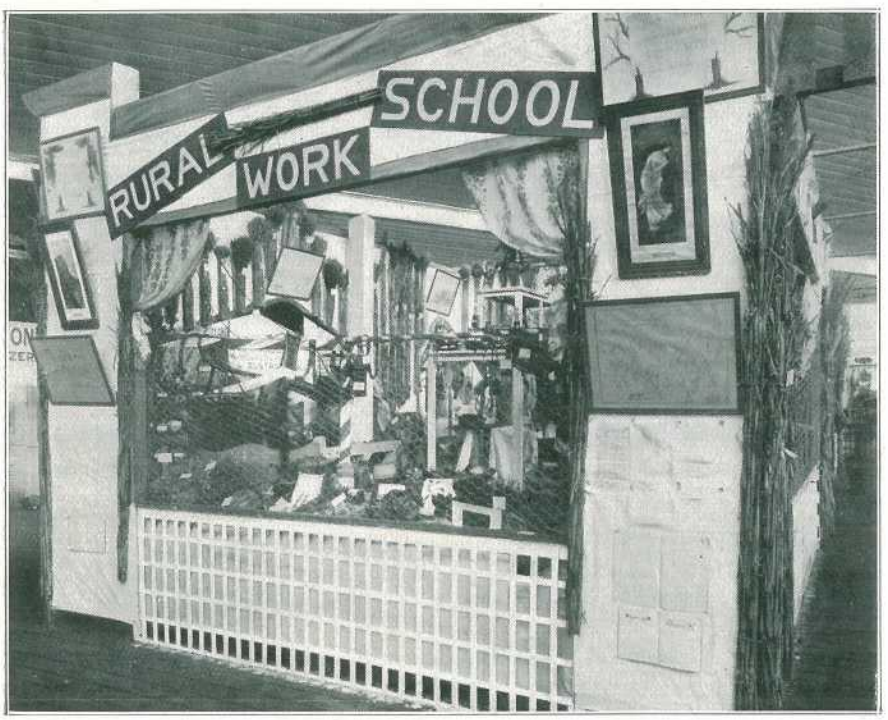

Photo : Dept. Agriculture and Stock.]

PLATE 29.—BOONAH RURAL SCHOOL DISPLAY.

knowledge and skill that can be applied to the daily duties of a rural vocation. Maize-growing, milk and cream-testing, photography, poultry-raising, forestry exhibits, artificial grasses, pot plants, electrification of seeds, kindergarten work, woodwork, tinwork, leatherwork, dressmaking, millinery, cookery, laundry work, knitting, soap-making, silkmaking, confectionery, jams and preserves, cordials, preserved vegetables, flowers—these are some of the things that occupy the attention of the pupils of the Boonah Rural School, and assisted to make up an exceedingly creditable and interesting display.

WOOL SECTION.

In this section some very high class wools were shown. With a few exceptions all the fleeces staged were selected from wools handled under the "Farmers' Wool Scheme."

The fleeces were ticketed with the qualities and price per pound realised on sale, and the very best wools in Queensland were represented in the exhibit.

The "Farmers' Wool Scheme" has now been in operation for five and a-half years. Over 200 farmers have taken advantage of the scheme with satisfactory results to them. In the course of that period over 1,000 bales have gone through the departmental wool room, and considering that the limit of numbers in a flock has been placed at 1,500, this record is commendable. Included in consignments from almost every district in Queensland were clips ranging in quantity from one fleece up to twenty-seven bales. The North, as far as Burketown, most of the islands off the coast, the Far West, the coastal areas from the Tweed to Cairns, the Darling Downs, Peak Downs, and other Central district areas all sent a quota. The top price, 22¾d., was received for coastal wools. The general average price right through the total works out at about 15d. per pound for all qualities. When it is remembered that the great bulk of farmers' wools is crossbred these results are very good. Latterly, however, coarse, burry and seedy crossbreds have been almost unsaleable, and in consequence the average price was reduced considerably.

Under this scheme the advantages to the small sheep farmer are many.

First.—In small quantities, his wool goes into the dags and butt sales, quite untreated. Some of the sorts may be worth, say, 18d. per pound and others as low as 3d. per pound. The buyer does not know the amount of good, bad, or indifferent wools in his consignment, and to protect himself he buys at the lowest quality price he sees.

Second.—No commission is charged, and, if required, an advance of 60 per cent. is given on receipt of wool in the departmental store.

Third.—As all the wools are pooled, the wool goes into the store as a big clip and so the charges are lighter by nearly one half.

Fourth.—If in good condition the farmers' own bales are used to repack, and a considerable saving is thus effected.

Fifth.—Skilled wool classers deal with the wools, thus ensuring evenness of "get up." There has been nothing but praise for the "get up" of the wools offered in the sales since the inception of the scheme.

The wools shown in the Wool Section at the National Association Grounds represent samples of the best received by the Department, but these illustrate the fact that any man with care and knowledge can grow wool quite equal in quality to the larger sheep farmers. No man need grow bad sheep and indifferent wool, and it is well known that ten ill-bred neglected sheep are not as good as five good animals.

In a sort of process of evolution all countries tend to subdivide and resubdivide, until the greater flocks of hundreds of thousand and tens of thousands come down in size approximating to those of the older lands, where 1,000 sheep is a large flock; the aggregate numbers on the land being very much greater than where great flocks range over extensive areas.

In Great Britain, for instance, they run on an area one-tenth of the size of Queensland sheep districts, 7,000,000 or more sheep, as many cattle as Queensland, besides horses and swine in great numbers. Queensland will some day run treble the numbers of stock she runs to-day when there are sufficient people to actually occupy and make full use of the land.

Sheep are as much a tool of a farm as ploughs or harrows. This is the teaching of history. Sheep were well named "Golden Toe" in ancient writing. Actually they were the first animals to be domesticated, and in this connection the Biblical quotation may be cited, "Abel was a keeper of sheep, but Cain was a tiller of the ground."

An officer was on duty at the Court during Show Week, to explain or instruct sheep farmers or would-be sheep farmers in all matters pertaining to the business, and free pamphlets were available to all who were interested in one of Queensland's great staple industries.

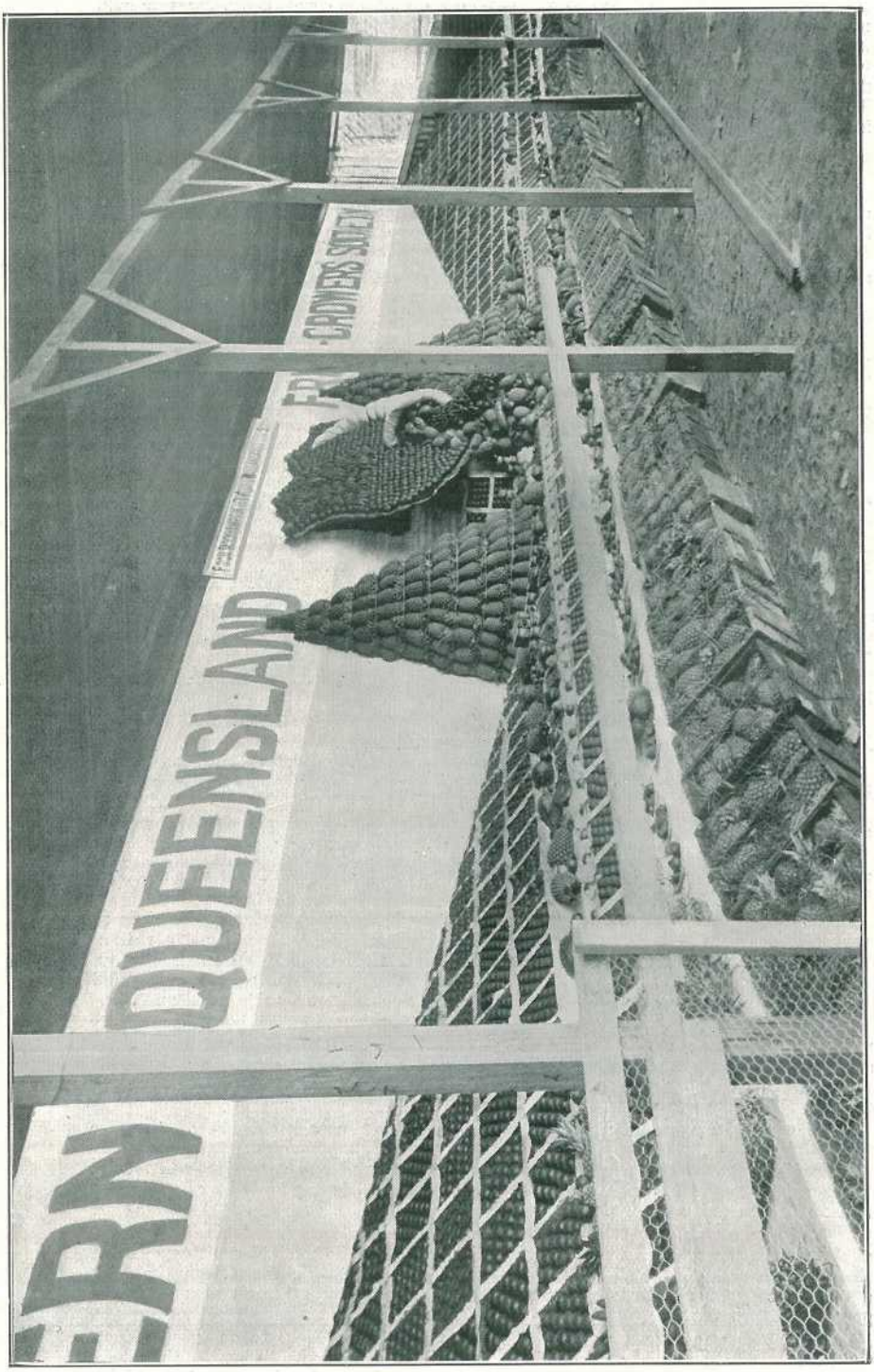

PLATE 30.—THE FINE DISPLAY OF THE SOUTHERN QUEENSLAND FRUITGROWERS' SOCIETY

Photo : Dept. Agriculture and Stock.]

PLATE 31.—SUGAR COURT—THE AUSTRALIAN SUGAR PRODUCERS' ASSOCIATION DISPLAY.

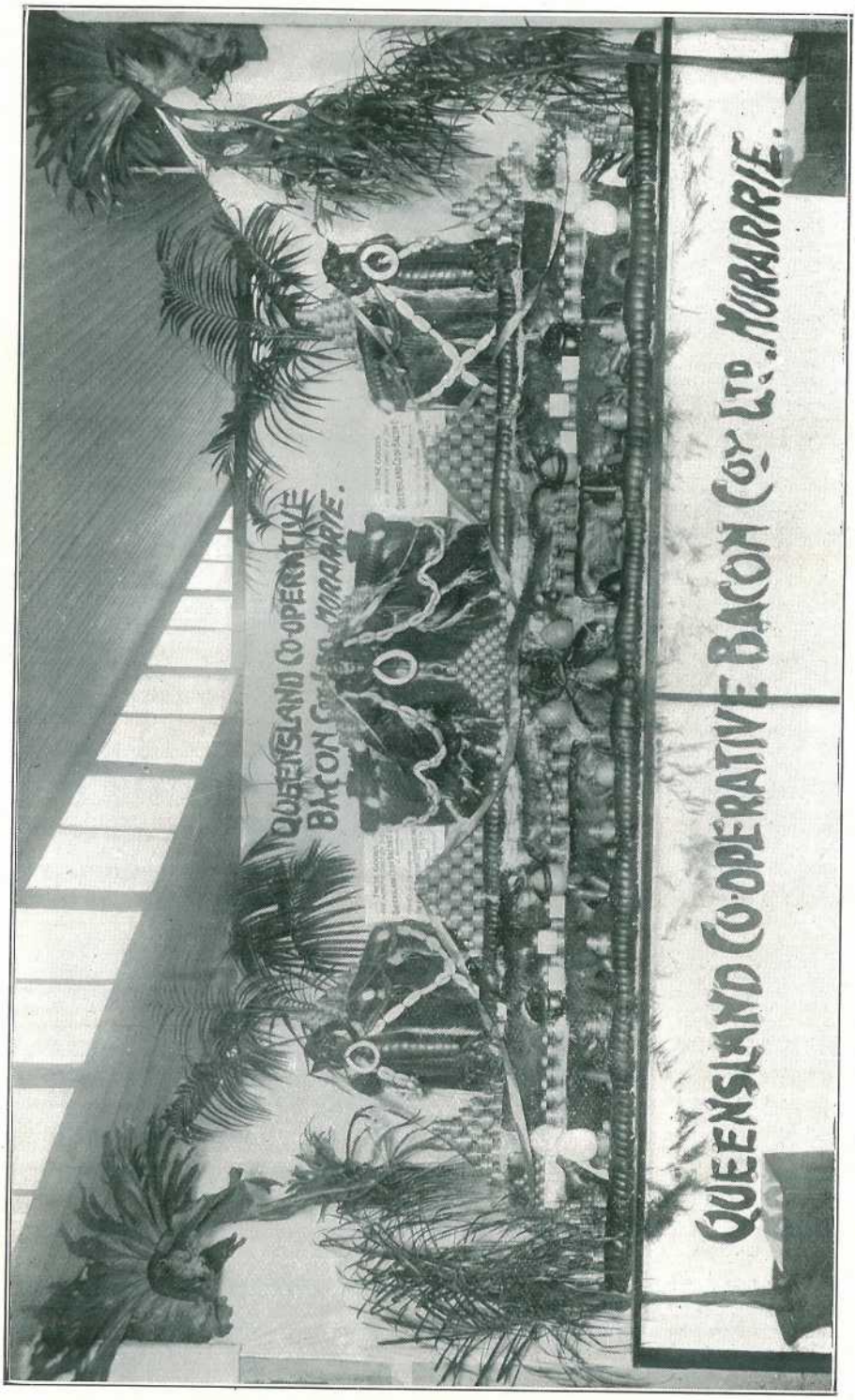

PLATE 32.—DISPLAY OF PRODUCTS FROM THE CO-OPERATIVE BACON FACTORY, MURARRIE.

PLATE 33.—THE GOVERNOR-GENERAL (LORD FORSTER), AND PRESIDENT C. E. MCDOUGALL INTERESTED IN THE JUMPING.

PLATE 34.—THE STATE GOVERNOR (SIR MATTHEW NATHAN), CONGRATULATING THE DRIVER OF EDNA WILKES ON HIS WIN.

STOCK DISEASES EXPERIMENT STATION, YEERONGPILLY.

Tick Eradication.

That the cattle tick continues to be a serious menace to our live stock industry was well illustrated by the numerous specimens exhibited showing its life history and development. Apart from heavy mortality from tick fever, the tick is the direct cause of injury to the hide and consequent depreciation in value.

Tick-infested cattle, apart from constant irritation, require more feed, while ticky cows give less milk.

The work of tick eradication was illustrated by numerous maps and diagrams.

Photo : Dept. Agriculture and Stock.]

PLATE 35.—STOCK INSTITUTE DISPLAY, COURT OF THE DEPARTMENT OF AGRICULTURE AND STOCK.

A striking feature of this interesting exhibit was a map and diagram showing what has been accomplished in tick eradication work in the United States, America, and in South Africa. In the first-named country there were originally 741,515 square miles tick-infested and under certain quarantine restrictions. For several years propaganda work was carried out by the officers of the Federal and various State Governments, assisted by Agricultural Societies, Stock-breeders' Associations, Farmers' Institutes, County Councils, Banking Institutions, Railway Companies, Manufacturers of Agricultural Implements, and in no small measure by the general public. The tick-infested area covered the whole or part of fifteen of the Southern States, stretching from the Atlantic to the Pacific Coast. On the 1st July, 1906, systematic tick eradication commenced, and up to the present time 510,000 square miles have been cleared up and released from quarantine restrictions. This area is equal to two-thirds, or nearly 70 per cent., of the original tick-infested country.

This great achievement has been accomplished primarily as a result of active propaganda and organisation by the staff of the Federal and State Departments of Agriculture for at least twelve months, followed by united efforts on the part of stockowners and others interested in the live stock industry.

In South Africa tick eradication has proved a great success. In Swaziland, with an area of 6,500 square miles, there are over 260,000 cattle which had to be dipped at least every three to five days. In the course of the past five years the cost of control, including erection of dipping tanks, dipping material, and European and native supervision, works out at 1s. 1d. per head of cattle per annum.

It should be pointed out that the Queensland cattle tick lives on the ground apart from its host for about six months, and that by dipping cattle on a farm every fourteen days for eight months will surely free the place from ticks.

The tick which causes East Coast fever is extremely hardy and can live on the ground apart from its host for over twelve months; therefore, it is absolutely necessary for dipping operations to be continued for at least fifteen months to clean the country and before quarantine restrictions can be removed. Moreover, as this tick has a preference for attaching and sheltering itself in the matted hair of the brush of the tail and in the depth of the ears, it necessitates hand dressing of these parts.

The overcoming of all obstacles and the successful results achieved in America and South Africa completely refutes the frequent assertions that tick eradication by dipping is impracticable in Queensland.

Contagious Abortion in Cattle.

This disease causes very serious trouble among dairy cattle, and is caused by a micro-organism, the bacillus Abortus, which was discovered by Professor Bang, of Copenhagen.

The exhibit showed examples of the organism growing artificially in tubes of Agar jelly in a partial vacuum as the germ has more or less a dislike to access to free oxygen.

There were also a series of tubes showing the method of testing the blood and milk of suspected infected animals by the agglutination test.

The staff at Yeerongpilly Experiment Station undertakes to examine specimens.

Should any farmer have reason to suspect that he has this infection among his cattle he should at once write for advice to Stock Experiment Station, Yeerongpilly.

Poultry Diseases.

Bacilliary White Diarrhœa of Young Chickens.—This serious trouble causes a heavy mortality, from 60 to 80 per cent., among young chickens from five to twenty days old.

It is caused by a germ which lives within the oviduct of the hen. A proportion of eggs laid by an infected hen hatch out infected chicks, and the excretions of these spread the disease to the other birds in the brood. It has been proved that chicks that recover from the disease may carry the causative micro-organism in the ovary and serve as a source of infection in the future. Outbreaks of this disease could be controlled readily by sanitary measures, but infection through the egg must be prevented by a process of weeding out the carriers among the hens used for breeding. The exhibit displayed cultures and drawings of the bacillus Pullorum, the cause of white diarrhœa in chickens, also a series of tubes illustrating the application of the agglutination test on the blood of suspected birds.

Blackleg.

A specially attenuated vaccine for the prevention of blackleg in calves was exhibited. Its efficiency is proved by the fact that it protects over 99 per cent. of over 100,000 calves treated.

Other specimens of vaccine included those of contagious mammitis, strangles, abscess, and natural lymph for protection against pleuro-pneumonia.

Another section of the exhibit demonstrated the absolute necessity for cleanliness in connection with the production and handling of milk, and illustrated by means of plates, cultures and diagrams the benefits and advantages of pasteurisation. It was pointedly indicated that if every farmer were to scald the milk before feeding it to pigs and calves, there would be a considerable reduction in the number of these animals affected with tuberculosis.

Official records show that of 131,783 pigs killed at the bacon factories under Government inspection there were found 9,362 carcasses showing lesions of tuberculosis.

A collection of preserved pathological specimens illustrating the various manifestations of tuberculosis, tick fever, blackleg, contagious mammitis, and other stock diseases was another educative feature of a distinctly valuable display.

PLATE 36.—THE COTTON PICKER.

Photo : Dept. Agriculture and Stock.]

PLATE 37.—FLEECY BILLOWS OF LINT—COTTON-GINNING AT THE BRISBANE EXHIBITION.

Photo : Dept. Agriculture and Stock.]

PLATE 38.—WEST MORETON DISTRICT EXHIBIT, FIRST IN "A" GRADE.

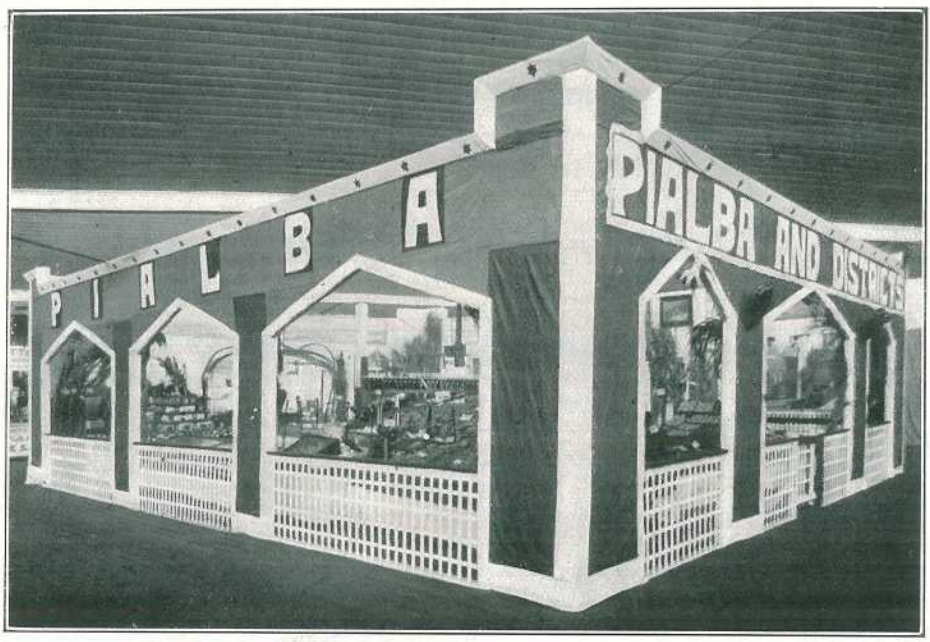

Photo : Dept. Agriculture and Stock.]

PLATE 39.—PIALBA DISTRICT EXHIBIT, FIRST IN "B" GRADE.

Photo : Dept. Agriculture and Stock.]

PLATE 40.—DAWSON VALLEY EXHIBIT.

Photo : Dept. Agriculture and Stock.]

PLATE 41.—WINNING EXHIBIT, ONE MAN FARM COMPETITION.

THE BOTANICAL DIVISION.

Weeds.

A representative collection of weeds, a source of trouble to horticulturists, agriculturists, and pastoralists throughout the State, was among the departmental displays. Most of these may be listed among the many undesirable importations from which Australia has suffered great economic loss. Many entered with seeds of economic plants, and by other agencies, such as straw for packing, and imported fodder. Some were introduced as ornamental garden plants, and having strayed from cultural control have become the pests we now find them. Among these are the billy goat weed, prickly poppy, and lantana. Some of the most obnoxious have been introduced for hedge-making, a disastrous example being the common prickly-pear. Hold-me-back or wait-a-while is another plant introduced for hedge-making that has become a curse in many scrub localities. Rank growing inkweeds, stinking rodger, wild cotton, and rag weeds are troublesome on newly-cleared and neglected cultivated lands, and of late years the federal weed, so called from its being first observed about the time of Federation, has spread on the newly-cleared scrub lands of the State. The khaki weed is an unwelcome visitor which is said to have been introduced from South Africa at the time of the Boer War, the needle-like burrs with which it is abundantly furnished cause great annoyance and detract from any fodder value the plant may possess. Quite a number in the collection may be termed noxious on account of their poisonous properties or harm they may cause to stock. Among these are the wall-flowered or heart-leaf poison bush, fuchsia bush, peach leaf poison, thorn apples, ironwood, and pimpernel. Many plants of the genus Cassia or Wild Sennas are continually being sent in as suspected of poisoning stock, the only harmful way in which these plants act, however, is as drastic purgatives. The question of plants poisonous or harmful to stock is one of the most complex that faces the botanist, veterinarian, and chemist alike, and one that calls for a good deal of scientific investigation in the State. Farmers and the public generally are once more reminded that the departmental officers are always willing and ready to report, free of charge, on any specimens of weeds, suspected poisonous plants, or other specimens forwarded to them. Each specimen in the collection is labelled with both the common and botanical names, and full information as to its properties and uses are supplied.

Grasses.

Queensland has always had a reputation for the richness of its pastures and the comprehensive collection of indigenous grasses and forage plants staged by the Department bears testimony that this distinction is fully justified. Among the Andropogons are the far-famed and fully appreciated blue grass and satin top, the former being one of the very best for fattening and grazing purposes, though not particularly drought resistant. The genus *Astrebla* comprises the highly-esteemed Mitchell grasses, of which four very distinct kinds are found in Queensland; the chief characteristic of these and some other of inland species of grasses and herbage is the tenacity of life which they possess, their drought resisting properties, and the rapid manner in which they respond to falls of rain after long periods of drought make their value in this respect nothing short of marvellous. Among the Star grasses, to the same genus of which belongs the imported Rhodes grass, are several varieties esteemed for their fodder value. The genus *Anthistiria* contains the well-known kangaroo grass and a near ally of this is the Flinders grass, which in a green and a dry state is so much relished by stock. Blady grass although a coarse grower is eaten by stock when it is young, especially the new growth that follows a burn off. This grass is of economic importance from its value as material for paper making. Quite an array of panicums was on view, most of them possessing high feeding values. Beautiful grasses are various *Eragrostis* or love grasses. The button grass and the crow foot are cosmopolitan species, the first named being a most valuable sheep fodder. Brown top bears a good reputation among some stockowners. Several species of native paspalum were shown. Native sorghums are of large growth, but when cut both horses and cattle do well on them. Coastal grasses were represented by spinifex, coast couch, and several dune grasses useful as sand binders. Among the grasses especially adapted for wet or swampy situations are water couch, rice grass, *panicum proliferum*, *panicum obseptum* (a particularly good grass for wet places), and two sorts of *chamæraphus* or swamp couch.

Edible Trees and Shrubs.

Among the more remarkable and valuable features of Australian vegetation are the edible shrubs and trees of our inland scrubs and open country. The collection shown of about thirty sorts proved most interesting and instructive to stockowners, pastoralists, and agriculturists generally. Among the many sorts especially noted were the mulga, kurrajong, apple tree, wild orange, native pomegranate or bumbil, belah, emu bush, whitewood, myall, cattle bush, cotton bush, and

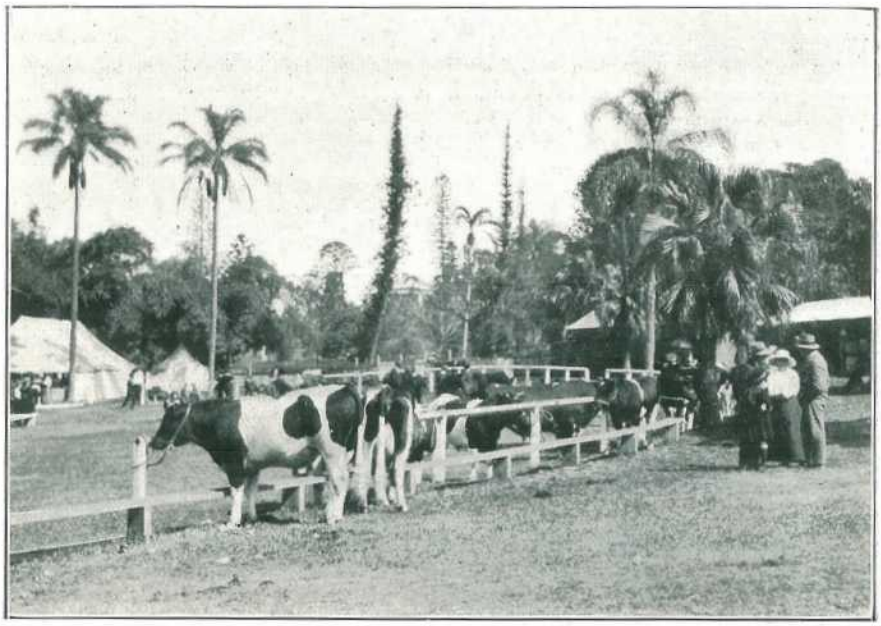

Photo: Dept. Agriculture and Stock.]

PLATE 42.—RESTING. A GLIMPSE OF THE JUDGING RING.

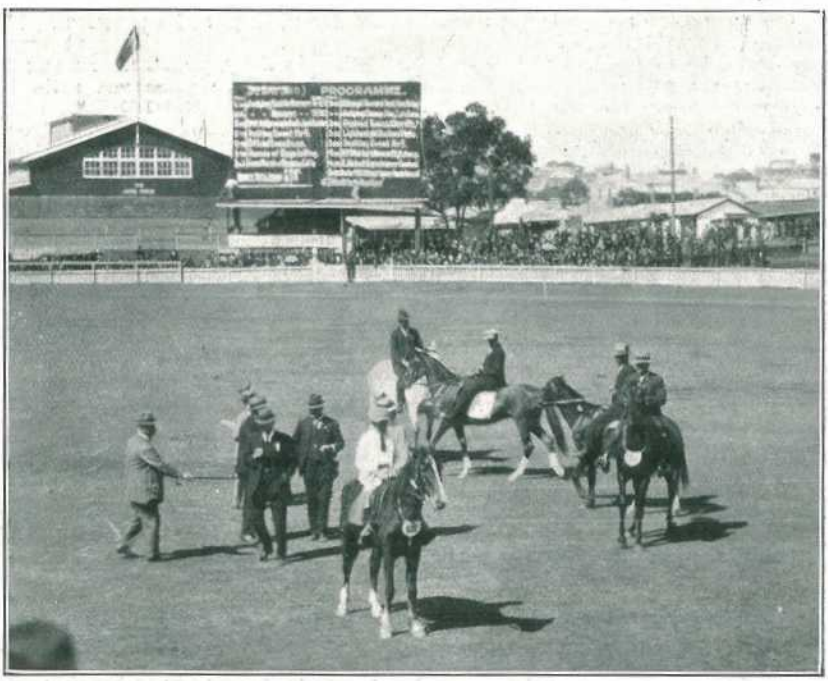

Photo: Dept. Agriculture and Stock.]

PLATE 43.—A POPULAR PRIZE-WINNER: NOT MUCH TO LOOK AT, BUT A "BLUE RIBAND" WALKER.

various salt bushes. All these and others have helped to keep stock not only alive, but in good condition during prolonged dry spells. The conservation, propagation, and utilisation of these valuable plants is a matter of national importance.

In connection with these exhibits it is again emphasised that officers of the Department are always willing and ready to identify and report on any samples of grasses, fodder plants, weeds, and other botanical specimens about which farmers, pastoralists, or others may desire technical or scientific information.

THE SEED LABORATORY.

Commercial Seeds and Seeds of Poisonous Plants.

The Seed Laboratory exhibit comprised a collection of agricultural and vegetable seeds, ninety of the weed seeds most frequently found in commercial seeds, and stock foods. Tables had been prepared giving the purity and germination of both Australian grown and oversea seeds, with the names of the countries from which the latter were imported. A purity table also listed the principal weed seeds found in samples examined in the course of 1921-1922, and from which it was noted that the poisonous *Datura stramonium* (Thorn Apple) seeds were found in samples of foxtail millet, japanese millet, Sudan grass, and in Queensland grown oats. Seeds of *Melilotus parviflora* (Hexham Scent), a butter and flour-tainting weed, were also discovered in samples of Cape barley, lucerne, and oats; they also frequently occur

Photo : Dept. Agriculture and Stock.]

PLATE 44.—WHEAT CLASSIFICATION EXHIBIT, COURT OF THE DEPARTMENT OF AGRICULTURE AND STOCK.

in wheat. Another germination table showed that lucerne and black cowpeas often contain a large proportion of hard seeds; seeds with husks so impervious to moisture as to delay germination. When the quantity of hard seeds present exceed 10 per cent. it is obvious that the effective germination is greatly reduced.

Every one should know the purity and germination of the seed that it is intended to sell or sow, also its freedom from hard seeds, insect-infested seeds, or seeds of any plant imparting a taint to butter, or deleterious to the life and health of stock. These matters can only be decided by a scientific examination of a large and truly representative sample, drawn from the bulk in the sender's possession. Seeds constitute the most variable material that the farmer or mechant purchases, and the success or failure of a crop, or even succeeding crops, may be wholly determined by the condition of the seed sown. No one can afford to leave any doubtful point to chance, and it is but common prudence to ascertain the purity and germination of all seeds before sowing or offering them for sale.

Samples of any seeds purchased or offered for sale as seeds for sowing may be sent to the Department of Agriculture for analysis. It is important that the sender's name and address be plainly written on each sample sent, and the parcel should be accompanied by a covering letter, addressed to the Under Secretary, Department of Agriculture and Stock, Brisbane. The weight of samples must not be less than 8 oz. of barley, cowpeas, beans, maize, tares, oats, wheat; 4 oz. of lucerne, sorghum, sorghum Sudanese (Sudan grass), millet, linseed, canary, prairie grass, cotton; 2 oz. of Rhodes grass, *paspalum dilatatum*, couch grass. A fee of 2s. 6d. is charged to vendors. A vendor is any person who sells, offers or contracts to sell, any seeds.

Free Analysis for Farmers.

No charge is made to farmers in respect to samples of any seeds purchased by them for their own sowing, provided the following particulars are plainly written on each sample sent:—Vendor's name and address; name of seed; quantity purchased; date of delivery; locality where seed is to be sown; name and address of purchaser.

Better Seeds—Better Crops.

The best is the cheapest, whatever the price, and quality should be the one and only consideration that determines a purchase. An opinion as to the quality or condition of any agricultural seed is useless unless based on actual facts revealed by an analysis conducted by uniform scientific methods. This important work is undertaken by the Seed Laboratory of the Department of Agriculture.

ENTOMOLOGICAL AND RELATED EXHIBITS.

The section of the Departmental Court illustrating the activities of the Division of Economic Entomology and Plant Pathology, in charge of Mr. H. Tryon, comprised, as relating to the former, twenty-four cases displaying life-histories of several of our more formidable pests of the orchard and field, as well as those of some of our stock-injuring insects. Thus were brought under notice the potato ladybird, the potato tuber-miner, the potato green caterpillar, the sweet potato web-worm, the sweet potato weevil, the cabbage diamond moth caterpillar, the cabbage stem miner, the cabbage godara caterpillar, the cabbage prodenia caterpillar, the pumpkin beetle, the bean fly, the cereals armyklorm, the grain weevil, the grain caterpillar, and the flour-eating caterpillar, the bean and pea weevils, the seven principal cotton-injuring insects. Among orchard pests were shown a series of citrus damaging insects, a series of citrus scale insects, the citrus stem-boring bettle, the so-called Queensland fruit fly, the banana weevil, the generally destructive peach moth (shown as affecting also almond, orange, loquat, guava, cherimoya, castor oil, cotton, and maize), the codlin moth. Stock injurious insects were illustrated by three cases showing sheep blowflies and their life phases and one devoted to the stock injuring "caterpillar" (a saw-fly larva).

These several life histories included not only specimens of the insects concerned, but also illustrations of their injuries and mode of action, indicated by models and water colour drawings, displaying life size and magnified representatons. They were prepared by the two Entomologists, Messrs. E. H. Jarvis and H. Jarvis, under

the direction of the Entomologist-in-Chief, and evinced the highest technical skill and scientific discrimination.

Plant Diseases.

Plant diseases proper, restricted in the extent of their display by exigencies of space, were illustrated by coloured plates relating to the following maladies:—Citrus die back, C. black spot, C. fruit dwarfing, C. Maori disease, C. brown rot, C. bud suppression, citrus black spot and lemon scab, potato Irish blight of (*a*) foliage, (*b*) tuber, P. nematode root-gall, P. scab, blackleg, and potato leaf spot, apple bitter pit, and pineapple fruitlet core rot. In this case, the nature prints were made by Mr. H. W. Mobsby, F.R.S.A., whilst to Mr. H. Jarvis is due the colour portrayal.

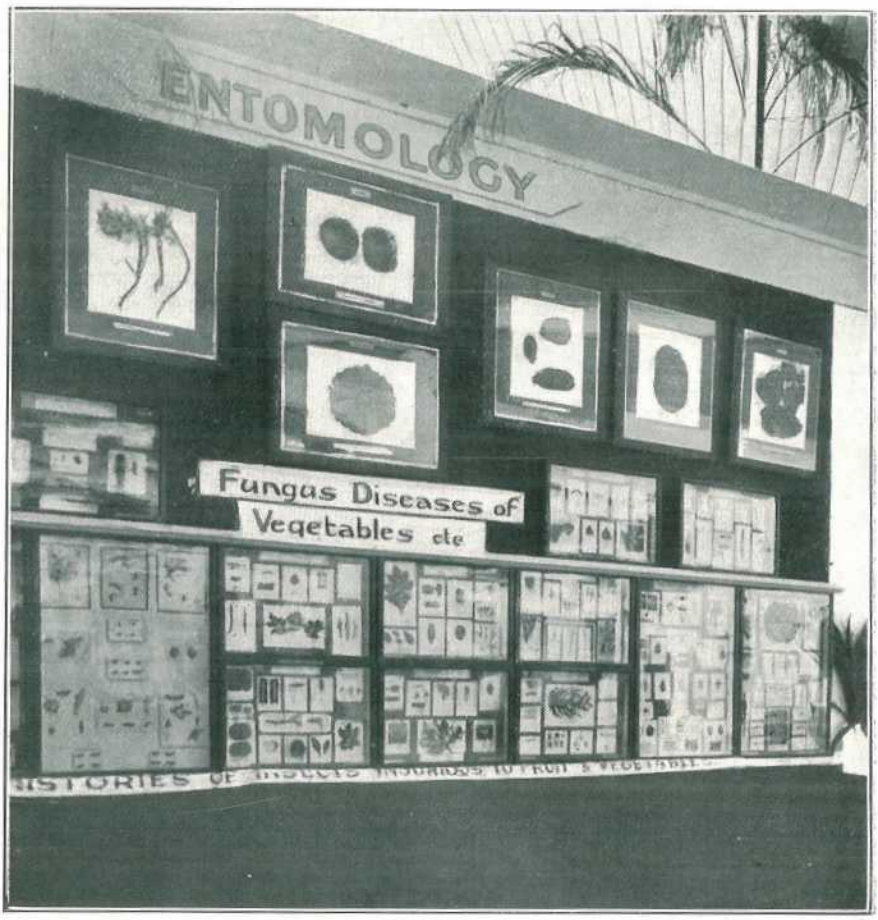

Photo : Dept. Agriculture and Stock.]

PLATE 45.—ENTOMOLOGICAL PANEL, COURT OF THE DEPARTMENT OF AGRICULTURE AND STOCK.

Banana Weevil Borer.

Distinct from the foregoing was a special stand devoted to this insect in charge of Mr. J. L. Froggatt B.Sc., entomologist in charge of banana beetle-borer investigations. This exhibit not only showed the beetle in all stages of its life history, actual living specimens supplementing others, but illustrations of its injuries and several modes of occurrence, As, in the case of the foregoing entomological and pathological exhibits, this section was evidently fully appreciated for its immense educational value.

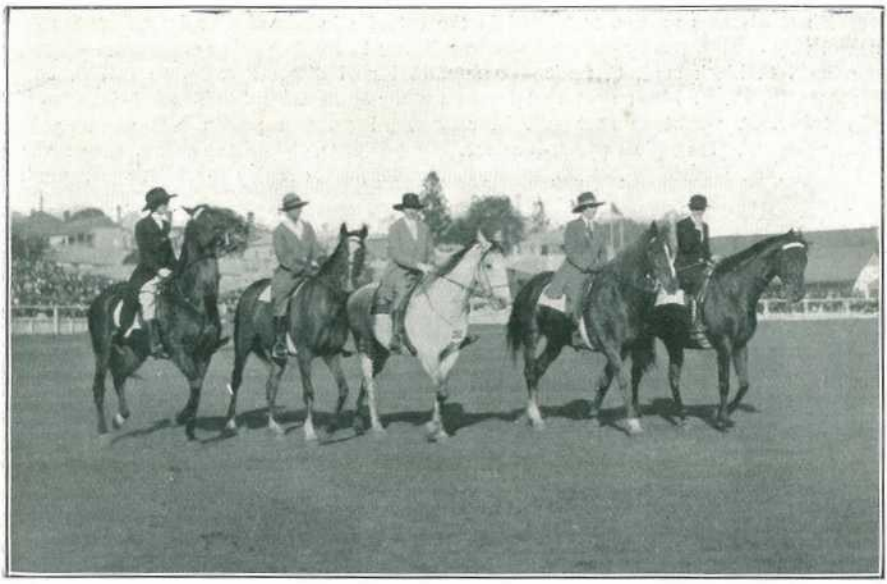

PLATE 46.—FIRST IN THE EQUESTRIENNE TEAMS COMPETITION.
THE BRISBANE TEAM.

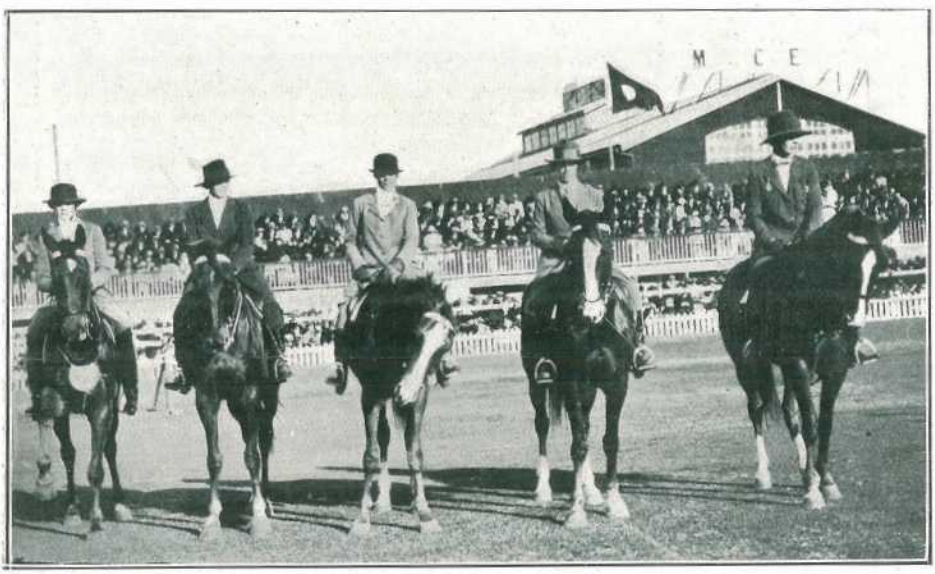

PLATE 47.—ROMA TEAM, SECOND.

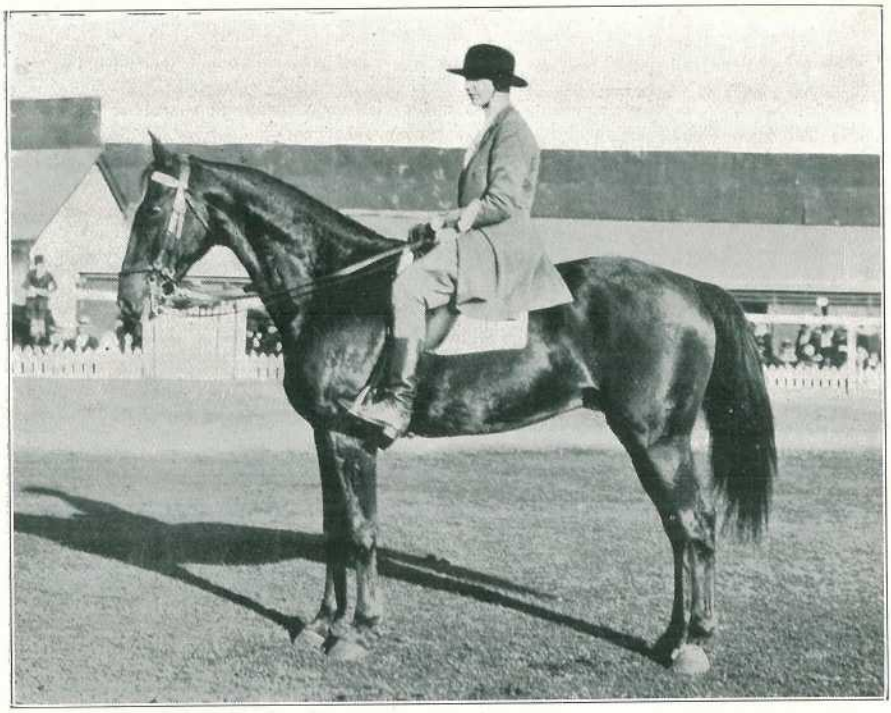

PLATE 48.—BEST AMATEUR LADY RIDER: MISS SUSAN SPENCER.

PLATE 49.—WINNER OF THE LADIES' HUNT: MISS WARD.

PLATE 50.—A. D. MCKAY'S "JACK," CHAMPION HACK: MISS MULLEN, RIDER.

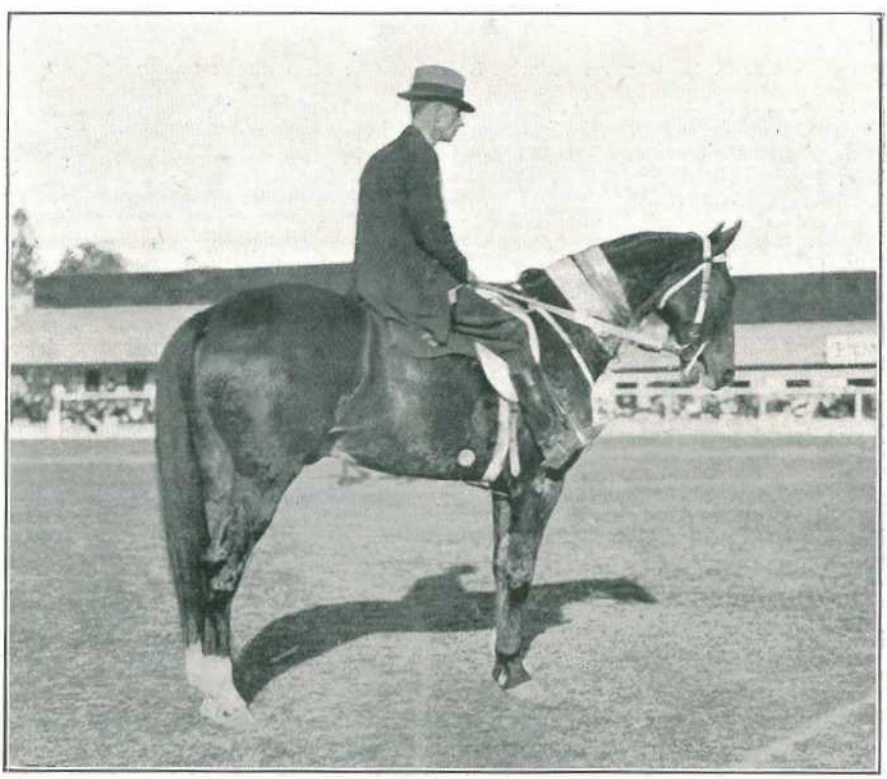

PLATE 51.—"BEN ARNOLD," SEVEN YEARS CHAMPION HACK.
The old horse, winner of many Championships at Brisbane and other Shows, died at the end of June.

DISTRICT EXHIBITS.

PRIMARY PRODUCTS AND MANUFACTURES.

The result in the award in the primary products and manufactures, or "A" grade exhibits, was a triumph for the West Moreton District, which won the coveted honour for the second year in succession with the very fine aggregate of 1,213 points out of a possible 1,558. Its only opponent—Wide Bay and Burnett—secured an aggregate of 816 points. The success of West Moreton can be better gauged from the fact that in 1921 its exhibit won with an aggregate of 1,094½, so that, notwithstanding the chief organiser's optimistic opinion that he had a 50-point better exhibit this year, he has done much better than he anticipated. It was indeed a very fine victory for those associated with the exhibit, and West Moreton will again hold the handsome Chelmsford Shield for twelve months. Wide Bay and Burnett's aggregate of 816 points was not so good as in 1921. The following detailed points, however, show the strong and weak sections of each of the two exhibits:—

	Possible Points.	West Moreton.	Wide Bay and Burnett.
(1) DAIRY PRODUCE—			
Butter, 1 box	90	88	89½
Milk, condensed, concentrated, or dried, and by-products	40	32	0
Cheese, 1 cwt.	60	50	46
Eggs, suitable for domestic use; 1 dozen of each variety	20	18	5
	210	188	140½
(2) FOODS—			
Hams and bacon	50	48	38
Rolled and smoked beef and mutton	20	20	8
Smallgoods and sausages, if smoked or preserved	10	10	8
Fish—smoked, preserved, and canned	10	7	3
Canned meats	25	25	0
Lard, tallow, and animal oils	20	20	8
All butchers' by-products, not included in any other part of scale of points	10	10	0
Honey and its by-products	20	20	19
Confectionery, factory made	10	10	6
Bread, buscuits, scones, and cakes, factory made	10	10	9
	185	180	99
(3) FRUITS, VEGETABLES, AND ROOTS—Fresh and Preserved—			
Fresh fruits—all kinds	60	39	51
Preserved fruits, jams, &c.	30	15	8
Dried fruits	20	6	6
Fresh Vegetables—all kinds, including table pumpkins, but excluding potatoes	25	20	5
Preserved and dried vegetables, pickles, sauces, &c.	10	5	0
Potatoes, English and sweet	40	30	15
Roots—all kinds—and their products, arrowroot, cassava, meal, &c., samples not less than 1 lb.	14	10	0
Cocoanuts, peanuts, and other nuts	6	4	2
	205	129	81
(4) GRAIN, &C.—			
Wheat	50	40	8
Flour, bran, pollard, macaroni, and meals prepared therefrom	10	0	8
Maize	50	42	28
Maizena, meals, starch, glucose, and cornflours	10	3	2
Oats, rye, rice, barley, malt, pearl barley, and their meals	30	22	2
	150	107	48

DISTRICT EXHIBITS—*continued.*

—	Possible Points.	West Moreton.	Wide Bay and Burnett.
(5) MANUFACTURES AND TRADES—			
All woodwork	30	28	23
All metal and ironwork	30	25	27
Leather and all leather work and tanning	20	12	8
Manufactured woollen and cotton fibre	30	25	0
All tinwork	10	7	9
Artificial manures	10	6	5
Brooms and brushes	10	5	7
Manufactures not otherwise enumerated	15	13	10½
	155	121	89½
(6) MINERALS AND BUILDING MATERIALS—			
Gold, silver, copper, and precious stones	25	16	14
Coal, iron, other minerals, and salt	30	21	21
Stone, bricks, cement, marble, terra cotta	20	18	8
Woods—dressed, undressed, and polished, one face to be polished, one face to be dressed, and half of it polished, back to be rough, samples of wood to measure not less than 12 x 6 x 1 inch thick	25	23	22
	100	78	65
(7) TROPICAL PRODUCTS—			
Sugar-cane	60	40	50
Sugar (raw and refined)	20	12	10
Rum, spirits, and by-products	10	5	5
Coffee (raw and manufactured), tea, and spices	10	9	6
Cotton (raw), and by-products	30	20	15
Rubber	10	0	0
Oils (vegetable)	10	8	0
	150	94	86
(8) WINES, &C.—			
Wines	15	15	10
Aerated and mineral spa water, vinegar, and cordials	10	8	9
	25	23	19
(9) TOBACCO—			
Tobacco, cigar and pipe, in leaf	20	10	0
(10) HAY, CHAFF, &C.—			
Oaten, wheaten, lucerne, and other hay	30	22	6
Grasses and their seeds	10	8	4
Oaten, wheaten, lucerne, and other chaffs	50	35	15
Ensilage and other prepared cattle fodder	20	16	0
Sorghum and millets, in stalk	10	6	8
Commercial fibres (raw and manufactured)	10	8	4
Pumpkins and other green fodder	10	7	3
Broom millet, ready for manufacture	10	6	6
Farm seeds, including canary seed	13	10	0
	163	118	46

DISTRICT EXHIBITS—*continued.*

—	Possible Points.	West Moreton.	Wide Bay and Burnett.
(11) WOOL, &c.—			
Scoured wood	40	35	39
Greasy wool	60	55	50
Mohair	10	8	10
	110	98	99
12) ENLARGED PHOTOGRAPHS— A maximum of 5 points will be awarded for enlarged photographs of district scenery and local raised live stock	5	3	0
(13) EFFECTIVE ARRANGEMENT—			
Comprehensiveness of view	30	24	19
Arrangement of sectional stands	15	12	8
Effective ticketing	20	14	8
General finish	15	14	8
	80	64	43
Totals	1,558	1,213	816

PRIMARY PRODUCTS ONLY.

The primary products only, or "B" Grade competition, provided an exceptionally close contest, and resulted in a win for the Pialba District with 809 points, Northern Darling Downs being runner up with 801 points, while the other three exhibits were all close up. Pialba District has gained distinction very early in its career, as this is the first occasion an exhibit has come from that district, and to defeat a strong district like the Northern Downs, which won in 1921, is no mean performance. It was unfortunate for Kingaroy to be again low down for effective arrangement, for this exhibit scored remarkably well in some of the other sections. Details are as follows:—

—	Possible Points.	Gympie.	Kingaroy.	Maranoa.	Northern Darling Downs.	Pialba.
(1) DAIRY PRODUCE—						
Butter	90	88	87	85	88	80
Cheese	60	40	49	40	57	40
Eggs, for domestic use	20	12	12	10	8	16
	170	140	148	135	153	136
(2) FOODS—						
Hams, bacon, rolled, and smoked beef and mutton	50	10	25	15	30	35
Fish—smoked	10	5	2	3	3	8
Lard, tallow, and animal oils	15	7	12	10	8	10
Honey, and its by-products	25	22	11	16	15	25
Confectionery (home-made)	10	9	5	4	6	7
Biscuits, bread, cakes, and scones (home-made)	10	7	6	5	6	6
	120	60	61	53	68	91

DISTRICT EXHIBITS—*continued.*

—	Possible Points.	Gympie.	Kingaroy.	Maranoa.	Northern Darling Downs.	Pialba.
(3) FRUITS, VEGETABLES, AND ROOTS—Fresh and preserved—						
Fresh fruits—all kinds	60	50	16	25	20	53
Preserved fruit and jams, &c., prepared by farmer	20	15	14	14	14	10
Dried fruit, prepared by farmer	5	3	3	..	..	..
Fresh vegetables—all kinds, including table pumpkins, but excluding potatoes	25	12	8	20	15	18
Preserved and dried vegetables, pickles, sauces, &c.	10	4	8	7	6	5
Potatoes	40	16	28	18	16	25
Roots—all kinds—and their products, arrowroot, cassava meal, &c., samples not less than 1 lb.	10	4	3	..	2	6
Cocoanuts, peanuts, and other nuts	10	5	6	5	4	8
Vegetable seeds	10	5	8	5	6	7
	190	114	94	94	83	132
(4) GRAIN, &C.—						
Wheat	50	6	15	44	42	6
Flour, bran, pollard, macaroni, and meals prepared therefrom	10	4	4	8	8	3
Maize	50	32	44	25	25	25
Maizena, meals, starch, glucose, and cornflour	10	3	6	6	6	5
Oats, rye, rice, barley, malt, pearl barley, and their meals	30	10	25	12	12	10
	150	55	94	95	93	49
(5) WOODS—						
Woods, dressed, undressed, and polished, one face to be dressed, and half of it polished, back to be rough, samples to measure not less than 12 x 6 x 1 inch thick	25	22	20	16	23	20
Wattle bark	15	10	12	8	12	9
	40	32	32	24	35	29
(6) HIDES (1) AND HOME PRESERVED SKINS FOR DOMESTIC USE—						
Must be free from offensive smell	15	9	4	14	12	13
(7) TROPICAL PRODUCTS—						
Sugar-cane	60	16	20	..	..	45
Coffee, tea, and spices	10	4	3	..	..	6
Cotton (raw) and by-products	30	12	10	15	10	15
	100	72	33	25	10	66
(8) MINERALS—						
Gold, silver, copper, and precious stones	25	14	8	..	5	12
Coal, iron, and other minerals, and salt	30	15	16	9	16	23
	55	29	24	9	21	35

DISTRICT EXHIBITS—*continued.*

	Possible Points.	Gympie.	Kingaroy.	Maranoa.	Northern Darling Downs.	Pialba.
(9) TOBACCO—						
Tobacco (cigar and pipe), in leaf ..	20	5	5	10	15	4
(10) HAY, CHAFF, &c.—						
Lucerne, oaten, wheaten, and other hay	30	8	16	25	18	12
Grasses and their seeds	7	4	6	6	4	3
Oaten, wheaten, lucerne, and other chaffs	50	20	25	40	44	30
Ensilage and other prepared cattle fodder	20	12	12	15	14	10
Sorghum and millets	10	7	7	7	7	3
Commercial fibres	10	5	5	7	5	5
Pumpkins and other green fodder ..	10	6	8	8	8	6
Hemp and flax	10	5	7	4	5	3
Broom millet, ready for manufacture	10	6	4	4	6	2
Farm seeds, including canary seed ..	13	6	11	12	10	7
	170	79	101	128	121	81
(11) WOOL, &c.—						
Scoured wool	40	30	36	39	38	30
Greasy wool	60	40	54	60	58	45
Mohair	10	9	7	9	8	7
	110	79	97	108	104	82
(12) ENLARGED PHOTOGRAPHS—						
A maximum of 5 points will be awarded for enlarged photographs of district scenery and local bred live stock	5	1	2	1	3	1
(13) LADIES' WORK—						
Needlework,—knitting	25	13	21	25	18	20
Fine arts	5	2	5	3	2	3
School work, maps, writing, &c., for pupils of schools in the district..	15	4	10	2	11	..
	45	19	36	30	31	23
(14) EFFECTIVE ARRANGEMENT—						
Comprehensiveness of view	30	24	14	16	20	26
Arrangement of sectional stands ..	15	11	7	8	9	13
Effective ticketing	20	16	8	11	12	14
General finish	15	12	7	9	11	14
	80	63	36	44	52	67
Totals..	1,270	757	767	770	801	809

ONE-FARM EXHIBITS.

WON BY MR. K. HAAG.

The one-farm exhibit competition resulted in a triumph for Mr. K. Haag, who secured an aggregate of 470 points, with Mr. V. O. Williams, 437 points, second, and Mr. S. C. Klumpp, 365 points, third. Details:—

—	Possible Points.	K. Haag.	S. C. Klumpp.	V. O. Williams.
(1) DAIRY PRODUCE—				
Butter, 6 lb.	25	23	22	23
Cheese, 1 large or 2 small (home-made)	20	18	8	14
Eggs, suitable for domestic use, 1 dozen each variety	5	4½	5	4½
	50	45½	35	41½
(2) FOODS—				
Hams, 15 lb.; bacon, 15 lb. (home cured)	20	17	15	14
Corned, smoked, and spiced beef and mutton, 10 lb.	10	8	8	8
Honey, 12 lb.	10	10	10	8
Beeswax, 6 lb.	5	5	5	2
Bread, 2 loaves; scones, 1 dozen	5	3	4	5
Confectionery and sweets, 3 lb.	5	4	3	4
Cakes and biscuits	5	4	3	4
Lard, tallow, oils	5	4	4	4
	65	55	52	49
(3) FRUITS, VEGETABLES, AND ROOTS: (Fresh and Preserved)—				
Fresh fruits, all kinds	25	11	17	9
Dried fruits	10	7	6	9
Preserved fruits and jams	15	15	13	14½
Fresh vegetables	15	12	10	5
Pickles, sauces, &c.	15	14	12	13
Potatoes, not less than 28 lb. (or a collection), and roots	25	20	15	22
Table pumpkins, squashes, and marrows, 56 lb.	10	10	7	10
Cocoanuts and nuts	3	1	1	1
Vegetable and garden seeds	5	3	3	5
Arrowroot, 10 lb.	5	5	5	2
Sugar beet, 3 lb.	5	4	2	2
Cassava, 3 lb.	5	4	4	..
Ginger, 3 lb.	5	5	..	..
	143	111	95	92½
(4) GRAIN, &C.—				
Wheat	25	23	7	12
Maize	20	18	10	18
Barley, oats, rye, and rice	20	15	..	16
	65	56	17	46
(5) TROPICAL PRODUCTS—				
Sugar-cane, 24 stalks or 1 stool	30	25	25	2
Cotton, in seed, 10 lb., long staple	10	8	6	5
Coffee, 10 lb.	5	..	5	3
	45	33	36	10
(6) TOBACCO—				
Tobacco leaf, dried, 5 lb.	10	..	6	5

ONE-FARM EXHIBIT—*continued.*

—	Possible Points.	K. Haag.	S. C. Klumpp.	V. O. Williams.
(7) HAY, CHAFF, &c.—				
Hay, oaten, wheaten, lucerne, and other varieties	20	18	10	20
Grasses and their seeds, including canary..	10	9	7	9
Chaff, oaten, wheaten, lucerne, and other varieties	20	18	16	18
Ensilage, any form	15	12	10	15
Cattle fodder (pumpkins and green fodder)	15	15	10	14
Sorghum and millet	10	10	4	8
Hemp, 5 lb.	5	3	3	5
Flax, 5 lb.	5	4	3	4
Cow pea seed, 7 lb.	7	7	..	5
Brown millet, 10 lb.	10	10	10	7
	117	106	73	105
(8) WOOL—				
Greasy, 5 fleeces	20	..	..	16
Mohair..	5	5	..	4
	25	5	..	20
(9) DRINKS, &c.—				
Temperance drinks, 6 bottles	10	8	4	4
(10) WOMEN'S AND CHILDREN'S WORK—				
Needlework, knitting	10	4	6	4
Fine arts	5	2	..	3
Fancy work	15	8	12	10
School work, maps, writing, &c.	10	..	1	8
	40	14	19	25
(11) MISCELLANEOUS—				
Articles of commercial va'ue	5	2½	2	5
(12) PLANTS AND FLOWERS—				
In pots	5	5	3½	4
(13) TIME AND LABOUR-SAVING USEFUL ARTICLES—				
Made on the farm	10	3	5	3
(14) EFFECTIVE ARRANGEMENT OF EXHIBITS—				
Comprehensiveness of view	10	9	6	8
Arrangement of stands	5	4	3	5
Effective ticketing	5	5	3	5
General finish	10	8	6	9
	30	26	18	27
Totals	620	470	365	437

BUTTER EXHIBITS.

GRANTHAM TAKES EXPORT CLASSES.

The Queensland Farmers' Co-operative Company, Limited, at Grantham, took first prize with 95½ points, the Dalby factory of the Downs Co-operative Dairy Company Limited was second with 95 points, and the Clifton factory of the same concern third with 94½ points.

Following are the details:—

EXPORT BUTTER (30 DAYS' STORAGE).

Class 8.

One box butter (salted), most suitable for export, to be stored thirty clear days prior to 7th August, 1922.

ONE BOX (SALTED), 30 DAYS' STORAGE.

—	Flavour.	Texture.	Colour.	Salting.	Packing.	Total.
Possible points	65	20	7	4	4	100
Queensland Farmers' Co-operative Co., Ltd., Grantham	61	20	7	4	3½	95½
Downs Co-operative Dairy Co., Ltd., Dalby	60	20	7	4	4	95
Downs Co-operative Dairy Co., Ltd., Clifton	60	19½	7	4	4	94½
Queensland Farmers' Co-operative Co., Ltd., Boonah	59	20	7	4	4	94
Caboolture Co-operative Dairy Co., Ltd. ..	59	20	7	4	3½	93½
Gayndah Co-operative Dairy Co., Ltd. ..	59	20	7	4	3½	93½
Goombungee Co-operative Dairy Co., Ltd.	58	20	7	4	4	93
Maryborough Co-operative Dairy Co., Ltd., Maryborough	58	20	7	4	4	93
Maryborough Co-operative Dairy Co., Ltd., Kingaroy	59	20	6½	4	3½	93
Murrumbidgee Irrigation Dairy Farmers' Co-operative Co., Ltd...	60	20	5	4	4	93
Logan and Albert Co-operative Co., Ltd...	58	20	7	4	3½	92½
Queensland Farmers' Co-operative Co., Ltd., Laidley	58	20	7	4	3½	92½
Stanley River Co-operative Co., Ltd., ..	58	20	7	4	3	92
Queensland Farmers' Co-operative Co., Ltd., Booval	57	20	7	4	3½	91½
Terror's Creek and Samson Vale Co., Ltd.	58	19	7	4	3	91
Wide Bay Co-operative Dairy Co., Ltd., Gympie	58	19	7	4	3	91
Maleny Co-operative Dairy Co., Ltd. ..	56	20	7	4	3½	90½
Wide Bay Co-operative Dairy Co., Ltd., Cooroy	56	20	7	4	3	90
Ballina Co-operative Preserving Co., Ltd.	55	20	7	4	3½	89½
Kin Kin Co-operative Dairy Co., Ltd. ..	54	20	7	4	3½	88½
South Burnett Co-operative Dairy Co., Ltd.	54	20	7	4	3½	88½

BUTTER EXHIBITS—*continued.*

ONE BOX (UNSALTED), 8 WEEKS' STORAGE.

One box butter (unsalted), most suitable for export, to be stored eight weeks prior to 7th August.

—	Flavour.	Texture.	Colour.	Packing.	Total.
Possible points	65	20	7	4	96
Downs Co-operative Dairy Co., Ltd., Dalby ..	61	20	7	4	92
Ballina Co-operative Preserving Co., Ltd. ..	61	20	7	3½	91½
Downs Co-operative Dairy Co., Ltd., Clifton ..	60	20	7	4	91
Downs Co-operative Dairy Co., Ltd., Crow's Nest	60	19½	7	4	90½
Maryborough Co-operative Dairy Co., Ltd., Kingaroy	61	20	6½	3	90½
Queensland Farmers' Co-operative Co., Ltd., Boonah	60	20	6½	4	90½
Gayndah Co-operative Dairy Co., Ltd.	59	20	7	4	90
Nanango Co-operative Dairy Co., Ltd.	60	20	6	4	90
Queensland Farmers' Co-operative Co., Ltd., Booval	60	20	6½	3½	90
Queensland Farmers' Co-operative Co., Ltd., Laidley	60	20	6½	3½	90
Caboolture Co-operative Dairy Co., Ltd.	59	20	6½	4	89½
Wide Bay Co-operative Dairy Co., Ltd., Gympie..	59	19½	7	3½	89
Oakey Co-operative Dairy Co., Ltd.	59	20	7	3½	89½
Queensland Farmers' Co-operative Co., Ltd. Grantham	60	20	6	3½	89½
Logan and Albert Co-operative Dairy Co., Ltd...	58	20	7	3½	88½
Maryborough Co-operative Dairy Co., Ltd., Maryborough	58	20	6½	4	88½
Warwick Butter and Dairying Co., Ltd., Mill Hill	58	20	7	3½	88½
Goombungee Co-operative Dairy Co., Ltd. ..	57	20	7	4	88
Wide Bay Co-operative Dairy Co., Ltd., Cooroy..	58	19½	7	3½	88
Terror's Creek and Samson Vale Dairy Co., Ltd...	58	19½	6½	3	87
Maleny Co-operative Dairy Co., Ltd.	56	19½	7	4	86½
South Burnett Co-operative Dairy Co., Ltd. ..	57	20	6½	3	86½

EIGHT WEEKS' STORAGE.

Class 10.

One box butter (salted), suitable for export, to be kept in cold stores not less than eight weeks prior to 7th August.

ONE BOX (SALTED), 8 WEEKS' STORAGE.

—	Flavour.	Texture.	Colour.	Salting.	Packing.	Total.
Possible points	65	20	7	4	4	100
Downs Co-operative Dairy Co., Ltd., Dalby	60	20	7	4	4	95
Warwick Butter and Dairy Co., Ltd., Allora	59	20	7	4	4	94
Stanley River Co-operative Co., Ltd. ..	59	20	7	4	3½	93½
Ballina Co-operative Preserving Co., Ltd.	58	20	7	4	4	93
Gayndah Co-operative Dairy Co., Ltd. ..	58	20	7	4	4	93
Logan and Albert Co-operative Dairy Co., Ltd.	58	20	7	4	4	93
Queensland Farmers' Co-operative Co., Ltd., Boonah	58	20	7	4	4	93
Queensland Farmers' Co-operative Co., Ltd., Booval	58½	20	7	4	3½	93
Queensland Farmers' Co-operative Co., Ltd., Laidley	59	20	7	4	3	93
Wide Bay Co-operative Dairy Co., Ltd., Gympie	58	20	7	4	4	93

BUTTER EXHIBITS—*continued.*

ONE BOX (SALTED), 8 WEEKS' STORAGE—*continued.*

—	Flavour.	Texture.	Colour.	Salting.	Packing.	Total.
Possible points	65	20	7	4	4	100
Oakey Co-operative Dairy Co., Ltd. ..	59	19	7	4	3½	92½
Queensland Farmers' Co-operative Co., Ltd., Grantham	58	20	7	4	3½	92½
Maryborough Co-operative Dairy Co., Ltd., Kingaroy	57	20	7	4	4	92
Wide Bay Co-operative Dairy Co., Ltd., Cooroy	58	19	7	4	4	92
Caboolture Co-operative Dairy Co., Ltd. ..	58	19	7	4	3½	91½
Downs Co-operative Dairy Co., Ltd., Clifton	57	20	7	4	3½	91½
Goombungee Co-operative Dairy Co., Ltd.	57	19½	7	4	4	91½
Nanango Co-operative Dairy Co., Ltd. ..	57	20	6½	4	4	91½
Downs Co-operative Dairy Co., Ltd., Crow's Nest	56	20	7	4	4	91
Warwick Butter and Dairying Co., Ltd., Mill Hill	57	19½	7	4	3½	91
Maleny Co-operative Dairy Co., Ltd. ..	56	19½	7	4	4	90½
Maryborough Co-operative Dairy Co., Ltd., Maryborough	56	19½	6½	4	4	90
South Burnett Co-operative Dairy Co., Ltd.	56	19½	7	4	3½	90
Terror's Creek and Samson Vale Dairy Co., Ltd.	57	10	7	4	3	90

FRESH BUTTER.

The following are the awards in the fresh butter classes:—

ONE BOX, FACTORY MAKE, LOCAL CONSUMPTION.

—	Flavour.	Texture.	Colour.	Salting.	Packing and Finish.	Total.
Possible points	65	20	7	4	4	100
Queensland Farmers' Co-operative Dairy Co., Ltd., Grantham	61	20	7	4	4	96
Queensland Farmers' Co-operative Dairy Co., Ltd., Booval	60½	20	7	4	4	95½
Logan and Albert Co-operative Dairy Co., Ltd.	60	20	7	4	4	95
Downs Co-operative Dairy Co., Ltd., Crow's Nest	60	20	7	4	3½	94½
Queensland Farmer's Co-operative Dairy Co., Ltd., Laidley	60	19½	7	4	4	94½
South Burnett Co-operative Dairy Co.,Ltd.	61	19½	6½	4	3½	94½
Maryborough Co-operative Dairy Co., Ltd., Kingaroy	60	20	6½	4	3½	94
Wide Bay Co-operative Dairy Co., Ltd., Gympie	61	19½	6½	3½	3½	94
Nanango Co-operative Dairy Co., Ltd. ..	60	19½	6½	4	3½	93½
Queensland Farmers' Co-operative Dairy Co., Ltd., Boonah	59½	20	7	3½	3½	93½
Scone Co-operative Dairy Co., Ltd. ..	59	20	7	4	3½	93½
Ballina Co-operative Preserving Co., Ltd.	59	19½	7	4	3½	93

FRESH BUTTER—*continued.*

ONE BOX, FACTORY MAKE, LOCAL CONSUMPTION—*continued.*

—	Flavour.	Texture.	Colour.	Salting.	Packing and Finish.	Total.
Possible points	65	20	7	4	4	100
Wide Bay Co-operative Dairy Co., Ltd., Cooroy	59	19½	7	4	3½	93
Kin Kin Co-operative Dairy Co., Ltd. ..	59	19½	6½	4	3½	92½
Oakey Co-operative Dairy Co., Ltd. ..	60	19	7	3½	3	92½
Stanley River Co-operative Dairy Co., Ltd.	59	19½	6½	4	3½	92½
Maryborough Co-operative Dairy Co., Ltd., Maryborough	58	19	7	4	4	92
Downs Co-operative Dairy Co., Ltd., Dalby	57	20	6½	4	4	91½
Terror's Creek and Samson Vale Dairy Co., Ltd.	59½	18½	6½	4	3	91½
Gayndah Co-operative Dairy Co., Ltd. ..	57	19½	6½	4	4	91
Goombungee Co-operative Dairy Co., Ltd.	58	19	7	4	3	91
Warwick Butter and Dairying Co., Ltd., Allora	58	19	7	3½	3½	91
Caboolture Butter and Dairying Co., Ltd., Pomona	58	19	6½	4	3½	91
Maleny Co-operative Dairy Co., Ltd. ..	57	19½	6½	4	3	90

SPECIAL AWARD FOR THE FACTORY SECURING THE GREATEST AGGREGATE NUMBER OF POINTS FOR ALL CLASSES OF BUTTER.

—	30 Days' Storage.	8 Weeks' Unsalted.	8 Weeks' Salted.	Fresh Butter.	Total.
Downs Co-operative Dairy Co., Ltd., Dalby ..	95	92	95	91½	373½
Queensland Farmers' Co-operative Dairy Co., Ltd., Grantham	95½	89½	92½	96	373½
Queensland Farmers' Co-operative Dairy Co., Ltd., Boonah	94	90½	93	93½	371
Downs Co-operative Dairy Co., Ltd., Crow's Nest	94	90½	91	94½	370
Queensland Farmers' Co-operative Dairy Co., Ltd., Booval	91½	90	93	95½	370
Queensland Farmers' Co-operative Dairy Co., Ltd., Laidley	92½	90	93	94½	370
Maryborough Co-operative Co., Ltd., Kingaroy ..	93	90½	92	94	369½
Logan and Albert Co-operative Dairy Co., Ltd. ..	92½	88½	93	95	369
Gayndah Co-operative Dairy Co., Ltd.	93½	90	93	91	367½
Wide Bay Co-operative Dairy Co., Ltd., Gympie	91	89	93	94	367
Ballina Co-operative Preserving Co., Ltd. ..	89½	91½	93	93	367
Goombungee Co-operative Dairy Co., Ltd. ..	93	88	91½	91	363½
Maryborough Co-operative Dairy Co., Ltd., Maryborough	93	88½	90	92	363½
Wide Bay Co-operative Dairy Co., Ltd., Cooroy	90	88	92	93	363
South Burnett Co-operative Dairy Co., Ltd. ..	88½	86½	90	94½	359½
Terror's Creek and Samson Vale Dairy Co., Ltd.	91	87	90	91½	359½
Maleny Co-operative Dairy Co., Ltd.	90½	86½	90½	90	357½
Stanley River Co-operative Dairy Co., Ltd. ..	92	..	93½	92½	278
Downs Co-operative Dairy Co., Ltd., Clifton ..	94½	91	91½	..	277
Nanango Co-operative Dairy Co., Ltd.	..	90	91½	93½	275
Oakey Co-operative Dairy Co., Ltd.	..	89½	92½	92½	274½
Kin Kin Co-operative Dairy Co., Ltd.	88½	..	..	92½	181
Warwick Butter and Dairying Co., Ltd., Mill Hill	..	88½	91	..	179½
The Scone Co-operative Dairy Co., Ltd.	..	..	..	93½	93½

CHEESE—EXPORT CLASSES.

The following are the awards in the export cheese classes:—

Two export cheeses, 70-80 lb. (not more than three weeks old prior to storing), white, suitable for English market:—

——	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Pittsworth Dairy Co., Ltd., Pittsworth	44½	25	15	10	94½
Pittsworth Dairy Co., Ltd., Factory	44	24½	15	9½	93
Goombungee Co-operative Dairy Co., Ltd. ..	42½	24½	15	9½	91½
Biddeston Co-operative Dairy Co., Ltd.	30	24½	14½	10	88
Maryborough Co-operative Dairy Co., Ltd., Brooklands	38½	24½	14½	9½	87
Carlyle Cheese Factory	38	24½	14½	9½	86½
Warwick Butter and Dairying Co., Ltd., Grey Mare	38	24	14	9½	85½
Downs Co-operative Dairy Co., Ltd., Hodgson's Vale	38½	24	14	8½	85

Two export cheeses, 70-80 lb. (not more than three weeks old prior to storing); coloured, suitable for English market:—

Possible points	50	25	15	10	100
Pittsworth Co-operative Dairy Co., Ltd., Pittsworth	45½	25	14½	10	95
Woodleigh Cheese Factory	43½	24½	15	9	92
Pittsworth Dairy Co., Ltd., Springsure	41	25	14½	10	91½
Biddeston Co-operative Dairy Co., Ltd.	42½	24½	14½	9½	91
Malling Cheese Factory	42	24½	15	9½	91
Maryborough Co-operative Dairy Co., Ltd., Brooklands	42	24½	14½	9½	90½
Mount Tyson Farmers' Co., Ltd.	42	24½	14½	9	90
Warwick Butter and Dairying Co., Ltd., Grey Mare	41	24½	14½	9½	89½
Carlyle Cheese Factory	39	24½	14½	9½	87½
Goombungee Co-operative Dairy Co., Ltd. ..	37	24½	14½	9½	85½
Downs Co-operative Dairy Co., Ltd., Hodgson's Vale	38½	24	14	8½	85

Two medium cheeses, not exceeding 40 lb.; age, over two and under three months:—

Possible points	50	25	15	10	100
Malling Cheese Factory	44	25	15	9½	93½
Pittsworth Dairy Co., Ltd., Pittsworth	44	25	14½	9½	93
Downs Co-operative Dairy Co., Ltd., Hodgson's Vale	44	24½	14½	9½	92½
Warwick Butter and Dairying Co., Ltd., Lord John Swamp	43½	24½	14½	9½	92
Carlyle Cheese Factory	43½	24½	14½	9	91½
Goombungee Co-operative Dairy Co., Ltd. ..	42½	25	14½	9½	91½
Warwick Butter and Dairying Co., Ltd., Elbow Vale	43	24½	14½	9½	91½
Merrimac Cheese Factory	42	24½	14½	10	91
Warwick Butter and Dairying Co., Ltd., Grey Mare	42	24½	14½	9½	90½
Mount Tyson Farmers' Co-operative Dairy Co., Ltd.	41½	24½	14½	9½	90
G. W. Stanley	41	24½	14½	9½	89½
Warwick Butter and Dairying Co., Ltd., Victoria Hill	40	24½	15	9½	89
Southbrook Co-operative Dairy Co., Ltd. ..	39	24½	14½	9	87
Warwick Butter and Dairy Co., Ltd., Bony Mountain	38	24½	14½	9½	86½
Rosalie Cheese Factory	38½	24	14½	9	86

CHEESE—EXPORT CLASSES—*continued.*

Two medium cheeses, not exceeding 40 lb.; age, over six weeks and under two months :—

—	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Pittsworth Dairy Co., Ltd., Pittsworth	45½	25	15	9½	95
Malling Cheese Factory	44	25	15	10	94
Mount Tyson Farmers' Co-operative Dairy Co., Ltd.	44	25	14½	9½	93
Warwick Butter and Dairying Co., Ltd., Bony Mountain	44	24½	15	9	92½
Downs Co-operative Dairy Co., Ltd., Hodgson's Vale	42½	24½	14½	9½	91
Pittsworth Dairy Co., (46A)	41½	24½	15	9½	90½
Pittsworth Dairy Co. (46B)	42	24½	14½	9½	90½
Warwick Butter and Dairying Co., Ltd., Victoria Hill	42	24½	14½	9½	90½
Carlyle Cheese Factory	41	24½	14½	10	90
Goombungee Co-operative Co., Ltd.	41	25	14½	9½	90
Pittsworth Dairy Co. (46C)	41½	24½	14½	9½	90
Warwick Butter and Dairying Co., Ltd., Elbow Valley	41½	24	14½	9½	89½
Warwick Butter and Dairying Co., Ltd., Lord John Swamp	41	24	14½	9½	89
Warwick Butter and Dairying Co., Ltd., Grey Mare	40	24½	14½	9½	88½
Southbrook Co-operative Dairy Co., Ltd. ..	40	24	14½	9½	88

Two loaf cheeses, not exceeding 12 lb.; age, over two months and under three months :—

Possible points	50	25	15	10	100
Warwick Butter and Dairying Co., Ltd., Bony Mountain	45	24½	15	9½	94
Pittsworth Dairy Co., Ltd., Pittsworth	44	25	15	9½	93½
Malling Cheese Factory	44	24½	15	9½	93
Mount Tyson Farmers' Co-operative Dairy Co., Ltd.	43	24½	14½	9½	91½
Warwick Butter and Dairying Co., Ltd., Elbow Vale	42	24½	14½	10	91
Warwick Butter and Dairying Co., Ltd., Grey Mare	42½	24½	14½	9½	91
Warwick Butter and Dairying Co., Ltd., Lord John Swamp	42½	24½	14½	9½	91
Merrimac Cheese Factory	41½	24½	14½	10	90½
Downs Co-operative Dairy Co., Ltd., Hodgson's Vale	41	24½	14½	10	90
G. W. Stanley	41½	24½	14½	9½	90
Carlyle Cheese Factory	41	24½	14½	9½	89½
Warwick Butter and Dairying Co., Ltd., Victoria Hill	40	24½	14½	9½	88½
Southbrook Co-operative Dairy Co., Ltd. ..	39	24½	14½	10	88
Goombungee Co-operative Dairy Co., Ltd. ..	38	25	14½	9½	87
Rosalie Cheese Factory	38½	24	14½	9½	86½

CHEESE—EXPORT CLASSES—*continued.*

Two loaf cheeses, not exceeding 12 lb.; age, over six weeks and under two months:—

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Pittsworth Dairy Co., Ltd., Pittsworth	44	25	15	9½	93½
Mount Tyson Farmers' Co-operative Dairy Co., Ltd.	44	24½	15	9½	93
Malling Cheese Factory	43	24½	15	10	92½
Carlyle Cheese Factory	42	24½	14½	10	91
Pittsworth Dairy Co., Ltd. (80A)	41½	24½	15	10	91
Pittsworth Dairy Co., Ltd. (80B)	42½	24½	14½	9½	91
Warwick Butter and Dairy Co., Ltd., Bony Mountain	42½	24½	14½	9½	91
Goombungee Co-operative Dairy Co., Ltd.	41½	24½	15	9	90
Pittsworth Dairy Co., Ltd. (80C)	41½	24½	14½	9½	90
Warwick Butter and Dairying Co., Ltd., Elbow Valley	41½	24½	14½	9½	90
Warwick Butter and Dairying Co., Ltd., Lord John Swamp	41½	24½	14½	9½	90
Downs Co-operative Dairy Co., Ltd., Hodgson's Vale	41	24½	14½	9½	89½
Southbrook Co-operative Dairy Co., Ltd.	40½	24	14½	9½	88½
Warwick Butter and Dairying Co., Ltd., Grey Mare	38	25	15	9½	87½
Warwick Butter and Dairying Co., Ltd., Victoria Hill	38	25	15	9½	87½
G. W. Stanley	39	24	14½	9½	87

TROPHY OF CHEESE.

	Export.	Medium.	Loaf.	Total.
Possible points	100	100	100	300
Downs Co-operative Dairy Co., Ltd., Hodgson's Vale	91	91	93	275
Carlyle Cheese Factory	89	89	86	264

HOME MILKING.

RESULT OF COMPETITIONS.

Home-milking competitions were conducted on farms under the supervision of officers of the Department of Agriculture, the conditions being the greatest yield of butter-fat for twenty-four hours under Babcock test, milk to contain an average not less than 3.3 per cent. of butter-fat. The following are the results:—

—	—	Milk. Lb.	Test.	Commercial Butter.
Jerseys.				
E. Burton's Oxford Buttercup IV.	N.	16	5·8	1·09
	M.	18	5·0	1·06
	N.	16½	6·7	1·30
		..	..	3·45
T. Mullen's Lady Lass III.	M.	23	5·25	1·415
	E.	23	5·25	1·415
		..	..	2·83
E. Burton's Oxford Golden Buttercup	N.	13	5·8	0·89
	M.	13½	4·4	0·695
	N.	12	5·0	0·70
		..	..	2·285
Illawarra Milking Shorthorns.				
R. Mears' Tulip of Morden	E.	18	5·4	1·15
	M.	24·5	3·6	1·02
	N.	21	5·5	1·36
		..	..	3·53
J. F. Cochrane's Trixie of Newholme	M.	34	3·6	1·43
	E.	29	5·6	1·91
		..	..	3·34
B. O'Connor's Fairy Queen 2nd of Glenthorne ..	M.	23·5	4·1	1·13
	N.	24	3·7	1·04
	E.	26	3·8	1·16
		..	..	3·33
B. O'Connor's Dahila II.	E.	21	3·9	0·96
	M.	27	3·0	0·94
	N.	24	4·3	1·20
		..	..	3·10
E. D. Lawley's Lorna of Arley	M.	27·5	4·0	1·28
	E.	28·5	5·1	1·71
		..	..	2·99
Edgar Hunt's Darling II. of Springdale	E.	15·5	5·1	0·93
	M.	16·5	3·5	0·67
		..	..	1·60

HOME MILKING—*continued.*

—	—	Milk Lb.	Test.	Commercial Butter.
Friesians.				
S. H. Hosking's Margaret Anglin II.	E.	20·5	3·9	0·93
	*M.	21·5	4·2	1·05
	†M.	22·0	3·5	0·90
	N.	22·5	4·0	1·04
		..	..	3·92
P. P. Falt's Oaklea Noreen	E.	33·5	3·8	1·48
	M.	36	5·4	2·29
		..	..	3·77
P. P. Falt's Dairymaid	E.	24	4·4	1·24
	M.	26	4·2	1·28
	N.	21·5	4·8	1·205
		..	..	3·725
Grindles Ltd. Lady Creamille	M.	34	3·8	1·51
	E.	31	4·2	1·53
		..	..	3·04
Ayrshires.				
Executors late John Anderson's Jeanette R. III. of Invercauld	M.	28·5	4·0	1·32
	E.	29	4·0	1·35
	M.	31	3·9	1·41
	E.	26	4·2	1·28
		..	..	5·36
Jonas Holmes' Peggy II. of Longlands	M.	27·5	3·5	1·120
	E.	28	4·4	1·440
	M.	25	3·6	1·070
	E.	28·5	4·6	1·530
		..	..	5·16
Penal Establishment's (St. Helena) Jeannie III. ..	M.	30	3·1	1·08
	E.	26	3·8	1·16
	M.	30	4·0	1·40
	E.	28	4·1	1·35
		..	..	4·99

* Midnight. † Morning.

MILKING TESTS.

Judges:—Messrs. R. W. Winks and L. F. Anderson. Mr. E. D. Lewley's Lorna of Arley won the National champion butter-fat test. Owing to an error the awards in two classes were not made available. Details:—

COW, 4 YEARS OLD AND OVER, AVERAGING THE GREATEST DAILY YIELD OF BUTTER FAT FOR 48 HOURS.

——	—	Milk, Lb.	Percentage.	Commercial Butter.	Points Butter Fat 24 hours.	Lactation Points.	Total Points.
E. D. Lawley's Lorna of Arley	M.	34·8	3·8	1·530	..	..	..
	E.	30·14	5·0	1·814	..	..	..
	M.	35·10	3·8	1·575	..	..	..
	E.	31·9	4·5	1·668	..	..	..
		132·9	..	6·587	52·7	..	52·7
A. Pickel's Jean the Fifth of Blacklands	M.	27·7	4·4	1·412	..	..	..
	E.	24·6	5·6	1·603	..	..	..
	M.	26·4	4·4	1·353	..	..	..
	E.	22·14	4·6	1·234	..	..	..
		100·15	..	5·602	44·8	..	44·8
B. O'Connor's Tulip the Fourth of Hillview	M.	28·12	3·7	1·240	..	..	..
	E.	25·6	4·5	1·339	..	..	..
	M.	27·8	4·2	1·350	..	..	..
	E.	25·10	4·5	1·351	..	..	..
		107·4	..	5·280	42·2	..	42·2
B. O'Connor's Dahlia 2nd of Hillview	M.	35·8	2·9	1·185	..	..	..
	E.	32·5	3·6	1·363	..	..	..
	M.	32·12	3·5	1·330	..	..	..
	E.	33·1	3·2	1·232	..	..	..
		133·10	..	5·110	40·9	..	40·9
R. Mear's Hazel of Morden	M.	22·12	3·9	1·030	..	..	..
	E.	19·14	4·1	0·945	..	..	..
	M.	21·5	3·2	0·789	..	..	..
	E.	20·14	4·1	0·995	..	..	..
		84·13	..	3·732	29·9	10	39·9
J. F. Cochrane's Trixie of Newholme	M.	29·4	3·3	1·128	..	..	..
	E.	27·8	4·0	1·280	..	..	..
	M.	30·0	3·5	1·220	..	..	..
	E.	28·10	4·0	1·325	..	..	..
		115·6	..	4·953	39·6	..	39·6
R. Mear's Tulip of Morden	M.	27·1	2·5	0·786	..	..	..
	E.	26·6	4·4	1·359	..	..	..
	M.	26·4	3·0	0·907	..	..	..
	E.	29·0	4·4	1·490	..	..	..
		108·11	..	4·542	36·3	..	36·3

MILKING TESTS—*continued.*

COW, 4 YEARS OLD AND OVER, AVERAGING THE GREATEST DAILY YIELD OF BUTTER FAT FOR 48 HOURS—*continued.*

——	—	Milk, Lb.	Percentage.	Commercial Butter.	Points Butter Fat 24 hours.	Lactation Points.	Total Points.
A. J. Caswell's Floss of Dalwon	M.	29·8	2·8	0·955	..	..	..
	E.	26·13	3·2	0·995	..	..	..
	M.	29·12	3·3	1·143	..	..	..
	E.	27·14	3·7	1·305	..	..	..
		113·15	..	4·298	34·4	..	34·4
E. Burton's Oxford Golden Buttercup	M.	19·14	4·4	1·024	..	..	..
	E.	18·5	5·3	1·139	..	..	..
	M.	19·11	4·5	1·044	..	..	..
	E.	18·6	5·0	1·079	..	..	..
		76·4	..	4·286	34·3	..	34·3
W. F. Hammel's Ginger	M.	23·14	3·7	1·025	..	..	..
	E	20·9	3·8	0·913	..	..	..
	M.	20·10	3·4	0·809	..	..	..
	E.	18·8	4·6	0·995	..	..	..
		83·9	..	3·742	29·9	..	29·9
J. William's Lizzie of Woodbine	M.	21·2	3·0	0·734	..	..	..
	E.	19·4	3·6	0·880	..	..	..
	M.	20·10	2·6	0·623	..	..	..
	E.	22·1	4·3	1·103	..	..	..
		83·1	..	3·260	26·1	2·2	28·3

COW, 4 YEARS OLD AND OVER, AVERAGING THE GREATEST YIELD OF BUTTER FAT FOR 48 HOURS.

——	—	Milk, Lb.	Percentage.	Commercial Butter.
E. D. Lawley's Lorna of Arley	M.	34·8	3·8	1·530
	E.	30·14	5·0	1·814
	M.	35·10	3·8	1·575
	E.	31·9	4·5	1·668
		132·9	..	6·587
A. Pickel's Jean the Fifth of Blacklands	M.	27·7	4·4	1·412
	E.	24·6	5·6	1·603
	M.	26·4	4·4	1·353
	E.	22·14	4·6	1·234
		100·15	..	5·602
B. O'Connor's Tulip the Fourth of Hillview.. ..	M.	28·12	3·7	1·240
	E.	25·6	4·5	1·339
	M.	27·8	4·2	1·350
	E.	25·10	4·5	1·351
		107·4	..	5·280

MILKING TESTS—*continued.*

COW, 4 YEARS AND OVER, AVERAGING THE GREATEST YIELD OF BUTTER FAT FOR 48 HOURS—*continued.*

——	—	Milk, Lb.	Percentage.	Commercial Butter.
B. O'Connor's Dahlia 2nd of Hillview	M.	35·8	2·9	1·185
	E.	32·5	3·6	1·363
	M.	32·12	3·5	1·330
	E.	33·1	3·2	1·232
		133·10	..	5·110
J. F. Cochrane's Trixie of Newholme	M.	29·4	3·3	1·128
	E.	27·8	4·0	1·280
	M.	30·0	3·5	1·220
	E.	28·10	4·0	1·325
		115·6	..	4·953
R. Mears' Tulip of Morden	M.	27·1	2·5	0·786
	E.	26·6	4·4	1·359
	M.	26·4	3·0	0·907
	E.	29·0	4·4	1·490
		108·11	..	4·542
A. J. Caswell's Floss of Dnalwon	M.	29·8	2·8	0·955
	E.	26·13	3·2	0·995
	M.	29·12	3·3	1·143
	E.	27·14	3·7	1·205
		113·15	..	4·298
W. F. Hammel's Ginger	M.	23·14	3·7	1·025
	E.	20·9	3·8	0·913
	M.	20·10	3·4	0·809
	E.	18·8	4·6	0·995
		83·9	..	3·742
E. Burton's Oxford Golden Girl	M.	21·12	3·4	0·859
	E.	20·4	3·8	0·900
	M.	19·10	3·8	0·875
	E.	19·2	4·3	0·956
		80·12	..	3·590
J. William's Lizzie Woodbine	M.	21·2	3·4	0·734
	E.	19·4	3·6	0·800
	M.	20·10	2·6	0·623
	E.	22·1	4·3	1·103
		83·1	..	3·260

MILKING TESTS—*continued.*

COW YIELDING THE LARGEST SUPPLY OF MILK IN 48 HOURS.

—	—	Milk, Lb.	Percentage.
B. O'Connor's Dahlia 2nd of Hillview	M.	35·8	2·9
	E.	32·5	3·6
	M.	32·12	3·5
	E.	33·1	3·2
Total	..	133·10	..
E. D. Lawley's Lorna of Arley	M.	34·8	3·8
	E.	30·14	5·0
	M.	35·10	3·8
	E.	31·9	4·5
Total	..	132·9	..
J. F. Cochrane's Trixie of Newholme	M.	29·4	3·3
	E.	27·8	4·0
	M.	30·0	3·5
	E.	28·10	4·0
Total	..	115·6	..
R. Mear's Tulip of Morden	M.	27·1	2·5
	E.	26·6	4·4
	M.	26·4	3·0
	E.	29·0	4·4
Total	..	108·11	..
B. O'Connor's Tulip the Fourth of Hillview	M.	28·12	3·7
	E.	25·6	4·5
	M.	27·8	4·2
	E.	25·10	4·5
Total	..	107·4	..
A. Pickel's Jean the Fifth of Blacklands	M.	27·4	4·4
	E.	24·6	5·6
	M.	26·4	4·4
	E.	22·14	4·6
Total	..	100·15	..
W. F. Hammel's Ginger	M.	23·14	3·7
	E.	20·9	3·8
	M.	20·10	3·4
	E.	18·8	4·6
Total	..	83·9	..

MILKING TESTS—*continued.*

SPECIAL PRIZE, 4 YEARS OLD AND OVER, AVERAGING THE GREATEST DAILY YIELD OF BUTTER FAT FOR 48 HOURS.

——	—	Milk, Lb.	Per-centage.	Com-mercial Butter.
E. D. Lawley's Lorna of Arley	M.	34·8	3·8	1·53
	E.	30·14	5·0	1·814
	M.	35·10	3·4	1·575
	E.	31·9	4·5	1·668
		132·9	..	6·587
A. Pickel's Jean the Fifth of Blacklands	M.	27·7	4·4	1·412
	E.	24·6	5·6	1·603
	M.	26·4	4·1	1·353
	E.	22·14	4·6	1·234
		100·15	..	5·602
B. O'Connor's Tulip Fourth of Hillview	M.	18·12	3·7	1·240
	E.	25·6	4·5	1·339
	M.	27·8	4·2	1·350
	E.	25·10	4·5	1·351
		107·4	..	5·280

ROYAL NATIONAL CHAMPION BUTTER-FAT TEST.

Cow, any breeding, averaging the greatest yield of butter-fat for forty-eight hours under the Babcock test, and which has been the property of the exhibitor three months before the entry.

£25 special prize, and a cash prize of £2 2s. yearly to the winner, presented by Brisbane Newspaper Company.

——	—	Milk, Lb.	Per-centage.	Com-mercial Butter.	Points for Butter 24 Hours.	Lactation Points.	Total Points.
E. D. Lawley's Lorna of Alrey	M.	34·8	3·8	1·530	..	..	..
	E.	30·14	5·0	1·814	..	..	..
	M.	35·10	3·8	1·575	..	..	..
	E.	31·9	4·5	1·668	..	..	..
Total		132·19	..	6·587	52·7	..	52·7

NOTE.—The above was the only one given in the official book.

MILKING TESTS—*continued*

The following additional milking test awards were made available on 9th August:—

COW OR HEIFER, UNDER 4 YEARS, AVERAGING THE GREATEST DAILY YIELD OF BUTTER FAT FOR 48 HOURS.

—	—	Weight of Milk.	Per-centage.	Com-mercial Butter.
A. J. Caswell's Rosie IV. of Greyleigh	M.	28·8	3·5	1·160
	E.	22·8	4·2	1·100
	M.	22·10	4·5	1·201
	E.	21·2	4·3	1·056
		94·12	..	4·517
E. Burton's Oxford Golden Buttercup	M.	19·14	4·4	1·024
	E.	18·5	5·3	1·139
	M.	19·11	4·5	1·044
	E.	18·6	5·0	1·079
		76·4	..	4·286
W. Spresser's Carnation Lucy	M.	19·4	3·6	0·800
	E.	18·8	5·3	1·150
	M.	19·0	5·0	1·120
	E.	18·12	5·2	1·145
		75·8	..	4·215
P. Moore's Clover V. of Sunnyside	M.	25·8	3·8	1·130
	E.	22·8	3·8	1·000
	M.	24·0	3·2	0·890
	E.	22·13	4·1	1·093
		94·13	..	4·113
C. Behrendorff's Fanny of Inavale	M.	22·14	3·2	1·015
	E.	22·3	3·7	0·958
	M.	24·10	3·5	1·005
	E.	22·0	4·0	1·020
		91·11	..	3·998
Macfarlane Bros.' Viola XXVI. of Darbalara ..	M.	23·2	2·9	0·774
	E.	22·2	3·8	0·985
	M.	22·9	3·5	0·924
	E.	21·8	3·6	0·900
		89·5	..	3·583
R. E. Freeman's Veresdale Ruby	M.	19·1	4·0	0·883
	E.	18·14	4·7	1·034
	M.	18·10	2·7	0·579
	E.	20·1	4·1	0·962
		76·10	..	3·458

MILKING TESTS—*continued.*

COW OR HEIFER, UNDER 4 YEARS, AVERAGING THE GREATEST DAILY YIELD OF BUTTER FAT FOR 48 HOURS—*continued.*

—	—	Weight of Milk.	Per-centage.	Com-mercial Butter.
A. Pickel's Pearl II. of Blacklands	M.	19·7	3·3	0·743
	E.	18·2	4·6	0·976
	M.	21·8	3·4	0·845
	E.	18·1	3·9	0·823
		77·2	..	3·387
Macfarlane Bros.' Handsome II. of Kilbirnie ..	M.	22·14	2·7	0·707
	E.	22·12	3·2	0·833
	M.	23·4	3·2	0·857
	E.	23·0	3·2	0·850
		91·14	..	3·247
F. G. Brown's Maud Rooker Korndyke	M.	23·2	2·0	0·538
	E.	24·0	3·0	0·849
	M.	22·3	3·2	0·816
	E.	17·8	4·0	0·810
		87·7	..	3·013
G. Isles' Lily II. of Eldo	M.	16·15	3·1	0·600
	E.	14·13	3·8	0·653
	M.	15·6	3·8	0·685
	E.	14·2	3·8	0·625
		61·4	..	2·563

COW OR HEIFER, UNDER 4 YEARS, AVERAGING THE GREATEST DAILY YIELD OF BUTTER FAT FOR 48 HOURS.

—	—	Weight of Milk.	Per centage.	Com-mercial Butter.	Points Butter Fat, 24 Hours.	Lactation Points.	Total Points.
A. J. Caswell's Rose the Fourth of Greyleigh	M.	28·8	3·5	1·160	..	..	..
	E.	22·8	4·2	1·100	..	..	..
	M.	22·0	4·5	1·201	..	..	..
	E.	21·2	4·3	1·056	..	..	..
		94·12	..	4·517	36·1	..	36·1
E. Burton's Oxford Golden Buttercup	M.	19·14	4·4	1·024	..	..	..
	E.	18·5	5·3	1·139	..	..	..
	M.	19·11	4·5	1·044	..	..	..
	E.	18·6	5·0	1·079	..	..	..
		76·4	..	4·286	34·3	..	34·3
W. Spresser's Carnation Lucy	M.	19·4	3·6	0·800	..	..	..
	E.	18·8	5·3	1·150	..	..	..
	M.	19·0	5·0	1·120	..	..	..
	E.	18·12	5·2	1·145	..	..	..
		75·8	..	4·215	33·7	..	33·7

MILKING TESTS—*continued.*

COW OR HEIFER, UNDER 4 YEARS, AVERAGING THE GREATEST DAILY YIELD OF BUTTER FAT FOR 48 HOURS—*continued.*

—	—	Weight of Milk.	Per-centage.	Com-mercial Butter.	Points Butter Fat 24 hours.	Lactation Points.	Total Points.
P. Moore's Clover the Fifth of Sunnyside	M.	25·8	3·8	1·130	..	..	..
	E.	22·8	3·8	1·000	..	..	..
	M.	24·0	3·2	0·890	..	..	..
	E.	22·13	4·1	1·093	..	..	..
		94·13	..	4·113	32·9	..	32·9
C. Behrendorff's Fanny of Inavale	M.	22·14	3·8	1·015	..	..	..
	E.	22·3	3·7	0·958	..	..	..
	M.	24·10	3·5	1·005	..	..	..
	E.	22·0	4·0	1·020	..	..	..
		91·11	..	3·998	32·0	..	32·0
Macfarlane Bros.' Viola the Twenty-sixth of Darbalara	M.	23·2	2·9	0·774	..	..	..
	E.	22·2	3·8	0·985	..	..	..
	M.	22·9	3·5	0·924	..	..	..
	E.	21·8	3·6	0·900	..	..	..
		89·5	..	3·583	28·7	..	28·7
M. Lawrence's Model the Second of City View	M.	16·12	3·4	0·659	..	..	..
	E.	14·6	3·5	0·585	..	..	..
	M.	16·8	3·5	0·670	..	..	..
	E.	14·8	3·9	0·660	..	..	..
		62·2	..	2·574	20·6	7·5	28·1
R. E. Freeman's Veresdale Ruby	M.	19·1	4·0	0·883	..	..	..
	E.	18·14	4·7	1·034	..	..	..
	M.	18·10	2·7	0·579	..	..	..
	E.	20·1	4·1	0·962	..	..	..
		76·10	..	3·458	27·7	..	27·7
A. Pickel's Pearl Third of Blacklands	M.	19·7	3·3	0·743	..	..	..
	E.	18·2	4·6	0·976	..	..	..
	M.	21·8	3·4	0·845	..	..	..
	E.	18·1	3·9	0·823	..	..	..
		77·2	..	3·387	27·1	..	27·1
Macfarlane Bros.' Handsome the Second of Kilbirnie	M.	22·14	2·7	0·707	..	..	..
	E.	22·12	3·2	0·833	..	..	..
	M.	23·4	3·2	0·857	..	..	..
	E.	23·0	3·2	0·850	..	..	..
		91·14	..	3·247	26·0	..	26·0
G. Isles' Lily the Second of Eldo	M.	16·15	3·1	0·600	..	..	..
	E.	14·13	3·8	0·653	..	..	..
	M.	15·6	3·8	0·685	..	..	..
	E.	14·2	3·8	0·625	..	..	..
		61·4	..	2·563	20·5	..	20·5

BACON, HAMS, AND LARD.

The following are the awards for bacon, hams, and lard:—

—	Flavour.	Texture.	Proportion of Fat and Lean.	Butchering.	Smoking.	Colour.	Total.
BACON, SIX SIDES, FACTORY CURED.							
Possible points..	45	10	10	10	10	15	100
J. C. Hutton Propty., Ltd., Brisbane	42	8	9	8	8½	13	88½
Queensland Co-operative Bacon Co., Ltd.	43	8	8½	8	8	12½	88
J. C. Hutton Propty., Ltd., Brisbane	41½	7	8	7½	8½	12	84½
Queensland Co-operative Bacon Co., Ltd.	41	8½	7½	8½	8	11	84½
J. C. Hutton Propty., Ltd., Canterbury, N.S.W.	40½	6	7	7	7½	10½	78½
HAMS, SIX, FACTORY CURED.							
J. C. Hutton Propty., Ltd., Canterbury, N.S.W.	42	9	9	8	8	13	89
J. C. Hutton Propty., Ltd., Brisbane	42½	9	8	8	8½	12½	88½
Queensland Co-operative Bacon Co., Ltd.	41½	8½	8	8½	9	12½	88
Queensland Co-operative Bacon Co., Ltd.	42	8½	7½	8½	9	9	87½
J. C. Hutton Propty., Ltd., Brisbane	42½	7½	7½	8	8	12	85½

—	Flavour.	Texture.	Colour.	Finish and Appearance.	Total.
LARD IN BLADDERS.					
Possible points	40	25	25	10	100
J. C. Hutton Propty., Ltd., Brisbane	35	23	24	9	91
J. C. Hutton Propty., Ltd., Brisbane	34	23	24	9	90
Queensland Co-operative Bacon Co., Ltd. ..	32	21	22	8½	83½
Queensland Co-operative Bacon Co., Ltd. ..	32	21	22	8	83

SAUSAGES, SMOKED, 14 LB.

Queensland Co-operative Bacon Co., Ltd., 1.
J. C. Hutton Propty., Ltd., Brisbane, 2.

YOUNG JUDGES' COMPETITION.

There was keen rivalry in the young judges' competition, which is open to students of agricultural colleges, young farmers, farmers' sons, and others twenty-five years of age and under. Competition took place in four classes—Clydesdale stallions, beef cattle, dairy cattle (Illawarra Milking Shorthorns and Jerseys), and swine. Details:—

Dairy Cattle.—Illawarra Milking Shorthorns: H. Gordon, Lawnton, 1; A. J. Brown, Mooroombin, Toogoolawah, 2; J. H. Bassett, Mullumbimby, 3. Jerseys: O. W. Spresser, Brassall P.O., Ipswich, 1; R. M. Anderson, Fairview, Southbrook, 2; W. Carr, junr., Indooroopilly, 3.

Swine.—Berkshires: J. H. Bassett, Mullumbimby, 1; H. F. Whittaker, Victoria Park, Southbrook, 2; H. Gordon, Lawnton, and J. B. Warburton, Northgate Junction, 3.

HORSES.

THOROUGHBREDS.

Judge, Mr. H. J. Gidney.

Stallions, 4 years and over, best adapted for improved racing stock: T. Jennings's Amberdown, 1; E. Bagley's Soldier's March, 2; State Stations Department's Paddington, 3. Four years and over, most suitable for getting horses for military purposes: W. H. Mayes's Hopoast, 1; E. Bagley's Soldier's March, 2.

Mares, 4 years and over: J. E. Shailer's Bonnie Syee, 1; J. T. Jackson's Miss Warroo, 2. Remount mares, best suited for producing remounts, hacks, hunters, &c.: Mrs. D. Fraser's Elsinora, 1; R. J. Andrews's Myrtle Pride, 2.

Champion stallion: T. Jenning's Amberdown. Reserve champion: E. Bagley's Soldier's March. The yellow ribbon went to Paddington (imp.), bred in England in 1903, and got by Martagon from Padua. Paddington was exhibited by the State Stations Department.

STUD TROTTERS AND PACERS.

Judge, Mr. W. J. Armstrong.

Stud book stallions, 6 years and over: J. Rice's Rex Wilkes, 1; M. W. Doyle's Sparkling Bells, 2. Stallion, 5 years and over: A. G. Hunter's Globe Derby, 1; R. Cocks's King Bells, 2. Colt, 2 years: J. Rice's Billie Wilkes, 1. Mare, 5 years and over: S. C. Reeves's Black Ribbons, 1; J. Rice's Ella Wilkes, 2. Mare, 4 years: J. Rice's Biddy Wilkes. Filly, 3 years: D. Knox's Winn Ella, 1; S. E. Green's Roma's Pride, 2. Family group, sire and two of his progeny: J. Rice's Rex Wilkes and progeny, 1.

Champion trotting stallion: A. G. Hunter's Globe Derby.

Reserve champion: J. Rice's Rex Wilkes.

Champion trotting mare: S. C. Reeves's Black Ribbons.

Reserve champion: J. Rice's Biddy Wilkes.

HEAVY DRAUGHT HORSES.

Judge, Mr. R. Tait.

CLYDESDALES.

Stallion, 5 years and over: J. Kilvington's Pride O'Glenore, 1; C. J. Ryman's Donald's Perfection, 2. Stallion, 4 years: J. W. McAllister's Prince Invermay, 1. Stallion, 3 years: Queensland Agricultural College's Prospector, 1; G. Elliott's Baron Windermere, 2. Colt, 1 year: J. H. Kilvington's Robin, 1. Mare, 5 years and over: G. Elliott's Lady Cellus, 1; R. Jackson, Ltd., Girlie, 2. Mare, 4 years: A. T. Creswick's Nellie, 1; A. T. Creswick's Lady Jane, 2; J. Hamilton's Heather Belle, 3. Brood mare: J. H. Kilvington's Myrtle, 1; J. H. Kilvington's Maidenhair, 2. Filly, 3 years: A. T. Creswick's Lady Windermere, 1. Filly, 2 years: G. Elliott's Lady Rangatira, 1; J. H. Kilvington's Madge, 2. Filly, 1 year: J. H. Kilvington's Star, 1. Family group, sire and two of his progeny: J. H. Kilvington's Pride O'Glenore (sire), Madge and Star.

SHIRES.

Judge, Mr. R. Tait.

Stallion, 3 years and over: J. Ernart's Hermitage, 1.
Champion draught stallion: J. H. Kilvington's Pride O'Glenore.
Reserve champion: Queensland Agricultural College's Prospector.
Champion draught mare: A. T. Creswick's Nellie.
Reserve champion: A. T. Creswick's Lady Jane.

MULES.

Light mule, any age: R. Jackson, Ltd., Digger's Donk, 1.

COBS.

Judge, Mr. L. P. Dutton.

Stallion, any age, not exceeding 15 hands: W. Wildermuth's Wildermere Meteor, 1. Mare, any age, not exceeding 15 hands: Miss E. O. Drury's Banshee, 1.

Champion cob stallion: W. Wildermuth's Wildermere Meteor.

Champion cob mare: Miss E. O. Drury's Banshee.

STUD PONIES.

Judge, Mr. L. P. Dutton.

Pony stallions best adapted for getting harness ponies. Stallion, any age, not exceeding 14 hands, to be driven in harness: H. A. Strong's Excel II., 1; T. Simpson's The Welshman, 2. Stallion, any age, to be led, not exceeding 14 hands: A. T. Noyes's Young Gaffer, 1. Stallion, any age, not exceeding 13 hands: H. A. Strong's Excel II., 1; G. E. Jackson's Little Harold, 2. Stallion any age, not exceeding 12 hands: C. J. Hobbs's Don, 1; E. J. Harris's Comet, 2.

Champion pony stallion, best adapted for getting harness ponies: C. J. Hobbs's Don.

Reserve champion: H. A. Strong's Excel II.

Pony stallions best adapted for getting saddle ponies. Stallion, any age, not exceeding 14 hands: E. Pocock's Ludo, 1; S. A. Whiting's Merry King, 2. Stallion, any age, not exceeding 13 hands: E. Pocock's Ludo, 1; S. A. Whiting's Merry King, 2. Stallion, any age, not exceeding 12 hands: Mrs. E. T. Thomson's Bonny Boy, 1.

Champion pony stallion best adapted for getting saddle ponies: E. Pocock's Ludo.

Reserve champion: S. A. Whiting's Merry King.

Welsh ponies, stallion, any age, not exceeding 14 hands: T. Simpson's The Welshman, 1; A. T. Noyes's Young Gaffer, 2.

Pony mares, brood mare, any age, not exceeding 14 hands: L. Dobson's Llew Lass, 1; C. J. Biddle's Wilston Belle, 2; highly commended, W. Farley's Dinah. Brood mare, any age, not exceeding 13 hands: R. C. Fagg's Girlie, 1; J. Mullen's Gold Top, 2; highly commended, A. E. Johnston's Peace. Brood mare, any age, not exceeding 12 hands: A. T. Noyes's Banglet, 1; Mrs. D. J. Stewart's Midge, 2; highly commended, E. B. Hughes's Bessie.

Champion pony mare: R. C. Fagg's Girlie. Reserve champion: A. T. Noyes's Banglet.

CATTLE.

HEREFORDS.

Judge, Mr. J. A. Beattie.

Hereford bull, 4 years and over: J. Sparkes's Mansel Liberator, 1; J. T. Turner's Holmwood Baron, 2. 3 and under 4 years: J. Sparkes's Mansel Banner Prince, 1; E. C. McConnel's Red Rupert, 2; J. T. Turner's Lord Chancellor, 3. 2 and under 3 years: J. Sparkes's Lyndley Monarch 1st, 1; J. H. S. Barnes's Broadwood Chance, 2; E. C. McConnel's Cressbrook Merry Boy, 3. 18 months and under 2 years: C. H. Tindal's Ramornie Commodore, 1; J. Sparkes's Admiration, 2; J. H. S. Barnes's King Broadwood, 3; E. C. McConnel's Cressbrook Premier, very highly commended;

J. Sparkes's Lyndley Baronet, highly commended. 12 months and under 18 months: J. Sparkes's Lyndley Royal, 1; J. Sparkes's Lord Lyndley 5th, 2; Tindal and Sons' Gunyan Magnitude 10th, 3. Bull calf, 6 and under 12 months: J. Sparkes's Lyndley Chief, 1; E. R. Reynolds's Sunrise, 2; F. Maxwell's Banner Prince, 3; F. Maxwell's Major Lad, very highly commended. Pair of bulls, 1 and under 2 years: J. Sparkes, 1. Group of three bulls: J. Sparkes, 1; J. H. S. Barnes, 2.

Champion Hereford bull: J. Sparkes's Mansel Liberator. Reserve champion bull: J. Sparkes's Mansel Banner Prince.

Cow, 4 years and over: J. Sparkes's Jessie Lyndley, 1; J. H. S. Barnes's Queen Flower 3rd, 2. 3 and under 4 years: J. H. S. Barnes's Miss Beattie 2nd, 1; J. Sparkes's Allie Lyndley, 2. Cow, with calf at foot: J. H. S. Barnes's Queen Flower 3rd, 1; J. Sparkes's Jessie Lindley, 2. Cow, with two or more of her progeny: J. H. S. Barnes's Queen Flower III., 1. Cow or heifer, 2 and under 3 years: J. Sparkes's Jessie Lydnley 15th, 1; E. C. McConnel's Cressbrook Bernice, 2; E. C. McConnel's Lady President 8th, 3. Heifer, 18 months and under 2 years, J. Sparkes's Lady Lyndley 33rd, 1; J. Sparkes's Lyndley Minerva 18th, 2; E. C. McConnel's Lady President 13th, 3. Heifer 12 and under 18 months: J. H. S. Barnes's Canning Chance, 1; J. Sparkes's Lyndley Minerva 19th, 2. Heifer calf, 6 and under 12 months: J. H. S. Barnes's Flower Queen, 1; J. Sparkes's Lyndley Baroness, 2; E. C. McConnel's Cressbrook Pallia 10th, 3. Pair of heifers, 1 and under 2 years: J. Sparkes, 1. Group of three heifers: J. Sparkes, 1.

Champion Hereford cow: J. H. S. Barnes's Miss Beattie 2nd. Reserve champion cow: J. Sparkes's Jessie Lyndley.

Group.—Sire and three of his progeny: J. H. S. Barnes, 1. Breeder's group (2 males and 3 females): J. H. S. Barnes, 1; J. Sparkes, 2. Exhibitor's group (2 males and 3 females), open: J Sparkes, 1; J. H. S. Barnes, 2. Sires' progeny stakes group, 3 animals, one sire's progeny: J. H. S. Barnes, 1; J. Sparkes, 2.

SHORTHORNS.

Judge, Donald Munro, Esq.

Bull, 4 years and over: J. Burgess's Adcote Butterfly Beau, 1; A. E. Slade's Warspite, 2. Bull, 3 years and under 4 years: Lord Bros.' Clifton Cherry Colonel, 1. Bull, 2 years and under 3 years: A. R. Lomax's Yandilla Grand Duke 47th, 1; C. E. McDougall's Lyndhurst Royal Peer 27th, 2. Bull, 18 months and under 2 years: J. S. Thonemann's Kuyara Duke of Derrimut 7th, 1; R. R. Dangar's Mooki Wild Eves Duke 2nd, 2. Bull, 12 months and under 18 months: C. E. McDougall's Lyndhurst Royal Peer 35th, 1; J. Burgess's Fairy King, 2. Bull calf, 6 months and under 12 months: J. Burgess's Fairy Knight 4th, 1; John Macgregor's Dalmore Favourite, 2; C. E. McDougall's Lyndhurst Wexham Heir I., 3; highly commended, John Macgregor's Dalmore Lord Matchem, J. S. Thonemann's Kuyara Prince 3rd, and J. S. Thonemann's Kuyara Duke of Derrimut 10th. Group of three bulls, 12 months and under 3 years: C. E. McDougall's exhibit.

Champion Shorthorn bull of Queensland: J. S. Thonemann's Kuyara Duke of Derrimut 7th. Reserve champion: J. Burgess's Adcote Butterfly Beau.

Shorthorn cow, 4 years and over: Lord Bros.' Yandilla Grand Duchess 8th, 1; J. Burgess's Princess Royal, 2; C. E. McDougall's Lyndhurst Princess Imperial 2nd, 3. Cow, 3 years and over 4 years: C. E. McDougall's Lyndhurst Royal Rose, 1. Cow, with calf at foot: J. Burgess's Princess Royal and progeny, 1; C. E. McDougall's Lyndhurst Princess Imperial 2nd and progeny, 2. Cow and two or more of her progeny: J. Burgess's Princess Royal and progeny, 1; C. E. McDougall's Lyndhurst Princess Imperial 2nd and progeny, 2. Cow or heifer, 2 years and under 3 years: C. E. McDougall's Lyndhurst Duchess of Ettrick, 1; C. E. McDougall's Lyndhurst Duke of York 2nd, 2. Heifer, 18 months and under 2 years: J. S. Thonemann's Kuyara Duchess of Derrimut 10th, 1; A. J. Cotton's Brooklyn Pansy, 2. Heifer, 12 months and under 18 months: C. E. McDougall's Lyndhurst Royal Rose 2nd, 1; Lord Bros.' Victoria Downs Duchess of Morven, 2. Heifer calf, 6 months and under 12 months: J. S. Thonemann's Kuyara Princess 2nd, 1; C. E. McDougall's Lyndhurst Lily of Gurley 2nd, 2. Group of three heifers, 12 months and under 3 years: C. E. McDougall's exhibit, 1.

Champion Shorthorn cow of Queensland: C. E. McDougall's Lyndhurst Royal Rose. Reserve champion: J. S. Thonemann's Kuyara Duchess of Derrimut 10th.

Breeder's group, 2 males and 3 females, 12 months and over: C. E. McDougall's exhibit. Exhibitor's group, 2 males and 3 females, 12 months and over, open: C. E. McDougall's exhibit, 1; J. Burgess's exhibit, 2. Sires' progeny stakes group: John Macgregor's exhibit, 1; C. E. McDougall's exhibit, 2.

STUD BEEF HERDS.

DEVONS.

Judge, Mr. T. McIlwraith Taylor.

Bull, 3 years and over: R. A. Howell's Field Marshal 16th, 1. 2 and under 3 years: R. A. Howell's Forester's Gold Dust, 1; R. A. Howell's Field Marshal 39th, 2; R. A. Howell's Field Marshal 40th, 3. Bull, 1 and under 2 years: R. A. Howell's Field Marshal 47th, 1. Heifer, 2 and under 3 years: R. A. Howell's Lusty, 1. Cow, 3 years and over: R. A. Howell's Lusty 17th, 1.

Champion bull: R. A. Howell's Forester's Gold Dust. Reserve champion bull: R. A. Howell's Field Marshal 16th. Champion cow: R. A. Howell's Lusty 17th. Reserve champion cow: R. A. Howell's Lusty 37th.

SOUTH DEVONS.

Cow or heifer: C. Brumpton's Gentle Honesty, 1.

SUSSEX.

Bull, under 3 years: J. T. Turnor's Holmwood Ironduke, 1. Bull calf, 6 and under 12 months: J. T. Turnor's Earl Rufus, 1. Cow, 3 years and over: J. T. Turnor's Oakover Twin 5th, 1. Heifer calf, 6 and under 12 months: J. T. Turnor's Holmwood Twin.

Champion Sussex cow: J. T. Turnor's Oakover Twin.

ABERDEEN-ANGUS.

Bull, 3 years and over: G. C. Clark's Tom Thumb, 1. 1 and under 2 years: G. C. Clark's Black Jupiter, 1; G. C. Clark's Scottish Peer, 2.

Champion Aberdeen-Angus bull: G. C. Clark's Tom Thumb. Reserve champion bull: G. C. Clark's Black Jupiter.

Cow, 3 years and over: G. C. Clark's Scotswoman.

Heifer, 1 and under 2 years: G. C. Clark's Fairy Princess. 6 and under 12 months: G. C. Clark's Raffia.

Champion Aberdeen-Angus cow: G. C. Clark's Scotswoman.

RED POLLED.

Bull, 3 years and over: E. J. McConnel's Royal Farmer, 1 and champion.

DAIRY CATTLE.

AYRSHIRES.

Judge, Mr. R. Brisbane.

Cow, 5 years and over, in milk: J. Holmes's Bell of Longlands, 1; J. Holmes's Thelma of Longlands, 2; Executors, late J. Anderson, Jeanette R 3rd of Invercauld, 3. 4 and under 5 years, in milk: J. H. Fairfax's Gem of Marinya, 1; J. Holmes's Blanche of Longlands, 2; G. Bell's Thelma 3rd of Longlands, 3. 3 and under 4 years, in milk: J. Holmes's Blonde of Longlands, 1; J. Holmes's Rosella of Longlands, 2; P. Bell's Iona of Nudgee, 3. Heifer, 2 and under 3 years, in milk: J. Holmes's Tidy 2nd of Longlands, 1; J. H. Fairfax's Fantasy of Marinya, 2; J. C. Mann's Beryl's Pride of Crescent Farm, 3. 1 and under 2 years, in milk: J. C. Mann's Beryl's Gem of Crescent Farm. Cow, 4 years and over, in calf 6 months or dry: P. Bell's Beauty 3rd of St. Helena, 1; P. Bell's Agnes of Fairfield, 2; J. C. Mann's Viola of Glenmore, 3; J. Holmes's Rosalind 2nd of Longlands, 4. 3 and under 4 years: F. A. Stimpson's Dairymead of Fairfield, 1; Carr Bros.' College Annette, 2. Heifer, 2 and under 3 years, in calf or dry: F. A. Stimpson's Catherine of Fairfield, 1; H. T. Horne's Mayflower of Thorpe Garth, 2; F. A. Stimpson's Aggie Acme of Fairfield, 3. 1 and under 2 years, dry: F. A. Stimpson's St. Helena Melba, 1; J. Holmes's Pearl of Longlands, 2; R. J. and J. Harding's Rosaleen of Wetton, 3. Heifer calf, 6 and under 12 months: J. Holmes's Pearl 2nd of Longlands, 1; Executors, late J. Anderson, Juliette 2nd of Fairview, 2; J. C. Mann's Heather Bell of Crescent Farm, 3. Ayrshire Derby sweepstakes, for heifers calved between 1st July, 1919, and 30th June, 1920: F. A. Stimpson's Catherine of Fairfield, 1; F. A. Stimpson's Aggie Acme of Fairfield, 2; L. H. Paten's Cornflower 2nd of Jeyandel, 3.

Champion Ayrshire Cow: J. Holmes's Belle of Longlands. Reserve champion cow: P. Bell's Beauty 3rd of St. Helena.

Cow or heifer giving greatest yield of butter fat for twenty-four hours under Babcock test, milk to contain on an average not less than 3.3 per cent. of butter fat: Executors of late John Anderson's Jeanette R. 3rd of Invercauld, 1; H. M. Penal Establishment's St. Helena Jeannie 3rd, 2; Jonas Holmes's Peggy 3rd of Longlands, 3.

Bull, 4 years and over: P. Bell's Prince Roy of Longlands, 1; G. E. Brown's Jamie of Wanora, 2; F. A. Stimpson's St. Helena Premier, 3; P. Bell's Bobs of Fairfield, 4. 3 and under 4 years: J. H. Fairfax's Jellicoe of Marinya. 2 and under 3 years: J. Holmes's Prince of Fairview, 1; J. Holmes's Viceroy of Longlands, 2; Executors, late J. Anderson, Jackeroo of Fairview, 3. 1 and under 2 years: F. A. Stimpson's Duncan of Fairview, 1; J. C. Mann's Heather Boy of Crescent Farm, 2; J. Holmes's Gallant Hero of Longlands, 3. Bull calf: H.M. Penal Establishment, St. Helena, St. Helena Mischief Maker, 1; J. Holmes's Sir Tristham of Longlands, 2; Penal Establishment's St. Helena Principal, 3.

JERSEYS.

Judge, Mr. W. Carter.

Cow, 5 years and over, in milk: W. and D. Carr's Larkspur, 1; E. Burton's Oxford Girl, 2; J. Williams's Carlyle Lady Lynn, 3; J. Sinnamon's Ferns Barleycorn, 4. 4 and under 5 years, in milk: J. Sinnamon's Oxford Hazel, 1; E. Burton's Oxford Palatine's Gem, 2. 3 and under 4 years, in milk: E. Burton's Oxford Golden Buttercup, 1; J. Sinnamon's Oxford Barleycorn 2nd, 2; W. W. Mallet's The Endless Chain, 3. Heifer, 2 and under 3 years, in milk: Wm. Spresser's Carnation Lucy, 1; H. H. Domin's Oxford Golden Rosette, 2; J. F. Burnett's Golden Lass of Rosehill, 3. 1 and under 2 years, in milk: E. Burton's Oxford Noble Buttercup, 1; W. W. Mallet's Sultane's Pride of Burnleigh, 2; J. F. Burnett's Fanny of Rosehill, 3. Cow, 4 years and over, in calf, 6 months or dry: W. and D. Carr's Carlyle Lark, 1. E. Burton's Oxford Buttercup 4th, 2; T. Mullen's Lady Lass 3rd, 3; W. S. Conochie's Sultane 5th of Oaklands, 4. 3 and under 4 years, in calf or dry: H. H. Domin's Oxford Palatine Safety, 1; W. and D. Carr's Carlyle Larkspur, 2; J. Williams's Oxford Noble Dot 3rd, 3. Heifer, 2 and under 3 years, in calf or dry: J. Sinnamon's Trinity Sultane's Lass. Heifer, 1 and under 2 years, dry: E. Burton's Oxford Noble Bell, 1; W. and D. Carr's Carlyle Songstress 2nd, 2; J. Collins's Queen of Calton, 3. 6 and under 12 months: E. Burton's Oxford Primrose, 1; T. Mullen's Norwood Rosebud, 2; W. and D. Carr's Carlyle Flower, 3.

Children's Calf Class.—Heifer calf, 6 months and under 1 year: Miss Leila Carr's Carlyle Bessie Woodside, 1; Master R. Hays's Kenmore Queenie, 2; Miss E. M. Hays's Kenmore Fancy 2nd, 3. Cow or heifer, Australian bred: E. Burton, 1 and 3; J. Williams's Carlyle Lady Lynn, 2.

Champion Jersey cow: W. and D. Carr's Larkspur. Reserve champion: E. Burton's Oxford Girl.

Bull, 4 years and over: E. Burton's Oxford Golden Noble, 1; J. Sinnamon's Noble Palatine, 2; W. S. Conochie's Oxford Palatine Sultan, 3; F. G. Burton's Montrose Jack, 4.

Bull, 3 and under 4 years: W. and D. Carr's Empire of Woodside, 1; T. A. Petherick's Trinity Alfriston Duke, 2. 2 and under 3 years: W. W. Mallet's Trinity Baron, 1; E. Burton's Oxford Fairy Prince, 2; J. Sinnamon's Ginger Duke, 3.

Children's Calf Class.—Bull calf, 6 and under 12 months: T. Mullen's, junior, Norwood Model.

Cow or heifer giving greatest yield of butter fat for twenty-four hours under Babcock test, as above: E. Burton's Oxford Buttercup 4th, 1; T. Mullen's Lady Lass 3rd, 2; E. Burton's Oxford Golden Buttercup, 3.

Groups.—Sire and three of his progeny: E. Burton's Oxford Golden Noble and progeny, 1; W. and D. Carr's Empire of Woodside and progeny, 2; W. W. Mallet's Trinity Baron and progeny, 3. Two males and six females: E. Burton, 1; J. Sinnamon, 2; W. and D. Carr, 3. Sires' progeny stakes group, Australian bred: E. Burton, 1 and 3; J. Sinnamon, 2.

Bull, 1 and under 2 years: E. Burton's Werribee Clementine's King, 1; J. Sinnamon's Lord Ettrey of Danyule, 2; W. J. H. Austin's Premier of Rosehill, 3. Bull calf: J. Collins's Retford K.C., 1; J. Sinnamon's Trinity Officer, 2; T. Mullen's Oxford Palatine's Butter Boy, 3.

ILLAWARRA MILKING SHORTHORNS.

Cow, 5 years and over, in milk: S. Mitchell's Fuchsia of Strathdu, 1; A. Pickels's Jean 5th of Blacklands, 2; B. O'Connor's Dahlia 2nd of Hill View, 3; B. O'Connor's Tulip 4th of Hill View, 4. 4 and under 5 years, in milk: R. Mears's Hazel of Marden, 1; A. J. Caswell's Floss of Dualwen, 2; R. J. Morgan's Doreen of Burradale, 3. 3 and under 4 years, in milk: R. E. Freeman's Veresdale Ruby, 1; A. J. Caswell's Rosie 4th of Greyleigh, 2; R. J. Morgan's Dairymead 2nd of Burradale, 3. Heifer, 2 and under 3 years, in milk: A. Pickels's Daffodil of Blacklands, 1; A. C. Payne's Heather 2nd of Hillcrest, 2; Macfarlane Brothers Viola 26th of Darbalara, 3. Cow, 4 years or over, in calf 6 months or dry: W. Middleton's Mabel of Talgai, 1; B. O'Connor's Charm of Glenthorne, 2; A. Pickels's Envy 2nd of Blacklands, 3; R. J. Morgan's Gem of Rosebank, 4. Cow, 3 and under 4 years, in calf or dry: B. O'Connor's Rosebud 2nd of Greyleigh, 1; A. Pickel's Model of Blacklands, 2; B. O'Connor's Ena of Hill View, 3. Heifer, 2 and under 3 years, dry: W. Middleton's Gentle 3rd of Devon Court, 1; G. Brown's Bangle of Blacklands, 2; B. O'Connor's Skylark 2nd of Cosy Camp, 3. Heifer, 1 and under 2 years: C. A. Rossow's Beauty 2nd of Woodleigh, 1; R. Mear's Norah 3rd of Morden, 2; Macfarlane Brothers' Remembrance 9th of Kilbirnie, 3.

Children's Calf Class.—Heifer calf, 6 and under 12 months: Master W. J. Freeman's Crimson of Edenvale, 1; Master R. Freeman's Bud, 2; Master J. Hunt's Iris of Homeleigh, 3.

Champion Illawarra milking shorthorn cow: S. Mitchell's Fuchia of Strathdu. Reserve champion: A. Pickels's Jean 5th of Blacklands.

Bull, 3 and under 4 years: G. E. J. Chaseling's Thor of Greyleigh, 1; Scot Brothers' Count of Burradale, 2; George Isle's Stella's Chief of Oakdale, 3; C. Key's Masterpiece of Oakdale and R. T. Ward's Charming Lord of Hillview, highly commended. 2 and under 3 years: B. O'Connor's Charm's Duholow of Oakvale, 1; A. C. Payne's Raleigh's Reflection of Glenthorne, 2; W. Caswell's Masterpiece of Greyleigh, 3. 1 and under 2 years: C. E. Franke's Warrior 1st of Hazeldean, 1; G. Rackemann's Spanker of Hanover, 2; A. Kent's Triumph of Oakvale, 2. Bull calf, 6 months and under 1 year, B. O'Connor's Brilliant of Oakvale, 1; A. Pickels's Prince Hugh of Blacklands, 2; Levingstone Brothers' Mystery Prince of Woodleigh, 3. Heifer calf, 6 and under 12 months: R. T. Ward's Fussy of Mount View, 1; B. O'Connor's Wakeful 4th of Oakvale, 2; F. O. Hayter's Fussy 4th of Spurfield.

Children's Calf Class.—Bull calf, 6 months and under 1 year: Master W. J. Freeman's Bachelor of Edenvale, 1; Master E. Cochrane's Nabob of Newholme, 2; Master E. J. O'Connor's General of Oakvale, 3.

Cow or heifer giving greatest yield of butter fat for twenty-four hours under Babcock test, as above: R. Mears's Tulip of Morden, 1; J. F. Cochrane's Trixie of Newholme, 2; B. O'Connor's Fairy Queen 2nd of Glenthorn, 3.

Groups.—Sire and three of his progeny: B. O'Connor's Gem's Plum of Hillview and progeny, 1; R. Mears's George of Nestles and progeny, 2; R. J. Morgan's Royalist and progeny, 3. Two males and five females: B. O'Connor, 1; A. Pickels, 2; R. J. Morgan, 3. Sires' progeny stakes group: A. Pickels, 1; B. O'Connor, 2.

Bull, 4 years old and over: F. O. Hayter's Sovereign of Warden, 1; Crowther Brothers' Plum of Hillview, 2; R. J. Morgan's Royalist 2nd of Fairview, 3; W. Middleton's Gay Boy of Tyrone Villa, 4.

Champion Illawarra milking shorthorn bull: E. O. Hayter's Sovereign of Warden. Reserve champion: B. O'Connor's Charm's Duhalow of Oakvale.

GUERNSEYS.

Judge, Mr. W. Carter.

Bull, 3 years and over: T. S. Champney's Moonstone, 1 and champion.

FRIESIANS.

Judge, Mr. D. Hutchison.

Cow, 4 years and over, in milk: S. H. Hosking's Margaret Anglin 2nd of Berry, 1; P. P. Falt's Dairymead, 2; Grindles Limited's Lady Creamelle, 3. 3 and under 4 years, in milk: C. Behrendorff's Fanny of Inavale. Heifer, 2 and under 3 years, in milk: F. G. Brown's Maud Rooker Korndyke. Cow, 3 years or over, in calf 6 months, or dry: S. H. Hosking's Duchess of Hanover of Berry. Heifer, 2 and under 3 years, dry: S. H. Hosking's Psyche 2nd of Gwithian, 1; P. P. Falt's Malba of Ryfield, 2. Heifer, 1 and under 2 years: G. Newman's Hamburg of St. Anthan, 1; F. G. Brown's Pandora 3rd of Mooroombin, 2; Grindles Limited, Johanna of Wolston, 3. Heifer calf, 6 and under 12 months: G. Newman's Maud 4th of St. Athan, 1; C. Behrendorff's Fanny 2nd of Inavale, 2; F. G. Brown's Mooroombin Doral, 3.

Children's Calf Class.—Heifer calf, 6 and under 12 months: Master P. R. Alexander's Irene Segis Denmark, 1; Master W. Weaker's Lovely of Glen Carmal, 2; Miss Nellie Falt's Queenie of Ryfield, 3.

Champion Freisian cow: S. H. Hosking's Margaret Anglin 2nd of Berry. Reserve champion: F. G. Brown's Maud Rooker Korndyke.

Bull, 4 years and over: G. Newman's Dominion Domino's Dutch Boy, 1; S. S. Holmes's Marso of Berry, 2; C. Behrendorff's Cordyline Mascot, 3. 3 and under 4 years: Grindles Limited's Black Prince, 1; E. C. McConnel's Victory Paxton of Monavale, 2; E. J. Wecker's Prince Colantha Oaklea, 3. 2 and under 3 years: R. G. McLeod's Menelaus of St. Athan. 1 and under 2 years: F. Pearce's Daman of St. Gwithian, 1; R. S. Alexander's Sir Cluny Colantha, 2; M. Mumford's Star of Cressbrook, 3. 6 and under 12 months: G. Newman's Dunce of St. Athan, 1; C. Behrendorff's Sundial of Inavale, 2; E. J. Wecker's King Hector of Glen Carmal, 3.

Children's Calf Class.—Bull calf, 6 and under 12 months: Master G. Hosking's Pontiac of St. Gwithian.

Cow or heifer giving greatest yield of butter fat for twenty-four hours under Babcock test, as above: S. H. Hosking's Margaret Anglin 2nd of Berry, 1; P. P. Falt's Oaklea Noreen, 2; P. P. Falt's Dairymaid, 3; Grindles Limited's Lady Creamelle, 4.

Group.—Sire and three of his progeny, 6 months old and over: C. Behrendorff. Two males and five females: G. Newman.

Champion Friesian bull: R. G. McLeod's Menelaus of St. Athan. Reserve champion: Grindles Limited's Black Prince.

FAT CATTLE.

Judge, Mr. H. Friend.

Champion, best bullock: W. Ross Munro. Pen of three bullocks, over 4 years, uniform breed: I. J. and M. S. Moore, 1; J. Collins and Sons, 2. Three bullocks, 3 to 4 years, suitable freezing, to weigh 650 to 750 lb.: I. J. and M. S. Moore. Three bullocks, not over 4 years, most suitable for export, to weigh 600 to 800 lb.: Wagner and Surawski. Three Hereford bullocks, under 4 years: I. J. and M. S. Moore, 1; Godfrey Morgan, 2. Three bullocks, under 4 years, uniform breed: I. J. and M. S. Moore, 1; Wagner and Surawski, 2. Three bullocks, not over three years: I. J. and M. S. Moore. Three bullocks, most suitable freezing, H. J. Winton. Three steers, over 2 and under 3 years: I. J. and M. S. Moore. Bullock, not over 6 years: W. Ross Munro: 1 and champion; H. Mort and Son, 2. Bullock, under 4 years: I. J. and M. S. Moore, 1; J. Collins and Sons, 2. Steer, under 3 years: I. J. and M. S. Moore, 1. Cow, not over 6 years: Macansh Estates Limited, 1. Heaviest bullock: W. Ross Munro; weight 18 cwt. 2 qr. 7 lb. Bullock for export purposes: I. J. and M. S. Munro, 1; J. Collins and Sons, 2. Bullock, for local consumption: H. Mort and Son, Limited, 1; J. Collins and Sons, 2.

STUD SHEEP.

Judge, Mr. W. B. Slade.

Merinos (strong-woolled).—Ram, 3 years and over: Lord Bros., 1, 2, and 3. Ram, 2 and under 3 years: H. M. Collins, 1 and 2; Lord Bros., 3. Ram, under 2 years, to have been shorn as a lamb: Lord Bros., 1 and 2. Ewe, 3 years and over: Lord Bros., 1 and 2. Ewe, 2 and under 3 years: Lord Bros., 1, 2, and 3. Ewe, under 2 years, to have been shorn as a lamb: Lord Bros., 1 and 2.

Merinos (fine-woolled).—Ram, 3 years and over: Lord Bros., 1 and 2. Ram, under 2 years, to have been shorn as a lamb: Lord Bros., 1. Ewe, 3 years and over: Lord Bros., 1 and 2. Ewe, under 2 years, to have been shorn as a lamb: Lord Bros., 1 and 2.

Groups (strong-woolled merinos).—Pen of five merino rams, over 1 and under 2 years: Lord Bros. Pen of five merino ewes, over 1 and under 2 years: Lord Bros.

Championships.—Strong-woolled merino ram, champion: H. M. Collins. Reserve champion: Lord Bros. Strong-woolled merino ewe, champion and reserve champion: Lord Bros. Fine-woolled merino ram, champion and reserve champion: Lord Bros. Fine-woolled merino ewe, champion and reserve champion: Lord Bros.

Judge, Mr. W. G. Brown.

British Breeds.—Lincolns, ewe, any age: S. E. Pullen. Romney Marsh, ram, any age: S. E. Pullen. Corriedales, ram, any age: J. H. Fairfax, 1 and 2. Ewe, any age: J. H. Fairfax, 1 and 2.

FAT SHEEP.

Judge, Mr. W. A. Nason.

Pen of five merino wethers, over 50 lb. weight: Jondaryan Estates Company of Australia, Limited, 1; E. J. McDonough, 2. Under 50 lb.: E. J. McDonough, 1; A. T. Creswick, 2. Most suitable for freezing: E. J. McDonough, 1; Jondaryan Estates Company, 2. Most suitable for butcher's trade: E. J. McDonough, 1; A. T. Creswick, 2. Pen of five merino lambs: S. E. Pullen, 2. Pen of five crossbred wethers, 70 lb. or over: Cecil Flemming, 1; J. H. Fairfax (Corriedales), 2. Pen of five crossbred wethers: S. E. Pullen, 1 and 2. Pen of five crossbred wethers: S. E. Pullen, 1; J. H. Fairfax, 2. Pen of five crossbred wethers, freezing quality: S. E. Pullen. Pen of five wethers, suitable freezing and export: E. J. McDonough. Pen of five crossbred lambs, suitable export as freezers: Stirling Bros., 1; S. E. Pullen, 2. Pen of five crossbred lambs, judged irrespective of weight: J. H. Fairfax, 1; Stirling Bros., 2. Pen of ten fat lambs, most suitable export: Stirling Bros. Pen of five lambs, most suitable freezing: J. H. Fairfax, 1; Stirling Bros., 2.

Single Exhibits.—Heaviest crossbred wether: S. E. Pullen, 1; J. H. Fairfax, 2. Heaviest merino wether: A. T. Creswick, 1; Jondaryan Estates Company, 2. Heaviest crossbred ewe: S. E. Pullen, 1; C. E. McDougall, 2. Heaviest merino ewe: Lord Bros.

SWINE.

Judge, Mr. E. J. Shelton.

Boars.—Over 18 months: W. J. Warburton, Northgate Item 2nd, 1; J. H. Cowen, Korumburra Sonny, 2. Between 9 and 18 months: W. J. Warburton, Northgate Duke 2nd. Between 6 and 9 months: J. H. Cowen, Cremorne Geoff, 1; W. J. Warburton, Northgate Sport, 2. Under 6 months: J. H. Cowen, Cremorne Fatty, 1; W. J. Warburton, Northgate Chance, 2. Pen of three Berkshire boars, under 16 weeks: J. H. Cowen, Cremorne Chief, Cremorne King, Cremorne Prince. Boar and three

progeny: J. H. Cowen, Korumburra Sonny and progeny, 1; W. J. Warburton, Northgate Item 2nd, 2. Champion boar: W. J. Warburton, Northgate Item 2nd. Reserve champion: J. H. Cowen, Korumburra Sonny.

Improved Berkshires.—Sows, over 18 months: H. B. Ellerton, Serang Maid, 1; J. H. Cowen, Lawrence Countess, 2; W. J. Warburton, Northgate Diamond Belle, 3. Between 9 and 18 months: W. J. Warburton, Northgate Diana. Between 6 and 9 months: W. J. Warburton, Black Tip, 1; Pretty Face, 2; C. Behrendorff, Inavale Daisy, 3. Under 6 months: W. J. Warburton, Lady Jane, 1; J. H. Cowen, Cremorne Peggy, 2; H. B. Ellerton, Goodna Dainty, 3. Pen of three sows, under 16 weeks: C. Berhendorff, 1; J. H. Cowen, 2. Champion sow: H. B. Ellerton, Serang Maid. Reserve champion: W. J. Warburton, Northgate Diana.

Yorkshires.—Boars, over 18 months: W. J. Warburton, Northgate My Lad. Between 9 and 18 months: W. J. Warburton, Newington Adventure. Under 6 months: W. J. Warburton, Major. Pen of three boars: W. J. Warburton. Champion boar: W. J. Warburton, Northgate My Lad. Reserve: W. J. Warburton, Newington Adventure.

Sows, over 18 months: W. J. Warburton, Northgate Gladdo. Between 9 and 18 months: W. J. Warburton, Northgate Shirley. Between 6 and 9 months: W. J. Warburton, Northgate Gem, 1; Northgate Daisy, 2. Under 6 months: W. J. Warburton, Northgate Snowy. Any age, in milk, with litter of not less than six suckers, not over 10 weeks old: W. J. Warburton, Northgate Ruth. Pen of three sows: W. J. Warburton. Champion sow: W. J. Warburton, Northgate Gladdo. Reserve champion: W. J. Warburton, Northgate Shirley.

Tamworths.—Boar, 18 months and over: W. W. Arnett, Sandy Macqueen, 1; J. H. Whittaker, Meddlesome Duke, 2. Boar, 9 months and under 18 months: J. H. Whittaker, Prince Royal. Boar, 6 months and under 9 months: Boorie Stud Farm, Ginger of Boorie, 1; Boorie Stud Farm, Sandy of Boorie, 2. Boar, under 6 months: W. W. Arnett, Rouse Hill Jim, 1; J. H. Whittaker, The Conqueror, 2; W. W. Arnett, Rouse Hill Sandy 2nd, 3.

Champion boar: W. W. Arnett, Sandy Macqueen. Reserve champion: J. H. Whittaker, Prince Royal.

Sow, 18 months and over: J. H. Whittaker, Knowles Princess 2nd, 1; J. H. Whittaker, Indian Princess, 2. Sow, 9 months and under 18 months: W. W. Arnett, Manning Ruby, 1; J. H. Whittaker, Perfection, 2; J. H. Whittaker, Poppy, 3. Sow, 6 months and under 9 months: J. H. Whittaker, Forget-me-not, 1; J. H. Whittaker, Wild Rose, 2; J. H. Whittaker, Blossom, 3. Sow, under 6 months: W. W. Arnett, Rouse Hill Myra, 1; W. W. Arnett, Rouse Hill Molly, 2; J. H. Whittaker, Pretty Polly, 3. Sow, any age, in milk: J. H. Whittaker, Perfection, 1; J. H. Whittaker, Carnation, 2.

Champion sow: W. W. Arnett, Manning Ruby. Reserve champion: J. H. Whittaker, Perfection.

Poland-China, boar, 6 months old and under 15 months: Boorie Stud Farm, Judge 3rd of Boorie.

Duroc-Jerseys, boar, any age: F. G. Brown's entry. Sow, any age: F. G. Brown's entries, 1 and 2.

Miscellaneous.—Three bacon pigs, any breed, 110 to 140 lb., estimated dressed weight: J. Fitzgerald, 1; C. Bright, 2. Three porker pigs, 60 to 80 lb.: H. McNeilly, 1; J. Fitzgerald, 2.

Additional Awards.—Poland-China, boar, 6 months old and under 15 months: J. T. Collett, Billy, 2. Pen of three young boars, under 6 months: J. T. Collett's entry. Pen of three young sows, under 6 months: J. T. Collett, 1; Boorie Stud Farm, 2.

FARM PRODUCE.

Judge, Mr. H. C. Quodling.

Maize, large yellow, improved yellow Dent: W. T. Beverley, 1; T. Fisher, 2. Horse tooth: H. Franke. Yellow Dent: H. Franke. Medium yellow, golden beauty: T. Fisher, 1: H. Lindner, 2. Yellow Dent: H. Franke, 1; H. C. Harvey, 2. Yellow peg tooth type: T. Fisher, 1; H. Franke, 2. Small yellow, early Leaming: H. Franke, 1; O. C. Granzien, sen., 2; C. J. Ryman, 3. Reid's funks or James's yellow Dent: H. Lindner. Early yellow Dent: H. Franke, 1; K. Haag, 2. Socalled ninety-day, small yellow: H. Franke, 1; C. S. Huxley, 2; K. Haag, 3. White varieties.—Large white: A. Loweke. Hickory king: O. C. Granzien, sen., 1; H. Franke, 2. Bone county, white: A. Loweke. Brazilian white: C. Behrendorff. Red varieties.—Red Hogan: H. Franke, 1; C. Behrendorff, 2; T. Fisher, 3. Sydney red: H. Franke. Red butcher: W. T. Beverley, 1 and 2. Small, early red: J. Logan. Sweet corn, any variety: H. Franke, 1 and 2. Pop corn: J. Donges, 1; H. Franke, 2. Maize ears, red: H. Franke. Wheat, medium strong flour: W. Dearling, 1; W. Auchter, 2 and 3. Weak flour wheat: W. Auchter. Best exhibit of wheat: Geitz Bros., 1; C. S. Huxley, 2; Geitz Bros., 3. Oats, Algerian or Sunrise: W. Dearling, 1; C. Behrendorff, 2. Rye: K. Haag. Hay, lucerne, best dry: Major B. C. Bell, 1; J. Campbell, 2. Hay, lucerne, sweated: J. Campbell, 1; C. Behrendorff, 2. Oaten: C. S. Huxley, 1; T. Fisher, 2. Wheaten: W. Auchter. Straw: W. Auchter 1; C. S. Huxley, 2. Soudan grass: H. Franke, 1; W. Auchter, 2. Maize, stover: H. Franke, 1; C. S. Huxley, 2. Millet or panicum: T. Fisher, 1; H. Franke, 2. Rhodes: W. Auchter. Bush: W. Auchter. Three sheaves, oaten, Algerian: T. Fisher, 1; J. Donges, 2. Three sheaves, oaten, Tartarian: B. H. W. Berlin, 1 and 2. Three sheaves, wheaten: W. Auchter, 1; J. Donges, 2. Chaff, lucerne, dry: W. T. Beverley, 1; J. E. Stanton, 2. Sweated: Major B. C. Bell, 1; J. Campbell, 2; W. Dearling, 3. Oaten: C. S. Huxley, 1; C. J. Ryman, 2. Wheaten: C. S. Huxley, 1; L. Auchter, 2. Canary: H. Franke. Soudan grass: W. Auchter, 1; H. Franke, 2. Millet or panicum: H. Franke, 1; K. Haag, 2; J. Logan, special 1st. Grass hay: H. Franke, 1; W. Auchter, 2. Wheaten straw: W. Auchter, 1; W. Dearling, 2. Straw: J. Campbell, 1; H. Franke, 2; W. Auchter, 3. Ensilage (chaff): F. G. Brown, 1; C. Behrendorff, 2. Ensilage (whole stalk): F. G. Brown, 1 and 2. Saccharine sorghums.—Sacchaline: E. J. Keys. Sorghum saccharatum: H. Franke. Planters' friend: B. H. W. Berlin, 1; H. Franke, 2; C. Behrendorff, 3. Amber cane: H. Franke, 1; K. Haag, 2. Soudan grass: C. Behrendorff. Broom millet, seed: H. Franke. Panicum and fodder millet.—Liberty millet: B. H. W. Berlin, 1; C. S. Huxley, 2; J. Campbell, 3. White seeded French millet: T. Fisher. Japanese millet: B. H. W. Berlin White panicum: B. H. W. Berlin, 1; C. Behrendorff, 2; H. Lindner, 3. Manchurian millet: H. Lindner. Pasture grass seeds.—Lucerne: C. S. Huxley, 1; Major B. C. Bell, 2. Linseed: W. Dearling. Beans and peas.—Haricot: C. S. Huxley. Cowpeas, black: C. Behrendorff. Cowpeas, clay-coloured: C. S. Huxley, 1; K. Haag, 2. Cowpeas, large black-eyed Susan: S. C. Huxley, 1; K. Haag, 2. Cowpeas, any other variety: K. Haag. Yorkshire Hero peas: K. Haag. Miscellaneous.—Giant Russian sunflower: J. Donges. Canary seed of commerce: C. S. Huxley, 1; K. Haag, 2. Cotton, long staple (judge, Mr. D. Jones): W. Grimsey, 1; J. Oln, 2; W. Thompson, 3. Potatoes, Guyra Blues, Coronations, or Commonwealths: C. Seiler, 1; H. Franke, 2; H. C. Harvey, 3. Manhattans: C. Seiler. Brownells, any variety other than Satisfaction: H. Franke, 1; C. J. Ryman, 2. Satisfaction: H. Franke. Carmens: H. C. Harvey. Collection English: H. Franke, 1; C. Seiler, 2. Sweets, red or pink, table variety: J. Seeleither. Yellow Spanish, table variety: J. Seeleither. Champion Brownell: H. Franke. Crown pumpkins, table: O. C. Granzien, sen., 1; J. Logan, 2; H. C. Harvey, 3. Ironbark, table: J. Campbell, 1; H. C. Harvey, 2. Silver Nugget, table: W. T. Beverley, 1; J. Campbell, 2; H. C. Harvey, 3. Pumpkins, cattle: A. Granzien. Marrows: H. C. Harvey. Piemelons: J. Seeleither. Arrowroot: J. Seeleither. Castor oil bean: H. Lindner.

Maize ears, large yellow: H. Franke. Medium yellow: H. Franke. Small yellow: K. Haag, 1; H. Franke, 2. Large white: A. Loweke, 1; H. Franke, 2. Any white variety: A. Loweke, 1 and 2. Small red grain (early): H. Franke, 1. Sweet corn: H. Franke. Popcorn: J. Donges.

Champion maize exhibit: W. T. Beverley. Champion maize ears exhibit: H. Franke.

Barley.—Champion malting barley: W. Dearling.

Hay.—Champion collection: William Auchter.

Chaff.—Champion collection oaten, wheaten, lucerne, and canary chaff: William Auchter.

Potatoes.—Champion blue varieties: C. Seiler. Champion brown varieties: H. Franke. Champion white varieties: H. C. Harvey.

FRUIT.

Judge, Mr. W. Soutter.

Six uncured lemons: W. K. Reach, 1; R. Percival, 2. One case cured lemons: F. Nicklin. Six lemons, suitable for peel: E. Curtis, 1; R. Percival, 2. Three bunches cavendish bananas: W. J. Parker, 1; B. C. Peachey, 2. Three cases bananas: M. H. Gray, 1; Thomas Ivans, 2. Three cases smoothleaf pineapples, packed for export: H. Willmott, 2. Three cases Ripley Queen pineapples, packed for export: H. B. Aplin. Six pineapples, smoothleaf: H. Willmott, 1; W. Dart, 2. Six pineapples, Ripley Queen: H. B. Aplin, 1; H. Willmott, 2. Six pineapples, roughleaf: H. Willmott. Three cases oranges, packed for export, but unwrapped: W. Dart. Three cases oranges, packed for export, wrapped: W. Dart. Six Tahiti limes: W. Dart, 1; C. J. Frost, 2. Six citrons: E. Curtis. Six Emperor of Canton mandarins: E. P. Noakes, 1; W. Hooper, 2. Six scarlet mandarins: J. Steggall, 1; J. C. K. Lethbridge, 2. Six Glen Retreat mandarins: W. Hooper, 1; J. C. K. Lethbridge, 2. Six mandarins, any other variety: W. Dart, 1; E. P. Noakes, 2. Six Valentia oranges, late: R. Percival. Six Mediterranean sweet oranges: W. Hooper. Six Sabina oranges: W. Dart. Six Washington navel oranges: R. Percival, 1; W. Hooper, 2. Six seedling oranges: J. C. K. Lethbridge, 1; W. Hooper, 2. Six Seville oranges: Mrs. R. P. Gale, 1; W. Dart, 2. Six poor man's oranges: C. J. Frost. Six grape fruit: J. A. M. Macnaught. Any new superior variety of citrus fruit: H. K. Roach. Dish of passionfruit: F. G. Gipps, 1; A. Hartley, 2. Six boxes Aurie strawberries: J. A. C. Jackes. Three boxes strawberries: J. A. C. Jackes. Three papaws: E. Parker, 1; W. J. Parker, 2. Six custard apples: R. Percival. Dish of tree tomatoes: A. Wyllie. Granny Smith apples, for export: The Summit Fruitgrowers' and Progress Association, 1; M. E. Sewell, 2. Any other variety apples, for export: The Summit Fruitgrowers' and Progress Association, 1; David Pfrunder, 2.

APICULTURE.

Judge, Mr. W. F. Lyon.

Honey, standard colour, light: A. Smith, 1 and 2; A. T. Baker, 3. Golden: S. L. Uhlmann, 1 and 3; A. Smith, 2. Dark: A. T. Baker, 1; A. Gambling, 2; S. L. Uhlmann, 3. Granulated honey, fine grain: A. Gambling, 1; A. Smith, 2; A. T. Baker, 3. Granulated honey, coarse grain: S. L. Uhlmann, 1; A. S. Douglas, 2; A. T. Baker, 3. Comb and extracted honey: S. L. Uhlmann, 1 and 2; A. S. Douglas, 3. Blocks solid honey, 1 lb. nominal weight: A. T. Baker, 1 and 2. Extracted honey (novice class): J. Jones. Clarity exhibit, best jar extracted honey: A. Gambling. Extracting frame of comb honey, not less than 50 square inches: S. L. Uhlmann. Extracting frame of comb honey, not less than 100 square inches: A. S. Douglas. Beeswax, natural yellow: A. Smith. White: A. Smith. Beeswax for retail trade, white, not less than 4 lb., in tablets: S. L. Uhlmann. Beeswax for retail trade, natural yellow: S. L. Uhlmann, 1; A. T. Baker, 2. Beeswax in trophy form: A. Gambling. Collection of articles showing the uses to which beeswax can be put: A. S. Douglas. Collection and display of apiary products (not by-products), in all forms, suitable for shop window display: A. Smith, 93 points, 1; A. Gambling, 92 points, 2. Observatory hive of Italian bees, showing queen bee: S. L. Uhlmann, 1; J. Jones, 2. Honey vinegar: A. T. Baker. Collection of confectionery made with honey: Mrs. A. Pitkeathly. Collection of cakes made with honey: Mrs. A. Pitkeathly. Collection showing medicinal uses of honey: A. S. Douglas. Champion prize for the best honey exhibited, in classes 1 (light), 2 (golden), 3 (dark), 8 (novice), and 9 (clarity exhibit): J. Jones (Alderley).

SCIENCE NOTES.

By EDMUND JARVIS, Entomologist, Bureau of Sugar Experiment Stations.

FACTORS LIMITING THE INCREASE OF SCOLIID PARASITES.

(1.) *Fungus attacking Larvæ and Adults of Campsomeris tasmaniensis* Sauss.

Being aware that the entomogenous fungus *Metarrhizium anisopliæ* (Metsch.) Sor. is not exclusively parasitic on larvæ, but invades also the adult form of quite a number of insects, experiments were initiated by the writer during June, 1919, with view to determining whether wasps of the genus *Campsomeris* were immune from attack.

Details relating to the technique employed need not be given here, it being sufficient for the present purpose to state that in less than a week after infection of the soil several caged wasps were found dead and covered with green spore masses.

The fungus broke through first between the antennal joints, an indication, perhaps, that disease had been contracted while the insect was forcing its way through the infected soil.

Two wasps placed in cages on 18th June were found dead the following day, one being underground and the other lying on the surface with a particle of milky-looking matter exuding from the anus. When next examined (forty-eight hours after introduction to cages), the fungus had appeared externally on legs and antennæ.

In the light of our present knowledge regarding the action of the green Muscardine fungus under field conditions, its occurrence would not be likely to materially affect the increase of our spring and summer broods of *Campsomeris*. During autumn months, however, I am disposed to believe that the number of wasps victimised by this vegetable parasite may not only equal but perhaps exceed the percentage of cane-grubs destroyed by the fungus in question.

This view appears reasonable when one considers that our digger-wasp, during its aerial existence of about two months, tunnels 9 inches or more into the ground once or twice each day, visiting all sorts of localities and classes of soils, and constructing a subterranean chamber at the end of every drive, and would, therefore, at some time during these excavations be very likely to run again soil containing spores of the "Green Muscardine" fungus.

On the other hand, we know that cane-grubs, when located under a stool, usually remain there, close to their food, seldom moving about more than is necessary, and accordingly incurring far less risk of infection from spores of entomogenous fungi.

A young larvæ of *C. tasmaniensis* Sauss. derived from an egg laid on 24th May on *Lepidoderma albohirtum* Waterh. was noticed, some days later, to be covered with Metarrhizium fungus.

Curiously enough, the host-grub was not in the least affected, although the maggot of the parasite had been dead some days, and masses of ripe spores had developed.

(2.) *Premature Death of Host from Abnormal Stinging.*

Occasionally a digger-wasp, instead of paralysing its host-grub in the usual manner (see Bull. No. 7, Qld. Bur. Sug. Expt. Stations, Div. Ent., p. 21), deals an almost fatal thrust of the sting, delivered perhaps in a wrong place by mistake, under stress of danger or excitement consequent upon having made a false move whilst attacking; for it must not be forgotten that this strange combat to the death between grub and parasite takes place below ground in the dark, where the dangerous proximinity of mandibles and sting being, presumably, invisible to either party, would need to be instantly located by some instinctive sense of feeling that we do not understand.

The economic significance of such abnormal stinging, however, does not appear to be appreciated by the parasite, since it will oviposit as usual on such over-stung hosts, although the resultant maggot, after hatching, be doomed to perish owing to premature decay of the former. A third-stage grub of *albohirtum*, for example, was stung in this manner by a specimen of *C. radula* on 17th April and died three days later.

The effect produced by such abnormal stinging is rather remarkable. Instead of becoming flaccid as usual, the grub stiffens and appears bloated, as though it had been boiled, assuming a U-shaped form, and remaining quite rigid in the cell until after death.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RECORDS OF COWS FOR JULY, 1922.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			lb.	%	lb.	
Dear Lassie ...	Ayrshire ...	19 June, 1922	960	3·9	43·80	
Hedges Nattie ...	Friesian ...	20 May, ,,	780	4·1	37·50	
College Cold Iron	Jersey ...	25 Jan., ,,	540	5·7	36·30	
Prim	Friesian ...	6 Feb., ,,	930	3·1	33·60	
Miss Fearless ...	Ayrshire ...	30 May, ,,	720	3·8	32·10	
Songstress	,, ...	4 July, ,,	756	3·4	29·96	
Dawn of Warragaburra	Jersey ...	17 May, ,,	480	5·1	28·80	
Little Buttercup...	Friesian ...	12 Dec., 1921	690	3·5	28·20	
Lute	Ayrshire ...	8 Jan., 1922	540	4·2	26·70	
Snowflake	Shorthorn...	20 Feb., ,,	570	4·0	26·40	
Skylark	Ayrshire ...	7 Feb., ,,	510	4·4	26·10	
Gay Lassie ...	,, ...	20 Feb., ,,	420	5·2	25·80	
Miss Betty ...	Jersey ...	17 May, ,,	420	5·2	25·80	
Buttercup	Shorthorn...	28 Oct., 1921	576	3·8	25·60	
College Prima Donna	Friesian ...	27 Nov., ,,	540	3·9	24·60	
Magnet's Leda ...	Jersey ...	8 Feb., 1922	450	4·7	24·60	
College Cobalt ...	,, ...	3 April, ,,	420	4·7	23·10	
College Nancy ...	Friesian ...	16 June, ,,	510	3·7	21·90	
College Ma Petite	Jersey ...	5 Feb., ,,	390	4·8	21·90	
La Hurette Hope	,, ...	30 June, ,,	465	4·0	21·70	
Rosine	Ayrshire ...	18 May, ,,	510	3·6	21·30	
Sheila of Nundorah	Guernsey ...	16 April, ,,	360	5·0	21·00	
College Wildflower	Jersey ...	10 Dec., 1921	360	5·0	21·00	
Auntie's Lass ...	Ayrshire ...	31 Oct., ,,	434	4·1	20·77	
College Nita ...	Friesian ...	26 Feb. 1922	480	3·7	20·70	
Lady Mitchell ...	,, ...	20 Dec., 1921	450	3·9	20·40	
Lady Annette ...	Ayrshire ...	2 Jan., 1922	360	4·8	20·10	

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, JULY, 1922.

Extremely cold weather was again experienced during the month of July, which considerably upset the laying. One death occurred, bowel trouble being the cause, otherwise we had a very good result for the month. Several of the leading pens are again doing good work. The White Leghorns are in the lead with a score of 148 eggs to Mr. N. A. Singer's pen; also his B bird has made a good run, unbroken, of 48 eggs. Mr. C. H. Singer's pen takes second place with a score of 147, also White Leghorns. The third pen is that owned by Messrs. W. and G. W. Hindes, with a score of 120. In the heavy breeds the best score for the month is 122 made by Mr. C. C. Dennis's pen, R. Holmes being second with 120, and R. Burns third with 116 eggs. The following are the individual records:—

Competitors.	Breed.	July.	Total.
LIGHT BREEDS.			
*W. and G. W. Hindes	White Leghorns ...	120	416
*N. A. Singer	Do.	148	411
C. H. Singer	Do.	147	392
*Bathurst Poultry Farm	Do.	92	372
*Geo. Trapp	Do.	98	332
*T. Fanning	Do.	109	332
*W. A. Wilson	Do.	102	328
J. H. Jones	Do.	91	328

EGG-LAYING COMPETITION—*continued.*

Competitors.	Breed.	July.	Total.
LIGHT BREEDS—*continued.*			
*Mrs. L. Andersen	White Leghorns ...	103	319
A. G. C. Wenck	Do.	83	317
*S. L. Grenier	Do.	97	310
*W. Becker	Do.	85	303
*G. Williams	Do.	96	297
*O. Goos	Do.	88	293
*J. M. Manson	Do.	103	292
*H. P. Clarke	Do.	102	291
B. Hawkins	Do.	85	291
*R. Gill	Do.	112	291
J. Purnell	Do.	75	285
A. Maslin	Do.	100	279
*R. C. Cole	Do.	96	272
*Mrs. E. White	Do.	86	271
*H. Fraser	Do.	76	271
*J. W. Newton	Do.	74	268
*C. Goos	Do.	81	255
*Oakleigh Poultry Farm	Do.	97	242
T. H. Craig	Do.	65	242
G. F. Richardson	Do.	78	240
*M. F. Newberry	Do.	98	236
*J. W. Short	Do.	93	234
*C. M. Pickering	Do.	93	236
*Mrs. R. Hodge	Do.	97	232
E. Stephenson	Do.	51	230
*F. Birchall	Do.	84	226
*Thos. Taylor	Do.	89	222
N. J. Nairn	Do.	75	222
B. C. Bartlem	Do.	56	220
*R. C. J. Turner	Do.	87	213
*E. A. Smith	Do.	64	211
E. Symons	Do.	69	203
A. Anders	Do.	38	178
Brampton Poultry Farm	Do.	59	158
H. Trappett	Brown Leghorn	59	132
Parisian Poultry Farm	Do.	13	24
HEAVY BREEDS.			
*A. E. Walters	Black Orpingtons ...	106	386
*R. Holmes	Do.	120	352
*R. Burns	Do.	116	341
*H. M. Chaille	Do.	108	339
Jas. Hutton	Do.	105	330
*T. Hindley	Do.	112	328
Mrs. A. Kent	Do.	78	327
Wambo Poultry Farm	Do.	50	315
*Rev. A. McAllister	Do.	85	279
*E. F. Dennis	Do.	88	279
*C. C. Dennis	Do.	122	265
*J. Potter	Do.	111	258
Mrs. A. E. Gallagher	Do.	84	258
Mrs. L. Maund	Do.	87	240
R. Innes	Do.	103	231
V. J. Rye	Do.	82	212
C. Doan	Do.	91	208
Jas. Hitchcock	Do.	64	199
H. B. Stephens	Do.	70	186
C. Rosenthal	Do.	54	181

EGG-LAYING COMPETITION—*continued.*

Competitors.	Breed.	July.	Total.
HEAVY BREEDS—*continued.*			
W. Becker	Chinese Langshans ...	109	178
*Parisian Poultry Farm	Black Orpingtons ...	97	166
W. C. Trapp	Do.	77	151
*J. E. Smith	Plymouth Rocks ...	60	84
R. Burns	Silver-laced Wyandottes	62	83
*Miss L. Hart	Rhode Island Reds ...	5	6
Total	...	6,060	17,896

* Indicates that the pen is being single tested.

DETAILS OF SINGLE HEN TESTS.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS.							
W. and G. W. Hindes	83	57	76	68	76	56	416
N. A. Singer	56	83	61	71	67	73	411
Bathurst Poultry Farm	53	48	67	70	79	55	372
Geo. Trapp	69	44	42	63	55	59	332
T. Fanning	37	75	61	65	77	17	332
W. A. Wilson	51	47	42	69	53	66	328
Mrs. L. Andersen	70	34	58	55	47	55	319
S. L. Grenier	47	27	60	56	59	61	310
W. Becker	43	28	63	49	52	68	303
G. Williams	42	55	58	50	46	46	297
O. Goos	48	32	59	69	54	31	293
J. M. Manson	48	33	61	31	68	51	292
H. P. Clarke	53	33	51	57	52	45	291
R. Gill	58	55	62	43	29	44	291
R. C. Cole	53	56	58	21	43	41	272
Mrs. E. White	60	11	47	37	61	55	271
H. Fraser	48	61	46	37	32	47	271
J. W. Newton	66	46	54	26	50	26	268
C. Goos	30	30	27	51	66	51	255
Oakleigh Poultry Farm	52	29	45	41	28	47	242
M. F. Newberry	41	23	30	69	24	49	236
J. W. Short	41	42	53	32	21	45	234
C. M. Pickering	57	53	21	36	43	23	233
Mrs. R. Hodge	63	10	36	38	53	32	232
F. Birchall	40	43	12	35	50	46	226
Thos. Taylor	55	22	44	40	39	22	222
R. C. J. Turner	38	24	49	46	42	14	213
E. A. Smith	53	24	52	42	17	23	211
HEAVY BREEDS.							
A. E. Walters	61	59	61	59	73	73	386
R. Holmes	46	71	59	59	54	63	352
R. Burns	48	64	44	64	60	61	341
H. M. Chaille	75	48	66	63	57	30	339
T. Hindley	30	59	27	90	88	34	328
Rev. A. McAllister	52	60	74	27	9	57	279
E. F. Dennis	50	43	67	7	49	63	279
C. C. Dennis	43	55	51	35	47	34	265
J. Potter	37	47	56	48	52	18	258
Parisian Poultry Farm	15	34	36	8	39	34	166
J. E. Smith	0	22	11	7	21	23	84
Miss L. Hart	0	3	1	2	0	0	6

CUTHBERT POTTS, Principal.

NATIONAL UTILITY POULTRY BREEDERS' ASSOCIATION COMPETITION.

By arrangement with the Council of the National Utility Poultry Breeders' Association the results of their egg-laying competition will hereafter be published monthly.

During August, 2655 eggs were laid by the birds in the N.U.P.B.A. competition at Zillmere, on an average of just over 22 eggs per bird. No. 79, a White Leghorn belonging to Mr. W. Bliss, laid 31 eggs in the month. The birds generally are in good health, and doing well. No. 85 was replaced and previous score struck out. Details:—

Pen No.	Owner.	August.	Total.	Pen No.	Owner.	August.	Total.
	WHITE LEGHORNS.						
29	A. S. Walters ...	26	125	10	P. Ruddick ...	23	88
2	A. Niel	26	118	69	A. Hodge ...	22	88
33	J. Purnell ...	27	118	8	J. Harrington ...	19	87
62	H. Sturman ...	24	115	41	G. Williams ...	21	87
19	L. Anderson ...	24	113	42	G. Williams ...	23	87
43	J. Davies ...	25	113	52	F. R. Koch ...	25	87
66	A. Cowley ...	25	112	46	H. Needs ...	21	86
38	Carinya Poultry Farm	19	111	59	C. M. Pickering ...	21	85
				17	R. Shaw	22	84
77	Kelvin Poultry Farm	27	111	67	R. D. Chapman ...	19	84
				22	E. Stevenson ...	20	80
27	Oakleigh Poultry Farm	26	109	54	A. W. Ward ...	23	80
				26	D. F. Adams ...	23	79
72	Enroh Pens ...	24	109	73	A. F. Knowles ...	22	79
7	J. Harrington ...	24	107	18	R. Shaw	23	78
25	P. F. Adams ...	23	107	56	W. H. Lingard ...	19	77
64	G. Trapp	26	106	58	M. Newberry ...	28	77
12	J. Potter	24	105	40	P. J. Fallon ...	23	76
34	J. Purnell ...	24	105	79	W. Bliss	31	76
61	H. Sturman ...	22	104	51	F. R. Koch ...	22	75
47	M. J. Lyons ...	23	104	76	A. J. Bourne ...	24	74
16	F. Flood	25	103	65	A. Cowley ...	20	72
70	A. Hodge ...	23	103	37	Carinya Poultry Farm	23	71
24	M. H. Campbell...	20	100				
55	W. H. Lingard ...	24	97	15	T. Flood	16	70
36	Parisian Poultry Farm	18	96	5	Wombo Poultry Farm	18	66
63	G. Trapp	24	96	20	L. Anderson ...	23	66
28	Oakleigh Poultry Farm	17	95	60	C. M. Pickering ..	19	64
				81	E. C. Raymond ...	22	64
30	A. S. Walters ...	19	95	14	J. Hutton ...	20	63
35	Parisian Poultry Farm	21	95	11	J. Potter	15	61
				31	R. H. Woodcock	17	60
68	R. D. Chapman ...	23	95	45	H. Needs ...	19	60
82	E. C. Raymond ...	19	94	50	R. Turner ..	21	56
44	J. J. Davies ...	22	94	71	Enroh Pens ...	24	55
39	P. J. Fallon ...	22	93	80	W. Bliss	22	53
48	M. J. Lyons ...	24	93	28	M. H. Campbell...	28	51
57	M. Newberry ...	19	93	78	Kelvin Poultry Farm	22	47
74	A. F. Knowles ...	19	93				
6	Wombo Poultry Farm	21	92	1	A. Neil	3	45
				3	W. Becker ...	23	43
9	P. Ruddick ...	24	91	4	W. Becker ...	17	42
13	J. Hutton ...	23	91	32	R. H. Woodcock	17	31
53	A. W. Ward ...	21	91	75	A. J. Bourne ...	23	26
49	R. Turner ...	21	89	21	E. Stevenson ...	21	24

NATIONAL UTILITY POULTRY BREEDERS' ASSOCIATION COMPETITION—*continued.*

Pen No.	Owner.	August.	Total.	Pen No.	Owner.	August.	Total.
	BLACK ORPINGTONS.						
107	E. Walters ...	28	115	99	L. J. Prichard ...	21	87
89	T. Brotherton ...	24	114	102	Parisian Poultry Farm	21	83
96	R. A. Boulton ...	27	112				
88	W. A. Blake ...	29	109	106	H. Pearse ...	26	82
92	P. C. Dennis ...	28	104	84	J. Hutton ...	26	80
105	H. Pearce ...	24	104	110	Wambo Poultry Farm	22	76
101	Parisian Poultry Farm	22	102	109	Wambo Poultry Farm	20	72
86	Kidd Bros. ...	20	98				
103	J. Potter	18	98	110	A. Neil	24	67
95	R. A. Boulton ...	28	95	94	E. F. Dennis ...	8	64
108	G. Walters ...	23	95	89	T. H. Brotherton	28	63
104	J. Potter	24	94	87	W. A. Blake ...	23	60
93	E. F. Dennis ...	24	93	98	Enroh Pens ...	20	57
100	L. J. Pritchard ...	24	93	112	A. Neil	25	43
83	J. Hutton ...	22	91	97	Enroh Pens ...	18	24
91	C. C. Dennis ...	26	91	85	Kidd Bros. ...	10	10
	OTHER BREEDS.						
118	P. H. Jones ...	25	110	119	T. J. Carr ...	24	62
120	T. J. Carr ...	25	91	115	G. and W. Hinds	20	52
117	J. H. Jones ...	20	90	113	Parisian Poultry Farm	21	45
116	D. and W. Hinds	20	84				
114	Parisian Poultry Farm	22	68				

CERTIFICATES OF SOUNDNESS.

Certificates of Soundness as under-listed were issued in the course of August, 1922 :—

Name of Stallion.	Breed.	Period for which Certificate issued.	Owner's Name.	Owner's Address.
Pride of Glenore	Clydesdale ..	Life ..	H. Kilvington ..	Glenore Grove, Forest Hill
Baron Windemere	Clydesdale ..	12 months	G. Elliot ..	Laidley
Statesman ..	Clydesdale ..	12 months	G. Elliot ..	Laidley
Crystal River	Clydesdale ..	12 months	S. E. Pullen ..	Prairie Plain, Wyalla
Paddington ..	Blood ..	Life ..	Queensland Government	Dillalah State Station
Soldiers March	Blood ..	Life ..	E. Bagley ..	Chester Street, Valley
Salopian ..	Blood ..	Life ..	Duncan Bros. ..	Childers
Ercanil ..	Blood ..	Life ..	Hon. A. H. Whittingham	Brisbane
The Joker ..	Trotting ..	Life ..	J. E. Moore ..	Maryborough
King Bells ..	Trotting ..	Life ..	R. Cocks ..	Sherwood Road, Toowong
Tom Holmes..	Trotting ..	Life ..	A. W. Baulch ..	Bald Hills
Bonnie Lad ..	Pony ..	12 months	F. Tucker ..	Sale Yards, Newmarket
Ludo	Pony ..	12 months	E. Pocock ..	Palmer Street, Windsor
Little Harold	Pony ..	12 months	G. E. Jackson ..	Eagle Street, Brisbane
Bonny ..	Pony ..	12 months	E. A. Taylor ..	Nudgee

ORGANISATION OF THE AGRICULTURAL INDUSTRY.

The Queensland Producers' Association.

A Record of Progress and Achievement.

The last Regular Meeting of the Council of Agriculture was held in the Council Room, Teachers' Training College Building, Turbot street, Brisbane, on Friday, 25th August, 1922. Subjoined is a complete record of Proceedings covering many matters of first importance to the Farming Industry.

Attendance.—

The Vice President (Mr. J. Purcell) was in the chair; and there were also present Messrs. J. W. Davidson, E. Graham, W. J. Short, H. C. Quodling, and J. D. Story (Administration); Messrs. J. E. Dean, W. Purcell, T. Flood Plunkett, H. Keefor, and J. T. Tod (Dairy Industry); Messrs. S. C. Howe, W. Ranger, H. I. H. Ross, and F. M. Runkin (Fruit Interests); Messrs. G. Batchlor, C. V. Hives, T. A. Powell, and C. H. Pritchard (Sugar Industry); and Messrs. T. Muir and R. Swan (Wheat Growers).

The Council passed the following resolutions:—

1. *Cold Stores at Hamilton—*

That the Chairman of the Dairy Committee and the Chairman of the Fruit Committee be advised to keep in touch as far as possible with the progress of the work in connection with the Cold Stores at Hamilton, so as to ensure that the accommodation promised by December next will be completed by that time.

2. *Standards for Apples—*

That the Department of Agriculture be advised that as a result of the recent National Conference held in Melbourne it is proposed to revise the Customs Regulations dealing with certain standards; and that in the circumstances the Department be asked to defer for the present further action in regard to the recommendations recently submitted by the Council of Agriculture respecting standards for apples.

3. *Railways Rates for Fertilisers—*

That the report made orally at this meeting by Mr. J. W. Davidson to the effect that a reduction of 25 per cent. will be made in the Queensland rates for distances over 200 miles, but not less than the present rate for 200 miles, be noted with an expression of the Council's appreciation of the action taken by the Railway Department in this matter.

4. *Railway Freight on Fruit Consignments.*

That the communication dated the 14th August, 1922, from the Secretary to the Commissioner for Railways be referred to the Fruit Committee for their information.

5. *Banana Pool Ballot—*

That the Under Secretary, Department of Agriculture and Stock, be advised that in view of the circumstances mentioned in Mr. Ross's memorandum of the 17th August, 1922, the Council concurs in the suggestion that a further ballot should be taken as indicated in the memorandum.

6. *Designation of Organisers—*

That it be a recommendation that the designation "Provisional Organiser" be changed to "District Agent."

7. *Appointment of Mr. Allan McKinlay—*

That Mr. Allan McKinlay be appointed as District Agent for District No. 13A, in the room of Mr. Harris, resigned.

8. *Bad Roads, Woombye District—*

(*a*) That a copy of the particulars received by the Chairman of the Administrative Committee from the Chairman, Main Roads Board, be sent to the Secretary, Local Producers' Association, Woombye.

(*b*) That a copy of the particulars received from the Local Producers' Association, of Woombye, in regard to the above matter, together with a copy of the details furnished by the Chairman of the Main Roads Board, be sent on to the Under Secretary, Home Department, for consideration in connection with any amendment of the Local Authorities Act which that department may have in contemplation.

(*c*) That the "Weight of Load" Regulations under the Main Roads Act be brought under the notice of the Transport Committee for consideration and recommendation to the Council in regard to any amendment which, in the opinion of the Committee, should be made in the Regulations in question.

9. *Telephone Service—*

That in regard to the application made to the Deputy Postmaster-General for the connection of the offices of the Council of Agriculture with the Central Telephone Exchange, the Deputy Postmaster-General be again communicated with and asked that, having regard to the public importance of the work which is being undertaken by the Council and to the difficulties which are being experienced in not having a telephone installed, he will be so good as to arrange to treat the application as urgent and to have the telephone installed as soon as the first line is available.

10. *Labour for Cotton Picking—*

(*a*) That the correspondence which has taken place between the Chairman of the Administrative Committee and the Director of Labour in regard to the above matter be noted.

(*b*) That a copy of the letter dated the 14th August, 1922, received by Mr. Story from the Director of Labour, be sent to the Wondai Chamber of Commerce, with a suggestion that should the Association desire to avail itself of the services of the Department of Labour, the Association communicate direct with the Director.

11. *State Sawmills, Amiens: Case Timber—*

(*a*) That the recent letter suggesting that the State Sawmill at Amiens be reopened for the purpose of cutting timber for fruit-case purposes be received and sent on to the Fruit Committee for consideration.

(*b*) That a copy of the letter in question be also forwarded to the Director of Forests for the information and consideration of that Department.

12. *Primary Producers' Organisation Act—*

That the recommendations of the Administrative Committee, as contained in Schedule 1 hereto, be approved and that the necessary further action be taken thereon.

13. *Constitution of District Councils—*

(*a*) That the number of District Councillors for each district be nine.

(*b*) That the ballot for the election of District Councillors be conducted on a sectional basis; that is to say—

(i.) That the registered producers in the nineteen districts be classified according to the section of the agricultural industry in which they are engaged, namely—

Dairying;
Fruitgrowing;
General Agriculture;
Sugar-growing.

(ii.) That the proportion of the nine Councillors to be allocated to the particular section of the industry be determined by the registered number of producers in that section as on 30th November, 1922.

(iii.) That in the case of ballots the producers in each section of the industry vote only for the persons nominated in that section—thus—

Dairymen shall vote only for the persons nominated for the Dairying Section;

Fruit-growers shall vote only for the persons nominated for the Fruit Section;

General Agriculturists shall vote only for the persons nominated in the General Agricultural Section; and

Sugar-growers shall vote only for the persons nominated in the Sugar Section.

(*c*) That each Local Producers' Association name not later than 30th November, 1922, the place which it desires to be the headquarters of its District Council.

(*d*) That in the event of more than one place being named as the headquarters of a particular District Council, a ballot of the registered producers in that district be taken to determine the headquarters; such ballot to be taken at the same time as the ballot for the District Councillors or at such other time as the Council of Agriculture may determine.

14. *Chairman, Dairying Committee*—

That it is noted that Mr. E. Graham has been elected as Chairman of the Dairying Committee.

15. *Question of Erection of a New Butter Factory at Rockhampton*—

That the report submitted by Messrs. Graham and Harris on their recent visit to Rockhampton for the purpose of attempting to bring about a reconciliation between the Directors of the Rockhampton Co-operative Company and the Provisional Directors of the Central District Co-operative Company be received, and that the particulars contained therein be noted.

16. *Pasteurisation of Milk and Cream*—

(*a*) That it is noted that the Dairy Committee is strongly of opinion that the installation of pasteurisers in Queensland factories, where necessary, would effect a general improvement in the quality of butter and cheese produced.

(*b*) That suitable particulars relating to this matter be embodied in the next Bulletin to be issued by the Council.

(*c*) That the particulars be brought suitably under the notice of the secretaries of the Co-operative Dairy Companies and Cheese Manufacturers' Associations, and that their co-operation and assistance be invited.

(*d*) That the several establishments which have kindly supplied the Committee with information respecting pasteurisers be suitably thanked and advised, at the same time, of the action taken by the Council.

(*e*) That further information regarding the cost of installation of the complete pasteurising plant (cooler, pump, &c.) be obtained from A. J. Dutch, Wellington, New Zealand.

17. *Co-operative Companies Bill*—

(*a*) That the report of the proceedings of the conference held to discuss suggestions for possible inclusion in the proposed Co-operative Companies Bill be received.

(*b*) That the Council endorse the resolution carried by the conference regarding the appointment by the Council of a special committee to report on the matter.

(*c*) That the several members of the Administrative Committee be appointed as a select committee to go thoroughly into this question with officers of the Crown Law Department.

18. *Herd Testing*—

(*a*) That the Council defer action in regard to the adoption of any definite scheme until after the arrival of the Director.

(*b*) That the Director confer with the Dairy Standing Committee and the Director of Dairying, with a view to the preparation of a concrete scheme to be submitted by the Council to the District Councils and Local Producers' Associations.

(*c*) That such scheme embody provisions for securing the support of dairymen, their compliance with prescribed rules and the financing of the scheme by a levy to be made and applied for the specific purpose of herd-testing in accordance with the regulations to be made under Section 14 of the Primary Producers' Organisation Act "for the expenditure of sums raised by any particular levy only in the interests of the particular industry or section of industry in which such levies were made."

19. *Complaint regarding Slaughtering Act*—

That in connection with the statements contained in a recent report received from Organiser McMaster regarding the above question, he be furnished with a copy of the particulars obtained from the Department of Agriculture and Stock as set out in the Under Secretary's letter of the 11th August, 1922.

20. *Jersey Breed at Warren State Farm*—

That in connection with the request contained in a letter received recently from the Milman Local Producers' Association, urging the establishment of a breed of Jersey cattle at Warren State Farm, the Association be suitably communicated with on the lines suggested by the Dairy Committee.

21. *Factory Returns relating to Low-Grade Cream*—

That the letter dated the 1st August, 1922, from the Department of Agriculture and Stock be received, and that in view of the circumstances mentioned therein the present system be given a further six months' trial.

22. *Dairy Inspectors and Instructors*—

(*a*) That it is noted that in the Estimates for the financial year 1922-23 provision has been made for the following additional appointments, namely:—An Assistant Dairy Expert, a Dairy Instructor, a Dairy Inspector, and two Herd-testers.

(*b*) That the Department of Agriculture be requested to take such action as will ensure the regular inspection of dairying premises.

23. *Facilities for Marketing of Pigs*—

(*a*) That it is noted that the Dairy Committee is in accord with the principles underlying the suggestions contained in a recent letter from Mr. Wight.

(*b*) That before any further action is taken in this matter the views of pig-producers be obtained as far as practicable.

(*c*) That with a view to obtaining the information referred to in (*b*) above, the matter be brought suitably under the notice of the District Agents and the Local Producers' Associations in districts and localities where pigs are produced.

24. *Question of Regrading of Australian Butter, &c.*—

That in connection with the Resolutions submitted by the Canaga Local Producers' Association regarding—

(*a*) The regrading, standardising, and branding of Australian butter at place of import;

(*b*) The overcoming of competitive antagonism in the marketing of Australian butter overseas; and

(*c*) The standardising of first-class butter by Government experts;

the Association be informed that (*a*) and (*c*) are matters for determination by the Commonwealth Government as a result of the recent agreement arrived at between the Commonwealth and the States; and that though in accord with the principle underlying (*b*) the Committee is not in a position at present to take any further action.

25. *Stabilisation of Prices.*—

(*a*) That the information contained in a wire dated 15th August, 1922, received from Mr. Owens (Commonwealth Dairy Pool), regarding the present position in Victoria, is noted with satisfaction.

(*b*) That the matter be brought up again for discussion on receipt of the further particulars promised by Mr. Owens.

26. *Improving Cultural Methods of Wheat Growing*—

That it is noted that in accordance with the proposals contained in the report submitted to the Council in May last, the whole of the stocks of selected wheats held by the Department of Agriculture were acquired by the Wheat Board and disposed of to growers upon specified conditions; and that reports to hand show that germination has been good.

27. *Maize Pool*—

(*a*) That the Department of Agriculture be requested to furnish as soon as possible, for the information of the Council, particulars in regard to the result of the ballot taken recently by the Department in regard to a Maize Pool.

(*b*) That the Director be requested to obtain, while in Victoria, such particulars as he may be able to secure in regard to the manufacture (by the Maize Products Company at Footscray, Victoria) of glucose, starch, and other by-products of maize.

28. *Wheat Board Election*—

(*a*) That it is noted that in the opinion of the Wheat and General Agriculture Committee it is desirable that the tenure of office of the members of the Wheat Board to be elected in November next should be two years.

(*b*) That the Department of Agriculture be advised accordingly.

29. *Export of Eggs*—

(*a*) That the recent letter from the Department of Agriculture and Stock covering copy of a communication from the Soldiers' Settlement Branch of the Lands Department, regarding the glut season for eggs and the desirability of organising an export trade, be acknowledged with an intimation that the matter is under consideration.

(*b*) That the South Australian Farmers' Union be communicated with in suitable terms, with a view to the obtaining from that body details of any scheme which it may have in operation regarding this matter: a copy of the letter to be sent to Mr. Macgregor for his information and for such action as it may be conveniently possible for him to take thereon when passing through Adelaide.

(*c*) That the Department of Trade and Customs be asked for:—

(i.) A copy of the regulations, if any, made under the Customs Act to bring about uniformity in regard to quality and size of eggs for export;

(ii.) Statistics in regard to eggs imported to or exported from Australia;

(iii.) Such further helpful particulars as the Department may be able to supply in regard to markets for eggs, egg-pulp, &c.

(*d*) That the views of the Brisbane Poultry Associations be ascertained generally on the question of promoting an export trade for eggs.

30. *Fertilisers*—

(*a*) That the letter dated the 8th August, 1922, from the Commissioner of Prices be received, and that the further consideration thereof be deferred pending action by the Commissioner as indicated in the concluding paragraph of his letter.

(*b*) That in the meantime the Agricultural Chemist be requested (through the Under Secretary, Department of Agriculture and Stock) to explain the method of determining the unit value of fertilisers and the most suitable means to be employed in disseminating the information to growers.

(*c*) That the Department of Agriculture be asked for full information in regard to the present system of testing fertilisers.

31. *Agricultural Machinery*—

(*a*) That inquiry be made from the South Australian Farmers' Union as to the system employed by them in regard to the indenting of agricultural machinery and the sale thereof to the individual farmers; a copy of this letter to be sent to Mr. Macgregor for his information and for such action as it may be conveniently possible for him to take thereon when passing through Adelaide.

(*b*) That inquiries be made also from New Zealand and Southern manufacturing firms respecting this matter.

(*c*) That the further consideration of the matter be then deferred until the Director arrives and he can be consulted thereon.

32. *African Maize*—

(*a*) That the wire dated the 11th August, 1922, from the Secretary, Local Producers' Association, at Atherton, asking the Council to urge the Minister for Customs to arrange for an immediate increase of three shillings cental duty on African maize, be received and transmitted to the Tariff Board, Melbourne, with an intimation that it is the opinion of this Council that, as Australia can produce sufficient maize under normal conditions for all Australian requirements, the request should be favourably considered.

(*b*) That inquiry be made at the same time as to the steps, if any, already taken by the Board in the matter.

33. *Question of Protection for Coffee-growers*—

(*a*) That the letter dated the 15th August, 1922, from the Secretary, Buderim Progress Association, intimating that unless some further protection is given to Queensland coffee-growers the industry must die out owing to the small prices obtainable at present for this commodity, be acknowledged with an intimation that inquiries are being made into the matter; the Secretary to be requested at the same time to furnish particulars as to the quantity of coffee produced at present by the growers to whom he refers.

(*b*) That a copy of the letter referred to above be sent to the Tariff Board, Melbourne; and that the Board be requested to furnish particulars as to—

(i.) The duty, if any, on coffee imported to Australia;

(ii.) The annual quantity produced in Australia at present;

(iii.) The annual consumption at present.

(*c*) That a copy of the letter be sent also to the Federal Member for the Lilley Division (*i.e.*, the Federal Electoral Division comprising the area mentioned in (*a*) above).

34. *Scheme for Improving Horses, &c.*—

(*a*) That the letter from the Under Secretary, Department of Agriculture and Stock, covering a scheme for the improvement of types of horses in Queensland, be received and acknowledged with an intimation that in the opinion of this Council all possible measures should be taken to produce good types of reliable horses suitable not only for use in Queensland but also for export to other countries.

(*b*) That this Council is also of opinion that a stallion tax should be imposed, and that the inspection and approval of mares is also desirable.

35. *Co-operative Purchasing of Stallions, Bulls, &c.* —

That the Council urge the Government to encourage and to assist as far as practicable in the co-operative purchasing, where necessary, of approved stallions, bulls (beef and dairy), rams, and boars.

36. *Minimum Load of Butter in Iced Wagons*—

That the following circumstances be noted:—

(*a*) The butter wagons which are capable of carrying up to 8 tons of butter are hauled to the factories empty; and a reduction of the minimum load from 3 to 2 tons would mean haulage of very lightly loaded vehicles;

(*b*) That there should be no difficulty in forwarding small loads of butter in louvred wagons during the winter, and that during the summer months, as factories are usually able to make up a minimum load of 3 tons, no serious difficulty should be experienced except, perhaps, in drought time, when the circumstances could be brought up for further consideration.

37. *Question of Motor Road Transport, Remote Localities*—

That it is noted that in the opinion of the Transport Committee this matter (arising out of a communication from Mr. C. H. Annesley, Cunnewin, *viâ* Roma, in which he intimates that he would be prepared to establish a motor transport service in any remote locality offering fair prospects of building up a successful business) is not one for its attention.

38. *Preferential Rates—Rural Industrial—*

That in connection with the reference from the Woombye Local Producers' Association:—

"To foster the establishment of rural industries, differential rates in favour of manufactured articles sent to port should be granted on the railways, and also the necessary essential requirements, such as tinned plate, sugar, cases, &c.,"

it is noted that the Transport Committee is of the opinion that this request has apparently been made without a full knowledge of the fact that jam, jellies, marmalade, preserved fruits, and fruit-pulp all obtain special low rates to port, and that sugar to jam factories, case timber, and tinplate, "B" class, are also chargeable at special cheap rates.

THE PRIMARY PRODUCERS' ORGANISATION ACT.

ITS PROVISIONS REVIEWED.

By "*The Primary Producers' Organisation Act of* 1922" the Queensland Producers' Association, made up of the Council of Agriculture, District Councils, and Local Producers' Associations, is now statutorily established, and its functions, powers, authorities, duties, and responsibilities are fully set out by parliamentary authority.

Council of Agriculture.

The Council of Agriculture, which is really the executive body of the Queensland Producers' Association, is now incorporated and has been constituted as follows:—

(*a*) The number of members of the Council shall be the number from time to time declared by the Governor in Council by Order in Council, but shall not exceed twenty-five at any one time.

(*b*) Not less than five members nor more than one-fourth of the total number of members shall be appointed by the Governor in Council as the representatives of the Government.

The Minister shall by virtue of his office be a member of the Council and shall be deemed to have been appointed by the Governor in Council as one of the said representatives of the Government.

(*c*) The remaining members, of whom there shall be not less than fifteen, shall be elected by the district councils.

Each district council shall elect one member in the prescribed manner to be the representative of such district council.

(*d*) All such representatives (other than the Minister) shall hold office only for a term declared by the Governor in Council by Order in Council, but not exceeding three years, and shall be eligible for reappointment or re-election, as the case may be.

(*e*) Any person who has his affairs under liquidation, or is an uncertificated or undischarged insolvent, or has been convicted of an indictable offence, or is undergoing a sentence of imprisonment, or becomes an insane person, shall be disqualified from being appointed or elected or from continuing a member of the Council.

The First President.

The Minister for Agriculture shall, by virtue of his office, be the President of the Council. The Hon. W. N. Gillies is, therefore, the first President of the Queensland Producers' Association.

Vacancies.

Full provision has been made for filling vacancies on the Council in the most democratic way possible. The appointment of a Director and a capable staff has also been provided for.

Functions and Objects of the Council.

The functions and objects of the Council shall be to co-operate with the Department, district councils, local associations, and other bodies and persons in—

(i.) Developing the rural industries;

(ii.) Effecting the stabilisation of prices of primary produce for the purpose of ensuring to the primary producer a fair remuneration for his labour;

(iii.) Investigating and dealing with problems relating to the rural industries including animal husbandry;

(iv.) Advising and instructing primary producers with regard to matters which require scientific knowledge and training, farm management and farm economics, including cost of production and farm accountancy;

(v.) Making research on subjects pertaining to the rural industries;

(vi.) Securing effective action for the controlling of diseases and pests generally;

(vii.) Securing additional markets for the disposal of produce and improved means of distribution;

(viii.) Studying markets; accumulating data regarding marketing processes and costs; disseminating accurate market information; and eliminating waste and unnecessary marketing expenses;

(ix.) Securing improved means of storage, handling, and transport;

(x.) Promoting a general policy of testing, standardising, and grading;

(xi.) Extending the usefulness of the professional staff of the Department by the utilisation of experts, the dissemination of literature and pamphlets dealing with matters of interest to primary producers, and by any other method which the Council thinks fit, including the establishment of a Bureau of Information for primary producers;

(xii.) Encouraging and assisting in the promotion of farmers' co-operative associations and enterprises;

(xiii.) Bettering the conditions of rural life and the extending rural education by co-operation with the educational authorities of the State and generally;

(xiv.) Dealing with matters in relating to agriculture and production of primary produce which may be referred to the Council by the Minister;

(xv.) Generally advising, assisting, and co-operating with the Department and the Associations in all matters pertaining to the rural industries; where deemed necessary, convening conferences;

(xvi.) Making research on the subject of the utilisation of rural products in manufactories; co-ordinating and assisting in the promotion of such industries by the extension of the Bureau of Information, and, where necessary, convening conferences for this purpose.

The Provisional Council.

The Provisional Council of Agriculture appointed by the Governor in Council, now in existence, is deemed to have been constituted as the Council of Agriculture under the Act, and its members shall hold office until the appointment or election of a Council of Agriculture in the manner prescribed, but in no case shall any member of the Council or any provisional district council continue in office after the 24th March, 1923.

District Councils.

For the purposes of efficient organisation, provision is made for the establishment of Districts within defined boundaries.

For each District a district council shall be constituted, the members of which shall be elected by members of local producers' associations for a term not longer than three years.

Levies.

The Act provides that before any levy is made on the primary producers in any industry, at the request in writing of at least one hundred primary producers in that industry a poll of such primary producers shall be held, and if upon such poll the majority of votes is against the making of such levy, no such levy shall be made upon the primary producers in that industry.

Rules Governing Proceedings.

Rules governing proceedings and business of the Council of Agriculture, district councils, and local producers' associations are set out fully in the Schedule of the Act.

What is a Primary Producer?

The definition of the term "primary producer" is set out clearly in the Act as follows:—

"Primary producer"—Every person, not being a person engaged in primary production as an employee on wages or piecework rates, engaged in the occupation of—

(*a*) Dairy farmer; or
(*b*) Wheat maize or cereal grower; or
(*c*) Cane-grower; or
(*d*) Fruit-grower; or
(*e*) Grazier; or
(*f*) Farmer, whether engaged in general or mixed farming, cotton potato or vegetable growing, or poultry or pig-raising; and

any class of persons, not being persons engaged in primary production as employees on wages or piecework rates, declared by the Governor in Council, on the recommendation of the Council, by Order in Council, to be primary producers for the purposes of this Act; and "primary produce" and "primary production" have correlative meanings.

BURNETT CANE CROP PROSPECTS.

Reporting on the cane crops in the Bundaberg, Isis, and Maryborough sugar areas, the Director of Sugar Experiment Stations, who recently returned from a brief visit to these places, said that although the cane was backward, due to the long spell of dry weather during the autumn months, the recent good falls of rain in July had much improved the prospects, with the exception of the standover cane, and the mills are now expecting to harvest more cane than was estimated six weeks ago. Some frosts have occurred, but these have done no serious damage, and if the remainder of the winter is mild and further rains fall there is plenty of time during the crushing season for the crops to still further improve. The sugar content in the cane is very fair to good at present, and farmers generally are well satisfied. The mills are working smoothly and the improvements made during the slack season are giving good results. The Isis Central mill has been brought up to date by the installation of a new 10-ton pan, a large extra effet, a fine spray system in place of the old water tower, new Edwards dry-air pump of special design, new duplex reciprocal pump, and centrifugal pumps. These improvements have been made under the supervision of the manager, Mr. J. Alison. Doolbi mill has also had new machinery installed, and a number of ingenious automatic devices at various stations are saving labour and regulating deliveries. These are principally the invention of the manager, Mr. G. Francis, who was assisted in some particulars by the mill overseer, Mr. G. Stevenson. The three mills in the district expect to treat about 170,000 tons of cane, and it is anticipated that another 30,000 tons will go to Fairymead.

The cane about Maryborough has also improved, though there is not so much grown now as there should be.

The cane at the Sugar Experiment Station, Bundaberg, was looking well. One of the more-recently introduced varieties, known as E.K.1, from Java, is of great promise. So far it has proved a fine ratooner and a good standover cane. Its commercial sugar content is good also, and it is attracting much attention from visiting farmers.

Editorial Notes.

Co-operative Butter Selling.

Variations in angles of sight of the directorate of one of our leading co-operative dairy companies in respect to co-operative selling, as expressed at a recent meeting, will not discourage the student of co-operative development. The conditions that must prevail and the fundamental principles essential for acceptance before any co-operative marketing system that is likely to endure can be established were not discussed at the meeting referred to, yet their consideration was important to its purpose and much needed, for the divergent viewpoints are rooted in them. Farmers in every country, when they first resort to co-operative methods of marketing, usually have to meet with bitter and often unscrupulous opposition from the interests that previously handled their produce. In the face of such opposition no amount of devoted effort or unstinted thought will bring success to co-operation unless the previous conditions were such as to present striking evidence of the benefits to be derived from combined, regulated, and forcefully directed effort. Hence we have a well-established principle in co-operative marketing that, unless at the time of organisation conditions are so satisfactory that immediate benefits are assured early in the life of the co-operative organisation, the concern is likely to suffer from inertia or succumb to attacks from outside interests. Experience teaches that co-operative marketing can only be readily established when conditions are such that the need of improvement is generally apparent to those engaged as producers in the industry affected. When they are otherwise, the well-meant efforts of promoters are more likely to hinder than to help the industry concerned. When prices are below cost and farmers are actually paying money in addition to their commodity for the privilege of marketing their output, co-operative selling can be readily incepted. Not until vignerons fed raisins to their horses were the fruitgrowers of California ready to organise the selling end of their business.

The principle that selling organisations must be composed of persons whose interests are similar is generally accepted by co-operators; and experience has shown that membership of sales organisations should usually be limited to actual producers. All attempts hitherto made to combine in one organisation the interests of producers and dealers or packers have demonstrated the incompatibility of such an arrangement. Many instances of their failure might be quoted. Combinations of this character for a while look as though they were the solution of every marketing problem. Success may be apparent for a time, yet, as a rule, the life of every such hybrid agency is brief and fitful. Conflicting interests and the grievances and jealousies they engender are usually the disintegrating causes. The outstanding factor of all success in co-operative effort is the loyalty of individual members. Other of the main contributing quantities are mutual confidence, sound economics, a common-sense knowledge of human nature, and fair dealing. All these elements are absolutely essential to the permanent success of co-operative enterprise, especially in a marketing organisation.

Underlying the clash of ideas at the meeting referred to, the will and determination to co-operate completely were evident, and in revealing this a big service to the dairying industry was done. And the meeting did even more, by focussing thought on its selling difficulties and clearing the ground for the extension of its co-operative enterprise. The difficulties expressed and appraised are not new. In other countries they have been encountered and overcome, and at this juncture it is a wise thing to survey, and, if possible, profit by the experience of co-operators in either Denmark or Germany.

In the countries named fully 90 per cent. of all dairies are attached to central organisations, which serve their common as distinct from their particular business objects. Such bodies are called unions, the main purpose of which is to undertake the audit and inspection of their affiliated societies. Besides this, they act in general as intelligent organisers and regulators of co-operative effort. These unions possess no purely business functions; their legal status is that of a registered association, which implies that they do not carry on any profit-making business. Membership does not involve any liability. Apart from audit and inspection, these unions undertake propaganda and advisory work. Their articles expressly state that the independence, internal economy, and administration of their affiliated societies shall in no way be interfered with as the result of their association in the union. Over 90 per cent. of dairies in Germany are audited by auditors appointed by these unions. This examination is not merely an accountancy audit, but rather a general audit and inspection of all the circumstances of a dairy. Experience favours audit by unions, for the specialists appointed are professional co-operators whose interests and lifework are linked with co-operation, and who are concerned in the lifting of the level of good management. With our dairy companies linked up in an audit union the reports of its auditors would furnish convincing evidence on commercial matters, as is evident from the proceedings of the meeting referred to, now receiving the close attention of co-operators, and should prove a satisfactory means of eliciting the data needed for influencing sound and timely business decisions.

Event and Comment.

The Cotton Guarantee.

In the course of his Budget Speech, the Treasurer (Hon. E. G. Theodore) made the following statement on the subject of the guarantee to cotton-growers:—

"Already cotton-growing has been greatly stimulated in this State by the action of the Government in guaranteeing to the growers 5½d. per lb. for all seed cotton of approved quality grown by them. This guarantee was for three years ending 30th June, 1923. In order to still further encourage the planting of cotton, the Government has decided to extend the existing guarantee until 31st July, 1923—that is, by one month—to enable the cotton-growers to reap the advantage of the guaranteed price of 5½d. per lb. for the whole of the forthcoming crop, which ought to be harvested by the extended date. It is intended also to guarantee a price for a further period of three years ending 31st July, 1926. The conditions under the new guarantee will be different to those ruling at present, as the price will be based on the quality and length of staple of the cotton. The details have not yet been worked out, but for the first year of the new guarantee period the maximum price will be 5½d. per lb. for seed cotton of one and a-quarter inch staple, of good quality and free from disease. In 1920 the Government entered into an agreement with the British Cotton Growers' Association (a body mainly comprising Lancashire cotton manufacturers), under which the Association guaranteed for cotton grown in Queensland the price of 1s. 6d. per lb. of clean lint of good quality, c.i.f. Liverpool. The agreement was for five years, but the Association's losses were limited to £10,000. The prices realised for Queensland cotton during 1921 were below the price guaranteed under the agreement, and it will, therefore, be necessary to draw upon the guarantee. Any balance of the £10,000 will be applicable to the 1922 crops, but any loss beyond the amount of the guarantee must be borne by the Queensland Government."

The Boll-Worm Menace to Queensland Cotton.

"I must emphasise the absolute need for the taking of every precaution to prevent the advent of the boll-worm in our cotton fields," remarked the Minister for Agriculture and Stock (Hon. W. N. Gillies) in the course of a recent Press interview. Mr. Gillies was speaking on the representations respecting this pest made by the Queensland Government to the Commonwealth authorities, to the Tariff Commisisoner, and to the Director-General of Public Health. "The matter," he said, "was discussed with the Tariff Commission by Messrs. Crawford Vaughan, D. Jones, and the Under Secretary (Mr. E. G. Scriven). Mr. Scriven also saw the Director-General of Health on the subject when recently in Melbourne, the request then made being that the carriage of seed through the post should be prohibited and that Brisbane should be made the only port of entry. Information had now reached him that all seed arriving through the Customs at any port other than Brisbane would be sent for treatment and for examination to Brisbane, where there were officers with special experience in cotton pests and diseases. America's experience with the boll-worm warranted the taking of the strictest precautions by Queensland to maintain her cotton fields free of all disease," the Minister continued. "The latest advices showed that America this year was suffering very badly from the pest, and though the extent of the damage was not fully known, the 'Manchester Guardian,' of 6th July, stated, on information based upon official reports from the United States, that the situation as indicated by a recent report of a crop condition of 71.2 per cent., an acreage of 34,850,000, and a crop of 11,065,000 bales is fraught with danger. The newspaper adds that a report from Georgia asserted that in a section of that State the damage by weevil was 100 per cent., and that a prominent farmer in Texas had computed the presence of the weevil upon his farm at the rate of 5,000 to the acre.

"This knowledge gave additional emphasis to the need for preventing the introduction of seed from America or any other source similarly affected, unless under the most stringent conditions of treatment. The interest in cotton cultivation in Australia was not confined to Queensland, but the residents of the Southern States had not had the experience of Queensland growers, and therein rested the danger—the possibility of affected seed being admitted at southern ports where those interested in the examination at the time of entry had not the knowledge and experience of the pests of cotton as are possessed by the Queensland Government Entomologist (Mr. H. Tryon). There had also existed the danger of seed being carried through the post, and only lately it was necessary to search for a parcel that had passed through the post without being noticed. Fortunately the seed was found before it was planted. It was now in quarantine."

General Notes.

TO CORRESPONDENTS.

To avoid delay in answering a number of questions on agricultural and kindred subjects, replies have been sent by post. The replies of general interest to farmers will be published in the Journal in due course.

CASSABA MELON SEEDS.

A number of requests have been received for cassaba seeds. As only last season's seeds are now on hand, we should like some grower who benefited by last year's distribution and who retained seed from the resultant crop for this year's sowing, to kindly supply a small parcel to enable us to meet these requests with new seed.

Farm and Garden Notes for October.

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

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

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

Orchard Notes for October.

THE COAST DISTRICTS.

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

Thorough cultivation of all orchards, vineyards, and plantations is therefore imperative if the weather is dry, as the soil must be kept in a state of perfect tilth, and no weeds of any kind must be allowed to grow, as they only act as pumps to draw out the moisture from the soil that is required by the trees or fruit-yielding plants. Should the trees show the slightest sign of the want of moisture, they should be given a thorough irrigation if there is any available means of doing so, as it is unwise to allow any fruit trees to suffer for want of water if there is a possibility of their being supplied with same. Intermittent growth, resulting from the tree or plant being well supplied with moisture at one time and starved at another, results in serious damage, as the vitality is lessened and the tree or plant is not so well able to ward off disease. A strong, healthy, vigorous tree is frequently able to resist disease, whereas when it has become debilitated through neglect, lack of moisture or plant food, it becomes an easy prey to many pests. If an irrigation is given, see that it is a good one and that the ground is soaked; a mere surface watering is often more or less injurious, as it is apt to encourage a false growth which will not last, and also to bring the feeding roots to the surface, where they are not required, as they only die out with a dry spell and are in the way of cultivation. Irrigation should always be followed by cultivation, so as to prevent surface evaporation and thus retain the moisture in the soil.

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

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

All leaf-eating insects should be kept in check by the use of an arsenate of lead spray, taking care to apply it as soon as the damage appears, and not to wait till the crop is ruined. Crops, such as all kinds of cucurbitious plants, tomatoes, and potatoes are often seriously injured by these insects, and the loss occasioned thereby can be prevented by spraying in time. In the case of tomatoes and potatoes, a

combined spray of Bordeaux or Burgundy mixture and arsenate of lead should be used, as it will serve the dual purpose of destroying leaf-eating insects and of protecting the plants from the attack of Irish blight.

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

THE GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS.

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

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

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

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

ASTRONOMICAL DATA FOR QUEENSLAND.

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

TIMES OF SUNRISE AND SUNSET.

AT WARWICK.

1922.	JULY.		AUGUST.		SEPTEMBER.	
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.
1	6·45	5·6	6·36	5·20	6·7	5·37
2	6·45	5·6	6·35	5·21	6·6	5·38
3	6·45	5·7	6·35	5·21	6·5	5·38
4	6 45	5·7	6·34	5·22	6·4	5·38
5	6 45	5·8	6·33	5·23	6·3	5·39
6	6·45	5·8	6·32	5·24	6 2	5·39
7	6·45	5·9	6·31	5·24	6·1	5·40
8	6 45	5·9	6 30	5·25	6·0	5·40
9	6·44	5·10	6·29	5·26	5·58	5·41
10	6·44	5·10	6·28	5·27	5·57	5·41
11	6·44	5·10	6 28	5·28	5·56	5·42
12	3·44	5·11	6·27	5 28	5·55	5 42
13	6·43	5 11	6 26	5·29	5·53	5·43
14	6·43	5·12	6·25	5·29	5·52	5·44
15	6·43	5·12	6 24	5·30	5·51	5·45
16	6·42	5 13	6·23	5·30	5·50	5·45
17	6·42	5·13	6·22	5·31	5·49	5 46
18	6·42	5·14	6·21	5·31	5·48	5 46
19	6·41	5·14	6·21	5·32	5·47	5·46
20	6·41	5·15	6 20	5·32	5·46	5·46
21	6·41	5 15	6·19	5·32	5·44	5·46
22	6·40	5 16	6·18	5·33	5·43	5 47
23	6·40	5·16	6·17	5·33	5·42	5·47
24	6·39	5·17	6 16	5·34	5·41	5·47
25	6·39	5·17	6 15	5·34	5·40	5·48
26	6 38	5·18	6·14	5·35	5 39	5·48
27	6 38	5·18	6 13	5 35	5·38	5·49
28	6·37	5·19	6·12	5·36	5·37	5·49
29	6 37	5·19	6·11	5·36	5 36	5·50
30	6·36	5·20	6·10	5 37	5·35	5·50
31	6·36	5·20	6·9	5·37	...	...

PHASES OF THE MOON, OCCULTATIONS, &c.

The times stated are for Queensland, New South Wales, Victoria, and Tasmania when "Summer Time" is not used.

			H. M.
2 July	☾	First Quarter	8 52 a.m.
9 „	○	Full Moon	1 7 p.m.
17 „	☽	Last Quarter	3 11 p.m.
24 „	●	New Moon	10 47 p.m.
31 „	☾	First Quarter	2 22 p.m.

Apogee on the 15th at 3.24 a.m.
Perigee on the 27th at 1.30 a.m.

About 8 o'clock in the evening of 29th July the apparent nearness of the Moon and the giant planet Jupiter low down in the west will form a very interesting spectacle; there will be an occultation of Jupiter about 9 o'clock.

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8 Aug.	○	Full Moon	2 19 a.m.
16 „	☽	Last Quarter	6 46 a.m.
23 „	●	New Moon	6 34 a.m.
29 „	☾	First Quarter	9 55 p.m.

Apogee on the 11th at 6.54 p.m.
Perigee on the 24th at 5.42 a.m.

During the evenings of 14th, 15th, and 16th August the planets Venus and Saturn will, with Eta Virginis, a second magnitude star, form an interesting group in the north-west.

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6 Sept.	○	Full Moon	5 47 p.m.
14 „	☽	Last Quarter	8 20 p.m.
21 „	●	New Moon	2 38 p.m
28 „	☾	First Quarter	8 40 a.m.

Apogee on the 8th at 4.12 a.m.
Perigee on the 21st at 3.36 p.m.

About 3 o'clock on the afternoon of 30th September a pair of binoculars should afford a view of the Moon and a third magnitude star—Beta Capricorni. In the course of an hour the star may be seen in a small telescope to disappear suddenly on the eastern side of the Moon and reappear on its western side.

The planet Venus will be at its greatest height in the western sky on 15th and 16th September.

The Great Australian Solar Eclipse will occur on 21st September between a few minutes after 3 p.m. to about a quarter past 5.

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

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

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