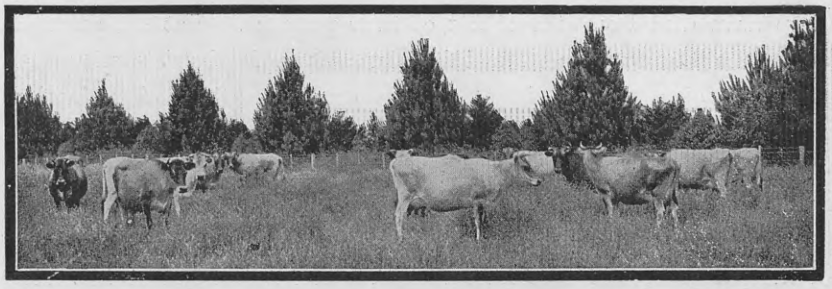
SOUTHDOWNS AT RUAKURA



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SHEEP-MANAGEMENT.

VIEWED FROM THE HEALTH STANDPOINT.

C. J. REAKES, D.V.Sc., M.R.C.V.S.

Continued from April issue.

PARASITIC DISEASES.

INTERNAL parasites still cause considerable loss to sheepowners, though far less than was the case some fifteen years ago, when heavy mortality occurred every year, among hoggets especially, throughout the west coast of the North Island, principally as a result of the attacks of lung and stomach parasites. At that time, and to some extent since, so-called lung-worm was looked upon as being the more serious affection, but the probability is that then, as now, the presence of small hairlike worms in the fourth stomach was really responsible for the greatest proportion of deaths, lung-worms being present in the animals at the same time. It must not be assumed that I suggest that these lung-parasites are not seriously dangerous, for they are, and many young

sheep have died from the effects of their presence. But the stomach-worms are the worst pest, and it is necessary, in districts where the conditions of soil and climate are favourable to their dissemination, to take practical precautions to guard against their attacks. These precautions are summarized in the following extract from the Bulletin on the subject, No. 3 (new series) :—

"To realize fully the value of preventive measures, the life-history of the parasites, so far as known at the present time, must be understood. Each animal suffering from the disease daily passes innumerable ova (eggs), and, possibly, also newly hatched worms, or mature female worms, loaded with eggs, who, having fulfilled their function, die, leaving the eggs virile (a single female may produce thousands). The eggs deposited on the pasture are ready to be taken up by sheep feeding upon it, who thus continually renew their trouble. In low-lying, wet pastures these worm-'eggs' and, possibly, also immature worms developed from them after deposition upon the ground-surface, or voided by the infected animals, are able to retain their animal vitality outside the animal body for a much longer period than on dry and sunny land. Therefore, removal from contaminated land to dry, well-drained, not-heavily-grassed paddocks is not only essential as a matter of treatment, but the depasturing of young sheep upon such paddocks is one of the best preventive measures. It is a notable fact that a few parasites may be found in the fourth stomach of a very great proportion of healthy and vigorous young sheep—it is only when present in large number that they do noticeable harm—and, seeing that they do not multiply within the body, it is obvious that suitable outside conditions are necessary to enable them to infest sheep badly. These conditions, as already stated, are to be found in low-lying, wet, badly drained pastures, in heavily grassed land where surface water does not get away freely, and also, during wet seasons, on good, well-grassed, otherwise sound paddocks. Whenever such conditions, favourable to the propagation of the parasite, exist, a close watch should be kept, and at the first clear indication of parasitic gastritis the flock should be transferred to another paddock—the best-drained and driest available."

As regards lung-worm, the same preventive measures apply, the conditions of soil, pasture, &c., which are favourable to the spread of the stomach-worms, being equally favourable to the worms infesting the lungs.

The sheep-maggot fly has been known to be present in the Dominion for some years past, and at times causes trouble. Though we cannot hope to rid the country of this insect, yet by careful shepherding and precautionary measures it can be prevented from doing any serious harm to our flocks. It deposits its eggs on dirty wool, and the filthier this is the better it seems to suit the fly. The maggots hatched out from the eggs afterwards burrow into the skin, or, if a slight wound be present, it affords them a still easier means of gaining entrance. The obvious precautionary measures are to maintain the sheep in as cleanly a condition in regard to their wool as possible. Proper dipping, crutching, dagging, &c., are necessary; and if scouring be present care should especially be taken to keep the posterior parts clear of dung-clogged wool, and, further, measures should be taken, by change of feed, &c., to stop the scouring if possible. If a wound is sustained it should be promptly dressed with tar. In the case of a sheep being "struck," the wool at the part should be closely clipped off and strong antiseptic dressings applied to the part, all maggots found being carefully removed and destroyed.

DIETETIC DISORDERS.

In order to maintain sheep in good health and condition care is necessary in the matter of the class of pasture on which they are placed. Rough, rank grass, especially of autumn growth, is not a suitable food for sheep, and at times considerable loss occurs through sheep being grazed on feed of this kind. A form of chronic indigestion is set up, resulting in a certain amount of fermentation occurring in the food in the stomachs or the bowels, which is apt to cause trouble in some form or other. In some cases the sheep simply die, in others they do badly, having fits of scouring alternated by constipation. Another condition resulting from this improper feeding is the development of an inflamed condition of the skin of the face and ears, causing such severe irritation that the affected animals, in their endeavours to obtain relief, rub their heads against fence-posts, logs, or on the ground-surface, often causing abrasions of the skin when doing so. This breaking of the skin enables outside germs to gain entrance and set up a condition of dry gangrene, the animals then presenting a most unsightly appearance. The whole of the skin of the head is converted into a sort of dry scab, with matter beneath, the eyes are inflamed and often sightless, and unless proper treatment be applied in time death frequently

occurs. It has been noted that when a large proportion of deaths do occur in an affected flock the liver has been found in a state of fatty infiltration, and the fatty condition of this important organ has naturally been a factor in the digestive derangement which has preceded the skin trouble. This affords another illustration of the necessity of so managing a flock, of breeding-ewes especially, that the animals do not become unduly fat at any time. Breeding-ewes have been at times heavy sufferers from facial eczema (or facial dermatitis), as this trouble of the skin of the head is termed. Unless in seasons when a heavy growth of rank autumn feed occurs, when it is difficult, and at times impossible, for owners to avoid depasturing their sheep upon it, there should be no reason for the sheep being exposed to the unfavourable feed-conditions liable to set up this affection, and careful management in this direction will prevent its occurrence. If it does occur, the prompt application of proper treatment will check it and prevent any severe loss. Change to short sweet pasture is the first measure to be adopted, and at the same time a strong solution (5 per cent.) of Lysol, Izal, or Jeyes fluid should be applied to the skin of the face and ears once daily for three or four days, care being taken to prevent it getting into the eyes or on the inside of the lips. This quickly allays the irritation present in the skin during the earlier stages of the trouble.

In those cases where facial trouble does not appear, but the sheep are simply sick, or are dying from the severe digestive disturbance set up by the rank, rough feed, the necessity for a change to a better paddock is obvious; and where the animals are considered of sufficient value to be worth the expenditure of the time and labour necessitated by the administration of medicine, one or two 3 oz. or 4 oz. doses (according to age) of Epsom salts dissolved in thin gruel are of great value. Great care must be exercised in drenching the sheep or they will be subjected to the risk of being promptly killed by the liquid finding its way into the windpipe and the lungs instead of into the stomach.

Lambs when on rape are liable to develop a skin affection, the skin of the ears especially becoming swollen and inflamed, general constitutional symptoms, which may result in death following unless the animals are promptly removed and given a change of diet in a grass paddock, when they soon recover.

Another form of skin trouble arising from the same cause is that known as "rape-scald," the skin along the back being usually affected

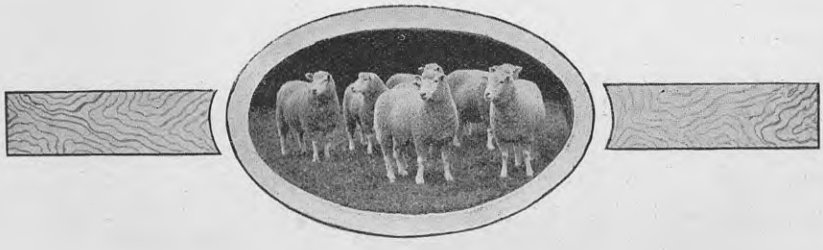
in this case. This has the additional disadvantage of impairing the value of the pelt. Here, again, a change to less-stimulating feed is required.

Some years since a considerable mortality occurred every year in the South Island among sheep, usually hoggets, when feeding on turnips. It was due to a disease closely resembling braxy. The cause lay in a germ present in the soil, which gained entrance into the systems of the animals. There is every reason to believe that one important feature in the prevalence of the trouble at that time lay in the dissemination of infection from the carcases of dead sheep left to rot on the ground-surface. At the same time, apart from this, there can be no doubt that the provision of a run off from the turnips on to a good grass paddock, by providing a variety of diet and a better camping-ground, is an important factor in avoiding loss from this disease. An additional advantage is that the animals do better with a mixture of other food with the turnips, the admixture of grass food aiding the digestion of the whole, and enabling them to obtain the greatest benefit from the turnips eaten. Dry feed, as oaten chaff, hay, &c., would answer the same purpose, but it means expense, and the animals do not always take readily to it.

Southern farmers have largely availed themselves of the knowledge gained regarding this disease, and the losses from it are now very small compared with those of some years ago.

CONCLUSION.

In concluding this paper I would once more impress upon sheep-owners the fact that good management is essential to successful sheep-farming, and that by the exercise of care and forethought much loss from disease in its various forms can be avoided. Much of the information given is based on the observations made by Dr. Gilruth, who, during his tenure of office in New Zealand, did an immense amount of good work in connection with sheep-management and sheep-diseases.



EARMARKING.

A SUGGESTED SYSTEM.

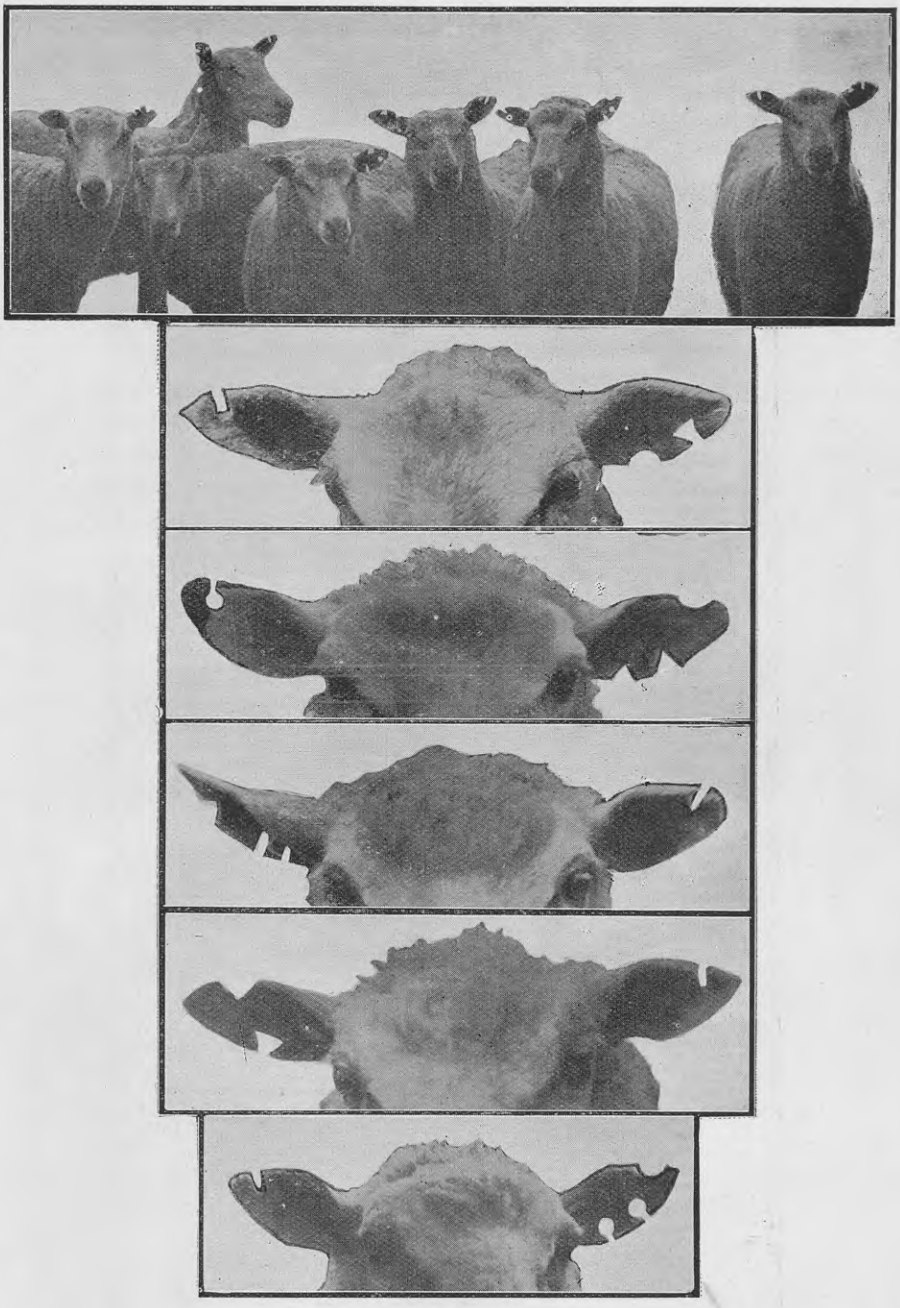
J. L. BRUCE.

THE accompanying illustrations are reprints of photographs demonstrating a system of earmarking sheep devised by the writer. The system is based upon the manipulation of a code of five approved marks, none of which, it will be observed, are capable of effectively defacing any other code-mark; consequently this eliminates the possibility of the surreptitious substitution of an existing mark (see key on page 583).

The earmarks depicted in the illustrations were applied to a number of lambs on Quail Island about eighteen months ago, and were recently photographed. Under this system seventy separate and distinct earmarks can be obtained by using one pair of pliers, 300 by using two, and 1,000 by using three, each representing a number signifying the breeder's registered earmark, by which, if recorded immediately opposite his name on the margin of the printed sheep returns of the Dominion (as is part of this system), the registered earmark of the breeder of any sheep can be definitely ascertained on reference thereto.

On the opposite ear to the breeder's earmark, and near to the tip, is placed the district mark. This mark also denotes a number indicating the stock or brand registration district in which the sheep were bred, thus not only facilitating the prompt location of the breeder but making it possible to allot a distinct and separate earmark for every sheepowner in the Dominion, from which the breeder's name and address can be obtained on reference to the published sheep returns.

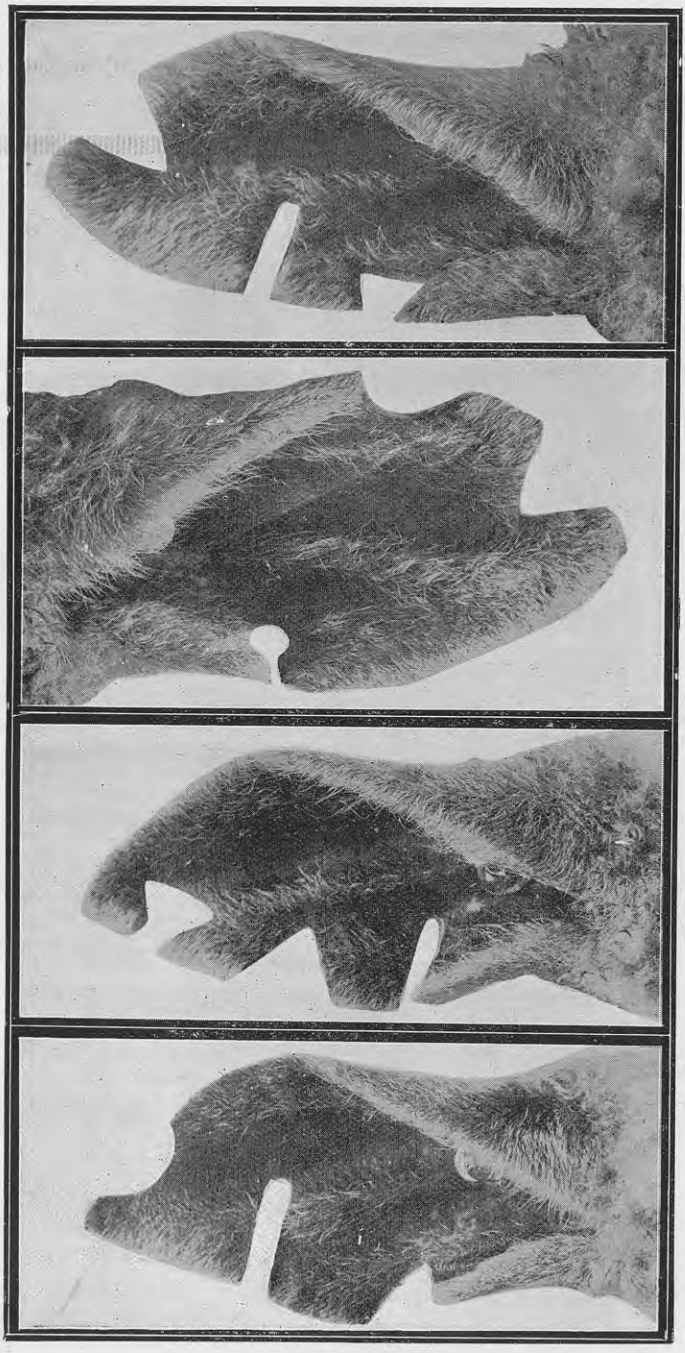
An age-mark, consisting of a single punch-mark, representing the year in which a lamb was born, may be added near the centre of the ear on which the district mark is shown—*i.e.*, a punch-mark representing 1 on the code for 1911, code-mark 2 for 1912, and so on up to 1920, commencing again with mark 1 for 1921. Age-marking, may, however, be optional.



BREEDERS' EARMARKS, ETC.

The breeder's earmark is shown on the near ear on ewes and off ear on wethers, with the district mark on the opposite ear. All are in District 1 except Nos. 311 and 852 in the group, the former having no district mark, the latter being District 5, and the second single sheep (No. 944), which belongs to District 7.

Breeders' numbers: Group, reading from left, 311, 40, 852, 53, 982, 15. Single sheep 60, 944, 422. 36. 988.



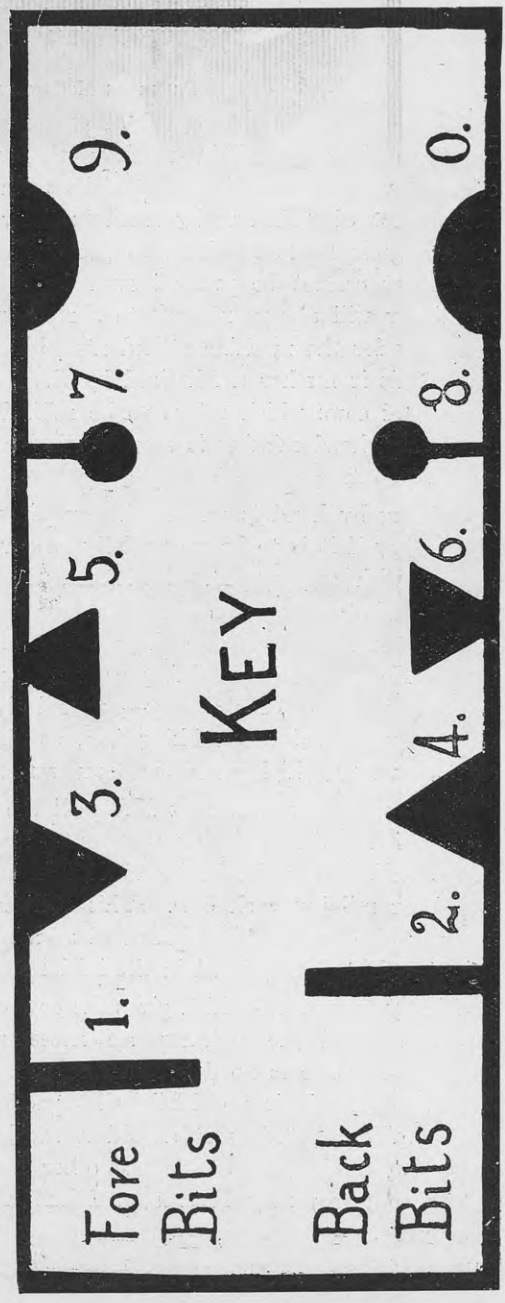
SINGLE EARS.

Breeders' numbers, reading from top: 326, 398, 642, 924.

All marks are in every case read from the tip of the ear towards the head, in the order in which they are placed upon the ear (see illustrations herewith).

Attention is directed to a very small punch-hole shown in the centre of the ear on earmarks representing District 1, breeders' Nos. 36 and 60. This is a portion of the system, and is intended to prevent tampering with any earmark consisting of less than a maximum number of marks. For example, when an earmark consists of a single mark two small punch-holes are added, and when it consists of two marks, as in the illustration just referred to, only one small punch-hole is added. In the case of a full earmark consisting of three marks no punch-hole is required. It will thus be seen that the addition of any mark or marks to an ear containing either one or two punch-holes would be an infringement of the system, and clear evidence that the ear had been tampered with; it would nevertheless still show the breeder's original mark.

Under this system the punching-irons would be uniform, and will possibly be supplied by the Government at cost price.



MILKING BY HAND.

PRIMROSE MCCONNELL.

IN these days of milking-machines, many types of which do very effectual work, it would at first sight seem almost superfluous to discuss the subject of "Milking by hand"; but, unfortunately, even the best machinery is liable at times to get out of repair, and, as milking is work that cannot be put off even for a short time, a failure of the machinery will always necessitate a recourse to the hands; hence it is necessary for the machine attendants to have a knowledge of the above art. This is further emphasized by the fact that there is a small percentage of cows which refuse to be milked by machinery; and with a small herd hand milking is more profitable than milking by mechanical means.

Milking by hand is an art that requires very great knack, patience, and energy if it is to be successfully accomplished. To obtain complete success with any system of milking, the cows should first of all be slowly and quietly driven in from the paddock, for the less they are excited the more freely do they yield their milk when they reach the byre. No unnecessary talking or banging of pails should be allowed, and the presence of strangers—particularly children—should be in no way encouraged during milking-time, as anything of this kind tends to excite cows of a highly nervous temperament.

Previous to commencing milking all the udders and flanks should be wiped with a damp cloth wrung out of a mild solution of lysol, and the milker's hands should be washed in a similar solution previous to and after milking each cow. This will not only ensure cleaner milk, but will also prevent the spread of such a disease as mammitis, which is not readily distinguished in the initial stage.

Kindly treatment—which gives the cow confidence in the attendant—expedition, and thoroughness are necessary to bring about the best results. If there is no desire on the part of the operator to learn the art thoroughly it is not likely that proficiency will ever be reached; and a milker of this sort should never be allowed inside a cow-byre except to clean it out. On the other hand, an indifferent milker (if willing to learn) may become proficient through getting a few lessons from an expert. If a cow is being skilfully milked her whole appearance will denote contentment, the most pronounced indication

being a chewing of the cud. If she shows uneasiness, it is due either to unnecessary roughness on the part of the milker or to some injury to teats or udder, and if the latter it will demand extreme patience and delicacy of handling on the part of her attendant.

The milker should approach the cow with a kind word and a pat, at the same time putting down the milking-stool as gently as possible. He or she should sit close up to the cow, with head pressed against the flanks. One arm will then be in such a position as will enable the milker to press it firmly against the hollow of the cow's hock in the event of her attempting to lift her leg. Many milkers sit down, and take up such a careless position that they cannot possibly do effective work or have any control over the movements of the cow—and this is, no doubt, the cause of such a free use of the leg-rope. Although the Ayrshire cow is naturally of a nervous temperament, yet in her native country herd after herd may be seen milked without the use of the leg-rope.

The milking should be commenced by grasping the fore teats *gently* with a *dry* hand, full pressure not being used until the cow lets the milk into the teats. The fingers should not be put completely round the teat, as is sometimes done, but only about three-quarters round, pressing the teats with the points of the fingers against the palms of the hands. This enables the operator to milk in a more expeditious and efficient manner than he would do if he put his fingers completely round the teat—because in the latter case pressure is not brought to bear on the milk-duct, which is a comparatively small channel in the centre of the teat. The perpendicular "tug" which causes a movement of the whole body of the cow, and hence an annoyance, is an absolute abomination.

The pressure should be horizontal only, the arms remaining almost motionless except for the action of the muscles, the teats scarcely ever being stretched beyond their natural length. There should be a slight upward pressure similar to the calf sucking; and a first-class milker will never let go until the teats are empty. The fore teats should be milked first, as this tends to increase the yield from and develop the fore quarters, which in a great percentage of cows are much less capacious than the hind ones. A good milker will completely empty the udder by horizontal and slightly upward pressure alone, without any undue stretching of the teats.

The question of milking with a dry or wet hand is a much debated one, but the best milkers, in my experience, milk with a dry hand. As I previously stated, the main essentials to success are expedition and cleanliness. It is a well-known fact that a thoroughly efficient milker will milk a cow giving 30 lb. milk perfectly clean in five minutes, while

another professedly good milker may spend ten minutes at the same cow and succeed in getting only 26 lb. In a herd of cows good milkers are invaluable, and worthy of very liberal remuneration.

Clean efficient milking stimulates the milk-glands and induces them to yield more and more milk: a lack of thoroughness causes them to become inactive and produce less and less, ultimately drying off the cow prematurely. If the milkers are efficient and trustworthy, stripping is unnecessary, but in the majority of cases it is desirable. Of course, it is admitted that there are exceptional cases which demand unusual treatment, but on the whole it will be found that expedition combined with gentleness is the keynote of successful milking. Women, as a rule, make the best milkers, and this art may be seen in perfection in the writer's native country (Ayrshire), where the female milker predominates.

LAMB-FATTENING.

EXPERIENCE AT MOUMAHAKI.

T. W. LONSDALE.

IN recent years many changes have taken place in agricultural practice. One of the most noteworthy has been that of reducing the age at which lambs are ready for marketing, and it is generally admitted that the earlier these can be brought to maturity the better they pay. To achieve this desired economy in production, rich, easily digested food is necessary, and hence the reason for the various forage crops now grown in this country for lamb-fattening. As to which variety of forage excels, this will probably for many years remain an open question. Climatic conditions vary considerably, and though in one season some particular forage may rank above others, the same variety may during the following season prove an absolute failure.

In the year 1912 an experiment designed to solve this problem was carried out at the Moumahaki Experimental Farm. The results of that trial could not be regarded as conclusive, and it was considered advisable to continue the experiment. In the tests conducted this season maize, which was tested the previous year, was not used, but other varieties of forage were tried, six crops being tested, as against four in 1912.

In 1912 the forage tested comprised silver-beet, rape, maize, and Buda kale. This year's trials included silver-beet, rape, chou moellier, Thousand-headed kale, Buda kale, and lucerne.

In 1912 the lambs remained on the forage eighteen days, and were weighed at the commencement and termination of the test. In this season's experiment fourteen days were allowed, the lambs being weighed three times during that period.

On the 13th March an even line of long-woolled lambs were selected, and divided into six lots of nineteen each. Each lot was weighed and marked with a distinguishing brand, so that, should the lambs accidentally get mixed, the straying ones could be immediately returned to their respective plots.

Following are the results of the 1912 and 1913 experiments :—

——	Silver-beet.	Rape.	Chou Moellier.	Thousand-headed Kale.	Buda Kale.	Lucerne.
1913.						
Weight of 19 lambs—	lb.	lb.	lb.	lb.	lb.	lb.
March 13	1,092	1,022	1,071	1,051	1,120	1,108
March 26	1,258	1,171	1,190	1,177	1,190	1,286
Total increased weight ..	166	149	119	126	70	178
Average individual increase	8·73	7·84	6·26	6·63	3·68	9·36
1912.						
Average individual increase	6·40	7·30	..	.. .	2·40	..

The results obtained from the Buda kale are in accordance with the 1912 trial, but the positions of silver-beet and rape have been reversed. Thousand-headed kale and chou moellier are practically equal, while lucerne, which had never been tested for feeding-value at this farm, ranks foremost.

In carrying out experiments of this description it must be recognized that good judgment is essential. The selection of suitable animals requires the aid of an experienced judge of live-stock, and, assuming that selection has been all that could be desired, so many things may occur which discount all previous calculations that it is only by the most careful supervision we may expect to arrive at any approach to accuracy.

WARNING TO PURCHASERS OF BASIC SLAG.

IT has recently come under the notice of the Department that low-grade basic slag, containing only about 10 per cent. phosphoric acid, is being imported, the fertilizer being sold in terms of tricalcic phosphate, 22 per cent. This is probably misleading to the purchasers, who may think that they are buying a slag containing 22 per cent. phosphoric acid (anhydride), which would be equal to 48 per cent. of tricalcic phosphate. Importers and purchasers of basic slag are strongly advised to carefully examine their invoice certificates, and, if in any doubt as to the quality of the slag, to have an analysis made, for which a fee of £1 11s. 6d. will be charged.—*B. C. Aston.*

SILVER-BEET.

ITS USE AS A FORAGE CROP.

A. MACPHERSON.

THE phenomenal success which has attended the introduction of silver-beet is naturally attracting the attention of farmers in all parts of the Dominion. Its freedom so far from insect pests and fungoid diseases, its great prolificacy in producing a wealth of stem and leaf (giving quite six feedings-off with sheep in twelve months' time from date of first feeding), its resistance to drought and severe frosts, its apparent freedom from causing scour or bloat in sheep, the appreciation of all classes of farm stock for it (trials having proved that it is relished before rape, kale, or roots), the enormous tonnage of succulent forage it produces, and its fairly high feeding-value place it in the forefront of all other forage or root crops grown for stock in this country at the present time. The remarkable results obtained last year in the growing and feeding capabilities of silver-beet with sheep at the Canterbury Frozen Meat Company's experimental farm at Belfast, and at other farms in the South Island where co-operative field experiments have been conducted, prove in a practical way its possibilities for the feeding and fattening of all farm-animals. At Belfast a quarter of an acre was sown with silver-beet on the 9th October, 1911, and was ready to feed off in the last week in February, 1912. Owing, however, to a flush of other feed, the silver-beet was not stocked until the 12th March, 1912, from which date till the 1st March, 1913, it was stocked at intervals with sheep, and fed off six times. The results from this quarter-acre show that one acre would approximately carry 1,014 sheep for eighty-four days. The weight of stems and leaves was 218 tons per acre, this weight of forage being produced within twelve months from the date of first stocking. It should be emphasized that the plants were by no means exhausted after the sixth feeding, and would have continued to give further feedings but for the fact that too long a period had been allowed to elapse between one or two of the foldings. Some of the plants had thereby thrown out seed-stalks, with the result that their feeding-value for subsequent growth was impaired. It was therefore decided not to keep further records.

SILVER-BEET ROOTING-SYSTEM.

From photograph of plant after having been eaten down eight times.

Specimens of the first growth of stems and leaves of four varieties sown last spring were analysed by Mr. Aston, Chief Agricultural Chemist, to ascertain their dry-matter content. This was found to average about 8 per cent. Specimens of a later growth of stems and leaves from the same varieties will have to be analysed before the percentage of dry matter can be ascertained with any degree of certainty. It may be assumed, however, that the average of 8 per cent. will be maintained, if not exceeded, as the stems of two varieties submitted were not fully developed. Taking the approximate yield at Belfast last year of 218 tons per acre, and the average dry-matter content at 8 per cent., it will be seen that a yield of 17·44 tons of dry matter per acre was secured within the twelve months.

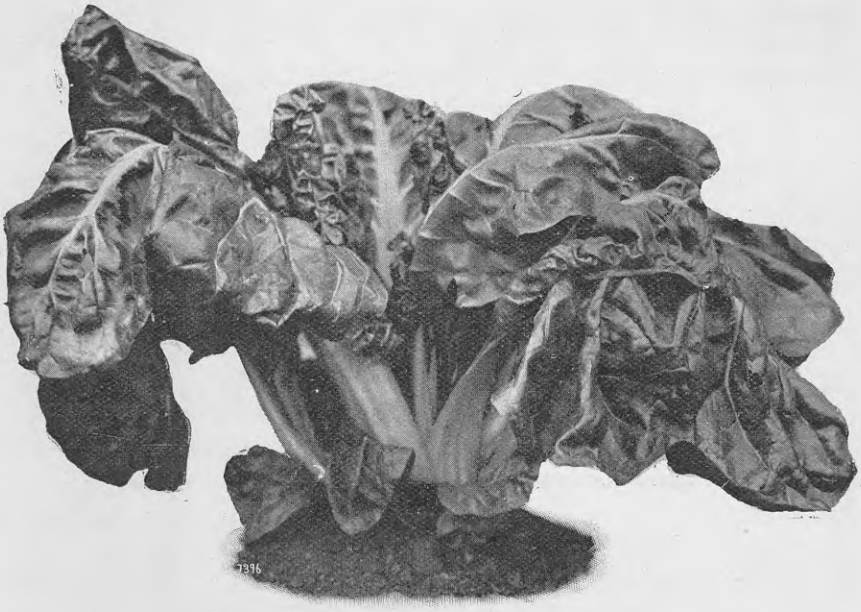
The value of silver-beet in the fattening of sheep was further demonstrated by several feeding tests conducted this year. In two instances the sheep put on at the rate of 1 lb. a day live weight on the silver-beet.

CULTIVATION OF CROP.

As farmers in general are not acquainted with silver-beet as a forage crop, it is desirable that full details be given as to the correct procedure in preparing the land, and of the subsequent management of the crop. In the first place it should be clearly understood that, whilst splendid results can be obtained from the plant in the feeding of stock, silver-beet is a crop that demands very careful treatment—indeed, more careful treatment than any other crop of a similar nature. While silver-beet has done very well on rather unpromising soils and in unfavourable locations, the best results will only be obtained where the soil is good and is well prepared for the crop. Then, when the crop is developed inter-cultivation is imperative, for it must be remembered that it is not the value of the first year's crop which determines the economical importance of silver-beet, but rather the many subsequent crops which well-nourished plants carefully managed afford at subsequent seasons of the year.

Silver-beet appreciates a deep loam, well cultivated, and free from other plant-growth. It should be sown in spring, when the ground is warm, and again in the autumn. From 6 lb. to 8 lb. of seed per acre, sown in drills 21 in. apart, should be employed. The seeds should be steeped for twenty hours in cold and clean water prior to sowing. Experiments have indicated that it is desirable to sow the seed on the flat — this in order to prevent stock from eating the plants too deeply down, which is always a danger with the plants sown in raised rows, when through the tramping of the stock too much of the root portion of the plant is exposed and eaten. The plants should be thinned out to about 12 in. in the row. If there are

No. 1.—SWISS CHARD (SILVER-BEET).



No. 2.—SWISS CHARD (SILVER-BEET).

blanks in the rows the plants will stand transplanting; but this should be done immediately before, during, or after rain.

Mangel-manure is a suitable fertilizer, and should be applied at the rate of about 3 cwt. to the acre. As it is impossible to definitely state what manure is necessary for the crop in all soils and situations, the farmer must decide this matter for himself by discovering the manurial requirements of his particular soil. The following mixtures are recommended to the growers of silver-beet, for testing the question, by Mr. B. C. Aston, Chief Agricultural Chemist:—

Plot 1: 1 cwt. superphosphate, 1 cwt. Island guano, ¼ cwt. seed gypsum, per acre.

Plot 2: 1½ cwt. superphosphate, 2 cwt. Island guano, per acre.

Plot 3: No manure (one row).

Plot 4: 1 cwt. superphosphate, ½ cwt. Island guano, ½ cwt. dried blood, ¼ cwt. seed gypsum, per acre.

Plot 5: 1 cwt. superphosphate, ½ cwt. Island guano, ½ cwt. dried blood, ¼ cwt. sulphate of potash, per acre.

To secure a good crop, inter-cultivation should be given until the plant is well established, as silver-beet will stand eating off several times. It is desirable immediately after each feeding is completed to run a cultivator between the rows, provided the land is in a fit condition to do this. After the first feeding it is advisable, judging from observations made, to slightly cover the stem of the plant with soil to a depth of 1 in. to 2 in. In the winter this will give the necessary protection to the roots and to the young springing shoots. Of course, after the colder weather is over this protection is not necessary.

MANAGEMENT OF THE CROP.

I have already pointed out that silver-beet demands careful management. Certain lessons in co-operative experiments in the South Island afford a good idea of the procedure in feeding off, &c. Let the farmer never make the mistake of growing more silver-beet than he can effectively control and feed off completely at the right periods. It is a crop that cannot be neglected or trifled with. It is, indeed, only when silver-beet is managed to the best advantage that its great value as a forage crop is realized. Care must be taken not to allow the plant to seed.

The crop is generally fit for feeding in about four months from sowing. Immediately the outer leaves show an indication of taking on a yellow tinge the crop should be stocked, and here comes in the

first danger. The procedure in carrying out the feeding-off process depends upon the number of sheep to be fed. In the first place, the break should enable the beet to be fed off in seven to nine days, or in a shorter period if possible. Therefore the break should always be

No. 3.—Swiss Chard (Lucullus).

a comparatively small one. This is necessary, for the reason that the plant shoots away very rapidly after being eaten down, and should stock remain a day too long they would eat the young shoots coming away, and therefore retard the second growth.

I might mention here that the principal feeding-off of silver-beet is not obtained in the first but in the following season. Therefore the main object of the grower should be to nurse and conserve the crop, in order that the most valuable forage to be secured in a subsequent season may be as abundant as possible. Say the first feeding has taken place in March, then the second feeding should be obtained in June. The plant will continue to grow throughout the winter, and

No. 4. PERPETUAL SPINACH-BEET.

in the spring provides its best and most abundant forage. It is at this time of the year that silver-beet shows up to the greatest advantage. But even with the remarkable spring feed it affords, silver-beet if properly managed will again provide good feed about the following March, and again in midwinter—a fact proved by the experience at Belfast, where the 1911-sown crop provided excellent feed in March of this year, and is ready this month again for another feeding.

VARIETIES.

Some disappointment has been experienced by growers of silver-beet, who have not gained anything like the results obtained in the co-operative experiments in the South Island. The cause in the majority of cases is the growing of the wrong varieties. In commerce there are eight varieties of Swiss chard, or silver-beet. Four varieties have been tested in the South Island experiments, and these are herewith illustrated.

(1.) Swiss chard (silver-beet) has a plain dark-green leaf, with broad wide stems and thick midrib. The plant illustrated was not fully matured at the time the photograph was taken. This variety is undoubtedly the best of the four tested, and is the one to be de-

SHEEP ON SILVER-BEET AT RUAKURA EXPERIMENTAL FARM.

pended upon to give the results referred to above. It is also remarkable for its greater vitality and longer life than the other varieties. It can therefore be relied upon to give a larger number of feedings before becoming exhausted.

(2.) Swiss chard (silver-beet) has a light-green leaf, with broad stem and a thick midrib. It is the second-best variety. The plant photographed was not fully matured.

(3.) Swiss chard (lucullus): Although this gives a wealth of stem and foliage, it apparently is not so well liked by stock, nor will it give the continuous crops that No. 1 will furnish.

(4.) Perpetual spinach-beet: This variety is being tried for the first time. It may prove successful in some localities, but so far it does not approach No. 1 as a fodder plant.

REGRASSING DEPLETED AREAS.

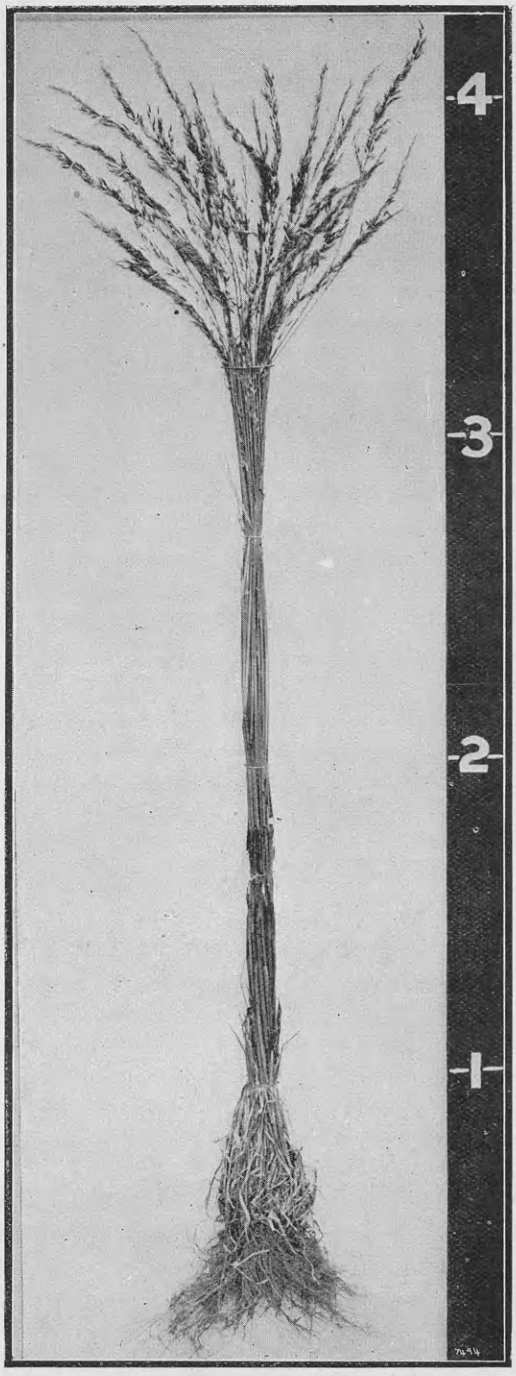
OF about seventy varieties of grasses, clovers, and other deep-rooted plants being tested for the re-vegetating of grass-denuded areas in the South Island, the tall oat-grass promises to be the most successful grass for the end in view. It has grown vigorously, and has stooled out well. A photograph of the grass on the following page will give some idea of the splendid growth it has made, the specimen being fully 4 ft. in height from the root-system to the seed-head.

Mr. J. Montgomery, the well-known seed-merchant of Christchurch, has forwarded the following communication to Mr. A. Macpherson, the officer in charge of the co-operative field experimental work in the South Island:—

"I recently visited the experimental grounds at Lindis Crossing, Central Otago, and thought you might be interested to hear some of the results from an unofficial source.

"The most remarkable result, to my mind, was the growth of the *Avena elatior* (tall oat-grass). This seems to show a better growth on this class of soil than any other variety of grasses sown. I think that, in view of the fact that this district is very dry in certain parts of the year, the experiments would be worth continuing. Evidently the chief trouble with the soil on the Morven Hills Estate is that, the vegetation having been eaten up by rabbits for a series of years, there is no appreciable humus left in the soil. The first consideration is to get some vegetable plants to grow which will regenerate the soil. Lettuce, chicory, and sheep's burnet all seem to do well, and cocksfoot, as usual, shows better growth than any of the finer grasses, though not so good as *Avena elatior*. The experiments there have been very carefully conducted, but, owing to those in charge having to rely on local farmers for horses and implements, they were unable to get the seeds sown at the right period of the year, consequently many of the experiments were not of much value. If the best work is to be got out of these experimental plots a team of horses and implements should be provided.

"The oats have not shown up very well, being sown too late. The Garton varieties, if anything, promise the best results. It seems a pity that this district should be depleted of all vegetation. I feel sure that this soil is capable of growing root crops, and well worth some expense to determine the most suitable grasses for the district. Rabbits, of course, have complete control at present, but could be exterminated under systematic methods of poisoning and trapping. That this district is capable of carrying a large quantity of stock is obvious from examination of some plots of land on the Queensbury side, where rye-grass and clovers are growing luxuriantly under irrigation."



IMPORTATION OF FERTILIZERS.

B. C. ASTON, F.I.C.

THERE are several interesting facts to be learnt from a study of the figures showing the yearly importations of fertilizers.

Looking at the respective quantities imported at the different ports, one is first struck by the enormous quantities of phosphate landed at the Port of Auckland. Thus, in the purely phosphatic manures (amongst which bone is included), Auckland imports as much (36,000 tons) as all the South Island ports, although there are two facts which somewhat discount this statement—viz., (1) that Dunedin possesses a phosphate-field and produces a considerable amount of phosphatic fertilizer, which does not therefore appear in these figures; (2) that the fertilizer imported into Otago (Dunedin) and Southland (Invercargill) is largely guano, which is much richer in phosphoric acid than either basic slag, bonedust, or superphosphate, the kinds of fertilizers mostly imported into the northern ports. But, making due allowance for these two facts, the amount of phosphates imported into Auckland is far greater than anything one can compare it with elsewhere in the Dominion. This great need of Auckland for phosphate, be it observed, is coincident with a paucity of available phosphoric acid in the majority of the soil-samples which have been analysed from that province (see *Journal of the Department of Agriculture*, Vol. iii, No. 4, p. 304, "Some Typical Auckland Soils," by B. C. Aston).

Considering the respective qualities of the different phosphates employed, it is seen that the soluble and quick-acting forms* of phosphate are more in favour in the northern parts, while the insoluble or slower-acting are more in demand in the extreme south. Thus the North Island ports, together with Lyttelton and Timaru, imported 64,700 tons of phosphates, of which only 18,300 tons were bonedust and guano; whereas Dunedin and Invercargill imported 21,000 tons, of which 15,700 tons were bonedust and guano, about 14,000 tons being guano. The reason that guano and ground rock phosphate are so abundantly used in Otago and Southland is well worth investigating.

On the relative merits of slag and superphosphate it is interesting to note that New Plymouth imports more slag than superphosphate,

* Bonedust would be quicker-acting on an Auckland soil than on a Southland soil, and hence might possibly be classified as a slow manure in the south.

and this disproportion will probably be much greater in future years, the Taranaki climate being exceedingly moist and the soil responsive to slag treatment. At Napier, on the opposite coast, the port for the Hawke's Bay District, the climate and soil of which is much drier than that of Taranaki, and the country often calcareous—conditions favouring the use of superphosphate—the imports of superphosphate are more than twenty times greater than those of slag. The same is true of the even drier climate of Canterbury (Lyttelton and Timaru ports).

A fact most worthy of close attention is that for the whole Dominion only 969 tons of purely nitrogenous fertilizers (valued at £12,816) were imported. A considerable quantity of this was probably not used as a fertilizer, but for manufacturing such articles of commerce as ammonia solution and nitric acid.

Of potash fertilizers, 4,248 tons, valued at £24,627, were imported.

The following particulars of the importation of fertilizers into New Zealand for the year ended 31st March, 1913, are compiled from returns furnished by H.M. Customs. The port of entry, name and quantity of fertilizer, and country whence imported, respectively, are shown.

AUCKLAND.

Bonedust.—Victoria, 335 tons; New South Wales, 4,786 tons; Bengal, 1,910 tons.
Bone Char.—New South Wales, 487 tons.
Blood Manure.—New South Wales, 20 tons.
Blood and Bone.—New South Wales, 150 tons; Victoria, 150 tons.
Bone Phosphate.—New South Wales, 31 tons.
Basic Slag.—United Kingdom, 6,655 tons; Germany, 478 tons; Belgium, 5,756 tons.
Superphosphate.—United Kingdom, 3,965 tons; Victoria, 25 tons; New South Wales, 44 tons; Germany, 1,225 tons; Belgium, 939 tons; Japan, 1,115 tons.
Phosphates.—United Kingdom, 3 tons.
Guano and Rock Phosphate.—New South Wales, 80 tons; Christmas Island, 6,200 tons; Seychelles, 1,500 tons; Ocean Island, 92 tons; Society Islands, 1,260 tons; Germany, 5 tons.
Sulphate of Potash.—New South Wales, 38 tons; Germany, 388 tons.
Muriate of Potash.—Germany, 20 tons.
Kainit.—United Kingdom, 31 tons; Germany, 655 tons; Belgium, 60 tons.
Phonolite.—Belgium, 3 tons.
Gypsum.—South Australia, 1,235 tons.
Sulphate of Ammonia.—New South Wales, 56 tons.
Nitrate of Soda.—Victoria, 41 tons; New South Wales, 202 tons.
Nitrolim.—Norway, 11 tons.
Sulphate of Iron.—United Kingdom, 25 tons.
Potato Fertilizer.—United Kingdom, 50 tons.

KAIPARA.

Bonedust.—New South Wales, 43 tons.

NEW PLYMOUTH.

Bonedust.—New South Wales, 200 tons; Bengal, 210 tons.
Basic Slag.—United Kingdom, 823 tons.
Superphosphate.—United Kingdom, 100 tons; Victoria, 129 tons; New South Wales, 250 tons; South Australia, 90 tons.

NEW PLYMOUTH—*continued.*

Guano and Rock Phosphate.—New South Wales, 49 tons; South Australia, 125 tons.
Sulphate of Potash.—United Kingdom, 55 tons.
Nitrate of Potash.—United Kingdom, 20 tons.
Kainit.—United Kingdom, 40 tons.
Gypsum.—South Australia, 339 tons.

PATEA.

Superphosphate.—United Kingdom, 30 tons.
Gypsum.—United Kingdom, 40 tons; South Australia, 25 tons.

WANGANUI.

Guano and Rock Phosphate.—United Kingdom, 1 ton.
Gypsum.—Victoria, 12 tons; South Australia, 5 tons.

POVERTY BAY.

Basic Slag.—United Kingdom, 20 tons.
Superphosphate.—Victoria, 10 tons; Belgium, 10 tons.
Kainit.—United Kingdom, 5 tons.

NAPIER.

Basic Slag.—United Kingdom, 175 tons; Germany, 50 tons.
Superphosphate.—United Kingdom, 425 tons; Victoria, 108 tons; New South Wales, 185 tons; Japan, 1,825 tons.
Phosphates.—United Kingdom, 110 tons; South Australia, 20 tons.
Guano and Rock Phosphate.—United Kingdom, 2 tons; New South Wales, 25 tons.
Sulphate of Potash.—United Kingdom, 16 tons; New South Wales, 2 tons; Germany, 10 tons.
Kainit.—United Kingdom, 1 ton; Germany, 125 tons.
Potash Manure.—Germany, 60 tons.
Gypsum.—Victoria, 20 tons; South Australia, 70 tons.
Sulphate of Ammonia.—New South Wales, 10 tons.
Nitrate of Soda.—New South Wales, 2 tons.
Nitrolim.—Sweden, 3 tons.

WELLINGTON.

Basic Slag.—United Kingdom, 4,393 tons; Germany, 515 tons; Belgium, 225 tons.
Superphosphate.—United Kingdom, 1,447 tons; Victoria, 1,837 tons; New South Wales, 373 tons; Tasmania, 25 tons; Germany, 612 tons; Belgium, 213 tons.
Phosphates.—United Kingdom, 90 tons; Belgium, 30 tons.
Guano.—Victoria, 50 tons.
Sulphate of Potash.—United Kingdom, 16 tons; Germany, 77 tons.
Kainit.—United Kingdom, 90 tons; Germany, 405 tons.
Phonolite.—Germany, 2 tons.
Gypsum.—Victoria, 512 tons; New South Wales, 75 tons; South Australia, 405 tons
Sulphate of Ammonia.—New South Wales, 21 tons.
Nitrolim.—Norway, 55 tons.
Castor Meal.—Bengal, 7 tons.
Turnip-manure.—United Kingdom, 75 tons.
Rape-manure.—United Kingdom, 75 tons.
Jadoo.—United Kingdom, 2 tons.

NELSON.

Basic Slag.—United Kingdom, 79 tons; Germany, 125 tons.
Superphosphate.—United Kingdom, 171 tons.
Guano.—Victoria, 20 tons.
Sulphate of Potash.—Germany, 10 tons.
Kainit.—Germany, 40 tons.
Gypsum.—Victoria, 21 tons.
Sulphate of Ammonia.—New South Wales, 12 tons.

BLENHEIM.

Superphosphate.—Victoria, 11 tons.

LYTTELTON.

Bonedust.—New South Wales, 25 tons.
Basic Slag.—United Kingdom, 350 tons; Germany, 50 tons.
Superphosphate.—United Kingdom, 1,305 tons; Victoria, 1,489 tons; New South Wales, 502 tons; Tasmania, 1,231 tons; Japan, 2,219 tons.
Phosphates.—United Kingdom, 140 tons.
Sulphate of Potash.—United Kingdom, 5 tons; Germany, 40 tons.
Muriate of Potash.—United Kingdom, 1 ton.
Kainit.—United Kingdom, 165 tons; Germany, 75 tons.
Potash.—United Kingdom, 95 tons.
Gypsum.—New South Wales, 100 tons; South Australia, 20 tons.
Nitrolim.—United Kingdom, 10 tons.

TIMARU.

Bonedust.—Bengal, 135 tons.
Basic Slag.—United Kingdom, 51 tons; Belgium, 105 tons.
Superphosphate.—United Kingdom, 2,640 tons; Victoria, 978 tons; New South Wales, 10 tons; Germany, 125 tons; Belgium, 50 tons; Japan, 1,471 tons.
Guano.—New South Wales, 74 tons; Madagascar, 1,575 tons.
Sulphate of Potash.—Germany, 35 tons.
Kainit.—Germany, 200 tons.
Potash Manure.—Germany, 75 tons.
Gypsum.—New South Wales, 5 tons; South Australia, 150 tons.
Insecticide Fertilizer.—United Kingdom, 30 tons.

DUNEDIN.

Bonedust.—New South Wales, 82 tons; Bengal, 175 tons.
Broken Bones.—New South Wales, 133 tons.
Blood and Bone.—New South Wales, 467 tons.
Basic Slag.—Germany, 50 tons.
Superphosphate.—United Kingdom, 225 tons; Victoria, 415 tons.
Guano.—Victoria, 1 ton; Malden Island, 2,686 tons; Christmas Island, 1,100 tons; New Caledonia, 1,413 tons.
Sulphate of Potash.—United Kingdom, 80 tons; Germany, 75 tons.
Muriate of Potash.—Germany, 2 tons.
Kainit.—United Kingdom, 25 tons; Germany, 125 tons.
Potash.—Germany, 185 tons.
Gypsum.—South Australia, 800 tons.
Sulphate of Ammonia.—New South Wales, 15 tons.
Nitrate of Soda.—Victoria, 89 tons; New South Wales, 30 tons.
Nitrolim.—Norway, 42 tons.
Potato-manure.—United Kingdom, 100 tons.
Turnip and Grass Manure.—United Kingdom, 100 tons.
Non-odorous Fertilizer.—New South Wales, 5 tons.

INVERCARGILL.

Bonedust.—New South Wales, 55 tons; Bengal, 1,325 tons.
Bone Char.—Bengal, 40 tons.
Blood and Bone.—New South Wales, 968 tons.
Basic Slag.—United Kingdom, 100 tons; Germany, 50 tons; Belgium, 83 tons.
Superphosphate.—United Kingdom, 200 tons; Victoria, 1,393 tons; New South Wales, 250 tons; Belgium, 297 tons; Holland, 3,000 tons.
Bernard's Phosphate.—Holland, 502 tons.
Guano.—Christmas Island, 2,449 tons; Malden Island, 2,597 tons; Seychelles, 1,400 tons; New Caledonia, 1,170 tons; Surprise Island, 1,159 tons.
Kainit.—United Kingdom, 25 tons; Germany, 400 tons.
Potash Manure.—United Kingdom, 75 tons; Germany, 415 tons.
Phonolite.—Germany, 1 ton.
Gypsum.—Victoria, 29 tons; South Australia, 300 tons.
Sulphate of Ammonia.—United Kingdom, 100 tons; New South Wales, 160 tons; Germany, 65 tons.
Nitrolim.—United Kingdom, 10 tons; Sweden, 5 tons; Norway, 10 tons.

SUMMARY.

The following is a summary of the kinds, quantities, and values of the various fertilizers imported into New Zealand during the year ended 31st March, 1913:—

Description.	Weight.		Value.	
	Year 1912-13. Tons.	*Year 1911-12. Tons.*	Year 1912-13. £	*Year 1911-12. £*
Bonedust	9,281	*10,799*	60,050	*69,032*
Broken bones	133	..	766	..
Bone char	527	*275*	869	*922*
Blood manure	20	*175*	130	*1,050*
Bone phosphate	31	*240*	109	*817*
Blood and bone	1,735	*635*	10,344	*3,924*
Basic slag	20,133	*16,227*	66,389	*53,067*
Superphosphate	32,964	*32,567*	120,303	*119,597*
Phosphate, n.o.e.	393	*690*	1,459	*2,587*
Guano and rock phosphate	25,033	*22,050*	65,084	*61,622*
Bernard's phosphate	502	..	1,598	..
Sulphate of potash	847	*796*	10,432	*9,772*
Muriate of potash	23	*20*	277	*234*
Nitrate of potash	20	..	241	..
Kainit	2,467	*2,187*	8,339	*7,255*
Potash salts	905	*916*	5,554	*5,235*
Phonolite	6	..	25	..
Gypsum	4,163	*5,494*	6,687	*7,604*
Sulphate of ammonia	439	*304*	6,962	*4,505*
Nitrate of soda	364	*258*	4,164	*2,725*
Nitrolim (calcium cyanamide)	146	*60*	1,560	*626*
Sulphate of iron	25	*63*	122	*217*
Potato-fertilizer	150	*225*	865	*1,168*
Turnip-fertilizer	75	*270*	350	*1,140*
Turnip and grass fertilizer	100	..	520	..
Rape-fertilizer	75	..	360	..
Insecticide fertilizer	30	..	167	..
Non-odorous fertilizer	5	..	78	..
Jadoo	2	..	16	..
Castor meal	7	..	437	..
	100,601		£374,257	

Importations for year ended 31st March, 1912, 94,296 tons, £353,327.

The Government has granted a sum of from £20 to £25 in order to enable experiments in top-dressing to be carried out in the Akitio County, with the object of ascertaining if a remedy can be discovered for osteomalacia, which has been appearing in lambs in that district this season.

RE-VEGETATING EXPERIMENTS IN SOUTH ISLAND.—Included in the varieties recently despatched from Ruakura Farm of Instruction to Central Otago for re-vegetating experiments is a grass commonly known as buck-bare (*Sporobolus argutus*). This is the first time it will be tested under ordinary field conditions in this country. Judging by its hardiness, habit of growth, quantity of feed thrown, resistance to insect and fungoid diseases, there is every probability of its becoming a valuable grass under certain conditions. Frosts at Ruakura Experimental Farm do not affect it, but the heavier frosts in Central Otago may prove too severe for it. As this grass is a native of the lower altitudes of Brazil, it may not prove sufficiently hardy for Central Otago conditions.—*A. W. Green.*

THE "JOURNAL OF AGRICULTURE."

WITH this issue the *Journal of Agriculture* enters upon the fourth year of its existence. It is now a firmly established and effective link between the Department and the farmers of the Dominion. That it is appreciated by those in whose benefit it is issued is proved by the fact that there are now 10,618 subscribers, while 1,050 copies go to reading-rooms and libraries, foreign Departments of Agriculture, experimental stations, and investigators in agricultural science in all parts of the civilized world. It has been most encouraging to officers associated in the production of the *Journal* to have received so many complimentary and encouraging letters from subscribers, a large number of whom have taken an active, and much appreciated, interest in widening the circle of readers. The present satisfactory position of the *Journal* is principally due to the splendid co-operation of the different divisions of the Department, the leading members of which have liberally contributed to its pages. In extending the circulation of the *Journal*, a number of officers of the Department have rendered conspicuous service. While the present position of the *Journal* is very satisfactory, in view of its youth and that the subscription list has been mainly built up on a voluntary basis, there are still many farmers in the Dominion who have to be made acquainted with it; and in this important work readers can render the Department good service, as so many have already done, by bringing it under the notice of neighbours and friends.

"As a result of the experiments your Department is carrying on from year to year I have been able to quadruple my income since the year 1907." —*Extract from letter from Mr. John Dowd, Waiau, North Canterbury, to Mr. A. Macpherson, Supervisor, Co-operative Field Experiments, South Island.*

A GOOD FODDER FOR STOCK.

W. C. BERRIDGE.

To provide green feed quickly during the middle of summer, when pastures are failing, is a vexed problem for the farmer, especially in dairying districts. Those who have a good lucerne patch are largely independent of adverse weather-conditions, as the lucerne, being a deep-rooted plant, makes its best growth during that season. Farmers who have forethought enough to provide green maize for their cows are also in a better position to face a dry season.

Those who for various reasons may not have green feed provided for the middle of summer should try a plot of Hungarian millet. This makes a rapid growth during the hottest weather, independent of rain. Hungarian millet should be cut before the seed-heads shoot, as it is then in its most succulent stage.

All live-stock seemed fond of the millet, both horses and cows eating it readily when first offered. Being succulent, there was little or no waste with it.

At the Tauranga Experimental Farm a piece of land, from which oats were cut last January, was ploughed, harrowed, and scarified, as it was very foul with sorrel and other weeds. Superphosphate, at the rate of 3 cwt. to the acre, was then broadcasted and harrowed in. The Hungarian millet was sown broadcast on the 28th January, at the rate of 12 lb. to the acre, and was covered with a chain harrow.

Though no rain fell for six weeks, the millet grew rapidly, and in ten weeks' time was ready to cut. It yielded at the rate of 17 tons to the acre. During the whole period of growth there were only two days on which rain fell.

A part of the plot was manured with half the quantity of superphosphate (1½ cwt. to the acre being applied), and this part yielded 40 per cent. less by weight.

Now that the millet is removed the land presents a very clean appearance, most of the weeds having been smothered by the dense growth.

After the millet was cut, the land was ploughed and sown with oats and vetches for spring feed.

FANCY-CHEESE MAKING.

ITS PROGRESS IN NEW ZEALAND.

MISS G. N. DAVIES, N.D.D.

UP to the present time the dairying industry in New Zealand has been chiefly confined to buttermaking and to one variety of hard-pressed cheese—viz., Cheddar.

As has already been stated in a previous article, the making of soft and fancy cheese is a most profitable industry. New Zealand offers an excellent field for the introduction of some of the numerous varieties of such cheese, from the small dainty cream cheese, only a few ounces in weight, to the large Cheshire, weighing 60 lb. or 80 lb. There is a growing demand for small cheeses of the soft variety, but the demand would increase enormously if only these were offered to the public in any quantity. Cheese is a good, wholesome, nutritious article of diet, and a good demand could easily be created. Two-thirds of a pound of cheese contains as large an amount of what laymen call the "muscle-forming" materials as a pound of beef of average composition. At the conclusion of some experiments carried on by the Department of Agriculture of Pennsylvania it was found that cheese was as easily digested as meat, and it may be used as a chief and a cheap article of diet; also that cheese compares favourably with other foods in thoroughness of digestion—that is, in the percentage finally digested.

For the manufacture of small cheese no expensive appliances are necessary, and the cost is nothing like as great as that for the equipment of a dairy or factory for the manufacture of Cheddar cheese. The process of making is not complicated or difficult to understand. As a side line in a cheese or butter factory, fancy-cheese making should prove a decided success, especially if in or near a large centre. In the making of soft cheese the ripening process is rapid, which means little loss of weight during ripening and a quick return financially. The work being light, interesting, and profitable, farmers should encourage their wives and daughters to take it up, as is done in most farmhouses in England. The cheeses likely to be the most popular are those weighing from 1 lb. to 2 lb. each, which in the first place is a size very suitable to the average householder, and presents a favourable appearance when placed on the table.

WHERE CHIEFLY MADE IN NEW ZEALAND.

Up to the present time fancy-cheese making has chiefly been taken up by the large dairy companies, and is now being made in Dunedin, Christchurch, Palmerston North, Wanganui, and Auckland.

There should be an exceedingly good market for this class of produce in Wellington, if only taken up thoroughly and made known to the public, the writer having on several occasions received inquiries as to where these small cheeses could be obtained.

As in the manufacture of soft cheese there is no very heavy work, and cheeses such as cream and club being small to pack and requiring to be made as attractive as possible in appearance, women are usually employed in this branch of work.

Dunedin.—One of the first places where the manufacture of soft and fancy cheese was taken up was at the main factory of the Taieri and Peninsula Milk Supply Company, in Dunedin. A special room has been fitted up for the purpose of fancy-cheese making only, and a young woman from England is employed in its manufacture. At this factory the manufacture of Stilton cheese has also been recently taken up.

Christchurch.—Again, in Christchurch the manufacture of different varieties of soft cheeses is carried on by the Central Dairy Company at their factory in Addington. The soft-cheese department is well fitted up and the work carried on by two young women who had had previous experience at Home. The popular size of a cheese in different places seems to differ. Here a cheese weighing about 2½ lb. seems to be in general favour.

Palmerston North.—In Palmerston North fancy cheeses are made at one of the factories of Messrs. J. Nathan and Co. at Whakaronga. The demand here is for a cheese just 1 lb. in weight. At this factory club cheese was taken up on a larger scale than at the others, and sold in small jars. This cheese when of standard quality is much appreciated by the general public, and in this attractive form is very suitable for the table or for picnics.

Wanganui.—In Wanganui the larger-sized varieties are made at the Westmere Cheese-factory, as well as cream and club, the last two named being also made by the Fresh Food and Ice Company.

Auckland.—In the north the manufacture of soft cheese is carried on at the butter-factory of Messrs. Ambury Limited, of Auckland, the cheese being made by the manageress of the humanized-milk department and her assistant. Cream cheese is made a specialty here, and finds a ready sale in all the dairy shops belonging to the firm.

Cream and club cheeses are also made by Mrs. Hesketh, at Manurewa, for the Auckland market.

STILTON AND CHESHIRE.

Besides Stilton, of the larger varieties the manufacture of Cheshire has been taken up. This latter variety has been made by Messrs. J. Nathan and Co., also by Mr. C. J. Billington at his factory at Pongaroa. It is a very suitable variety for manufacture in New Zealand, the size of the cheese being the same as a small Cheddar, and the only essential difference in the utensils is the moulds or hoops. This is a cheese which has a large sale in England, and is certainly more profitable than Cheddar, the weight of cheese from a given quantity of milk being decidedly higher.

There are districts still in New Zealand where the manufacture of these cheeses has not yet been taken up, and where there would without doubt be a good market for them if they were only made and brought before the public. In a place like New Plymouth there should be a ready sale for them, but up to the present they have not been tried in Taranaki. In the Wairarapa, too, there should be a considerable sale, but they have yet to be introduced to this district.

DIFFERENT VARIETIES OF CHEESE.

There are many different varieties of cheese and kinds to suit all tastes, whether full-flavoured or mild, hard, soft, or containing blue-mould. They can all be placed under three different headings—viz., hard-pressed, blue-veined, and soft.

CHEESE FOR EXPORT.

As there are only about a million people in New Zealand, certainly not enough to consume all the cheese of any kind which can be made in the country, it would without doubt prove very profitable to manufacture different varieties of cheese for export in addition to Cheddar, especially the kinds which would command a much higher value. A variety of cheese which commands a very high price is Stilton, few of which are made in New Zealand, and some of which are imported. Why not manufacture the most expensive kinds, and import, if necessary, the cheaper varieties? Stilton cheese comes under the heading of "blue-veined," and, besides being made for sale in New Zealand, should easily bear transit. Another of the same variety which could be made for export is the Stilton-shaped "Wensleydale," the process of manufacture being shorter than that of Stilton, and the price of the finished article much the same.

Another variety which should easily bear transit, and has a very good sale in Wales and the west of England, is Caerphilly. This cheese is not very big, and, the process of manufacture not being

difficult, it should find a ready sale in New Zealand, besides being suitable for export.

Then there is the Cheshire variety already mentioned. This cheese in size and appearance is very like Cheddar. The time of ripening depends on the process followed, and it can be made to ripen quicker than Cheddar. The texture is more open, and, unless the long-ripening method is followed, more moisture is retained, a greater weight of cheese resulting.

The above-named are considered the most suitable for export, but up to the present only Stilton and Cheshire are being taken up in this country.

Among the smaller varieties, Miniature Wensleydales and Little Welsh, if made to weigh, say, 2 lb. in weight, should be suitable for export, if carefully packed and not sent away when too green. If made smaller than the above-mentioned size their tendency would be to get too dry. The profit on any of the above-mentioned varieties would compare most favourably with the profit made on Cheddar cheese.

If the smaller varieties of soft and cream cheeses were only taken up by farmers' wives and daughters on the farm, where they can be made in small quantities, the best possible article could be produced, because the milk can be properly controlled right from its source; a ready sale would assuredly be found in the local towns, and the business would be found to pay handsomely.

If the manufacture of the other varieties mentioned in this article were taken up more at the different factories, both for local consumption and for export, they would be found most profitable. By shipping direct to the Old Country a trade would at once be opened up which would assuredly prove highly beneficial to every one concerned.

Lime and lime without manure
Makes both farm and farmer poor,
BUT
Lime, manure, and vigorous clover
Make the old farm rich all over.
—*Dr. Vivian, of the Ohio Agricultural College.*

DO not leave the preparation of the land till the crop is to be planted. Have everything ready, so that immediately a good seeding-time comes the crop may be put in at once under the most favourable conditions. Inability to take advantage of suitable planting-conditions is responsible for most of the failures in cropping operations.

SILAGE.

THE STACK SYSTEM.

W. DIBBLE.

IN this favoured country, where there is not generally the necessity to stall-feed cattle in the winter, the preparation of silage in specially constructed silos does not appeal to the farmer in the same way as it does in those countries where the winters are severe and the feeding of cattle under shelter is imperative. Therefore silage in the stack form is the method favoured, and is the system which will prove more acceptable to the majority of our farmers. Especially to the dairy-farmer and grazier on medium and large holdings will stack silage appeal. In this form, with the preserved plant complete, it can be thrown out on to the fields, and the work of feeding be thus accomplished with as little delay and loss of time as possible. The feeding of silage in the fields presents a distinct advantage, in that the one objection to silage from the milk-producer's view-point—liability to taint milk—is removed. I have fed stack silage for seventeen years to cows milked for a city trade without receiving a single complaint in regard to the flavour of the milk, but the silage was always fed in the field and after milking. On the other hand, when the material for silage has been chaffed for a silo, it must be fed in troughs. Where every care has been taken to secure only a sweet silage this can be fed in the milking-shed without endangering the milk-flavour; but generally there is a risk in feeding it in the same place where milk is handled. Thus it is always better to feed silage away from the milking-shed. Herein the stack form presents a decided advantage, as it can be thrown out on the ground, whereas taken from a silo (which is filled by chaffed fodder) feeding-troughs must be provided.

A great advantage of stack silage is that the stack may be built in any paddock, and at a point where it can be most conveniently used for feeding purposes.

But a few years ago the making of silage, even in the simple stack form, was regarded as work demanding special knowledge and experience on the part of the farmer. The many farmers throughout the Dominion who are now appreciating the value of ensilage have, however, found that there is little to master in making successful silage—in fact, that it is one of the simplest of farm operations.

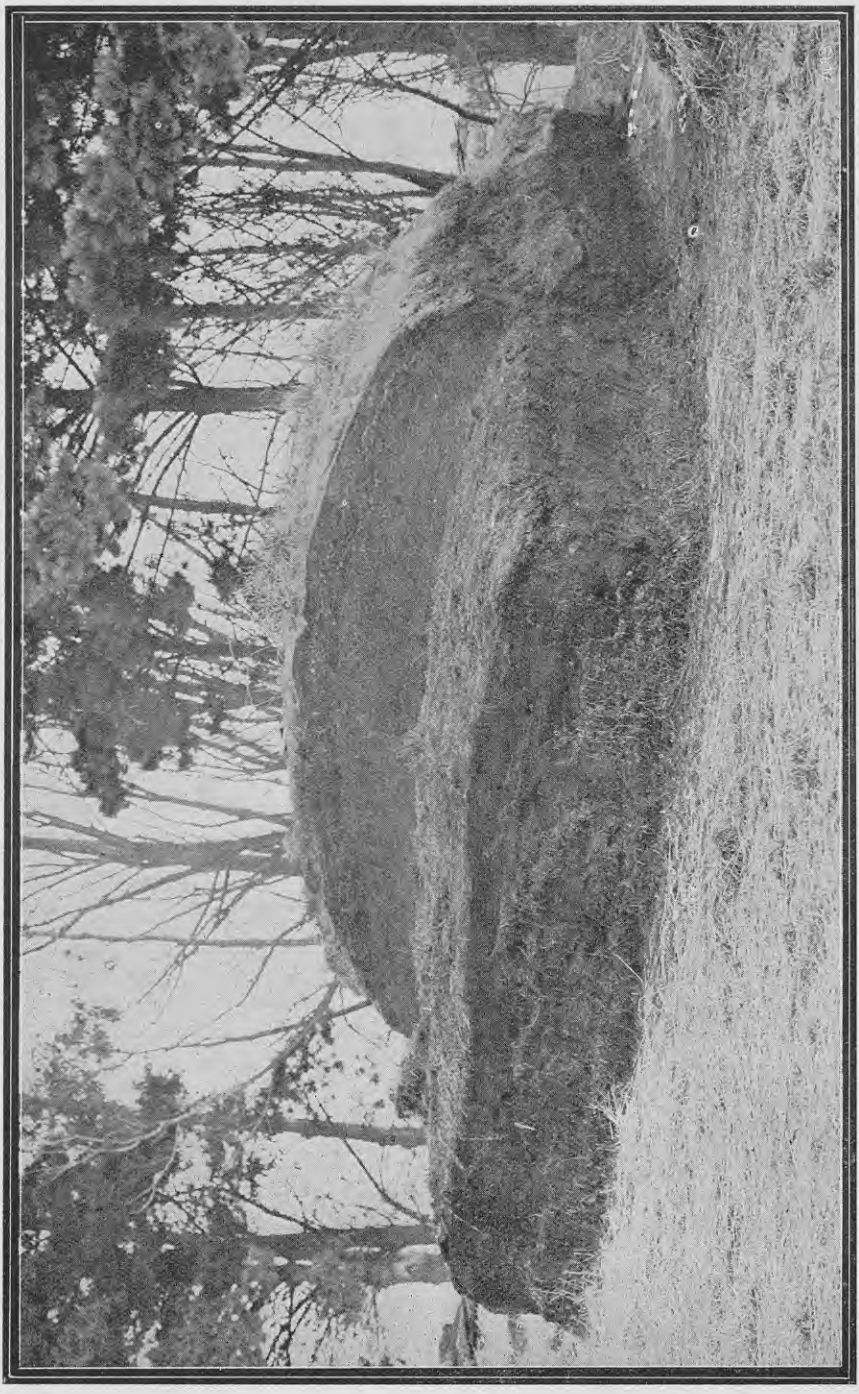
The mere fact of making sure that the first 6 ft. or so of material —the section of the stack which constitutes the barometer in silage-making—is of the right heat, or, to be exact, that the correct degree of temperature (130° Fahr.) has been secured, is all that needs special attention. The remainder of the operation is so simple that any farmer can carry it out successfully by following simple printed instructions.

Grasses or fodder plants for silage should be cut when they are in the most succulent stage, or when approaching full bloom. Maize should be allowed to stand until the cob is formed and is in its dough stage. Crops for silage should not be allowed to wilt in the sun, but carting and stacking should proceed as soon as possible after cutting. To commence, cut six swaths from the boundary-fence. This will provide the first layer for the stack. After clearing up this, the work can be laid out so that each day a sufficient quantity, and a quick run to the stack, will be provided. There are two kinds of silage—viz., green and brown. For green silage the temperature required is from 130° to 140° Fahr.; for brown silage the temperature may be allowed to rise to 160°, but this form of silage is not recommended. Should a greater heat be attained the silage would be of little value. If the temperature does not reach 120° the product would be what is known as "sour" silage, which, though wholesome, is not usually considered so satisfactory as "sweet" silage, especially when intended for fodder for milking-stock. A cubic foot of silage should weigh from 45 lb. to 56 lb.

The silage will be greatly improved by the addition of salt, in the proportion of 1½ lb. to 1 ton of the green material.

THE SITE.

The location of the stack should be level, but at the same time should provide for effective drainage. It should be at some distance from the milking-shed, as, in the event of any portion of the stack being of a sour nature, the resulting odour will not affect the flavour of the milk. If available, a layer of straw 12 in. deep, or of rushes, should be provided for a foundation, but timber should never be used for the purpose, as this will admit the air, whereas the secret of silage-making is the exclusion of air. The stack should be set out square if of a small size—say, up to 14 ft. by 14 ft. for a 30-ton stack—but should be a little longer than the width if of a larger size, a stack containing from 50 to 60 tons occupying a space of 16 ft. by 18 ft., and larger stacks slightly longer than the width in about the same proportion.



Lucerne Silage-stack at Sunnyside Mental Hospital, Christchurch, cut at Eighteen Months from stacking.

THE FIRST LAYER.

The whole success of the process of silage-making may be said to depend on the management of the first layer. The farmer should carefully study the instructions in regard to this before proceeding with the building of the stack, especially as local conditions and the season of the year largely influence the procedure to be adopted.

Much depends on the condition of the material to be made into silage. For instance, in the spring it may be of a rank succulent nature, whereas in the latter part of the summer it may be too ripe, and therefore rather dry for the purpose. In the former case it is difficult to get the heat up in the desired time, and sometimes it is necessary to wait a day or two to secure the desired temperature, whereas in the latter case it may be difficult to control the tempera ture. Where silage is being made on a large scale and the cost of labour is a consideration, a good plan where very succulent material is being handled is to start the work of stacking at the end of the week, so that the day of rest may be availed of to bring about the desired condition in the foundation of the stack before building is proceeded with. With dry material—of course, if succulence has quite disappeared silage-making is out of the question—the desired temperature in the foundation layer will be probably secured at once; and in dealing with this ripe fodder it is generally necessary to stack as rapidly as possible, and get the weight on without delay. Weight—provided by the silage material's own bulk and by the earth on top—is essential to stop the oxidation process when it has proceeded far enough, for if the oxidation (which takes place in the presence of air) continues the material will be burnt up and be useless.

The simplest method of ascertaining the temperature of the bottom layer is to insert perpendicularly a 1 in. galvanized-iron pipe in the centre of the stack, to within about 3 ft. from the ground. In this suspend a thermometer attached to a string. The bottom of the pipe will of course remain open, but the top end of the pipe must be closed by a cork. A cheap and fairly reliable thermometer, very suitable for the purpose, can be obtained from suppliers of dairy requisites, and probably may be secured from the nearest dairy factory.

BUILDING THE STACK.

In making the stack the ordinary procedure in stack-building should be reversed. Thus, instead of the centre being the highest part of the surface it should be lower, if anything, than the sides, the idea of this being that the sides press out to a level with the centre when weight is applied.

When the heat in the bottom layer has reached 130° Fahr. according to the thermometer stacking may be proceeded with. Remove the pipe while stacking is going on, and add to the stack at the rate of from 3 ft. to 6 ft. daily, building up the stack in as perpendicular a manner as possible. Under ordinary conditions this depth of material can be added to the stack day by day without the necessity of taking the temperature, providing the desired temperature of 130° has been attained in the foundation layer, but to make sure that the silage will be a success it is advisable to take the temperature every morning. In this case it is necessary, after each layer is added, to insert the pipe (in the centre and perpendicularly), suspend the thermometer in it, and cork up the aperture, in order to be able to ascertain the temperature on the following morning before proceeding with more stacking. Should the temperature be then found to be above 130° Fahr. stacking should proceed without delay, and a heavy layer be put on. Then, indeed, is the time to call upon all available energy to pile up the ensilage material on the stack. If, on the other hand, the temperature has not reached 130° Fahr. stacking should be delayed till the desired heat is recorded.

LUCERNE PLANT AFTER EIGHTEEN MONTHS IN SILAGE-STACK.

Where sheaves are used in the stacking process the sheaves should be double-banked at the corners, in order that these may be as solid as possible when the weight is applied.

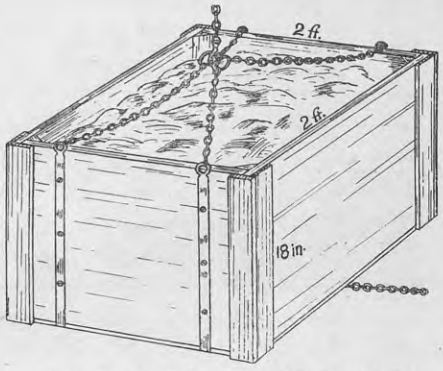
HEIGHT OF STACK.

Even though there is a great subsidence in an ensilage-stack the height of the green material should not exceed about 20 ft. It should be remembered that the making of silage in the stack form is largely influenced by the prevailing winds. A strong wind blowing from one quarter will drive the heat through to the opposite side, with the result that the stack has a tendency to subside on the lee side. Therefore the higher the stack the greater the danger from this cause. If heavy winds are experienced while building, it is advisable to hang a tarpaulin over the side of the stack exposed to the wind. This will allow the stack to settle evenly. Of course, when the weight has been applied there is little or no danger from wind.

WEIGHTING.

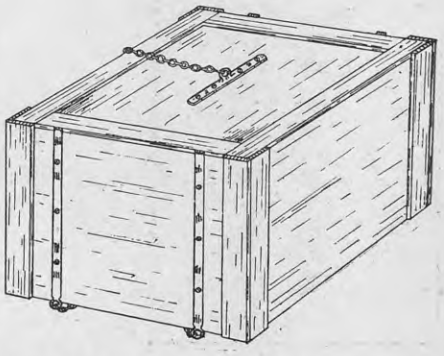
The completed stack should be topped by a platform of rough timber provided with a ledge (18 in. to 20 in. deep) around the edges. This should be filled with soil taken from a trench around the stack. The simplest method of elevating the soil is to use boxes (as illustrated on this page) and carry them up by the hoist used for stacking.

STACKING.



BOX FOR LIFTING SOIL FOR WEIGHING.

There are several methods of conveying the material to the stack. A simply constructed sledge, about 8 ft. square, which any farmer can construct, is as good as anything. The runners should be made of 12 in. by 3 in. timber shod with iron, and the platform may be formed of 9 in. by 1 in. boards Chains should be attached to the end of each runner, and centred in a ring for hitching to the haulage-tackle. Two to three sledges should be provided—two if not more than a 20-acre paddock is being worked, and three if a large area is being cut. Alongside the stack two posts 12 ft. apart should be erected. The sledge of silage material should be taken in between these for unloading, the front of the load being level with the posts. Attached to one of the posts, 2 ft. from the ground, is a rope about 16 ft. long. This is passed in front of the load and just above the level of the flooring of the sledge, drawn taut, and hitched around the other post. The horses are then driven forward, and the load is left on the ground ready for hoisting. Where sheaves are being carted, slings are placed across the sledge when these are being loaded—one on the flooring, another on the first layer, and a third below the last layer. Then, when the sledge reaches the stack, the material is hoisted at once by means of the slings.



THE METHOD OF USING THE CHAIN FOR TIPPING OVER THE BOX.

For a small stack a simply constructed derrick is excellent, while, where a large stack is being constructed, the Manitoba hay-stacker is probably the more convenient.

STACK CAPACITY.

About 40 cubic feet of stack silage go to the ton. It may be taken as a fair average—allowing for the fact that the appetites of individual cows vary greatly—that 40 lb. of silage will be required for each cow. The farmer can therefore calculate the amount of silage he will require. In making this calculation, however, it is well to remember that silage in reserve is always a valuable asset—an insurance against drought and other adverse weather-conditions.

CUTTING OUT.

When the ensilage is required for use, sufficient boards may be removed to allow space for the hay-knife. The remainder of the roof will be undisturbed. The first cut should be about 6 ft. square.

COST OF PREPARATION.

The main argument urged in this country against silage is the cost of preparation. Certainly this is heavy where all the labour required has to be specially engaged for the purpose, though even then the expense is more than counterbalanced in those unexpected periods of weather-adversity when silage is the only thing that can be depended upon. In some districts where silage is appreciated a customary procedure is for neighbouring farmers to assist each other in the work. Thus silage can be made on three different farms at about the same time, on alternate days. Where this is done I would suggest that the plant be put in order during the off season of the year. Then, when the season for making the silage arrives, everything will be ready at the opportune time. Not only can economy be effected by co-operating on the actual work of stacking, but the greater part of the necessary plant may be purchased on the co-operative principle. The mower, binder, rake, sledges, and hoist can be moved from farm to farm, but I would always recommend each farmer to have his own hoist—a simple derrick will do. A great advantage in working on this principle is that there need be no loss of time in waiting for the temperature to rise, and as bad weather means very little delay the work can be completed in a very short space of time.

Over a hundred varieties of potatoes have been tested at Ruakura Farm of Instruction this season.

BUSH-SICKNESS INVESTIGATIONS.

C. J. REAKES, D.V.Sc., and B. C. ASTON, F.I.C.

IN the April issue of the *Journal* details were given of three cattle experiments which had given distinctly successful results. In addition to these experiments a number of others were at the same time carried out, these also consisting of the application of various top-dressings, sheep and a few cattle being afterwards grazed upon the treated pastures. While the sheep experiments did not, on the whole, yield such definitely good results as did those experiments limited to cattle alone, yet they proved of great value, and the interesting information obtained from them will, it is anticipated, greatly aid in overcoming the difficulty of bringing bush-sick lands into profitable use for pastoral purposes. It has been a recognized fact that sheep develop bush sickness much more readily than do cattle, and that the younger they are the more quickly the characteristic symptoms make their appearance when the animals are living on badly affected land, while on other slightly affected areas adult sheep can live and remain healthy, though lambs cannot be fattened for the lamb market or reared to maturity. On such areas cattle are often unaffected, though probably they do not develop so quickly, fatten so readily, or, in the case of milch-cows, milk so profitably as on normal land. Following are particulars of these additional experiments :—

SERIES NO. 1.

Paddock No. 2, Te Pu ; area, 2 acres. Top-dressed with quicklime, 1 ton per acre, November, 1910. Stocked with sheep sixteen months old.

Sheep.	Date when placed in Paddock.	Appearance of First Noticeable Symptoms.	Result.
No. 1 ..	8/1/11	..	Accidentally killed by a dog.
No. 2 ..	8/1/11	29/9/11	Died of bush sickness on 8/11/11.
No. 3 ..	28/3/11	16/7/11	Died of bush sickness on 2/11/11.
No. 4 ..	30/4/11	2/10/11	Died of bush sickness on 13/2/12.
No. 5 ..	30/4/11	2/10/11	Died of bush sickness on 13/2/12.

Sheep No. 3 had been on the untreated control paddock for over two months before being placed on this lime paddock.

Paddock No. 3, Te Pu; area, 2 acres. Top-dressed with superphosphate, 5 cwt. per acre, November, 1910. Stocked with wether sheep sixteen months old.

Sheep.	Date when placed in Paddock.	Appearance of First Noticeable Symptoms.	Result.
No. 1 ..	8/1/11	..	Died from accident, 30/8/11.
No. 2 ..	8/1/11	8/10/11	Died, 10/11/11. See below.
No. 3 ..	8/1/11	2/10/11	Died, 16/11/11.
No. 4 ..	30/4/11	..	Removed in good health, 12/2/12.
No. 5 ..	30/4/11	..	Removed in good health, 12/2/12.
No. 6 ..	30/4/11	11/2/12	Died of bush sickness, 1/4/12.

Sheep Nos. 2 and 3 died a day or two after having been shorn, the weather being very cold and wet. Both were, however, affected with bush sickness, but under normal weather-conditions they would probably have lived some weeks longer.

Paddock No. 4, Te Pu; area, 2 acres. Top-dressed with basic slag, 10 cwt. per acre, November, 1910. Stocked with five wether sheep sixteen months old, and one ewe twenty-eight months old.

Sheep.	Date when placed in Paddock.	Appearance of First Noticeable Symptoms.	Result.
No. 1 ..	8/1/11	..	Died through accident, 15/8/11.
No. 2 ..	8/1/11	..	Died through accident, 28/9/11.
No. 3 ..	8/1/11	8/11/11	Died of bush sickness, 25/11/11.
No. 4 ..	30/4/11	27/1/12	Died of bush sickness, 3/3/12.
No. 5 ..	30/4/11	6/2/12	Died of bush sickness, 29/4/12.
No. 6 (ewe) ..	30/4/11	6/2/12	Removed in good health, 12/2/12.

Paddock No. 5, Te Pu; area, 2 acres. Top-dressed with calcium nitrate, 2 cwt. per acre, November, 1910. Stocked with wether sheep sixteen months old.

Sheep.	Date when placed in Paddock.	Appearance of First Noticeable Symptoms.	Result.
No. 1 ..	8/1/11	29/9/11	Died of bush sickness, 3/10/11.
No. 2 ..	8/1/11	24/10/11	Died, 10/11/11.
No. 3 ..	8/1/11	5/11/11	Died, 10/11/11.
No. 4 ..	30/4/11	..	Removed in good health, 12/2/12.
No. 5 ..	30/4/11	..	Removed in good health, 12/2/12.

Sheep Nos. 2 and 3 died after shearing, the weather being very wet and cold. Both were affected with bush sickness in a fairly advanced stage, but the inclement weather immediately after they were shorn hastened their death.

Paddock No. 6, Te Pu (control); area, 2 acres. No top-dressing. Stocked with wether sheep sixteen months old.

Sheep.	Date when placed in Paddock.	Appearance of First Noticeable Symptoms.	Result.
No. 1 ..	8/1/11	..	Transferred to paddock No. 2, 28/3/11.
No. 2 ..	8/1/11	24/10/11	Died of bush sickness, 13/11/11.
No. 3 ..	8/1/11	5/11/11	Died of bush sickness, 3/1/12.
No. 4 ..	30/4/11	6/2/12	Died of bush sickness, 27/4/12.
No. 5 ..	30/4/11	6/2/12	Died of bush sickness, 16/5/12.
No. 6 ..	30/4/12	..	Removed in good health, 12/2/12.

SERIES NO. 3, AT MAMAKU.

Land partially cleared bush country with many stumps and fallen logs on surface. Surface-sown with cocksfoot and clover some years since.

Paddock No. 1; area, 2 acres. Top-dressed with ground limestone, 2 tons, and superphosphate, 5 cwt., per acre, November, 1910. Stocked with one steer about eighteen months old, and two wether sheep of about the same age.

Animal.	Date when placed in Paddock.	Appearance of First Noticeable Symptoms.	Result.
Steer ..	19/4/11	..	Developed bush sickness end of December, 1912. Then removed to experimental farm and placed under medicinal treatment. Still at farm, and is improving.
Sheep No. 1 ..	8/1/11	2/12/11	Died from accident, 15/12/11.
Sheep No. 2 ..	8/1/11	31/10/11	Died from bush sickness, 15/12/11.

Paddock No. 2; area, 2 acres. Top-dressed with lime, 1 ton per acre, November, 1910. Stocked with one steer and two wether sheep, all about eighteen months old.

Animal.	Date when placed in Paddock.	Appearance of First Noticeable Symptoms.	Result.
Steer ..	19/4/11	10/5/12	Removed to "healthy" country. Sold, fully recovered, in March, 1913.
Sheep No. 1 ..	8/1/11	25/9/11	Died of bush sickness, 18/10/11.
Sheep No. 2 ..	8/1/11	25/9/11	Died of bush sickness, 1/11/11.

Paddock No. 3; area, 2 acres. Top-dressed with sulphate of iron, 5 cwt. per acre, November, 1910. Stocked with one steer and two wether sheep, all about eighteen months old.

Animal.	Date when placed in Paddock.	Appearance of First Noticeable Symptoms.	Result.
Steer ..	19/4/11	..	Still healthy and growing well at March, 1913, when sold to butcher.
Wether No. 1	25/2/11	..	Found dead 19/12/11, four days after shearing. Carcase was in good condition, and death was not due to bush sickness.
Wether No. 2	25/2/11	1/12/12	Lived until January, 1913, and then died of bush sickness.

Paddock No. 5; area, approximately 100 acres, much of it in standing bush. Utilized to accommodate control animals. No top-dressing. Stocked with four steers about fifteen months old, four ewes and four wethers about fifteen months old, and three lambs.

Sheep.	Date when placed in Paddock.	Appearance of First Noticeable Symptoms.	Result.
Steer No. 1 ..	8/1/11	..	Found dead. Possibly accident.
Steer No. 2 ..	8/1/11	..	Developed bush sickness, end of December, 1912. Removed to experimental farm, and there improved, and was sold.
Steer No. 3 ..	8/1/11	..	Still healthy in March, 1913, when sold to butcher.
Steer No. 4 ..	8/1/11	15/9/12	Removed when very noticeably affected, 16/11/12. Died, 31/3/13.
Ewe No. 1 ..	16/10/10	18/7/11	As had developed into a good case of bush sickness, was killed (5/9/11) in order to secure post-mortem specimens.
Ewe No. 2 ..	16/10/10	..	Remained healthy until killed by dogs about 10/11/12.
Ewe No. 3 ..	16/10/10	..	Remained healthy until killed by dogs about 10/11/12.
Ewe No. 4 ..	16/10/10	..	Remained healthy until killed by dogs about 10/11/12.
Wether No. 1	16/10/10	..	Found dead, 15/6/11. Doubtful whether bush sickness cause of death.
Wether No. 2..	16/10/10	..	Found dead, 2/5/12. Cause of death not bush sickness.
Wether No. 3..	16/10/10	..	Remained healthy until killed by dogs about 10/11/12.
Wether No. 4..	16/10/10	..	Remained healthy until killed by dogs about 10/11/12.
Lamb No. 1 ..	16/10/10	25/2/11	Killed, 6/3/11, when well affected with bush sickness.
Lamb No. 2 ..	16/10/10	23/4/11	Despatched to Wellington for experimental purposes, 30/4/11; affected then with bush sickness.
Lamb No. 3 ..	16/10/10	..	Remained healthy until killed by dogs about 10/11/12.

SERIES NO. 4, AT LICHFIELD.

Open undulating country at lower level. Is considered "healthy" for cattle, but not for sheep, especially lambs. All four of the paddocks used were first ploughed and sown down with English grasses and

clover. The control paddock had been in grass for several years, and was not ploughed.

Paddock No. 1; area, 2 acres. Top-dressed with 3 tons of carbonate of lime and 2½ cwt. superphosphates per acre, January, 1912. Stocked with three pregnant ewes about one year and nine months old.

Animal.	Date when placed in Paddock.	Appearance of First Noticeable Symptoms.	Result.
Ewe No. 1 ..	19/6/11	11/4/12	Removed, 10/6/12; then noticeably suffering from bush sickness.
Ewe No. 2 ..	19/6/11	1/6/12	Removed, 10/6/12; then slightly affected with bush sickness.
Ewe No. 3 ..	19/6/11	..	Removed, 10/6/12; then healthy.
Lamb No. 1 ..	Date birth, about 5/8/11	11/12/11	Died of bush sickness, 25/1/12.
Lamb No. 2 ..	Date birth, about 5/8/11	3/2/12	Killed, 17/3/12; then badly affected with bush sickness.
Lamb No. 3 ..	Date birth, about 5/8/11	22/2/12	Died of bush sickness, 30/3/12.

Paddock No. 2; area, 2 acres. Top-dressed with 5 cwt. salt and 2½ cwt. superphosphate per acre, January, 1911. Stocked with one barren and two pregnant ewes about one year and nine months old.

Animal.	Date when placed in Paddock.	Appearance of First Noticeable Symptoms.	Result.
Ewe No. 1 ..	19/6/11	..	Removed, 10/6/12, healthy.
Ewe No. 2 ..	19/6/11	..	Removed, 10/6/12, healthy.
Ewe No. 3 ..	19/6/11	..	Removed, 10/6/12, healthy.
Lamb No. 1 ..	Date birth, about 5/8/11	22/2/12	Died of bush sickness, 17/4/12.
Lamb No. 2 ..	Date birth, about 5/8/11	5/3/12	Killed when badly affected with bush sickness, 17/3/12.

Paddock No. 3; area, 2 acres. Top-dressed with sulphate of iron, 5 cwt. per acre, January, 1911. Stocked with three pregnant ewes about one year and nine months old.

Animal.	Date when placed in Paddock.	Appearance of First Noticeable Symptoms.	Result.
Ewe No. 1 ..	19/6/11	..	Removed, 10/6/12, healthy.
Ewe No. 2 ..	19/6/11	..	Removed, 10/6/12, healthy.
Ewe No. 3 ..	19/6/11	..	Removed, 10/6/12, healthy.
Lamb No. 1 ..	Date birth, about 15/8/11	5/3/12	Found dead, 15/4/12; probably died from bush sickness.
Lamb No. 2 ..	Date birth, about 15/8/11	..	Died, 20/11/12, after shearing. Cause of death, bush sickness, accelerated by exposure after wool removed.
Lamb No. 3 ..	Date birth, about 15/8/11	..	Died, 28/11/12. Carcase in very fair condition. Doubtful whether affected bush sickness.

Paddock No. 4; area, 3 acres. Top-dressed with basic slag, 10 cwt. per acre, January, 1911. Stocked with one barren and three pregnant ewes about one year and nine months old.

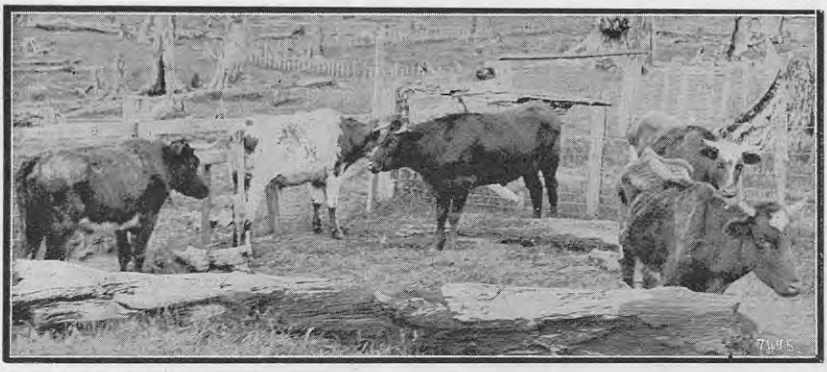
Animal.	Date when placed in Paddock.	Appearance of First Noticeable Symptoms.	Result.
Ewe No. 1 ..	19/6/11	..	Removed, 10/6/12, healthy.
Ewe No. 2 ..	19/6/11	..	Removed, 10/6/12, healthy.
Ewe No. 3 ..	19/6/11	..	Removed, 10/6/12, healthy.
Ewe No. 4 ..	19/6/11	..	Removed, 10/6/12, healthy.
Lamb No. 1 ..	Date birth, about 15/8/11	11/1/12	Died of bush sickness, 28/1/12.
Lamb No. 2 ..	Date birth, about 15/8/11	13/2/12	Killed when in extremis, badly affected with bush sickness, 25/3/12.
Lamb No. 3 ..	Date birth, about 15/8/11	..	Still alive and well, 20/12/12. Later developed bush sickness, was removed to healthy country, and recovered.

Paddock No. 5; area, about 30 acres. Used as control. No top-dressing. Stocked with one barren and four pregnant ewes about one year and nine months old (one of which gave birth to twin lambs), and three hoggets.

Animal.	Date when placed in Paddock.	Appearance of First Noticeable Symptoms.	Result.
Ewe No. 1 ..	19/6/11	11/12/11	Died of bush sickness, 14/1/12.
Ewe No. 2 ..	19/6/11	30/4/12	Died of bush sickness, 15/6/12.
Ewe No. 3 ..	19/6/11	10/6/12	Removed, 10/6/12; then showing symptoms of bush sickness.
Ewe No. 4 ..	19/6/11	10/6/12	Removed, 10/6/12; then showing symptoms of bush sickness.
Ewe No. 5 ..	19/6/11	10/6/12	Removed, 10/6/12; then showing symptoms of bush sickness.
Hogget No. 1..	8/10/10	28/8/11	Exhibited well-marked symptoms of bush sickness, 5/9/11, and then sent to Wellington for experimental purposes.
Hogget No. 2..	8/10/10	28/10/11	Exhibited well-marked symptoms of bush sickness, 5/9/11, and then sent to Wellington for experimental purposes.
Hogget No. 3..	8/10/10	28/11/11	Died of bush sickness, 18/12/11.
Lamb No. 1 ..	Date birth	28/11/11	Died of bush sickness, 17/12/11.
Lamb No. 2 ..	Date birth	11/12/11	Died of bush sickness, 7/1/11.
Lamb No. 3 ..	Date birth	11/12/11	Died of bush sickness, 24/1/12.
Lamb No. 4 ..	Date birth	19/1/12	Died of bush sickness, 22/2/12.
Lamb No. 5 ..	Date birth	22/2/12	Died of bush sickness, 25/3/12.

It should be noted that in the experiments carried out at Te Pu and at Mamaku the animals were kept supplied with rock salt practically throughout the whole time, while at Lichfield rock salt was not used. It was most unfortunate that so many sheep were killed by dogs, no fewer than six of the control sheep at Mamaku being lost on one night. These control animals were being watched with great interest, as they had kept in good health for a much longer period

than had been anticipated, and their untimely death prevented the attainment of what would very probably have proved most useful information. They were running over a large area (100 acres), much of it in standing bush, and it would appear that they had been able to select feeding-areas where the herbage contained all the food constituents necessary for the maintenance of health and vigour. This is especially interesting in view of the fact that the district is one which is recognized as being affected much more than the Lichfield district. Yet in the Lichfield experiments every one of the control sheep developed bush sickness, and their lambs died several months before those on the dressed paddocks. Another interesting point is that in series No. 1 the sheep on the lime-treated paddock, even before exhibiting definite symptoms of sickness, did not thrive so well as did those on



B. C. Aston, photo.

THE LEAN STEERS ON RIGHT ARE FROM CONTROL PADDOCK (SERIES NO. 3), MAMAKU.

the other paddocks, including the controls. In series Nos. 1 and 3 the moist climate and the conditions of the land (partially cleared bush land) was not such that a farmer would term "good sheep-country," and, quite apart from the question of bush sickness, the land is far better fitted for grazing cattle, the existing natural conditions in themselves constituting a handicap to the maintenance of sound health in sheep.

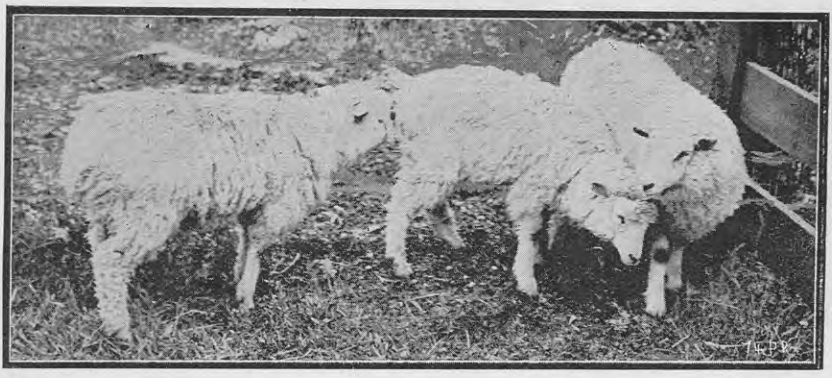
A study of these experiments, including those detailed in the April issue of the *Journal*, indicates that the best results were obtained, in the case of cattle, with soil-dressings of (1) superphosphate, (2) sulphate of iron, (3) blood and bones (with luxuriant herbage ploughed in), (4) guano (with luxuriant herbage ploughed in); in the case of sheep, with (1) sulphate of iron, (2) basic slag, (3) superphosphate.

With cattle the most striking results were obtained with superphosphate, these being emphasized by the comparison furnished by the

control steers (see April issue). The steer in the iron paddock in No. 3 series also furnished an example of the value of the top-dressing applied, his growth, development, and good condition being well marked

Those steers on the control paddock which kept healthy longest acquired the habit of disappearing into the bush for months at a time, then probably feeding on the bush rather than on pasture. N.B.—Wild cattle running in the bush are popularly supposed not to suffer from bush sickness.

It will be noted that with sheep the best results were obtained from those depastured upon paddocks top-dressed with iron sulphate (paddock No. 3, series No. 4). In this case the ewes kept in excellent condition throughout, and reared their lambs successfully, with one exception,



B. C. Aston, photo.] BUSH-SICK LAMBS.

and that lamb had reached good marketable condition, and could have been profitably sold, before any indication of bush sickness was manifested by it. Further, on the other two experiments in series 4, where no iron dressing was used, all the lambs died; and in the adjacent control paddock not only did all the lambs die, but also all the three hoggets and two of the five ewes on it. In the case of the other iron-sulphate experiments with sheep it was unfortunate that one of the two animals used died through accident. The other, however, maintained excellent health and condition for a long period, ultimately dying of bush sickness in January, 1913.

Regarding the basic-slag sheep experiments, the most noticeable feature was the manner in which up to a certain point the sheep throve. The soil-dressing had the effect of producing a luxuriant growth of herbage (see photo, *Journal*, July, 1912, Vol. v, p. 26), especially of clover, and the animals put on flesh and really fattened.

Too much rich feed, with its concomitant lack of necessity for exercise, is not good for the prolonged maintenance of health and vigour in sheep, fatty infiltration of the liver usually resulting; and this may have been a contributing factor in the less successful result of the basic-slag experiment. As it was, it gave better results with sheep than did the other top-dressing experiments (except the iron sulphate) in series 1 and 4.

The good results obtained with sheep from sulphate of iron used as top-dressing were rather seriously discounted by a later experiment conducted at Te Pu, where ewes, placed some time before lambing in paddocks top-dressed with this, died a few months later, together with their lambs; a further similar experiment at Lichfield also proving far less successful than did the first. There can, however, be no doubt, when the results on the control paddock are compared with those on the dressed plots, that the fertilizers exercised a very favourable effect on the health of the animals.

One point must be noted in connection with these later sheep experiments—viz., that the ewes utilized for them were designedly obtained from just over the reputed border of the affected country, where sheep can certainly be successfully kept, but probably have, so to speak, no reserve to draw upon when taken on to bush-sick land.

To sum up, we have had excellent results with cattle, but still have to determine whether, and by what means, sheep can be kept and lambs reared successfully. The Mamaku farm is now stocked with sixty two-year-old in-calf heifers, thirty yearling steers, and twenty-five in-lamb ewes. We look for good results with the cattle, and are hopeful regarding the sheep, though realizing that they present far greater difficulties.

In the swede manurial experiments at Ruakura Farm of Instruction the bones-and-superphosphate mixture has given the highest yield (40 tons to the acre), the no-manure plot yielding only 2½ tons. The blood-and-bone mixture gave the lowest yield.

The town does not need the retired farmer, while the farm does need his experience and his capital. A retired farmer is capital going to waste.—*Scientific American.*

THE successful farmer does not leave everything to chance. He provides in ample time against weather-adversity and crop-failure, and he is coming to appreciate the fact that one of the best means to this end is silage.

FRUITGROWING IN THE WAIKATO.

LESSONS FROM RUAKURA.

A. W. GREEN.

THE Waikato district is eminently adapted for the cultivation of fruits of the Temperate Zone. In the earlier days of settlement commercial fruitgrowing was carried on in this part of the Dominion by quite a large number of orchardists, but of late years dairying has largely displaced the industry. There was therefore no necessity to demonstrate at Ruakura Farm of Instruction that fruit could be grown in the Waikato. An experimental orchard was, however, established in order to discover and demonstrate the varieties of different classes of fruits most suitable for the locality, to illustrate the most satisfactory methods of pruning, and to test the value of different spraying and other compounds for the control of disease.

In reporting on the orchard at the present time it must be remembered that the trees are yet young. Some have been six years planted, others but five years, while the remainder were subsequently added by annual plantings. The selected area at the first planting presented an exceedingly rough appearance, being undrained poor kahikatea swamp. Consequently it could not be expected that the trees would make much headway for a time, and experience has shown that progress is slow for the first two years under such conditions.

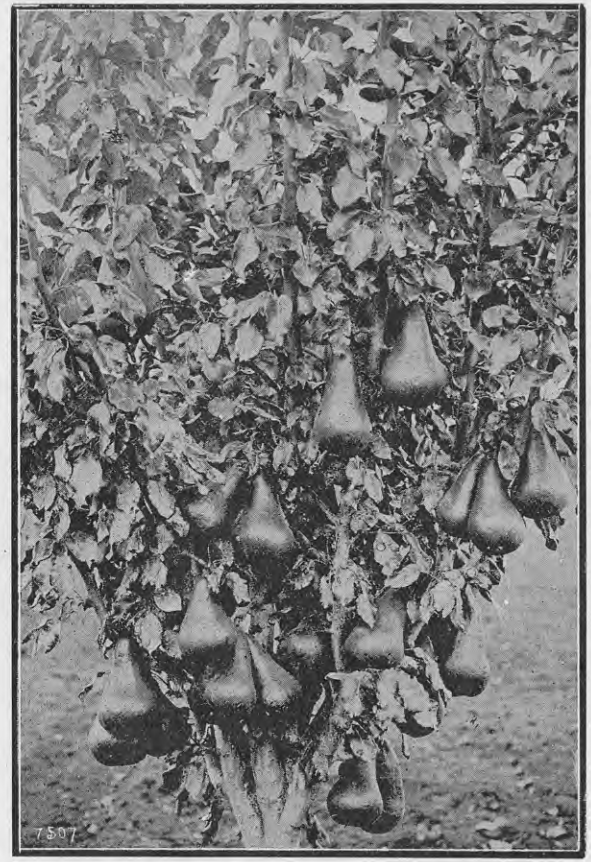
Success, however, with some varieties on this class of land is each season becoming further assured. On the other hand, with the vast number of varieties under test, it can be seen that some will prove unsuitable for this locality. They will not flourish in this environment with the same degree of success met with in other soils and situations.

To any one desiring to plant in this district, an inspection of the orchard would be amply repaid. It is most instructive to observe and compare how well one variety thrives while another alongside it can barely exist.

With the exception of a block laid out for spraying experiments, the number of trees of each variety is limited to two. In order to conduct trials with various spraying-compounds it was considered necessary to plant a block with a few well-known varieties, and a sufficient number

HARRINGTON'S VICTORIA PEAR.

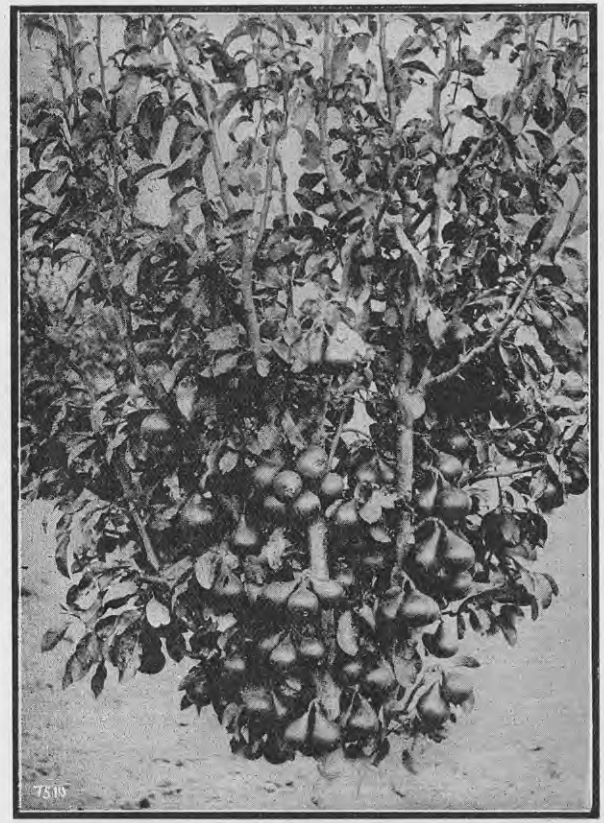
Four-year-old tree, 4 ft. 6 in. high; 20 lb. of fruit; fine late-keeping variety; bears early.



GROSSE CALIBASSE PEAR.

Five-year-old tree, 6 ft. high; 53 lb. of fruit.

DIRECTEUR HARDY PEAR.
Seven-year-old tree, 8 ft. high; 114 lb. of fruit.

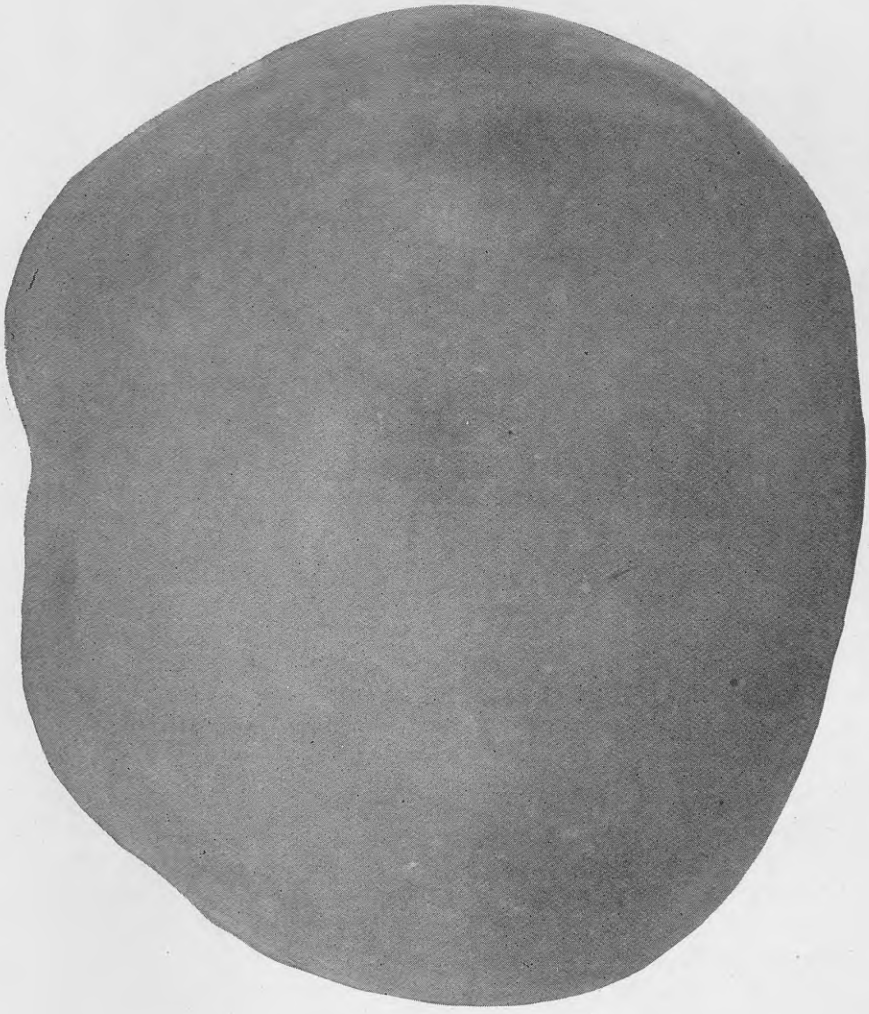


BEURRE DE CAPIAUMONT PEAR.
Five-year-old tree, 6 ft. high; 42 lb. of fruit.

of each to provide the means for properly conducting the desired experiments. In all such trials it is essential that trees of the same variety should be included in each test, as a basis for comparison. The opposite occurs with variety trials, and with these one spray is used throughout. It is the pruning which is difficult to regulate in variety tests. The amount and style of pruning unavoidably varies, according to the vigour of the tree and the habit of growth characteristic of the variety. Nevertheless, the same system is followed as much as possible. The amount of cultivation and the manure to be applied can easily be regulated.

In regard to spraying, this season's results have contributed something to past records, especially in regard to the control of codlin-moth and scab. It is generally recognized in spraying that the treatment necessary to counteract the disease must be applied before the disease presents itself, the spray acting as a preventive measure rather than as a cure. Too much stress, therefore, cannot be laid on the importance of winter sprayings. It has proved profitable to apply two winter sprayings of Bordeaux mixture at a strength of 10-10-40 for the control of apple and pear scab (*Fusicladium dendritricum*). This materially reduces the number of summer sprayings necessary to hold the disease in check. With some varieties no summer applications have been considered needful. Directeur Hardy, Harrington's Victoria, and P. Barry pears, and Duke of Clarence, Aromatic Russet, Brownlee's Russet, Wealthy, Lord Derby, and Cole's Rymer apples, all gave clean fruit without any application of the summer formula. Summer sprayings were found indispensable for the following varieties of pears: Beurre Diel, Vicar of Winkfield, Marie Louise, D'Uccles, and Williams's Bon Chrétien; and for the following varieties of apples: Adam's Permain, Sharp's Midseason, Romanite, Red Quarrenden, Tairaru Seedling, Betty Geeson, and Rhodes Orange.

With peaches it has also been proved that for the die-back fungus (*Clasterosporium carpophilum*) two sprayings are to be preferred, the first to be applied as soon as possible after the leaves have fallen and the second just before the blossom-buds open, using the Bordeaux mixture at a strength of 10-10-40. Little good can be done by spraying after the disease has made its appearance, therefore spray before the disease appears. This same rule must be remembered when applying arsenate of lead for codlin-moth (*Carpocapsa pomonella*). Get in early or the moth will win. To combat mussel scale (*Mytilaspis pomorum*), woolly aphis (*Schizoneura lanigera*), and red spider (*Bryobia pratensis*), a winter spraying of red oil, or lime-salt and sulphur, is all-important. Miss this spray and these pests will give endless trouble during the summer. C. D. Jarvis, in his bulletin on apple-growing, sums up the



PRINCE ALFRED APPLE.

Natural size; picked from five-year-old tree, bearing 40 lb. of fruit. The apple pictured weighs 22 oz.

whole problem explicitly and correctly in these few words: "Know the pest; know what to use; know when to use it; apply it thoroughly."

To illustrate the results obtained at Ruakura a few photos are herewith reproduced.

Some varieties which prove suitable for planting in this locality are here tabulated. There are other promising varieties not included in this list, but the trees are young, and it will take some time to prove their suitability:—

Peaches: Brigg's Red May, Wiggins, Early Newington, Ruby Red, Hales' Early, Triumph, and Reeves' Golden Nugget.

Nectarines: Goldmine and Ansenne.

Apples: Scarlet Permain, Golden Pippin, Irish Peach, Duchess of Oldenburg, Prince Alfred, Willie Sharp, Early Almond, New Rock Pippin, Brownlee's Russet, and Jonathan.

Pears: Directeur Hardy, Beurre de Capiaumont, Howell, Kieffer Hybrid, Williams's Bon Chrétien, Grosse Calibasse, and Harrington's Victoria.

PUBLIC DEMONSTRATIONS IN APPLE GRADING, PACKING, ETC.

DURING the months of March and April public demonstrations in apple packing and grading, pruning and spraying, general fruit-culture, and tomato-culture were given at the following places by the Orchard Instructors:—

Wade, Birkdale, Albany: N. R. Pierce.

Silverdale, Birkdale, Albany: W. C. Thompson.

Levin, Palmerston North, Feilding, Wanganui, Urenui, Rata, Greytown: G. Stratford.

Lower Hutt: T. C. Webb, jun.

Pangatotara, Ngatimoti, Lower Moutere, Richmond: J. H. Thorp.

Blenheim: B. G. Goodwin.

Totara Flat, Reefton: W. J. Courtier.

Adair, Hunter, Willowbridge, Morven, Waimate, Oamaru: A. B. Mansfield.

In the horticultural section at the Ruakura Farm of Instruction a fruit-house has been provided, to test the keeping-qualities of different varieties of apples and pears, and to serve as a showroom where the fruit can be labelled and properly displayed for the benefit of visiting fruitgrowers.

CHEESE.

EXAMINATIONS FOR CONTENT OF MOISTURE AND FAT.

W. E. GWILLIM.

THE particulars given here are the results of cheese examined for content of moisture and fat from the 9th January to the 20th March of this year, and is a continuation of the work described in the first article on this subject, which appeared in the January and February numbers of this *Journal*.

The examinations were conducted on similar lines. Samples of cheese of all grades of quality were examined, and the age of each cheese was noted, the value of the body and texture being scored in points.

Appended to list A (Part II) is a summary of the average percentages of each factory brand for the periods from the 17th October to the 27th December, and from the 9th January to the 20th March, and also a summary of the average percentages of the brands as shipped by each fortnightly steamer.

A comparison of both parts of each list, of the percentage of cheese having a moisture-content between 35 and 38 per cent. and fat-content between 32 and 35 per cent., is as follows :—

—	Highest Percentage.	Lowest Percentage.	Average Percentage.	Percentage of Samples.
List A : Moisture—				
Part I	38·2	35·0	36·85	95
Part II	38·6	32·8	35·46	56
List A : Fat—				
Part I	36·8	31·2	33·64	75
Part II	36·8	29·6	34·41	47
List B : Moisture—				
Part I	38·8	33·4	36·25	83
Part II	37·4	33·2	35·34	61
List B : Fat—				
Part I	36·8	30·4	33·78	81
Part II	37·6	31·2	34·15	56
List C : Moisture—				
Part I	39·5	32·3	36·06	66
Part II	36·0	34·4	35·23	50
List C : Fat—				
Part I	36·8	30·8	33·73	75
Part II	37·2	34·0	35·40	12

The cheeses in list C are of indifferent make. In the first part 27 per cent. and in the second part 62 per cent. were second grade, on account of defects in body and texture. It is apparent from these

examinations that this class of cheese has nothing to commend its manufacture.

This work will conclude with the close of the export season, and a final report will appear in due course.

LIST A, PART II.

Particulars of fifty-nine samples of cheese examined for content of moisture and fat, ex lots from ten factories in the Wairarapa and Forty-mile Bush districts, exported by the six fortnightly steamers "Ruapehu," "Athenic, "Turakina," "Corinthic," "Remuera," and "Arawa," which sailed 9th January to 20th March, 1913, inclusive. One sample from each brand each fortnight. Body and texture about normal for acid. Maximum grading score obtainable for body and texture, 30 points.

Number for Factory Brand.	Moisture.	Fat.	Casein and other Solids.	Age, and Notes at Sampling.		
				Days old.	Body and Texture.	
					Points.	Remarks.
	Per Cent.	Per Cent.	Per Cent.			
1	34·6	33·6	31·8	27	28½	..
	35·4	32·4	32·2	12	28	..
	36·3	34·8	28·9	12	28	On green side.
	36·4	34·8	28·8	9	28	,,
	35·8	36·0	28·2	18	28	Little acidy.
	35·1	35·0	28·9	15	28	On green side.
Average ..	35·60	34·60	29·80	15·6	28·1	
2	38·6	32·0	29·4	20	28	Little weak and open.
	35·6	34·4	30·0	21	28	Little weak.
	35·5	34·4	30·1	22	28½	..
	35·3	34·8	29·9	25	28	..
	35·0	36·8	28·2	19	28½	Tender enough.
	36·2	35·6	28·2	22	28½	..
Average ..	36·03	34·67	29·30	21·5	28·3	
3	35·0	33·6	31·4	24	29	..
	35·8	31·6	32·6	25	29	..
	35·3	34·4	30·3	20	28	..
	34·6	35·2	30·2	27	29	..
	35·2	35·2	29·6	22	29	..
	35·4	36·0	28·6	16	29	..
Average ..	35·22	34·33	30·45	22·3	28·8	
4	35·2	33·2	31·6	17	28½	On green side.
	34·0	33·6	32·4	21	29	..
	33·7	35·6	30·7	18	28½	..
	32·8	35·6	31·6	15	28½	..
	34·6	36·4	29·0	15	29½	Good.
	34·4	36·4	29·2	25	29	..
Average ..	34·12	35·13	30·75	19·5	28·8	

Number for Factory Brand.	Moisture.	Fat.	Casein and other Solids.	Age, and Notes at Sampling.		
				Days old.	Body and Texture.	
					Points.	Remarks.
	Per Cent.	Per Cent.	Per Cent.			
5	38·4	32·0	29·6	14	28	On green side.
	37·0	29·6	33·4	14	28	,,
	38·0	32·8	29·2	20	28	Little weak.
	36·3	34·5	29·2	20	28	..
	36·0	34·4	29·6	14	28	On green side.
	36·8	32·0	31·2	14	28	,,
Average ..	37·08	32·55	30·37	16	28	
6	35·0	32·8	32·2	19	28½	..
	35·4	32·8	31·8	19	28½	..
	37·2	33·6	29·2	31	28	..
	35·7	33·2	31·2	17	28	Little acidy.
	35·4	35·6	29·0	18	29	..
	36·0	34·4	29·6	29	29	..
Average ..	35·78	33·73	30·49	22·2	28·5	
7	38·6	31·2	30·2	24	29½	Good.
	36·4	31·2	32·4	25	28½	..
	34·6	35·6	29·8	21	28½	..
	34·5	35·6	29·9	30	28½	..
	35·4	33·6	31·0	25	28½	..
	36·0	35·2	28·8	16	29	..
Average ..	35·92	33·73	30·35	23·5	28·7	
8	35·6	34·2	30·2	34	28½	..
	36·0	34·4	29·6	33	28	..
	..	..	..	..	..	(None shipped.)
	35·3	34·8	29·9	18	28	..
	34·8	36·0	29·2	22	28½	..
	36·0	36·0	28·0	21	28	..
Average ..	35·54	35·08	29·38	25·6	28·2	
9	35·8	33·6	30·6	25	29½	Good.
	36.2	34·4	29·4	28	28½	..
	33·9	36·0	30·1	28	28½	Tender enough.
	34·2	35·6	30·2	28	29	..
	34·8	36·4	28·8	23	28½	Tender enough.
	34·2	36·8	29·0	24	29	..
Average ..	34·85	35·47	29·68	26	28·8	
10	34·8	33·6	31·6	24	28½	..
	34·6	32·8	32·6	20	28	..
	34·4	34·4	31·2	20	28½	Tender enough.
	34·2	36·0	29·8	31	29	..
	34·2	35·6	30·2	24	28½	..
	34·8	36·4	28·8	21	28½	Tender enough.
Average ..	34·50	34·80	30·70	26·3	28·5	

Summary of the Average Percentages from 9th January to 20th March, 1913.

Number for Factory Brand.	Moisture.	Fat.	Casein and other Solids.	Age, and Notes at Sampling.		
				Days old.	Body and Texture.	
					Points.	Remarks.
1	35·60	34·60	29·80	15·6	28·1	..
2	36·03	34·67	29·30	21·5	28·3	..
3	35·52	34·33	30·45	22·3	28·8	..
4	34·12	35·13	30·75	19·5	28·8	..
5	37·08	32·55	30·37	16·0	28·0	..
6	35·78	33·73	30·49	22·2	28·5	..
7	35·92	33·73	30·35	23·5	28·7	..
8	35·54	35·08	29·38	25·6	28·2	..
9	34·85	35·47	29·68	26·0	28·8	..
10	34·50	34·80	30·70	23·3	28·5	..
Average ..	35·47	34·40	30·13	21·5	28·5	..

Summary of the Average Percentages in First Part of this List from 17th October to 24th December, 1912.

Number for Factory Brand.	Moisture.	Fat.	Casein and other Solids.	Age, and Notes at Sampling.		
				Days old.	Body and Texture.	
					Points.	Remarks.
1	37·17	32·67	30·16	..	..	..
2	37·43	33·40	29·17	..	..	..
3	36·98	33·80	29·22	..	..	..
4	36·08	33·80	30·12	..	..	..
5	37·41	33·20	29·39	..	..	..
6	36·75	33·40	29·85	..	..	..
7	36·87	34·33	28·80	..	..	..
8	36·48	33·93	29·59	..	..	..
9	37·03	33·40	29·37	..	..	..
10	36·25	34·53	29·22	..	..	..
Average ..	36·85	33·64	29·51	..	..	..
General average	36·16	34·02	29·82			..

Summary of Average Percentages of the Ten Brands shipped by each Fortnightly Steamer.

Steamer.	Moisture.	Fat.	Casein and other Solids.	Days old.	Points.	Sailing-date.
	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	1913.
Arawa	35·49	35·48	29·03	20·3	28·6	March 20.
Remuera	35·12	35·60	29·28	20·0	28·6	,, 6.
Corinthic	34·93	35·01	30·06	22·0	28·4	February 20.
Turakina	35·43	34·62	29·95	21·3	28·3	,, 7.
Athenic	35·66	32·70	31·64	21·8	..	January 24.
Ruapehu	36·16	32·98	30·86	22·8	..	,, 9.
Average (second six shipments)	35·47	34·40	30·13	21·5	28·5	
						1912.
Ionic	36·88	33·44	29·68	20·0	..	December 27.
Rotorua	36·85	32·72	30·43	21·5	..	,, 12.
Tainui	36·90	33·08	30·02	..	..	November 28.
Ruahine	36·93	33·60	29·47	..	..	,, 14.
Arawa	36·46	34·40	29·14	..	..	,, 1.
Remuera	37·06	34·64	29·30	..	..	October 17.
Average (first six shipments)	36·85	33·64	29·51	..	..	
General average ..	36·16	34·02	29·82	..	..	

LIST B, PART II.

Particulars of thirty-six samples of cheese examined for content of moisture and fat, ex lots of thirty-one factories graded at grading-ports as stated and shipped by various Home-going steamers which sailed from the 9th January to the 20th March, 1913, inclusive. Body and texture about normal for acid. Maximum grading score obtainable for body and texture, 30 points.

Tested to	Graded at	No. for Brand.	Moisture.	Fat.	Casein and other Solids.	Age, and Notes at Sampling.		
						Days old.	Body and Texture.	
							Points.	Remarks.
			Per Cent.	Per Cent.	Per Cent.			
9/1/13	Wellington ..	99	34·6	33·6	31·8	27	28½	
24/1/13	,, ..	103	35·8	32·0	32·2	21	29	
	,, ..	4	33·6	36·0	30·4	18	29	
	Patea ..	70	36·6	33·2	30·2	35	28	
	,, ..	104	36·8	32·0	31·2	34	28	
	New Plymouth	105	36·8	33·2	30·0	25	28	
	,,	84	34·6	34·8	30·6	18	29	
	,,	83	37·4	32·0	30·6	27	28	Little weak.
	,,	106	34·6	32·8	32·6	28	28	
	,,	87	35·0	32·8	32·2	30	28	
	,,	107	36·0	32·8	31·2	30	28½	
	,,	102	35·2	32·4	32·4	21	28	

Tested to	Graded at	No. for Brand.	Moisture.	Fat.	Casein and other Solids.	Age, and Notes at Sampling.		
						Days old.	Body and Texture.	
							Points.	Remarks.
			Per Cent.	Per Cent.	Per Cent.			
	New Plymouth	108	36·0	31·2	32·8	30	28	Little acidy.
	,,	109	35·4	33·2	31·4	27	29	
	Lyttelton ..	110	35·2	32·8	32·0	34	28	Firm enough.
	,, ..	111	34·8	32·8	32·4	30	28	
	,, ..	112	34·0	34·0	32·0	25	28½	
	,, ..	113	36·0	32·0	32·0	30	28	Firm enough.
7/2/13	Wellington ..	103	35·6	35·6	28·8	28	29	
	,, ..	15	36·0	34·8	29·2	20	28½	Firm enough.
	,, ..	99	34·6	34·8	30·6	28	28½	
	,, ..	52	33·4	36·0	30·6	33	29	
	,, ..	114	34·4	36·0	29·6	18	28	Little acidy.
	,, ..	115	35·6	36·0	28·4	24	28	Tender enough.
	Patea ..	116	35·8	34·0	30·2	35	28	Could be firmer.
	,, ..	117	33·4	37·2	29·4	26	28	Firm side ; salty.
	,, ..	59	36·4	34·4	29·2	24	29	
6/3/13	Wellington ..	118	35·2	36·0	28·8	16	28	
	,, ..	119	34·5	34·4	31·1	25	29	
	,, ..	4	33·2	37·6	29·2	23	29	
	,, ..	55	36·4	35·2	28·4	31	28½	
	,, ..	50	34·6	36·4	29·0	15	29½	Good.
	,, ..	65	35·6	35·6	28·8	20	28½	
	,, ..	2	35·8	35·2	29·0	16	28	Little weak.
	New Plymouth	107	36·6	33·2	30·2	20	28	,,
	,,	102	36·8	33·2	30·0	24	28½	
	Average ..	..	35·34	34·15	30·51	25·4	28·4	

Summary of Averages.

Graded at	No. of Samples.	Moisture.	Fat.	Casein and other Solids.	Days old.	Points.
		Per Cent.	Per Cent.	Per Cent.		
Wellington	16	34·93	35·33	29·74	22·7	28·6
Patea	5	35·80	34·16	30·04	30·8	28·2
New Plymouth ..	11	35·86	32·87	31·27	25·5	28·3
Lyttelton	4	35·00	32·90	32·10	29·7	28·1
Average ..	36	35·34	34·15	30·51	25·4	28·4

Percentages of 105 Samples given in First Part of this List: 17th October to 24th December, 1912.

——	Moisture.	Fat.	Casein and other Solids.	Days old.	Points.
	Per Cent.	Per Cent.	Per Cent.		
Average of 105 samples ..	36·08	33·75	30·17	..	..
General average of 141 samples ..	35·89	33·85	30·26	..	..

LIST C, PART II.

Particulars of eight samples of cheese examined for content of moisture and fat, ex lots from seven factories graded at Wellington and shipped by various Home-going steamers which sailed from the 9th January to the 20th March, 1913, inclusive. Cheese scoring 27 points and over are first grade; below 27 points are second grade.

Tested to	Graded at	No. for Brand.	Moisture.	Fat.	Casein and other Solids.	Age; and Notes at Sampling.		
						Days old.	Body and Texture.	
							Points.	Remarks.
			Per Cent.	Per Cent.	Per Cent.			
7/2/13	Wellington ..	120	34·4	35·2	30·4	21	27½	Lacks silkiness.
	,, ..	75	34·8	35·2	30·0	24	26½	Green; sweet holes.
	,, ..	2	35·6	34·0	30·4	13	26½	Sweet holes.
	,, ..	121	35·6	35·2	29·2	14	26	Dry; acid cut.
	,, ..	1	34·6	35·2	30·2	18	27	Green; dry; salty.
6/3/13	,, ..	122	36·0	36·0	28·0	21	27	Weak; acidy.
	,, ..	121	34·8	35·2	30·0	29	26	Acidy; dry; salty.
20/3/13	,, ..	89	36·0	37·2	26·8	21	26	Acid cut; soft.
	Average ..	..	35·23	35·40	29·37	20·1	26·6	

Percentages of Forty-one Samples given in First Part of this List: 17th October to 27th December, 1912.

—	Moisture.	Fat.	Casein and other Solids.
	Per Cent.	Per Cent.	Per Cent.
Average	36·06	33·73	30·21
General average of 49 samples	35·92	34·0	30·08

SUMMARY OF PERCENTAGES: LIST A, PART II.

Moisture-content.

Highest.	Lowest.	Average.
38·6 ..	32·8 ..	35·46
Range.	No. of Samples.	Per Cent.
32·1 to 33·0 ..	1 ..	1·69
33·1 to 34·0 ..	3 ..	5·09
34·1 to 35·0 ..	19 ..	32·20
35·1 to 36·0 ..	23 ..	38·98
36·1 to 37·0 ..	8 ..	13·56
37·1 to 38·0 ..	2 ..	3·39
Over 38·0 ..	3 ..	5·09
	59	100·00

Fat-content.

Highest.		Lowest.		Average.
36·8	..	29·6	..	34·41
Range.		No. of Samples.		Per Cent.
29·1 to 30·0	..	1	..	1·69
30·1 to 31·0	..	..	..	..
31·1 to 32·0	..	6	..	10·17
32·1 to 33·0	..	5	..	8·47
33·1 to 34·0	..	10	..	16·95
34·1 to 35·0	..	13	..	22·03
35·1 to 36·0	..	18	..	30·52
Over 36·0	..	6	..	10·17
		59		100·00

SUMMARY OF PERCENTAGES: LIST B, PART II.

Moisture-content.

Highest.		Lowest.		Average.
37·4	..	33·2	..	35·34
Range.		No. of Samples.		Per Cent.
33·1 to 34·0	..	5	..	13·89
34·1 to 35·0	..	9	..	25·00
35·1 to 36·0	..	14	..	38·89
36·1 to 37·0	..	7	..	19·44
Over 37·0	..	1	..	2·78
		36		100·00

Fat-content.

Highest.		Lowest.		Average.
37·6	..	31·2	..	34·15
Range.		No of Samples.		Per Cent.
31·1 to 32·0	..	4	..	11·11
32·1 to 33·0	..	6	..	16·66
33·1 to 34·0	..	8	..	22·23
34·1 to 35·0	..	6	..	16·66
35·1 to 36·0	..	9	..	25·00
36·1 to 37·0	..	1	..	2·78
Over 37·0	..	2	..	5·56
		36		100·00

SUMMARY OF PERCENTAGES: LIST C, PART II.

Moisture-content.

Highest.		Lowest.		Average.
36·0	..	34·4	..	35·23
Range.		No. of Samples.		Per Cent.
34·1 to 35·0	..	4	..	50·00
35·1 to 36·0	..	4	..	50·00
		8		100·00

Fat-content.

Highest.		Lowest.		Average.
37·2	..	34·0	..	35·40
Range.		No. of Samples.		Per Cent.
34·1 to 35·0	..	1	..	12·25
35·1 to 36·0	..	6	..	75·50
36·1 to 37·0	..	..	..	..
Over 37·0	..	1	..	12·25
		8		100·00

WATERS FOR DAIRY PURPOSES, ETC.

SOME ANALYSES.

B. C. ASTON.

RESULTS, IN PARTS PER 100,000.

Laboratory No.	Locality.	Odour on heating to 100° Fahr.	Chlorine in Chlorides.	Nitrogen in Nitrates.	Nitrogen in Nitrites.	Free and Saline Ammonia.	Albumenoid Ammonia.	Total Solids.	Remarks.
C 223	Mataura River	Faint ..	1·090	Fairly large	Large ..	0·0100	0·048	23·96	A contaminated water.
261	Makarewa Freezing-works	None	3·763	Small ..	Fair quantity	0·0120	0·004	12·20	Permissible for use if no better water available.
363	Kumara (spring) ..	,, ..	0·923	None ..	None ..	0·0008	0·003	4·94	A pure water, as far as chemical analysis can show.
505 (1)	Longburn	Slight..	4·685	Small ..	Fair quantity	0·0160	0·054	27·34	Chars, with strong odour, on ignition. Unsuitable for watering stock if a better water is available.
505 (2)	,, ...	,, ..	3·550	,, ..	,,	0·0300	0·062	24·60	Ditto.
505 (3)	,, ...	,, ..	3·686	,, ..	,,	0·0260	0·054	19·80	,,
557	Konini, Pahiatua ..	None ..	1·775	,, ..	,,	0·0300	0·004	10·76	Permissible for use in dairy factory.
646	Wataroa, Westland ..	,, ..	0·530	None ..	None ..	0·0080	0·012	7·30	A good water, suitable for dairy purposes.

LIVE-STOCK.

STATEMENT SHOWING CONDITION OF LIVE-STOCK DURING THE PAST SEASON, 1ST APRIL, 1912, TO 31ST MARCH, 1913.

Groups of Stock-inspection Districts.	SHEEP.									
	Number of Sheep at 30th April, 1912.	Health and Condition.	Mortality Percentage.	Number of Breeding Ewes on Hand intended to be bred from.	Lambing: Estimated Percentage.	Estimated Mortality Percentage among Lambs up to Weaning.	Estimated Number of Lambs reared.	Clip: Weight and Condition.	Condition of Flocks regarding Lice and Ticks.	Dipping: How performed.
North Island.										
No. 1—Ohaeawai, Whangarei, Auckland, and Thames	533,701	Good ..	Adults, 5; hoggets, $10\frac{3}{4}$	264,942	85	4	223,754	Not so heavy as last year, but condition better, and sounder	Fairly satisfactory	Satisfactorily, except in Thames district.
No. 2—Hamilton, Te Kuiti, and Tauranga	927,453	Very good	Adults, $2\frac{1}{2}$; hoggets, 5	494,833	92	6	427,933	Hamilton, heavy and good; Te Kuiti, much improved; Tauranga, not so good as usual	Fairly satisfactory	Hamilton and Te Kuiti, satisfactorily; Tauranga, not satisfactorily.
No. 3—New Plymouth, Opunake, Stratford, and Hawera	468,853	Good ..	Adults, $3\frac{1}{4}$; hoggets, $4\frac{1}{2}$	247,237	90	$5\frac{1}{2}$	210,275	Weight heavier, except in Hawera. Condition better than usual all round	Satisfactory all round	Not satisfactorily in New Plymouth district; satisfactorily in other districts.
No. 4—Wanganui, Feilding, and Palmerston North	2,970,763	Good ..	Adults, $3\frac{1}{4}$; hoggets, 6	1,473,354	95	3	1,357,696	Weight lighter than last season. Condition good	Satisfactory, except in Feilding district	Fairly satisfactorily.
No. 5—Gisborne and Hastings	4,903,569	Good ..	Adults, $2\frac{1}{2}$; hoggets, 6	2,441,350	85	$1\frac{1}{2}$	2,044,020	Good	Not satisfactory ..	Not satisfactorily.
No. 6—Woodville, Masterton, and Wellington	2,814,750	Good ..	Adults, $3\frac{1}{2}$; hoggets, 4	1,471,744	92	3	1,313,384	Good	Fairly satisfactory in Woodville and Wellington, but prevalent in Masterton	Not satisfactorily in Woodville and Masterton; satisfactorily in Wellington.
Totals, North Island ..	12,618,089	..	..	6,393,460	..	..	5,577,062	..	..	..

South Island.											
No. 1—Nelson and Blenheim	1,197,071	Good	..	Adults, 4½; hoggets, 7½	649,214	71	13	401,019	Good in Nelson; neither so heavy nor so good as usual in Blenheim	Fairly free from lice, but ticks very prevalent	Fairly satisfactorily.
No. 2—Hokitika	110,562	Good	..	Adults, 3; hoggets, 5	51,070	95	10	43,664	Weight, heavy; condition, good	Very fair ..	Fairly satisfactorily.
No. 3—Amberley, Christchurch, and Sockburn	3,538,804	Good	..	Adults, 3¼; hoggets, 5½	1,980,884	93	7½*, 2¾†	1,780,981	Weight, average; condition, good	Satisfactory ..	Satisfactorily.
No. 4—Timaru and Oamaru	2,148,120	Good	..	Adults, 6; hoggets, 6½	1,177,046	97½	4	1,101,715	Light	Satisfactory ..	Satisfactorily.
No. 5—Dunedin, Mosgiel, and Balclutha	2,092,604	Good	..	Adults, 3¾; hoggets, 7½	1,011,268	82	3¼	802,289	Light; good condition	Satisfactory as to lice, ticks not satisfactory	Fairly satisfactorily.
No. 6—Invercargill and Gore	1,966,298	Good	..	Adults, 4½; hoggets, 9	980,634	77½	9	691,592	Invercargill, heavy, but not in good condition; Gore, light, condition sound	Fairly satisfactory	Fairly satisfactorily.
Totals, South Island ..	11,132,064	..	..	..	5,850,116	..	..	4,821,260	..	..	..
Totals, North Island ..	12,618,089	..	..	..	6,393,460	..	..	5,577,062	..	..	..
Grand totals ..	23,750,153	..	..	..	12,243,576	..	..	10,398,322	..	..	..

* Merino. † Crossbred.

NORTH ISLAND GROUPS OF STOCK-INSPECTION DISTRICTS.

No. 1 stock-inspection district comprises the Counties of Mongonui, Whangaroa' Hokianga, Bay of Islands, Whangarei, Hobson, Otamatea, Rodney, Waitemata, Eden, Manukau, Coromandel, and Thames.

No. 2 stock-inspection district comprises the Counties of Waikato, Raglan, Waipa, Ohinemuri, Piako, Matamata, East Taupo and Rotorua, Kawhia, Waitomo, Awakino, West Taupo and Ohura, Waimarino, Kaitieke, Tauranga, Whakatane, and Opotiki.

No. 3 stock-inspection district comprises the Counties of Clifton, Taranaki, Egmont, Stratford, Whangamomona, Eltham, Waimate West, and Hawera.

No. 4 stock-inspection district comprises the Counties of Patea, Waitotara, Wanganui, Rangitikei, Kiwitea, Pohangina, Oroua, Manawatu, Kairanga, and Horowhenua.

No. 5 stock-inspection district comprises the Counties of Waiapu, Cook, Waikohu, Wairoa, Hawke's Bay, Waipawa, Waipukurau, and Patangata.

No. 6 stock-inspection district comprises the Counties of Weber, Dannevirke, Woodville, Pahiatua, Akitio, Eketahuna, Masterton, Mauriceville, Castlepoint, Wairarapa South, Featherston, Hutt, and Makara.

SOUTH ISLAND GROUPS OF STOCK-INSPECTION DISTRICTS.

No. 1 stock-inspection district comprises the Counties of Collingwood, Takaka, Waimea, Sounds, Awatere, and Marlborough.

No. 2 stock-inspection district comprises the Counties of Buller, Inangahua, Murchison, Grey, and Westland.

No. 3 stock-inspection district comprises the Counties of Kaikoura, Amuri, Cheviot, Waipara, Tawera, Ashley, Selwyn, Waimairi, Malvern, Paparua, Heathcote, Halswell Springs, Ellesmere, Mount Herbert, Akaroa, Wairewa, and Ashburton.

No. 4 stock-inspection district comprises the Counties of Geraldine, Levels, Mackenzie, Waimate, and Waitaki.

No. 5 stock-inspection district comprises the Counties of Waihemo, Waikouaiti, Peninsula, Vincent, Maniototo, Taieri, Bruce, Clutha, and Tuapeka.

No. 6 stock-inspection district comprises the Counties of Lake, Southland, Wallace, and Fiord, and Stewart Island.

STATEMENT SHOWING CONDITION OF LIVE-STOCK, ETC.—*continued.*

Groups of Stock-inspection Districts.	CATTLE.								
	Number, including Dairy Cows, April, 1911.	Number of Dairy Cows, April, 1911.	Estimated Percentage of Mortality among Dairy Cattle during Spring Months, due to all Causes.	Estimated Percentage of Calves kept, and how fed.	Estimated Percentage of Mortality in Calves due mainly to Insufficient Feeding.	Estimated Number of Calves reared.	Estimated Percentage of Depreciation in Value of Calves due to Insufficient Feeding.	Provision for Winter Feed.	Condition of Cattle at end of Winter.
North Island.									
No. 1—Ohaeawai, Whangarei, Auckland, and Thames	262,674	88,016	6	Ohaeawai, all kept; Whangarei and Auckland, 70 per cent.; Thames (4,500), whey and skim-milk	7	80,164	20	No special provision..	Ohaeawai, poor; Whangarei, fair; Auckland, good; Thames, poor.
No. 2—Hamilton, Te Kuiti, and Tauranga	278,663	85,485	3	Hamilton and Tauranga, 85 per cent.; Te Kuiti (5,595), whey and skim-milk	25	57,049	70	Hay and a few turnips, but generally very little special provision	Tauranga, poor; Hamilton and Te Kuiti, good.
No. 3—New Plymouth, Opunake, Stratford, and Hawera	260,511	122,742	3	65 per cent.; fed on skim-milk and whey mixed with some kind of calf-food	6	68,700	25	Hay and root crops ..	Very fair except in Opunake district, where the condition is very poor.
No. 4—Wanganui, Feilding, and Palmerston North	265,012	79,244	4	68 per cent.; skim-milk and whey chiefly, with calf-meal added in some cases	8½ in Wanganui and Palmerston, 5 in Feilding	44,067	34	Very little special provision	Wanganui, good; Palmerston, fair; Feilding, poor.
No. 5—Gisborne and Hastings	289,318	24,611	2¼	62 per cent.; skim-milk and calf-food	3½	14,350	15	Very little provision other than hay	Very good.
No. 6—Woodville, Masterton, and Wellington	235,811	60,671	3	44 per cent.; factory by-products and some calf-food	10	22,835	25	Fair provision in Woodville district—hay and root crops; very little provision in Masterton and Wellington	Good in Woodville, medium in Masterton and Wellington.
Totals, North Island ..	1,591,989	460,769	..	..		287,165	..	..	..

South Island.									
No. 1—Nelson and Blenheim	39,636	14,929	2	56 per cent.; skim-milk	7½	8,111	22½	A little provision in dairying districts, no provision elsewhere	Poor in Nelson, good in Blenheim.
No. 2—Hokitika	38,740	11,233	..	90 per cent.; whole and skim milk and other ingredients	7½	8,734	20	Practically no provision; a little hay	Medium.
No. 3 — Amberley, Christchurch, and Sockburn	103,364	42,878	1½	53 per cent.; skim-milk and some patent food	2	18,798	30	Much neglected in Amberley district. Hay and root crops in other districts	Good.
No. 4—Timaru and Oamaru..	47,856	21,573	3	75 per cent.; skim-milk and artificial food	8	14,911	25	Very little special provision	Good.
No. 5—Dunedin, Mosgiel, and Balclutha	81,691	36,004	3½	41 per cent.; skim-milk, whey, and artificial food	4½	12,187	30	Fair	Fairly good.
No. 6—Invercargill and Gore	116,895	46,347	2	60 per cent.; skim-milk and artificial food	3½	25,878	30	Good	Good.
Totals, South Island ..	428,182	172,964	..	..	..	88,619	..	..	..
Totals, North Island ..	1,591,989	460,769	..	..	..	287,165	..	..	..
Grand totals ..	2,020,171	633,733	..	..	..	375,784	..	..	..

NORTH ISLAND GROUPS OF STOCK-INSPECTION DISTRICTS.

No. 1 stock-inspection district comprises the Counties of Mongonui, Whangaroa, Hokianga, Bay of Islands, Whangarei, Hobson, Otamatea, Rodney, Waitemata, Eden, Manukau, Coromandel, and Thames.

No. 2 stock-inspection district comprises the Counties of Waikato, Raglan, Waipa, Ohinemuri, Piako, Matamata, East Taupo and Rotorua, Kawhia, Waitomo, Awakino, West Taupo and Ohura, Waimarino, Kaitieke, Tauranga, Whakatane, and Opotiki.

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No. 5 stock-inspection district comprises the Counties of Waiapu, Cook, Waikohu, Wairoa, Hawke's Bay, Waipawa, Waipukurau, and Patangata.

No. 6 stock-inspection district comprises the Counties of Weber, Dannevirke, Woodville, Pahiatua, Akitio, Eketahuna, Masterton, Mauriceville, Castlepoint, Wairarapa South, Featherston, Hutt, and Makara.

SOUTH ISLAND GROUPS OF STOCK-INSPECTION DISTRICTS.

No. 1 stock-inspection district comprises the Counties of Collingwood, Takaka, Waimea, Sounds, Awatere, and Marlborough.

No. 2 stock-inspection district comprises the Counties of Buller, Inangahua, Murchison, Grey, and Westland.

No. 3 stock-inspection district comprises the Counties of Kaikoura, Amuri, Cheviot, Waipara, Tawera, Ashley, Selwyn, Waimairi, Malvern, Paparua, Heathcote, Halswell Springs, Ellesmere, Mount Herbert, Akaroa, Wairewa, and Ashburton.

No. 4 stock-inspection district comprises the Counties of Geraldine, Levels, Mackenzie, Waimate, and Waitaki.

No. 5 stock-inspection district comprises the Counties of Waihemo, Waikouaiti, Peninsula, Vincent, Maniototo, Taieri, Bruce, Clutha, and Tuapeka.

No. 6 stock-inspection district comprises the Counties of Lake, Southland, Wallace, and Fiord, and Stewart Island.

STATEMENT SHOWING CONDITION OF LIVE-STOCK, ETC.—*continued.*

Groups of Stock-inspection Districts.	HORSES.			PIGS.					
	Number April, 1911.	Health and Condition.	Breeding: Progressive or Otherwise.	Number April, 1911.	Health and Condition.	Breeding: Progressive or Otherwise.	Diet.	Whether Store Pigs are generally housed or allowed to roam.	Whether usually fed off upon Pollard or Grain.
North Island.									
No. 1—Ohaeawai, Whangarei, Auckland, and Thames	47,843	Fair ..	Not very progressive; poor stallions	39,699	Good ..	Not very progressive	Mostly whey and skim-milk	Roam ..	Yes in Auckland, but not in the other districts.
No. 2—Hamilton, Te Kuiti, and Tauranga	49,344	Very good	Hamilton, not progressive; Te Kuiti, progressive; Tauranga, slightly progressive	49,328	Good ..	Not progressive	Skim-milk and fern-root	Roam ..	Very seldom.
No. 3—New Plymouth, Opunake, Stratford, and Hawera	22,642	Good ..	Progressive in Hawera district in draught horses; not progressive in other districts	47,016	Good ..	Fairly progressive	Skim-milk and whey with sucrosine, and root crops and pollard	Mostly allowed to roam	Yes in all districts except Stratford, where they are not finished off on grains.
No. 4—Wanganui, Feilding, and Palmerston North	38,441	Good ..	Palmerston N., not progressive; Wanganui and Feilding, progressive in draughts	38,218	Good ..	Fairly progressive	Factory by-products, and calf-meals and pollard	Mostly allowed to roam until taken in for fattening	Yes in some cases, but not generally.
No. 5—Gisborne and Hastings	43,252	Gisborne, not very good; Hastings, good	Gisborne, not very progressive; Hastings, progressive	16,002	Good ..	Gisborne, medium; Hastings, progressive	Skim-milk, boiled offal, maize, carrots, and mangels	Housed ..	Yes.
No. 6—Woodville, Masterton, and Wellington	29,270	Good ..	Not progressive ..	27,210	Good ..	Progressive in Masterton, but not progressive in Woodville or Wellington	Skim-milk and whey with calf-food. Hotel-refuse mostly about Wellington	Allowed to run in small paddocks	Yes.
Totals, North Island ..	230,792	..	..	217,473	..	..	..	..	..

South Island.									
No. 1—Nelson and Blenheim	14,198	Very good	Not progressive ..	12,675	Good ..	Fairly progressive	Grains and root crops	Allowed to run in small paddocks and yards	Yes.
No. 2—Hokitika	6,185	Good ..	Not progressive ..	4,987	Very fair	Progressing slowly	Skim-milk and root crops	Roam ..	Yes in most cases.
No. 3—Amberley, Christchurch, and Sockburn	53,144	Good ..	Draughts, progressive; light, not progressive	54,254	Good ..	Progressive ..	Skim-milk, root crops, and grass	Roam ..	Yes.
No. 4—Timaru and Oamaru	31,327	Good ..	Draughts, progressive; light, not progressive	22,006	Good ..	Not progressive	Mostly skim-milk, a little root crops in some cases	Mostly housed..	Not much.
No. 5—Dunedin, Mosgiel, and Balclutha	34,520	Good ..	Progressive ..	18,991	Good ..	Progressive ..	City offal, skim-milk, and root crops	Allowed to roam until taken in to fatten	Yes.
No. 6—Invercargill and Gore	34,118	Good ..	Progressive ..	18,368	Good ..	Not very progressive	Whey, offal, potatoes, and grain	Mostly housed..	Yes.
Totals, South Island ..	173,492	..	..	131,281	..	..	..	..	..
Totals, North Island ..	230,792	..	..	217,473	..	..	..	..	..
Grand totals ..	404,284	..	..	348,644	..	..	..	..	..

NORTH ISLAND GROUPS OF STOCK-INSPECTION DISTRICTS.

No. 1 stock-inspection district comprises the Counties of Mongonui, Whangaroa, Hokianga, Bay of Islands, Whangarei, Hobson, Otamatea, Rodney, Waitemata, Eden, Manukau, Coromandel, and Thames.

No. 2 stock-inspection district comprises the Counties of Waikato, Raglan, Waipa, Ohinemuri, Piako, Matamata, East Taupo and Rotorua, Kawhia, Waitomo, Awakino, West Taupo and Ohura, Waimarino, Kaitieke, Tauranga, Whakatane, and Opotiki.

No. 3 stock-inspection district comprises the Counties of Clifton, Taranaki, Egmont, Stratford, Whangamomona, Eltham, Waimate West, and Hawera.

No. 4 stock-inspection district comprises the Counties of Patea, Waitotara, Wanganui, Rangitikei, Kiwitea, Pohangina, Oroua, Manawatu, Kairanga, and Horowhenua.

No. 5 stock-inspection district comprises the Counties of Waiapu, Cook, Waikohu, Wairoa, Hawke's Bay, Waipawa, Waipukurau, and Patangata.

No. 6 stock-inspection district comprises the Counties of Weber, Dannevirke, Woodville, Pahiatua, Akitio, Eketahuna, Masterton, Mauriceville, Castlepoint, Wairarapa South, Featherston, Hutt, and Makara.

SOUTH ISLAND GROUPS OF STOCK-INSPECTION DISTRICTS.

No. 1 stock-inspection district comprises the Counties of Collingwood, Takaka, Waimea, Sounds, Awatere, and Marlborough.

No. 2 stock-inspection district comprises the Counties of Buller, Inangahua, Murchison, Grey, and Westland.

No. 3 stock-inspection district comprises the Counties of Kaikoura, Amuri, Cheviot, Waipara, Tawera, Ashley, Selwyn, Waimairi, Malvern, Paparua, Heathcote, Halswell Springs, Ellesmere, Mount Herbert, Akaroa, Wairewa, and Ashburton.

No. 4 stock-inspection district comprises the Counties of Geraldine, Levels, Mackenzie, Waimate, and Waitaki.

No. 5 stock-inspection district comprises the Counties of Waihemo, Waikouaiti, Peninsula, Vincent, Maniototo, Taieri, Bruce, Clutha, and Tuapeka.

No. 6 stock-inspection district comprises the Counties of Lake, Southland, Wallace, and Fiord, and Stewart Island.

CEREALS INTRODUCED BY DEPARTMENT.

G. DE S. BAYLIS.

THERE are many of these which have now passed out of the sphere of co-operative experiments, stocks having been harvested from the original plots by the experimenters. These have again been sown, and probably portions of the yields sold to neighbouring farmers. In this way some of the varieties have been fairly widely distributed.

Mr. Radcliffe, of Masterton, has threshed 67 bushels per acre of Turkey Red wheat.

R. Warriner, of Greatford, has threshed 43 bushels per acre of Federation wheat. He reports, "I drilled 3 bushels per acre on the 6th September, with 2 cwt. slag. About one-third of this crop was a partial failure, owing to heavy rains just after sowing. It stands up well, is free from blight and rust, and is good to harvest. The yield for the whole paddock was 43 bushels. Harvested, 24th January.

Mr. McKay, of Masterton, is reported to have won from four bags of Hannchen barley 113 sacks.

Inspector Dunlop reports that W. R. McKenzie, Okaihau, Bay of Plenty, threshed 34 bushels of Red Fife.

Inspector Watson reports that Gray Bros., of Upper Tutaenui, threshed 52 bushels of Canadian Red Fife wheat.

Mr. W. Perry, Penrose, Masterton, had a good crop of Hannchen barley—a fine sample of grain.

I shall be glad to receive further reports from those who have grown any newly introduced variety outside the co-operative experiments.

WEED DISPLAY.

A FEATURE of the displays of the Department at the winter shows of this year is a set of ten weed-cards, exhibiting about a hundred and fifty varieties of weed-plants correctly named (with both the common and botanical titles) and with descriptive matter regarding them. The cards will be subsequently available for lending to rural societies who may desire them for the benefit of their members. A specimen card is illustrated on the following page.


HEMLOCK
PARSNIP
FENNEL

THE HEMP INDUSTRY.

W. H. FERRIS.

THOUGH a slight improvement was noticeable in the hemp graded last month over the general quality of that of the earlier part of the season—this applying more particularly to the Manawatu district—there was still a high percentage of indifferent fibre forwarded for shipment. The improvement was specially observable where millers had good leaf to work with. It is unfortunate that much of the leaf being milled is diseased. Those handling it have had, consequently, to be content to work for a "fair" grade.

No doubt the better discrimination in market values between "good-fair" and "fair"—the London quotations having increased, from a difference of £1 10s. between the two grades in the beginning of this year to £3, according to the last cable from the High Commissioner—is responsible to a large extent for the improved quality being turned out by millers who have the desired quality of leaf.

OTAGO AND SOUTHLAND HEMP AND TOW.

Millers in Otago and Southland, although working with good-quality leaf, though this is a little on the short side, have been producing a lower grade of fibre, the predominant weakness being poor stripping. In some cases the fibre has been badly bruised, while in other instances the opposite was the case, the leaf being only partially stripped. In a few instances millers have maintained their hemp at a good standard. The weather has certainly been all against satisfactory work in the South, the bad drying-conditions being responsible for a considerable amount of hemp, well enough stripped, only reaching a common grade. It is satisfactory to be able to report, however, that practically all the fibre being produced in Otago and Southland is well scutched, and in this respect is in strong contrast to much of the fibre reaching North Island grading-stores. As in the North, southern scutching is done on the contract system.

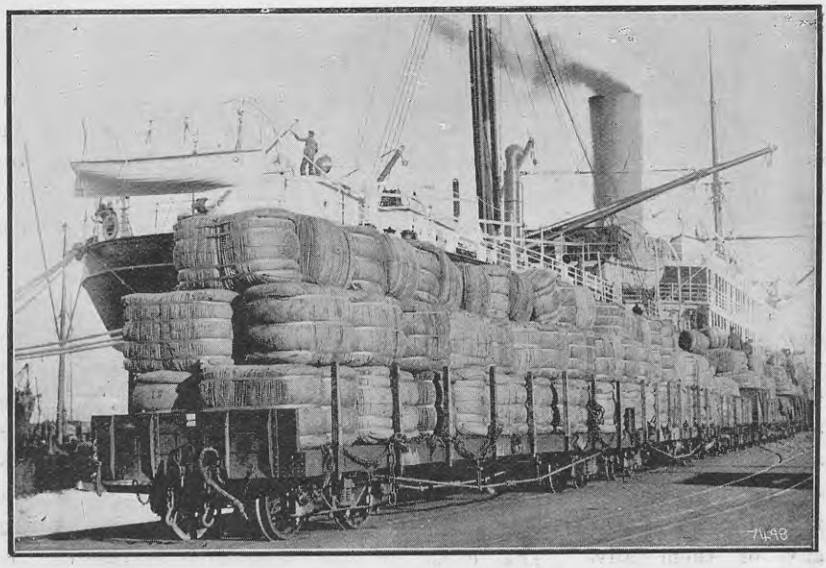
Quite a number of Otago and Southland millers are sending in their hemp very carelessly baled—loose, and thereby making it very difficult for the storemen at the shipping-ports to properly dump it and make a presentable package. The same remark applies to tow. In several instances tow has reached the grading-stores with some of the bands

missing, and being merely unsightly bundles. This matter demands immediate attention. The oversea shipping companies have already made strong complaints in regard to it. While the tow in question has been badly baled, it has also been of a most unsatisfactory character. In some cases no attempt whatever had been made to free it from dust, while several lines came forward in such a damp condition that they had to be condemned for export. This is disappointing, as in the earlier portion of the season Otago and Southland tow was of fairly good quality. In view of the present strong position of the tow-market, and the increasing uses to which tow is being put, the indifferent manner in which it is too often prepared for export is much to be regretted.

Southern millers in general do not observe the regulations in regard to labelling as carefully as is desired, a weakness which is also complained of by the shipping companies. The required label is used, but the brand is merely cut in instead of being impressed in ink, with the result that the brands are frequently undecipherable.

OTHER PORTS.

While Westland hemp has receded in quality owing to unfavourable weather, that of Marlborough and Hawke's Bay is still of a good standard, the bulk of the fibre from these districts being "fine" and "good-fair."



SHIPPING WOOL AT LYTTELTON.

APIARY NOTES.

F. A. JACOBSEN.

BEE-PARALYSIS.

THIS is not a prominent disease in New Zealand, but it is well to be prepared for it. The symptoms are a distended abdomen, with quivering wings. The only definite cure is dequeening the hive for about a fortnight, and the introducing of a young queen. A partial cure is effected by sprinkling the combs with sulphur. It is a summer trouble, and the true cause not being yet ascertained it is impossible to give any preventive advice.

FOUL-BROOD.

Ants may eventually prove a feature in the work of controlling foul-brood. It is well known they increase rapidly whenever an apiary is established, and are fond of stealing honey. Could they not be made to clean out combs of foul-brood, and the combs afterwards exposed to the sunlight as a further effort in the destruction of germs? Experiments are to be conducted on these lines next spring.

MOTHS AND INSECTS.

An excellent preventive against moths and insects of all descriptions is the use of carbon bisulphide. The supers of combs should be stacked in a pile, and a saucer full of the liquid placed on the top of the stack, this being protected with a hive-cover. The density of the evaporated fluid compels it to sink slowly through the combs to the bottom super, thus killing insect-life at all stages.

A SERIOUS EPIDEMIC.

In some parts of Australia beekeepers suffered severely last season through what has been termed the "disappearing disease." Whole apiaries were wiped out in the autumn by the bees simply disappearing, the colonies dwindling down till none were left. Some beekeepers reported that their colonies were reduced to such a weakened condition that they have had great difficulty in keeping any of them alive. The cause of the wholesale destruction is unknown, but steps are being taken to investigate the matter.

WINTER REMEDIES.

During winter keep your bees as warm as possible, and avoid an excessive amount of stores being consumed by the bees. The colder they are the more food they require to keep them warm, so use warm mats on top of the frames, and provide for each hive a substantial roof that will not leak.

Do not leave empty supers over your colonies during the winter, but put your bees down in the brood-chamber. This is to obviate the bees unnecessarily keeping a large instead of a small space at a living-temperature.

Do not let the bees starve, but observe closely the amount of stores consumed by colonies through the winter months, and feed where necessary.

The winter Shows provide an excellent opportunity for comparing notes with fellow-beekeepers. We can always learn from the experiences of others.

"So work the honey bees,
Creatures that, by a rule of nature, teach
The art of order to a peopled kingdom.
They have a king and officers of sorts,
Where some, like magistrates, correct at home;
Others, like merchants, venture trade abroad;
Others, like soldiers, armed in their stings,
Make boot upon the summer's velvet buds,
Which pillage they, with merry march, bring home
To the tent royal of their emperor,
Who, busied in his majesty, surveys
The singing masons building roofs of gold;
The civil citizens kneeding up the honey;
The poor mechanic porters crowding in
Their heavy burdens at his narrow gate;
The sad-eyed justice, with his surly hum,
Delivering o'er, to executors pale,
The lazy, yawning drone."

—*Shakespeare*, Henry V, Act 1, Scene II.

The export trade in honey has received a great fillip this season by reason of growers in Canterbury and in Taranaki co-operating in the shipment of large uniform lines to the British market. At the request of the shippers, officers of the Department of Agriculture, Industries, and Commerce graded the honey prior to shipment, an arrangement of distinct advantage to both the growers and the industry.

ORCHARD WORK FOR JULY.

W. A. BOUCHER.

PLANTING.

IN many localities in the Dominion the planting of orchard-trees during the month of July is to be avoided, on account of the unsuitability of soil and climatic conditions. Usually at this season of the year cold and more or less wet weather prevails. Under such circumstances the soil is not in a satisfactory condition either for working or for planting. It is far better to wait for a later period, and set out the trees when the soil is warm, friable, and moist, but not wet. Consignments of trees arriving from the nursery should be carefully heeled in until such time as the soil and climatic conditions are favourable for planting the orchard. To heel in, prepare a trench in moist friable soil, either with the plough or spade. When the trench has been prepared lay the trees in, either singly or in small bundles; shovel in the loose earth, shake it in among the roots, and press down fairly firmly with the foot. The object in view is, as far as possible, to prevent the air from reaching the roots during the period in which the trees must remain in the trench.

SPRAYING.

During the month of July spraying for several pests and diseases can be satisfactorily carried out—in fact, every opportunity should be taken of suitable weather-conditions to push on the work, in order to avoid an unnecessary rush at a later period. Mussel scale, red spider, and mealy bug should receive the careful attention of growers, and every effort be made, by thorough spraying with the red-oil emulsion, to as far as possible eradicate these pests from the orchard. It has been noticed that fruit infected with all three pests has arrived at the markets from districts and orchards where spraying is regularly practised. A Fruit Inspector naturally has no desire to find unnecessary fault, but in the course of his duties must draw the attention of growers to the fact that pest-infected fruit is coming forward, although he may know that spraying for the control of the pests has been carried out. It is then for the grower to investigate and find out the reason why, even in spite of spraying, the pests are still in evidence. The question of results is a most important one. The principal cost involved in spraying is that of labour, so that every effort should be made to

secure and effectively apply a material that will produce the results desired. It should be remembered that the cheapest spraying-materials are not always the best, and that the saving of a small amount in the cost of material may lead to considerable loss in the cost of labour and possible loss of fruit. It is especially desirable that only compounds of proved worth should be used, in view of the export trade that is now being established. It is obvious that only fruit free from pest or blemish of any kind should be sent to foreign markets, and to secure such fruit the most thoroughly effective spraying with compounds of proved value will be required.

PRUNING.

Pruning operations may now be carried on with advantage. It will be necessary to cut back young trees and thin out older ones. Where canker is known to be present in an orchard special attention should be given, and care exercised to see that infected twigs or limbs are cut back to clean healthy wood. It is not infrequently the case that prunings are left to lie about in an orchard or garden or in the vicinity. All prunings should be gathered up and burned, as some diseases, at any rate, are carried over from season to season in the diseased bark or wood that has been removed from infected trees.

PEACHES AND NECTARINES.

Fruit-trees of this class that have not already been sprayed should receive an application of the Bordeaux mixture—10-10-40 formula. It is important that a first spray should be applied as soon as possible after the leaves have fallen, in order to protect the bark of the trees, and especially the leaf and blossom buds, from attack by the die-back fungus (*Clasterosporium carpophilum*).

GOOSEBERRY LEAF-SPOT.

Gooseberry-bushes should be thoroughly sprayed with the Bordeaux mixture, 10-10-40 formula, to protect them against attack by leaf-spot, which in many instances of late years has proved fatal to the crop, and in some cases to the bushes themselves.

Raspberries and currants will also benefit by the application of the Bordeaux mixture—10-10-40 formula.

ERRATUM.

Journal, Vol. vi, p. 509, 15th May, 1913, "Analyses of Soils": The amount o citric-acid soluble potash in soil from Waihao Forks (last on list) should read "0·010 per cent.," not 0·100 per cent."

GRAPE-CULTURE.

S. F. ANDERSON.

VINE-HOUSE NOTES FOR JULY.

ALL pruning of vines in the cool-house should be completed this month.

Where vine-borders have been mulched with stable manure or other material during the past summer it should now be forked in, provided the weather is suitable. If the vines require further manuring a light dressing of bonedust may be first spread over it, and the forking-in proceeded with. In applying artificial manure to vine-borders—that is, those manures other than stable or farmyard manures—the custom has been in most cases to apply them in excess of what the plants can really take up. When this is done, the excess of plant-food they contain is washed away by rain or it sinks down into the lower soil, and, so far as the vine-roots are concerned, is lost. The quantity applied to farm crops is the best guide. With soils of medium quality the usual dressing given of bonedust is from 2 cwt. to 3 cwt. per acre. Reduce the application from acres to square yards, and adjust it to suit the borders of a vine-house 51 ft. by 16 ft. The borders of a house this size should extend 10 ft. all round it. This would be a piece of ground 71 ft. by 36 ft., or 284 square yards. At the rate of 3 cwt. to the acre, this is a little over $1\frac{1}{10}$ oz. to the square yard, and would take 20 lb. only of bonedust. If the house is situated on high land, and the soil be below medium quality, increase the fertility by addition of stable manure or a top-dressing of an inch or more of rich soil, in preference to artificial manure.

In vine-houses where the laterals or fruit-bearing shoots have become weak and spindly this must not in all cases be put down to a want of forcing by manure. The cause of it is nearly always overcrowding and depriving the vines of their foliage during the growing season. Where this practice has been continued for a number of years the inevitable result is weak growth. Provided good pruning and cultivation have been given a vine, it takes many years before a falling-off is shown in the vigour and fruit-bearing quality for want of manure. It is then quickly restored by a top-dressing of bonedust or of good soil.

Considerable loss of fruit has been noticed during the past season from shanking. One of the chief causes of this is insufficient draining. When vine-borders are being made, the drainage from them in some instances is not deep enough to carry off the soakage from the bottom of the border. The vine-roots getting into a cold clayey subsoil inevitably results in their becoming weakened and subject to disease. There is no plant in horticulture more easy to grow than the vine, or one that responds more generously to common-sense treatment.

VINEYARD NOTES FOR JULY.

If not already done, the pruning should be pushed forward. July is the worst month of the year for outdoor work usually, especially where working the soil is concerned. The beginning of June is the best time to commence pruning, because it can rapidly be followed by the gathering-up of the prunings and the ploughing. In nearly all the vineyards in the Dominion vines are grown on espalier fences, and to cover up weeds, and manure where applied, a winter ploughing is done. Only one ploughing in the year is recommended. All other working of the soil should be done with the cultivator. The spring-tooth cultivator is a fine implement for this. In ploughing vines that are grown on espalier fences it is necessary to have headlands of ample width for turning out of one row into another with two horses. The vineyard should be divided off by the ploughman into lands of so-many rows each. Eight is a convenient number. Strike out down No. 1 and up No. 5, down No. 2 and up No. 6, down No. 3 and up No. 7, down No. 4 and up No. 8. This completes the first round. This allows of easy turning into the rows. Having done this, reverse the order, commencing at No. 8 and finishing at No. 1. This throws the two furrows (which should be 6 in. deep) up against each other. Care must be taken that no core is left between the two. It may not make a pretty job, but it breaks up the centre completely. The next two furrows on either side should be 5 in. deep, the next two 4 in., and the finishing ones next the vines 2 in. Throwing the soil into the centre a little does not matter, and it helps to aerate the whole better; when the cultivator gets to work in the spring it is soon levelled down. Graduating the depth of the ploughing from the vines to centre of the row drains the water to that place, to soak away after rain. Hence a warmer condition for the vines, and less chance of mildew in the summer. The work should be done by an experienced ploughman with a single-furrow plough.

THE FARM GARDEN.

W. H. TAYLOR.

TOMATOES AND BLIGHT.—A RETROSPECT.

AT the time of writing—12th May—we have just gathered the last ripe tomatoes of the season. Frost has killed the plants, or there would have been a few more. Blight is very common in this district every year. The crop just over is the eighth I have grown at the Weraroa Experimental Farm, but only once have I been troubled by blight. Last year, when the crop was two-thirds gathered, it suddenly appeared during some very wet weather. Very little spraying is done in these parts—the plants being sprayed sometimes once, but generally not at all. There were absolutely no tomatoes in the district during two seasons except at this farm. The reason for this immunity is, I believe, because I have always worked on the plan advised by this Department—viz., I never manure at the time of planting. All the manuring done is the giving of a dusting of superphosphate and bonedust after the first fruits are set. The fertilizer is hoed in with a flat hoe, or with a sharp rake. Inquiries made from people who have lost their crops through blight have always elicited the fact that the plants were well manured, and, in some cases, frequently watered. The general opinion appears to be that, being a strong-growing plant, the tomato requires a lot of feeding. Thus every means are taken to build up the very thing that should be most avoided—a soft, gross plant. What is really required is a tough, firm growth. We should aim, in fact, to correct the natural gross habit of the plant, by growing it in only moderately good ground, and also, by constant repression of shoots, to prevent a lot of growth. There is another source of blight worth mentioning. All efforts to grow a hard-wooded plant may fail if the surroundings are not conducive to that state. A perfectly open situation and full exposure to sun are necessary. And an otherwise open situation may be completely altered by growing the wrong crops in close proximity to the tomatoes. A case in point: A plot of ground, through which ran a row of tomato-plants, was sown with partridge peas, to be dug in as green manure. The peas made strong growth, covered all the ground, and stood up about 15 in. above the surface. At early morning the pea-haulm was reeking with moisture, and the sheltering growth kept the ground wet all day, thus creating a

moisture-laden atmosphere about the tomato-plants, which were on the side of the pea-patch opposite to the windy quarter. When blight was reported on a plant where I expected its appearance the plant was at once pulled out and the peas dug in.

Overfeeding.—Along the same lines as overfeeding tomato-plants, mistakes may be made with other things by those who are the fortunate possessors of a good supply of stable manure. Certain plants are said to require "high cultivation" or "good cultivation," but the terms are often misunderstood as meaning a tremendous lot of manure. "High cultivation" is often used to indicate that a certain thing requires skill, with or without much feeding. The highest cultivation is to give a plant exactly the treatment it requires, perhaps with no manure at all. Some years ago there were a series of losses that caused much debate in a certain part of New Zealand. A mysterious disease killed all the asters in a rich man's garden. Our scientists could find no disease. There was none. The explanation, I believe, was to be found in the fact that too much manure had been applied. The ground was given all it would hold, and as soon as the plants were established in the ground a heavy mulch of rich manure was put about them. The result was that in a very short time they were certainly remarkably fine plants, but then came an extra hot day, and the plants laid down and died, simply collapsing. In the course of two or three weeks all that had made strong growth were dead. The reason for the collapse was that the ground was so rich that the plants made tops out of proportion to the roots. When the stress of hot weather came the roots were not able to supply sufficient moisture to the tops to compensate for the loss by evaporation. There can be no doubt but that overfeeding predisposes plants to disease.

VEGETABLE CULTURE.

A knowledge of how plants behave in different circumstances is necessary to an understanding of what is right. Tomato-plants grow far too strongly in our climate. In a hotter and drier climate they are not so rampant, and in such circumstances more manure would be required. Rhubarb and cauliflowers are worthless unless they grow very strongly. Both are liable to collapse if insufficiently fed. Rhubarb, it is well known, will die in early autumn if unable to find sufficient food. It may be useful to state the manner of the collapse. In the first place, the leaves turn yellow in patches; this colour gives place to red, deepening to crimson. The stalks turn brown and soften, and the leaf falls. This takes place over the whole clump, and the crowns rot away. Cauliflowers and plants of the same family when imperfectly fed are subject to a trouble known as "malnutrition

disease." The plants make very poor growth, and the leaves are spotted with black. The fact that the leaves are spotted need not necessarily be due to want of feeding, because there are other diseases causing such an appearance. It is necessary to have some understanding of the requirements of the various subjects to be grown if good crops are to be raised. By this time a general plan for next season's planting and sowing should have been arranged. I am supposing that manure is available—and nothing else is so good for many crops. Ground newly manured is not good for underground root crops, such as parsnips, carrots, beet, artichokes, and potatoes. The last-named, advisedly, will be referred to again. Peas, beans of all kinds, cauliflowers, cabbages, lettuce, turnips, spinach—all thrive best on freshly manured ground. The best plan is to alternate the crops: manure well for those last enumerated, and in the following year use the ground for the previously mentioned crops, applying a little artificial manure as well. Celery and rhubarb cannot be overmanured. Rhubarb is, of course, not merely an annual tenant. Celery, to be well grown, has to be planted in deeply dug and heavily manured trenches. The digging of the trenches and the various operations of moulding up give the ground a very fine tilling, and the remains of the manure produce a lasting benefit. This year's celery quarters are the best possible place for next year's parsnips. The soil will be in good tilth; the manure being low down and the strength having gone from it, the roots work freely, and go down to the manure, which is too low to have any effect in causing them to fork, as fresh manure dug in will do. Where stable manure is scarce recourse may have been had to tares, clover, or partridge peas for a supply of humus to dig in.

Some say that winter cover-crops will keep down weeds, but this is a delusion and a snare when applied to vegetable-gardening. If any such crops are now growing, or if there is any weedy ground, dig them in at once and give the soil the benefit of a good airing before seed-time. This will do more good than a little extra green growth, and will afford an opportunity of getting rid of slugs, for cropping with legumes has the serious disadvantage of forming a nursery for slugs. In the ordinary course of gardening, slugs disappear in the hot weather and are not troublesome again till spring. If you grow patches of partridge peas you will have them all the time. We have found it so to our cost.

To return to potatoes and manure: The general opinion is that maiden pasture land is best for potatoes, without using manure of any sort. My own observations verify this. But it must be good land, and the turf turned under in autumn. Given land of fair to good quality, such as that around me, it can be cropped two years with

potatoes without manure. The second year usually gives the better crop, doubtless because of the complete disintegration of the turf which had not taken place in the first year. The addition of farmyard manure to such land has been proved to be attended with disastrous results. A large amount of haulm is produced with a poor crop of tubers, and the overluxuriant haulm is predoomed to blight. But all land will not grow potatoes without manure, and where this is the case it is necessary to apply it. The same must occur in gardens that are under continual cropping. Manure may then be given with safety. But I conclude as I began, by stating that the best potatoes are grown without stable or farmyard manure.

In the working of a garden there is from time to time necessity for fires, to burn up rubbish of various kinds. The remains of these fires are of value. If branches have been burned, so as to leave a residue of wood-ash, it is worth while putting the ashes under cover as soon as they are cold and before much rain has fallen on them. If a corner of a shed is available, or a corner sheltered with a few sheets of old corrugated iron so as to keep the ashes dry, they will be valuable as a top-dressing to soil prepared for onions. We always do this, and spread the ashes just before we draw the drills. When the fire-remains consist more of burnt earth than of wood-ash they should be wheeled to a convenient place, where they may lie for a time, not sheltered from rain in this case. These ashes are very useful in a variety of ways when the lightening of heavy soil may be desirable, or for mixing with compost for raising seedling plants.

CURRENT WORK.

General seed-sowing will soon be the order of the day. There is also a certain amount of planting to be done. Planting should include rhubarb of the summer varieties, cabbage, cauliflower, lettuce, onions, garlic, shallots, potato onions, and potatoes for early supply in places not subject to frost.

Pea sowing begins now in the ordinary course. Varieties have been dealt with in recent issues of this *Journal*. Sow a dwarf variety for first uses, and, at the same time, a taller one to succeed them.

Broad beans may be sown, if not in before.

Carrot seed of Early Horn type may be sown in small quantity.

Lettuce seed may be sown.

Onion seed may be put in wherever the soil is in a fit state and can be relied on to remain so, always bearing in mind that, though the earlier they can be got in the better the chance of good crops, it

is bad practice to sow seed if it will be a long time coming up, or if the plants linger in growth after they are up, as will be the case if the soil is cold.

Onions require a firm seed-bed on soil that will not cake under heavy rain. Drills should be very shallow, merely deep enough to allow for covering the seed. Soot is a very fine fertilizer for onions, and helps to keep insect pests away. It should be broadcasted before sowing the seed. Superphosphate is also a good fertilizer, and should be broadcasted as though it were grass-seed and about as thick as you would sow grass-seed.

Rhubarb should be planted in rich ground, in rows about 3 ft. apart, and 30 in. to 36 in. apart in the rows. The sets should be put in so that the crowns are barely covered. Where there are old beds of rhubarb, with the clumps getting broad, they are probably deteriorating, and should be dug up and chopped in pieces. They will make as many new sets as can be secured with crowns. One or two strong crowns are enough for a set. It is best to take the plants up after three years. Sometimes, to save the trouble of lifting, the outer parts are chopped off, but this is hardly a good plan, though advised by supposed great authorities, for it is evident that the young parts are destroyed and the old parts kept.

Cabbage and *cauliflower* plants put out should be from the autumn sown bed. Older plants may be available when the latter are not, but it would be bad policy to plant them, as they would be almost certain to bolt to seed without heading in.

Lettuces may be planted as soon as young plants are large enough, if the bed of young plants is sufficiently extensive. Those wanted for planting should be drawn out in such a way as to leave some plants undisturbed and a few inches apart. Those so left will provide the earliest cutting. In damp situations the lettuce-beds should be raised. Beds should be about 5 ft. broad with a spit-wide path between, in order that weeding can be done from each side without treading between the plants.

Onions planted now are to secure large bulbs—that is, proportionately large according to variety. The usual object in sowing onions in autumn for transplanting is to produce large bulbs. For this purpose varieties of the Rocca and Ailsa Craig type are sown. These must be allowed room in proportion to their size. The rows may be 15 in. apart, and a 12 in. space between the plants is not too much if the soil is good and has been supplied with stable manure. If less rich allow 10 in., as we do without stable manure. Bulbs may be expected to vary from 2 lb. to 3 lb. each in these conditions, being heavier where they have stable manure to feed on. Give a top-

dressing of wood-ashes if at hand before planting. There are various ways of planting. It is best not to let the plants get long beforehand. Care must be taken not to bury the stems; just the roots and the smallest possible portion of the stems should be covered. It is best not to try to make them stand upright. Let them lean on the ground. They will right themselves very soon after they begin to grow. The smaller varieties, those of the Brown Spanish type, should be planted closer—say, 5 in. or 6 in. apart. For these the most expeditious way of planting is to draw a shallow drill. The marker used to drill for seed will make drills deep enough. Lay the plants on their sides, with the roots in the drill, and push in just enough soil to cover the roots.

SMALL FRUIT.

Gooseberry bushes may now be pruned. The chief object sought should be a bush with branches so arranged that it will be easy to gather the fruit. This means that they must not be very close together, and that the centre of the bush should be open. Varieties of a drooping habit should be pruned with a view to counteracting this tendency. Shoots pointing downward should be removed, or if this is not desirable they should be pruned to an upward bud. There is no necessity for much shortening of side shoots. It should be remembered that the young wood will bear fruit, and that the quantity will be in proportion to length of this. While it would not be wise to leave the shoots full length and institute a state of overbearing, which would result in poor fruit, it is preferable to shorten those on the outer and upper parts by about one-third, and those in the inner and lower parts of the bush back to spurs. Gooseberry-bushes may also be planted now. Plant 5 ft. apart. The most profitable variety for culinary purposes is Farmers' Glory, a very large and prolific sort. This is the variety I recommend for planting in quantity. The good points of some varieties are lost in this part of the world, where jam from ripe gooseberries is practically unknown. This is a pity, for preserves from ripe fruit are very superior to those made from green. Ironmonger (Rough Red) and Warrington are the two famous jam-making varieties in the Old Country—that is, when the ripe fruit is used. Broom Girl, China Orange, High Sheriff, Pineapple, Gipsy Queen, Red Champagne, Overall, Gregory's Perfection, Freedom, Whitesmith, and Jolly Miller are all good desert varieties.

Many attempts to grow *red currants* have proved futile, partly through wrong pruning, but mainly through planting wrong varieties. Pruning consists in securing an open framework of leading branches. All side shoots are to be pruned back to short spurs, for the red currant never bears fruit on the young shoots, but on spurs on older

wood. Reliable varieties are Chenanceaux, Cherry Red, La Versaillaise, and Fay's Prolific.

Black Currants.—The chief difficulty with these is the borer. A proper system of pruning, however, pretty well conquers it. But it is useless to attempt to grow black currants unless soil and other conditions are suitable. There must be plenty of moisture all through the summer, with a cool subsoil. This state can be provided by deep trenching and plenty of strong manure. In the absence of manure do not try to grow black currants, unless the soil is of an exceptional character, retaining moisture throughout summer. In such cases artificial manure will supply the place of natural manure. Black currants bear on the young wood, and this should be encouraged, cutting away old wood to make room for young. Young side shoots should be slightly shortened, not much beyond removing the tips which are immature. There is this vital difference in the training of the red currant and the black: that whereas the red must be trained to a single clean stem from the ground, no suckers whatever being allowed, the black currant should be encouraged to make suckers, and these should be preserved in sufficient number to enable the gradual and continual renewal of the bush by cutting out the old branches to make room for young suckers, not doing it all at once, but a little each year. This method promotes continual youth in the bush, and prevents the borer from doing much harm.

Raspberry canes should be thinned out to about 6 in. in each clump, and should all be shortened by about 12 in.

Loganberries.—Young rods that have been preserved, as previously advised, should be laid in in place of old ones, which after bearing twice should be cut out. Rods that have borne fruit last season and are to be retained will be furnished with the shoots that carried the fruit. These should be cut back to short spurs.

FLOWER-GARDEN.

Complete rose-planting as soon as possible, and prune established bushes. Pruning varies for the different classes, and even for individual varieties occasionally. With hybrid perpetuals there is a general shortening of shoots in a severe manner. It should be the aim to produce shapely bushes, therefore the centre stem should be the highest. Roughly stated, leading shoots should be shortened to one-third of their length, and side shoots to two eyes. The first thing is to remove entirely any spindly shoots there may be, and any dead wood, any extra gross or soft shoots, and any that appear to threaten to crowd the bush. Frau Karl Druschki and J. B. Clark are both exceedingly strong, and must not be cut back so severely. New long shoots may

be tied over like a bow, and not shortened, but remove some of those previously treated in the same way. Or the shoots may be somewhat shortened according to strength, leaving them from 6 in. to 10 in. long. I find this plan answers well. Remember when planting these varieties to allow them plenty of room, as they make large bushes. Thin out old twiggy branches of tea roses, to make room for young growth, and remove weak spindly stuff; shorten the remainder only slightly. Clear out the centres of polyantha roses, and shorten remainder by one-third. Lay in young rods of climbing-roses, and remove old rods that have become twiggy. As a rule it is best to remove a rod after it has flowered twice. All side shoots should be cut back to spurs.

When cleaning up the *borders* it is usual to do a certain amount of pruning to the various shrubs. This kind of thing should be done with understanding, and with a view to develop the characteristics of the individuals, and not to make them all alike by cropping with shears. *Prunus pissardi*, the purple-foliaged plum, is a beautiful tree if allowed to assume its natural habit. It should be trained up as though it were an ordinary plum-tree, only the centre instead of being hollow should be full—the style, in fact, of a standard cherry-tree—viz., a clean stem for a few feet, then main branches radiating equally around so as to form an even head, which should not be crowded. The flowering-cherries should be similarly treated. The generality of flowering-shrubs should not be pruned at this time, the exception being the case of late-flowering varieties. The pruning of all flowering-shrubs should be done immediately after flowering, whenever that may be, and it is not, in proper practice, permissible to do anything more now than to cut away straggling branches of the early flowering-shrubs.

Hydrangeas may be shortened back to strong buds in the case of the old flowering-shoots. These end in the dead flower-head, but those shoots that are terminated by foliage should be left untouched, as the ends of such shoots will develop blossoms. This reminds me of an old way of furnishing nice little plants for house-decoration. If a watch is kept on the leafy shoots of the hydrangeas they will presently show the beginning of the flower-heads. As soon as this is seen cut off the shoots just below the second joint, pot them singly in 3 in. pots in light soil, and plunge them in a hotbed. They will soon root. Then take them out to a cooler frame, water with weak liquid manure every time, and they will develop heads of flower 5 in. or 6 in. across.

A hotbed is very useful at this time for raising seed and striking cuttings. When July is well in, a start may be made with the sowing of half-hardy annuals, &c., under glass; and in places free of frost hardy annuals may be sown in the open ground. Pansy-plants should be got into their beds. These like cool weather, and get a strong start if out early, giving the best flowers of the season towards the end of spring.

THE POULTRY INDUSTRY.

F. C. BROWN.

JULY WORK.

JULY may fairly be considered the most important month in the poultry calendar. Profitable production implies profitable stock, and the securing of this rests, in the main, on the foundation blood and the manner in which this is mated and handled. July is therefore the crucial month, the time when the judgment of the poultryman is put to the most severe test. If he acts with the desired judgment arising from the many lessons taught in the course of keen practical experience he will study industriously his breeding operations, and be guided by the sound underlying principles upon which the successful breeding of all classes of stock rest. The A B C of this is that like begets like, and that no stock can be too good to place in a breeding-pen. Many poultrymen consider that the incubating and brooding stages are the main considerations, but these are only necessary links in the chain. The quality of the parents is the first consideration. In last month's issue some advice was given in regard to mating, and Felch's valuable line-breeding chart was reprinted. Too much importance cannot be attached to this. To succeed in poultry-keeping everything must be ordered on the most exact principles. In the first place, the breeder must know exactly what he is doing, and this implies a correct knowledge of the history of the birds he intends to mate. Happily, in these days it is at times possible to obtain information of the pedigree of performance, some idea of the hereditary productive capacity of fowls. Having this both on the male and female side, a poultryman knows just what he is doing in forming a breeding-pen, and if his information as to the pedigrees of performance is correct he cannot go wrong if he has at the same time attached due importance to constitution, the possession of which is imperative to secure heavy laying-stock with the power to produce to their full capacity. A common mistake made, even by those who realize the importance of breeding only from the desired stock, is that they attempt too much, and therefore mate up birds which should never be bred from. Careful mating means a smaller percentage of cull birds. It is, however, an unfortunate thing that culling of the young stock is either not sufficiently drastic or is neglected altogether. The careful

poultryman who is keenly intent on raising the productive character of his flock, and thereby making poultry-keeping the payable business it should be, will appreciate the necessity of more care in mating up the breeding-pens, especially in seeing that only the most desirable birds are used.

DAY-OLD CHICKS.

A correspondent is anxious to know if there is any danger in purchasing day-old chicks, especially from a man who says he has orders already booked for several thousands. I can only reply in the affirmative. The day-old-chick method of rapidly establishing a flock is an excellent one, provided, however, that there is some guarantee that the chicks purchased come from approved and selected laying-stock. If a man is turning out day-old chicks by the thousand it is obvious that he must have an enormous number of breeding-stock from which to select the necessary number of breeding-pens, or he must be breeding from all his stock irrespective of quality. This is where the possible danger comes in, as, while the day-old chick from good breeding-birds is all right, the chick from cull stock is all wrong. It is the difficulty of making sure of obtaining the former where the drawback to this method of stocking up comes in. Some breeders supplying day-old chicks have very even flocks, and are capable of making up a large number of good breeding-pens, and are thereby able to send out chicks which should develop into payable stock; but, on the other hand, there are no doubt flocks in which only a comparatively small percentage of the birds are fit for breeding from, and if the owners of these are tempted to supply large numbers of day-old chicks they will find it a very difficult matter giving satisfaction to their customers. After all, it is the same in all branches of stock-dealing. It is not every one who is naturally a successful breeder, and if good stock is to be secured the successful and reliable breeder must be looked to.

BAD LUCK!

Bad luck has a lot to answer for; it is the cause of so many failures in poultry-keeping. A hatch fails—because the board that was put in front of the nest to make the hen feed was not taken down again. Bad luck! The hen neglected the eggs—because she was tormented by vermin. Bad luck! Chickens were lost—drowned in a deep water-tray. Bad luck! Chicks drowned again—by water getting under the coop. Bad luck! The hatch failed in the incubator—the lamp was not filled at the right time. Bad luck! Another hatch failed—the wick was not renewed. Bad luck! A poor hatch—the eggs when taken out to cool were forgotten. Bad luck! A

second poor hatch—something had been thrown on the regulator. Bad luck! Infertile eggs—the breeding-pen had been neglected. Bad luck! A spoilt hatch—thermometer broken, and a spare one not on hand. Bad luck! Chickens died from bowel trouble—the lamp went down in the brooder. Bad luck! More chicks died—food ran out, and had to feed something else. Bad luck! Still more died—shut them out of the brooder, and forgot to let them in again. Bad luck! The best of the lot went—to the rats. Bad luck! No eggs—forgot to feed the fowls. Bad luck! Still no eggs—fowls roosting in trees. Bad luck! Again no eggs—raining for days, and no dry scratching-place. Bad luck! Pullets moulting—hatched too early. Bad luck! Some hatched at the right time also moulting—had to change their food and quarters. Bad luck! Disease breaks out—had too much stock, and overcrowded the houses. Bad luck! Lost money—thought anybody could run poultry. Bad luck! And so it goes from year to year. It is the bad luck that is the cause of all the failures.

There are some people, however, who start on a sound financial footing, understand something of poultry-keeping, consistently endeavour to improve their methods, and conduct the business in a careful and methodical manner. Somehow they never have bad luck. Certainly they occasionally, like human beings in general, make mistakes, but these seldom are of any moment. They succeed in the things that really matter, and thereby make poultry-keeping the profitable work it is to those who thoroughly understand it, and treat it as a serious proposition to be mastered and conducted on the same strict business principles as any other commercial undertaking.

THE OVERFEEDING MYTH.

It is surprising the number of people who continue to believe that the heavy layer can be overfed. We never hear any warning being given the dairy-farmer not to overfeed his heavy milkers. True, with both the egg type of bird and the deep-milking cow the feeding of highly concentrated food can be overdone, but food of the right description can never be fed in excess in either case. In the old days, when birds were only capable of laying half the eggs now regarded as essential to profitable production, it was possible to make the birds overfat, and consequently unhealthy. It is very different with the type now favoured—birds bred according to a pedigree of yielding-capacity, and shelling out a two-ounce product of the most highly concentrated material known in the animal kingdom day after day for probably over 200 days out of the 365. Obviously such birds must have the necessary material from which to manufacture their phenomenal product

and at the same time maintain the bodily vigour necessary to enable them to do so, especially in cold weather, when any stinting in the food-supply is fatal to production. In the hundreds of visits I pay to utility-poultry plants during the year I invariably find that it is only where the food is supplied with an unsparing hand that the egg-yield is satisfactory, whereas where any attempt is made to calculate the allowance for each bird the results in egg-yield are generally disappointing. Only the other day I visited a man who had 320 fowls, and who was not only feeding them on the special ounce a bird at the evening meal sometimes advocated, but was not as careful as he might have been as to the time when he fed them. His egg-yield was actually less for the month than that of the fifteen birds of a neighbour who believed in giving his fowls all they could eat. Of course, it is not everybody who follows the latter principle who gets the eggs he should. He may scatter the food broadcast, but if he fails to keep the birds provided with fresh water and grit his returns will still be disappointing. Again, he may not have the right class of birds. The man who stints his fowls cannot have that true regard for animals which a man must possess to make a success of handling any class of live-stock. Hand-in-hand with spare feeding is generally found a neglect of those many details strict attention to which is essential in managing poultry to advantage. The houses are unclean, and vermin is abundant—the blood-sucking insects making a greater drain on the animal system than the heaviest laying—the yards are foul, and water, grit, and green stuff are seldom in constant supply. He who stints his fowls would be better employed at some other occupation.

How to tell the Layer.

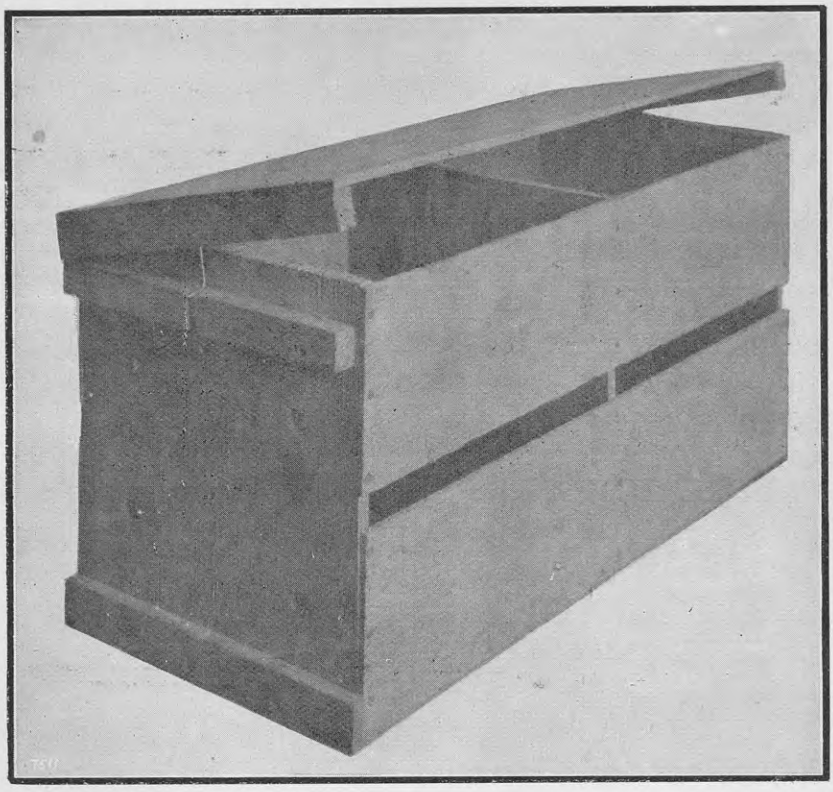
A correspondent is anxious to know if there is any means of telling by the outward form of a bird whether it is a layer or not. There certainly is, but it is only the man with a keen eye for form and who is a student of type who can readily distinguish between laying and non-laying birds. I cannot do better to emphasize the difference between the two types than instance the striking difference in form between the beef-forming cow and the dairy type. The former is of a blocky build, while the deep milker has all her development concentrated at the business end. Thus, while she should be fine in front she has a great barrel and exceptional width and depth in the milk-producing regions. So with the heavy layer. She naturally must possess exceptionally generous development in the latter half of her anatomy, where the egg machinery is located, tapering to that fineness in her fore end which is always indicative of a highly developed nervous temperament, the natural characteristic of the

heavy producing animal. The non-layer, like the beef type of cattle, is square and blocky with a rather sluggish temperament. A man with any eye at all for form should be able readily to distinguish the two types. It is impossible to estimate from the appearance of a bird the extent of her laying-capacity, but it is easy enough to tell whether or not she is of the laying type. One character which must go hand-in-hand with the laying type is the possession of the desired constitution. This qualification is indicated by bright feathering, a bold bright eye, legs well apart (as they should be in the laying type in general), and the possession of a very active disposition. Of course, there are individual birds which conform to all the desirable points looked for in a heavy layer and yet fail to prove satisfactory layers. This is due to some weakness in construction or an abnormal development not observable to the eye. I once picked out a bird which I considered was a capital type of a layer, but found on handling her that she had a large tumour in the abdomen. The eye for form is a natural gift, but it can to a very large extent be developed by close study and observation.

NEW ZEALAND EGGS IN LONDON.

A correspondent, in expressing appreciation of the results of the Department's experimental shipment of eggs to London, is anxious to know if the eggs were specially selected, or were they but a fair sample of the eggs ordinarily sold on New Zealand markets, as, he writes, the London *Dairy* made this remark on the shipment: "They were found to be in splendid condition, and could fairly rank as new-laid. They compared favourably with anything on the market, and hardly one was broken." The eggs were certainly an exceptionally good line. I personally selected and packed them. They represented three days' yield of the flock of the Heretaunga Poultry Plant, Wellington; and as the flock of 1,500 birds is entirely of the White Leghorn breed, singularly uniform in type, while the birds at the time of year (December) were of an adult age, the eggs were a very straight line, fully 90 per cent. being first grade. These were selected for shipment. As the birds have roomy scratching-quarters, clean nests, and good grass runs the eggs were particularly clean. Again, the fowls being well fed and supplied with an abundance of green material (watercress), the eggs were as good internally as their outward appearance suggested. The eggs were infertile, which is imperative in catering to a distant market. They were packed in Canadian cases, holding thirty dozen each. These cases are made of very thin wood, with openings between the slats, but having stout ends. They are divided in the centre by strong boarding. The eggs were packed in manila cardboard fillers—strawboard is unsuitable, as with moisture it imparts a

musty flavour to the eggs. On each tier of eggs a sheet of manila cardboard was placed. These were specially perforated for the London shipment, in order to allow as free a circulation of the cold air through the package as possible. The Canadian case is illustrated herewith. I have to express appreciation of the keen interest taken in the shipment by the refrigerating staff of the s.s. "Rotorua," by which steamer



THE CANADIAN EGG-CRATE.

the eggs were shipped to London. No doubt the care taken of the eggs on the oversea voyage was largely responsible for the excellent condition in which they reached the Home market.

QUALITY VERSUS QUANTITY.

While the laying competitions have rendered the industry excellent service in developing the laying-power of certain breeds of poultry, this should not be their only objective. The day is passing when the consumer will purchase eggs irrespective of quality. He will demand,

even with the guaranteed fresh egg, that it be of a certain weight. The recognition of weight in the eggs laid by the respective pens in the competitions becomes therefore a matter of prime importance. It is gratifying to see the publication of the weight of eggs produced by competing pens at the last test, the figures disclosing valuable comparative data, clearly indicating that the number of eggs produced is not everything, and that we can obtain a yield at too great a cost. While the Utility Poultry Club is to be congratulated on the information furnished, this would be much more valuable and be appreciated more highly were it supplied month by month during the currency of the test. For instance, poultrymen are naturally guided as to the source from which to obtain their stock and settings by the progress reports of the competition results; but if only the number of eggs laid is supplied, a reliable guide as to the breeding-quality of the stock of competing breeders is not made available. No wise poultryman will use a small egg for breeding purposes, and he runs a very good risk of securing these if he is guided merely by the number of eggs produced by certain competing pens. Many breeders are pinning their faith to an export trade as a means of unloading the summer surplus, but they will find the critical oversea markets will not pay full rates for undersized eggs, and only the best values will warrant the export business. Especially is it necessary to remember quality in initiating a trade.

THINGS TO REMEMBER.

Give the breeders ample exercise.

Strong chicks imply strong germs, and strong germs come only from vigorous breeding-stock.

Do not force the breeders, but provide nourishing food with ample green stuff.

Study nature, and especially at mating-time provide natural conditions as far as possible.

Always have spare breeding-birds in case of accident, and where the breeding season is prolonged a change of male bird is desirable.

Do not cut off the whole of the wing-feathers of hens intended for the breeding-pen. If you do, poor fertility will probably result.

Long sharp spurs on the male bird are a drawback where fertility is desired. These should be pared and made blunt or cut off altogether.

During the early breeding season it is necessary to have a dry place in the breeding-pen if a high percentage of fertile eggs is to be secured.

LUCERNE ON SAND FOR POULTRY-FEEDING.

Profiting from experiments being carried out by the Fields Division of the Department of Agriculture in reclamation of sand areas, and following the advice published from time to time, Mr. J. Salkeld, of Burwood, Christchurch, was induced to try lucerne-growing on sand for poultry-feeding. The area on which he sowed the lucerne was pure sand, and was dressed with fowl-manure before being sown, on 12th July, 1912. Since then Mr. Salkeld has taken five cuttings off the crop—the first at the beginning of October, the second at the end of November last, the third early in January, 1913, the fourth in February, and the fifth in March.

LUCERNE ON SAND.

THE DEPARTMENT'S STOCK.

"From the Government poultry-farm at Milton," says the *Otago Daily Times*, in writing of the display of poultry in the Department's exhibit at the Dunedin Winter Show, "comes a splendid exhibit of poultry, comprising a number of splendidly grown specimens of the utilitarian varieties. Several gentlemen who are in a position to judge stated that the exhibit was the best of its kind they have seen, and one went so far as to state that it would equal anything to be seen in the Southern Hemisphere." All the birds in the exhibit were the progeny of the stock imported by the Department from Australia last year.

The fact should never be forgotten that the heavy-layer cannot be overfed.

Poultry-keeping is one thing and poultry-farming another. A man who keeps a cow or two is never called a dairy-farmer, nor is a man who has a few sheep termed a sheep-farmer.

PASTURES AND CROPS.

MAY.

OFFICERS of the Fields and Experimental Farms Division of the Department report as follows on the condition of the pastures and crops during the past month :—

BAY OF ISLANDS.—The disastrous drought broke on the 25th April, when a fairly heavy downpour of rain caused every settler to rejoice. The total rainfall for April was 1·78 in., which fell on five days, the heaviest being on the 25th, when 1·12 in. fell. May has been more favoured, and rain fell on twelve days, the heaviest being on the 15th, when 0·73 in. fell. The total for the month up to the 27th amounted to 2·59 in. Unfortunately, the autumn was too far advanced, and with the belated rain came cold temperatures, which have militated against any satisfactory growth being made in the pastures. As predicted last month, stock have suffered very much from the cold and bitter westerly winds that prevailed for the greater part of May. Towards the end of the month there were a few congenial days, the sun shining and the wind ceasing. The few of the more progressive farmers of this district who go in for turnip-growing have found the salvation and value of their wisdom in doing so, and have proved to their less progressive neighbours that it pays handsomely to cater for their stock in this way during the autumn and winter months. As a result of the drought a lot of the grasses have died, and weeds are growing luxuriantly in their place. It would pay many farmers, where it is possible to cultivate, to plough up such pastures and sow them anew. This would serve a twofold purpose, by preventing the propagation of weeds and improving the condition of the soil and pastures.—*W. J. Dunlop.*

WHANGAREI.—The weather for May was windy, with cold showers. On the night of the 10th this part of the country had one of the most severe gales yet experienced, and it was accompanied by a very heavy rainfall. The stormy weather continued until about the 20th. There has been little growth in the pastures, and consequently there is every prospect of this winter proving a very severe one on stock. Most of the turnip crops are failures, and there will be little feed to carry stock through to the spring.—*A. P. Speedy.*

AUCKLAND.—May opened with very unfavourable weather—southerly winds, strong to a gale, prevailed, and were followed by cold showery weather. Although there was plenty of moisture in the soil, there was not sufficient heat to encourage the growth of grass: consequently the pastures are bare. It is regrettable that very few farmers have made provision for winter and spring feed. Some who are fortunate enough to have an ample supply of feed have nothing to fear, but those who have not will find it difficult to obtain fodder without having to pay dearly for it. Turnip crops are much better than last year, and are now being fed off. Preparation of land for the early planting of potatoes is in progress, particularly in the Bombay district, and there is every indication that the area under this crop will be greatly increased this year.—*R. Rowan.*

OPOTIKI.—During May there were a few light rains, which were followed by severe frosts; consequently feed throughout the district is very scarce. It is feared that settlers have a hard winter before them. Maize-picking is now in full swing, and early planted crops are expected to yield as well as in past seasons.—*J. Case.*

TE AROHA.—The early part of May was dry. Sunny days were followed by severe frosty nights, which retarded all growth. The latter part of the month has been boisterous, with cold north-westerly squalls and very cold showers. In the Thames Valley pastures are very fair, but in other parts of the district feed is very scarce. Turnip and other root crops are good this season; and, with good crops of hay and oats harvested, settlers are fairly well prepared to meet the winter, which, from all appearances, is likely to be a severe one.—*J. R. Morris.*

HAMILTON.—The weather during May was wet, cold, and boisterous, with occasional frosts, which had a disastrous effect on the pastures. Feed is scarce throughout the district, and turnip crops are being fed off earlier than usual. Stock are still looking well, but owing to scarcity of feed in other districts large numbers of cattle and sheep have been brought into the Waikato, and the prospect of keeping them in good condition until spring is not good.—*J. Kerr.*

TE AWAMUTU.—The fine weather experienced during April was not continued this month. The weather for May was exceptionally stormy and wintry. Cold winds, rain, and frost predominated over occasional fine days. Winter has fairly set in, and stock are already feeling the pinch of bare paddocks. Turnips are good, but the area sown is small, and holders of large mobs of cattle are keenly competing for available supplies. The milking season, which was not up to expectations, is finished.—*C. E. McPhee.*

CAMBRIDGE.—The weather during May was very dry, with just odd showers. Hard frosts prevailed right throughout, and have retarded all growth. Pastures are bare but green. Turnip crops, on the whole, are good, but from present indications farmers will require all their straw and hay to see them through the winter.—*A. A. Clapcott.*

KING-COUNTRY.—May has been a typical winter month for this district, with cold rains and hard frosts. The latter were followed by days of clear sunshine. The rain freshened the pastures, but it promoted very little growth. Turnips sown on new fern land have not been a success, the fern having asserted itself. Swedes grown on well-cultivated old pasture country show the best results, though the size of the roots is below the average. Winter feed will be at a premium before the spring growth appears. —*B. Bayly.*

TAUPO.—The month of May was very dry, with a few showers at intervals. Cold southerly winds and a few frosts have retarded growth generally. Pastures are fairly bare, but green swede crops are, on the whole, looking well.—*H. Allen.*

TAIHAPE.—May was a very rough, cold month. Snow fell at intervals, and was accompanied almost immediately by severe frosts, which completely stopped growth in pastures. The farmers are already complaining, and are anticipating a very severe winter for all classes of stock. They say that they do not remember ever starting a winter before on so little feed. Turnips grown on Waiouru pumice plain are easily the pick of the district.—*A. P. Smith.*

MANGAWEKA.—Old settlers agree that May was one of the coldest months they have ever experienced in this district. Snow fell on several occasions, and was accompanied by a keen biting wind. The frosts, too, were exceptionally keen for so early in the year. Grass is showing signs of the severity of the weather, and stock have suffered a good deal from cold and exposure, and have gone back considerably, especially dairy cattle.—*J. A. Melrose.*

NEW PLYMOUTH.—May was a very cold month. There were several falls of snow on the mountain, and an unusual number of frosts. Rain fell frequently. All stock are looking well. The pastures, owing to the cold and frosts, are getting very short.—*R. E. Fairfax-Cholmeley.*

STRATFORD.—May was a very variable and broken month, with strong southerly winds, very heavy rain, very sharp frosts, and towards the end of the month a few bright days. The rough weather and frosts stopped all growth of pastures, with the result that farmers have had to start on their winter feed sooner than they expected. As a lot of the turnips are diseased, the prospects for wintering stock are not too bright, except for those who are well prepared for it. There are several turnip crops affected with club-root. Already there is a demand for turnips, hay, and grazing.—*A. F. Wilson.*

WANGANUI.—The weather during May was infinite in variety, but generally unsatisfactory from the farmer's view-point. Storms of exceptional fury raged on the 1st, 2nd, 9th, and 20th, the last-mentioned being accompanied by thunder and a deluge of hail which spread a snowlike covering over the countryside. Conditions during the last two months having been inimical to the usual growth of grass, pastures generally are comparatively bare, and the outlook for stockowners who are dependent on natural feed is not encouraging.—*C. Watson.*

FEILDING.—The weather up to the 19th May was cold and wintry, with snow and sleet on the high country. Since that date fine weather with light frosts has been welcomed for working the land and sowing autumn crops; also for lifting potatoes, which have turned out very satisfactorily. From 15 tons to over 20 tons per acre have

been mentioned, principally of the Northern Star variety, which has become famous in this district, as it is grown practically free from blight.—*W. Dibble.*

GISBORNE.—The weather during May was cold and boisterous, with a good deal of frost for this district. Feed for sheep is fair, but for cattle scanty. The rainfall was light.—*W. Ross.*

WAIROA.—The weather-conditions of May were of a seasonable character. Fine sunny days accompanied by frosty nights, and alternating with occasional broken periods of a wintry nature, were experienced. Pastures still continue to make moderate headway, and stock are in fair condition. Turnip crops are being generally regarded as a failure, and farmers will require to derive all the benefit from nature's unassisted growth to maintain their own.—*T. F. Mullaly.*

WAIPUKURAU.—The month of May was a very wintry one; high rains fell, and there are heavy coatings of snow on the Ruahines. The lower levels experienced heavy frosts throughout the month, and the growth of pastures has consequently been retarded. —*H. O. M. Christie.*

HASTINGS.—The weather during May was seasonable. There were cold nights and several severe frosts. Less rain fell than is usually recorded at this time of the year. Consequently stock are looking exceedingly well, considering the scarcity of feed.—*J. G. Parker.*

PAHIATUA.—Winter set in in real earnest from the commencement of May up to about the last week, when frosts came, with fogs for three mornings. The fogs helped to prevent the frost from cutting down the pastures. The soil is in good condition for the plough, and it will now pay to turn the land and work it well. Farmers will now have to begin to feed their stock. During the month rain fell in Pahiatua on fifteen days, as against ten days for the same period last year. The total fall during the month was 6·11 in.—*T. Bacon.*

NORTH WAIRARAPA.—Rough weather was experienced throughout the district during May. This will tend to make feed scarce, and to raise the price of fat and forward stock. Turnips are not standing much feeding off. The majority of the butter and cheese factories will be closing down about the middle of June. There have been more cows milked in the Wairarapa this year than formerly. This will help to make cow-feed very scarce about spring. There is still a fair amount of crutching to be done on the stations. Farm-work is at a standstill, the ground being too wet to plough. Those who have winter feed should reap the benefit.—*J. S. Rankin.*

MASTERTON.—The weather during May was exceptionally wet and cold, and has seriously interfered with farming operations. Ploughing in particular has been thrown back, but, fortunately, a considerable amount of ploughing was done last month, and in isolated cases early oats were sown. It is very noticeable that the autumn-sown crops usually turn out much better than the spring crops. Weak sheep are feeling the rigorous weather which has been experienced in this district, and it is reported that a number have already succumbed. Snow fell on the low-lying country on the 22nd, but remained only a short time. Pastures have suffered with the early approach of winter, but so far there appears to be ample feed to see the winter through. Fortunately, there was a large quantity of real good hay saved this season.—*T. C. Webb.*

CARTERTON.—The weather during the month of May was very unsettled, and on the high country snow was very much in evidence. Several heavy frosts were experienced. The milk-yield has decreased considerably, and all factories will shortly be closing. Stock in general are looking well. Many farmers are having trouble in obtaining grazing for their dairy herds. Autumn-sown crops are looking well.—*S. C. Ivens.*

WELLINGTON.—Winter made its appearance in earnest with the incoming of May. The continued cold southerlies, with heavy rain, during the first ten days were followed by keen frosts, which cut back the growth of pastures severely. As a result, feed will now be scarce on exposed lands. Crops of swedes were very fair, and mangels were good generally. Autumn-sown oats were looking well. The weather was too wet for potatoes; altogether it has been a poor year for this crop. Milking-herds suffered a good deal, but other classes of stock were looking fairly well.—*G. H. Jenkinson.*

BLENHEIM.—Winter set in unusually early, and there is every promise of it proving a severe one for stock. With few exceptions there was frost every night during May, the hardest being about 12 degrees. On the 9th and 10th of the month cold rain set in, and on the high levels the snow was very heavy. Even the lower hills round Blenheim had a fairly thick covering, which came unusually low down. The days were beautifully bright and sunny, if somewhat cold.—*F. H. Brittain.*

NELSON.—The weather for May was very cold, with snow on the hills and frosts at night. Though only a little over 2 in. of rain fell, there were two falls of snow. It is many years since there was so much snow in May. The country is still dry, and the rivers and creeks are very low. The ground has been so dry that it has been difficult to plough anything but stubble land. Owing to the weather being so cold and the ground so dry, there has been little growth in the grain crops. The pastures are poor, and feed is getting scarce. There is every prospect of a very severe winter for stock.—*Gilbert Ward.*

WESTLAND.—The weather-conditions throughout May were of a very boisterous nature, and considerable damage was done in the Inangahua and Murchison districts owing to heavy falls of snow. Settlers who had sheep depasturing on the high country seem to think that their losses will be somewhat heavy in consequence. As they did not expect such severe weather so early in the season they had no opportunity of removing stock. Dairy stock have also suffered considerably.—*H. J. Walton.*

SEDDON.—Up to the 15th May there were heavy rains combined with snow falling heavily, especially through the Upper Awatere. After this severe frosts started, being followed by bright sunny days, which prevailed to the end of the month, when heavy rain set in. All farming operations had practically to be suspended during the early part of the month, as the ground was too sodden from the recent rains for suitable working. There is promise of a plentiful supply of feed during the coming winter.—*E. T. Sinclair.*

KAIKOURA.—Extremely cold weather prevailed for the first half of the month of May, and heavy falls of snow on the Kaikoura Mountains made access to the Clarence Valley a difficult undertaking. The latter half of the month was fairly dry and seasonable. Pastures and crops have made very little growth, owing to cold weather and frosts.—*W. S. Goodall.*

ROTHERHAM.—The weather during May was of a very wintry character, and there was every indication of an early winter. During the first week there was a heavy rainfall with severe snow in the back country, a fall of 3 ft. being reported in the Clarence country. It was also very severe in Tarndale and Molesworth districts, where there was still snow to a depth of 2 ft. at the end of the month. Gangs of musterers have been snowed up since the first week of May. Towards the end of the month severe frosts set in, and there is every indication of the snow remaining for the winter. This would prove disastrous to stock, which cannot be got on to the winter country. Potato-digging has been in full swing, but the returns have been very poor.—*W. M. Munro.*

RANGIORA.—There were a few wet days in the early part of May, but the remainder of the month was very fine. Farmers were busy ploughing and lifting potatoes and mangels. Two or three paddocks of mangels appeared not to be quite ripe, owing probably to late sowing and early frosts. A large number of farmers have pitted their potatoes, expecting prices to improve. The crops are heavier than was anticipated, but there are more small ones than usual. There were several severe frosts during the month, and the hills have been covered with snow for some time.—*A. Hughes.*

LINCOLN.—May commenced wet and cold, and continued so with little change for sixteen days. As a consequence, farm-work was brought almost to a standstill. During the remainder of the month, when the weather was fine but cold, teams were kept hard at work. Growers have been busy drilling winter wheat, of which a considerable acreage still remains to be sown. The greater part of the potato crops are now dug, and are coming out of the ground in a generally sound condition. The early setting-in of winter this year has emphasized the importance of providing plenty of winter feed for stock. Happily, in most cases due provision has been made in this respect.—*J. G. Scott.*

ASHBURTON.—Rain fell on twelve days during May, and the total measurement was 4·18 in., against 0·86 in. for the corresponding period of last year. An unusually early fall of snow occurred at the commencement of the month in the back country, and from information received there is likely to be a heavy mortality on runs at the head of the Rakaia Gorge, as the owners were just starting to muster for the winter to put their sheep on the safe country. For the best part of the month beautiful sunshine, with frost occurring for twenty-three nights, has been experienced, and farmers have been busy getting in their winter wheat. A very large number of breeding-ewes have been brought into the district during the month, and up to £1 3s. has been given for fat lambs. Now that the leaves have been eaten off the turnips, some very fine crops are to be seen. Potato-lifting is now in progress, but the crops are only medium, with comparatively no blight.—*C. Branigan.*

FAIRLIE.—There was a very heavy fall of snow in the north end of the Mackenzie country in the beginning of May. After this, mild weather was experienced, with strong north-westers in the back country. On the low levels all stock is doing well, and there is no scarcity of feed.—*W. B. Manning.*

TIMARU.—The early part of May was wet, with a lot of cold weather and a light fall of snow on the downs. The latter part of the month was warm and foggy. Good headway has been made with the sowing of winter wheat. Threshing cow-grass seed is general, and some good yields have been reported.—*J. C. Huddleston.*

WAIMATE.—The weather during the month of May was very changeable and excessively cold, with periodical frosts. Several snowstorms were experienced on the high country. Farmers are busy with the sowing of cereals. There is a considerable demand for wheat known as Red Marvel, grown so successfully last season on the co-operative experimental area in this district. Pastures look well, and there is ample feed in evidence to carry stock over the winter months. Stock in general are looking well. Some very fine crops of swedes are to be seen throughout the district, but on some of the low-lying lands turnips have suffered considerably owing to too much moisture. Maize and lucerne have been much hindered in growth by frost and cold winds. Farmers are becoming interested in silver-beet growing, and there may be a good demand for this frost-resisting plant.—*F. A. Macdonald.*

KUROW.—May was a good month for the farmer, and the frosts did not interfere with ploughing operations. Consequently, at the end of the month horse-work on the farm was well forward. During the earlier part of the month there was a fairly heavy fall of snow on the high country, but it was followed by mild weather, and the snow melted. Potato-digging was still going on, but the crops were not turning out very well. Pastures were still good, but there was a very limited supply of turnips and mangels in this district. Sheep mustered off the high country during the month came in in good condition.—*G. Reid.*

OAMARU.—May was a fair month for the farmer, and ploughing has been in full swing. There was a cold snap in the middle of the month, and much snow fell on the high country. Potato-digging has been carried on, but light crops have been experienced. The month closed with cold southerly gales and stormy weather.—*W. F. Flower.*

PALMERSTON (SOUTH).—The weather was exceptionally rough, and temperatures were unusually low during the greater part of May. The rainfall since the 28th April was 263 points, of which 93 fell on the 30th May. There is a heavy coating of snow on the Kakanu Ranges. A keen frost was experienced on the night of the 9th, and was followed by rain and gales. The barometer registered lowest on the 19th. It has been a severe month on stock.—*C. S. Dalgliesh.*

DUNEDIN.—The weather during May was rough and stormy, and exceptionally cold. In fact, many old residents maintain that it has been the roughest May experienced in Otago since 1878. All farm-work is at a standstill. In several cases the potatoes are still in the ground, and there seems little chance of lifting them before spring comes in. The dairy-farmers are feeding heavily on green feed and roots, as there is not much feed left on the pastures.—*J. R. Renton.*

STRATH TAIERI.—The weather during May was unusually wintry, and it is many years since such weather was experienced at this time of the year. Pastures are becoming bare, but on hill country there is a fair growth. Turnip crops generally are light.—*W. Scott.*

CLYDE.—The weather for the month of May was squally. A good deal of rain fell, and there were some heavy falls of snow on the high levels. As there has been very little frost, the recent rains have brought the pastures along fairly well. It looks as if the farmer will have a fair amount of winter feed, instead of having none, as it looked like a few months ago.—*T. N. Baxter.*

MANIOTOTO.—During the first ten days of May the weather was very unsettled. Cold winds, accompanied by snow and sleet, were experienced. The latter part of the month was fairly fine. There was a good deal of frost during the month, especially after the 22nd. The high country has been slightly covered with snow. Stock are in good heart, and the district is looking well.—*A. T. N. Simpson.*

LAWRENCE.—The weather for May was very cold and wet. There was a little snow and few nights of frost. Owing to so much rain farming operations are backward, and stock are not doing very well on turnips. There are a few isolated cases of the oat crop still remaining to be stacked. If rough and wet weather continues there is a possibility of a shortage of feed for stock before the spring.—*R. Barron.*

GORE.—The weather during May was very bad, and, with the exception of an odd day, has been continually wet and cold. Consequently, farm-work has been almost at a standstill. In one or two places there is still some grain in the stook, and this will now be difficult to save. Farmers of long standing say that the weather during the past month was the worst they have experienced for a great many years. Turnips have done well, but the continuous rain has made it very bad for feeding off.—*B. Grant.*

OWAKA.—The weather during May was of a wintry nature. Cold stormy weather set in on the 1st, and continued up to the 23rd. The higher parts of the district received several coats of snow, while cold rain-showers were experienced on the low levels. The roads have been in a bad state owing to the wet weather experienced. Feed is plentiful, and the outlook for winter is satisfactory.—*R. McGillivray.*

LUMSDEN.—May, our first winter month, was certainly seasonable. Altogether, there was not a week's good weather throughout the month. Much snow fell on the back country, while biting winds accompanied by hail and sleet were general in the district. Oats are still to be seen uncut and in stook. The potato crops are turning out better than was expected. The turnip crops will not stand the feeding-off that they first gave promise of.—*W. S. S. Cantrell.*

INVERCARGILL.—There was very little sunshine during May, and the weather was cold and wet. Farm-work has been retarded on account of the land being too wet to work. Very little frost has been experienced so far. Grass is scarce, and turnips are being fed off. The rainfall for the month was 7·85 in.—*J. S. Whyborn.*

OTAUTAU.—The weather for May was wet and cold. On the 21st a good deal of snow fell on the ranges, and a little on the flat country as well. Very slow progress has been made with the ploughing, and unless a change comes soon there are indications of another late harvest. A good deal of the present harvest is still out, and there is no sign of ever getting it in. A few oats have been sown. Potato-digging is in progress, but slow headway is being made owing to the wet weather. The yield is far below the usual, many crops not going more than about 6 tons to the acre, and there is a good deal of blight in some.—*H. F. Dencker.*

QUEENSTOWN.—For the month of May there was exceptionally wintry weather; snow fell on the high country, and continuous rains on the low levels, during the whole period. A few nights' hard frost have had the effect of cutting the pastures back somewhat. Some crops are still out on the Crown Terrace, but, generally speaking, the farmers have saved their crops fairly well.—*A. Clarke.*

PEMBROKE.—The weather during this month has been exceptionally severe, and it is several years since the snowfall on the high country in May was as heavy as it has been this year. Several runholders who had not mustered were compelled to snow-rake to secure their sheep. However, no serious losses have been reported. Feed is plentiful, and with a favourable winter farmers and pastoralists should have a satisfactory season.—*J. A. Griffith.*

SOUTH AMERICAN TRADE.

THE steamer "Ionic," which sailed from Wellington to London on the 15th ultimo, had on board the following cargo for South American ports: For Monte Video: From Hobart—8,150 cases apples; from Melbourne—22 cases fruit-trees; from Hastings—432 cases apples; from Nelson—2,198 cases apples, 460 cases preserves, and 4 bales hops. For Rio de Janeiro: From Hobart—7,050 cases apples, 200 sacks potatoes; from Nelson—500 cases apples; from Dunedin—500 sacks potatoes, 50 cases onions; from Lyttelton—200 sacks potatoes.

The steamer "Opawa," which sailed from Wellington for London on the 13th ultimo, had on board a transhipment of 8,875 cases of apples from Hobart for Monte Video.

The steamer "Ruapehu," which sailed from Wellington for London on the 29th ultimo, had on board the following cargo for Monte Video: 2,005 cases apples from Nelson, 840 cases apples from Wellington, and 320 sacks oats from Lyttelton.

The steamer "Pakeha," which sailed from Auckland for London on the 14th ultimo, had on board 9,450 cases apples for Monte Video, and 5,694 cases apples, 19 cases pears, 200 sacks potatoes, and 200 sacks oats for Rio de Janeiro. The above items, with the exception of the oats, which were shipped at Christchurch, were transhipments from Australia per s.s. "Ionic."

THE FRUIT CROP.

THE officers of the Orchards, Gardens, and Apiaries Division report as follows on the condition of the fruit crop at the end of May :—

WHANGAREI.—Apples nearly finished. Lemons, crop medium to fair. Pears, crop finished. Oranges promise a fair crop. Loquats showing well. Pruning of stone-fruit is proceeding.—*J. W. Collard.*

AUCKLAND (NORTH).—Apples, fair crop of late varieties. Lemons, crop looking well. Pears, crop nearly finished.—*W. C. Thompson.*

AUCKLAND (SOUTH).—Apples, crop all picked, small quantity late stored. Pears, crop finished. Strawberries, runners looking well, large quantity being planted this year. Tomatoes practically all done; several heavy frosts.—*N. R. Pierce.*

HAMILTON.—Apples all harvested; fair supply, realizing good prices. Lemons still very scarce. Pears all picked. Tomatoes, crop finished. Walnuts, crops all picked; crops light but of fair quality. The pruning and spraying of peach-trees has just commenced.—*T. E. Rodda.*

POVERTY BAY.—Apples, poor prospects for the winter; ravages by codlin-moth and dry season greatly affected the crop. Lemons poor. Pears, prospects not bright for winter; late varieties ripened off too early. Walnuts, good average crop.—*W. R. L. Williams.*

MANAWATU AND WAIRARAPA.—Apples, fairly good crop of late varieties; nearly all apples now picked; very good prices obtained. Pears, good crop late varieties, free from "black-spot." Tomatoes, season over; most growers had good crops. Walnuts all gathered.—*G. Stratford.*

WANGANUI.—Apples, trees in excellent condition, as also are apricot, cherry, gooseberry, and lemon trees. Nectarines, trees never looked better at this season; pruning has commenced. Pears, some big crops are being harvested and quitted at good prices. Plums, trees in fair condition. Raspberries, canes fair to poor. Strawberries, plantations generally good, many being remarkably free from spot. Tomatoes, crop over. Walnuts, condition fair; not much grown.—*W. C. Hyde.*

HASTINGS.—Apples, supplies running short, prices good. A start has been made with the pruning and spraying of nectarine and peach trees; in many cases considerable damage has been done to the fruiting-wood by rust and dieback. Pears, scarcely any other than cool-store fruit available. Walnuts, season over, running short, prices good. —*J. A. Campbell.*

WELLINGTON.—Apples, average crop, growers storing considerably. Pears, average to heavy crop, supply has shortened. Tomatoes, average crop; early frosts have almost finished the remainder.—*T. C. Webb.*

BLENHEIM.—Apples, main crop nearly harvested, and pruning just commencing. Lemons, still gathering a few. Peaches, pruning of trees just commencing; very poor growth owing to leaf-curl earlier in the season. Pears, all varieties harvested; a few commencing to prune. Walnuts, heavy crop, nearly all harvested.—*B. G. Goodwin.*

NELSON.—Apples, picking now completed; good quantity of fruit still on hand, much of which is second quality, chiefly owing to black-spot; shipments for the month to South America total 4,866 cases. Large quantities of young trees have already been landed for the season's planting; they are a splendid lot, well grown, clean, and healthy. Pears, picking now finished, only limited supplies on hand. Strawberries, growers are busy putting their plots in order, and extending their areas for the coming season.—*J. H. Thorp.*

CHRISTCHURCH.—Apples nearly all harvested; a good quantity has been placed in cool stores; a shipment of apples is leaving Lyttelton for South America by the s.s. "Athenic" on the 4th June. Pears all harvested; turned out well, and fair quantity placed in cool store. Tomatoes, crop over; good crop harvested.—*W. J. Courtier.*

TIMARU.—Apples, all varieties harvested. Pears, all varieties gathered; good crops of Winter Cole variety. Raspberries, canes are now being trimmed in some districts. Strawberries, plants have made good supplies of runners. Walnuts, fine samples of local walnuts now being offered.—*A. B. Mansfield.*

DUNEDIN.—Crops of all varieties of fruit harvested now. Pruning and other winter work in full swing.—*W. T. Goodwin.*

HONEY-CROP PROSPECTS.

THE Director of Orchards, Gardens, and Apiaries Division has received the following reports on the honey-crop prospects from the Apiary Instructors :—

AUCKLAND.—From the latest reports received it seems that some beekeepers have overestimated their honey-yields, but notwithstanding this the average yields for the Auckland districts have been good. Prices have an upward tendency, and most of the producers have now placed their surplus honey at prices from 10s. 6d. to 11s. 6d. per dozen for 2 lb. tins, and from 1s. to 1s. 2d. each for 2 lb. glass jars. Some of the beekeepers have had further inquiries for more honey, but have not been able to supply. Requests for section honey have also been received here from Dunedin merchants, offering from 6s. 6d. to 7s. 6d. per dozen for 1 lb. sections; but owing to the poor prices obtained in the past for this class of honey there is very little on the market. The quality of the honey this year has been very good, and only a small percentage of inferior grades have been obtained. Beeswax is bringing higher prices this year, 1s. 5d. to 1s. 6d. per pound being offered.—*G. V. Westbrooke.*

WELLINGTON.—The prices ruling last month have not changed up to date—viz., 4d. per pound and over for bulk. Wholesale price of 2 lb. tins, 10s. to 11s. per dozen; 2 lb. glass jars, 13s. to 14s. per dozen. Most of the produce is being sold in bulk lots, and a shipment is now being graded in Taranaki for the Home market. This will have a tendency to harden prices. Beeswax is realizing 1s. 6d. per pound.—*F. A. Jacobsen.*

CHRISTCHURCH.—There is a steady retail trade doing, prices for sections and extracted honey being the same as last month. An advance in retail prices is anticipated very soon. Beekeepers have a fair stock on hand, and do not seem too keen to sell. No doubt the export of honey recently will materially help in maintaining a fair price. A cable offering 4d. in bulk for honey exported and Government-graded has been received, but not accepted, the producer anticipating a better price when the honey is landed. The first consignment of 10 tons left on the 1st May. The second consignment of 8¼ tons left on the 29th May. The third consignment is coming to hand to be graded.—*L. Bowman.*

DUNEDIN.—There is practically no alteration in the local honey-market. Bulk honey is in good demand. The first consignments of pat honey opened up well, and lots brought at auction 5½d. to 6½d. per pound. Good sections are still in request at 7s. per dozen.—*E. A. Earp.*

Beds of carrots, parsnips, and beet-root, on light land at Ruakura Farm of Instruction, grown for winter use resulted in failure, owing to the grass-grub. On heavier soil the grub was absent, and good crops of these vegetables resulted.

In order to encourage the production of wool in Canada the Dominion Department of Agriculture has appointed a sheep specialist and two expert wool-sorters (who will take charge of the sorting of wool at shearing-sheds), while for the current year it will pay 25 per cent. of the freight charges on wool from port of shipment to the London market.

THE WEATHER FOR MAY.

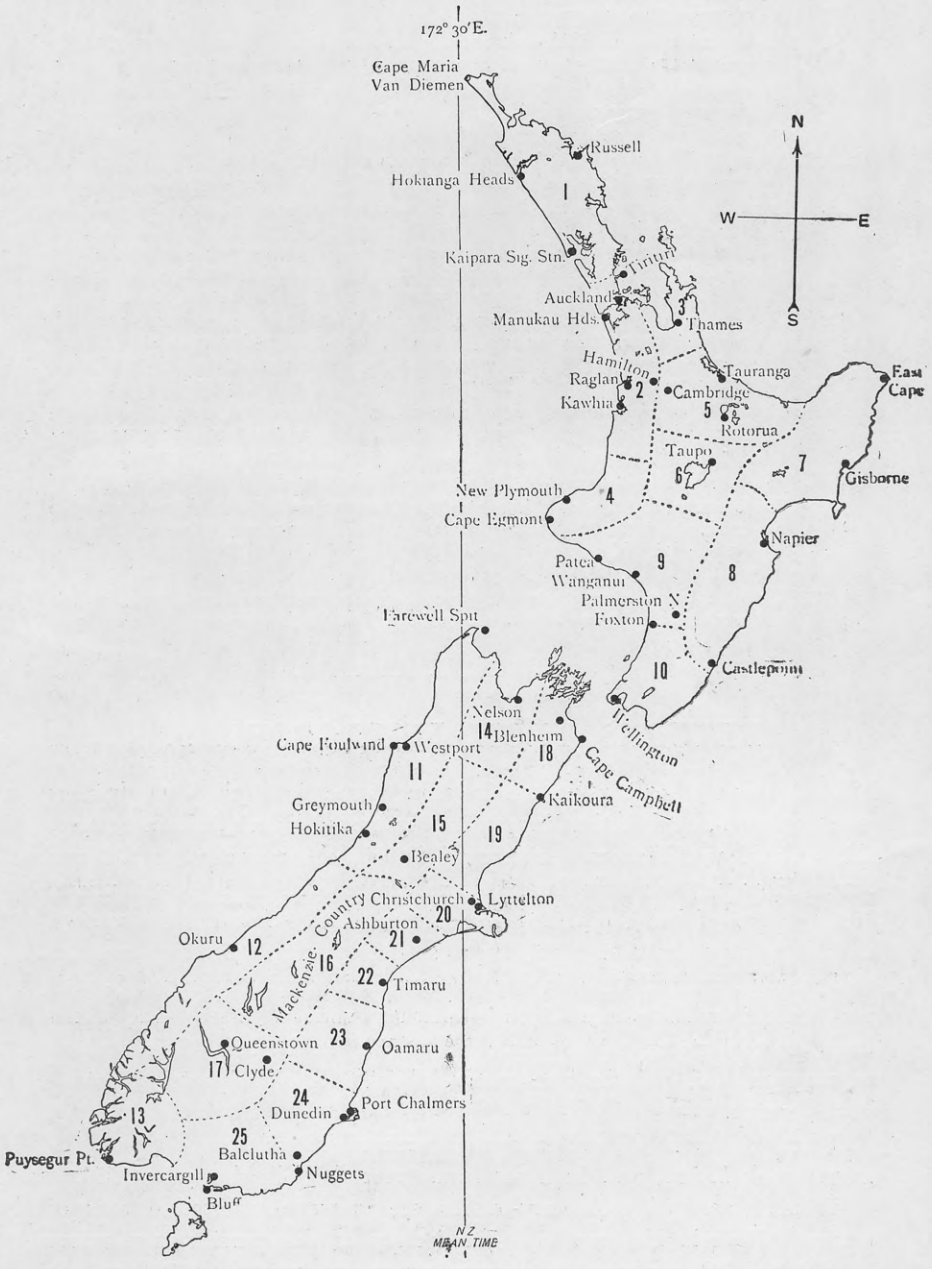
D. C. BATES.

THE barometer was below the average during the greater part of the month, and the exceedingly low reading of 28·48 in. was recorded on the 19th at the Bluff, being only one-hundredth above the record for New Zealand. The readings from Adelie Land and Macquarie Island were not so low, and the whole disturbance bore the character of a vast cyclone in high latitudes. Anticyclonic conditions with fair weather ruled at the close of the month.

Strong southerly winds were prevalent with cold and boisterous weather, except in the Bay of Plenty and Nelson districts, which are somewhat sheltered from these winds.

The total rainfall during the month was not excessive, except in the southern portion of the North Island and parts of the east coast and southern districts of the South Island.

District.	*Chiefly from Telegraphic Reports.*
1, 2, 3.	The month was cold and showery, with stormy conditions ruling during the first half, but no particularly heavy rainfalls were recorded, the total being about 35 per cent. below the average in districts Nos. 1 and 3, but only slightly under the average in No. 2.
4.	Cold southerly winds predominated, attaining gale force on numerous occasions during the first three weeks. A severe thunderstorm was experienced at many places on the 10th, accompanied by a heavy fall of hail, the latter in some cases being reported as large as peas. Some stations also had extremely heavy rainfalls on the 19th and 20th. The aggregate, however, was usually about 30 per cent. lower than the mean May fall.
5.	Rainfall was less than the average by from 40 to 60 per cent. Cloudy weather was frequent, with occasional showers, but conditions were not generally so unfavourable as in those districts more exposed to the southerly winds which prevailed during the month.
6.	During the greater portion of the month cold and showery, and at times boisterous, weather prevailed. Snow fell frequently on the high land. The last week was more favourable, although cold with frosty nights. About 35 per cent. less than the average rain was recorded.
7, 8.	Rainfall was considerably below the average in both these districts, being chiefly of a showery nature. Fair weather predominated, especially in the latter portion of the month. Some hard frosts were experienced during the last week.
9, 10.	During the first half of the month weather-conditions were extremely boisterous, high winds and heavy rains being frequent. The heaviest rain generally occurred on the 1st, when some stations, especially in the extreme south of the North Island, recorded extraordinary falls. At Wellington on this day the total for the twenty-four hours was 5·70 in., but this was exceeded at Wainuiomata, where 9·93 in. were recorded in nineteen hours. At the latter station this was the amount actually measured, but the total should be more than this, the rain-gauge having become flooded afterwards.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New Plymouth
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Cape Egmont
Napier
Patea
Wanganui
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Foxton
Farewell Spit
Castlepoint
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Nelson
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Blenheim
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Wellington
Cape Foulwind
Westport
11
Cape Campbell
Kaikoura
Greymouth
Hokitika
15
19
Bealey
Christchurch
Lyttelton
Country
20
Ashburton
21
Okuru
12
16
22
Timaru
Mackenzie
Queenstown
23
Oamaru
17
Clyde
24
Dunedin
Port Chalmers
13
25
Puysegur Pt.
Balclutha
Invercargill
Nuggets
Bluff
N.Z. MEAN TIME

District.

11, 12, 13. Cold and showery weather prevailed, with the exception of a few short periods of clear conditions. Snow fell on the higher levels on the 10th and 21st, and electrical disturbances occurred at many places on the 20th and 21st. Precipitation was everywhere below the average, the deficiency ranging between 20 and 50 per cent.

14. The weather was cold though usually fine, and frosts were almost of daily occurrence. Fifty per cent. below the normal rain was recorded.

15. The rainfall was below the average, the difference varying considerably. Several short periods of fair weather were experienced, but cold and showery conditions prevailed, with snow at times.

16, 17. About the average rain fell, in some cases slightly above. Dull and cold weather predominated, and snow fell on the 10th at many places.

18. From the beginning to the 20th of the month very boisterous conditions were the rule, with cold and at times high southerly winds. On the 1st and 10th very heavy rain fell, causing an excess of the average at most stations in the total for the month. Snow fell on the hilly country on the 1st, 10th, and 11th. Frosts were frequent.

19. Cold and boisterous weather prevailed in the first half of the month, and much rain fell during this period. In the latter half more-favourable conditions were experienced, but temperatures were usually below the mean, and frosts were numerous. The rainfall was double the average in some cases.

20. About 30 per cent. above the average rainfall was recorded, most of it falling during the first eleven days. Fair to cloudy and cold weather prevailed for the remainder of the month, and some hard frosts were experienced.

21, 22. Rainfall slightly in excess of the average. Weather similar to district No. 20.

23. The beginning of the month was stormy, and unsettled conditions continued until about the 15th, after which conditions improved. Snow fell inland on the 1st. The aggregate rainfall was below the average by about 15 per cent.

24, 25. The month was characterized by very cold and wet weather throughout, no particularly heavy rainfalls occurring, but the number of wet days was excessive.

RETURNS FROM FRUITGROWING.

FROM 30 acres of orchard in the Croydon district, Victoria, 7,000 bushels were gathered; and, estimating at 3s. per bushel, which is conservative, this orchard would show a return of £1,050, or equivalent to £35 per acre. However, the fruit from the orchard realized much better prices, 10s. per bushel being obtained for plums of the Grand Duke variety in the Sydney markets. This is a splendid plum, will keep well in cool storage, and stands shipping. Gravenstein apples averaged 8s. 6d. per bushel; whilst those of the Jonathan variety, after being taken from the cool stores, sold at from 9s. to 10s. per bushel. This orchard is well cared for, and the trees receive about 3 lb. of sulphate of potash in the spring.

From 10 acres of well-cultivated orchard in the same State the grower took £1,150, and from the same trees the following year £750.

From 1 acre of gooseberry-bushes the grower harvested 6 tons of berries. He sold his crop to a jam-factory at the remunerative prices of £18 to £22 per ton. This profitable acre returned £120 to the grower.—*A. Bailey Mansfield.*

ANSWERS TO CORRESPONDENTS.

CORRESPONDENTS are requested, when desiring information through the Journal in regard to disease in animals and plants, to forward, where possible, affected specimens, in order to facilitate a correct diagnosis of the trouble, and to ensure the best advice. In stating a question, the most complete descriptive details should be furnished.

BEEKEEPING.

MR. LEONARD LORD, Napier:—

I have read several of the articles in your *Journal* on beekeeping, and I wish to make a start in a small way. Could you advise me where I could get a colony? I should like leather-coloured Italian. Kindly also advise me if there is a good book to be had on the subject.

The Orchards, Gardens, and Apiaries Division replies,—

Strong healthy colonies of bees are procurable from the Government Experimental Farm at Waerenga, in the Waikato. A price-list containing conditions of sale, &c., has been posted you, also copy of Bee Bulletin No. 18, which contains valuable information, especially for beginners in beekeeping.

ERADICATION OF WEEDS.

MR. D. C. D. THOMAS:—

Could you inform me, through your *Journal*, how to kill dandelions and other weeds in lawns without taking the lawns up? I understand that there is some mixture that can be made which will do this, without hurting the grass or clover at all.

The Orchards, Gardens, and Apiaries Division replies,—

One of the best means of killing weeds in a lawn is by sulphuric acid. As only a few drops are required for each weed, a good way of applying it is by using a large nail, which is dipped in the acid and applied to the centre of each weed. Care should be taken to see that the hands or face do not come in contact with this acid, as it will inflict severe burns. Sheep-dip undiluted applied with an old brush to the crown of each weed is also a good eradicator.

ONIONS.

"GROWER," Taihape:—

As I am contemplating planting a few acres with onions, I should be grateful to you for the following information:—

1. The best and most profitable seed to sow, and average yield per acre from same.

2. Is this district a good one for growing onions (soil, rich brown)? If so, the time to plant, quantity of seed per acre, and best fertilizer to use.

3. Does frost and snow affect growth? If so, method of protecting plants from same.

The Director of Fields and Experimental Farms Division replies,—

The best onion-seed is Australian. This seed can be obtained from New Zealand seedsmen. The yield of onions per acre might be anything between 2½ tons and 15 tons; 10 tons is a very good average on moderately good soil. I

have no personal knowledge of the soil and climate of Taihape, but I understand it is very cold, with a late spring. If this be the case it cannot be considered an ideal place for growing onions. I know of no practicable way to protect the crops from snow and frost. It would be useless to sow until snow and hard frost is past, as a few degrees of frost would nip the tops and check growth. In the Manawatu district many people do not sow until middle of September, and succeed in ripening crops. Late sowing is not desirable, as there is additional risk from mildew. Sow Australian Brown Globe or Brown Spanish. These varieties mature well, as a rule. Sow as early as you think safe, having in mind the above remarks *re* frost and snow. Thin quickly and cultivate well to encourage rapid growth. Soot and wood-ashes are excellent fertilizers; so are superphosphate and bonemeal—two of superphosphate to one of bonemeal—3 cwt. per acre. To hurry growth, give 1 cwt. nitrate of soda immediately after thinning. Apply the other fertilizers two or three weeks before sowing. The soil should be prepared some weeks before sowing. If the land is in grass it should be ploughed in autumn, and well worked to break down the sods. It is necessary to secure a firm and even seed-bed by means of a levelling-drag and roller, or the drag only will answer both purposes if heavy enough. A rough slab of timber that one horse can pull makes a good drag. This implement will level small hollows and crush lumps. It is usual to sow the fertilizers at the same time as the seed, but I think that in the case of onions it should be broadcasted separately, in advance of the sowing. Three pounds of seed is sufficient for an acre. This Department is this season testing a new variety of onion, which is said to mature quickly. If this characteristic is proven, it will be a boon to growers in such places as Taihape, where the season is short.

CALIFORNIAN THISTLE.

MR. D. R. BARRON, Arrowtown :—

I should be glad if you would kindly answer the following question for me through the columns of your *Journal:* If horses are fed on oaten chaff which contains Californian thistle, is there any likelihood of the seed germinating after it has passed through the animals ?

The Fields and Experimental Farms Division replies,—

Numerous instances have been recorded of thistle-seeds germinating after being eaten by stock, and there appears to be a likelihood of Californian thistle being spread in this way.

SWEDE-TURNIP ROT.

MR. ARTHUR E. PEARCE, Konini, Waituna West :—

Can you give any information regarding the cause of swede-turnip rot ? I have a crop affected with it this season, and should like to know if there are any preventive measures that may be taken. Are any of the varieties of swede proof against the disease ? Is the trouble more prevalent on land that has produced a succession of root crops ?

The Biologist replies,—

Swede-turnip rot, which is a bacterial trouble, cannot be controlled in any practical manner. In districts that are liable to the disease great care should be used in selecting land that has not grown a root crop for some years. There are several distinct swede rots, and I would be obliged if some specimens were sent me.

TURNIP-DISEASE.

"DARWINIAN," Karamea :—

By this mail I am sending you one swede, also 5 lb. of soil for analysis. All my swedes are the same, with dark, hard centres, which renders them unsuitable for table use. The soil I am sending is a sample of the ground in which they were grown. It

has been properly cultivated, with top-dressing of 1 cwt. basic slag and 1 cwt. of rock superphosphate, well mixed together, to the acre. The crop is the best I have ever grown, equalling 60 tons to the acre. Kindly advise me at your earliest opportunity, through the columns of your *Journal*, what is the cause of the dark, hard centres in the swedes, and how it is to be remedied. Would lime do as a fertilizer for mangels in ground from which sample has been taken? If so, please state what kind and quantity of lime to use.

The Biologist replies,—

The presence of clear hard spots in the interior of swedes, which is by no means a common complaint, appears to be similar to the diseased appearance occurring in apples under the name of "glassy core." There is, however, no evidence that the trouble is due to any specific organism. The analysis of the soil may reveal the cause of the disease, as it is supposed to be a physiological one, and caused by the character of the soil in which the crop has been grown. The soil was sent to the Agricultural Chemist, who has forwarded you a copy of his Annual Report for 1908, on page 258 of which is an article dealing with this subject. He adds that liming these lands is recommended for internal brown-spot of turnips.

SILVER-BEET.

MESSRS. JONES BROS., Paengaroa, Bay of Plenty:—

Having seen an article on silver-beet in the April number of the *Journal*, we would like to know if the Department can furnish us with more particulars as to the growing and feeding-off of this plant, or any other information bearing on the subject.

An article on silver-beet, covering the information you desire, appears in this issue of the *Journal*.—ED.

CABBAGE-APHIS.

MR. H. HUMPHREY, Silverhope:—

I am troubled very much with blighty cabbage in summer and autumn. Can you suggest a remedy for this?

The Director of Orchards, Gardens, and Apiaries Division replies,—

The cabbages are evidently attacked by cabbage-aphis. Spray with a tobacco-wash in the following proportions: 1 lb. strong tobacco or 3 lb. waste tobacco, 3 lb. soft-soap, 20 gallons water. If cabbages are young use about twice as much water as that given in above formula, if necessary gradually increasing the strength of the wash as the season advances and the growth hardens. Another good spray for the control of aphis is one cake of sunlight soap boiled in 3 gallons of water, and applied with a fine spray, care being taken to see that the under-sides of the leaves are covered with the fluid.

SHEEP TROUBLES.

F. G., Rangiwea, Ruanui:—

I would like your advice about some lambs of mine that are going blind. The most of them are Romney-Lincoln, a few of them being pure Romney. They were weaned and dipped on the 17th March, and were put into a clean paddock with good fresh feed in it. On the 30th March they were shifted into another good paddock. On the 18th May they were put into a small paddock of soft turnips. This is the first crop of turnips that has been taken off this paddock, as it has never been ploughed before. The other paddocks are all bush country. The day I put the lambs on the turnips I noticed two of them were blind. After they had been on for about three days I noticed a good many of them getting sore eyes. I left them on the turnips for five days, camping them in a grass-paddock for three nights. Yesterday I took out ten blind ones, and a good

many of the others seem to be going blind. There are six big sheep running with the lambs, and two of them are blind in one eye and seem to be going blind in the other eye. One is a fat Romney ewe, and the other a Corriedale. I am now turning the lot out into a grass-paddock again. Do you think it is likely to spread right through the flock? And what should I do to get the blind ones right again? Also, what is the best treatment for sheep with large warts between the toes? One thing I forgot to mention about my lambs: whilst they were on the turnips we had a light fall of snow, and two very hard frosts following the snowstorm. But my turnip-paddock is well sheltered by native bush.

The Director of the Live-stock and Meat Division replies,—

It is rather unusual to get cases of ophthalmia at this time of the year. My opinion is that some digestive disturbances are the cause; and from the account you give of the management of your flock I should attribute this to the action of the frost and snow on the turnips. Neither the frost nor the snow itself would cause it directly. You did quite right to put them back on to the grass-paddock. I should put them on the barest one you have got for a time, to give them a change. The condition is not contagious; the reason why so many are affected is that they all have been subjected to the same cause. It would be better to separate the blind ones, and put them in a paddock where they cannot fall into the ditches, gullies, &c. The eyes, as a rule, clear up by themselves when the animals are given a change. You can, however, treat them by dropping into the eyes a small quantity, twice daily, of a solution of sulphate of zinc. Get your chemist to make you up the following: zinc sulphate, 16 gr.; rose-water, 8 oz.

I do not know what you mean by large "warts" between the toes. Are the sheep lame, or have they foot-rot? I think the best plan would be to have the sheep examined, and I am asking Mr. Huddleston, Inspector of Stock, to call and see you.

POTATO-GROWING.

MR. R. BRADBURY, New North Road, Kingsland, Auckland:—

As a new hand at agriculture I am going to ask a little advice, so would you please give me a few hints on potato-growing? I have a couple of acres, and intend putting potatoes in for early spring. Would you tell me how much and what kind of manure is best per acre; what is the best way to apply it; what kind of potatoes are best for early market; and how many hundredweight of seed-potatoes per acre? If you will kindly answer these questions, with any hints that would be of value, I should be very much obliged. The soil is a light one, and is situated close to the water's edge, Auckland.

The Fields and Experimental Farms Division replies,—

Well-rotted farmyard manure is a good fertilizer where humus is deficient. If heavy amounts are not available, small amounts used in connection with artificial fertilizers will be found very beneficial. The following mixed fertilizer can be recommended per acre: 2 cwt. to 4 cwt. superphosphate, 1 cwt. to 2 cwt. sulphate of potash, and 1 cwt. to 1½ cwt. sulphate of ammonia. This should be applied before planting the potatoes. The following are good varieties for light soils: Early Vermont, American Early Rose, Henderson Improved Early Puritan, Robin Adair, and British Queen. 12 cwt. to 15 cwt. of cut sets per acre should be planted. Land should be deeply cultivated. Use clean and even-sized seed. Keep down weeds between drills by scarifying, and earth as high as possible.

EXPERIMENTS IN BEEF-PRODUCTION.

"INTERESTED," Pohokura, Taranaki:—

Would you kindly give me information on the following, through the *Journal:* I have read with interest the experiments the Department are carrying out with the different breeds of sheep for fat-lamb raising, and find same very instructive, and should like to see similar experiments carried out with different breeds of beef-cattle, both pure-bred and crossbred. I think it would be very valuable to the fattener to know which

breed brings in the quickest net returns. Personally, I should like to see an experiment carried out between the pure Shorthorn and the pure Hereford and both crossed; also the Aberdeen-Angus.

The Fields and Experimental Farms Division replies,—

Some experiments in grazing and feeding various breeds of cattle may be undertaken later. It is pointed out that much greater provision will have to be made for this purpose, and that a very much longer period is required to arrive at conclusions with cattle than with sheep.

UTUWAI, OR BIDABID.

"UTUWAI," Colyton:—

Will you please let me know if there is any way of destroying utuwai, or bidabid as it is more commonly called? I find that after the runners have made some growth from the main root they develop a tender yellow shoot, which appears to be another root, and, in my opinion, that is the reason utuwai gains such a quick hold in the ground.

The Fields and Experimental Farms Division replies,—

It is presumed that your inquiry refers to steep country, or to country which on account of the presence of logs, &c., cannot be cultivated. In such country some control can be established by means of fires, followed by grass-sowing and judicious stocking. This weed is not usually of serious importance after grass has been well established.

RING-BONE.

"SUBSCRIBER," Mangonui:—

Is it possible to cure ring-bone in horses? The animal I wish to cure has been lame about two years, and has a hard swelling extending all round the foot, over the coronet. Only one hind foot is affected. If it is possible to improve the condition of the foot, where could I obtain the remedies required?

The Live-stock and Meat Division replies,—

Once a ring-bone has formed there is no possibility of cure. Horses sometimes have them and go sound; this is when the joint or tendons are not interfered with. You state, however, that your horse has been lame about two years. The animal is evidently unfit for work without cruelty, and your best plan is to destroy it.

FAT-HEN.

"WILLIAMSBURG," Dunedin:—

I intend sowing an acre of land infested with fat-hen, the soil being rich. It will be subsoiled before working up. As I understand that where weeds are very prevalent it is sometimes recommended to drill the seed in, can you tell me the best course to pursue with this end in view?

The Director of the Fields and Experimental Farms Division replies,—

As the seed of the fat-hen has ripened and fallen this year, I should advise ploughing the land deeply for the purpose of thoroughly covering the seed, and so prevent germination as much as possible. In sowing I would recommend drilling the seed in. This would admit of weeding.

HORSE AILMENT; PENNYROYAL.

"SUBSCRIBER," Churchill:—

Could you inform me through the *Journal* as to what is the cause of swellings on my horse's body? They are about as large as a man's hand, and seem very flabby.

There are three distinct swellings, and are situated behind the shoulder, and seem to shift about a bit. The horse is running with another one. But I do not think the swellings are due to a kick from the other horse, as one of them runs well under the body.

Secondly, could you enlighten me as to whether pennyroyal causes abortion in cows?

The Live-stock and Meat Division replies,—

We could not tell without examination what is the cause or nature of the "swellings." They are probably of no moment, and will disperse naturally.

No, we do not think pennyroyal causes abortion.

LUCERNE.—ACACIA BAILEYANA.

"A. B. H.," Matahiwi, Masterton:—

Is the Department supplying seed, manure, and inoculated soil for lucerne experimental plots? Where can the seeds of the *Acacia baileyana* be procured?

The Director of Fields and Experimental Farms Division replies,—

No decision has yet been arrived at as to whether the Department will repeat its offer of last year to supply experimenters with sufficient seed, soil, and lime to cultivate an acre of lucerne. Should it be decided to do so, due notice will be given in the *Journal*. Any reputable seedsman will supply or procure *Acacia baileyana* seed.

TEMPORARY PARALYSIS OF COW'S LEG.

MR. JAMES BISHOP, Pleasant Point:—

I have a young cow, calved about three months, milking well, and in good thriving condition; but one of her hind legs becomes paralyzed or stiffened at times, so that she cannot bend it either at the hock or the hoof, but holds it straight out behind, with the hoof dragging on the ground. This comes on suddenly and lasts a few minutes, goes off just as suddenly, and she then walks all right. Can you tell me the cause, and what treatment, if any, will be beneficial?

The Live-stock and Meat Division replies,—

This appears to be a case of luxation or partial dislocation of the patella. The patella, which corresponds to the knee-cap in man, is a bone placed in front of the stifle-joint. It is kept in its place by ligaments and certain muscles, and works in a groove between two prominences of the end of the femur. The internal prominence is the larger; and owing to accident or weakness of the muscles the patella slips out of the groove to the outside, causing the symptom stated—viz., inability to bring the leg forward. By manipulating the part the bone can be pushed back into its proper place, when the animal will walk as if nothing had happened, until the bone slips out again. When the bone goes into its proper place again there is generally a distinct "click" heard. This, while a serious accident in a horse, is not of so much consequence in a cow. Your cow, being young, may grow out of the trouble as she gets stronger. Keep her on level pasture, and apply a blister to the stifle, composed of powdered cantharides, 2 drams; lard, 2 oz. Rub this well into the parts for ten minutes. It will be necessary to keep the cow in the bail for twenty-four hours afterwards, to prevent her licking the part and blistering her mouth.

STRAWBERRIES AND RASPBERRIES.

MR. J. C. FOWLER, Peach Grove, Marton:—

I shall be obliged by replies to the following queries, through the *Journal*. My strawberries have sent out no runners, presumably because they have been in fruit continuously, and still yield a picking. I want to make a commercial bed for next season. What I wish to know is whether divisions of the crowns will answer the same end as runners. I may say the variety is a seedling raised by a friend—a superb variety.

I also want to know the most suitable manure for a raspberry plantation on very rich reclaimed peat land, where this fruit does very well. Which would be the better

superphosphate or basic slag? Cousins, in his book "The Chemistry of the Garden," advises heavy dressing of superphosphate, but probably on account of the natural acidity of the peat land another manure might be better.

The Orchards, Gardens, and Apiaries Division replies,—

Dividing the crowns for planting out is not recommended, as the plants, having been allowed to fruit continuously, will have become somewhat exhausted. In order to obtain runners the best plan will be *not* to allow the plants to fruit next season. This will enable them to produce good strong runners.

For raspberry-growing on your land I would advise a dressing of basic slag, applied at the rate of 4 cwt. or 5 cwt. per acre.

"PROUD-FLESH" ON LEG OF MARE.

MR. A. M. FEIST, Otarere, *via* Rotorua:—

I have tried bluestone for months to remove some large lumps of proud-flesh formed on the hind leg of a fine mare. She was lacerated twice in the same place by barbed wire. After bluestone is applied she keeps the wound raw by chafing with her hoof. One of the lumps is now as large as a teacup. Can you furnish me with any remedy?

The Director of the Live-stock and Meat Division replies,—

In place of bluestone, I would suggest that you should have used nitrate of silver in order to check the excessive granulations during the healing processes which constitute the so-called "proud-flesh." I fear that in the case where the granulation tissue has reached the size of a teacup such methods will not succeed in entirely removing the extra growth, and it may be necessary to resort to surgical interference. The operation would be best carried out by a duly qualified veterinary surgeon. A safe and efficient instrument for removing the superabundant tissue would probably be a firing-iron, heated to a dull red, or the surgical instrument known as an "ecraseur" could be used. Such an operation would be attended by a considerable amount of pain, necessitating the use of a local or general anæsthetic, and for this reason, if for no other, professional assistance should be sought.

CRACKED HOOF OF COW.

MR. R. SNODGRASS, Westport:—

I have a cow in milk with the outer half of each fore foot split up and grown longer than usual. She walks slightly on her heels, and used to go lame, but now appears to be only tender on her fore foot. She has been bad for about six months. Will you kindly inform me what steps to take in treating her?

The Director of Live-stock and Meat Division replies,—

Your cow is evidently suffering from cracked hoof. The best remedy, if the crack does not extend up into the region of the hair, is to fire across the top of it with a firing-iron or some such instrument having a blunt edge—an old file or blunt axe-edge would do. The iron should be heated to a dull-red heat, and a horizontal line drawn across immediately above the limit of the crack, about $\frac{1}{8}$ in. deep. Should the crack extend into the hair, V-shaped lines should be fired on either side of it, the V extending from the top of the hoof to about the middle of the crack. The object of these lines is to limit the extension of the crack. The overgrown hoof should be trimmed down by means of a farmer's knife or hoof-cutter, and great care should be taken to keep the crack cleaned out and free from dirt or grit. Neglect of this precaution frequently gives rise to inflammation of the sensitive structures enclosed within the hoof, followed by acute lameness and further complications.

PIG-FEED.

MR. J. A. CRUICKSHANK, East Chatton, Gore:—

I would be very pleased to know, through the *Journal of Agriculture*, if there is any food at the farmers' command that would take the place of skim-milk or whey for

feeding young pigs. I do not milk for the factory, and consequently have very little milk to spare.

The Live-stock and Meat Division replies,—

If by "food at the farmers' command" you mean grown upon the farm, you are referred to the Department's *Journal* for April last, page 450. There are quite a number of artificial foods on the market especially suitable for pig-feed.

FIRE-BRANDING OF SHEEP.

"SUBSCRIBER," Hokianga:—

Being a novice, I would like your advice, through the *Journal*, how to fire-brand sheep. Is the nose the best place? Would you advise me to get the Methven brand?

The Live-stock and Meat Division replies,—

The centre of the nose is the best place to fire-brand sheep, as in that position the brand is most easily seen. There are a number of good fire-marking appliances on the market which are well spoken of, including the Methven; but this is a matter which is best left to the discretion of the user.

In this issue of the *Journal* the Department of Immigration has an announcement of interest to those desirous of securing the services of domestic workers assisted to New Zealand by the Government.

The number of visitors registered at the main experimental farms during the past month was as follows: Ruakura, 527; Weraroa, 135; Moumahaki, 130; Waerenga, 48.

STOCK IN QUARANTINE.

THE following stock was received into quarantine during the month of May:—

No.	Breed.	Sex.	Port of Origin.	Owner or Agent.	Address.
			MOTUIHI ISLAND (AUCKLAND).		
1	Fox-terrier ..	Male ..	Liverpool ..	J. P. Sydney ..	16 Arawa Street, Auckland.
			SOMES ISLAND (WELLINGTON).		
1	Pug-dog ..	Female ..	London ..	Mrs. Dean ..	Whangamomona.
			QUAIL ISLAND (LYTTELTON).		
2	Fox-terriers ..	Male ..	London ..	W. H. Calvert ..	C/o N.Z. Express Co., Lyttelton.
1	Airedale terrier	" ..	" ..	G. Kingscote ..	Ditto.
1	Bull-terrier ..	" ..	" ..	" ..	"
1	" ..	Female ..	" ..	" ..	"
1	Guernsey calf	Bull ..	Melbourne	H. S. Kyle ..	Sockburn.

THE DOMINION'S EXPORTS TO BRITAIN.

COMPILED FROM MANIFESTS OF VESSELS SAILED DURING RESPECTIVE MONTHS OF THE CURRENT AND PRECEDING SEASONS.

Month.		Mutton, Carcases.	Lamb, Carcases.	Beef, Quarters.	Butter, Boxes.	Cheese, Crates.	Wool, Bales.	Wheat, Sacks.	Oats, Sacks.	Rabbits, Crates.	Hemp, Bales.	Tow, Bales.	Kauri-gum, Cases.	Sundry.
January,	1913	166,714	229,179	6,886	109,251	63,864	118,986	..	329	..	6,969	2,215	4,110	611 carcases pork.
"	*1912*	*237,284*	*302,399*	*12,424*	*114,512*	*64,005*	*95,994*	..	..	*7,295*	*6,365*	*1,942*	*3,407*	*59* "
February,	1913	326,337	403,698	12,666	89,098	81,733	127,968	..	..	..	12,520	4,295	7,973	64 carcases pork.
"	*1912*	*208,424*	*273,246*	*13,052*	*101,544*	*62,398*	*106,074*	*607*	..	..	*6,831*	*1,615*	*1,056*	..
March,	1913	86,224	210,166	7,428	47,560	59,844	49,661	..	115	..	12,552	7,662	4,043	250 carcases pork.
"	*1912*	*324,192*	*518,402*	*20,201*	*64,925*	*49,308*	*70,022*	..	*4,980*	..	*3,832*	*1,352*	*2,644*	*16* "
April,	1913	303,937	647,948	16,834	11,358	52,934	61,988	..	300	..	9,049	3,351	3,889	457 carcases pork.
"	*1912*	*213,178*	*355,829*	*7,046*	*38,986*	*38,137*	*31,615*	*4,905*	*2,180*	..	*5,134*	*1,958*	*4,458*	..
May,	1913	418,221	731,520	22,073	637	46,304	33,281	..	265	2,000	15,751	5,005	9,057	100 carcases pork.
"	*1912*	*454,506*	*744,287*	*32,691*	*1,441*	*40,535*	*51,833*	*11,157*	*26,569*	*1,500*	*11,963*	*2,826*	*6,287*	..
June,	1912	170,738	287,697	24,605	558	7,712	18,138	9,160	7,622	2,039	5,646	1,168	1,213	221 carcases pork.
"	*1911*	*214,079*	*448,432*	*15,789*	..	*6,323*	*19,568*	*39,422*	..	*14,128*	*4,763*	*525*	*5,528*	*2,434* "
July,	1912	291,097	371,474	29,457	684	1,255	16,567	44,324	23,216	20,573	7,463	1,856	5,892	210 carcases pork.
"	*1911*	*206,869*	*260,761*	*14,296*	..	*276*	*14,100*	*29,452*	..	*10,334*	*6,022*	*1,073*	*2,786*	*175* "
August,	1912	207,239	157,589	10,478	559	..	10,409	42,580	38,802	19,562	3,758	523	4,219	..
"	*1911*	*66,608*	*110,054*	*3,653*	..	..	*5,260*	*31,976*	..	*18,231*	*3,443*	*303*	*3,475*	*203 carcases pork.*
September,	1912	44,657	40,759	1,174	8,723	1,204	6,671	15,742	17,363	19,933	2,957	501	3,671	..
"	*1911*	*102,081*	*40,057*	*6,059*	*6,404*	..	*7,390*	*38,151*	..	*33,059*	*5,604*	*393*	*7,672*	*220 carcases pork.*
October,	1912	51,263	15,393	3,882	49,962	16,389	4,647	7,952	64,480	5,396	4,193	401	9,075	..
"	*1911*	*9,417*	*2,043*	*100*	*49,626*	*11,501*	*2,182*	..	..	*32,094*	*4,514*	*754*	*2,982*	..
November,	1912	54,175	8,286	282	140,751	57,181	33,305	3,680	40,896	13,892	9,866	1,911	5,466	..
"	*1911*	*47,770*	*10,427*	*403*	*135,741*	*57,319*	*44,934*	*15,833*	..	*16,606*	*7,844*	*2,183*	*3,085*	..
December,	1912	117,740	106,310	4,774	119,885	66,213	44,789	5,868	30,490	10,070	3,816	2,613	3,686	..
"	*1911*	*72,192*	*91,965*	*765*	*109,397*	*46,883*	*54,297*	..	..	*4,366*	*5,719*	*1,364*	*2,708*	..

LONDON MARKET VALUES.

COMPARATIVE STATEMENT COMPILED FROM THE HIGH COMMISSIONER'S CABLES FOR THE THREE MONTHS ENDED 31ST MAY, 1913.

London Date.	Mutton.		Lamb.		Beef.		Butter.					Cheese.			Hemp (Spot).			Hemp (Forward Shipment).			Wheat.		Oats.	
	Canterbury.	North Island.	Canterbury.	Other than Canterbury.	Hinds.	Fores.	New Zealand.	Danish.	Siberian.	Australian.	Argentine.	New Zealand White.	New Zealand Coloured.	Canadian.	New Zealand Good-fair.	New Zealand Fair.	Manila.	New Zealand Good-fair.	New Zealand Fair.	Manila.	Short-berried.	Long-berried.	Sparrowbills.	Danish.
1913.	d.	d.	d.	d.	d.	d.																		
Mar. 1	4 5/8	4 1/8	6 1/2	6	3 5/8	3 1/8	117/0 to 119/0	133/0	110/0	111/0	110/0	60/6	60/6	..	33/0/0	31/0/0	33/10/0	33/0/0	31/10/0	33/10/0	37/6	38/6	24/6	..
,, 8	4 1/2	4 1/8	6 1/2	6	3 3/4	3 1/4	117/0 to 120/0	133/0	110/0	110/0	109/0	61/6	61/6	..	34/0/0	31/0/0	34/0/0	34/10/0	31/10/0	35/0/0	..	..	..	..
,, 15	4 1/2	4	6 1/4	5 7/8	3 3/4	3 1/4	119/0 to 121/0	133/0	110/0	110/0	109/0	61/6	61/6	..	34/0/0	31/0/0	33/0/0	34/10/0	31/10/0	34/10/0	..	..	..	..
,, 22	4 1/2	4	6 1/4	5 7/8	3 7/8	3 1/4	119/0 to 121/0	130/0	109/0	109/0	109/0	61/6	61/6	..	34/0/0	31/0/0	33/0/0	34/10/0	31/10/0	34/10/0	..	..	..	..
,, 29	4 1/2	4 1/8	6 3/8	6	3 3/4	3 1/8	119/0 to 120/0	129/0	111/0	109/0	109/0	61/0	61/0	..	34/0/0	31/0/0	33/0/0	34/10/0	31/10/0	34/0/0	38/6	39/6	25/0	20/0
Apl. 5	4 1/2	4 1/8	6 1/2	6 1/4	3 3/4	3 1/8	117/0	125/0	110/0	108/0	108/0	60/6	..	64/6	34/0/0	31/0/0	33/0/0	34/10/0	31/10/0	34/0/0	..	..	..	..
,, 12	4 1/2	4 1/4	6 5/8	6 3/8	4 1/4	3 1/2	115/0 to 117/0	120/0	110/0	108/0	108/0	60/0	59/0	65/0	33/0/0	30/0/0	33/0/0	33/0/0	30/0/0	33/0/0	..	..	..	..
,, 19	4 1/2	4 1/4	6 5/8	6 3/8	4 1/4	3 1/2	113/0 to 115/0	119/0	108/0	109/0	108/0	58/0	..	..	33/0/0	30/0/0	33/0/0	32/0/0	29/10/0	33/10/0	..	..	23/0	21/0
,, 26	4 1/2	4 1/4	6 3/4	6 3/8	4	3 3/8	113/0 to 115/0	120/0	106/0	109/0	106/0	58/6	..	..	32/0/0	28/10/0	33/0/0	32/0/0	28/10/0	34/0/0	..	..	..	..
May 3	4 3/8	4 1/8	6 7/8	6 5/8	3 3/4	3 1/4	113/0	117/0	104/0	107/0	103/0	58/6	57/6	..	31/0/0	28/0/0	33/0/0	31/0/0	28/0/0	34/0/0	..	..	..	..
,, 10	4 3/8	4 1/8	6 3/4	6 1/2	3 5/8	3 1/8	113/0	114/0	100/0	107/0	104/0	58/0	56/6	..	31/0/0	28/0/0	33/10/0	31/0/0	28/0/0	34/0/0	..	..	..	..
,, 17	4 3/8	4 1/8	6 3/4	6 1/2	3 7/8	3 1/8	113/0	114/0	100/0	106/0	104/0	59/0	56/6	..	31/10/0	28/10/0	33/0/0	32/0/0	28/10/0	33/10/0	..	39/0	22/6	20/6
,, 23	4 3/8	4 1/8	6 1/2	6 1/4	3 7/8	3 1/8	113/0	114/0	100/0	106/0	104/0	59/6	57/6	..	31/10/0	28/0/0	32/0/0	32/0/0	28/0/0	32/10/0	..	..	..	..
,, 30	4 1/2	4 1/4	6 1/4	6	3 7/8	3 1/8	115/0	115/0	100/0	106/0	102/0	61/0	59/0	..	30/0/0	26/10/0	32/0/0	30/0/0	26/10/0	31/0/0	..	..	..	..

HEMP AND TOW GRADING RETURNS.

MAY.

Hemp.—The total number of bales graded was 17,107, as compared with 9,931 for the corresponding month of last year, an increase of 7,176 bales. For the twelve months ending 31st May, 1913, the number of bales graded was 137,169, as compared with 90,529 for the previous twelve months, the increase being 46,640 bales.

Tow.—During the month 5,128 bales were dealt with, as compared with 2,814 for the corresponding month of last year, an increase of 2,314 bales. For the twelve months ending 31st May, 1913, the number of bales graded was 47,003, as compared with 24,855 for the previous twelve months, the increase being 22,148 bales.

HEMP, TOW, AND STRIPPER-SLIPS GRADED THROUGHOUT THE DOMINION DURING THE MONTH OF MAY, 1913.

Hemp.

Port.	Superior.	Fine.	Good-fair.	Fair.	Common.	Rejected.	Condemned.	Total.
	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland ..	..	..	666	2,212	903	114	27	3,922
Napier ..	..	..	..	..	..	..	..	..
Foxton ..	..	..	1,569	3,865	220	..	..	5,654
Wellington ..	..	..	1,913	2,454	236	67	12	4,682
Blenheim ..	..	71	208	..	..	..	..	279
Picton ..	..	175	105	125	13	..	..	418
Lyttelton ..	..	52	..	..	..	..	..	52
Dunedin ..	..	21	194	502	261	..	..	978
Bluff ..	..	..	125	821	156	20	..	1,122
Totals ..	..	319	4,780	9,979	1,789	201	39	17,107
Percentages of totals	..	1·87	27·94	58·33	10·46	1·17	0·23	..

Tow.

Port.	First Grade.	Second Grade.	Third Grade.	Condemned.	Total.
	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland ..	26	377	744	281	1,428
Napier	..	..	..	..	..
Foxton	214	603	379	..	1,196
Wellington ..	178	1,026	207	56	1,467
Blenheim ..	38	..	..	..	38
Picton	167	29	13	..	209
Lyttelton ..	13	76	..	..	89
Dunedin ..	..	80	70	35	185
Bluff	..	92	339	85	516
Totals ..	636	2,283	1,752	457	5,128

Stripper-slips.—Passed for export: Auckland, 23; Foxton, 248; Wellington, 433; Picton, 44; Lyttelton, 12; Dunedin, 37; Bluff, 8—total, 805. Condemned: Auckland, 3; Wellington, 30; Dunedin, 7; Bluff, 10—total, 50.

NEW ZEALAND–SAN FRANCISCO TRADE.

THE following are the shipments of produce for San Francisco, Rarotonga, and Tahiti, and transhipments for Vancouver from New Zealand, since January last:—

—	"Tahiti," 31st Jan.	"Moana," 28th Feb.	"Aorangi," 28th March.	"Tahiti," 25th April.	Moana," 23rd May.
Gum, packages	20	20	50	..	30
Seeds, sacks	..	..	31	61	..
Grain, &c., sacks	69	324	57	115	84
Meats, cases	272	100	262	250	355
Onions, cases	52	1,759	10	8	19
Potatoes, sacks	24	2	32	10	27
Sundries, packages	126	54	131	235	210
Butter, boxes	7,782	7,281	3,783	405	8
Hemp, bales	296	282	..	271	394
Frozen lamb, carcases	3	2	3	2	2
" veal, "	71	..	..	..	..
" beef, quarters	489	150	..	..	..
" sundries, packages	..	2	..	13	..
Timber, pieces	1,440	..	93	..	..

NEW ZEALAND–VANCOUVER TRADE.

FOLLOWING are the shipments of produce for Vancouver and North American ports from New Zealand since December last:—

—	"Marama," 20th Dec.	"Makura," 17th Jan.	"Zealandia," 14th Feb.	"Marama," 14th March.	"Makura," 12th April.	"Niagara," 10th May.
Butter, boxes	11,377	10,960	5,205	9,402	6,535	465
Mutton, carcases	..	..	..	..	..	1,291
Beef, quarters	580	716	..	1,254	2,428	5,492
Veal, carcases	393	276	181	400	402	324
Frozen sundries, packages	12	..	39	147	86	79
Wool, bales	20	30	..	..	..	50
Grass-seeds, beans, &c., sacks	..	..	54	..	147	..
Hides and skins, sacks, &c.	595	329	583	..	249	270
Onions, cases	..	14	1,572	..	732	25
Sheep-skins, bales	..	24	112	..	24	..
Jam, cases	50	50	75	175	25	91
Sundries, packages	92	313	250	214	470	112
Potatoes, crates	165	20	..	..	..	..
Kauri-gum, packages	21	..	176	41	7	150
Hemp, bales	..	246	129	126	..	126

STOCK EXPORTED.

MAY.

THE following table shows the numbers and descriptions of stock exported from the Dominion :—

Port of Shipment.	Horses.			Cattle.			Sheep.			Swine.
	To Australia.	To Pacific Islands.	To Fiji.	To Australia.	To Pacific Islands.	To South America.	To Australia.	To Pacific Islands.	To Argentine.	To Pacific Islands.
Auckland	4	4	..	..	89	..	..	254	..	56
Gisborne	..	..	..	..	..	..	..	..	..	..
Napier	..	..	..	..	..	..	..	..	..	..
Wellington	1	..	..	2	..	..	20	..	..	..
Lyttelton	1	..	..	1	..	..	..	..	..	..
Timaru	..	..	..	..	..	..	..	..	..	..
Dunedin	35	..	..	2	..	..	..	..	..	..
Bluff	20	..	..	..	..	..	71	..	..	..
Totals	61	4	..	5	89	..	91	254	..	56

The following are the particulars of the horses shipped : Thoroughbred—3 geldings, 1 mare; draught—3 stallions, 13 colts, 30 mares, 9 geldings; hackney—5 mares; trotting—1 gelding; pony—1 Shetland mare.

PRODUCE IMPORTED.

THE following return, compiled by the Customs Department, shows the total importations into New Zealand during the month of May, 1913, of agricultural and farm products :—

Item.	Quantity.	Value.
		£
Bran	..	..
Butter	..	..
Cheese	1 cwt.	5
Chaff	4 tons	16
Fruits, fresh, all kinds	1,537,589 lb.	7,895
Barley	..	..
Oats	..	..
Wheat	..	..
Onions	2,679 cwt.	1,032
Pollard and sharps	383 tons	1,785
Potatoes	1 ton	4
Seeds, grass and clover	1,067 cwt.	1,013
Total value imported ..	..	£11,705

AGRICULTURAL EXPORTS.

THE YEAR'S FIGURES.

THE following figures show the values of the exports of the principal agricultural products for the years ended 31st March, 1912 and 1913:—

Products.	1912.	1913.	Increase.
	£	£	£
Butter	1,776,440	2,056,615	280,175
Cheese	1,297,088	1,859,179	562,091
Beef, frozen	250,304	324,578	74,274
Mutton, ,, ...	1,197,594	1,544,250	346,656
Lamb, ,, ...	1,750,236	1,825,342	75,106
Grain, wheat and oats	235,125	564,294	329,169
,, and pulse other than wheat and oats..	101,861	162,872	61,011
Potatoes	6,439	150,601	144,162
Hemp	310,884	483,353	172,469
Tow	23,289	41,005	17,716
Hops	11,594	20,698	9,104
Hides	159,835	234,735	74,900
Skins (all kinds)..	676,407	860,782	184,375
Tallow	566,373	672,849	106,476
Wool	6,579,074	8,065,945	1,486,871
	14,942,543	18,867,098	..
Total increase	..	..	3,924,555

CO-OPERATIVE EXPERIMENTS.

THE Department co-operates with farmers who desire to carry out crop experiments—both variety and manurial—on their farms.

The Department will supply the seed and manure, and will design and supervise the experiments; while the farmer provides the land and labour, and retains the crop.

Further information can be obtained from—

THE DIRECTOR OF FIELDS AND EXPERIMENTAL FARMS,
DEPT. OF AGRICULTURE, INDUSTRIES, AND COMMERCE,
WELLINGTON.