Scene in a Nelson Hopfield.]

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SHEEP-MANAGEMENT.

VIEWED FROM THE HEALTH STANDPOINT.

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SHEEP-FARMING is already a great industry in New Zealand, but it has a still greater future before it. Not only is there yet much land waiting settlement capable of carrying considerable flocks, but the land already in occupation could, with improved methods of management, quite well carry more sheep than at present, and this without interfering with other branches of rural industry, as dairy-farming, &c.

One cardinal principle in successful sheep-farming is that the flocks be maintained in as sound health and condition as possible, in order that the yield of marketable products, whether wool, lamb, or mutton, may return their full share of profit to those engaged in the industry, and this can only be brought about by good management, which in turn is dependent upon the possession of good practical knowledge on the part of the farmer. New Zealand is free from any serious disease of a contagious nature affecting sheep, and such mortality as does

occur year by year is due principally to causes which are more or less preventable—though, unfortunately, in some cases the preventive measures necessary are such as to be in a degree opposed to the most advanced methods in practice and, for that matter, necessary for commercial success in sheep-farming—and in these cases the sheep-owner is faced by the proposition whether it is not better to take the risk of some possible loss rather than to accept the certain loss of profit which is entailed by taking the necessary measures to ensure the greatest possible immunity from sickness or mortality.

The Question of Environment.

New Zealand is, on the whole, an excellent country for sheep-farming, much of its area constituting ideal country for it from a health point of view, but other portions, particularly in the North Island, have so copious a rainfall, so good a soil, and so plentiful a growth of herbage that sheep, unless carefully managed, are apt to suffer through life being made too easy for them. The sheep is an animal particularly well adapted for living on dry hilly or undulating country, with a sufficiency but not an excess of food, and when in such an environment a high standard of general health and vigour is maintained in the flocks. By a process of gradual natural adaptation of the character and constitution of sheep to environment—in which the principle of the survival of the fittest doubtless played an important part—followed later by careful breeding and selection, various breeds of sheep have been evolved which have become specially adapted to different classes of country, and thus animals have been produced which, given proper management, can be more or less successfully kept on land which in itself is not naturally suitable for sheep. A notable instance of this is seen in the Romney breed, whose original home was in the low-lying, marshy, alluvial tract situated in the southern part of Kent, and known as Romney Marsh. Not only is the land there low-lying and wet, but the climate is usually more or less moist, and the conditions, as a whole, are opposed to those usually looked upon as being best adapted for the maintenance of sound health in sheep. Yet the breed persisted, and has now made a high reputation for itself for its capacity for withstanding soil and weather conditions of a nature detrimental to most other breeds. Certainly the breeding and rearing of Romney sheep is not now confined to Romney Marsh alone, higher and drier country being also utilized, but the fact remains that the breed was originally evolved in this wet, low-lying area.

Within a comparatively short distance of Romney Marsh are the low chalky hills known as the South Downs, which constitute the native home of the Southdown sheep, an animal of entirely different

type, eminently adapted for its own particular environment, but unsuitable for the low-lying wet country on which the Romney sheep was developed. And so on throughout England and Scotland we see particular breeds domiciled in different districts, each largely confined to its own district and each suited to the particular soil and climatic conditions existing there. Perhaps the British farmer is at times somewhat too conservative and too parochial, so to speak, in this matter, yet the principle is a sound one and one which could be followed out in New Zealand with profit to a much greater extent than is the case at the present time. True, on many properties this principle is adopted, but often the smaller owner, who runs sheep in conjunction with other stock and with cropping, has to go to the saleyards for his purchases, and under present-day conditions he cannot always afford, when purchasing ewes, to be too particular as to breed, as he might thereby miss his chance of buying; but he can, at any rate, always do his best in this direction, and he can always secure purebred rams, and these should certainly be of the right breed for his country, with, of course, due regard for the production of wool, and of good-quality fat lambs when required. But, with the ram, breed is not the only consideration: care must be exercised to select well-furnished vigorous animals, well woolled throughout. Thus one principle of profitable sheep-farming is the maintenance of a flock bred under such conditions as to render it best adapted to the class of country and climate prevailing. Another is to take all possible steps to maintain the sheep in sound health and condition. This requires good management, and, as already stated, it is often a difficult matter to make conditions of health harmonize with commercial necessities. On poor country, be it high or low, provided it is not ill drained and wet, there is very little mortality among sheep, except as a result of extremes of weather; but on rich country considerable trouble often occurs through the feeding-conditions being really too good to a greater or lesser extent, partly according to the breed of sheep kept.

Management of the Ewe.

Breeding-ewes are the principal sufferers, they being very apt, especially when carrying their lambs, to put on fat freely, to become lazy and take too little exercise, and to degenerate in health and vigour in consequence. Well-marked instances of the results of a combination of too much good feed and too little exercise are seen in two conditions occurring in ewes before lambing, and known respectively as ante-partum paralysis and ante-partum extrusion of the vagina. (See Bulletin No. 15, by Dr. Gilruth, "Two Diseases affecting Pregnant Ewes," which contains a full description of these diseases.) The first-mentioned was formerly principally met with in Canterbury and Otago, but of late

years it has been often found in the North Island also. Extrusion of the vagina is still far more common in the North than in the South Island. Both can be prevented by suitable management, and even after either has made its appearance a change to short pasture combined with a sufficiency of daily exercise is the most effectual means of stopping the trouble. The change of feed most desirable, if it be available, is to place the ewes on a paddock of short fresh-growing grass or one of young green oats, the laxative effect of this feed no doubt assisting nature in restoring the balance of the system and enabling the ewe to return to a condition of normal health. I had an interesting practical experience of this some years since. A number of stud ewes in high condition were on exceptionally good feed, and deaths began to occur. In a few days the mortality reached an average of seven or eight daily, and the owner naturally became alarmed. At his request a visit was made to the farm, and after a careful examination the cause of the trouble was determined. A change on to short pasture was advised, together with the ensuring of daily exercise by a man going into the paddock twice daily and keeping the animals on the move for an hour or so each time. The result was that after two days the mortality ceased entirely. Similar treatment has generally been found equally successful in other cases of the kind when the owner has been able to properly carry it out — not always an easy matter when a man's time is involved ; but the change of pasture alone does a lot of good.

Extrusion of the vagina rarely affects ewes other than those carrying twin lambs ; and with this, care in preventing the ewes coming to their lambing in too high condition, at the same time ensuring that they get a sufficiency of exercise, is of the highest value as a preventive measure, as is pointed out in the leaflet on the subject, referred to above. It is a mistake to suppose that the higher the condition of the ewe the stronger and healthier will be her lamb or lambs. The ewe most likely to produce the best and strongest progeny is the ewe in good healthy, strong condition. A ewe which is too fat is neither healthy nor strong. The time to provide an abundance of good feed for breeding-ewes is not before they lamb, but after, when they are suckling their young. Before lambing all they need is a sufficiency to keep them in good sound health and condition, but not an excess, such as would be liable to induce laziness and an accumulation of fat in the system. An instance of the efficacy of this practical and common-sense treatment came under my notice recently. A large sheepowner who had been troubled with extrusion of the vagina among his stud ewes year after year decided to try it. He brought his ewes to their lambing in a paddock of short sweet grass, and put on an old man to go among them daily, stir them up, and keep them moving round.

The result was most satisfactory, only one or two isolated cases occurring instead of a considerable number as had been the case in previous years. There is, I know, still some diversity of opinion among sheepowners as to the cause of this trouble, and this is no doubt encouraged by the fact that occasionally a case occurs in a ewe not in high condition. But occasional cases may occur from other causes, as, for instance, constipation, indigestion causing distension of the first stomach or the bowels, through the formation of gas produced by the fermentation of imperfectly masticated or improperly digested food. Retention of urine, again, caused by the muscles controlling the neck of the bladder not relaxing and allowing the urine to be passed when it should be, and consequent straining on the part of the ewe, is another very probable direct cause. But this, as with digestive trouble, constipation, &c., is far more likely to occur in a fat lazy ewe than in one in less high condition.

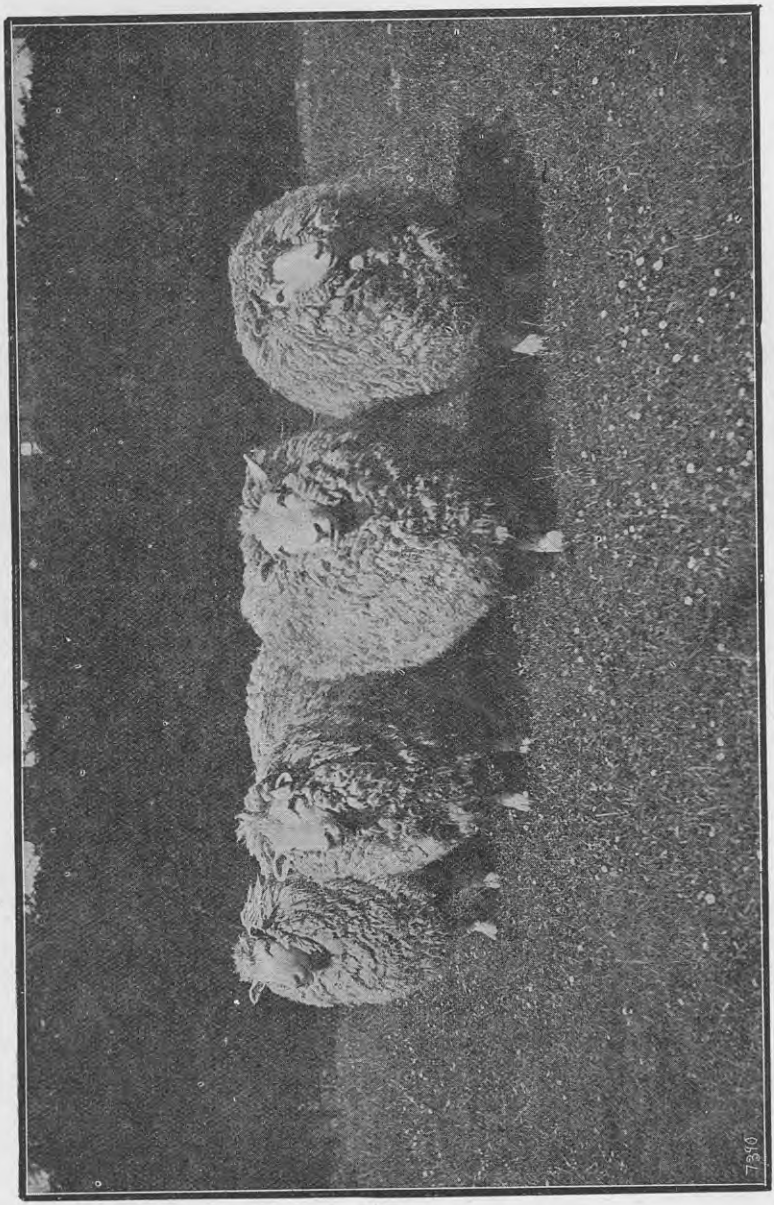
Lamb-troubles.

Another source of loss to the sheep-farmer, if the necessity for proper preventive measures be not acted upon, lies in the tendency of lambs—usually single lambs—to develop a condition of acute congestion of the kidneys, due to overnutrition when their dams are on good feed and are yielding a plenitude of rich milk. Earlier in this article I indicated the necessity for providing plenty of good feed for ewes suckling their lambs as preferable to putting them on it before their lambs are born. This is especially necessary for the production of early lambs of good freezing-quality, but the lambs need careful watching in order to ensure that they do not suffer as a consequence of too plentiful and too rich a food-supply. Twin lambs, having to share the milk of one ewe, are rarely affected with kidney-congestion, single lambs being the chief sufferers. The remedy is simple, seeing that the trouble in most cases makes its appearance before the lambs are cut and tailed, what is needed being something which will counteract the plethoric condition of the system and the consequent overworking of the kidneys; this is provided by the bleeding which results from these operations. This relieves the plethora and enables the system to regain its normal balance, the lambs consequently continuing to do well after a quick recovery from the temporary check. Whenever fat lusty lambs commence to die the whole of those in the flock should at once be cut and tailed. This will usually stop the trouble, though occasionally it occurs later, a little time after marking. Then the blood-letting resulting from taking a little bit more off the tail does good. Or removing ewes and lambs for a little time to a poorer pasture and ensuring a sufficient amount of exercise is of great value as a measure to counteract the mortality, though it may throw back

in condition the more backward lambs. When carrying out the operations of cutting and tailing, care must be taken to ensure that any knife used is perfectly clean. I well remember a heavy mortality due to blood-poisoning which occurred in a lot of lambs which were operated upon with an unsterilized knife often used by its owner for skinning dead sheep. The practice of searing the stump of the tail of lambs is often adopted, and where the lambs are not in really high condition it is a good practice. The lamb which is not plethoric falls back temporarily through loss of blood and searing helps to prevent this. But with fat, lusty single lambs a little bleeding does no harm at all, but may have the effect of keeping alive good marketable lambs which otherwise would be lost. At one time this mortality which annually occurs in lambs through congestion of the kidneys (though now much less in extent than formerly) was largely ascribed by owners to the reputed evil effect of wool-balls in the stomach, many having examined dead lambs and, finding these accumulations of wool, blamed them for being the cause of death. This was entirely fallacious, and though it is not absolutely impossible that a "wool-ball" might under special circumstances work mischief in the digestive system I have never yet seen a case or heard of one where it was proved to have caused death. As a matter of fact, a considerable proportion of fat healthy lambs are found, when slaughtered, to have these wool-balls present in the stomach (abomasum). Last season arrangements were made to collect some records on this point, and at six different freezing-works the stomachs of a number of good, healthy lambs were examined, after slaughter, in order to determine whether wool-balls were present or not. In all 4,043 were examined, and of these 20 per cent. were found to contain wool-balls of varying sizes. The sheep-farmer has no need to trouble himself about wool-balls. What he should realize, however, is that in sheep-breeding and sheep-management the greatest measure of success is gained by the man who uses his brains and knowledge to the best advantage in fostering the natural processes of body-development and fattening to the greatest extent compatible with the maintenance of health. To attempt to go beyond that means not only a risk, but a probability of loss.

(To be continued.)

NO breeder has ever permanently advanced any character in an animal who has neglected to maintain constitution in the process.



Romney Ewes in the Stud Flock of Mr. W. Gibson, Kiwitea.

HOME SEPARATION.

G. M. Valentine.

Methods of Conveyance.

In those districts where the home separator has been adopted there has naturally followed a radical change in the system of handling the cream. Taken up in the first instance by settlers remote from a creamery or factory, or who had bad roads to contend against, it gradually spread until in the North Auckland district it is practically the only system in vogue, and the cream-can is as common as the mail-bag. The carriage of the cream is one of the most difficult problems with which the home-separator factory has to deal. Cans arrive by packhorse, wagon, rail, oil-launch, and, in fact, by any and every means of transport available. The first system to be adopted was for every supplier to bring his own cream, and this is still the practice at a good number of factories. From the buttermaker's point of view this is the ideal system, as the weighing is done in the presence of the supplier, and an opportunity is thereby given for pointing out any defects in the cream. In some cases a system developed of one settler bringing the cream from several neighbours on the same road, which in time developed into a regular contract arranged by the factory for the collection and delivery of the cream. Indeed, in some instances the cream is two days on the road and is carried by two different contractors. This is not only expensive—costing as high as 1d. per pound of butter-fat for cartage—but is altogether against the cream reaching its destination in a good condition. Contractors for the carriage of cream are paid in various ways: at per hundredweight of cream carried, at per trip, or at per gallon of cream. In some cases the whole cost of collecting is borne by the factory, while in others the cost is allocated amongst the suppliers according to the number of pounds of butter-fat delivered by each. Figures taken from two factory balance-sheets for last year give the cost as 0·5d. and 0·895d. per pound on the whole of the butter-fat delivered to the factory, so that in comparing the net amount actually paid for butter-fat this must be taken into consideration. The first system has the advantage that the factory-manager has more direct control over the delivery of the cream, the decision resting with him as to how often the collecting shall be done. When freights are charged up individually the inclination is for

suppliers to want to send less frequently, on account of the cost, as soon as supplies begin to fall off. This explains the fact that, while some home-separation factories can hold their own as to quality while the flush of the season is on, they find it impossible to do so in the spring and autumn. This is the weak spot in the home-separator system. Under ordinary conditions the best quality of butter is made under a daily delivery.

A practice generally in use is for the individual supplier to provide his own cans, and under existing conditions the life of these is somewhat short. Wagons may be seen loaded with two tiers of cans, the larger ones with flat covers underneath and the smaller ones on top. The wear-and-tear is very considerable, and cans will sometimes only last two seasons. The usual method is to weigh and sample the cream, wash the cans, and pass them on to the vehicle by which they arrived. The washing is necessarily a more or less speedy performance, and the lids are usually put on while the can is still hot. It is therefore absolutely necessary to again wash them on their return to the farm. The principal disadvantage of this system is that the factory-manager does not come into direct touch with the suppliers, and has not the opportunity of pointing out any defects in the cream.

Another system of collecting, usually adopted where there is a large number of small suppliers, is to weigh and sample the cream at the farm and empty it into large cans. This saves a lot of cartage, but as success depends entirely on the drivers, it is imperative that they should be trained men employed by the factory. The great danger is that one bad lot of cream may be overlooked and spoil a whole canful. Given good men, this plan is very successful, for their personal contact with the suppliers can be of great assistance to the factory-manager. One difficulty associated with it is getting a scale which will be sufficiently accurate and which will stand the rough usage and weather inseparable from the road. It will usually be found that on the average the total weights from the drivers' books will be more than the weight of cream received at the factory, due to the difficulty of weighing a number of small lots of cream correctly, and also to the loss of cream left in the cans. The latter can be reduced to a very small amount, however, by using a squeegee scraper for cleaning out the cans. This can be made of hard red $\frac{3}{8}$ in. rubber, 5 in. square. A metal stirrer must also be carried by the drivers with which to mix the cream before taking the sample, or the results in testing will be all against the factory. The sample-bottles must be kept tightly corked to prevent evaporation, and a wet sack thrown over them in hot weather will help to keep them in good order. Wet canvas coverings over the cream-cans will also be found to reduce the temperature of the cream very considerably.

WEIGHING, SAMPLING, AND TESTING

Of home-separator cream, though at first sight a simple matter, requires very careful attention if justice is to be done to both factory and supplier. Were all cream delivered to the factories in sweet, fresh condition this would be a simple matter, but, unfortunately, most of the cream received at home-separator factories is two days old. In some cases it is quite impossible to get a representative sample. The first consideration of managers under the new system was, naturally, how to keep up the quality of their butter under the very heavy handicaps which it imposed, and rightly so. As a consequence, certain points have in a measure been neglected, and in the majority of cases the suppliers have been paid for more butter-fat than they delivered, due to a too-liberal reading of the "fat" column. Neglect of these points has given rise to the very general impression among farmers that the supplier who delivers his cream makes the most out of his cows. If this be so, the supplier of rich cream must be losing more in his skim-milk; but the very general experience of home-separator factory-managers, who have done a lot of skim-milk testing for suppliers, is that this is not so. Indeed, the chances are all in favour of better skimming, as the speed is more likely to be maintained when aiming at a rich cream. Similarly, where the cream is thin it is usually the result of driving the separator too slow. Michels says, "Most standard makes of separators will do good work when delivering cream containing 50 per cent. of butter-fat." ("Creamery Buttermaking," Michels, page 61.) If the sampling and testing are not properly done, however, the thin cream will no doubt pay the supplier best, especially if it is sour when delivered. Unless it is thoroughly stirred, the sour milk at the bottom will not be properly mixed with the cream and the sample taken will be too rich. Again, if a pipette is used to measure the sample into the cream-testing bottle the result from thin cream will be about right, but the rich cream may be 2 per cent. too low. Allowing, however, that the samples are weighed into the cream-bottles, by reading the "fat" column to extreme points, as is very often done, it is possible to be 2 per cent. too high with both samples; but 2 per cent. added to a 35 test and 2 per cent. added to a 42 test is not fair to the latter. The most satisfactory cream for both supplier and factory is one containing from 40 to 45 per cent. of butter-fat, and any good separator will do very satisfactory work between these points if reasonable care is taken in running it. A thin cream is a loss to every one concerned, and those factories that pay ½d. per pound of butter-fat less for cream testing 35 per cent. and under are on the right track.

The first question of freight alone is a big one. A five-horse wagon will bring in a load of about 4,000 lb. of cream, which at an average

test of 42 will produce 1,680 lb. butter-fat. To produce the same amount of butter-fat at a 35 test it would have to carry 4,800 lb. of cream, a difference of 20 per cent.; and this 20 per cent. extra will have to be handled right through the manufacturing process until the churning process is reached. The suppliers, on the other hand, will have 800 lb. less skim-milk on the farm. Most of the bad flavours noticed on the receiving-platform are found in thin cream, which develops acid quicker than a rich cream, has a rough, lumpy appearance, blocks up the strainer, burns on the pasteurizer, is almost impossible to sample fairly, causes a bigger loss in buttermilk, and, when manufactured into butter, usually makes an inferior article. A 42-per-cent. cream, on the other hand, is smooth and free from lumps, can be more accurately sampled, and leaves more skim-milk on the farm. It will keep sweet longer, and when sour more frequently develops a clean acid flavour. It costs less per pound of butter to manufacture, gives a bigger overrun, and, with proper handling, will turn out a higher-grade article.

Quality of Cream determines Quality of Butter.

That on the amount of care exercised on the receiving-platform largely depends the quality of the butter turned out is as true under home separation as it always has been where whole milk is received; the manager who sets a high standard and insists on the cream being up to that standard is still making the best butter. Where, owing to competition and other causes, managers have to take in cream which should not be accepted, the quality of the butter is correspondingly low. Some suppliers argue that so long as a factory output is all first grade all is well, but the reputation of New Zealand butter was not built up on an 88 grade, and it is not likely to be maintained by the manufacture of an article of such quality. To accept everything that comes along, as some managers are unfortunately instructed to do, is altogether wrong in principle, and simply means that the supplier of good cream has to help to pay for the carelessness of a careless neighbour.

Cream-grading has been successfully tried at a number of factories, and payments made according to the condition of the cream. There is an almost universal agitation in countries working under the home-separator system for its adoption. The standard fixed in those New Zealand factories which have adopted grading is not very exacting, and may be reached by any supplier with reasonable care. First grade is usually cream testing over 35 per cent. of butter-fat, smooth texture and clean in flavour, though not necessarily sweet; second grade, cream testing under 35 per cent. of butter-fat, or coarse in texture or unclean in flavour, and is paid for at ½d. per pound less.

Each can received has the owner's name and address painted on the lid or stamped on a brass label (as well as that of the factory to which it is consigned when full, if sent by rail), in addition to the tare weight, on the can. In most factories the practice is to weigh the cream in the can and deduct the weight of the latter. A weigh-can is sometimes used. It is satisfactory with thin or fresh cream, but is quite unsuitable with thick sour cream. Some managers take the weight of the empty cans to the nearest pound, while others mark them to a quarter of a pound. Similarly the cream may be credited to half a pound to the nearest pound, or all fractions may be taken by the factory. The second is the most common practice, and it certainly has the advantage of saving a lot of figures. Weight-slips are returned to the suppliers daily or weekly, and on testing-days have the test added. Of the various kinds of scales in use, those having the dial face have the advantage of being very quick, but it is a wise precaution to have some stamped weights at hand and try them daily, whatever the make. A scale only half a pound out can make a big difference in the day's results where a large number of cans is being weighed, especially in the autumn, when weights are small.

Generally speaking, the weighing is very conscientiously done at all the factories I have had the privilege of visiting, and if some suppliers could see their cream for themselves on arrival at the factory they would understand why the weight is short. Because a can weighs 50 lb. when filled to a certain mark to-day, it does not follow that it will weigh the same if filled to the same mark the next time it is sent. I have seen an 8-gallon cream-can, filled to within 2 in. of the top, which weighed 47 lb. net, running over on the way to the factory, due to its fermenting. Such cream should be returned to the supplier.

There is room for improvement in the rinsing of floats and cans at a great many factories. Some managers will use a half-ounce dipper for sampling to save waste of cream, and leave an ounce sticking to the floats, on the plea of want of time. The rubber squeegee before referred to will remove all the cream from the floats, and do it as quickly as the open hand or scraping them on the top of the can. A quick and effectual way of rinsing the cans is by means of a steamer fixed over the receiving-vat, the cans being inverted over it. This can be easily arranged by fixing two lengths of pipe across the vat, with a goose-necked steam jet between them. The steam will immediately loosen the cream, which drops into the vat, and while one can is steaming another is being weighed, so that there is absolutely no waste. Objection may be made that the heating will have a bad effect on the cream in the vat, but the same may be said of a can of hot rinsing-water. This objection does not hold good in practice, as

immediately the heated cream drops into the vat it sinks to the bottom and finds its way to the tap at the lowest point. If the cans have much sticking to them and a steamer cannot be used, a steam hose is a good substitute.

No factory-manager who has once used a strainer and has repeatedly seen what it collects would ever think of doing without one. Many object that it is too slow and the cream will not run through. If made with the wire gauze commonly used for milk-strainers this is true. Made of tinned steel, punched with holes $\frac{3}{32}$ in. in diameter in the bottom and sides and big enough to hold several gallons, this drawback is removed. By catching the casein it will give an indication of how the farm separator has been run, and it will ensure more even feed to the pasteurizer by breaking up the cream, which would otherwise block the taps.

TRIUMPH OAT AS FODDER.

T. W. Lonsdale.

It is well known that only with liberal feeding is the dairy cow stimulated to the best milk-yield within her capacity. So generous is she in the return for time and money spent on her that many dairy-farmers acknowledge they seldom supply their cows with sufficient feed to induce the largest flow of milk possible by all members of the herd. On the other hand, when fed sparingly or with fodder of faulty character the normal milk-flow is diminished. It is obviously essential that not only from the humane view-point, but as a business proposition, the dairy cow should be provided with an abundant supply of the best milk-producing food.

Many varieties of fodder are grown for the purpose, and in old-established dairying countries a mixture of oats and peas has for many years been grown. As there are numerous varieties of oats—some more suitable than others for providing a large amount of fodder—it is advisable to grow the oat best adapted to the purpose. It is questionable if a better variety than Triumph is known for producing a green fodder, and grown in conjunction with peas it will provide ideal food for dairy stock. This oat is a strong-growing variety, producing a great quantity of flag and strong upright straw. It is therefore adapted for giving the necessary support to the peas, whereas an oat producing fine straw would be useless.

MOTOR TRACTION ON THE FARM.

THE "AGRIMOTOR."

E. Clifton.

The farm is already supplied with a reliable power-producer in the fixed or portable internal-combustion or oil engine now installed on numerous farms. It is of all dimensions, from the small requirements of the cream-separator or the shearing-machine to those of the chaff-cutter and threshing-machine. The internal-combustion engine stands high in the appreciation of the farmer. It is in readiness for work at a few moments' preparation, and the modern types are simple and reliable.

Manufacturers now offer an "agrimotor," or farm tractor, of all dimensions, of all ranges of horse-power, and for all purposes, from the implement of 50 horse-power and 15 tons weight for the farmer on the prairie of Canada, or the ranchowner of the plains of Argentina, or the contractor conveying wool over hundreds of miles in Australia, to the pigmy capacity required in the garden.

There are many purposes to which the motor tractor can be applied on the farm. These are almost too numerous to mention; among them are, however, the chaffcutter, the threshing-machine, the corn-crusher, the pump, the saw-bench, the shearing-machine, and, not to be forgotten, the plough, as well as the general implements of tillage and harvest. With this, the first words almost certain to be uttered are, "The farm tractor cannot take the place of the horse." "Where is the sowing?" "Horses have still to be kept." It is probable, even certain, that this tractor will not do away with any horse. Indeed, it is trusted that it will not. It is, however, believed that the application of mechanical power will materially increase the production of the farm and improve its condition. There are certain times on the farm when the horse-power that is generally kept is unable to keep up with the work, as at and immediately after harvest, when stubble should be ploughed and the horses are all employed carting; also when the land is to be ploughed and cultivated for cropping in a catchy season. It is at all these times that the reserve power of the tractor becomes of all importance; and, remember, it is not demanding feeding and attention when not working. It is not to be assumed or believed that this implement is to be used only on relief-works. This

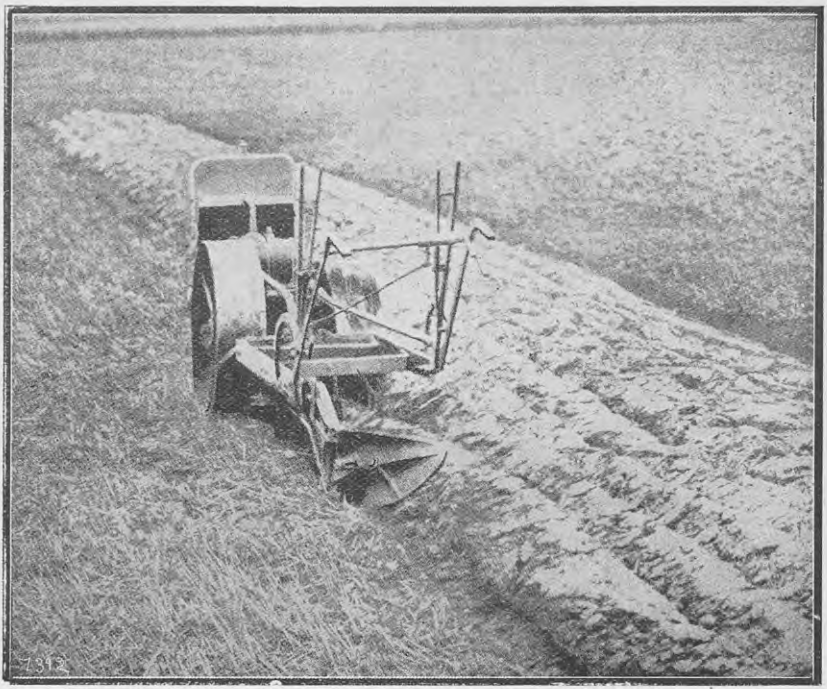
may be an immediate purpose. There is, however, the assurance that the manufacturers of the world are keenly watching the requirements of the farm, and are alert to the adaptation of the machine to meet those needs, and this with the utmost economy and reliable efficiency.

The farmer who is fortunate to own or who can obtain the services of a power outfit to plough or cultivate when occasion demands has an advantage over those who are not so provided. He can work the soil to whatever depth its nature permits. He can quickly overtake work. It is probable this last consideration is of the greater importance. This particularly applies where rain in certain places suspends operations for weeks. This naturally causes a pressure of work to be overcome in a curtailed season. It is an incalculable advantage to have the implements and the power at hand to utilize to the uttermost every opportunity afforded by the weather. This is so far as assisting or relieving. There is the factor of deep cultivation—deep stirring, not deep ploughing—to consider. This is usually accepted as desirable, but set aside as costly and practically impossible to accomplish with horse-power. It is actually both costly and difficult. It came to the writer to subsoil for orchard planting 250 acres to about 16 in. in depth. There were good teams and careful men, but half an acre per day with four horses about represented the average of the day's work. The work of cultivating a few acres to this depth is not a serious undertaking. It is when the acres are many that the labour is appreciated, and this is the task of power from steam or petrol. A particular instance of the value of deep tillage has been afforded recently in Great Britain. Some 3,000 acres of sugar-beet have been grown in the eastern counties. These are spread over a wide area. The crops vary in size from a few acres up to 100 acres. The cultivation is as varied as the acreages of the fields. Some are horse ploughed and cultivated, others deeply stirred with steam-power implements. It is claimed that the crops on the former were disappointing, while on the latter, power-tilled, they were both superior and heavier in yield. Such differences are mentioned as 5 tons and 17 tons, as the preparation of the soil was shallow or deep. The sugar-beet is no doubt a plant that requires a deep, well-prepared soil, and there are other crops that appreciate and respond to deep tillage. This can be provided by the agrimotor. In this it is not to be understood that deep tillage is recommended on all soils and in all conditions. It is, indeed, not so. Deep tillage can be profitable only on fertile and well-drained soils. These respond while similar cultivation on poor wet soil is simply the dissipation of both energy and money.

The present oil-tractors for the farm may be separated into two groups. Those of large dimensions and of high power are suitable for

contractors and large properties, while those of the other group are specially adapted to the average farm and even to the orchard and garden.

Of the large type, there is built in England, engined by Messrs. Hornsby and constructed by W. Foster and Co., for export to South America, an internal-combustion petrol engine or agrimotor of 55 b.h.p., in weight 14 tons. It is two-cylindered, and the mechanism is of the simplest design. The wearing-parts are massive. The driving-wheels are 8 ft. in diameter. There is embodied in it a remarkable



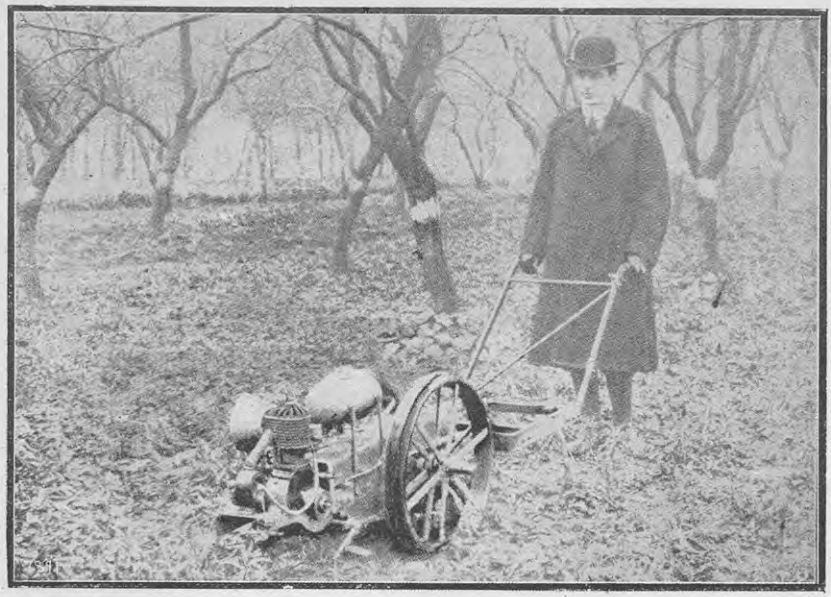
THE 3 H.P. AGRIMOTOR AS A PLOUGH.

device for starting. This implement has successfully undergone trial. It is declared extremely suitable for the special conditions for which it is intended—that of cultivation on extensive level country.

In New Zealand there are now in operation several agricultural tractors, manufactured by the International Harvester Company, U.S.A. The 20 b.h.p. is a single cylinder engine. It is started with petrol and worked with kerosene. In weight it is about 5 tons 10 cwt. It is carried on wheels of which the tire is 20 in. wide. The Department of Agriculture is operating one of the implements. With it a plough of five furrows was successfully used on land that was particularly hard. The plough is arranged on a frame bringing one mould-board

close to the tractor, so enabling turning to be accomplished on a headland of reasonable width. In Canterbury, Southland, Auckland, and other districts the owners of these tractors are particularly well pleased with them. The importers are in receipt of many gratifying testimonials. The purchasers are farmers and contractors who thresh and chaff by agreement and who undertake ploughing for farmers.

The somewhat smaller type, yet not the smallest, is one lately imported into Canterbury. The manufacturers of this machine, "The Universal," are Messrs. Saunderson and Giffkins, Bedford, England. It is of four cylinders, is water-cooled, is started on petrol, and is worked with kerosene. The wheels are in height 5 ft., the tires being 18 in. wide, and the weight 4½ tons. It operated with ease a four-furrow



The Agrimotor as a Cultivator.

plough to the entire approval of the farmers who were present at the recent demonstration at Lincoln.

The agrimotor that more directly appeals to the smaller farmer, to the orchardist, and even to the gardener is one lately placed on the market by Messrs. Wyles, of Evesham, England. It is available for the field, the orchard, and the garden. It is claimed that this implement is of the type that, when one sees it, the natural exclamation is, "Why has not this been thought of before?" The inventor is an engineer who is interested in farm pursuits. This agrimotor is the outcome of the combination of the trained skill of the engineer and the practical knowledge of the wants of the small farm. It is described as

a self-contained motor-plough, the cost being £75. The petrol engine is of 4 b.h.p., it is water-cooled, magneto ignition. The weight of the whole single-furrow implement is 6 cwt. It is driven through a metal cone clutch, with chain and spur-wheels to the driving-wheels proper. The engine is so governed that the attendant has to operate only the clutch, the adjustment of the driving-wheel regulating the depth. The designer has ingeniously provided for the necessary adjustment of the two driving-wheels independently of each other. The frame is constructed to admit of the direct attachment of implements for harrowing, drilling, hoeing, &c.

At a public demonstration in England the 4-horse-power motor-plough cut a furrow of 6 in. It travelled at a speed of over three miles per hour. The first furrow was opened with the wheels level. The steering was simple. The plough was quickly turned on the narrowest of headlands. The furrow-wheel was readily adjusted, and the implement started on its return. When the land was opened out the implement was permitted to proceed unattended. The adjustment and balance were so complete that a straight and even course was maintained to the end of the furrow. Inequalities of the surface and differences in the texture of the soil were easily overcome. It was estimated that in ordinary ploughing and with reasonable conditions of soil this implement consumed 2 gallons of petrol per acre. This particular demonstration was performed under unfavourable weather-conditions, the soil being in a sodden state. It was, however, completed to the eminent satisfaction of the interested observers.

The same makers exhibited a still smaller implement for use in root crops, or orchards, or gardens. This is hand-guided, the driving-wheels being adjustable laterally. It operates as a cultivator or hoe through trees or rows of plants where horses are inadmissible and where manual work would be both tedious and costly.

The small agrimotors should rapidly secure favourable attention. The cost is within the capacity of even small orchardists or market-gardeners. With these, used in the orchard and the market garden, the horse can be entirely displaced. The weight is light. They are easily operated. They can even work on land that the horse could not traverse, and they are reliable. This implement can be equipped with a belt-pulley. With this other machinery can be used, and the farmer can thus be provided with an agrimotor and a stationary power-outfit.

The agricultural land of New Zealand has reached a high price. Increased production is necessary to maintain our prosperity. Our farmers must avail themselves of the most modern appliances of cultivation, and of these the most valuable may be the agrimotor.

FRUIT - DISTRIBUTION.

William C. Hyde.

A Possible Revolution in Local Marketing.

Considerable attention has been given to the *production* of high-grade fruit—the selection of the land, methods of culture, combating of disease and pests, storing the crop, and the grading and packing of the fruit. All these details have formed the subjects of articles, discussions, and demonstrations, in order that the produce may be grown to perfection and packed in a clean and an attractive manner. The fruit having been successfully produced and properly prepared for market, the commercial fruitgrower naturally looks for a return to cover interest, labour, and cost of material. Thus we arrive at the second important phase of fruit-culture—distribution, a subject that is made increasingly difficult owing to the perishable nature of the produce. Adequate return for patience, energy, and skill expended on production depends almost entirely on a wise and carefully organized distribution. Attention to this subject is the more pressing in view of the rapidly extending nature of the industry, which is attracting many people and much capital at the present time.

That an ample demand for fruit exists is undoubted, but that a carefully organized system of distribution is necessary in order to supply that demand effectively is not generally recognized. Precedent often has been kind and generous, and a false sense of security has in many cases been thus established, the slowly changing circumstances being often overlooked and sometimes altogether ignored.

The subject of distribution may be classified under two headings—(1) export, (2) domestic; and the latter again under (*a*) by means of agents, (*b*) direct to the consumer. There is no doubt *all* these means are necessary, and to be effective each must be organized to a fine degree — *i.e.*, by the removal of every obstruction that hinders the steady flow of the product in the direction of the demand.

Referring to that important part of the general scheme of distribution coming under the heading of "Direct Fruit-supply to Consumers within the Dominion," valuable parcel-post facilities have been afforded by the organization recently completed by the Postal Department, which came into force on the 1st January of this year. By means of

this the carrying services—postal, railage, shipping, and cartage—have been induced to co-operate and work under fixed standard rates, with the prospect of an extension of the scheme in the future as soon as circumstances warrant it.

A fresh-fruit supply is becoming a growing need in the households of the people of to-day. Experience has long since proved that there is a very large number of consumers desirous of getting periodical supplies direct from the grower, and so securing the advantages immediately apparent when the perishable nature of the goods concerned is taken into consideration. Whilst this trade has been cultivated by many growers and has assumed considerable dimensions, it has been seriously interfered with (1) by the heavy freight charges and delayed delivery that were unavoidable when small consignments had to be dealt with and such consignments had to be transhipped; (2) by the correspondence and book-keeping, which entailed a heavy drain on the resources of the grower, at a time, too, when these resources are tested to the utmost—the harvest-time. The first disability discouraged the consumers and reduced this form of distribution to a minimum; the second discouraged the growers and thus further hampered this desirable direct trade. These drawbacks have now been entirely removed by the organization above referred to. By consigning fruit on the railway by "Parcels" it is given the utmost despatch, and, with rare exception, a case of fruit can be consigned from any railway-station in the Dominion and delivered *to the house* of the consumer in the largest centres of the same Island for 9d. or 1s., according to the size of the case. If it has to go "oversea," and transhipment is necessary, it can be "booked through" in one consignment-note at standard rates that are but a fraction of those that ruled previously, and, what is as valuable, time in transit has been reduced in equal degree. Correspondence and book-keeping on the part of the grower have been almost obliterated by the "fruit-order coupon" system of the Post Office, or, in other words, the "cash-with-order" method of sending fruit through the Post Office from producer to consumer direct. The freights being assessed by a competent clerk, and the whole order having his supervision, errors in ordering are being reduced to a minimum. Ripe stone-fruits (apricots, peaches, and cherries) have been sent under the above system from the centre of the North Island to Otago, and *vice versa*, and have been delivered within forty-eight hours in excellent condition. Consumers and growers alike have expressed and shown practical appreciation of these facilities, though not, in the case of the grower particularly, to the immediate extent expected. The new regulations, however, were only published in the middle of the stone-fruit season—the busiest period in the growers' calendar, a period that does not permit time to reorganize, and, indeed, when contracts and arrangements have often

already been made for the distribution of the crop. It is most desirable that growers should, in their own interest, thoroughly test this scheme at the earliest opportunity in order that the facilities provided may be continued, and, if necessary, gradually moulded to fit the circumstances. It should be recognized that the first move in this direction is to advertise, either by circular or in the newspapers. Inquiries made by consumers have indicated the demand along these channels, but they have been unable to take advantage of the system because they did not know the classes of fruit available, definite sources of supply, and the prices demanded. Investigation has also revealed the fact that fruit-growers' associations generally are not yet sufficiently united to operate under the scheme, and that the work must be done by individuals, but doubtless this condition will not last much longer.

May the time soon come when the advantages of co-operative marketing will be recognized as they should be, and when the innumerable brands, grades, and cases are simplified and standardized, so that the goods may be given that cheaper and quicker despatch so necessary in successful fruit-distribution, and consequently profitable production.

DEPARTMENTAL DISPLAYS AT SHOWS.

Owing to the very heavy demand made by departmental exhibits on the time of the expert officers of the Department, and the cost involved in the preparation, it has been decided to restrict the number of shows to be attended. In future two main displays will be made each year—one in the North Island and the other in the South Island. The former will be made alternately at Palmerston North and Auckland; provided that should the Auckland Agricultural and Pastoral Association not be holding a winter show in the year in which its turn falls the display will be made at Hamilton. In the South Island the main display will be made at the Dunedin Winter Show. In addition to these main displays, two other exhibits (one in each Island) on a smaller scale will be made each year at the following places, taken in rotation, if the necessary arrangements can be made: North Island—Hamilton, New Plymouth, Hawera, Hastings, and a northern town such as Whangarei or Dargaville; South Island—Invercargill, Nelson, Blenheim, Christchurch, Timaru, and Ashburton.

During the coming winter-show season exhibits will be made at Palmerston North and Hamilton in the North Island, and Dunedin and Invercargill in the South Island.

FRUIT-EXPORT.

J. H. Thorp.

The first shipment of fruit for export to South America this season was despatched by the s.s. "Alexander" from Motueka, on the 4th March, to Wellington, where it was transhipped to the s.s "Remuera" for its destination.

A Tier of Motueka Apple-cases ready for Shipment.

The quantity forwarded was 3,370 dump cases, made up as follows: Monroe's Favourite 1,156, Jonathan 1,045, Cox's Orange Pippin 266, New York Pippin (Cleopatra) 250, Hoover 234, Reinette du Canada 109, Spitzenburg 87, Adams' Pearmain 38, Worcester Pearmain 63, Blenheim Orange 47, Ribstone Pippin 21, Cellini 16, Allington Pippin 12, Alexander 5, Dessert (unnamed) 6, Winesap 3. Some of the Jonathans, although apparently mature, were of rather poor colour, and the same may be said of some cases of Monroe's Favourite. In picking it would be well if growers would take a little more care to select only those apples that show most colour, leaving the others to fill out and colour up for later shipments. Hoovers, although of good colour and apparently mature at the time, are really a late apple, and are better left on the

PACKING MOTUEKA APPLES FOR EXPORT.

The Department's Inspector and the local expert packers at work. Bales of wood-wool for packing the apples in the background.

trees till later in the season. The New York Pippins (Cleopatras) were a nice line. Although apparently an early shipment of this variety, it is one that will stand shipping on the green side. All the other varieties were in good condition for shipment.

The fruit on the whole was well graded. Part of the shipment was branded "large" and "medium," while the balance was marked in sizes, uniformity in this respect being desirable. The fruit was shipped by Messrs. E. Buxton and Co., of Nelson, and the bulk of it was packed by their expert Tasmanian packers, of whom they now have four in their employ. The balance was packed by the Moutere Asso-

Scene on the Motueka Wharf.

ciation's packers. Excepting a case or two a little on the loose side, the packing was excellent. This season the principle has been initiated of packing all the fruit at a central packing-shed, a store at the wharf being used for this purpose. The fruit is carted in loose and graded and packed there, saving a great loss of time in going from orchard to orchard, and also enabling the work of inspection to be carried out more thoroughly.

The cases supplied by growers for the export trade leave a great deal to be desired, some of them being old and stained, besides being badly made, with the boards overlapping the ends and with only two nails in each end instead of three, thus incurring great risk of ullage. In only one instance was there any attempt made to trim the cases,

THE LABEL IN USE BY MOTUEKA SHIPPERS FOR EXPORT APPLE-CASES.

and where this was done the better appearance of the cases was very marked and was commented upon. A departure has been made this season in the method of marking the cases, the stencilling being replaced by a neatly designed label, for which the shippers are to be highly commended. I would much like to see the words "New Zealand Apples" appearing on the label.

As there are several more shipments to go forward this season, I trust growers will supply their best fruit as well as giving attention to the smaller details. We are now embarking on the export trade against more experienced competitors, and it behoves all interested in the industry to do their best to put that trade in a similar position to that occupied by our dairy-produce and meat trades. It is only by giving attention to the matters I have endeavoured to bring before growers in this article that this can be accomplished.

CERTIFICATES IN SPRAYING AND PRUNING.

T. W. KIRK.

SOME time since arrangements were made by which the Orchards, Gardens, and Apiaries Division of the Department undertook to conduct examinations, both written and practical, of persons desirous of obtaining certificates of competency in the work of spraying and pruning. Up to the present time the following have passed the examinations and hold departmental certificates:—

Spraying and Pruning.

Mackenzie, Thomas, Cromwell.
Harrow, C. C., Christchurch.
Thorne, Frederick A., Christchurch.
Kalaugher, J. P., Devonport, Auckland.
Brine, J., Wanganui East.
Brown, N. B., Wanganui East.
Hayward, F. H., Kaikoura.

Spraying only.

Boniface, H. A. J., Gisborne.

As the season for winter spraying is rapidly approaching, persons desirous of obtaining these certificates should notify the Director of Orchards, Gardens, and Apiaries, Mr. T. W. Kirk, without delay. He will then arrange for examinations to be held at suitable centres.

VACCINE THERAPY.

H. A. Reid, F.R.C.V.S., D.V.H.

Readers of the *Journal* may remember a case reported in the issue of August, 1912, of a draught mare suffering from multiple sinuses of the quarter and hip, then under treatment by means of bacterial vaccines. In spite of the encouraging results obtained up to the time of recording particulars of the case, doubt was expressed as to whether the mare might ultimately become workably sound. It was decided, however, to persevere with the treatment. It may therefore be of some interest to relate that without in any way modifying the method of application the mare has completely recovered, and has for some time been doing very useful work. Considering the apparently hopeless nature of the case at the outset, and the fact that for two years it had resisted the application of various other forms of treatment, this result seems worthy of record as a striking example of the efficacy in certain cases of vaccine therapy.

PUREBRED MILKING SHORTHORNS.

A BRITISH RETURN.

In the last issue of the *Journal of the British Board of Agriculture* there is an article on the famous Kelmscott herd of purebred dairy cows, by the well-known writer on agricultural affairs, "Home Counties." The owners—Messrs. R. W. Hobbs and Son—send milk to London daily from more than two hundred cows, and farm an area of 2,144 acres in contiguous holdings in Oxfordshire, Gloucestershire, and Wiltshire. The herd is said to be the largest collection of purebred dairy Shorthorns in Britain. It has been bred for milk since 1878, and cows and heifer calves are rarely purchased. Careful milk-records have been kept for many years, and every cow's milk is weighed daily. The owners have won the Oxfordshire and the Bath and West Agricultural Societies' prizes for the best herd of dairy cows.

The average milk-yield per cow per year for the three years ending 30th September, 1911, was, for 134 cows, 6,015 lb., this being the lowest average for many years owing to the summer drought. The average yield per cow for 1910 was 6,330 lb. ($10\frac{1}{4}$ lb. to the gallon), and for 1909 6,500 lb. The average yield of an average farm cow in Great Britain is perhaps 4,500 lb. During the past three years there

have been on an average fifteen cows milking at Kelmscott yielding about 1,000 gallons or over. Rose 26th yielded 13,903 lb. from 10th June, 1904, to 10th June, 1905. At Tring Show she gave 72½ lb. 6 oz. in twenty-four hours. Blossom 5th, between 28th December, 1898, and 2nd September, 1908, produced ten calves. Her average annual yield for ten years was 8,049 lb., and her total yield 86,523 lb.

Messrs. Hobbs have made an estimate of the cost of a herd of forty dairy cows under their system. It is sufficiently interesting from a comparative point of view to justify the publication in full. It is as follows :—

ESTIMATED COST OF HERD OF FORTY DAIRY COWS.

	£	s.	d.
Grazing, 1¼ acres per cow = 50 acres, at £1 10s.	75	0	0
Rates at 2s. 6d. in the pound	9	7	6
After-feed, 1¼ acres per cow = 50 acres, at 6s.	15	0	0
1¼ tons of hay = 50 tons, at £2	100	0	0
56 lb. mangels per day per cow for 210 days = 5¼ tons × 40 = 210 tons, at 5s.	52	10	0
Feeding-stuffs, 6d. per cow per day, 210 days	5	5	0
Feeding-stuffs, 2½d. per cow per day, 90 days	0	18	9
40 × 6 3 9 =	247	10	0

Attendance.

Thirty Weeks' Winter.

	£	s.	d.
Two men to milk and feed, &c., at 16s. per week	1	12	0
Two men to milk (only), at 7s. per week	0	14	0
One lad to wash and clean cows (part time)	0	5	4
One lad to carry in and cool milk (part time)	0	5	4
One lad to weigh milk (part time)	0	5	4
One woman to clean buckets and utensils	0	4	0
30 × 3 6 0 =	99	0	0

Fourteen Weeks' Summer.

	£	s.	d.
Four men to milk, at 7s.	1	8	0
One lad to weigh	0	5	0
One lad to carry in and cool	0	5	0
One woman to clean buckets and utensils	0	4	0
14 × 2 2 0 =	29	8	0
Milk-cart, horse, and driver	40	0	0
Depreciation in value of cows (bought a heifer at £20 and sold in five years at £15) = £1 per year per cow	40	0	0
Losses in death, abortion, and veterinary expenses = £1 per cow	40	0	0
Expense of bull, 5s. per cow	10	0	0
Upkeep of dairy utensils, at 5s.	10	0	0
40)	767	15	6
Per cow	£19	3	10

	£	s.	d.	
Produce per cow : 600 gallons milk, at 8d.	20	0	0	
Value of calf	2	10	0	
	22	10	0	
	19	3	10	
Balance	£3	6	2	gross profit per cow.
To railway company : Carriage of milk, 600 gallons, at 1d. per gallon	2	10	0	
	£0	16	2	net profit per cow.

THE JERSEY COW.

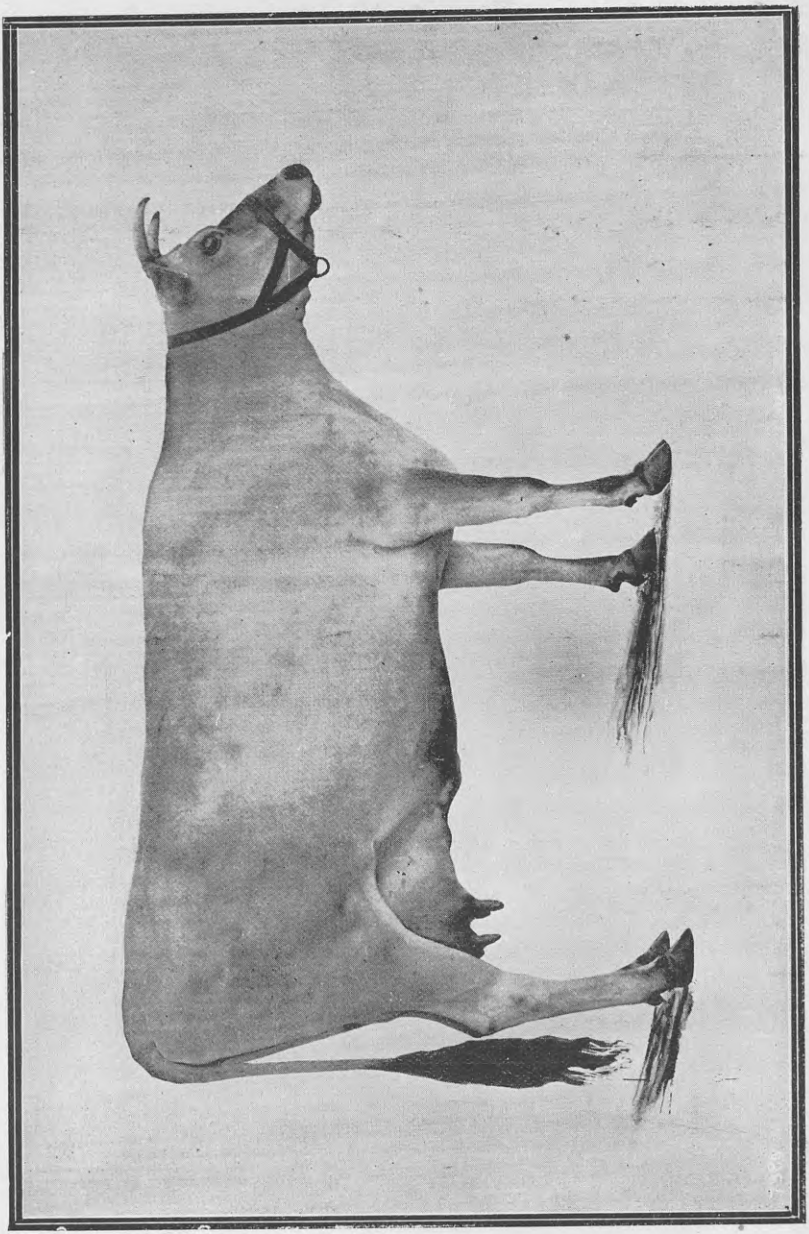
PRIMROSE MCCONNELL.

THE Jersey cow has no occasion to enlist the services of an apologist. She is the aristocrat of the cow tribe. She is of "the blood royal," and for generations the greatest care has been taken to guard her against the evil of "morganatic" connection.

In her island home two attempts were made in the early days to improve the breed by crossing with Ayrshire and Shorthorn sires. The results of these crosses were, however, considered so undesirable that the importations and all their descendants were slaughtered—the Jerseymen had no room for crosses. Since that time her purity has been protected by several Acts of Parliament; in fact, the law in this direction is now so strict that cattle-importations to the island are not allowed except for immediate slaughter.

In her native home the Jersey cow is treated more as a member of the human family than as an ordinary chattel, and she is undoubtedly a lovable and attractive animal. No true dairyman can do other than admire her, even if he is convinced in his own mind that she is not the best cow for his purpose.

Weight for weight, and taking the average of whole herds, she will produce more butter-fat than any other known breed. She is also more hardy than she gets credit for; as a matter of fact, I have seen young acclimatized Jerseys wintered out among the snow on the south-west coast of Scotland. I have also taken particular care to note the results of severe weather on the two breeds at this station (Ruakura), and I find that the Jersey is as little affected by the bad weather as the Shorthorn—and the winters here are trying enough. She is naturally of good constitution, and tuberculosis is unknown on the Island of Jersey. In my own opinion, any tendency to delicacy of constitution of individual Jerseys has arisen through too much attention being paid to purely show points, and I think we would do well to encourage a little more of the big-framed roomy cow of undoubted constitution. As showing the great care that is taken by the Jerseymen to keep their herd-book beyond suspicion, I cannot do better than quote from an article by Ernest Matthews, M.A., author of "Economics in Dairy-farming": "Before any animal can be admitted into the herd-book and given a number in either section it must be passed by the herd-book judges. These examinations take



Ruby's Buttercup.

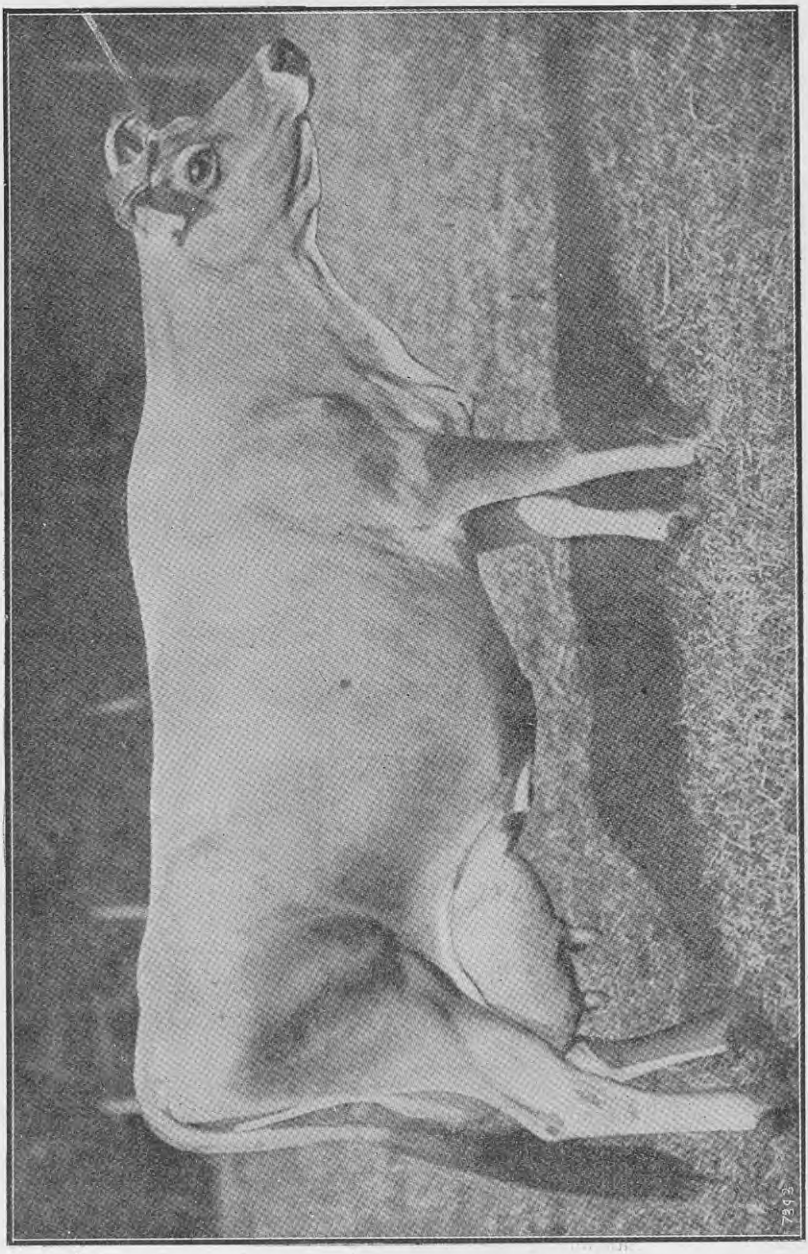
A New Zealand Jersey, a member of the herd of the Ruakura Farm of Instruction.

place at different times of the year and in various parts of the island. Five or six judges are usually present, but only three are in the ring at one time. *If a judge knows any of the animals, he steps out of the ring, when his place is taken by another.* Two qualifications are given —'Commended' and 'Highly commended'—and animals failing to get either of these commendations are rejected. No female is examined until she has had a calf, *and all bulls must be shown with their dams.* Calves are registered when they are born, and the certificate of registration decides which section of the herd-book they are eligible for when they come up for examination." Mr. Matthews also states, "I have been present at the herd-book examinations in Jersey, and thereby testify to the fact that no animal with a bad udder, teats, &c., could get a number allotted to her, however good she may be in other directions."

It may be truly said of the Jersey that, although naturally timid, under gentle treatment she becomes exceedingly docile. Like most breeds of farm stock, the Jersey may be seen to greatest perfection in her native country, and this is no doubt due to geological as well as geographical conditions.

The unceasing care that has been taken in the development of the dairy qualities of the Jersey has undoubtedly brought her well to the front as a dairy cow, but if the breeders of this valuable animal wish her to retain her present popularity they must get away from the overfine show type, and develop something built on stronger lines. There is not much chance of the "battle of the breeds" being decided yet. One man pins his faith to one breed and his fellow to another breed, and as long as the breeds are kept pure not much harm is done; but the dairyman's trouble begins with the crossing of pure breeds, and although he may be able to rejoice over a few good animals as a result of the first cross, he has nothing certain to work upon, and the end is invariably disappointment. We have plenty of material to work upon among the various dairy breeds we now possess without attempting to form new breeds. As far as can be seen, the dairy industry will always be one of New Zealand's greatest mainstays, but possibly the beef question will have to receive serious consideration in the near future; and as to whether this question will affect the future of the Jersey and other light breeds is a matter of opinion.

The paddock of tares and barley directly in front of the homestead at Ruakura Farm of Instruction has made phenomenal growth, and is now being fed off with dairy stock. The success achieved with this crop on raw poor swamp land speaks volumes for green-manuring.



AN ENGLISH JERSEY CHAMPION, CUTE II.

THE RUAKURA RAPE CROP.

Primrose McConnell.

I have pleasure in reporting another successful rape season, due to a great extent to early sowing, the use of the double ridger, repeated cultivation, and liberal manuring.

In the last-named connection it may be permissible to impress upon readers of this report that on this new poor soil we are compelled to manure with the object of improvement, not merely with the object of maintenance of fertility, as is sufficient on rich virgin soils. If manures were not applied in sufficient quantities, cultivation would, in a manner, be thrown away, as the yield would not be sufficiently large to pay for the cultivation alone. This, of course, refers more to that part of the farm which is in a raw state. Improvement of this land is slow work, but it is trusted that discoveries will be made that will tend to shorten the process.

The first paddock sown was drained during the last winter, and a considerable portion stumped, the latter being a fair sample of some thousands of acres of adjoining uncultivated swamp. It was ploughed with the swamp-plough in June to a depth of 7 in., Cambridge-rolled in July, double-disced, tine-harrowed, double-disced, and tine-harrowed in August, and the seeds and manures sown with the double ridge in the last week of the same month, the seeding being at the rate of 3 lb. Essex rape and 4 oz. mustard per acre.

Through the ravages of small birds part of the paddock had to be resown, and this was fatal to any exact account of manurial experiments; but in this paddock the best result was undoubtedly obtained from basic slag alone. The rows were horse-hoed at intervals during the growth of the rape.

Taking all circumstances into consideration the crop was satisfactory with the exception of portions of the newly stumped land, and with this particular class of soil there is undoubtedly much still to learn as to the proper manner of treating it. At the same time good results cannot reasonably be expected in the initial stages of cultivation of such soils. Experiments are now being undertaken to determine the best manurial treatment.

The crop was fit for feeding by the end of November, the second growth being fed off in January, and the remains ploughed under

in March. The other paddock devoted to rape was of an entirely different class of soil—a strong loam—and had previously grown a very heavy crop of oats. It was twice ploughed during winter to a depth of 7 in., and afterwards rolled, twice double-disced, twice tine-harrowed and rolled, cultivated, and the seeds and manures sown during the first week in November. The double ridger was used as in the former paddock, the rows being 27 in. apart, to admit of horse-hoeing, which was several times done during the growth of the crop.

The rape was fit to feed off seven weeks after the date of sowing, at which time there was an excellent crop all over the field, the mustard on portions of the paddock reaching a height of 7 ft. Even in the driest of weather there was no trace of blight.

At the date of writing (29th March) the crop has been fed off four times, the fifth crop being reserved for ploughing under. This paddock has fattened off an average of fifty sheep and lambs to the acre.

In the manurial experiments the most notable feature is the good results from the "no-manure" plot, the yield from which is a record on this station. In my opinion this was due to the dressing of lime in 1911, the double ploughing, repeated deep cultivation previous to sowing the seed, and surface cultivation during the growth of the crop. It should also be remembered that this paddock is entirely different from the average poor swamp soil in the neighbourhood.

The following table gives the results of the manurial experiments :—

Plot.	Manures per Acre.	Tons per Acre.	Gain by Manure. Tons.
1	No manure	20·7	..
2	Seychelles Island guano, 2½ cwt.; basic slag, 2½ cwt.	35·0	14·3
3	Basic superphosphate, 5 cwt.	35·2	14·5
4	Superphosphate, 5 cwt.	33·6	12·9
5	Basic slag, 5 cwt.	32.5	11·8
6	Seychelles guano, 5 cwt.	27·9	7·2
7	Slag, 2 cwt.; superphosphate, 2 cwt.; steamed bones, 2 cwt.	37·5	16·8

It must be at once admitted that the above results lead to the conclusion that a slightly less quantity of manure would probably have given more profitable results; but such results were unlooked-for and could not have been foreseen by drawing conclusions from former experiments, and, as already pointed out, the soil is much better than the average soil of the farm.

With respect to the addition of mustard to the rape, its value as a corrective cannot be doubted, and in this instance, although some of the lambs were fed entirely on the crop for several weeks, there was no trace of swollen ears or other bad effects that usually arise from feeding on rape alone.

THE BUSH-SICKNESS INVESTIGATION.

C. J. Reakes, D.V.Sc., M.R.C.V.S., and B. C. Aston, F.I.C.

Some Experiments concluded.

The whole of the first series of practical experiments in connection with this investigation, commenced over two years since, have now been concluded. These consisted of the application of various soil-dressings to small paddocks, followed by the grazing of cattle or sheep upon them. Three of these experiments must be looked upon as having been distinctly successful so far as cattle are concerned, and detailed particulars concerning them will no doubt be of interest, though during their progress they have been more than once referred to in the *Journal* as well as in the Annual Report. Following are the particulars:—

Cattle Experiment No. 1.

Land: Partially cleared bush, many stumps and fallen logs being present in the paddocks, surface-sown with grass (principally cocksfoot) and clover. Feed: Plentiful and presenting every appearance of being of good quality.

Paddock, 4 acres, top-dressed with superphosphate, 7 cwt. to acre;* good water available. Three steers, about a year and eight months old, placed in this paddock in April, 1911. Previously, on the 8th January, 1911, three steers of like class, then eighteen months old, had been placed on adjoining land, not top-dressed. These had the same water-supply, and their pasture was apparently equally good, except for the lack of top-dressing, and was much less closely stocked. They, however, had a wide range of pasture, whereas the three on the top-dressed paddock were limited to the 4 acres comprising it. As a matter of fact, the food became so scarce in this paddock in August last that these animals had to be removed to untreated land for four weeks in order to allow the grass to recover itself somewhat. These three steers are at the time of writing (April, 1913) still alive and in good health (see photo.), and, moreover, have grown and developed well throughout. The three control steers have all died of bush sickness, the symptoms exhibited being typical and the clinical opinion confirmed by post-mortem examination.

The first control animal apparently exhibited the initial premonitory symptoms on the 30th April, 1911, and died on the 14th February,

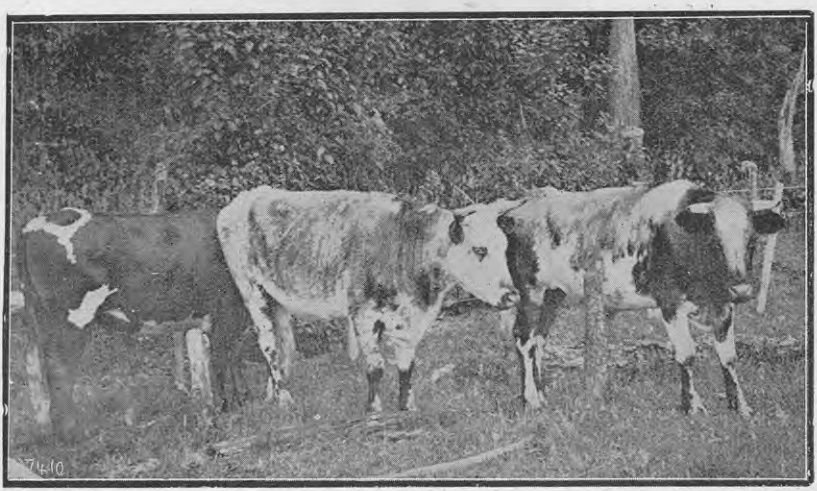
*It is to be noted that the above quantities of fertilizers are large, and are not necessarily those which would be adopted in farming practice.

1912. The second exhibited the first premonitory symptoms on the 20th September, 1911, and died on the 25th April, 1912. The third exhibited the first premonitory symptoms on the 2nd October, 1911, and died on the 27th May, 1912.

It should be further noted that these three control steers had not grown or developed, even before exhibiting any symptoms, in the same normal manner as had the three on the top-dressed paddock. Rock salt was supplied to all alike.

Experiments Nos. 2 and 3.

Paddock of cleared and grassed bush land about 5 acres in area, which had been reploughed and sown down with English grasses and clover, manured with Malden Island guano, 10 cwt. per acre. Two



THREE STEERS AFTER TWO YEARS' GRAZING ON PASTURE DRESSED WITH SUPERPHOSPHATE.

Three similar steers grazed for the same period on adjacent undressed land died of bush sickness.

steers, about twenty-one months old, were placed on this paddock in July, 1911. These animals have remained there throughout, showing no signs whatever of bush sickness, and growing and developing in a normal and natural way. One of these had two attacks of some form of indigestion, each of which threw it back temporarily, but on both occasions a good recovery was made without treatment. These animals were transferred to the Mamaku Experimental Farm in January last, being still in excellent health. Since going on to the experimental farm they have remained well. Two ewes were also placed in this paddock on the same date as the steers, but one of these unfortunately died as the result of an accident seven months afterwards. The second

lived and remained healthy for sixteen months, when it was worried by a dog. Neither suffered from bush sickness.

Another experiment was carried out in an immediately adjoining paddock of similar land on the same farm. This was a small piece of land, slightly under 2 acres in area, which was ploughed and sown down in English grasses and clover, and manured with blood and bone manure, 7 cwt. to the acre. One steer, about twenty-one months old, was placed on it on the 12th July, 1911, and remained in perfect health and growing well until January last, when it was removed to the Government farm. This animal has kept in good condition through the experiment, and when removed showed every sign of perfect health, and, moreover, since going on to the farm it has still remained healthy. Two ewes were also placed in this paddock on the 7th July, 1911. One died as the result of an accident on the 26th February, 1912; the other was killed by a dog in November, 1912. Neither had developed bush sickness. No control cattle were used in these two experiments, but the farm is well known to be affected with bush sickness, the owner generally having found it necessary not to run young cattle on it for more than eight or nine months at a time without a change.

That the soil-treatment given here did not entirely prevent the development of bush sickness was shown by the fact that of three lambs born of the ewes running in these paddocks with the steers (one ewe proved barren), two out of three died of bush sickness. All three lambs were born about the 15th June, 1911. The deaths from bush sickness occurred on the following dates: 1st January, 1912, and 30th March, 1912. The third lamb remained healthy until fifteen months after birth, when it, with its dam, was killed by being worried by a dog. Lambs are much more susceptible to the development of bush sickness than are any other animals, becoming victims of it on only slightly affected land whereon cattle and older sheep will remain free from it. It was unfortunate that these experiments, so far as sheep and lambs were concerned, were incomplete owing to accident.

It is proposed in the next issue of the *Journal* to give full particulars of each individual experiment in this series, including those which proved indecisive.

The subdivision of the Mamaku Experimental and Demonstration Farm is now about completed. It has been stocked, and all arrangements are well under way for commencing practical dairy-farming on it next season.

NATURAL resources are the nation's greatest asset, and in this Dominion the individual farmer is the chief guardian of this capital fund.

SILVER-BEET AS A FORAGE CROP.

ARTHUR P. HOPKINS, Works Manager, Belfast Freezing-works.

AMONGST the various tests conducted at their experimental forage farm at Belfast by the Canterbury Frozen Meat Company in co-operation with the Fields Division of the Department of Agriculture, Industries, and Commerce, during the past twelve months, by far the most important and conclusive was that which demonstrated in a practical form the advantages of growing silver-beet or Swiss chard for topping off and finishing forward store lambs or wethers. From our experience at Belfast I believe it to have many advantages over either rape or kale. It is more quickly grown, recovers quicker from feeding off, is absolutely immune from blight, and, as far as my observation went, no tendency to either scouring or bloating was noticed. The only pest observable was a slight attack of the leaf-miner, which occurred before the first eating-off and did not recur in the subsequent growths.

The stock fed off at Belfast were mainly in the first instance most indifferent low-priced stores (hoggets and two-tooths), but which were eventually killed and sold in the company's butchers' shops at a considerable profit.

The breaks were fed off altogether six times during twelve months. It may be as well to mention here the advisability of feeding silver-beet off quickly and in small breaks, as the sheep eat it so greedily and closely that if they are left on too long the young shoots coming up are eaten right to the roots and the next growth necessarily suffers.

There is no doubt that stock will prefer it to either kale or rape. We found that rape could be fed off at least three times, kale only twice, the third time the stock (owing to its seeding) sulking on it; whereas they tackled the beet for the sixth time as greedily as at the first. The tendency of both rape and kale to blight must also be borne in mind. Had it not been for the long wet spell last winter, during which the retentive clay land at Belfast was too soft to put stock on, I am sure another feeding could have been taken off.

We used about 5 lb. seed to the acre, thinning the plants out 10 in. apart in the rows, and using 3 cwt. of the company's fertilizers per acre. Directly after each feeding-off the cultivator was run lightly between the rows.

From actual weighings, conducted by the Agricultural Department's officers under the superintendence of Mr. Alex. Macpherson (to whom

I believe New Zealand is indebted for first proving the value of this plant as a forage crop), the yield of green stuff grown during the twelve months was 218 tons per acre.

From the following table, which applies to one quarter-acre only, it will be seen that the feeding of silver-beet at Belfast equalled the carrying of 1,014 sheep per acre for eighty-four days:—

Feeding.	Dates of Feeding.	Number of Sheep.	Equal to	Quantity of Leaves stripped.
				Tons.
First ..	March 12–22 ..	85	243 sheep per acre for 14 days..	51·72
Second ..	June 30 – July 15	50	214 ,, ..	48·22
Third ..	Sept. 2–13 ..	50	171 ,, ..	30·00
Fourth ..	Nov. 2–9 ..	50	100 ,, ..	27·00
Fifth ..	Dec. 24–31 ..	50	100 ,, ..	26·86
Sixth ..	Feb. 25 – Mar. 1	163	186 ,, ..	34·20
		Totals ..	1,014 ,, ..	218·00

There were three varieties grown—a dark smooth plain-leaved, a very light yellow, and a light curly-leaved plant. Of the three, the first mentioned is the most valuable, from its heavier growth of both leaf and large fleshy stalk, and from its longer abstention from seeding.

ERADICATION OF WEEDS.

A. H. Cockayne.

The statement is frequently made that the expense necessary to eradicate weeds is often so great that it is impracticable to carry out any effective work. This statement is nearly always made in the case of the control of weeds on permanent pasture, where the great factor in weed-eradication, good cultivation, cannot be taken advantage of. The problem of the control of weeds on such land is therefore one of considerable importance. Any expenditure, no matter how great, provided it returns a good interest on the money spent, cannot be looked upon in any way as a monetary loss to the farmer. Unfortunately, too many farmers destroy weeds merely to keep within the Act rather than as a necessary procedure in the economy of the farm. The work should never be regarded as a necessary evil, but as an investment capable of giving an absolutely certain return, often of very much greater value than the time and money spent upon it, at the same time giving a permanent and truly increased value to the property

by reason of the better carrying and selling capacity. It may be well to indicate how much can be actually spent with certainty of profit. On land worth £1 an acre containing 10 per cent. of useless plants an expenditure of over 2s. per acre will be fully compensated if these useless plants are suppressed and their place taken by utility plants. Thus for every £1 value of grazing-land containing 10 per cent. of weeds 2s. an acre can be spent with certainty of a profitable investment; that containing 20 per cent. 5s. can be expended; 30 per cent., 8s. 6d.; 40 per cent., 13s.; 50 per cent., £1; 60 per cent., £1 10s.; 70 per cent., £2 6s.; 80 per cent., £5; and 90 per cent., £10. Thus land worth £38 per acre containing 20 per cent. of weeds can have £9 10s. spent on it for weed-suppression, and then show a direct profit, to say nothing of the permanent gain. From the above it can be seen that the control of weeds on high-class land will always be profitable, but their control on very cheap land will depend upon the percentage of ground occupied by them. Where this is large weed-control, even if the land be very cheap, is probably payable. Thus, for example, land worth £2 an acre containing 60 per cent. of tauhinu can have £3 per acre spent with profit in controlling this weed.

These remarks refer very largely to those useless plants the presence of which is nearly always condoned by the farmer on the plea that it will not pay to deal with them. Of course, with regard to extremely noxious and aggressive weeds, the amount that can be spent depends entirely on the loss in the value of the land that would occur were the weeds left in possession.

With the idea of affording country ministers an opportunity of securing some knowledge of farm work and life, the Agricultural College at Missouri (U.S.A.) has established a short summer course for the clergy.

The results of the manurial experiments on the swede crop at the Ruakura Farm of Instruction up to the present are extremely puzzling, and certainly not what an agricultural chemist would expect, reports the Manager. One of the most even plots and the cheapest as regards cost of fertilizers received a haphazard mixture of basic slag and basic superphosphate. In every instance where sulphur was added to other manures, at the rate of 1 cwt. per acre, the germination was excellent, and the plots at the present moment have an exceedingly healthy appearance. On the other hand, where sulphur alone was applied to the mangel crop, at the rate of 5 cwt. per acre, the result was not so good as that of the no-manure plot. In the early, late, and subsoil ploughing experiments, which cross the mangel plots, the subsoiling at present shows the best results.

RURAL EDUCATION.

WORK IN THE NORTHERN WANGANUI DISTRICT.

Agricultural education in the district high schools of the northern district of the Wanganui Education Board is being conducted on a sound and original system. Practical field-work is the main feature, and this, being carried out under a capable and enthusiastic director, Mr. R. Browne, is proving an effective means of imparting to the senior boys of the schools in question a good working knowledge of the various processes of rural economy based on correct underlying principles. It is gratifying to know that the lads have been extremely

The Boys in the Mangel Crop listening to a Practical Instruction by Mr. R. Browne.

interested in the work, and as a consequence many of them are expected to take up farming pursuits in preference to city occupations which have absorbed so many country boys in the past.

Following is a synopsis of the work of this season, the course in each case lasting for a fortnight :—

At Hawera, in early August :—

(1.) Incubator work ; housing and feeding of fowls.

(2.) Veterinary science, dealing more especially with the dairy cow, and diseases of same.

(3.) Orchard work : Pruning and spraying of local orchards.

(4.) Manures and top-dressing ; study of pastures.

(5.) Babcock test ; herd-testing.

During the course special attention was directed to veterinary science, to orchard work, and to top-dressing. Veterinary work was taken in the form of lectures, as demonstration and practical work in the field, and at night lantern-slides were used with good effect. Orchard work took on so well that more orchards were available than could be attended to. Farmers are keenly supporting the class in top-dressing, giving the use of their paddocks and finding the necessary manures for use during the coming winter.

At Hawera, in early December :—

(1.) Shearing.

(2.) Wool-sorting.

(3.) Pastures and their treatment.

(4.) Manuring and sowing mangels, carrots, turnips, and lucerne.

(5.) Dairy-work : Use of Babcock machine, and lactometer ; calculation of added water ; herd-testing continued.

Mr. T. W. Lonsdale, Manager of Moumahaki Experimental Farm, giving an Address on the Judging of a Dairy Cow.

Special features in this course were the classes in shearing and wool-sorting. As soon as the lads had sufficient practice, owners freely offered the use of sheds, and allowed the students to shear their flocks under actual shearing-conditions. The lads thoroughly entered into the spirit of the work, working on some days from 7 a.m. till 6 p.m. At the end of the course farmers provided funds, and competitions were held in shearing, wool-sorting, and in milk-testing.

At Moumahaki Experimental Farm, in February :—

(1.) Weeding and thinning root crops, turnips, carrots, and mangels.

(2.) Lucerne-growing, also saving of crop as hay or ensilage.

(3.) The potato : Seed-selection, storing, and sprouting.

(4.) Study of grass and other trial plots.

(5.) Selection as applied to cereals—wheat, oat, and rye-corn varieties and strains.

(6.) Stacking.

(7.) Veterinary work : Study of cow, horse, and sheep, with special reference to the dairy cow, and diseases of these.

(8.) Orchard work in season.

The lads were thoroughly interested in their work at the farm, and are anxious to return, especially to carry out winter spraying and pruning operations in the orchard, and later on to shear all the sheep available. For this course only senior boys will be taken—*i.e.*, those between fifteen and seventeen years of age.

The Austrian Government has set aside a fund which provides an annual sum of £250,000 for the development of the animal-breeding industry.

In spite of a plentiful supply of forage at Ruakura Farm of Instruction the dry spell reduced the milk-yield considerably, and the probability is that records will not be so high as those of last season.

The fourth crop of lucerne hay has just been cut at Ruakura Farm of Instruction, and, as it may be reckoned that four crops of hay are equal to six of green feed, the result is very encouraging.

Experiments are being conducted in England to test the value of marram-grass for papermaking. The grass was boiled under pressure when passing through crushing-rollers, and was then bleached. It was found to produce a soft pulp with a short tear, which more nearly resembles the general feel and external appearance of the pulp produced from esparto, or chemical aspen-wood pulp. The primary function of marram-grass is, of course, as a sand-binder; but it is possible that, should it be deemed of sufficient importance as papermaking material, its cultivation will be extended over considerable areas of sandy country. The commercial value of the grass for papermaking has not yet been ascertained.—*Journal of British Board of Agriculture.*

LIME-SULPHUR AS A SUMMER SPRAY.

T. W. KIRK, F.L.S.

THIS mixture has been spoken very highly of in other countries, and has been somewhat extensively tried in New Zealand during the past season, in some instances with deplorable results. Each Orchard Instructor was therefore requested to report as to whether growers in his district had suffered through the use of this spray damaging their trees. The following is a digest of their replies:—

J. W. COLLARD, Whangarei.—Not aware of anybody using it.

N. R. PIERCE, Auckland.—Not aware of anybody using it.

W. C. THOMPSON, Auckland.—Have not seen or heard of any serious damage, but have noticed more or less severe russeting in several instances.

W. R. L. WILLIAMS, Auckland.—Have not come across any damage yet. Very little, if any, of the spray has been used in this district.

T. E. RODDA, Hamilton.—Not used to any great extent. Any damage done seems to have been caused by adding arsenate of lead and by improper agitation.

J. A. CAMPBELL, Hastings.—In some cases serious damage has occurred, while in others very little has been reported. In one orchard a tenth of the leaves and half the fruit have fallen. Good work has been done in controlling pests. More damage seems to have been done by the weaker mixtures than by the stronger.

W. C. HYDE, Wanganui.—To my knowledge no orchardists have used it in this district.

G. STRATFORD, Palmerston North.—One grower estimates the damage at £200 on Sturmers and Washingtons alone. Some trees have been wholly defoliated, and most of fruit has dropped. Another orchard looks as though fire has gone through it, and the best part of the crop was lost.

T. C. WEBB, Wellington.—To my knowledge no orchardists have used the spray in this district.

J. H. THORP, Nelson.—A good deal of damage has been done to orchards, foliage and fruit dropping heavily. Very little good seems to have been done in controlling black-spot. Apparently most damage has been done by weaker solutions.

W. J. COURTIER, Christchurch.—Only one specific case of damage has been reported in this district. The fruit and leaves were badly burnt. Very little used.

E. A. REID, Christchurch.—No experiments have been carried out with the spray in this district.

A. B. MANSFIELD, Timaru.—Very little damage has been reported. In one case, however, some varieties were badly burned. The spray seems to leave a caustic action behind, causing the bark to roughen and shed.

W. T. GOODWIN, Dunedin.—Am not aware of any damage having been done in this district.

In the experiments to determine the influence of manures on the feeding-value of pastures at Ruakura Farm of Instruction superphosphate is still at the top, followed in order of merit by basic superphosphate, basic slag, and no manure.

THE HEMP INDUSTRY.

W. H. Ferris.

General Deterioration in Quality.

Notwithstanding the splendid values ruling for high-quality fibre the phormium hemp graded in the Dominion last month was of a most disappointing character. Especially is the position unsatisfactory when it is remembered that the milling plant has been greatly improved during the last few years, thereby making it possible to produce a much freer and better-coloured fibre. The principal cause of the serious decline in quality is, in my opinion, poor stripping, due either to a desire to strip more fibre than the stripper is capable of treating effectively, to careless work on the part of the stripper-keeper, or the employment of inexperienced men. In many cases the phormium-leaf has been merely split, owing to the stripper not being maintained at the correct set, due either to a desire on the part of the miller to rush as much leaf through as possible irrespective of quality, or to carelessness on the part of the stripper-keeper. For the same reason much of the hemp has been bruised, and thereby reduced in strength. The stripping being bad, after-processes have failed to correct the weakness. Where the vegetation has not been properly removed from the fibre, no system of washing or bleaching will ensure a good colour. Where the stripping has been satisfactory the fibre has had in a few cases to be graded down owing to the poor scutching, and bad scutching is often more serious from the cordage-manufacturer's point of view than bad stripping. The latter may leave considerable vegetable matter adhering to the fibre and may cause it to have a poor colour, but the fibre will not be knotted or towy. Of course, it is impossible to properly scutch fibre bruised in the stripping process. The more such fibre is scutched the worse its condition becomes.

It is not forgotten that some mills have badly diseased leaf to deal with—leaf from which nothing but a common grade can be produced; but these mills are excluded from the above remarks. Some of the best mills in the country, having a good leaf to deal with, are turning out the unsatisfactory fibre. Not for six or seven years has such a high percentage of low-grade fibre reached the grading-stores. There is little doubt it is chiefly due to the high values ruling, as the unsatisfactory milling-work became noticeable last November and has continued to the present time, being very accentuated last month. Between the

previous and the present boom the general standard of our fibre was excellent. Certainly, only the best mills were working at the lower values, but these were palpably intent on aiming at quality rather than quantity. Now, as in the previous boom-time, the position is reversed, and everything is apparently being sacrificed to quantity. More money may be made by turning out a huge output of low-grade fibre, which can be sold at a high price, but it is doubtful if it is more profitable even now than milling a superior article, and is certainly against a permanent demand for phormium the reputation of which is being imperilled by the present short-sighted policy.

There is a big demand for "good-fair" fibre, but there is no fibre of this quality available—a matter for very great regret, as good-fair has been our standard quality for binder-twine. If this grade is not obtainable, cordage-manufacturers will be compelled to use other fibres for this purpose, to our permanent disadvantage. Australian binder-twine manufacturers would take New Zealand good-fair in preference to Manila, but as the former is unobtainable they are being forced to use Manila. Even our high-pointed fair cannot be used for binder-twine, owing to being too coarse and wiry.

A very bad feature of some lines coming forward is that, evidently with the idea of utilizing every scrap of fibre, some hanks are being "faced" with good fibre, giving the drawn hank the appearance of being of decent quality; but when the hank is opened up for inspection it is found to contain hemp of a very inferior description. This has not occurred for some years, and is to be deplored. At a time like the present it is particularly unfortunate, as the graders are busy enough with a record output to deal with without having to examine more hanks than should be necessary in order to discover if the "facing" trick is in evidence. As a consequence, strict instructions have been issued to the graders to examine the hemp as thoroughly as possible. I am continually expecting to have complaints as to grading, owing to the apparent prevalence of the "facing" deception.

The only districts turning out decent-quality fibre at the present time are Hawke's Bay, Marlborough, and Canterbury. The poor quality is confined to Auckland, Wellington, and Southland districts. Westland fibre is not so bad, but has gone back in quality owing to defective scutching of the tail-ends.

Stripper-slips have in many cases been coming to hand in a damp and even wet condition. A considerable number of bales have had to be condemned in consequence.

Needless to say, tow has been unsatisfactory—its quality is a reflex of that of the hemp. Condemnations on account of bad shaking and poor colour have been general.

THE APIARY.

ESSENTIALS NECESSARY IN ESTABLISHING THE INDUSTRY.

F. A. JACOBSEN.

THE study and practice of beekeeping requires the application of much intelligent thought and energy. To the average man little is known of our fascinating industry, but a perusal of the following brief notes will give a general idea of the various intricacies and scope of the apiary. It is commonly thought that little attention is necessary to be given to bees. This is erroneous, for to get the best results bees must be closely studied, be given considerable handling, and be subjected to many artificial systems necessary to control their work and life. Those most skilled in scientific and practical beekeeping receive the highest remuneration from their labours, and to-day we have numbers of men and women making independent incomes from the toll they receive in honey and various other commercial commodities from their bees. As previously stated, then, commercial beekeeping requires study of all branches of bee-life as well as the most diligent labour.

LOCATION OF FIRST IMPORTANCE.

Those entertaining the idea of establishing an apiary must first look for a suitable location. The etiquette of the bee world prohibits encroaching on another person's site. That is to say, do not place your bees near anybody else's, especially if the other person has fully stocked the district. Find some country rich in clovers and bee-forage that is free from any restriction as above, and there secure a site and establish your plant. It is unprofitable to keep bees in any but a good nectar-yielding district.

STYLE OF HIVE TO ADOPT.

After securing the site it is necessary to select the best style of hive. This is probably the Langstroth, which is used very extensively in the Dominion, and may be purchased at a reasonable price from the dealers. In a specially favourable district it would be an advantage to adopt the twelve-frame size, but for ordinary purposes a ten-frame hive will meet all requirements.

KIND OF BEES TO KEEP.

The bee that is recognized as possessing the best all-round qualities is the leather-coloured Italian, and it is recommended that these be kept and bred as pure as possible. They have yellow stripes across the abdomen, and are very attractive in appearance. The predominant race is known as "blacks," but they do not possess the good qualities attributed to the former kind, and are not so docile. Italians, as a rule, also gather a larger crop of honey. The black bees are superior comb-honey builders, and cap their combs with an air-space between the honey and the wax cap, which imparts a beautiful white appearance to the comb.

PROCEED WITH CAUTION.

In the first instance it is advisable to purchase a colony from some reliable apiarist, and gather from him at the same time as much information as possible. There is nothing like practical knowledge, so proceed with caution to build up your apiary from this hive, and thus gain experience as time advances.

It is impracticable for a novice to manage a large apiary without previous experience, and I warn all those who intend keeping bees to always bear this in mind. Read plenty of bee literature and gain the experience of others, and experiment to find what methods are most suitable to your location.

PROFITS OF THE APIARY.

The chief source of revenue derived from the farming of bees is honey. From individual colonies as much as several hundreds of pounds are sometimes taken. As an instance of good management I may mention an average crop of 179 lb. of honey which was secured by an apiarist in Canterbury. A crop like this, however, is exceptional, and an average of between 50 lb. and 100 lb., taking one season with another, is considered profitable. Some years a very poor crop is secured, while at other times the yield is phenomenal. These erratic changes are due almost entirely to climatic conditions. The careful and watchful apiarist seldom falls below the 50 lb. mark, which, at the price of 4d. per lb. net, works out at 16s. 8d. per colony. One man, with a little help in the busy season, could look after four hundred or five hundred colonies, which under favourable circumstances would net him a very fair income.

WAX.

In every apiary, no matter how carefully managed, there is an accumulation of wax. Cappings as a rule furnish the most, but old

combs that it is necessary to discard, those that become broken and irreparable, combs from colonies that have been treated, burr combs, &c., furnish quite a lot in addition.

These are melted up in various ways, and rendered into pure wax, which sells at about 1s. 6d. per pound. It is difficult to estimate the revenue from this source, but probably 1s. per colony would be about right. Many beekeepers make their own foundation, and in these cases the wax is retained and used for that purpose.

Queen-rearing.

Probably the most fascinating yet the most difficult work in the apiary is queen-rearing. Many methods are in practice, and beekeepers invariably experiment with these before finally selecting the plan which is most suitable for their location. In this particular branch of bee-culture the novice is confronted with difficult complications which require much thought to circumvent. Queen-rearing is, indeed, a branch in itself, and many persons occupy their full time in this work. The queens are raised by artificial means, as a rule, and hatch out in separate cages. A number of these cages are sometimes together in one hive, which is called a "nursery." After leaving the nursery they are introduced to what are called "mating-boxes" or "nuclei," from which they take their wedding flight. This single occurrence is sufficient to keep them fertilized throughout their entire life. After this nuptial revelry they are able to lay drone or worker eggs at will, and are ready to be introduced to large colonies of bees that need requeening, and so fulfil their destined mission. A commercial queen-breeder rears as many queens as he has orders for, and has his apiary stocked with especially well-bred bees. Special equipment is also needed for this purpose. Her royal highness is sold for various prices according to her quality, the general price of a first-class fully developed and tested Italian queen being about £1.

Selling Colonies.

A source of revenue is derived from the sale of surplus colonies. For instance, an apiary may be increased by swarming or artificial means from seventy-five to one hundred stocks, and if this increase is not desired the surplus colonies are usually sold. In some cases they are left until the winter, when they are united with other stocks, thus forming exceptionally strong colonies that should do well the following year.

Foundation-making.

This branch of apiculture is fast becoming popular in New Zealand, and the time will come when it will be unnecessary to import founda-

tion into this country. The quality usually manufactured, when used for ordinary purposes, is equal to foreign. One apiculturist, who has since retired from business, put through 70 tons of foundation, so there is scope indeed for development in this direction. The latest plant for foundation-making has not yet been imported to the Dominion, but the time will come when machinery of this description will be necessary. A complete outfit would cost between £200 and £300.

Proper Marketing.

A lot could be said on this important question, and if the interested parties in the Dominion would co-operate with a view to equalizing distribution, prices would certainly be in their favour. A great deal of improvement has, however, been effected during the last few years, especially in connection with the export trade. The President of the Federated Association of Beekeepers, Little River, Canterbury, has arranged for the export of 12 tons of first-grade honey monthly, and those desiring to ship under advantageous conditions should communicate with him without delay. All produce going through this channel will be graded by a Government expert, as would other shipments should application be made to the Department.

Individual Yields.

A hobby apiary of five colonies of black bees at Eltham produced this season almost 700 lb. of superior-grade honey, exclusive of the final extracting. Many other small apiaries have done equally well.

RETURNS FROM FRUITGROWING.

W. R. L. Williams.

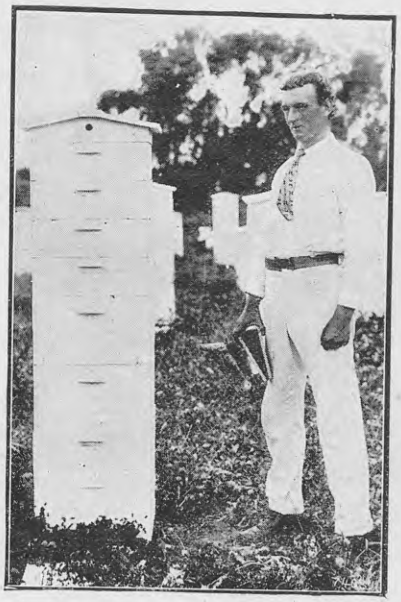
The high returns possible by fruitgrowing from a comparatively small area of land are undoubted. The following instance recently came under my notice: A small Auckland orchard of 3½ acres, of which not more than 3 acres are in stone fruits, has had an output this season of 55,000 lb. of stone-fruits (mostly peaches) actually marketed. Practically none of this fruit was sold under 2d. per pound, whilst the early peaches were sold at a high rate. However, allowing only 2d. per pound, the gross return would be £458, equal to over £152 per acre.

"Weeds are the farmer's best friends," says an American writer. "They force him to cultivate; and lack of cultivation is the crime of modern farming."

RESULT OF GOOD MANAGEMENT.

L. Bowman.

The accompanying photograph is one of the evidences to be seen on a plant in the Canterbury District of the application of modern methods applied by an apiarist imbued with enthusiasm and never sparing in his energy. The apiary was established at Fendalton three years ago with about twenty colonies, which were increased to seventy-two at the beginning of the present season. With the object of establishing his hobby as an independent business, the owner, Mr. R. M. Gidley, removed the plant to the Ellesmere district. At this time all the colonies were in a very weak condition owing to unfavourable weather-conditions; but, notwithstanding an adverse spring, Mr. Gidley has by dint of unremitting but intelligent work built up large powerful colonies to the number of 100, all provided with ample stores to carry them through the coming winter. The photograph shows a typical colony which from a weak foundation has been built up into a hive providing 417 lb. of honey. Besides the take from the apiary —which is very creditable, 4 tons 17 cwt. — 2,100 combs have been built out from foundation. At 4½d. a pound, at which price the honey is being sold privately, the return from the young business is under the circumstances a speaking example of what can be done by a keen amateur developing his hobby into a commercial undertaking with expanding knowledge.



In 1911 Austrian co-operative associations having as their object the purchase of fertilizers and feeding-stuffs were subsidized by the Government to the extent of £5,300.

ORCHARD WORK FOR MAY.

W. A. BOUCHER.

AUTUMN PLANTING.

IN some districts the month of May frequently proves suitable for autumn planting. Many growers prefer autumn to spring planting of orchard lands. Much, however, depends upon the nature of the soil and climatic conditions of the season whether autumn planting is desirable or otherwise. Two most important considerations are the nature of the soil and its condition when the setting-out of an orchard is contemplated. In the case of light, free, well-drained soils planting may be carried out in spite of showery weather sometimes experienced during the months of May and June, but in the case of moisture-retentive clay lands, even when well prepared, the rainfall will at times reduce the land to such a saturated condition that planting should be deferred until spring, when, with dry warm weather, the soil will have become friable again and suitable for working. Should fruit-trees ordered in the early part of the season come to hand when the land is not in a satisfactory condition for planting, they should be heeled in for the time being, to be lifted again and planted out when the soil has become moist and friable.

PRUNING.

In some districts of the Dominion the pruning of orchard-trees may now be commenced with advantage. Instances have occurred, however, where heavy winter pruning has been commenced when the trees were still in full foliage and the leaves green and fleshy. This practice is one that cannot be recommended, as in time the removal of a large quantity of vigorous foliage would react seriously upon the vitality of the trees.

LEMON-CULTURE.

Recently lemons have proved a very profitable crop, the returns received by the grower being entirely satisfactory. This fruit is one well worthy of cultivation in the warmer districts of the Dominion. In suitable soils and localities lemon-trees grow freely and come into bearing at an early age, provided that they receive the necessary cultivation and the treatment required for the control of the pests and

diseases to which they are subject. All of these can be both easily and economically kept in check if the necessary measures recommended by the Department are adopted. One disease, due to attack by the fungus commonly known as "brown-rot," requires the attention of growers during the month of May, and certainly not later than June. "Brown-rot" first made its appearance in New Zealand in the year 1908. Unlike many other parasitic fungi which require moist warm weather for germination and dissemination, the fungus that causes brown-rot thrives in cold wet weather. For this reason it is necessary to adopt preventive measures not in the early part of the season, as is usually the case with diseases of this class, but in the latter part shortly before winter weather sets in. A treatment that has been proved to be thoroughly effective is to apply around the trees a soil-dressing of pulverized sulphate of iron, at the rate of 1 lb. to 4 lb. per tree, according to size and age of the trees. This should be scattered beneath and round about the trees and lightly worked into the soil. The object of this is to, as far as possible, destroy the spores of the fungus, which during the summer months remain dormant, only to become active again when winter weather is approaching. To further protect the crop the trees should be thoroughly sprayed with the Bordeaux mixture, 4-5-50 formula.

Provided the trees are kept healthy and vigorous, successful results in lemon-culture depend mainly upon the careful handling of the fruit. There is perhaps no other fruit that requires such careful preparation for marketing. Lemons should be gathered not according to ripeness but according to size, a diameter of $2\frac{1}{4}$ in. producing a lemon which when cured will realize the highest market value. In order that lemons may keep, cure, and carry well, every care should be taken to avoid bruising when gathering from the tree and in the necessary handling afterwards. It does not appear to be generally recognized by growers in the Dominion that lemons carefully handled and cured will keep in excellent condition for some months, thus affording an opportunity for supplying the markets when the fruit is most in demand and values correspondingly high.

Spraying Peaches and Nectarines.

In some of the colder districts of the Dominion peaches and nectarines will have shed their leaves before the end of May. In order to protect the trees from attack by the fungus *Clasterosporium carpophilum*, commonly known as "die-back," they should be thoroughly sprayed with the Bordeaux mixture, 10-10-40 formula. This is desirable because "die-back" fungus attacks during the winter months the bark and buds of the young twigs of the season's growth—that is, the

fruiting-wood of the following season. From this it will be seen that prospective crops of peaches and nectarines depend very largely upon the care bestowed in keeping the trees free from the disease. It is to be noted that the strong winter formula of the Bordeaux mixture recommended above is not to be applied to the trees until they have shed their leaves.

GRAPE-CULTURE.

S. F. Anderson.

Vine Work for May.

During the past month many growers experienced the common trouble of their grapes rotting, and in more than one instance this vexatious trouble has been put down to disease. It is not so, however. The matter has been carefully investigated by the Biologist of the Department, Mr. A. H. Cockayne, who states that "The only fungi present are saprophytic ones that would appear as soon as the grapes begin to rot, and they must have commenced to rot through having water on them." The trouble is more noticeable where the bunches have been imperfectly thinned, thereby preventing the water or moisture condensed on them from going through the bunch, or drying up. It is easily avoided by keeping the bunches more open.

The month of May is a quiet one so far as cultural operations are concerned. The renovation of old vine-borders (advised in the notes of the February issue) may now be proceeded with, provided they are not too dry or that the weather has not been continuously dry for some time. In this case, wait for rain.

Growing Outdoor Grapes.

As a branch of horticulture grape-growing has reached an important stage in this country. Although grapes are never likely to form an article of export, it has been conclusively shown during the last two years that local consumers can be supplied without the necessity of importing them from other countries, and this at reasonable prices. The production of good fruit, however, is capable of much greater extension. It would be better, too, for the production of the best outdoor table-grapes if the work were confined to small holdings—say, from 1 to 5 acres in extent—and if these areas were cultivated in a thoroughly up-to-date manner. Only in this way can the business be made to pay. It is most important that the site chosen should be on

hill country, preferably on well-drained slopes lying to the sun. This cannot be too strongly impressed on those intending to embark in the business. The quality of the soil for the vineyard is not so important a matter as the choice of locality, and it may be at once stated that all parts of the North Island are not suitable for the industry. The rainfall varies considerably, and this must naturally influence the grower in choice of district. Hawke's Bay, especially the southern portion, is the best in that respect. There are, however, many other places on the eastern side of the North Island that are eminently adapted for the purpose.

The following varieties have proved suitable for growing outdoors for table purposes :—

Black : Black Hamburgh (early), Besgano Nero (mid-season), Muscat Hambro (mid-season), Chasselas Rose (early). White : Golden Chasselas (early), Chasselas de Fontainebleu (early), Foster's Seedling (early).

All the above are European varieties, and can be grown on espalier fences in the same way as the wine-grapes.

Albany Surprise and Pierce : American (mid-season). For the culture of these see leaflet No. 11, New Series.

Manuring of the Vineyard.

Some vinegrowers do not manure their vines until they notice a falling-off in the general growth and bearing-capacity. They should not wait to be reminded of the want of plant-food in this way. It is obvious that where a considerable weight of plant material and ripe fruit is taken away some return must be made. It is one of the inexorable laws of plant-cultivation that sooner or later a return to the soil must be made for the annual tax upon it. In the case of vineyards, a green crop, such as horse-beans, field-peas, mustard, rye, or in fact any crop of green stuff that can be ploughed in and gives the least trouble afterwards, should be grown every few years. In the intervening years it can take the form of well-rotted stable manure, bonedust, blood-meal, or artificials suitable to the particular soil. Most hill country is deficient in phosphoric acid, so that phosphatic manures are the best for such locations. The quantity applied should not exceed 2 cwt. to the acre. Sulphate of ammonia and nitrate of soda are more fitted for vegetables and cereals, and should not be used for vines. Slow-acting manures are the best. April is the time to commence this work.

Whereas there were only thirty-nine agricultural credit societies in Russia in 1909, the number increased to 107 by 1912.

THE FARM GARDEN.

W. H. TAYLOR.

VEGETABLE-CULTURE.

ALTHOUGH we cannot change winter into summer, yet we can, by the exercise of a little care and thought, ameliorate winter conditions to a considerable extent. Hoeing is done in summer-time partly to destroy weeds and partly to preserve a fine surface that will act as a mulch and prevent evaporation of moisture. A fine surface during summer does not prevent ingress of air, which is very essential to the growth of plants, but a like condition during winter, when there is a greater rainfall and less and weaker sunshine, would not tend to encourage such growth as we have reason to expect and desire. It is also obvious that a rougher surface will expose a greater area to atmospheric influences, and is therefore most beneficial at this time. During summer-time one grows lettuces in deep drills, so that the roots are well away from the dry surface soil; in winter raised beds are the natural position. A trench a spit deep thrown out around a bed will tend to dry the soil even though there be no outlet for water, and such a thing is often very beneficial to growing crops, and particularly to beds containing seedling cabbage, cauliflower, lettuce, and onions. On some soils these precautions are not necessary—that is, where drainage is perfect and the soil light or porous.

Deep cultivation is necessary to ensure uniform success. Where the soil is heavy deep working is necessary to allow water to sink down in the rainy season, and also because when water lies near the surface during wet weather such soil is nearly always abnormally dry when rainfall becomes light, and unless roots get deep down the plants suffer from drought. On the farm this condition is met by subsoiling, but the improvement is only temporary, and insufficient for continued cultivation. When the site of a vegetable-garden is a fixed one, measures must be taken to meet the requirements of the various crops as well as the variations of weather. Soil naturally becomes worn by constant cropping. It also loses humus. Both losses must be compensated for. Shallow soils and also those that lack humus may produce fair crops while rain is frequent, but fail to give adequate return when dry weather sets in. Deep cultivation and restoration of humus is the only remedy under these conditions. Farmyard and stable manure is the only perfect manure for constant cropping. It supplies nearly all

the fertilizers wanted, while it provides humus, without which plants will not thrive. By darkening the soil it increases its warmth, for anything of a dark nature absorbs heat, and light colours reflect heat. It increases moisture in dry weather, and generally effects improvement in working and makes for the congeniality of the soil as a rooting-medium. When large quantities of this kind of manure are not available it would be unwise to bury it deep down; it would be better, too, when trenching to work in any garden or farm rubbish (such as the bottom of hay or grain stacks, or cleanings of roadsides and ditches) into the lower strata of soil, and keep the good manure for the top; but be very careful not to work in anything in the way of wood (such as gooseberry-prunings, or hedge-clippings containing firm wood), for they fill the soil with fungoid growths that are inimical to plant-life. All such rubbish should be burned.

Cauliflower-plants for spring planting are in some places somewhat difficult to raise. This is particularly the case in low-lying places subject to frost. Usually all goes well for the first few weeks; then they begin to damp off, or cease to grow. To a large extent raised beds remedy this evil, sometimes entirely so; but some protection is at times imperative to ensure good plants. There are several ways of raising plants. Some sow the seed in boxes under glass. I think this plan a bad one, because at this dull part of the year such treatment is more than likely to result in soft plants. I prefer to sow in the open. Let the plants remain there till they show signs of stagnation; then lift and prick off into boxes. Put these under glass, but keep the glass off on all fine days. When the plants have become large enough for planting out, the boxes should be placed outside in a dry situation to harden off before finally planting them out.

Cabbage-plants should be pricked off into new beds as soon as they are large enough to handle. The site of the beds should be in a well-drained position and be raised above the ordinary level. Prick out the plants about 4 in. or 5 in. apart. Dealing with the plants in this manner provides a stocky plant, and also accelerates their growth, and that to such a marked degree that when these are finally planted and in good growth those in the original bed will have been so much retarded by crowding each other as to provide plants for a successional bed.

Sowing *cabbage*, *cauliflower*, *lettuce*, and *onion* was previously advised as work to be done at the beginning of this month. If such has not been done, neglect it no longer. In some places turnips may be sown up till May. This will be in fairly dry and sunny situations. I have sown *carrot-seed* during the latter part of April, but it is seldom worth while to do so. The only valid reason is that it continues the supply till the latest possible date in spring. Thus any one having an imperative call for carrots for flavouring all through the year will find that these

late-sown ones will go to seed a little later than the matured roots, and the difference is usually just enough to enable them to last out till the first little ones from spring-sown seed are ready.

Winter crops of the Brassica family, which includes *cabbage* and *broccoli*, should now be so far advanced as to have covered all the ground about them, and weeds will be no trouble; but other crops, such as *parsnips*, &c., are sure to get infested. The weeds should be pulled or dug out and wheeled away to the heap. Sorrel and couch, when in such positions, increase rapidly during wet autumn weather, and if neglected are likely to cause much trouble hereafter. It is, however, no easy matter to dig the roots out from among parsnips and carrots. The best way to deal with them is to clean the ground as the crop is used. The crop should be dug systematically, not by digging roots here and there, but by beginning at one end of a bed and digging clean, turning the soil over properly and digging in the trimmed-off tops, leaving the ground neat and clean where the crop is used. The same remarks apply to celery-trenches. If these are left rough till a trench is cleared out, it is quite a task to level them down among the rubbish; whereas if it is done in a workmanlike way from the start it is no trouble at all. The first spit in digging out a root should go to the hollow side and forward. In the hole that is left the trimmed-off tops should be put. Digging the next head covers the debris of the first and levels the ground, so that when the last has been dug the whole ground is level, all the debris is buried to enrich the soil, and much labour is saved.

Small Fruit.

If seed of *Cape gooseberries* has not yet been sown, as previously advised, it should be sown at once. Sow in boxes under glass, or, if there are no frames available, stand the box in a sheltered, sunny corner, and cover it with a sheet of glass. It is not a good plan to wait for chance plants to spring up in the garden. They do not develop early enough to ensure a good crop the first season. A word of warning: If seed is to be purchased, obtain the Cape gooseberry, not the variety called Francheti (Giant Japanese). The latter is a highly ornamental plant, but the fruit is not palatable, although it is advertised as edible, and is recommended for preserves.

Raspberry plantations may well be put in order now. There is more than likely some necessity for clearing them of weeds, and it is well at the same time to clear out the dead canes and surplus suckers. It is useless at this season of the year to hoe weeds. They must be pointed in, or dug out, as their nature requires. After the plantation is made clean, a dressing of farmyard or stable manure should be given. If artificial manure is to be applied, it had better be delayed for a couple of months. The kind and quantity will be given later.

Gooseberries and *Currants*.—It is unlikely that the annual pruning will be undertaken yet, but weeds may demand attention, and in that case it will be an advantage to the work to remove any straggling branches there may be, and, in the case of gooseberries, to shear off the drooping ends of branches, so as to render it easier to work around the bushes. A mulch of manure around and beneath the bushes will keep the ground clean as well as manure them.

Where *strawberries* are to be manured by a mulch of manure, it may be put on at any time. It is best done some weeks in advance of growth, so that the fertilizing properties may become washed out and into the soil, the debris remaining clean as a check to weeds and protection for the fruit from dirt. Doubtless some of the manure will be leached through the soil, but there is also loss in other ways if it is kept till spring.

The Flower-garden and Tree-planting.

Planting *roses* may be taken in hand now. The planting season extends from the middle of April until the middle of July in an ordinary way, with a still further extension in cases of necessity for a further period of about six weeks. Autumn planting is to be preferred, for the reason that as the bushes become re-established before winter they are in a condition in spring that enables them to break away strongly and more vigorously than those planted in spring can do. There is one great difference in treatment to be observed in autumn planting—that is, there must be very little pruning done at the time of planting. Straggling branches may be shortened to some extent, and soft shoots—late and immature growths—may be cut out. Beyond this the bushes should be planted as they are when lifted, the object being to retain as much foliage as possible, as the foliage is necessary to promote the formation of new roots. If this were not accomplished it would be better to leave planting till a later date. The object of shortening branches as described is twofold—first, to relieve the depleted roots of undue strain; secondly, to enable the plants to stand firm by the removal of some of the top hamper, which if left on would give wind too much play on them. New roots cannot form unless the bush stands firm. It is important that the soil should be trampled firmly over the roots, not only to keep the bush firmly in position but also to ensure that all roots are in close contact with the soil, a very necessary condition to the formation of new roots. It is of equal importance that the surface soil shall be quite loose, so as to enable rain and air to readily penetrate. Roses are commonly reputed to do best on clay land. Doubtless this is to a large extent misunderstood. They do better in heavy soil than in that of a very light character, and in such soil they are benefited by an addition of clay—that is, clay of a kind.

The character of clay that is useful in such soil is sticky, puggy clay; not the marly kinds. Where the soil is naturally of a heavy character it may not be fit for treading down hard, becaues it might become a stodgy mass. When this is the case it is advisable to provide some lighter material to put over the roots when planting. The importance of firmly treading in the soil around newly planted trees and shrubs is often underestimated. It is really one of the most important factors in successful planting, and for quite opposite reasons in different cases. Suppose a tree or shrub is moved with a ball of earth attached, this ball of earth will be more or less hard according to the nature of the soil. A hole is prepared for the reception of the ball, and refilled when the tree is in position. Now, unless the soil that is returned is made quite as solid as the ball of the tree, water will centre into the loose soil and never penetrate the ball. The tree then dies of starvation when dry weather sets in. In such cases the soil should be trodden or rammed very firmly, the surface left loose, and the final filling should be done so as to leave the bole of the tree standing in a shallow cup—the lowest part, in fact—so as to direct rainfall to the ball of the tree. The opposite case is when a plant is put in that has no ball of earth, firm treading is just as necessary then to prevent an undue soakage of water to it, as would happen if the soil about it were looser than that in the surrounding plot.

Planting trees and shrubs of almost all varieties may with advantage be done in autumn, but some knowledge of local conditions is necessary in some cases. Where the soil becomes very cold and wet during winter it will probably be better to delay the work till spring, for it is not probable that trees can make new roots in cold, wet soil; and unless they do so the trees must perish. Early-autumn planting is the only alternative to waiting for spring in such cases. There is no doubt about the advantage of planting in autumn wherever possible. It practically means gaining a year.

THE CARE OF NURSERY PLANTS.

Many failures are experienced for want of proper treatment of young trees, &c., received from nurseries. There is a certain shock to young trees that are transplanted that is quite unavoidable. They also suffer somewhat during the period in which they are on the journey from the nursery to the planter. There should be a short period allowed in a suitable place for resuscitation before planting, or losses are sure to follow on sudden exposure to all the vagaries of wind and weather. My own plan is to unpack immediately on receipt, and heel the plants in a somewhat sheltered place in free soil. Heeling is done by throwing out a shallow trench to begin with, putting the soil on the side of the trench opposite the digger. A row of plants is laid close together,

the roots in the trench and the plants resting against the bank of soil thrown out. Now dig in soil to cover the roots, and at the same time form another trench; but before completing the next trench tread the soil already thrown over the roots of the first row; this will raise the plants from the ground a little, but still leave them reclining from the upright. Now finish the next trench, throwing the soil forward over the trodden part, but leave this layer loose. The plants are to be left here several weeks until they show signs of new growth. They will then have made new roots and may be safely planted out. When these precautions are taken there are seldom many losses — in fact, I have handled thousands, and have only had units of loss.

Spring Flowers.

Plants raised as advised for this purpose should now be ready for planting out. Wallflowers make the finest show when massed either in beds or on borders. A solitary plant here and there is not nearly so effective as a group. Colours should be grouped separately, or arranged in bands and masses in beds. Very beautiful beds can be made by a judicious arrangement of colours. The yellow and white annual *Bartonia aurea* would make a good edging for a bed of dark-coloured wallflowers. Seeds of Bartonia can be sown when the wallflowers are planted. They soon come into flower. Forget-me-not edged with white arabis is effective. Plants of both would be required. Beds of anemone might be edged with *Alyssum minima*, whose white flowers would not clash with the various colours of the anemones. Antirrhinums, particularly the dwarf kinds, make good early beds, and are past their best in time for summer bedding—that is, if they are good plants now. Most hardy annuals may be sown at once, also pansies. Where there are bands of Lobelia that it is desirable should be moved, a few clumps should be heeled in in a nurse bed. They will provide a nucleus for propagating from in spring. Iresines and Altenanthera should be lifted and put in boxes away from frost.

If up-to-date scientific, agricultural, educational, and household methods were applied on the farm, in the school, and in the home, each farm in Canada would be capable of supporting at least ten times as many persons as it now supports, and maintain them in a condition of comfort if not luxury. At the same time, the productive power of the soil would constantly increase; the drudgery of indoor and outdoor farm-work would almost entirely disappear. There would be ample time for rest, reading, and recreation. Country children would receive as good an education as their city cousins. An attitude of appreciation of rural life would be engendered.—*Dr. S. B. Sinclair, Dean of the Faculty of Education, Macdonald College, Quebec.*

THE POULTRY INDUSTRY.

F. C. Brown.

May Work.

It is full time the breeding operations were planned, for it is always a safe rule to be well prepared and have everything in readiness if success is to be assured. Of course, I am only referring now to early hatching, to the breeding of birds for autumn and early winter laying. Hatching operations should certainly not commence before July, as birds of the heavier breeds hatched then will come on to lay on the rising egg-market. While this is so, preparations for the important work should be got under way in May. The breeding stock should, even now, be on the proper diet, a healthy blood-clearing ration with nothing to unduly force the birds to heavy laying. The cock bird should also be got into vigorous condition. Green stuff, grit, fresh water, are all essentials to making the birds fit, while it is very desirable that at this time the breeders should have some range, and thereby an opportunity to secure the desired exercise. It should be unnecessary to emphasize that if vigorous and profitable stock are to be bred—and it will only be profitable if it is vigorous—it can only come from parents of sound constitution in perfect health and condition at the time of mating. The parents at this time demand the most careful treatment not only in the matter of diet, referred to above, but should be comfortably housed without being coddled, and by good shelter and in other ways be given every opportunity to conserve their virility in view of their important work when mating takes place. It is useless having a strong male in the top of his form and the females in poor condition, and *vice versa*. The other day I saw a young imported cockerel penned by himself alongside a wire-netted run of pullets. The untiring activity of the young sire, racing up and down the pen, was enough to bring him to a dangerous state of exhaustion in a week. With such treatment the bird was being rendered useless for breeding. Male birds should be kept by themselves well removed from the sight of the fowls, but it is advisable to keep young cockerels with a few old hens. Even when a male bird, through going off, has to be taken out of a breeding-pen, it is a mistake to place him in solitary confinement. He will exercise more and eat better if given the company of one or two hens. The feeding of the breeding-pen cannot be too liberal. Too often poor

fertility and unsatisfactory stock are the result of spare feeding of a breeding-pen, owing to a good cock bird being too solicitous for the hens in allowing them to have all the feed. Of course, while the diet should be liberal it should be plain. Records are of no account in breeding operations. It is the record of fertility and percentage of vigorous stock produced that should be the objective. Too often we hear of incubating and brooding troubles which could all be put down to mismanagement in the breeding-pen.

It is generally recognized now that the late moulter, if of the desired type, is the bird to breed from, a principle I have long advocated and heartily subscribe to; but if the late moulter is to be bred from it should not be put into a breeding-pen immediately after the moult following its long and exhausting laying season. The best plan is to force the selected birds into a false moult, in the direction of changing the feed from wheat to maize or oats. The moult having been brought about, they should then be liberally fed on a plain and nutritious diet, so that the stamina of the birds may be built up before mating.

The quarters for the breeders should be as clean and sweet as possible. It is not always possible, however desirable, to keep the breeding-pens for their special purpose, therefore the houses and runs to be used for the breeders should now receive a thorough cleansing. Abundant scratching-material should be provided. This is an excellent means of inducing exercise, the best way of all of building up bodily vigour. It is advisable in poultry-keeping to neglect no detail in regard to cleanliness, proper feeding, and general management, but with breeding stock this attention to detail is imperative.

Adopt Business Methods.

How few people there are, especially those who keep poultry as a side line, who really know whether their birds are paying them or not, much less know which are the money-makers and which are the wasters. It is coming to this in dairying: that the farmer who does not know exactly the amount of milk each cow in his herd is producing every year will have to retire from the business. While it may not be possible to keep a record of every fowl on the plant, still an intelligent study of the birds will enable one to decide which are profitable and which are unprofitable. This knowledge is necessary to reduce the cost of production and make the keeping of fowls really profitable. The profit-and-loss standpoint will never appeal to the poultry-keeper unless he acquires the habit of keeping a strict account of his receipts and expenditure. When he realizes, for instance, that his returns have declined he will be impelled to look for a cause, probably finding it in having too many old hens on hand, having bred from a weak cockerel, or not having been particular enough in regard to feeding and managing

the birds to the best advantage. It is surprising how contented people become with poor results when they fail to closely examine the financial side of the business. A simple poultry account-book can now be obtained for a shilling, and with this carefully kept it should be easy enough to ascertain at a glance whether the poultry is a paying or a losing transaction. If the latter, then something is radically wrong, for with the type of bird now available at cheap prices from the plants of the Department there is no excuse for want of success. The only explanation that can be offered is want of knowledge or carelessness on the part of the owner.

THE DEAR-EGG SEASON.

We are now right into the dear-egg season. The production of eggs at this time of year is quite artificial. Therefore the fowl bred out of her natural season must be treated in an exceptional manner. Of course, it is the pullet which must be mainly depended upon for eggs at this time. Bred at the right season and managed to the best advantage up to the present, she should be laying now at top if every favouring condition is present. There must be no weak link in the chain. The reason some fail and others succeed in securing eggs when these are most valuable is because in the one case some essential factor in management has been neglected, while in the other case the birds have been handled to the best advantage right through. Having the desired heavy egg-producing strain, hatched in the right season, is only one essential requirement. The birds should never have had the slightest check in the process of development. Then when they are about to lay they should receive liberal food of the best quality, and, above all, be properly housed, preferably in a roomy open-fronted building in which they can remain on cold and wet days and yet have ample exercise by scratching in litter. Dry feet with hens is just as necessary to their well-being as with human beings. It must be remembered that I am now speaking of the artificial high-type layer bred to lay when we want her to and not when her nature dictates. It goes without saying that animal food at this time of year, especially in the colder localities, is imperative. Where fresh meat cannot be obtained meat-meal may be used, as well as blood-meal employed with care, while there is nothing better than milk, and where this is not obtainable on an economic basis skim-milk may be used to advantage. If any argument be required to prove the necessity of this special care of the laying-fowl in the dear-egg season it is surely contained in the fact that, notwithstanding the greatly increasing number of egg-record stock distributed throughout the country and hatched (by artificial means at the right time) eggs are still dear at certain seasons, certainly much dearer than they would be if all the birds hatched to lay now

were doing their duty. This emphasizes the fact that a high percentage of these birds have not been properly managed. Hatching the winter layer at the desired period does not mean that winter eggs will be secured. It is only one factor. More depends on the subsequent management, especially at the laying-period, when everything in nature is against the bird laying.

I realize that the farmer, or his wife, who has studied egg-production on right lines experiences a greater difficulty every year in securing the necessary broodies, for the more the egg-yielding power of the flock is improved the greater becomes the tendency for the brooding propensity to diminish. The only thing to do is to go in for a small incubator or purchase day-old chicks from a reliable breeder. The difficulty, of course, will not be so great with the heavier breeds, but if the laying strains of these be secured—and they are the only types worth bothering with—the question of securing broodies will become almost as great as with the special egg-producing breeds, such as White Leghorns. The time is coming when natural rearing will be almost eliminated from successful poultry-keeping. While it is the specialist now, incubating only by artificial means, who produces the great bulk of the winter eggs, before many years are past it will be the farmer who will be responsible for the main supply. Before this comes about, however, the methods of the specialist will have to be adopted by the farmer.

THINGS TO REMEMBER.

Do not starve your birds because they are not laying.

Do not have the birds standing about in a wet yard waiting for the morning meal.

Feed the layers in the house if this is, as it should be, roomy and well provided with litter.

Aim at making a high average profit from the flock rather than an exceptional return from a few.

The yolk of eggs may be made a deeper colour by feeding lucerne, clover, or watercress.

The moulting bird should be specially well fed. She has gone through an exhausting laying-period, and if early eggs are to be expected from her she should be done well now.

The wasters, which can generally be distinguished when quite young, should be weeded out without delay. Always bear in mind the food bill, the most serious factor of the business. Many hens die in debt to their owners; if they had been culled at the right time the boot would have been on the other foot.

CO-OPERATIVE EXPERIMENT RECORD.

SOUTH ISLAND.

A. MACPHERSON.

NEW VARIETIES OF PLANTS UNDER TEST.

THE following new varieties of seeds of roots, forage plants, and clovers, introduced by the Fields Division of the Department of Agriculture, Industries, and Commerce, are being used in connection with the South Island co-operative experiments of the 1912–13 season :—

Kohl-rabi (from Barteldes Seed Company, Lawrence, Kansas).

Early White Vienna ; Early Purple Vienna.

Swedes (from Portland Seed Company, Portland, Oregon).

Bangholm Pajbjerg, Improved Danish Purple-top.—This variety was awarded a first-class certificate by the Danish Government for heaviest yield, having given 49 tons per acre. In shape it is a little more elongated than the Globe types. This variety is recommended as the best of its class.

White Sweet Russian.—This variety is excellent either for table or stock. It grows to a very large size. Flesh white, solid, of a firm texture, sweet and rich. An excellent keeper.

Swedes (from D. M. Ferry and Co., Detroit, Michigan).

Hartley's Bronze-top.—A very large, oval swede, with very short neck. The colour of the root is yellow, with bronze-green top. This is a favourite sort in Canada, and can be depended upon to give good results.

Universal, or Canadian Gem.—Roots nearly round, purple above ground, yellow beneath. Very small in top and neck. Flesh yellow, and of excellent quality. Exceptionally hardy and vigorous. Sometimes sold as " Century."

Perfection White.—Absolutely neckless. Tops small, strap-leaved. Flesh white and unusually fine-grained. Vigorous in growth, and usually yields better than the yellow-fleshed sorts. While valuable for stock-feeding, the white flesh is so excellent in quality that it is particularly desirable for table use.

Yellow Swede.—Shape oblong ; dull reddish colour above ground, but yellow underneath ; is hardier than the common turnip, and will keep solid until spring.

Swedes (from Montgomery and Co.).

Springwood Purple-top.—Globular shape, small top ; very fine, firm flesh.

Edina Purple-top.—Hardiest of all. Brownish, thick, leathery skin, resisting severe frosts. Particularly free from mildew and finger-and-toe. Rich juicy flesh.

Triumph Purple-top.—Extra fine selection from Drummond's Improved Standard. Large-growing variety.

Harrietfield Bronze-top.—Globular shape, small top ; grows great size with neat tap-root. Flesh deep-golden colour.

Mangels (from Portland Seed Company, Portland, Oregon).

Danish Sludstrup.—This new mangel comes highly recommended. Our seed is direct from the originator. We give his descriptions, as follows : " Long, reddish-yellow, grows well above ground, and is easy to pull. Has repeatedly been awarded a first-class certificate by the Danish Government, and is doubtless the best mangel in the world."

Danish Red Giant Eckendorf.—Is of straight, cylindrical form, very blunt, and grows mostly above the surface. Awarded a first-class certificate as a very heavy cropper.

Yellow Giant, Intermediate, or Gatepost.—Roots very large, growing over one-half out of the ground. Flesh white, sweet, and tender; tops bright-green, comparatively small; neck small and short. We think this is perhaps the best of the yellow-fleshed beets, because its fine flesh never becomes woody, and its roots grow so well out of the ground that the crop is easily harvested. An enormous cropper.

Carrots (from F. H. Brunning Proprietary (Limited), Melbourne).

Querande or Ox-heart.—This stump-rooted carrot is a decided advance in shape. It is intermediate as to length, between the half-long varieties, such as Danvers, and the Shorthorn carrot, but much thicker than the latter, attaining at the top from 3 in. to 4 in. in diameter. It is of very fine quality for table.

Summer Favourite.—A splendid half-long sort, producing handsome bright cochineal-scarlet carrots early in the season.

The Gem.—A splendid variety. The roots average 4 in. to 5 in. in length and about 3 in. in diameter, although they have been grown to nearly double these dimensions. Quality first rate, being very tender, with almost an entire absence of core.

Silver-beet (from F. H. Brunning Proprietary, Limited, Melbourne).

Swiss Chard or Silver (plain).—Habit erect and vigorous. The midribs are silvery-white and very large; they should be served as asparagus, and the remainder of the leaves make a very valuable dish dressed as spinach. This beet is reproductive, and will bear frequent cutting, but the roots are not edible.

Swiss Chard or Silver Lucullus (curled).— This new variety grows to a height of 2 ft. to 2½ ft., and produces very large crumpled leaves on stalks as thick as rhubarb. These stalks are delicious when cooked and served in the same manner as asparagus. The leafy portion of the foliage, which is cooked and served in the same way as spinach, is very tender and of fine flavour.

Alfalfa or Lucerne (from Portland Seed Company, Portland, Oregon).

Dry-land Alfalfa.—This new Dry-land alfalfa is said to produce large profitable crops of hay and excellent pastures on the high dry lands of eastern Oregon, Washington, Idaho, and Utah. Dry-land alfalfa is especially recommended for the hills and plateaux where irrigation is impossible. It comes from the highest, driest, alfalfa sections, and is declared to be very superior seed.

Turkestan Alfalfa.—Will produce, it is reported, a luxuriant growth in the driest and hottest sections in America without irrigation. It is perfectly hardy, and will stand extreme cold in winter without harm. It yields a very heavy and rich crop of hay and makes a permanent pasture. We have the genuine imported seed.

Clovers (from Messrs. Laing and Mather, Kelso).

Wild White Clover.—The effect of Wild White clover in pastures seems to be that it has a fining influence on the other grasses: cocksfoot, for instance, not being half so rank as when sown ordinarily. It is a slow grower, and does not show much in the first year, but in the second year it becomes thoroughly established and spreads rapidly.

Clovers (from Barteldes Seed Company).

Mammoth Sapling or Pea-vine Clover.—Being a rank grower, it is most valuable for fertilizing purposes. Foliage, flower, and stem are much darker than common red clover. It ripens later than the latter, about the time timothy, red-top, and other grasses ripen, making thereby a much better quality of hay when mixed with them. Sow 12 lb. to 15 lb. to the acre.

Japan Clover.—Low perennial; spreading habit. Stands excessive drought well. Flourishes on poorest soil in southern States of America. Sow 15 lb. per acre. It makes a fair hay, and stock eat it readily when green. It is also valuable for turning under as a green manure. Sow in spring, and broadcast at the rate of 30 lb. per acre.

Esparsette or German Clover.—A leguminous plant with many stems 2 ft. to 3 ft. long; leaves in pairs of oblong leaflets, hairy on under-side; flower-stalks higher than leaves, with spikes of crimson or variegated leaves followed by hard flat pods toothed and prickly. Perennial. Roots hard and woody. Same family as alfalfa. Adapted to light chalky soils; stands gravel and barren regions deficient in rainfall and without irrigation privileges. Shorter-lived plant than alfalfa, but will last from eight to ten years according to soil by judicious top-dressing of manure. It is excellent for cows, increasing flow and quality of milk. Would advise early and heavy seeding, followed with roller. Sow seed 2 in. deep and from 30 lb. to 40 lb. per acre.

BELFAST EXPERIMENTAL AREA.

SILVER-BEET VARIETY TEST, 1912–13.

A. MACPHERSON.

I HAVE to report that preparatory to being fed off by sheep the foliage from an area of the four varieties grown was cut and weighed on the 19th March, 1913, the following being the results:—

Plot.	Variety.	Date sown.	First Stripping: Yield.
	Montgomery and Co.'s—		Tons per Acre.
1	Perpetual spinach	16/11/12	34·30
2	Swiss chard or Silver Lucullus (curled)	16/11/12	42·80
3	Swiss chard or silver (plain), dark-green leaf ..	16/11/12	36·19
4	Swiss chard or silver (plain), pale-green leaf ..	12/11/12	25·52

The land on which the first three varieties were sown was in mangels last year, and that on which the fourth variety was sown was in Buda kale. Prior to sowing the seed each plot received a dressing of Belfast rape and mangel manure at the rate of 2 cwt. per acre.

VANCOUVER EGG-MARKET.

SPECIAL PROVISION FOR SHIPPING-SPACE BEING MADE.

THE Director of the Live-stock and Meat Division has received the following communication from the General Manager of the Union Steamship Company. It will be seen that the company has made special provision for the carriage of eggs under the most favourable conditions during next season.

We understand that there is every likelihood of shipments of eggs being offered for Vancouver next season, and that we shall be asked to provide space in cold storage. The difficulty hitherto has been that shipments have been offered in such small quantities that we had no chambers small enough to set aside for the purpose, and on account of the different temperature required the eggs could not be stowed in the same chamber with butter or meat. The cold-storage capacities of the Vancouver steamers will, however, be very much larger than was the case during the season just passed, and we are now endeavouring to make such arrangements as will afford convenience for shipments of eggs on at least some of the trips, if not every trip. We cannot say definitely what can be done until we gather some idea of the butter and meat space likely to be required in the coming season, but we are not likely to be able to gauge this with any reliability until the first week in September, but perhaps that will be soon enough to decide what can be done with regard to eggs.

PASTURES AND CROPS.

MARCH.

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 severe drought which has prevailed here since the middle of October still continues and is growing more serious to farmers every day. The oldest settlers assert that the present is the severest drought they have ever experienced, and numbers of large creeks have gone completely dry, a condition of things unknown before. It has had very disastrous effects upon all the lucerne experiments being carried out in this district. This is very disappointing, both from the settlers' and the Department's point of view, as they are the first trials of this splendid forage plant in the northern peninsula. The much-prized grass (*Paspalum dilatatum*) of the north has had a good opportunity to assert itself as a drought-resister. It is showing a splendid growth on the rich heavy soils of the Kaitaia district, and is a cheerful relief to the eye after viewing the parched areas of volcanic land in the Bay of Islands County. Fires were rampant during the month, and settlers had a very anxious time in fighting against the withering flames and saving their homesteads and fences from destruction. In many cases their efforts were in vain. Stock are now beginning to show the evil effects of the prolonged dryness, and the outlook for winter is very discouraging indeed. As a result prices at the live-stock sales are considerably lower than they have been for some time. Owing to the very low supply of cream, the local butter-factory proposes to cease operations at the end of the month, but farmers have not had large cheques this season to gladden their hearts.—*W. J. Dunlop.*

WHANGAREI.—The drought still continues, and many of the streams are beginning to run dry. Pastures are bare, and the only green vegetation to be seen is where paspalum is growing. The whole country is more or less fire-swept, and unless rain comes at once there will be a big mortality among stock. Most of the maize crop is a failure. —*A. P. Speedy.*

AUCKLAND.—The month opened with fine weather, followed by light showers at intervals; then warmer weather prevailed up till the 11th and 12th instant, when rain set in again. The moisture quite revived the pastures and gave an exceptional growth of grass all over the districts, green crops also benefiting by the rains. Then dry weather set in again and continued up to the 29th instant, when a change took place, followed by a constant downpour all day, which will do an immense amount of good to the pastures and forage crops, which were robbed of their green foliage by the drought. There is sufficient moisture now to nourish plant-life. I think there is nothing to fear, and there will be an abundance of feed to carry all descriptions of stock through the winter and the spring months. No doubt the dry spell of weather seriously affected the milk-supply for the city, and dairy factories as well; but stock did not suffer much, on account of the farmers having a plentiful supply of hay, maize, and other green food which were given them liberally, and kept them in the pink of condition, especially dairy cows. The bush settlers are the only ones who have not grumbled at the dry weather. They had large areas of felled bush waiting to be burnt off. I notice they, with few exceptions, got good burns. Now that the rains have set in there will be large areas ready for surface sowing at once. The turnip crops and autumn-sown potatoes are looking well.—*R. Rowan.*

OPOTIKI.—The weather during the early part of last month was very dry, but nice mild rain fell on the 11th and 12th. This was badly needed. Pastures are now looking well, and there will be plenty of feed throughout the district to commence the winter with. Early-sown maize is looking well, but that planted later has not done so well on account of the dry season.—*John Case.*

HAMILTON.—Beneficial rains on the 11th, 12th, and 28th of the past month had the effect of freshening up the pastures and promoting a good growth in the root crops, the turnip crops looking particularly well. This district has a remarkably good appearance for this time of year, and there is every prospect of a good supply of feed for the winter months. Dairy herds are in good order, and the milk-supply is greater than usual at this season. All classes of stock are in good condition, and prices are ruling high. In the back districts, with few exceptions, settlers have had excellent burns, and are busy sowing grass-seed and clovers.—*J. Kerr.*

TE AWAMUTU.—March was characterized by exceptional weather from a farmer's point of view. Twice during the month this district was blessed with splendid warm rains, ensuring abundance of grass for the autumn and a splendid root-crop for the winter. Crops have been harvested in good order, and stock are in splendid condition, with good markets.—*C. E. McPhee.*

KING-COUNTRY.—The weather was most seasonable. Pastures, winter crops, and newly sown bush burns are in splendid order.—*B. Bayly.*

OHAKUNE.—From the 1st to the 16th exceptionally dry weather prevailed throughout the district. Rain fell on the 17th and 18th, and a cold snap was experienced until the 28th. Then warm winds sprang up, which were followed in due course by a heavy downpour on the 29th, since which date the condition has been variable, light showers alternating with periods of sunshine and frost at night. The spell of comparatively dry weather experienced up to the middle of last month did not appreciably affect pastures, and at present all classes of stock are amply provided for. Turnips, mangels, and carrots are looking remarkably well, and promise to prove a valuable asset to farmers during the winter months. Oats matured earlier this season than is usual for the district, and on the majority of farms where grown have been stacked in good condition. The amount of bushfelling on the different blocks and the successful burns thereon have materially enlarged the area of cleared ground within the district.—*P. Barry.*

GISBORNE.—There was a nice fall of rain about the 11th of the month, which gave the pastures a start. Further rain fell toward the end of the month, but not sufficient to do much good. The pastures throughout the district are parched in appearance and very scanty. Unless we have more rain soon, feed will be very short during the coming winter, more especially cattle-feed.—*W. Ross.*

NEW PLYMOUTH.—There were frequent light showers during the early part of the month, no heavy rain falling until the 28th. This lasted two days and caused the rivers to rise slightly. Although the nights have been cold the days have been very muggy and oppressive. The wet weather during the early part of the month caused considerable delay and damage to the late crops, and it is feared that there will be a considerable quantity of damaged grain and chaff. Threshing has begun. The yields so far are below the average. The root crops have made good growth, and maize has also done well this year. The pastures are exceptionally good, and there is abundance of feed in all parts of the district. The milk-yield is decreasing, as is to be expected at this season of the year; nevertheless cows are milking remarkably well. Within the last two months several of the factories have commenced to manufacture casein. All farmers are now very busy ploughing and getting in their winter crops, and burning and clearing weeds, the growth of which has been phenomenal. The increasing shortage of casual labour is keenly felt.—*R. E. Fairfax-Cholmeley.*

MANGAWEKA.—Fairly dry weather was experienced during March. Good heavy rain-showers fell on the 13th and 29th, which will do a lot of good to the country. The newly sown burns will benefit by this downfall. On the papa country old pastures still retain a greenness. There is still plenty of feed about, and some good crops of turnips are to be seen. Potato-digging is now general. The tubers vary a good deal as to size, but the table ones are better than they have been for some years. The weather for dipping favoured those who had plenty of water, but others again have not fared so well owing to creeks having dried up. Stock of all descriptions are doing well, and if the weather will only continue warm after this rain feed should be plentiful for starting the winter.—*J. A. Melrose.*

FEILDING.—The weather was dry during the past month. The pastures were not of a milk-producing nature, therefore the milk-yield was disappointing through feed not being succulent. Ensilage would have assisted in keeping up the milk-supply, and no doubt suppliers to factories will take notice when they read of distant friends reaping the benefit of feeding ensilage to stock during dry and off seasons of the year. We are getting warm rains now, which should send a plentiful supply of feed for the

autumn months. Peas are threshing out very good, while potatoes are turning out well in the Kiwitea and Kimbolton districts, and are very free from blight.—*William Dibble.*

WAIROA.—The weather during the month of March continued very dry, with the exception of a few refreshing showers that occurred at intervals throughout the month. There was no rainfall to promote growth to any extent, the consequent result being a great shortage of pastures throughout the district, thus causing the settlers anxiety with regard to making the necessary provision for the wintering of their stock. Stock are in good condition.—*T. F. Mullaly.*

HASTINGS.—The weather during March was of a pleasant description. Light rain fell on several days, and did much good, especially to turnip and rape crops, while pastures benefited to some extent. Much more rain is wanted. Self-sown grasses germinated freely after the rain, but are now suffering from drought and high winds.—*J. G. Parker.*

WAIPUKURAU.—Last month was a slight improvement on the previous one, there having been a good rain on the 11th, which promoted a fair growth in pastures, and will greatly assist the root crops, which were feeling the effect of the continued dry weather. Stock have got through the dry weather very well, and are in fair condition to face the coming winter.—*H. O. M. Christie.*

PAHIATUA.—Rainfall for the month was 4·91 in., rain falling on fifteen days, and the heaviest fall being 1·34 in., on the 11th instant. (Corresponding month of last year: Total fall 4·56 in. on thirteen days; heaviest fall 1·30 in., on the 15th.) The weather during the month was all that could be desired. We had a fair amount of warmth following the rain, and consequently there has been a fair growth both in roots and pastures. I sowed an experimental plot of lucerne on the 27th January; it made its appearance on the 1st February, and it is now 8 in. high. My plot of oats and vetches for winter use is now looking well. The birds were a great nuisance, causing the oats to come rather thin. Indications at the present time for winter feed are good.—*T. Bacon.*

NORTH WAIRARAPA.—The past month was favourable for farmers. The recent rains have had a tendency to freshen the pastures and bring away a nice growth. If favourable weather continues it should ensure winter feed. Harvesting is practically finished. Late-sown turnips have benefited by the recent rains. Stock also are looking well.—*J. S. Rankin.*

MASTERTON.—The country got very much dried up in the early part of the month, and the outlook was very serious. Warm rain set in on the 18th, continuing for several days, and we have had intermittent showers since, which have saved the situation. In some parts of the district it must have meant hundreds of pounds to the farmers. The ground had become very hard and dry, the grass was withering up fast, and the outlook for winter feed was very gloomy; now, however, a good supply of winter feed is assured. In some parts turnips and rape have done very well, potatoes promise a fair yield, and stock all look in very good condition. I notice pennyroyal is spreading rapidly in parts of the district.—*T. C. Webb.*

SOUTH WAIRARAPA.—The fine weather broke up on the 11th of last month, light showery weather following, which was required by dairy-farmers, as their herds had dropped considerably in their milk. At the present time the land is in exceptionally good order for breaking up for autumn cropping. Stock in general are looking well. Many turnip crops are affected with disease.—*S. C. Ivens.*

WELLINGTON.—March weather-conditions were very favourable to farmers and graziers. Grass is abundant—in parts of the district overgrown. Maize, mangels, and rape, together with all descriptions of stock, are looking very well. A notable feature of the month's climatic conditions was the prevalence of dense fogs over all the higher country.—*G. H. Jenkinson.*

BLENHEIM.—The greater part of the month was hot, dry, and windy. Rain fell after Easter, being followed by two nights' frost. Heavy rain came on again on the 28th, lasting for several hours, and the weather became very cold and wintry, but again changed to bright sunny weather. If there are no more frosts the prospects for winter feed will be assured.—*F. H. Brittain.*

SEDDON.—The weather for the month of March was very variable, consisting of some very warm and extremely cold days. Rain fell at intervals with some exception-

ally heavy winds, particularly at the latter end of the month, with cold showers and a slight fall of snow on the high country. Pastures all through the district are looking well. All chaffcutters and threshing-mills are working full time.—*E. T. Sinclair.*

NELSON.—The odd showers of rain and foggy weather during the month kept the pastures and root crops growing. The native grasses, where they were burnt off during the dry weather, are looking remarkably well. A large percentage of the turnips are young, but they are of good colour and are making good growth. The grain crops are all harvested and threshing-machines are at work. The frost that came about the 24th did some damage to the potatoes, but on the whole they are looking pretty well.—*Gilbert Ward.*

WESTLAND.—The weather last month was very wet and disagreeable, and at times exceptionally cold for the season of the year. The rainfall to date (28th) has been 5·47 in. It has rained on eighteen days, the maximum fall being on the 11th, when 1·05 in. was recorded. Snow fell on the ranges, and owing to the lateness of the season it is likely to remain throughout the winter, and early frosts may be expected in consequence. The weather experienced this summer has been very detrimental to the farmer, delaying agricultural pursuits generally, and is not at all encouraging for dealing with cultivation on an extensive scale. The majority of settlers seem to think that their attention is better directed by dealing with their land for grazing purposes.—*H. J. Walton.*

KAIKOURA.—With the exception of two days' nor'-wester winds, good weather prevailed throughout the month. Harvesting operations are completed, and returns satisfactory. Pastures and green crops are good and promise well for winter feed. Irish blight is prevalent among potatoes which have not been sprayed.—*W. S. Goodall.*

ROTHERHAM.—The weather for the month of March was exceptionally dry, the rainfall being the lowest for some years. We had a slight shower on the 11th instant—the only rain for the month. Pastures are drying up very fast, and unless a good rain comes soon the prospects for winter feed will not be too bright. We had a great deal of north-westerly weather during the month, and a terrific gale, on the 27th and 28th, which caused a big thaw in the back country, the rivers being all in very high flood on the 29th instant. Threshing is well on in this district, but the yields upon the whole are very disappointing. Prices offering for grain, potatoes, and fat stock are good, and farmers generally are in good spirits. Turnips and potatoes are fairly good and free from blight, but badly require rain. The rape crop this year was badly affected by the blight, consequently it did not stand much feeding.—*W. M. Munro.*

RANGIORA.—Early last month very heavy hailstorms did a large amount of damage to the Sheffield district. One farmer, at Waddington, calculates his loss at £600. Paddocks of grain were entirely stripped. The weather during the month was fairly fine and allowed nearly all the grain to be harvested and threshed. The results have not been as good as was expected. There was a great rainfall on the hills, but very little on the plains. These rains caused the Waimakariri to overflow at Bealey and also at Belfast, but I have not heard that it did very much damage. Rainfall for month, 0·5 in.; sunshine, 156 hours 5 minutes. Winds, easterly and westerly alternating.—*A. Hughes.*

LINCOLN.—During March a dry spell of weather was experienced. This, whilst it enabled good progress to be made with the threshing of cereals and the harvesting of clovers, was unfavourable to the growth of green crops and pastures. A good rain would now be very welcome. In some localities blight has appeared in the potato crops. Late crops also have been injured by frost. On some farms skim-ploughing of stubbles has been pushed ahead. Leas, however, are at present rather hard for ploughing.—*J. G. Scott.*

FAIRLIE.—A good deal of wet weather was experienced during the month. Root crops and pastures have done well. Potatoes are being dug, and the crop is a very poor one. Large numbers of fat lambs are now going down to the works. High prices are being realized, one mob being sold in the yards at £1 0s. 2d. Ewes are also very dear, two-tooth half-breds bringing up to £1 5s.—*W. B. Manning.*

TIMARU.—During March the weather was very unsettled, with high winds from the north-west and south-west, accompanied by constant showers and heavy rain; there were also a few frosts. Potato-blight has shown up in a few places. The pastures have a good growth of grass, and there should be good winter feed.—*J. C. Huddleston.*

WAIMATE.—The month of March was unusually wet, and threshing operations have been somewhat hindered. Generally speaking, grain has been safely stacked, and fair yields are expected, although it is thought the average yields will be much below those of last year. The weather from a grazing point of view has been suitable. Pastures are good, and there is an abundance of feed, and there are now good prospects of an ample supply of feed to carry stock over the winter months. Turnips, rape, and mangels have done fairly well. Potatoes, although some fair crops can be noticed, are in many cases blighted, but fair returns may be hoped for. Threshing is now in full swing, but finer weather would greatly facilitate the work.—*F. A. Macdonald.*

KUROW.—We had a fair share of showery weather during the past month, which will ensure a good growth of autumn feed, providing we have no hard frosts to retard growth. Stock of all kinds, both on the high country and lowlands, are in splendid condition and in good heart to face the approaching winter. The Waitaki River is in high flood just now, and old residents state that it has not been so high for over twenty years.—*G. Reid.*

OAMARU.—This month was most unsettled throughout. North-east rains and southerly winds and rain were prevalent throughout the month, with short periods of warm fine weather between. The pastures have improved considerably on account of moisture. The harvest is practically over, and yields are averaging about 35 bushels in most cases. The potato crop is not reaching expectations and is digging light. Rainfall, 2·28 in.—*W. F. Flower.*

PALMERSTON SOUTH.—A good deal of fog and drizzling rain during the first part of the month, and heavier rains during the latter. Rain fell on seventeen days, the total being 1·60 in. Pastures freshened up greatly, and there is now a good supply of rough feed. Root crops made excellent progress during the last six weeks. Threshing is now in full swing.—*C. S. Dalgliesh.*

DUNEDIN.—The weather during March was stormy, cold, and wet—in fact very bad harvest weather, as there was some rain practically every second day. This had a bad effect on turnips, mangels, and potatoes, as there was no genial sunshine to make up for late sowing. Pastures are fairly good, as they usually require a lot of moisture, and most farms not being heavily stocked during summer, there will be a good deal of rough paddock feed for the winter months. This district has escaped the disastrous floods which did so much damage elsewhere.—*J. R. Renton.*

MOSGIEL.—During the month of March the weather was unfavourable for threshing and stacking. Rain fell on the 10th, 12th, 13th, and 14th, the heaviest fall being on the 27th and 28th, but no damage was done to crops or stock. Throughout the district pastures are looking well, as well as early turnips and mangels. Threshing is in full swing. The average yield will not be as good as last season. Half the potato plots growing at Milton District High School were sprayed with Bordeaux mixture on the 11th February by Mr. W. T. Goodwin, Orchard Instructor, and are quite green in the leaf and healthy, while the half left unsprayed are blighted very badly. Any one interested in growing potatoes should inspect the plots and see the result.—*H. McLeod.*

STRATH TAIERI.—The weather during the greater part of the month was rather cold and dry, with several days of high wind. A heavy rainfall took place on the 28th (2·36 in.), which will greatly benefit pastures and green crops. Cereal crops were saved in good condition, and where threshing has been carried out the returns are satisfactory. Turnip crops are lighter than usual, and blight is noticeable among swedes.—*W. Scott.*

MANIOTOTO.—Good growing-weather during whole of month. Turnips came away very well; plenty of grass, and on high country good rough feed. Stock looking well.—*A. T. N. Simpson.*

CLYDE.—The weather for March was very dry right up to the end of the month, when on the 27th and 28th we experienced very heavy rain. The rainfall for the month was 3·10 in. All rivers in the district rose a considerable height above normal. The majority of farmers have their crops threshed and carted away, and are preparing for next season's crops.—*Thomas N. Baxter.*

LAWRENCE.—The weather for the month was variable. A good deal of the crop has been cut and stacked. Towards the end of the month a very heavy rainfall was experienced, with floods upon low-lying country, which had a disastrous effect upon stock and standing crops, &c.—*R. Barron.*

OWAKA.—March was a most changeable month. There was not much rain, but showers were frequent, and this has retarded harvesting operations. There are some very fine crops of oats and turnips in the district, and rape is also looking well. Most of the potato crops are blighted and the yields will not come up to expectations. Pastures are satisfactory, and there is plenty of feed everywhere.—*R. McGillivray.*

TAPANUI.—During the early part of the month the weather was fair, enabling much of the grain to be stacked, and mills are now busy. Some of the best oat crops are yielding from 50 to 60 bushels, but the majority are very light. Wheat in most cases looks well. Turnips are still growing well, especially swedes, and no blight is noticeable. Blight on the potato crop is almost unknown in this district, but a very heavy frost on the morning of the 24th blackened the tops everywhere. It is not thought that much harm will result from this, as the tubers are well advanced. Extremely heavy rain started here on the evening of the 27th and continued steadily for over twenty-four hours, rivers and creeks being in high flood at time of writing.—*W. J. McCulloch.*

GORE.—During the greater part of the past month the weather was favourable, and farmers made good progress with the harvest. Pastures are holding out well, and turnips are looking splendid. On the evening of the 27th exceptionally heavy rain set in and continued for thirty hours without intermission, and in the early hours of Saturday morning came down one of the most disastrous floods in the history of this district. At present the damage to crops and other property can hardly be estimated. Paddocks of grain have disappeared, and also fences in some localities.—*B. Grant.*

LUMSDEN.—The weather for the month of March was very changeable. The first week was very wet, but was followed by some warm sunny days, and farmers were to be seen making the most of the fine weather, cutting and harvesting the crops. Towards the middle of the month we experienced several sharp frosts, which cut down a good number of the potato crops. On the 27th very heavy rain fell, causing the river to overflow, doing a tremendous amount of damage, the old settlers considering it the biggest flood known for the last thirty years. In most cases threshing returns are very light. Pastures were looking well until this recent flood. Turnip crops are very good.—*W. S. S. Cantrell.*

INVERCARGILL.—The country throughout this district begins to have a wintry appearance, grass paddocks are bare, and on some places turnips and rape are being eaten off. Harvest is dragging slowly on, owing to the unsettled state of the weather. Grain crops generally are light, but turnips and potatoes promise well. We have had a few sunny days this month, with a sharp frost on the night of the 23rd instant, the grass on the following morning being quite stiff and white. The rainfall was 7·34 in., which is very high for this season of the year, 2·69 in. having fallen in twenty-four hours on the 27th and 28th of the month, and the fall was much heavier inland, the result being that the biggest floods ever known to the oldest inhabitants of Southland were experienced on Saturday and Sunday last. Farmers on low-lying lands have suffered very severe losses, and railway traffic has been completely disorganized.—*J. R. Whyborn.*

OTAUTAU.—The weather for the month was anything but favourable for the farmers, harvesting being prolonged through constant wet weather. Some threshing is done, but results are poor compared with previous years. Rain commenced last night and continued throughout the whole night, the result being the heaviest flood ever known. So far I have not been able to ascertain the extent of the damage, but from what can be seen near at hand many thousands of pounds will be required to cover the loss.—*H. F Dencker.*

QUEENSTOWN.—During the month the weather was very broken, and although a considerable number of wet days were experienced no great amount of rain fell until the 27th and 28th, when we had about twenty-six hours, swelling the rivers and lake, but no damage therefrom is so far reported in this district. We had frosts on the mornings of the 17th and 31st.—*A. Clarke.*

PEMBROKE.—The weather during the month was changeable, and at times very cold and stormy. The rainfall was exceptionally heavy and all rivers are in flood. Pastures, crops, &c., have come away well, the growth being very noticeable throughout the district.—*J. A. Griffith.*

Moisture in the soil is like money in the bank.

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 March :—

WHANGAREI.—Apples, medium crop. Lemons looking well. Pears heavy; main crop finished. Tomatoes nearly finished; no sign of blight. Oranges, promise of an average crop—*J. W. Collard.*

AUCKLAND NORTH.—Apples, good crop. Lemons, crop looking well. Peaches nearly over. Pears, good crop. Plums practically finished. Tomatoes, crop finished.—*W. C. Thompson.*

AUCKLAND SOUTH.—Apples, only late varieties left; fair crop. Pears almost done. Nectarines, crop finished. Peaches, crop finished. Tomatoes, still good picking; free from blight.—*N. R. Pierce.*

HAMILTON.—Apples still in fair supply; prices for good grades higher than usual. Lemons very scarce; young fruit developing well. Nectarines all harvested. Peaches getting scarce. Pears, late crops still to harvest; prices are very firm. Plums (English), practically all harvested. Plums (Japanese), all harvested; have realized higher prices than usual. Tomatoes, fair crop; these are of extra-good quality and free from disease. Walnuts, light crop.—*T. E. Rodda.*

POVERTY BAY.—Apples, crop below average; dry summer is bringing late varieties to maturity long before their usual season, and large quantities rendered unmarketable owing to the ravages of codlin-moth where spraying neglected. Lemons, poor crop. Peaches, late crops good, now almost over. Pears, good crop; same remarks as to apples. Tomatoes, good crop. Walnuts, good average crop; an extra heavy crop would have been harvested but for the severe attack of bacteriosis.—*W. R. Williams.*

MANAWATU AND WAIRARAPA.—Apples, medium crop; late varieties better than anticipated. Pears, fairly good crop; fetching good prices in market; some varieties attacked with black-spot. Tomatoes, average crop; very cheap lately; glut in market; very little disease.—*George Stratford.*

HASTINGS.—Apples, moderately good crop. Lemons, very little grown in district. Nectarines, season over. Peaches, season almost over; crops very heavy, size small; average prices satisfactory; rust troublesome. Pears, heavy crops, good quality; damaged by scab in early season. Plums, season over. Tomatoes, good average crop. Walnuts, good crop.—*J. A. Campbell.*

WELLINGTON.—Apples, average crop. Pears, average to heavy crop. Plums, crop finished. Tomtaoes, average crop.—*T. C. Webb.*

NELSON.—Apples, good crop; crops picking as well as anticipated. Peaches, crop almost finished with the exception of a few going into canning-works and market. Pears, fair crop being picked. Plums, crop nearly finished; a few cases of late red being sent away. Strawberries, second crop very poor. Tomatoes, mostly factory fruit now being gathered.—*J. H. Thorp.*

BLENHEIM.—Apples, medium crop; looking very well, especially Jonathan, which are very highly coloured. Apricots, very light crop; late frost in November cut nearly all fruit off. Cherries, fair to medium; harvest completed. Lemons, good crop. Nectarines, light. Peaches, very light, owing to late frost; all picked except a few late varieties. Pears, fair average crop; some varieties badly damaged by scab. Plums (English), heavy crop, which is almost over. Plums (Japanese), medium crop. Tomatoes, good crop, ripening and growing well. Walnuts, heavy crop; just commencing to gather a few.—*B. G. Goodwin.*

CHRISTCHURCH.—Apples, good crop; a few varieties slightly affected with black-spot. Peaches, practically over. Pears, good crop; some damaged with pear-scab. Plums, crop almost over. Tomatoes, good crop, still picking freely. Walnuts, light crop.—*W. J. Courtier.*

TIMARU.—Apples, main crop coming to hand; the supplies are short of the demand, and consequently prices are good. Pears, supplies coming forward; these are rather scabby, but not bad enough to warrant condemning. Tomatoes, heavy supplies, low prices ruling in consequence. Walnuts, good crop; crop doing exceptionally well.—*A. B. Mansfield.*

DUNEDIN.—Apples, good crop. Pears, good crop. Tomatoes, good crop. Walnuts, fair crop.—*W. T. Goodwin.*

MARKET CONDITION OF LOCAL FRUIT AND VEGETABLES.

THE Fruit Inspectors of the Orchards and Gardens Division report as follows on the condition of locally grown fruit and vegetables in the shops and auction-rooms, and the market position of these, for the month of March:—

AUCKLAND.—Throughout the month of March large quantities of locally grown fruit have been handled and examined, and I am pleased to report that, with the exception of a line of six cases of pears which arrived from Whangarei badly affected with scab and were destroyed, the fruit was clean, and no warning notices were issued. The markets have been heavily supplied with all seasonable fruits, particularly apples and pears; but, as the demand for fruit has been keen, the prices are good. Occasional lots of Northern Spy are coming to hand, and these are of very good size, colour, and quality, and show a good return to the grower at from 8s. to 9s. 6d. per case. The average prices ruling throughout the month for fruit are as follows: Apples—choice dessert, 5s. to 9s. 6d. per case; second class, 3s. to 5s. per case. Pears—choice dessert, 5s. to 9s. 6d. per case; second class, 3s. 9d. to 6s. per case. Quinces, 3s. 6d. to 4s. 9d. per case. Grapes—hothouse, 9d. to 1s. 3d. per pound; outdoor, 3s. to 5s. per 18 lb. case. Lemons—choice, 9s. to 14s. per case; second class, 5s. to 8s. per case. Figs, 2s. to 4s. per 18 lb. case. Water-melons (local), 9d. to 1s. 3d. each. Tomatoes—very unsteady, fluctuating from 1s. 6d. to 5s. per 18 lb. case.—*C. Craigie.*

WELLINGTON.—Supplies of practically all lines of local fruit dropped in price during the beginning of this month, but are now improving. The markets were glutted in the earlier part of the month with tomatoes, and low prices prevailed, some lines selling at 6d. per case. Later, however, the market has improved considerably and higher prices realized. Apples and pears are now arriving in good order, nicely packed and graded. The approximate prices ruling for fruit during the month are as follows: Apples—choice, 5s. 6d. to 8s. 6d. per case; cooking, 4s. to 5s. 6d. per case. Pears—choice, 5s. to 8s. 6d. per case; cooking, 2s. to 3s. 6d. per case. Plums (small supply), 2s. 6d. to 3s. 6d. per half-case. Peaches—choice, 3s. to 3s. 6d. per case; others, 2s. per case. Grapes—Lower Hutt, 7d. to 11d. per pound; Nelson, 5d. to 10d. per pound. Cape gooseberries, 4d. to 5d. per pound. Blackberries, 5s. to 6s. per kerosene-tin. Quinces, 1s. 6d. to 3s. per case. Tomatoes—choice, 2s. to 3s. per case; medium, 1s. to 1s. 6d. per case. Cucumbers—hothouse, 2s. to 3s. per case; outdoor, 5s. to 6s. per banana-case. Potatoes have eased slightly, due to South Island supplies, which are arriving in fair condition, and realizing £6 to £7 10s. per ton. Onions are in fair supply and the quality is good; prices have eased somewhat, fetching from £6 to £7 per ton. All other vegetables are in good supply, and the prices vary very little from last month's quotations.—*T. C. Webb.*

CHRISTCHURCH.—Fruit and vegetables are in fair supply, the ruling prices being as follows: Apples—dessert, 4s. 6d. to 5s. per case; cooking, 3s. 6d. to 4s. per case. Bananas—Cook Islands, 8s. to 9s. per case; Fiji, 9s. to 10s. per case. Lemons—Italian, £1 2s. 6d. per case. Grapes—Australian, 4d. per pound; local, 6d. to 10d. per pound. Peaches, 1d. to 2d. per pound. Pears, ½d. to 2d. per pound. Potatoes, 6s. to 7s. per cwt. Cucumbers, 2s. to 3s. per case. Tomatoes, ¾d. to 1½d. per pound. Other vegetables in fair supply.—*E. A. Reid.*

DUNEDIN.—During the month peaches, plums, and tomatoes have been in poor supply, grapes, apples, and pears have been plentiful, while apricots are now finished. Cauliflowers, cabbage, lettuce, rhubarb, carrots, beetroot, and potatoes have been plentiful. All lines of fruit and vegetables were in good order, and the ruling prices for the month are as follows: Tomatoes—outside, 2¼d. to 3¾d. per pound; hothouse, 5d. per pound. Plums, 2d. per pound. Pears, 5s. to 6s. per case. Apples, 6s. to 7s. per case. Apricots, 4d. per pound. Blackberries, 6¼d. per pound. Peaches, 4d. per pound. Potatoes, 6s. 4d. per cwt. Peas, 1¾d. per pound. Cabbage, 2s. 6d. per sack. Shops well stocked.—*E. T. Taylor.*

BLUFF.—A large amount of New Zealand fruit was on this market during March. However, as the demand for fruit was keen the market was not glutted, except perhaps for a few days in the case of tomatoes. The local markets are stocked with fruit from Auckland, Hawke's Bay, Nelson, Canterbury, North Otago, Teviot, and Southland, and owing to the local supply importations have eased. The majority of the fruit is very well packed and graded and in a clean condition. Warning notices were issued to Canterbury growers for scab on apples and pears. The following is a list of the average prices ruling during the month: Tomatoes—hothouse, 3d. to 5d. per pound; outdoor, 1d. to 4d. per pound. Peaches, 2½d. to 4¼d. per pound. Plums, 2d. to 4d. per pound. Pears, 2s. 6d. to 8s. per case. Apples—dessert, 6s. to 8s. per case; cooking, 2s. 6d. to 6s. per case. Grapes, 8d. to 1s. 3d. per pound. Quinces, 5s. per case. Onions, 8s. to 9s. per cwt. Potatoes, £5 to £6 per ton. Cabbages, 1s. per dozen. Cauliflowers, 2s. to 3s. per dozen. Parsnips, carrots, and turnips, 1s. per bunch of a dozen. Cucumbers—hothouse, 2s. 6d. to 3s. per dozen; outdoor, 1s. per dozen. Rhubarb, 1d. to 1½d. Marrows and pumpkins, 10s. per cwt.—*R. Hutton.*

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.—Owing to dry summer, honey-flow ceased early in March, but good yields were secured. The market price averaged 10s. per dozen 2 lb. tins.—*G. V. Westbrooke.*

WELLINGTON.—Honey crop in my district now almost completely gathered, the greater quantity of which was of excellent quality. Prices are firm, and beekeepers in Taranaki and elsewhere are arranging for export shipments, which are expected to assist the local trade.—*F. A. Jacobsen.*

CHRISTCHURCH.—Honey season is now finished, and most beekeepers are preparing for the winter. A fair trade doing, and prices much the same as last month, although there is a tendency to advance.—*L. Bowman.*

DUNEDIN.—The surplus of honey is in excess of last season's crop. Extracting has finished. Bulk honey sent forward is meeting good demand, bringing from 4d. to 4¼d. per pound; in 1 lb. glass bottles, 9s. per dozen. Fancy white-comb honey realizes 7s. per dozen. Beekeepers are warned against forwarding lots in second-hand packages (kerosene-tins). Dunedin auctioneers complain bitterly of methods adopted, and consequently by which prices are affected.—*E. A. Earp.*

HONEY ON A LONDON ROOF.—It will surprise many to learn that an apiary is being maintained with profit in the very heart of busy London. Within sight of Holborn, on the roof of a block of flats, Mr. Wakevell keeps fifteen hives, from one of which last year he obtained 53 lb. of honey. The bees buzz as merrily in the London smoke as if they were in a country garden. They find their own food in the summer, but during the winter sugar-canes are placed on the roof for them.

THE WEATHER.

DISTRICT NOTES DURING MARCH.

D. C. BATES.

District. *Chiefly from Telegraphic Reports.*

1. The weather was generally fine and warm, with bright sunshine in excess of the average and rainfall below, especially in the northernmost portion, where the percentage below ranged from 60 to 80 per cent. In the southern half the total fall was about 20 per cent. less than the average.

2, 4, 9. The departure from the normal rainfall varied greatly in these districts—viz., from slightly below to 50 per cent. in excess; but generally the difference was a positive one. Fair weather predominated, but cloudy and misty conditions were frequent. Heavy rain fell on the 12th, and in parts on the 28th and 29th, but usually precipitation was in the nature of showers.

3, 5, 6. About 28 per cent. below the usual March rainfall. Moderate and variable breezes prevailed, with fine weather generally.

7, 8. Warm and dry weather was experienced, the rainfall being less than the average by from 60 to as much as 100 per cent.

10. In the northern half of this district precipitation exceeded the average slightly, but in the south about 20 per cent. less than the average amount was recorded. During the first week fine and clear weather prevailed, but from then to the end of the month dull conditions were much in evidence, and temperatures were appreciably lower towards the close of the month. On the 28th and 29th high northerly winds were experienced.

11, 12. About the average and slightly less than the average rain fell in these districts. No very heavy falls occurred, but showers were frequent. Very squally conditions were experienced on the 17th and 28th, with northerly winds, but the directions were very variable during the month and much dull and misty weather prevailed.

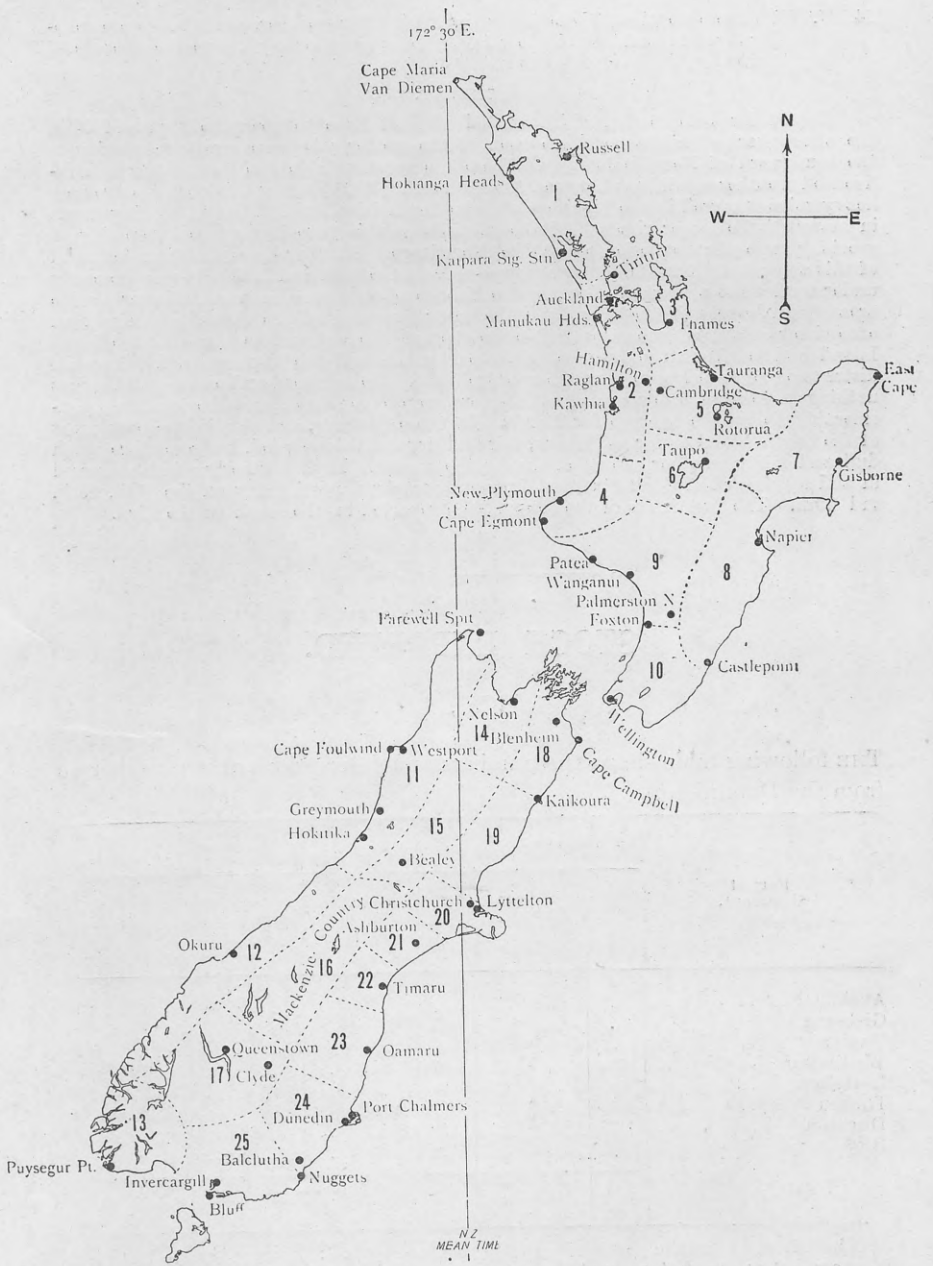
13. In the beginning and end of the month much rain fell, and the total fall was usually double the average. With the exception of the 16th and 17th, fair weather prevailed between the 9th and 20th, but unsettled and wet conditions ruled during the remainder of the month. Some dense fog occurred on the 12th and 13th.

14. With the exception of a few unsettled and wet days in the middle and at the end of the month weather-conditions were very favourable. Forty-five per cent. below the average rainfall was recorded.

15, 16. Particularly heavy rain fell in all the high country, especially on the western slopes, where over double the average amount was recorded for the month. Following are some of the high-level stations with their total rainfall recorded during the four days from the 26th to the 29th: Otira, 17·17 in.; Bealey, 6·52 in.; Bealey Flat, 18·44 in.; Hermitage, 21·93 in. During this period many of the larger rivers became flooded.

17. Owing to the heavy rains between the 26th and 29th, the total for the month greatly exceeded the average, in some cases by over 100 per cent. The weather was very changeable; showers were frequent, especially on the higher levels. Some cold nights were experienced, and the first frosts on the 23rd.

18–22. In all these districts the rainfall was below the average, the difference ranging from about 20 to 80 per cent. Continuous fine weather prevailed between the 1st and 10th, and other shorter periods of similar conditions were experienced during the month. Strong winds, however, were frequent.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District.

23. Much showery weather prevailed between the 9th and 17th, and again towards the end of the month, but fair though cold conditions predominated. Precipitation was about 30 per cent. in excess of the average for March.

24, 25. With the exception of a few short periods of fair weather, conditions were generally cold and damp, the rainfall being considerably above the average.

SUMMARY.

Except for a depression which existed off East Cape between the 23rd and 26th, the atmospheric disturbances have been of the westerly low-pressure type, passing to the southward of New Zealand. Of these the most notable one was that which influenced weather-conditions between the 26th and 30th. During this period extremely heavy rains occurred in the high levels of the South Island and in Otago, causing floods in many of the larger rivers. Of the rainfalls at this time it may be interesting to specially note that experienced at the Hermitage. On four days 21·93 in. fell, and of this amount 19·10 in. fell on two days—viz., on the 27th and 28th. It may be easily understood what a marked effect on the river-level such an abnormal fall over a wide area would have. While Otago and the central portion of the South Island had an excessive rainfall, in some cases double the average, the east and west coast of the South Island had less than the average. In the North Island the Taranaki and Wanganui districts experienced more than the average, but in the northern and east coast districts nothing more than a few occasional showers were experienced, and the total was considerably below the average for March. In these districts, and also in the east coast of the South Island as far as Timaru, fair and dry conditions ruled, but elsewhere much dull and misty weather prevailed during the month. High northerly winds occurred in and southward of Cook Strait on frequent occasions, particularly on the 17th, 28th, and 29th. The first frosts of the season were reported in the south on the 23rd.

STOCK EXPORTED.

MARCH, 1913.

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 Argentine.	To Australia.	To Pacific Islands.	To South America.	To Pacific Islands.
Auckland	33	7	..	..	13	..	..	224	..	29
Gisborne	4	..	..	..	..	..	..	..	..	..
Napier	..	..	..	..	..	..	..	..	..	..
Wellington	39	..	..	7	..	..	..	..	..	..
Lyttelton	33	..	..	1	..	..	93	..	..	..
Timaru	..	..	..	..	..	..	274	..	..	..
Dunedin	18	..	..	..	..	..	63	..	..	..
Bluff	7	..	..	..	..	..	..	..	..	..
Totals	134	7	..	8	13	..	430	224	..	29

The following are the particulars of the horses shipped: Thoroughbred—1 stallion, 25 mares, 9 geldings, 4 colts, 4 fillies; ponies—2 mares, 2 geldings; hacks—4 stallions, 9 mares, 25 geldings; draught—19 stallions, 15 mares, 1 gelding, 9 colts, 7 fillies; 1 half-draught mare, 1 gelding, 1 half-thoroughbred mare, 1 gelding cob, 1 Welsh stallion.

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.

ERADICATION OF CALIFORNIAN THISTLE.

MR. C. MCGUINNESS, Mangatoki, writes as follows :—

Will you kindly let me know through your correspondence column whether any experiments have been made to kill Californian thistle with common coal-tar by the Agricultural Department? I have noticed that wherever tar has been spilt all herbage dies, and am of opinion that if a coat of tar was put over the thistle, with holes driven here and there with a bar and filled with tar, it might have the desired effect.

The Fields and Experimental Farms Division replies,—

While it is well recognized that the application of coal-tar has the effect of destroying weeds, it has to be remembered that it would be impracticable of application on an extensive area.

FERTILIZERS.

MR. W. B. FITCHETT, "Tiritiri," Kawhia, writes,—

Can you inform me whether the following manures may be safely mixed together without any harmful results: (1) Basic superphosphate and kainit; (2) basic superphosphate and nitrate of soda; (3) basic slag and kainit?

The Agricultural Chemist replies,—

These may be mixed if sown immediately after mixing.

PHALARIS BULBOSA.

"SUBSCRIBER," Riverlea, Taranaki, writes,—

Would the Department answer through the *Journal* the following :—

1. Would *Phalaris bulbosa* be a good grass to introduce in a patch of raupo swamp that is gradually drying up?

2. Do cattle eat it readily, or would it become coarse like tall fescue and become a nuisance; if so, would it be difficult to eradicate?

The Fields and Experimental Farms Division replies,—

Phalaris bulbosa is spreading in many swamps. It is readily eaten by cattle. It may not be a particularly valuable grass, but gives more winter feed than many of the other grasses. If sown with cocksfoot and rye-grass much more feed would probably be obtained. It is of a different character to tall fescue, and would not be likely to become a nuisance.

CLOVERS.

MR. G. A. READE, Pukerangi, Central Otago, writes,—

I forward under separate cover two forage plants of the trefoil family, which I have found growing together in masses on sunny banks at an Otago seaside resort, and it occurs to me they might be useful for surface-sowing on sheep-country in Central Otago

occupied by me. One of the specimens (the larger-leaved) produces a small spiral burr, which I feel would be sure to adhere to the sheep's wool, and it would therefore probably be inadvisable to introduce the plant on sheep-country. I shall feel obliged if you will kindly in the *Journal* give me the names of the two plants, and any information at your disposal as to the full value of each variety; also whether you agree with me as to the risk of introducing the burr-producing plant among sheep.

The Fields and Experimental Farms Division replies,—

The names of the specimen clovers sent by you are—No. 1, Spotted burr clover (*Medicago maculata*). An account of this clover will be found in the May, 1911, number of the *Journal*. No. 2, English clover (*Medicago lupulina*). This is an annual or biennial clover that is often sown on sheep-country. It is decidedly useful on light soils, especially those of a sandy nature. It is common throughout Hawke's Bay, though not regarded as of very much value, but it certainly yields a good deal of highly nutritious fodder.

BRANDING SHEEP.

C. E. B., Nelson, writes,—

Would you oblige by letting me know through your paper (1) if oxide paint is harmful to the wool if used for branding sheep, and (2) if hæmatite used for same is harmful.

The Live-stock and Meat Division replies,—

Although neither oxide paint nor hæmatite is regarded as harmful to the wool, both are very difficult to remove, and are therefore objectionable; consequently one of the several recognized branding-fluids is recommended.

VETERINARY SCIENCE.

MR. G. C. NEVILLE, Opotiki writes,—

I should be very much obliged if you could tell me if there is a course one can take in veterinary surgery so as to qualify as a veterinary surgeon, and where could one take this course, and what length would it be, and how much would it cost.

The Live-stock and Meat Division replies,—

The nearest colleges where such a course could be taken are in Australia—Sydney and Melbourne—where they are in connection with the Universities. We have only the Melbourne prospectus. There are two courses open to students—one, of four years and a half, leading to the degree of Bachelor of Veterinary Science and ultimately Doctor; the other, of four years, leading to the License in Veterinary Science. The candidate for the degree is required to pass a preliminary examination similar to that required for the medical profession and for all the veterinary schools in the United Kingdom—viz., Latin, English, arithmetic, algebra, geometry, and one of the following optional subjects: Greek, French, or German. A candidate for the licentiate is required to pass a preliminary examination of a lower standard in those subjects which are indispensable for an understanding of the work of the course—viz., English, arithmetic, algebra, and geometry, and two other optional subjects. Examinations are held each year, and the student must pass these before he undertakes further work. If he fails he must come up again. We do not know exactly when the examinations are held, probably twice a year, as in the English schools. This means, should a student fail, say, in his first professional examination, he would have to study for another half-year before presenting himself again. The fees payable for the courses are as follows: Bachelor of Veterinary Science—For matriculation, £1 1s.; for first year, £22; for second year, £25; for third year, £25; for fourth year, £25; for fifth year, £20; for license and degree, £7 7s. License in Veterinary Science—For the first year, £18; for the second year, £25; for the third year, £25; for the fourth year, £25; for the license, £5 5s. To these fees must be added cost of books, microscope, instruments, and living-expenses. The Sydney course is practically the same as that of Melbourne.

MISCELLANEOUS QUERIES.

MR. J. E. LUCKENS, Lawson's Creek, Auckland Harbour, writes as follows:—

1. Where can I get the spineless cactus which Luther Burbank has evolved from the prickly pear and which produced 200 tons of fodder per acre?

2. Which is the right name for "Boyd's clover"—*Lotus hispidus* or *L. angustissimus?* Neighbours praise it highly; but I think *Lotus major* the best for this poor gum land.

3. Has sea-water any wholesale manurial properties? I watered some plants with it, but it killed them finally.

4. What is the best kind of goat to keep for milk; and do you think a goat dairy would pay, as some of my land is too rough for cows?

5. What would you recommend as food for milch-goats?

6. Which is the best butter-fat cow? Jersey, I believe; but, judging by some Holstein records, the latter is as good, and has the advantage of being a beef cow as well. I suppose Jerseys would eat less fodder, though?

The Fields and Experimental Farms Division replies,—

1. I would refer you to Luther Burbank himself, whose address is Los Angeles, California.

2. *Lotus angustissimus* is the correct name for Boyd's clover. This clover and *Lotus hispidus*, which is a closely allied species, are being very highly praised; but in localities where *Lotus major* thrives well the last-named is probably preferable to sow. *Lotus major* seed is, however, considerably dearer than *Lotus angustissimus*, and there seems no reason to think that the price will ever be low enough to sow it in any great quantity in a mixture.

The Agricultural Chemist replies,—

3. It is not advisable to water any crops with sea-water. Salt drilled in with the manure may prove useful for some crops, such as turnips, kale, rape, mangels, sugar-beet (grown for stock-food), asparagus, and plants whose ancestors inhabited marine or salty situations.

The Live-stock and Meat Division replies,—

4. Probably the best milch-goat of the British breeds is the English one, which has had a society for the improvement of the breed since 1879. The Scottish Lowlands goat is perhaps the next-best milker. Welsh and Irish goats are poor milkers, and are only in profit for a short period. The two best milking breeds are foreign, and both have been crossed with the English goat, greatly to the improvement of the latter. The one first imported was the Nubian. Pure specimens, however, cannot be obtained now. The other and much the best is the Swiss breed called the Toggenburg. It is rather a tall goat, measuring about 30 in. high at the shoulder. Neither sex has horns. The udder is well developed, with the teats far enough apart. It is stated that as much as 158 gallons in a season of over three hundred days has been obtained from them. I do not think there are any of the breed in this country, and they could not be imported from Switzerland owing to our regulations prohibiting live-stock from Continental countries. Specimens, however, could be obtained from Great Britain. We could not advise you as to whether a goat dairy would pay. It would depend on the demand you got for the milk. You would hardly make a success of it with the goats here, without crossing, as they would not give enough milk to be profitable.

5. Goats are browsing animals mainly, but will practically eat anything—all sorts of vegetables, potatoes, carrots, &c. A Swiss authority considers that in summer a goat will consume on an average 3 lb. of hay, 3 lb. of clover, and 10 lb. of green food per diem; and, in the winter, 6 lb. of roots, 2 lb. of hay, 3 lb. of clover, and ½ lb. to 1 lb. of crushed oats. The crushed oats may also be given during the time the animal is in milk.

The Dairy-produce Division replies,—

6. It may be said that there is no "best" breed of dairy cattle amongst the various breeds of that class of stock, for there are unprofitable as well as profitable cows amongst all breeds of dairy cattle. As a breed the Jerseys are noted for a

high percentage of butter-fat in their milk, but it does not follow that these cows give a higher aggregate quantity of fat in a given period than other well-known breeds, and, after all, it is a total quantity given that counts. There are first-class cows among all breeds, including Jerseys, Guernseys, Holsteins, Ayrshires, &c., and the only true test of value is to produce a record of the quantity of both milk and butter-fat given by a cow for her whole period of lactation, by weighing and testing the milk. In choosing a special breed of dairy cattle the class of land to be used has to be taken into consideration. For instance, it would be unwise to select one of the heavier breeds, such as the Holstein, for lightish land or that which is too hilly. On such country one of the lighter breeds would be more serviceable. Then again, a farmer when making his selection is wise in being guided to some extent by the class of cattle in which he may have a special interest. Heavy animals, of course, usually require more food to maintain their bodies than do those of lighter breed, but just what that amount may be is not definitely known, so far as we are aware. A Jersey cow giving 6,000 lb. of milk testing 5 per cent. in a season would produce 300 lb. of fat, while a Holstein giving 8,600 lb. of milk testing 3·5 per cent. would do equally well and produce 301 lb. in a season. When considering the extra food required by the larger cow, however, allowance should be made for the value of the extra quantity of by-product that would be available from her milk.

CLOVER-HAY.

MR. J. W. BOWE, Marotiri, Wellington, writes,—

I have a crop of cow grass and alsike clover which I cut for hay about two months ago and which is almost ready to cut again. Please let me know whether you think it would be advisable to cut it again, or do you think it would impoverish the land too much? The soil is a good, deep, clayey loam, which has only been broken up about eighteen months.

The Fields and Experimental Farms Division replies,—

On fertile lands it is not unusual to take two crops of clover hay in the same season. It must, of course, be accepted that with each crop removed the soil is impoverished to a certain extent. A top-dressing with some phosphatic fertilizer, such as basic slag, will, however, have a good effect.

FARM BOOK-KEEPING.

"LEARNER," Woodville, writes as follows:—

Will you kindly inform me through the columns of the *Agricultural Journal* of a simple method of book-keeping for everything in connection with mixed farming; also necessary books required; if convenient, kindly give me a few examples.

The Fields and Experimental Farms Division replies,—

Leaflets on farm book-keeping can be procured from almost any stationer. These provide forms for the different items of the farm, as stock, crops, milking, &c.

GREASY HEELS IN HORSES.

"GREENWOOD," Maungatua, West Taieri, writes,—

Could you advise me of a cure for "grease" (greasy heels) in horses?

The Live-stock and Meat Division replies,—

"Grease" is an eczematous condition of the skin about the heels of heavy hairy-legged horses, and in some strains of blood there is undoubtedly a hereditary tendency to it. It is also seen, although less frequently, in lighter-legged horses. The general cause in these cases is irritation of the skin by dirt and wet. The hair-follicles and sebaceous glands of the skin are first irritated and then inflamed. This condition causes an excessive discharge from the glands, and often an enlargement of the parts; in some cases this is so excessive as to form grape-like bunches. Treatment will depend on the stage the disease has reached. Usually in the early

stages a lotion composed of chloride of zinc, 40 grains to the pint of rain-water, applied twice a day, will be sufficient to arrest the condition. The best way to apply it is to sop a piece of cotton-wool in the lotion and apply to the part, securing this by a bandage, which should be applied fairly tight so as to exert a little pressure. If the disease has got to the "grape" stage, these can only be removed by excision or the hot iron. During the treatment the legs should as far as possible be kept clean and dry. Any cracks may be dressed with carbolized vaseline.

LUCERNE.

MR. F. W. CORBAN, Hastings, writes,—

I sowed about three-quarters of an acre of lucerne in the spring. It came away fairly well at the start, but the dry weather and the weeds have been against it. Would it be advisable to harrow it and top-dress it when the ground gets wet; and, if so, when should it be done, and what manure should be used? Clover grows well in this locality.

The Fields and Experimental Farms Division replies,—

The harrowing of your lucerne, giving it one stroke with fairly heavy harrows, would probably have a most beneficial effect. Without a more definite description or knowledge of the land, proper advice cannot well be given of the manure most suitable to use for top-dressing. In your district it would perhaps be advisable to use phosphatic manures with the addition of potash in some form.

CALVES'-FOOT JELLY.

MR. J. PARSONS, "Sarnia," Whenuakura, Patea, writes,—

Where do the manufacturers of "genuine calves'-foot jelly" get their raw material from, assuming that it is made from the feet of young calves? Also, is there a market for same; or could it be made on a dairy farm as a profitable concern? If so, could you tell me where I could get the necessary information, &c., for making it, as we kill something like 100 to 120 newborn calves during the season, and could also get other supplies if it could be made into a business.

The Live-stock and Meat Division replies,—

Genuine calves'-foot jelly is manufactured from gelatine, and not directly from the feet of young calves; therefore it is not likely that the feet of calves slaughtered upon the farms can be utilized for this purpose.

GRASS-GRUB.

MR. J. T. BICKNELL, Kahutara Road, Featherston, writes,—

I have read the article in your March issue on the grass-grub with interest, and per parcel-post herewith send you a tin containing samples of a grub which causes great damage in this locality. This grub, I believe, develops into what is known as the "manuka-beetle," being brown when it first takes wing, and then gradually turning green. In damp seasons the grubs come to the surface in February and March, in dry seasons later, and then they remain in the ground until they take wing. In a cold season the time of flight is generally later than in a warm one. About the end of November and in December the beetle is formed, and they rise then thickest, although a few take wing in January and February. So thick sometimes are these beetles that they resemble a swarm of bees. I have a plantation of mixed trees—gums, pines, wattles, &c.—in which the beetles are very thick, but they have not affected these trees, although I have had the roots of azaleas and other shrubs eaten, and the shrubs so killed. A paddock of grass lately sown down by me and just coming up is now attacked by these grubs, which are in it in hundreds, and quite spoiling it. I shall be very much obliged if you can tell me what to do to get rid of this pest.

The Biologist replies,—

There is really no practical method of dealing with the grass-grub over extended pastures.

ORCHARD DISEASES.

MR. EDWIN ASHBY, Mangatainoka, writes,—

I had several peach-trees this last season that blossomed well, but just as the fruit formed the leaves and twigs turned dark, the leaves and fruit fell off, and some of the young wood died. On several apple-trees also the leaves had brown spots, and the apples were very small and cracked across. If you could advise me what to spray with, and when, I should be obliged. I used Vacuum red oil on apple-trees last winter, but did not spray peach-trees at all.

The Orchards, Gardens, and Apiaries Division replies,—

The peach-trees are evidently attacked by peach dieback (*Clasterosporium carpophilum*). To control this disease the trees should be sprayed in the late autumn, when the leaves have just fallen, with the 10-10-40 formula of the Bordeaux mixture, and again in the early spring, when the buds are beginning to swell, with the same mixture. The apple-trees are apparently attacked by a fungus disease known as apple-scab (*Fusicladium dendriticum*). Spraying the trees in the early spring, when the buds are beginning to swell, with the 10-10-40 formula of the Bordeaux mixture, and later, if the disease appears, with the 4-5-50 formula of the same mixture, should prove effective. Red-oil spray is purely an insecticide for the control of scale, red spider, &c., and must only be used in the winter when the trees are quite dormant.

LUPIN ON SAND-AREAS.

"RETTAN," "Orongohura," Kawhia, writes,—

I propose endeavouring to stop drifting sand further encroaching on my property, and would be pleased if you would inform me the best time to sow lupin-seeds, and treatment of seeds previous to planting ?

The Fields and Experimental Farms Division replies,—

Lupin is ordinarily sown in the spring, but for the purpose you intend it will be better to sow in the autumn, as there is less chance of wind blowing the sand over the young plants. The seed requires no special treatment previous to planting, but germination could be hastened by soaking in cold water for twelve hours.

PIG-REARING.

MR. T. OSBORNE, Ponsonby, Auckland, writes,—

Will you be kind enough to enlighten me on the following :—

1. Is pig-rearing a profitable business ?
2. Which are the best pigs to breed, either for bacon or pork ?
3. How many litters a year does a sow have, and what is the best time of the year for her to have them ?
4. What is a fair average per litter ?
5. If well fed, and well cared for in every way, what is an approximate time before they are ready for market ?
6. Do you agree with me that pigs should be fed on root crops ; if so, what kind of crops do you suggest ? (I might suggest that I believe pigs should be fed on all kinds of crops, and that they should be given to them in various ways, such as a few mangels and carrots one day, turnips and potatoes another day, and a mixture of all the above chopped up small and cooked another day, with an occasional pick at the grass.)
7. If the above food is given, and no milk is available, what would you suggest by way of a drink ?
8. What kind of land do you think is suitable, if run on the lines stated.

The Live-stock and Meat Division replies,—

1. Pig rearing and feeding is a profitable business provided the person engaged in the same has some knowledge of the management of pigs, also he must have sufficient land of good quality to grow some of the food required for the pigs. Pig rearing and feeding is the same as any other branch of farming : to be successfully

undertaken a person must have a knowledge of agriculture in general whereby he can grow the food required at the lowest cost possible combined with efficient production.

2. The best pigs would be pigs of a pure breed; thereby the sale of purebred boars and sows would materially assist the returns. The breed chosen should be one quick in reaching maturity, and one in which the laying-on of flesh and fat is rapid. Berkshires are no doubt one of the best breeds, both for bacon and pork; however, if they are allowed to mature before being fattened they are prone to lay on fat at the expense of the flesh. Berkshires cross exceedingly well with other pure breeds (especially the Tamworth and Large Black), and the produce when skilfully managed will weigh at four months old dead-weight 84 lb. and upwards. Therefore the herd should be partly composed of purebreds and crossbreds to obtain the best results, but in no case should the breeder go beyond crossing with two pure breeds, as thereby a mongrel is bred, which is unprofitable.

3. A sow comes in season for the first time after breeding (according to condition) about three days to a week after the little pigs are weaned. The period of gestation is sixteen weeks. A sow may be made to have five litters in two years in place of two in one year; this is brought about by commencing to feed the young pigs on milk at two or three weeks old and gradually thickening with oatmeal porridge, and after a few days turning the sow out during the day and feeding her liberally. She would then come into season again before the young are weaned. (Young pigs should be weaned at about six weeks old.) Spring and early autumn are the best times of the year for sows to bring forth litters.

4. For a young sow on her first litter a fair average would be six to eight, and each litter afterwards ten to twelve.

5. If for bacon, between six and seven months old; they should then dress to a weight of 168 lb. to 196 lb. Porkers from three to four months old should dress from 56 lb. to 75 lb.

6. Pigs can be fed on root crops such as mangels, carrots, turnips, potatoes, and cabbages. Roots are best given uncooked, but raw potatoes should never be given to pigs. The best results are obtained by mixing meal (dry) with pulped roots, allowing the meal and roots to lie from one meal-time to another. The meal suggested may be a mixture of pollard, maize, crushed peas, or barley-meal. Pasteurized skim-milk and whey, fortified with an effective substitute for the extracted butter-fat or casein, is, however, a diet on which very good pigs can be raised. When pigs are grazing there is a danger of their being made to take too much moisture if the food is given wet. The pig is an animal with an exceedingly small stomach. The best results have been obtained by not giving too much bulk of food. In some of the large pig-feeding districts of America excellent results are obtained by feeding with concentrated food, such as ground oats, and, as stated above, given in a dry state. If too much moisture or liquid food is given it is washed into the intestines before it is thoroughly digested.

7. If the above principle of feeding is carried out, unless the weather is exceedingly dry, very little drink is required if the pigs are on grass. Swill with a little meal added would be the best drink.

8. The land should be of good quality capable of growing good crops. The paddocks on which pigs are running should be well drained so that they can have dry camps. No animal is more injuriously affected by damp than the pig.

The Government of India has passed an Act for the promotion of thrift and self-help among agriculturists, artisans, and persons of limited means. It will generally affect the co-operative credit societies, which so far in India have usually been based on the principle of unlimited liability of the members for the debts of the societies; indeed, of the 7,562 rural societies of India, 7,239 are formed on this principle. It is said the members greatly value the audit, inspection, and advice of the official staff, which is entirely composed of Indians, who travel about the country examining the affairs of existing societies, and aiding in the establishment of new ones.

COMMERCIAL REPORTS.

THE HIDE MARKET.

IN view of the enhanced value of hides and skins on New Zealand markets, the Director of the Live-stock and Meat Division of the Department, Mr. C. J. Reakes, D.V.Sc., M.R.C.V.S., asked Mr. A. Crabb, M.R.C.V.S., the Government's London Veterinary Officer, to investigate the hide and skin position in Great Britain. Mr. Crabb's report is as follows:—

I note the conditions existing in New Zealand, as described in your memorandum, and find, on making inquiries, that a similar state of affairs obtains here—namely, that values have had an upward tendency for some considerable time, that the demand undoubtedly exceeds the available supply, and that it is considered more than likely that such conditions will not only continue but may probably become more acute.

Dealing first with the actual prices: An examination of the ordinary market quotations shows that the value of hides has been increasing more or less regularly for some years, and the following extract from the *Leather Trades Review* of November, 1912, shows the position: "Since February last, hides have gone up as much as ¾d. per lb. From 1894 to 1906 the prices went up steadily, dropped slightly in 1907, since when they have ruled gradually higher until, in the spring of this year, they touched 7d. To-day, 7¼d. has to be paid for hides of good quality."

The above refers to Great Britain, while an American report of October, 1912, states, "Market active; prices high—fully ½d. higher than record prices of 1909; up to 19 cents."

As an illustration of the more or less steady increase in value the following quotations may be of interest; they are London prices and refer to ox and heifer hides (first); but a similar rise in price is noted in hides of all grades:—

	90 lb. and upwards. Per lb.	59 lb. and under. Per lb.
January, 1909	5¼d.	4⅜d.
,, 1910	6⅛d.	5⅝d.
,, 1911	5⅜d.	5¼d.
,, 1912	5⅞d.	5¾d.

During the year 1912 the rise in value was very marked, the price increasing month by month until in December last 90 lb. and up were quoted at 7⅜d. and lighter weights at 7¼d. per lb. During this month the prices have eased slightly, the latest quotations being 6⅞d. and 6¾d. respectively; even this, however, being an increase of 1½d. to 2d. per lb. in four years.

As to the cause, I find that this question has been exercising the minds of those interested in this country for some considerable time, and various reasons have been given for the disturbed state of the market; it is not, however, considered to be due to any trust or market manipulations, but the result of a genuine and gradually increasing shortage.

Statistics show that in most countries the increase in the number of cattle is not in proportion to that of the human race, and that *there are now less cattle per thousand of the population than was the case some years ago.* Other contributing conditions are (as in New Zealand) increase of dairying resulting in decrease in weight of hides, increase of individual wealth and of demand for luxuries, the last named involving a decided increase in the uses to which leather is put.

Again quoting from the *Leather Trades Review* of November, 1912, I find the position dealt with as follows: "Owing to a variety of causes, one of them being the rapid development of the motor-car industry, there is an unprecedented demand for leather and a great shortage of hides . . . there is apparently not the slightest likelihood of any drop in prices taking place; indeed, the tendency is rather the other way."

Then, dealing with the cause, the same report continues, "A greatly increased demand has, doubtless, contributed something to the shortage of hides, but the more important factor is that, both here and abroad, fewer cattle are being reared. In America alone during the last twelve years, while the population has increased 25 per cent., the supply of cattle has shrunk by 7 per cent."

As illustrating the smaller proportion of cattle to population, the following figures, although it has not in all cases been possible to bring them right up to date, will be of interest :—

——	Cattle.	Population.	Number of Cattle to each 1,000 Inhabitants.
United Kingdom :—			
1895	10,800,000	38,800,000	278
1904	11,600,000	42,700,000	271
1911	11,860,000	45,360,000	261
United States :—			
1890	57,600,000	67,600,000	852
1900	62,000,000	75,600,000	820
1910	69,000,000	91,900,000	750
Argentine :—			
1888	27,500,000	4,600,000	5,978
1904	33,000,000	5,900,000	5,593
Australia :—			
1893	11,600,000	3,090,000	3,754
1911	11,740,000	4,470,000	2,626
New Zealand :—			
1904	1,700,000	800,000	2,125
1911	2,020,000	1,050,000	1,923
India :—			
1898	87,000,000	228,500,000	381
1903	85,100,000	231,800,000	367

On the other hand, Canada and Russia show a slight increase in the number of cattle, as under :—

——	Cattle.	Population.	Number of Cattle to each 1,000 Inhabitants.
Canada :—			
1901	5,600,000	5,600,000	1,000
1911	7,900,000	7,200,000	1,097
Russia :—			
1888	27,600,000	102,000,000	269
1904	33,200,000	116,000,000	286

The increases, however, have not been sufficiently large to balance matters, as from the latest statistics available the proportion of cattle to inhabitants of the whole world is as follows: In 1880 there were 192,000,000 cattle as against a population of 411,000,000, or 467 cattle to every 1,000 inhabitants; in 1908 the figures were 269,400,000 cattle to 572,700,000 people, or 383 cattle per thousand.

IMPORTATION OF FROZEN MEAT TO SPAIN.

In forwarding a copy of a despatch on the above subject from H.M. Ambassador at Madrid, the High Commissioner writes as follows :—

It will be noted that the Ministry of the Interior has not yet come to any decision on the question of permitting the importation of frozen meat, although, as is known, the subject has been under discussion for some good length of time. While on the point I might mention that frozen meat was included in the new Customs tariff of Spain, which came into force on the 1st January, 1912, the item reading " Fresh or frozen meat," whereas in the 1906 tariff " fresh meat " only was provided for. The new duties, too, were made 12 pesetas (gold) per 100 kilos (= 4s. 10½d. per cwt., or rather more than ½d. per lb.) as against the old tariff of 14 pesetas, so that there would seem to be some little ground for the belief expressed by the member of the Royal Council of Health that permission for the importation of frozen meat in some form will probably be given.

GERMANY'S CONSUMPTION OF FIBRE.

The following report on the fibre position in Germany is furnished by H.M. Ambassador at Berlin :—

None of the leading German industries are so thoroughly dependent upon foreign supplies for their raw materials as the textile industry in its various branches. Practically none of the raw materials needed are produced at home. Wool, flax, and hemp were originally home-grown, and to a certain degree this is still the case, but the quantities so produced have become insignificant, and official statistics so far as flax and hemp are concerned have been discontinued altogether.

Experiments are from time to time made to discover German-grown plants the fibre of which could be used by the textile industry. Among the more recent efforts in that direction figure nettle (*Urtica*), broom (*Genista*), and certain barks of trees. These attempts have not, however, matured into practical importance. Only two fibre-plants are at present produced in Germany—viz., flax (*Linum usitatissimum*) and hemp (*Cannabis sativa*).

The last official return concerning the cultivation of flax and hemp in Germany was published in 1902, and referred to the cultivation in 1900. The totals, compared with previous returns, are as follows :—

Year.	Flax. Hectares.	Hemp. Hectares.
1900	33,662·5	3,537·4
1893	60,956·0	7,921·3
1883	108,297·2	15,255·1

(1 hectare = 2·42 acres.)

This clearly shows the retrogression in the areas of cultivation, and it is generally believed that since the last return the cultivation of both plants has further and rapidly receded.

The following figures show the imports and exports of flax into and from Germany in 1911 and 1910 :—

Imports.

Year.	Flax.	Hemp.
1911	73,797·3	62,821·4
1910	72,307·8	50,508·6

Exports.

Year.	Flax.	Hemp.
1911	26,371·2	11,638·1
1910	27,677·7	9,369·8

APPLE EXPORT TRADE.

Mr. E. Rabbits, formerly an Orchard Instructor of the Department, stationed for some years in the Marlborough District, visited Great Britain during the latter part of last year, and took advantage of the opportunity to learn something of the fruit trade on oversea markets. In a letter on the subject to the Director of Orchards, Gardens, and Apiaries Division of the Department, Mr. T. W. Kirk, Mr. Rabbits conveyed some instructive observations. He writes,—

The vessel by which I travelled to London was the "Corinthic," which left Wellington on the 16th May of last year. She carried 15,000 cases of Tasmanian apples, transhipped at Wellington, and a few hundred cases of New Zealand apples from Hawke's Bay, all the fruit being for South America. It was carried as ordinary cargo, being distributed in three holds. Two of these were never uncovered for ventilation purposes, and when opened up at Rio de Janeiro the top cases were sodden with moisture, being nearly black with discoloration, and having a thick coating of mould on them. The after hatch, which had been ventilated, opened up in good order. At the South American port the steamer has to lie off a considerable distance and the cargo is discharged into lighters. The handling by the Natives is anything but satisfactory. I noticed that among the cargo for Rio de Janeiro was seven or eight large cases of fruit-trees (500 trees to a case) from a Victorian nurseryman, so that evidently South Americans intend to extend their own fruitgrowing industry. I was also informed that a New Zealand nurseryman is visiting the Argentine in order to establish a connection with growers there for nursery stock.

On arrival in England I spent some time at Covent Garden, and came into touch with a number of salesmen there. At their request I furnished them with the names of several leading fruitgrowers in the Nelson District, to whom they intend, they informed me, to communicate, with the object of establishing a business connection. I gathered one or two useful facts at Covent Garden. The most important is that it is useless shipping New Zealand fruit to the Home market to arrive at a time when the English fruit is coming in, such as strawberries, cherries, gooseberries, raspberries, &c. Complaint was made by several brokers of New Zealand apples reaching the market in a shrivelled condition. This suggests the question, Are we shipping the right varieties? Then there is the question of shipping certain varieties at the wrong time. It is useless expecting apples to open up in the pink of condition on the London market if they are shipped before they are properly matured. For instance, I picked a case of well-matured Sturmers from my fruit-garden, with the intention of using them on the voyage. But, with the object of testing this question, I made arrangements, after the fruit had been in cabin a fortnight, to have it carried in the vegetable-room of the steamer. It arrived in England in splendid condition—in fact, appeared a far finer fruit than any of the colonial apples I saw exposed for sale in London. I attribute this solely to the fact that the apples were mature when gathered. Not a single apple out of the case went wrong. Yet I consider that if I had had a shipload of the same fruit on the London market at that time (the end of June) they would not have brought a top price, owing to the competition they would have had to meet from Home-grown fruit.

It is interesting to study the various methods by which fruit is disposed of in England in order to cater to different classes of customers. England is a country of social extremes, and very rich people order their fruit regardless of cost, while the majority of people hardly ever have the opportunity of tasting fruit at all. Apples as a rule are sold at so-much for each one, the average being 1d. for a Sturmer Pippin. The most popular-sized apple with the dealers is 2½ in., and the more uniform the apples the better they like them.

The steamer "Ruahine," which sailed from Wellington to London on the 3rd instant, has on board 12,727 cases of apples for Montevideo and 2,375 cases for Rio de Janeiro, these being transhipments from Tasmania.

PRODUCE IMPORTED.

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

Item.	Quantity.	Value.
		£
Bran	Nil	..
Butter	Nil	..
Cheese	10 cwt.	39
Chaff	Nil	..
Fruits, fresh, all kinds	2,140,902 lb.	10,359
Barley	29 centals	25
Oats	9 centals	49
Wheat	7 centals	26
Onions	575 cwt.	159
Pollard and sharps	Nil	..
Potatoes	Nil	..
Seeds, grass and clover	1,580 cwt.	5,117
Total values imported ..	..	£15,774

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	6,611 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,	1912	213,178	355,829	7,046	38,986	38,137	31,615	4,905	2,180	..	5,134	1,958	4,458	..
"	*1911*	*172,503*	*491,413*	*19,106*	*14,823*	*33,411*	*42,917*	*38,456*	*6*	..	*9,233*	*1,827*	*2,577*	*2,431 carcases pork.*
May,	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	..
"	*1911*	*204,390*	*377,105*	*20,173*	*995*	*20,732*	*33,033*	*93,854*	..	..	*7,443*	*1,210*	*7,720*	*1,087 carcases pork.*
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	23,215	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*	..

COMPARATIVE TABLE OF PRICES.

COMPILED FROM THE HIGH COMMISSIONER'S CABLES FOR THE THREE MONTHS ENDED 31ST MARCH, 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.	New Zealand Good-fair.	New Zealand Fair.	Manila.	New Zealand Good-fair.	New Zealand Fair.	Manila.	Short-berried.	Long-berried.	Sparrowbills.	Danish.	Cocksfoot seed.	Beans.	Peas.
1913.	d.	d.	d.	d.	d.	d.																				
Jan. 4	..	4 3/4	5 3/4	..	3 3/4	3 1/8	119/0	130/0	111/0	113/0	111/0	61/0	62/0	33/0/0	31/0/0	33/10/0	33/10/0	31/10/0	35/0/0	36/0	37/0	24/6	22/6	..	39/6	38/6
,, 11	..	4 3/4	5 3/4	6 3/4	3 3/4	3 1/8	117/0	128/0	110/0	111/0	110/0	60/6	62/0	33/0/0	31/10/0	34/0/0	33/0/0	31/10/0	35/0/0	..	..	..	..	..	..	..
,, 18	..	4 7/8	6 3/4	6 3/4	..	..	116/0	127/0	109/0	110/0	110/0	60/0	60/0	33/0/0	31/10/0	33/0/0	33/10/0	31/10/0	35/0/0	..	..	..	..	..	..	..
,, 25	..	4 7/8	6 1/2	6 1/2	3 3/4	3 1/8	114/0	125/0	109/0	108/0	108/0	60/6	60/6	33/10/0	32/0/0	33/10/0	33/10/0	32/0/0	35/10/0	..	..	..	..	54/0	..	..
Feb. 1	..	4 7/8	7 1/4	6 1/2	3 5/8	3 1/8	113/0	127/0	109/0	107/0	105/0	60/6	60/6	34/0/0	32/10/0	34/0/0	34/0/0	32/10/0	35/10/0	37/0	38/0	24/0	23/0	..	40/0	37/6
,, 8	4 3/4	4 5/8	7	6 1/2	3 3/8	3 1/8	116/0	129/0	110/0	109/0	108/0	60/6	60/6	34/0/0	31/10/0	33/10/0	34/10/0	32/0/0	34/10/0	..	..	..	..	..	..	..
,, 15	4 5/8	4 1/2	7	6 1/2	3 5/8	3 1/8	114/0 / 120/0	129/0	110/0	110/0	110/0	60/6	60/6	34/0/0	31/10/0	33/10/0	34/10/0	32/0/0	34/10/0	..	..	..	..	..	..	..
,, 22	..	4 3/8	6 3/4	6 1/4	3 3/4	3 1/8	116/0 / 119/0	131/0	110/0	112/0	110/0	60/6	60/6	33/0/0	31/0/0	33/10/0	33/10/0	31/10/0	34/0/0	..	..	..	..	..	..	..
Mar. 1	4 5/8	4 1/8	6 1/2	6	3 5/8	3 1/8	117/0 / 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	..	62/0	41/0	40/0
,, 8	4 1/2	4 1/8	6 1/2	6	3 3/4	3 1/4	117/0 / 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 / 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 / 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 / 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	..	41/0	41/0

HEMP AND TOW GRADING RETURNS.

MARCH.

Hemp.—The total number of bales graded was 17,553, as compared with 9,343 for the corresponding month of last year, an increase of 8,210 bales. For the twelve months ending 31st March, 1913, the number of bales graded was 120,542, as compared with 85,684 for the previous twelve months, the increase being 34,858 bales.

Tow.—During the month 6,439 bales were dealt with, as compared with 2,678 for the corresponding month of last year, an increase of 3,761 bales. For the twelve months ending 31st March, 1913, the number of bales graded was 39,933, as compared with 23,433 for the previous twelve months, the increase being 16,500 bales.

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

Hemp.

Port.	Superior.	Fine.	Good-fair.	Fair.	Common.	Rejected.	Condemned.	Total.
	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland ..	..	..	581	2,598	600	50	28	3,857
Napier ..	..	189	184	76	..	..	..	449
Foxton ..	..	..	942	2,962	284	6	..	4,194
Wellington ..	..		1,140	3,583	596	11	..	5,332
Blenheim ..	..	60	111	55	..	..	..	226
Picton ..	..	178	71	252	114	..	..	615
Lyttelton ..	..	..	..	..	..	..	..	..
Dunedin ..	..	22	246	452	23	..	..	743
Bluff ..	..	..	379	1,686	72	..	..	2,137
Totals ..	..	451	3,654	11,664	1,689	67	28	17,553
Percentages of totals	..	2·57	20·82	66·45	9·62	0·38	0 16	100

Tow.

Port.	First Grade.	Second Grade.	Third Grade.	Condemned.	Total.
	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland ..	9	424	1,025	264	1,722
Napier	..	94	60	..	154
Foxton	137	628	252	11	1,028
Wellington ..	269	1,143	616	60	2 088
Blenheim ..	46	21	68	..	135
Picton	115	47	62	..	224
Lyttelton ..	..	..	..	..	..
Dunedin ..	..	74	181	..	255
Bluff	14	285	467	67	833
Totals ..	590	2,716	2,731	402	6,439

Stripper-slips.—Passed for shipment: Auckland, 85; Napier, 12; Foxton, 390; Wellington, 800; Blenheim, 16; Picton, 2; Dunedin, 11; Bluff, 81—total, 1,397. Condemned: Auckland, 18; Foxton, 107; Wellington, 89; Dunedin, 4; Bluff, 17—total, 235.

NEW ZEALAND–SAN FRANCISCO SUBSIDIZED STEAM SERVICE.

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

—	"Moana," 6th Dec.	"Aorangi," 3rd Jan.	"Tahiti," 31st Jan.	"Moana," 28th Feb.	"Aorangi," 28th March.
Gum, packages	13	..	20	20	50
Seeds, sacks	..	..	..	..	31
Grain, &c., sacks	79	343	69	324	57
Meats, cases	413	523	272	100	262
Onions, cases	3	6	52	1,759	10
Potatoes, sacks	26	11	24	2	32
Sundries, packages	562	948	126	54	131
Butter, boxes	7,410	5,894	7,782	7,281	3,783
Hemp, bales	281	173	296	282	..
Frozen lamb, carcases	..	..	3	2	3
" veal, "	..	..	71	..	..
" beef, quarters	..	..	489	150	..
" sundries, packages	..	..	..	2	..
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 October last:—

—	"Makura," 25th Oct.	"Zealandia," 22nd Nov.	"Marama," 20th Dec.	"Makura," 17th Jan.	"Zealandia," 14th Feb.	"Marama," 14th March.
Butter, boxes	9,777	5,945	11,377	10,960	5,205	9,402
Eggs, "	226	..	..	..	..	..
Beef, quarters	..	..	580	716	..	1,254
Veal, carcases	..	..	393	276	181	400
Frozen sundries, packages	12	5	12	..	39	147
Wool, bales	..	6	20	30	..	..
Grass-seeds, beans, &c., sacks	50	177	..	..	54	..
Hides and skins, sacks, &c.	721	559	595	329	583	..
Onions, cases	..	..	..	14	1,572	..
Sheep-skins, bales	138	..	..	24	112	..
Jam, cases	125	100	50	50	75	175
Sundries, packages	21	329	92	313	250	214
Potatoes, crates	23	..	165	20	..	..
Kauri-gum, packages	46	53	21	..	176	41
Hemp, bales	..	..	..	246	129	126

STOCK IN QUARANTINE.

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

No.	Breed.	Sex.	Port of Origin.	Owner or Agent.	Address.
		MOTUIHI ISLAND (AUCKLAND).			
4	Shorthorn ..	Heifers ..	Sydney ..	J. Fisher	Cambridge.
		SOMES ISLAND (WELLINGTON).			
2	Holstein ..	Bulls ..	San Francisco	W. Barton ..	Featherston.
9	" ..	Heifers ..	Ditto ..	" ..	"
1	" ..	Bull ..	" ..	G. L. and S. J. Sievers	Carterton.
2	" ..	Heifers ..	" ..	Ditto	"
1	Airedale terrier	Male ..	London ..	McMillan and Frederic	Stratford.
1	Ditto ..	Female ..	" ..	Ditto	"
		QUAIL ISLAND (LYTTELTON).			
2	Guernsey ..	Heifers ..	Melbourne	Dalgety and Co. ..	Christchurch.

H.M. Consul-General at Chicago, in a report dated the 9th January, states that the number of cattle received for packing purposes during 1912 was 1,681,136, compared with 1,715,279 in 1911 ; of calves, 482,932, compared with 493,561 ; of swine, 5,998,782, compared with 5,929,585 ; and of sheep, 4,880,873, compared with 4,452,821. The total of all kinds was 13,043,723 in 1912, and 12,591,246 in 1911.