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THE ILLUSTRATED JOURNAL OF AGRICULTURE

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE FOR THE PROVINCE OF QUEBEC.

Vol. V.

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Important Notice.

The grant for the Journal of Agriculture having been reduced last session by more than a half, it has been decided that the distribution of the Journal shall be no longer gratuitous.

The subscription to the Journal for all who are not members of an agricultural or horticultural society, or of an agricultural club, will still be \$1.00. As to the members of agricultural societies, their subscription will be 30 cents a year, and will be voluntary.

Thus, from the 1st August next, nobody will receive the Journal gratuitously. The secretaries of the agricultural societies have only to send us the names of the members who wish to receive the Journal, and it will be sent to them immediately.

The price of the subscription, 30 cents, having to be retained from the grant made by the Legislature to the Agricultural Societies, the secretary-treasurers of each society should take care that they are reimbursed by each subscriber.

Monthly report of the operations carried on at the Provincial Model-Farm at Rougemont.

In accordance with an arrangement made with the Government, the Journal of Agriculture will give every month a sketch of the proceedings at the provincial model-farm. The first report must necessarily be short, on account of the work which had to be done before the farm could be put in order.

Fourteen apprentices have arrived at the present date, June 6th. When all who are accepted by the Government shall have arrived, a list of their names will be given.

Besides the operations subsequently mentioned, it may be well to say that the gardener, who only came on the 2nd of May, has sown and planted the vegetable garden, and pruned the orchards, which he has put into perfect order; so that all, with which he is concerned has an excellent appearance; in fact, considering the bad weather, things look much better than might be expected.

May, 25th.—Subjects discussed.—

M. Ulric Bernard, of St. Flavien, made inquiries as to the value of *mechanical dung spreaders*, which were recognized as being very useful, although heavy and costly. It was determined to write for more information about them.

A *cockchafer*, the first seen this season, having fallen on the table, Mr. Barnard described the nature of the animal; showing that, in order to destroy the white grub, the progeny of the cockchafer, the stubbles should be scarified immediately after harvest; which operation would also destroy the weeds. The cockchafer lays its eggs in the newly stirred earth, and dies. The egg goes through its metamorphoses, and in a little time, small grubs are developed almost on the surface of the ground.

Scarifying the stubbles.—Immediately after harvest, the land should be harrowed, in the hottest and brightest weather; this will expose the grubs to the rays of the sun, and they will perish. Repeating the operation next day across the former work, still in sunny weather, will put an end to most of these pests, which, if left alone, would destroy, during their three years life, all that came in their way.

The grubber, working only an inch deep, would do better than the harrow.

These operations would also have the effect of covering all the seed-weeds that might have ripened and fallen before the harvest. Thus covered, they will sprout at the next rains, and be destroyed by the autumn-ploughing.

Messrs Whitfield and Bernard explained to the pupils that they intended to treat them as the best of fathers treat their children. In case of sickness, by night or day, they were to call upon him or upon Mr. Whitfield for aid without any hesitation. He hoped that in any difficulty, or if they wished for any information, they would apply to him at once. They were to consider themselves, in all points, as being as much at home as if they were in their fathers' houses.

At present, with the full consent of all the pupils, the hour for rising is to be fixed at 5 o'clock a. m. Work will begin at 5.15; breakfast at 7; dinner at 12.15 p. m.; and supper, when the day's work is done, at 7. The meeting of the managers, sub-managers, and apprentices, will take place at 8, and at 10, all the lights in the pupils' rooms are to be out.

Mr. Barnard observed that suspicion should have no place here as regards the character of the pupils. All the liberty that grown men enjoy will be theirs; but if the slightest scandal happens, the respectability of the establishment must be preserved at any cost, and the offender must withdraw at once. The pupils, said Mr. Barnard, are entrusted to my care by their parents, and I will do my best to deserve the confidence they have placed in me.

May 26th.—Work that presses: Sheep-shearing; making the line-fence. The properties of lime, plaster, ammonia, bone-dust, superphosphate and mineral manures, were discussed. How to cut and plant potatoes.

The Messrs. Watson, father and son, are among the most celebrated breeders of Polled Angus cattle. The son is at present attached to the model-school farm.

Food for work-horses.—21 parts of oats and 7 parts of corn. The heaviest oats are not the best, but the very light ones are still worse.

Food for calves.—When it is desired to push calves along very quickly, those from 15 days to 6 months old receive whole grain three times a day; two parts of oats, one of corn and one of wheat-bran. The calves digest it very well. (1)

May 30.—*Anæmia* in cows. *Anæmia* hinders breeding, and brings on consumption.

Leucorrhœa—Caused by premature parturition, abortion, or retention of the placenta for too long a time.

Strangulis filaria. This is a microscopic worm which is found in the lung-passages of calves. Severe diarrhœa affects the subject, which seems very ill, and breathes painfully and lengthily. Remedy—I drachm of camphor, 1½ oz. turpentine, 3 oz. linseed oil; dose once a day for three days. Another, still better, 20 drops of turpentine in a gill of milk. Calves treated thus have been cured in three days. Dr Perrin, of Chicago, gave this receipt to Mr. Watson.

June 2.—M. Raskin, inspector and agricultural engineer, has arrived, and has begun his inspection of the farm previous to making his report.

Gestation of cows. In England, after 700 trials, it has been settled that cows go with young, on an average, 9 months and 7 days.

June 5th.—Trials to be made on the milking value of each cow. Mr Raskin called attention to the absence of lime in the meadows and the low lands. Lime would also be beneficial to the uplands. Animals of this farm have been killed by poison laid for foxes—arsenic or strychnine. To see what the law says on the subject, and what punishments it imposes.

Swiss Cheese.

A cheese-maker, who knows how to manufacture six varieties of Swiss cheese, offers us his services. If any one of our readers wishes to engage him, his address is as follow:

M. ARNOLD VON ARX,
Hereford, Compton, Que.

MANUAL OF FORESTRY.

The following article is the commencement of a work on arboriculture which will soon be published in book-form. The whole has been carefully revised by the author since the article has been printed, and will be found very much improved. Still, in reading what follows, our readers will be able to form a very good idea of what the completed work will be.

INTRODUCTION.

The economists and practical agriculturists of our province have for a long time been sorely disturbed by the injuries to which our superb forests have been subjected. Not a year passes without our having to deplore the loss of miles upon miles of woodlands, containing thousands of the finest trees, losses caused, for the most part, by the carelessness of settlers and men in pursuit of game, who seem to think that the fires they light for the preparation of food, &c., will extinguish themselves. Again, the purchasers of timber-limits devote themselves entirely to procuring the greatest possible quantity of lumber, without troubling themselves in the least about the future. Everything is made serviceable to them, or if anything is unserviceable, it is supposed to be injurious to them, and for that reason is swept away.

Alarmed at such a state of things, and observing as the

(1) I hesitate about this.

same time how large a proportion of our territory is already denuded of its wood, a few large-minded men united, last September, and founded a Forestry Association, the object of which is to promote the preservation and the replanting of the old forests of our province, as well as the creation of new ones.

The first step, then, in the right direction has been taken. Our onward march must be energetic, and all the necessary means must be employed to follow out the programme of the association; and to this end, the members of the council and of the general committee of the society must set the example, and work with all their hearts to make as many active proselytes as possible in all parts of the country.

As a member of the general committee, I have thought it my duty to compose the little manual which I now present to my readers, in order to aid those who wish to enrol themselves as members of our association in accomplishing their work as *Foresters*, novices though they must for the most part necessarily be, but at the same time, full of earnest wishes for the success of the proposed work.

My readers would look in vain for a complete and elaborate treatise on arboriculture in this manual. All I have aimed at is a concise statement of the general principles of forestry. These I have condensed and arranged in such a way that they may be within the reach of all who are inclined to join in this national work: national, because the whole country is interested in the preservation, the restoration, and the creation of forests.

I have divided my essay into three distinct heads: First part, the preservation of forests; Second part; The restoration of forests; Third part, The creation of new forests.

FIRST PART.

THE PRESERVATION OF FORESTS.

CHAP. I.

GENERAL CONSIDERATIONS.

The traveller who, leaving behind him the wood-divested districts of Europe, suddenly comes upon our magnificent forests, is struck with astonishment at the luxuriant growth of the finest specimens of timber with which he meets in his wanderings. But his astonishment at their beauty fades into insignificance, compared with his surprise at the cool neglect with which they are treated, when he remembers the care and attention with which the different European governments treat the few forests still remaining in their possession.

And there is nothing wonderful in this. What does one see on all sides? Extensive districts destroyed by fire, offering to the eye nothing but the half burnt trunks of the great trees, which, like gigantic spectres, seem from their rigid look to protest against man's neglect. Whole regions of waste ground, entirely denuded of timber by the axe of the greedy lumberman, who carries off all the wood useful in his business, and most unnecessarily destroys all that he considers unserviceable. Lands once cut over, (1) now covered with brushwood, the remains of former clearances and as dry as tinder, offer but too ready a chance for the reception of a spark from the pipe or half extinguished match of the careless tramp.

Who would not be moved at such a sight? Could the force of human negligence go further? What, because we are surrounded on all sides by forests, because these forests

(1) *Tailis*—copse, in our English wood-language—the *under-wood* is cut every 10, 12, or 14 years, for hop-poles, broom-handles, hurdles, &c., and sells for from \$40 to \$120 per acre, standing. *Tailis*, from *tailer*, to cut, evidently conveys the idea of this mode of treatment. (Query—does our cry when we see the hunted fox, *tally-ho*, pronounced, or rather yelled, *Tallyo*, derive from "*au tailis ho!*")

hinder the cultivation of the land, because we possess thousands upon thousands of acres of woodlands, must we for such reasons as these burn and destroy the whole? If a rich man were to fling his money out of the window, as has sometimes been heard of, what should we predict? Would not every one say that, before long, he would be begging his bread? The same sad fate might well be prophesied of the nation, which, because it possesses the finest forests in the world, destroys them from a deliberate purpose.

As every body is interested in this question, let us see what duty each has to perform who would aid in the preservation of our woodland. The government should be the first to put its hand to the plough; then the limit-owners, the wood-dealers, &c.; next the settlers; and, lastly, tourists, fishermen, hunters, and all who frequent the forests during the course of the year. (1)

CHAP. II.

THE DUTIES OF THE GOVERNMENT AS REGARDS THE PRESERVATION OF THE FORESTS.

Two characters are assumed by the duties of the government in the preservation of the forests. prevention and guardianship.

The best means possessed by the government for maintaining our forests in a relative state of integrity is legislation.

My own opinion is, that a law declaring that, as a general rule, no woodland, unfit for cultivation when cleared, shall be granted to settlers, would be the first finger-post on the right road. What do we see, now? A great extent of land, without any agricultural value, has been granted away; the first settlers have cleared it of wood, and have immediately vanished from the scene. Their successors, dying with hunger on these ungrateful soils, have also vanished, and taken their departure for the stranger's land. There lies the ground, stripped for ever of its natural wealth, useless, and utterly lost to all the ends of rural economy. Had the government retained it in its own hands, it would now be returning a revenue. Wood for building and for firing could be sold, certain rules as to the preservation of the young growing wood being laid down. Wood-cutters, too, might be compelled to free the land from chips &c., which tend very much to increase the number of fires. Instead of the sad sight of devastated and sterile districts which now distresses us, we should look upon many a fine forest, ready to furnish all kinds of wood to the succeeding generation.

Next, the general cutting of the timber (*bois de commerce*) must be so regulated that all the trees that do not exceed a certain size shall be left standing. If, in addition, the law prohibits the felling of timber on land that has been once cut over more frequently than once in ten years, these "limits," instead of being worn out, as they are at present, would be always ready for use (*exploitation* — a terrible word!). The same precautions as to the chips, &c., will be necessary here as elsewhere.

The third clause of the law which I propose refers to the clearances made by settlers. The settler is the sworn enemy of the forest. In his blind hatred, he attacks it in single combat, and as he is the stronger, his axe never stops until the last tree is felled. A few years later, if his land does not turn out to be of the best quality, the settler is forced to leave it, and to seek a foreign soil, unless he sets to work to clear, and therefore to ruin, some other part of his own country. To put a stop to this evil, nothing would be easier than for the government to compel each settler to keep a

certain number of acres of his farm uncleared. At the end of fifteen or twenty years he would bless those who had thus forced him to observe the injunctions of foresight. The cleared townships would thus have all the wood necessary to the wants of their inhabitants, and we should no longer see whole districts absolutely deprived of their growth of timber.

So much for the means of prevention. The guardianship, to be exercised as a *moyen curatif*, would include the sanction of the preventive means, and would consist in establishing a well organised police to watch over the observation of the law.

When I say police, I make use of a general term, intended to express the forest-guardians and other agents whose duty it will be to see the proposed regulations carried out. These regulations relate, first, to the concession of the lands only fit for agriculture; secondly, to the restriction of the cutting of trees to those of the proper size; thirdly, to the removal, or burning at certain fixed times, of the chips, wastage, &c.; fourthly, to the forbidding settlers to burn the bush (*faire des brûlés*) at fixed periods, and to hinder tourists, hunters, and others, setting fire to the bush in preparing their food; fifthly, to fix the reserve wood to be made by each settler on his farm; sixthly, to the fines to be paid for each infraction of the law.

Let us consider, briefly, these regulations. First, the agents should be authorised to refuse leave of occupation to all those lands which the government land-surveyors have pointed out as unfit for the purposes of agriculture. Secondly, their duty would be to see that no tree less than six inches in diameter be cut, and that the cut be not renewed at less intervals than ten years on the same spot. Third, they would have to make the wood-cutters burn the chips &c., at times fixed by the government, which times should vary with the locality.

It is my duty to say, that this part of the programme has met with much opposition from those who term it impracticable. I am, nevertheless, of opinion that it should be tried, on account of its evident utility. Fourthly, the police must watch with extreme care to prevent farmers, settlers, &c., from bush-burning in summer, when woods are most easily set on fire. Hunters, fishermen, tourists, should be the object of special watchfulness. Fifthly, instant report should be made to the government if a settler neglects to observe the rule as to the reserve of wood on his farm. Sixthly, they will have to make the declarations necessary to the recovery of the fines incurred by the transgressors of the law. Thus, to sum up, the government may pass a law to regulate the concession of farms, the cutting for sale of the timber-limits, the reserve of wood on the settlers' farms, the duties of the agents specially appointed to see to the execution of the law, and the fines to be imposed.

This, doubtless, would not be perfection, but it would be an approach to a better state of things.

CHAP. III.

THE DUTIES OF THE MANUFACTURER, THE LUMBER-MERCHANT, AND OTHERS, AS REGARDS THE PRESERVATION OF THE FORESTS.

The government in passing such a law as I have sketched in the preceding chapter, would impose no obligations on manufacturers except those which it would be their duty to assume, even if they had not the force of law.

To state more clearly what I mean by these obligations, I will quote the example of a firm which has been engaged in the lumber-trade for thirty years, and which turns its limits to profit in a very intelligent manner, as the following account will show. When the firm began business, it determined never to fell any tree below a certain girth. Another principle was, not to cut over the same place several years in succession, but to allow ten years, at least, to elapse bet-

(1) To hunt, in English, means to pursue the stag, the fox, the otter, or the hare, with hounds. The idea of a gun is utterly excluded.

weor the falls. Its servants, too, acted as a sort of police, and watched the hunters &c., as closely as possible. The result is, that to-day these limits are almost as valuable as the day the firm began operations. Instead of having to buy new limits, as the short sighted are often obliged to do, the mills have abundant provision of wood from the property of the firm. In fact, the firm is free and independent in its own possessions, employing to great profit the territory, which, treated in this way, becomes an almost inexhaustible source of revenue.

Well, what this firm has done, let all do. What is possible to one is possible to all. Let all lumbermen unite in the determination never to fell any tree of a less diameter than a foot, let them allow time for the trees to grow on their limits, let them assist the forest guardians in preventing robberies and fires, and their action, united to that of the government, will produce immediate good effects.

One of the chief objections made by certain lumbermen is, that they have not sufficient control over their servants to insure the following out of the plan. This objection does not seem even plausible.

Let the manufacturers instil strongly into the minds of their head-men the ideas we have put forward, and hold them responsible for their execution. All will then go well, for the truth is, that up to the present time an incredible amount of carelessness has ruled in this branch of commerce, whence chiefly spring the principal evils which we are combating.

CHAP. IV.

THE DUTIES OF SETTLERS TOWARDS THE PRESERVATION OF THE FORESTS.

It is in vain to deny it, our settlers have been more guilty of the destruction of our forests than any other class of men. Dispersed here and there in the bush, obliged to clear and sow at the most rapid possible rate, the settlers do not go gingerly to work. Axe in hand, the woodman chops away freely, until the piece of land he intends to sow is cleared. Then, he piles up the trees and sets them on fire, it may be in the height of summer, when the last year's leaves and the mossy carpet are as dry as tinder, crackle underfoot, and only wait for a spark to set them blazing. Burning-time is come, burn we must, and, in truth the whole burns together. Soon, the flame passes beyond the clearance, it runs along the dry leaves which cover the ground, reaches out its fiery tongues in all directions - the forest is on fire! The first victim is the careless settler, then comes the turn of the ancient trees which, one after the other, lose their leaves and branches, and remain naked, blackened, hideous, in the desert prepared by the improvidence of man. The passing traveller is horrified at the sight of a waste, where once stood a luxuriant forest.

My readers know well that what I have just described happens every year in one or more parts of the province. I have described, above, the means government should use to stop this evil. But the remedy is valuable in proportion to the way in which the settlers themselves aid in its administration. Why do they not determine for themselves never to burn without using all possible precaution, and at a season of the year when it would not be dangerous to the forest. What is a month's delay compared with the damage caused by a fire blazing away at an improper season?

So much for fires. A word, now, as to the reserve of wood I wish to see made by each settler. Can a law be necessary to secure this reserve? Reflection alone, it seems to me, should be enough to induce every settler to keep part of his land uncleared. He, too often, comes from an old parish, where the inhabitants have been accustomed to go nine, twelve, even fifteen miles for their fire-wood, and even fur-

ther for their building wood. The settler in question has himself done it. And, now, right in the bush itself, he forgets it all, he sees only the land he is about clearing, and reflects not that the parish he has left was once in the forest, though to day it is miles away from it. It is time to put a stop to such folly as this. Let every one who takes up a lot of land look out for the worst part of it, and keep it untouched by axe or fire. The value of the reserve will in a few years double the value of the whole lot.

CHAP. V.

THE DUTIES OF TOURISTS, HUNTERS, FISHERMEN, &c. AS REGARDS THE PRESERVATION OF FORESTS.

I said, just now, that the settlers themselves are the chief contributors to the forest fires. Unfortunately, they have active assistants in the hunters, fishermen, tourists, and others. They stroll through the bush, they light a fire, to dry their clothes, to cook with, or for some other reason, and when they have done with it, it may go out or not as it likes. But a coal remains. The fire has been made on a bed of leaves and moss, and without the slightest precaution. Up gets the wind, all is in a blaze! And the author of the destruction goes on his way in happy ignorance. How true it all is! And yet, nothing could have been easier than to have lighted the fire on a site carefully cleared from inflammable matters, to have kept it at a distance from the trunks of trees, and, after watching it carefully while burning, to have put it out completely before leaving. Simple precautions, these; they suggest themselves, and yet how few observe them! The settler who burns his brush &c., is excusable up to a certain point. Burn he must, and his fire is not always manageable. But what excuse can be made for the careless hunter who ruins a whole township because he will not take the trouble to extinguish a fire which he himself has lighted, and which is under his own control. No excuse for him, and if the settler deserves punishment, how much more he! Yes, it is he who must suffer, and severely too. It is he whom the forest-police should watch, for his negligence is the worst of all.

Hunters and other frequenters of the bush, be wise. Remember how irreparable is the damage your carelessness may cause. Not only will the forest disappear before the fire you have lighted, but entire townships, newly cleared, and covered with harvests which constitute the sole wealth of the poor settlers, may, perhaps, be devastated by the flames. What a responsibility to incur from a simple act of negligence!

Here ends the first part of my work. I think I have shown, that by wise legislation, earnestness, and attention, our fine forests can be easily preserved. Now, our task is to describe the labour to be undertaken in restoring those forests which are half-ruined to their primitive state of vigour.

J. O. CHAPUIS.

from the French.

OUR ENGRAVINGS.

Guernsey Bull.—Sir Champion XIII.—
Southdown Sheep.—
Shire-Mares.—First and second prize at R. A. S. show 1882.—

GUERNSEY CATTLE.

- Their merits as dairy stock.

I notice with much satisfaction the beautiful illustration of the fine Guernsey bull Sir Champion XIII in your issue of May 31st. This is a fair representation of a good Guernsey, and should attract the attention of Western dairymen

who desire to improve their dairy stock. He has a large, well-proportioned body, set on legs of the right shape and length. The color and mellowness of his skin can only be judged by those who have seen him. I presume in this respect he is also a good specimen of the breed.

So many illustrations appear in the agricultural journals representing individuals and types of the various breeds, that only casual notice may be given to any one, and for this reason only I desire to call the especial attention of your readers to this illustration of a breed not so well known as its superlative merits warrant.

The Guernsey are not a numerous family. There are about 4,000 of all ages on the Island of Guernsey, and about 1,200

breed, though they possess other desirable characteristics that commend them, especially to that numerous class whose acres runs from 50 to 200, and who pursue a plan commonly designated by the term "mixed farming." Fruit, grain, grass and a small or large dairy, according to the number of acres, are usually the leading features of such farms. If fruit is cultivated for the family first, and the market second, then grain or grass will be the chief product; grain, alone, will soon wear out the farm, so that grass must ultimately have the first place on a large majority of such farms. The cheapest and best fertilizer to enable the farmer to grow the greatest possible crops of grass must be found in the compost of the barnyard. The most profitable machine to manufacture the econ-



GUERNSEY BULL.

in this country. The pedigrees of most of these are recorded in the Herd Register of the American Guernsey Cattle Club. The number exported from the Island is about 1,000 annually, the larger percentage going to England, where they have long been used to color the milk of other breeds. For this purpose they are without a rival as a breed. The English dairymen discovered this fact many years ago, and acted on this knowledge by taking nearly all the surplus Guernseys the Island farmers could spare, when very few were exported to the United States.

The extreme richness and intense color of the milk and cream are the most positive recommendations of the Guernsey

tial elements of the compost heap is a good dairy cow. Beef will be mainly relegated to the larger farms. If the product of the dairy cow is the most profitable crop for the ordinary farmer, then he has the best market for his grass and hay at home, if he has the most profitable and best cow. The common cow has answered a most excellent purpose, and has enriched a numerous class of farmers. So did the now antiquated plow, cultivator and harrow. Intelligent, enterprising farmers have long since substituted the latest improved machinery for the crude implements of the past. Why not discard the old-time cow, which no longer pays in milk or butter? It costs from \$40 to \$60 to provide feed and care for

a good one. In the one case there is loss, and in the other profit. The product of a poor cow will not command \$50, and that is about the average cost of her keep. Whereas a good one will readily sell for \$75 to \$100—turning loss to gain. The improvements in farm machinery have been very rapid. No valuable implement has to wait long before it is in use. Some wide-awake farmer sees its advantages, and proves its superiority over others in use, and though it cost a little more, its saving in time and labor, and its greater efficiency, compel the more hesitating to follow suit. All that is needed to popularize the Guernsey cow among practical farmers in any section of the country is the possession of a single good herd. A few visits to such a dairy will make one dissatisfied with the milk and cream of a poor cow. It takes but a few years to effect an entire revolution. Prejudice, doubt and the expense involved in making the change will all yield, as the superior quality and increasing profit is demonstrated. Such has been the result in my own neighborhood. For, although I am still the only breeder of pure-bred animals, one after another, the enterprising dairymen have purchased pure-bred bulls, and now fine, grade Guernseys are quite common, and a few milk dairies will soon have entire herds of grade Guernseys. The milk of such cows readily commands twenty-five to fifty per cent higher prices than that of common cows. Most city people desire cream for their coffee, as well as good milk. They get both from the grade or purebred Guernsey. Good Guernsey cows will give from fourteen to twenty-two quarts of the highest colored milk daily, and that is as much, or more, than can be got from any other breed of rich milkers. Good grades ought to do as well. If poorer milk is preferred it can be made from this by the addition of water, and thus save the trouble and expense of drawing it from the cow.

Good Guernsey bulls or bull calves can be purchased for \$50 to \$100, the more fancy and finer specimens commanding much higher prices. There is no reason why two or more farmers should not unite in the purchase of such a calf making the expense very trifling to any one person, as the freight a young animal is very small.

The essentials are that the sire and dam shall be good themselves, and from good families. The calf should have those qualities which are essential to a good Guernsey—a deep yellow and mellow skin.

The Guernsey is very easily and quickly fattened when not milking. No animal is more so. In fact, it is difficult to keep a Guernsey in poor flesh when not milking.

As there are not enough pure-bred Guernseys "to go around" they can only be known extensively for many years through their grades. For this purpose every good bull calf should be raised by some dairy farmer who wishes to be in advance of his neighbors in the earlier possession of the best dairy stock that is to be had anywhere.—SILAS BETTS.

Country Gentleman.

A Cotswold breeding flock.

My flock consists of 420 breeding ewes, made up by the usual average proportion of ages—that is, shearling, 2-shear, or, more properly speaking, 2-tooth, 4-tooth, and 6-tooth ewes. Care is taken to draft all the full-mouthed ewes every year, and to replace them by 2-tooths, a system that is not so scrupulously carried out as it should be, the culls of all ages only being generally drafted, and hence the custom of calling them cull ewes instead of draft ewes.

I started my Cotswold flock in the year 1874, on succeeding my father, who had previously kept a half-bred flock. I did so by purchasing the best ewes I could, but found great difficulty in having only cull ewes to select from. I generally turn out the ram about September 20—the usual time in this district—the ewes having been previously drawn in lots

of about seventy, the number usually allotted to each ram, according to size, coat, and character. The ram is also selected to make up any deficiencies in the ewes. Both rams and ewes are marked alike, so that each ram's offspring may be known, and, if approved of, he is retained for another season. I generally put the new purchases to three 2-tooth ewes—if liked, retaining them for three seasons. Lamb rams are not generally used, as Cotswolds are late lambers, and also rather a difficult breed to force to early maturity: but they are now more sought after for crossing with Down sheep than formerly. I have not experienced much difference in the number of lambs, whether it be from ram lambs or older sheep; the matter of most importance, is, I think, the condition the ewes are in and the keep they are on during the rutting season. Most doubles, I always find, come if the ewes are on pasture. Clover should be avoided, as the ewes generally "turn" a good deal when kept exclusively on that sort of food. The food generally supplied to the ewes, from the time the ram is turned out, is cleaning up the seeds not already ploughed for wheat, also the one year leys and stubbles, the latter being very good, suitable food, especially when the pastures cannot be spared. They so remain for about six weeks, and then some of the rams are taken up, several lots being put together. The young ewes then generally go to turnips, running out by day, the old ewes also going out by day, and, lying behind the lambs at night on turnips. In another three weeks the rams are taken up, the whole time of their being out being from nine to ten weeks. As November comes in, the young ewes get a little hay or a little chopped hay and straw mixed. The old ewes are given some straw, if good enough, either pea or oat, followed by haulm, sainfoin, and other hay. If roots are plentiful, a good daily supply of turnips is given, and the dry food is increased according to the weather, always trying to keep improving their condition. Turnips are usually replaced by swedes as the new year comes in, or, as it happens, a good piece of turnips being quite as good, if not better, than swedes for lambing. I have never had very much loss from abortion, the cause of which can generally be traced to some severe check which the ewe has received, or to too rapid improvement. I find sheep most healthy with plenty of roots, and they are certainly kept much more cheaply.

The lambing season commences about the end of February, but lambs do not fall quickly till the beginning of March, that being the most usual time for the district. I do not expect to have such very rough weather at that time as to require an expensive lambing pen. Thatched hurdles, with covered pens for the weakly or young lambs, are the chief shelter required; these are placed in the corner of the turnip field wherever the roots are. The ewes and lambs soon run out on the turnips, coming back to the pen at night, for a week or two. The doubles are generally sent off to the pastures, where some swedes are drawn for them; the ewes are given a pint of corn per head per day. The ewes with singles sometimes get corn until they go to the water meadows, when a little maize and cotton cake well repays the outlay, as the grass, although good for increasing the ewe's milk, is not very nutritious, and often causes scour and debility. I believe even the wool repays the cost of the corn. The first loss of lambs generally occurs from what is locally known as "the wool," which the lambs get into their stomachs either from the ewes or from the hurdles. It forms a hard substance, causing stoppage, consequently inflammation and death. Then comes castration. That, however, usually causes a check, and but few losses occur as a rule, the old plan of *drawing* being generally done by the shepherd with success, after the best have been picked out for rams.

I now come to the critical time of weaning, when proper

food is most important. I prefer a piece of old sainfoin, giving the lambs a fresh patch every day, with a little corn, malt, or linseed cake, which they will have learnt to eat whilst with the ewes.

Care must be taken to keep the lambs improving. They should not be allowed to go back to stale feed, but ought to be kept continually shifted to fresh food, and have the first of everything. I find they do better lying about than being huddled upon vetches and forced with corn; and the fewer there are together the better. They will not stand the forcing like Downs, and not being required to be brought out so soon, pay better, as they are kept at less cost. They will also be good mutton and heavy enough by shear time, when even the despised Cotswold mutton usually sells well. One of the chief causes of the loss of lambs in this district is, I think, the lateness at which the lambs are put on turnips in the autumn; they suffer from tapeworm or scour. The losses in a wet summer being often very heavy, the lambs should be put on turnips in August, and run out to sainfoin by day. A little old sainfoin hay is a fine thing for them. By keeping ewes and lambs in the way described, I have nearly always succeeded in rearing 15 to 20 per cent, more lambs than ewes. The loss of ewes per year is on an average about 3 per cent.—T. R. HULBERT, in the "*Agricultural Student's Gazette*," R. A. C., Cirencester.

Breeding Horses.

A writer in the *Field* contributes the following—"Earnestly do we, one and all, look forward to an early day when every farmer shall again ride a young one into a saleable price, that will pay for his hunting. As one who has ridden bad and good, may I on this point presume to offer one word of advice? A good big young one will pay for his corn, a meagre bad bred one will never pay for his clipping. A farmer must ride something about his land. Why not shepherd on an improving colt rather than on a weedy hack or half-bred cart horse? Yorkshire farmers sell at a profit that will buy an additional youngster and a bullock besides. The Leicestershire farmer is too prone either to ride an animal that will bring neither profit nor pleasure, or else to outstand his market for a fancy price. We seldom see a good one of a farm in the shires, and, when we do, as much money is demanded as would pay the leading dealers for risk and a living."

The farmer has a range of choice, and no additional outlay in buildings or accommodation is requisite; it is horse rearing and not accommodation that we contemplate.

1. Hunter breeding—up to weight and worth to sell as accomplished hunters: 200 and 300 gs. or more.
2. Heavy or light draught horses, suitable for farm and town work, or for exportation: 80 gs., up to 400 and 500 gs. or more.
3. Vanners: buyers, Pickford, Chaplin, and town contractors generally; railway contractors, brewers, &c.; 60, 80, 130 gs., 3 and 4 years old.
4. Harness horse trade: match pairs in colour, make, and action, 15.3 to 16.2, and state horses for royalty, the Corporation of London, and family coach horses, 17 hands or 17.1, 200 gs. each to sell.
5. Hackneys, blood and weight-carrying cobs, blood ladies' hacks, park hacks, the produce of half bred mares with quality, stunted thoroughbreds, or stock blood short of racing form, sire and dam.
6. Light-weight hunters, troopers, covert hacks. Avoid breeding from light, weedy, speed-thoroughbreds. The demand for the general purpose horse exceeds the supply, but many horses of this class have neither size nor action to

recommend them. It is symmetry, elegance in external conformation, truth in anatomical delineation—i.e., bone and muscular development—which must be exhibited in the same degree and extent, that is, the same ratio to the pace or velocity, and stamina or bottom and stoutness demanded in both parents, and in all classes—if profit is to accrue. It is well-proportioned locomotive parts, well-sloped shoulders, legs and joints in proportion, carcass strong and long, back short, thighs well let down—that constitute formation calculated to get animals for rapid motion with endurance; and these are essential qualification in all marketable horses at the present day for general purposes and in their special classes.

For more strength, a horse cannot be too compact. Elephantine proportions or ponderosity are in themselves a defect, and tire the subject; but flat bones and stout muscles on short shanks and free workers are in constant and increasing demand throughout the world. Especially is this the case in England, America, and our colonial empire. Breed for it.—N. B.

THE SHIRE-HORSE.—I have spent the last two days pleasantly on a tour of inspection of the Shire-horse, as he is to be met with in the northern division of the county of Derby. Throughout the great part of this highland district there is very little land under tillage, hence, except during the hay harvest, the labour is light. The farmers prefer mares, two, three, or more of which are kept according to the size of the holding. These are all put to the horse, though they seldom all prove in foal; the colts are all sold off either as foals or yearlings. Many put their fillies to the stud at 2 years old. Owing to the exposed district and meagre fare, it undoubtedly tends to stunt their growth. Except in the severest weather, the mares lie out all winter, the only food they receive in addition to what they can gather from the pastures, is an armful of hay once or twice a day. The mares are not of great stature, running mostly from 15.2 to 16 hands, remarkably compact, well-laid shoulders, and free action. Nowhere have I met with such legs and feet, plenty of flat bone well covered with a profusion of fine silky feather; the feet are well curved, pasterns long and sloping. We are not surprised at their being keenly sought after by the canny Scots to cross with their best Clydesdales for the breeding of a superior class of dray horses. The Peak men are fully aware of their value. Really good mares cannot be bought at a low figure.—G. M.

JERSEYS—OLD AND NEW STYLE.

In our last number was presented an engraving of the old style of Jersey cow, specimens of which were not uncommon, in some parts of the island, as late as the year 1843.

According to Col. Le Couteur, the then President of the Agricultural Society of Jersey, the best of this sort gave as much milk and butter as the best of the improved kind did at the date in question.

In 1833, the first attempt to establish fixed rules to guide in the improvement of the form and quality of the Jersey cow was made. Major-General Thornton, the Lieutenant-Governor assisted by a few gentlemen, selected two beautiful cows as models. One was supposed to be perfect in her fore-quarters; the other equally good in her hind-quarters. From these two the following points were laid down to be the rule for governing the judges in all the cattle-shows of the Jersey Agricultural Society. Up to 1843, certainly, and to the best of my belief, for some years afterwards, no deviation from these rules was made, except as regards the points for general appearance and condition.

"Scale of Points for Bulls."

Art.	Points.
I.—Purity of breed on male and female sides, reputed for having produced rich and yellow butter	4
II.—Head fine and tapering, cheek small, muzzle fine and encircled with white, nostril high and open, horns polished, crumpled, not too thick at the base, and tapering, tipped with black; ears small, of an orange colour within, eye full and lively	8
III.—Neck fine and lightly placed on the shoulders; chest broad, barrel hooped and deep, well ribbed home to the hips	3
IV.—Back straight from the withers to the setting of the tail, at right angles to the tail. Tail fine, hanging two inches below the hock	3
V.—Hide thin and moveable, mellow, well covered with soft and fine hair of a good colour	3
VI.—Fore arm large and powerful, legs short and straight, swelling and full above the knee, and fine below it	2
VII.—Hind quarters from the huckle to the point of the rump, long and well filled up; the legs not to cross behind in walking	2
VIII.—Growth	1
IX.—General appearance	2
Perfection	28

No prize shall be awarded to a Bull having less than 20 points.

Art. *Scale of Points for Cows and Heifers.*

I.—Breed, on male and female sides, reputed for producing rich and yellow butter	4
II.—Head small, fine, and tapering; eye full and lively muzzle fine and encircled with white; horns polished and a little crumpled, tipped with black; ears small, of an orange colour within	8
III.—Back straight from the withers to the setting on of the tail; chest deep and nearly of a line with the belly	4
IV.—Hide thin, moveable, but not too loose, well covered with fine and soft hair, of good colour	2
V.—Barrel hooped and deep, well ribbed home, having but little space between the ribs and hips, tail fine, hanging 2 inches below the hock	3
VI.—Fore legs straight and fine, thighs full and long, close together when viewed from behind, hind legs short, and bones rather fine; hoof small; hind legs not to cross in walking	2
VII.—Udder full, well up behind; teats large and squarely placed, being wide apart; milk veins large and swelling	4
VIII.—Growth	1
IX.—General appearance	2
Perfection for Cows	30

Two points shall be deducted from the number required or perfection on heifers, as their udder and milk veins can-

not be fully developed. A heifer will therefore be considered perfect at 28 points.

No prize shall be awarded to cows, or heifers, having less than 21 points."

Colour, black tongues and black switches were not regarded in those days. All the breeders best qualified to judge regarded was the characteristics of a milk and butter producing animal. Neither did they boast of cows giving 26 lbs of butter a week. Col. Le Couteur's cow *Beauty*, at 4 years old, gave 12 lbs imperial of butter in 7 days, from 19 imperial quarts of milk daily. This lovely animal, a portrait of whom was given last month, won the 1st prize as a two years old heifer; being awarded 27 points, out of a possible 28.

The Jerseys bred on the heights of St. Ouen, St. Brelade, and St. Mary, if hardiness is sought for, as it ought to be in the case of all importations into our climate, are represented by the Colonel as able to meet even a Scotch winter without injury; those bred in the lowgrounds and rich pastures, he says, are of a larger carcass, but are more delicate in constitution.

Quayle, in his "Agricultural Survey of Jersey," states "that the Ayrshire was a cross between the Shorthorn and the Alderney." We must remember that until a few years ago all the Channel-islands cattle were called "Alderneys." Now, there is no doubt that crosses from the Jersey breed have taken place. General Conway, Horace Walpole's friend, when he was Governor of the island, and General Gordon, who succeeded him, sent to England and Scotland, as far back as the end of the last century, some of the best animals to be found in the island; and there is no doubt that many of the smaller Ayrshire cattle, in my time, shewed, distinctly, marks of a Channel Islands descent.

Col. Le Couteur gives, as an undoubted sign of a good butter cow, that she should have ears with yellow or orange colour inside. Some of the best cows, he adds, give 26 quarts imp. of milk a day, and 14 lbs of butter a week. The price, in 1843, of the best Jersey cows, including points and quality, was from \$100 to \$150; yearling bulls, of the best breed and points, from \$50 to \$75. What would the good Colonel say if he could hear of the mad prices which a "Rioter" or an "Alpha" bring a day?

ARTHUR R. JENNER FUST.

Clay-Burning.

Driving along the lovely lanes of the Weald of Kent, with the hops just coming into burr on one side, and the ripening wheat on the other, a stranger would be surprised to see vast heaps of what appear to irregularly shaped, badly burnt bricks.

In Gloucestershire, after the last load of grain is safe in the stack, the whole of the heavy land seems covered with small heaps of smouldering earth, very little smoke escaping, and no flame at all.

Now the object of the farmer in both these practices is the same, though the means employed are different; the system which answers in one soil would probably fail in the other, for whereas the heavy land of the Wealden formation will only burn in large masses, the greater mixture of organic matter in the red-sandstone of Gloucestershire submits to the influence of fire in heaps of two to three bushels, with no other fuel than the stubble of the lately reaped grain crops.

It is, to my mind, a very doubtful point whether the indisputably beneficial effect of the burnt clay is due solely to its mechanical or to its chemical action: probably, it is due to the two combined. Its mechanical action is easily understood: like slaked lime, the burnt clay falls into the finest powder under the influence of the rain, the frost, and other

disintegrating agents; each little particle of dust finds its way into the interstices of the surrounding soil, and until, in process of time, the whole sinks below the ordinary plough-furrow, insects and their eggs are destroyed, as well as weeds, the land is rendered lighter in texture, the ordinary acts of husbandry are more easily and rapidly executed, the rain passes more freely through the soil, and the roots of the cultivated plants, finding a comparatively easy path for their foraging expeditions, obtain their food with less trouble, and return a willing answer to the demands of the farmer on their renewed energies.

The chemical effects of burnt clay are not so easily des-

My own experience in clay-burning is confined to my own farm in Kent, Eng.—but I have seen a great deal of it done in various parts of the country, and on all sorts of soils: on the thin chalky downs of Sussex, the fens of Cambridgeshire, and the heavy Oxford clay of Berkshire. In all cases it did much good, and I never saw it do harm; though some of the landlords did not fancy it, fearing that the land would be exhausted. Of course, if a succession of grain-crops were grown after burning, the last state of the land would be worse than the first; but the almost invariable practice with us is to take a rape or root crop after the ashes are spread, and the usual rotation follows. (1)



SOUTHDOWN SHEEP.

cribed. Potash is formed from the combustion of the inert vegetable matter, and whatever chalky matter exists in the soil is converted into lime. Charcoal (carbon), as we know, attracts ammonia largely from the atmosphere; but in our Wealden clay the quantity of organic matter is so trifling, and the clay is burnt to such a degree of redness, that hardly a particle of carbon is visible in the finished clump. I really do not see what the chemical effect is, so I won't pretend that I do. All I know is that an *immense* additional yield of all crops is the invariable consequence of the process, when properly carried out.

As an example of what may be expected from this way of treating the land, I will give an instance of what was done on an utterly worn out farm in the midland counties of England.

The land in question, a clay-loam on a chalk subsoil, was one mass of couch-grass, and as the last tenant had lost all his capital on it, the neighbours looked askance when the farm was offered them, and the unfortunate proprietor began to

(1) The rape and turnips are fed off on the land with sheep eating cake or corn, and the three following crops—barley, clover, wheat—are sure to be good.

fear he should be obliged to work it himself. A stranger, however, was at last induced to look at it, and, eventually, took it on a ten years lease, rent-free for the first two years, and 5s. an acre, for the remaining eight years.

The first season, 8 acres of the heaviest part of the farm were burned, about 100 loads of ashes spread on each acre, which after lying exposed to the air and rain for a couple of months, were ploughed in with a shallow furrow, rape was sown, fed off by sheep, the land ploughed again a little deeper, and sown with fall-wheat. Yield of the crop 48 bushels per acre, which, as wheat was then worth nearly 8s. a bushel, greatly exceeded the value of the fee-simple of the land. The cost of the operation was, to the best of my recollection, £3. 10 an acre for the burning, and putting the other expenses at £5 more, we arrive at a total expenditure of £8. 10, or \$42.00, the return from the crop being $48 \times 2 = 96$; a clear profit of \$54 per acre, and the land left in a clean, workable condition. The process was, I heard, continued, until the whole farm was gone over, and a miserable, poor lot of exhausted soil, converted into one of the best farms in the neighbourhood.

Mr Randell, a large Berkshire farmer, gives his experience, in the Journal of the Royal Society of England for 1844. He starts with a piece of land, rent 6s. an acre, "of the very poorest description of clay, on the side of a steep hill, wholly inaccessible to the dung-cart, to which it had always been a stranger." After ploughing it once, it was worked with the grubber and harrows, and the clods of couch-grass and wiry turf dragged to the surface, collected with rakes and forks, and burned in heaps of a cartload each, with wood from the neglected hedges round the field, at a cost of \$10 an acre. After a shallow ploughing, the land was sown with vetches (tares), which were fed off by sheep, the whole field, again after a deeper furrow, planted with wheat, the yield of which was 45 bushels an acre, sown down with grass-seeds, and it carried a much larger grazing stock than it ever had done before.

I could give a dozen other instances of the wonderful effect of burning land, but it is hardly necessary to do so. I can only lament that it has never been tried here (except by myself on a very tiny scale), for I am convinced that, cheap as fuel is in the country parts, it would prove to be the best and easiest way of restoring to fertility the heavy lands in the St. Lawrence valley.

There are two ways of managing the process; in large masses, and in small heaps; and two descriptions of soil are collected for that purpose; the one consisting of the green strips of grass round the fences, which should be dug up in spadefuls about 7 inches deep, and partially dried by the sun and air before burning; by the other, the whole surface of the field is ploughed up, with the thinnest possible furrow, and the grubber and harrow having reduced the clods to a reasonable size, they are collected into heaps of about 4 perches square, and burnt by the process I am about to describe, until the mass is reduced to about half its original size, when the ashes and unconsumed matter are spread as manure for the succeeding crops. I think that the best time for doing this here, would be just before haying. It is rather an idle time just then with our heavy land farmers, and the sun is at its hottest. The land to be burnt should be the longest in grass, as the sod would be at its toughest, and from the quantity of roots contained in it, would burn more easily: a consideration by no means to be overlooked in the case of inexperienced hands.

The labourer begins by placing some large pieces, by which he frames an artificial furnace, open to the windward side; he then places some dry straw, bits of wood, rough underbrush, or chips, any worthless stuff in fact, and par-

tially covers the fuel with the driest of the collected earth; the fire is then applied, and as it progresses, the whole is speedily covered with the earth, until by degrees the whole of the earth is applied. Great care must be taken never to allow the fire to burn through to the external surface of the heap without applying a fresh lot of earth, and at the same time avoiding laying it on too thickly, so as to press down the heap too closely at first. With attention, many of these fires are kept burning at once, night and day, until the whole field is gone over. With proper care on the part of the workman, very little escapes the fire in the first instance, but should any escape, it is collected and carried forward to the next succeeding row and there consumed. The grand point, I repeat, is to put such a layer of clods on the fuel that the cover may neither be too heavy, nor light enough to let the fire burst out, for should the former be the case, the fire would be smothered, whilst in the latter event, the whole force of the combustion would be directed to the thinly covered spot, and the fire of the whole soon become extinguished. (1)

Stifle-burning, the small heap plan mentioned at the beginning of this article, is done in the following manner: The land is ploughed as thinly as possible after harvest; it is then worked with the grubber and well harrowed; and when the clods are dry, the couch, stubble, and rubbish, are raked into heaps, a small bundle of straw placed in the middle of each heap and set on fire. The hole is then closed, and as soon as the heap burns freely, the earth is shored upon the fire in moderate quantities; sometimes as much as eight or ten bushels are burnt in a heap, but generally not more than four or five. The slower the burning, and the less, therefore, the air is admitted consistently with the thorough combustion of the heap, the better will the ashes be.

If I were to set about burning a worn out pasture, I fancy the cheapest plan would be to take a common one-wheel-plough, and get the blacksmith to fit it with a share, steeled if possible, about 14 inches wide at the hinder end. With such an arrangement, a pair of ordinary horses would skim, roughly it is true, about $2\frac{1}{2}$ acres a day. It is not necessary to cut every particle of ground-surface; what is wanted is plenty of flag to burn, the cleaning operations may be gone through afterwards. There is a beautiful implement made in England, the Leicester paring-plough, one of which I had the pleasure to possess; but as it cost £5 at Leicester, it would probably, with the 35 0/10 duty and the freight &c., cost \$45 here, which would completely debar us from using it. The only difficulty with the wide share I have recommended is that, owing to the extreme shallowness of the furrow, the plough is difficult to hold steadily. In practice, however, this does not signify two straws, for the work is so rapidly gone over that it would not be a tedious operation to cross-plough athwart the first furrow. Anyhow it ought not to be difficult to get rubbish enough to give 100 cubic yards of ashes per acre, which is a full dressing. The base on which the burnt heaps stood should be shovelled out six inches deep, or the next grain-crop there will fall on its back before harvest.

ARTHUR R. JENNER FUST.

(1) Mr Tremayne, of Heligan, Cornwall, Eng., sowed 7 acres of rape, with no manure but ashes, on the 5th of May, and on the 20th of June stocked it with sheep. seventy-five sheep were kept on it for several weeks, the greater part of which were fattened, and all maintained during the summer. In September there were fifty wethers on it, and it kept them until the land was ploughed for wheat at the latter end of October. If I could afford it, I would offer a prize to that farmer who should burn and sow with rape, to be fed off with sheep, five acres of land in the most workmanlike fashion.

POULTRY DEPARTMENT.

Requisites for Incubation.

EDS. COUNTRY GENTLEMAN.—Eggs from old birds are difficult to hatch. This fact is more particularly observed late in the season. The chicks will be strong and lusty, and cheap in the shell, yet will not chip it, but die in the prison. I have had considerable trouble in this way this season. The chicks come up to within a day or two of hatching, and nearly fill the shell, and then die. There are thus many troubles and difficulties to be experienced, and many disappointments to be encountered, in the raising of chicks. The fowls which lay the eggs must have extra care and feed, so as to produce eggs with firm, hard shells. This is an important item, and one difficult to obtain with the fowls in confinement. Over fat fowls almost always lay soft or weak-shelled eggs. If the eggs are purchased, and prove good, there should be no grumbling at prices, where the breed is choice and the fowls perfect. If only common chicks are required, the eggs may be picked up almost anywhere, at market prices. A good poulterer is particular about his fowls, and has learned by experience that pure-bred fowls (or nearly so) pay a larger percentage of profit. This is a truth as far as both eggs and flesh are concerned.

During incubation, there will probably be one or two eggs broken in the process. This is the first disappointment. Young beginners must not be too sanguine in their expectations. There may be some that are not fertilized. This often takes six eggs out of a sitting of thirteen, leaving seven with chicks. If these all come out and do well, it may be counted on as good luck, especially with the non-sitters, whose eggs are seldom as well fertilized as those of the sitters. This season, I gave a hen a sitting of 15 Brown Leghorn eggs, and she brought out only one chick. There were too many eggs, while others still were too weak to break from the shell. At the same time, another hen was given 13 Dorking eggs, and brought out every one. Too rapid laying of the fowls renders the eggs unfit for incubation. Greased eggs will not hatch. If the sitters are lousy, do not grease them under the wings, as is the common practice, but dust with insect powder. Hens that are infested with vermin are uneasy and unstable sitters, and liable to stop at any time. A sitter should always have a clean nest, with lime at the bottom. Eggs that are set on the ground hatch much better than those on lofts or in boxes, as the egg requires a certain amount of dampness to prevent the skin from drying on the chick before it is out of the shell.

c. B. *Duchess Co., N. Y.*

The Light Brahma Fowls.

EDS. COUNTRY GENTLEMAN.—The origin of the Brahma breed of fowls is involved in dispute. I believe it has been settled that Light Brahmas were first bred in the United States, and that all which now exist owe their origin to a pair obtained in 1846, through a steam-propeller clerk, by a Mr Chamberlain of Hartford, Conn. They were then known as Chittagongs, and not called Brahmas until 1852, a few breeders only calling them Gray Shanghaes. The late T. B. Miner, an acknowledged authority, tells us that in 1851 his old friend Dr. J. C. Bennett of Great Falls, N. H., conceived the idea of naming them Brahma-Pootras, but at the urgent recommendation of Mr Miner, Pootra was dropped, and the name Brahma adopted in 1853. A few months later Mr G. P. Barnham sent to Queen Victoria eight specimens of Light Brahmas, and from that time onward there was great excitement in England in regard to these fowls.

This is a justly prized breed for the average farmer or

village resident who wishes to keep a few hens for the eggs they will produce. They are quite hardy and contented under restraint, and give a goodly number of eggs. They are good steady sitters and mothers after becoming initiated. It seems that no satisfactory Dark Brahmas were known until about ten years after the introduction of the Light Brahmas.

W. H. WHITE. *Worcester Co., Mass.*

EGGS IN LOW TEMPERATURE.—It is often asked how low a temperature eggs will endure and yet be uninjured for hatching. While it is not best to expose them carelessly to frost, it would be foolish to discard choice eggs unless they are known to be actually frozen, for although some would undoubtedly be spoiled, yet many would remain uninjured. On the 30th of April a nest of ten turkey's eggs was found in an exposed place in the field; the mercury stood that morning at 26°, and the day before hens' eggs were found cracked with freezing. Two of the turkeys' eggs were broken, the white of one was stiff with frost, the other appeared all right, so, as an experiment, the remaining eight were placed under a hen, and in 27 days she brought out seven active little turkeys.

O. A. A.

EXTERMINATING HEN LICE.—Will you advise me how to rid my hen-house of hen lice, and what may be a good preventive for same? H. G. D. *Baltimore, Md.* [Whitewash the entire inside of the building with a lime wash made with hot water three parts and kerosene one part. If you can get crude petroleum, paint the whole with that first, and use ordinary whitewash after the petroleum has been absorbed by the wood. The roosts and floor must be included in the treatment. An occasional application of kerosene to the roosts, during warm weather, will prevent the trouble, after the building is cleaned.]

LEG SPASMS.—Our chickens hatched early in April are troubled by a curious lameness, something like stringhalt. They can run very well, half hopping and half flying, but in walking the foot comes up very high, sometimes nearly pushing them over, coming up tight to their breast, and requires a great effort to put it down again. They are well otherwise. What is the disease, the cause and the remedy?

Surrey, N. H.

M. E. W.

CHICKENS AND CUCUMBER BEETLES.—A hen can be confined in a coop, with from twelve to twenty chickens, too young to harm the garden by scratching, and be really helpful to keep the insects from the young cucumber plants. If the patch is a large one, two broods would do better service. There will be no need of protecting the plants, or of hand-picking the beetles.

From the Country Gentleman.

Live Stock Management.

[We take the following from Mr James McDonald's account of the Polled Aberdeen and Angus breed in a recent number of the *English Agricultural Society's Journal*.]

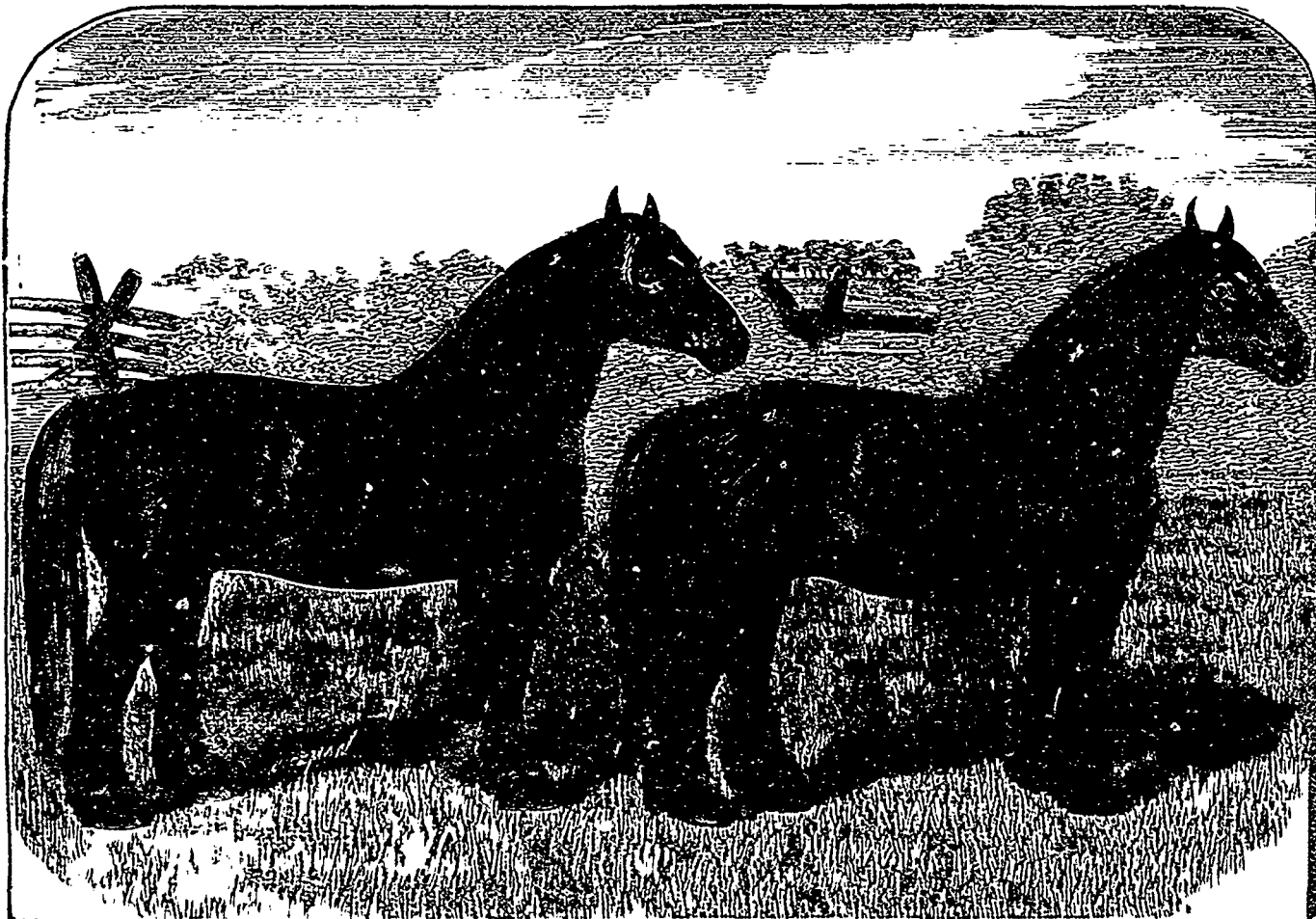
The general system of management pursued by the various breeders of Polled Aberdeen and Angus cattle differs but very slightly. It is as a rule simple and natural. High feeding has of course been freely resorted to in the training of showyard animals, but the great bulk of the breed has had hardly any "pampering" or unnatural treatment of any kind. To this last fact I have no doubt the well-known fecundity, general soundness, good health, and hardness of the breed are mainly attributable. No race of animals can long withstand unnatural treatment, however systematic and skilful that treatment may be. As a rule, breeders aim at

having the calves dropped between December 1st and the end of March. A good many come later, and some earlier, but these are not in favour. There is no doubt great advantage in having early calves, and breeders are now endeavouring to obtain as many as possible before the end of January. I may quote a few notes from some leading breeders as to their system of management.

Mr Thomas Ferguson, Kinnochtry, states that his calves suckle their dams till from 6 to 8 months old; and that after being weaned they get straw, turnips, and cake or bruised oats in covered courts. He feeds the bull calves in the same manner all the winter after weaning, and generally sells them in spring when they are a little more than a

Mr Bowie, Mains of Kelly, rears most of his calves by the pail or "cog," giving at the outset about 1 pint, and gradually increasing the quantity till it reaches 7 or 8 quarts. Small quantities of cake, corn, and turnips, are ultimately given along with the milk. The better sorts, perhaps intended for showing purposes, are allowed to suckle their dams for longer or shorter periods, and when weaned are shut up in loose boxes and treated to all sorts of good things. Mr Bowie keeps his breeding cattle in moderately lean condition. He does not think it wise to bull heifers until they are 2 years old, as too early breeding checks their growth.

Mr William Smith, Stone O'Morphie, states that he endeavours to have his calves dropped in February and March.



SHIRE-MARES.

year old, the price generally ranging from 25 to 50 gt. Last season his yearling bulls brought an average of over 40 gs. each. After Mr Ferguson's heifers are ten months old, they get little food, excepting straw and turnips, until put upon the grass. Bulls are used when about 12 months old, and heifers bulled about 2 years old, seldom sooner. He feeds liberally the bulls that are in use, but he keeps his cows rather lean than fat. In winter his cows before calving are fed in covered courts, with about 30 or 40 lb. of turnips per day along with barley, wheat, or oat straw, generally either of the two former, as oat straw is scarce. After calving, they get three times as many turnips as before; and in summer they are kept solely on the grass fields.

He rears his calves upon their dams, till from six to eight months old, and then puts the young bulls into small covered courts, where they are fed on cut grass and vetches, and from 2 or 3 lb. of linseed cake per day, until turnips are ready to take the place of vetches and grass. The young bulls are sold for use when 11 or 12 months old. Heifers are treated in the same way as bulls, except that they get a smaller allowance of cake in winter and none at all in summer. He finds that heifers require no extra feeding on the fields to put them into good condition. Formerly, his heifers were bulled in April, when just past 2 years old; but now he endeavours to have them bulled so that the calves may come in December and January, which, by those showing

young animals, is found to be a great advantage. Cows get no extra food, simply turnips and straw.

Mr R. C. Auld, Bridgend, states, that while early calving gives advantages in the way of strong yearlings, it incurs great expense in keeping cows and calves during the winter and spring, before the grass season comes round. He says that during the period of gestation cows should be kept on good pasture when outside, and fed on good food when inside; and that some days before calving it is well to take a small quantity of blood from them, as a preventive of milk fever; and to have them closed up by themselves in a calving box. Just after calving, the cows should be kept quiet, well "bedded" with fodder, and get a drink of milk-warm water and oatmeal. The calf should be carefully watched until it "gets its legs" and when the cow has been milked, a small quantity of the first milking should be given to the calf. He approves of cows being allowed to "lick" their calves, and regards the process as useful to the cow herself, as a medicinal corrective. (1) He brings up the calves upon their dams; but if the cows are heavy milkers, he milks them dry now and again, until the calf is able to do so itself. The first fortnight is a most critical time with calves, and Mr Auld states that when he sees any sign of dulness or inactivity in their system, he gives them a tablespoonful of treacle dissolved in warm water. He finds that the calves are fond of this, and that it operates beneficially. He states that his late uncle, Mr McCombie, of Tillyfour, was always most careful to have his calves muzzled during the first fortnight, so as to prevent them attempting to eat straw. As soon as they are old enough to be able to take them, they should be taught to eat cake and turnips, and should be allowed plenty of exercise. Mr Auld does not approve of cows being bulled sooner than six weeks after calving. Weaning usually takes place about the end of the grass season, and after that has been done, the "cording" of the calves (putting setons into their dewlaps) is carefully attended to. Young bulls and young heifers, he thinks, should be liberally fed, and cows kept in moderate condition.

Mr. Anderson, Wellhouse, say:—"Calves drop from December 1 to March 31. Cows with bull calves meant for sires rear their own calves, but I have several cows that rear two calves each. I deprive no calf of its mother's milk. For the first fortnight, calves fed by hand get 1 imperial pint of warm milk four times a day; after that, milk is given three times a day, and the quantity is generally increased to 4 pints each time, till they are six or eight weeks old, when bruised oilcake or linseed made into gruel is given once or twice a day along with the milk. A very small quantity of this gruel is given at first, so as to avoid scouring. Cut turnips and oat straw are also given at that age. Calves are weaned when from six to nine months old. Young bulls get 2 lb. of oilcake per day after they have been weaned, with turnips and straw, and they are allowed to go at large in a loose box. They are sold at from 20 to 40 gs. and upwards, when twelve months old. Heifers are not so liberally fed as bulls; but after weaning they get 1 lb. of cake daily, along with grass, turnips, and straw. Early heifer calves might be served in May or June of their second year, and if not then, certainly as early as possible the following year. Cows are on the fields all summer, with no extra food. In winter they get straw and turnips, with about 2 lb. per day of oilcake for two or three weeks at calving time." (2)

(1) True, but the cow is more quiet if she never sees her calf at all. A. R. J. F.

(2) All crush the grain.

A. R. J. F.

THE TURNIP FLY.

[To Mr. Geo. Brown, jun., Watten, Cuthness, we are indebted for the following:—]

THE "turnip fly" has ever been one of our most destructive pests, and its ravages are at present general over all Scotland. The undernoted has been written in the hope that it may prove of some service in averting this evil in the future, and be the means of in some slight degree mitigating the injury our crops are at present sustaining.

The volume from which these notes have been taken (at present in the press, and its issue may be shortly expected), is entitled *A Manual of Injurious Insects, and Methods of Prevention*, by E. A. Ormerod, F. M. S., Isleworth, a laborious and painstaking worker in the field of entomology, who has during the last four years been in communication with over 400 observers in all parts of the country, who report to her all insect attacks upon our food crops, forest trees, and fruit; and the modes of prevention or remedies that have been adopted to meet the evil. These remedies are therefore such as have undergone the test of practical experiment, and have been compiled from notes forwarded by trustworthy observers. With these preliminary remarks I now place before your readers a few extracts from the proofs of the book, which I have had the privilege of perusing:—

"During winter the turnip fly beetles may be found sheltered under bark, fallen leaves, clods of earth, and the like places, also amongst stubble, and especially in heaps of long strawy manure left on the fields, and on particularly fine days they may be seen coming out to sun themselves.

"On the return of spring warmth they begin work, and, till the crops are ready for them, are especially to be found on weeds of the same family as the turnip and cabbage, such as charlock, shepherd's purse, and Jack-by-the-hedge.

"When the attack begins on the turnip, the female lays her eggs, which are few in number, for successive days on the under side of the rough leaf. The maggots which hatch from these in ten days are white or yellowish, fleshy, and cylindrical; with three pairs of feet in front, and a sucker foot at the end of the tail. The head is furnished with cutting jaws, and has large dark eyes. Directly they are hatched they gnaw through the lower skin into the pulp of the leaf, and make their way onwards, forming winding burrows inside it. Here they feed for about six days, then they come out and bury themselves not quite 2 inches deep in the ground, when they turn into the chrysalis stage, from which the 'turnip fly' or 'fla beetle' comes up in about fourteen days.

"It is in this state that the so-called 'fly' does most mischief. It gnaws the seed leaves, and the young plant when it first springs, and thus often totally destroys it, and also gnaws the rough leaves, forming large holes through the leaf.

"There may be five or six broods in a season.—(Farm Insects.)

Prevention and Remedy.—The points that need particular attention are—1st, clearing off such weeds as the fly feeds on till the turnips are ready for it; 2nd, such a method of cultivation and manuring as shall give a fine, deep, clean, and moist seed-bed, rich in available plant food, so that a healthy and rapid growth may be promoted, and all points of shelter or harbourage for the fly be reduced to the lowest limit; 3rd, available means of applying moisture in dry season; 4th, applications and special treatment to destroy the fly when it is badly infesting a crop.

"With regard to weeds:—The fly frequents wild plant, of the cabbage tribe, as shepherd's purse, Jack-by-the-hedges and is especially fond of charlock. It has been observed as unusually numerous where this weed has been plentiful in

the previous year, and also to spread (as from a centre) to the neighbouring crops from a charlock infested field. It is often supported in the spring by these or other weeds till the turnips are large enough for it to attack, and therefore means should be taken to get rid of them beforehand from the autumn stubbles. In the case of charlock, a double turn of the harrow over the stubble is of use, small weeds may be cleaned by broad-sharing; the seeds are thus covered sufficiently to induce immediate germination, and the sprouting weeds, as well as roots in the soil, will be cleaned by the regular processes of cultivation further on. Waste spots of land and hedge-sides should also be attended to; the first is often overrun with Shepherd's purse; the second is often infested with the tall large-leaved, onion-like smelling plant with white flowers, the shape of the charlock blossom, known as 'Jack-by-the-hedge.

"A deep cultivation that will turn down weeds and destroy insects is very serviceable, and care should be taken that all manure from the yards or sheds should be completely buried. Any long strawy lumps left on the surface will shelter the fly, and from these it will come out to the destruction of the crop.

"The three requisites for healthy germination are warmth, moisture, and some amount of air; and it is only by securing these that a rapid and healthy development of the plant can be obtained. It has therefore been recommended, when the surface is prepared for drilling, to leave it undisturbed for three weeks; also, on the other hand, when partly rotted farm manure is ploughed in in spring, to sow immediately. In each case the reason is the same—that is, to secure the moisture in the ground—in one instance by not opening the pulverised earth more than can be helped, and in the other by putting the seed above the half-rotted dung before the moisture and warmth accompanying decomposition has gone from it.

"Thick sowing is advised by various growers, who state that thus, in case of hot dry weather, the plants will thrive better for the protection they give to each other (being thus moderately damp, with the roots shaded), and that some may be reckoned on to escape the fly. This, however, needs careful looking to, or the result will only be a worthless drawn growth.

"With regard to swedes, it has been found, from the preference of the fly for the white turnip, that if the seed is mixed in the proportion of one-quarter white to three-quarters swede, or again, if one drill of white is put in at intervals amongst the swedes, that the fly will be attracted to the white and thus allow the swedes to get well ahead. This plan was found to answer well by several years' experience in East Lothian and elsewhere.

"The turnip fly is active in bright dry weather; and when the thermometer stands at 75° in the shade it has been observed on the wing in great numbers; when the weather, on the contrary, is cold and wet, it is sluggish; and in rain or heavy dew these beetles cannot leap, from the moisture clogging their legs, and thus preventing the powerful springs with which they customarily leap out of the way of attack.

"This circumstance has much to do with the very different success, in different circumstances, of exactly the same remedy. A dressing that is put on early in the morning, whilst the dew is still heavy on the plant, has a very different effect to what it has either on a morning that is dewless or in the middle of the day, when the fly has every chance to protect itself under clods of earth, etc., before the dressing reaches it, and, though the reason is not given, the advice is constantly the same in observations on remedies—apply whilst the dew is on.

CARE OF CALVES.

The Jersey calves will be kept in box-stalls all the summer. It is less trouble to feed them there than in the fields. They will not be exposed to the changes of the weather, or to the flies, as they would be out-of-doors. They are less liable to sickness, and will grow just as fast, and faster, with a feed of skim milk, oat meal and oil meal, three and one mixed, and plenty of hay. They should be well bedded, and the stables be frequently cleaned. Calves kept in this way will have shining coats and be tame, quite the reverse of their condition if running wild in a field. The meal should be fed sparingly at first, beginning with a pinch and gradually increasing up to a quart a day by the time they are two months old. As they begin to take more meal, they will require less milk, as they will at the same time eat more hay. Clover hay cut when green is the best. When they can get this kind of hay they will do with less milk. One Ayrshire cow feeds three calves until they are six weeks old, and then they get the same amount of milk with twelve hours' cream taken off. When ten or twelve weeks old they get four quarts daily of sour milk. Calves raised for cows should not be made fat, but be kept in a thrifty, growing condition. There should be an equilibrium of fat, muscle, bone, etc., and not an excess of fat, which will spoil any calf.

Rural New-Yorker.

Different Breeds for the Dairy.

The Toronto Globe gives the following as the conclusions from experiments at the Ontario Model farm, as deduced from Prof. BROWN'S last report:

An average cow for dairy purposes should give 20 pounds of milk per day during 200 days every year; 8 pounds of cream for every 100 pounds of milk; 45 pounds of butter from every 100 pounds of cream, and fully 10 pounds of cheese for every 100 pounds of milk. Bulk, volume, or percentage of cream, is no safe criterion of the quantity of butter in that cream; weight alone is the proper mode of judging. Breed, as much if not more than food, affects the quantity and quality of milk, cream, butter and cheese. In Ontario Experimental Farm experience, the Short-Horn is an average milker, short in duration per season, low in specific gravity, high in per cent. of cream, proportionately high in butter, and also high in cheese production. The grade of this breed approaches the nearest of any others to what is called a "general purpose cow." The Aberdeen Poll is low in quantity of milk, and the second highest of any in specific gravity. The grade of this breed is much improved in milking properties, giving a greater weight of cream, though a lower per-centage of it. The Hereford is not more prominent than the Short Horn and Aberdeen Poll in regard to milk, except in proportion of butter from cream, in which it is highest. The grade is very prominently in advance, particularly in proportion of cream, but one of the lowest in cheese. The Devon is most distinct in highest specific gravity of milk, and the weight of cheese from milk. We have no experience with the grade of this breed.

The Galloway milk appears to be of a peculiar texture—rich, or so very small in butter globules as to rise very slowly and very indistinct in the test tube.

The Ayrshire is a particularly heavy, long milker, giving five times her own weight per season. The milk is some what low in specific gravity and per cent. of cream, but is over the average in cheese production. The Ayrshire grade is not improved in any respect except in duration of milking season.

The Jersey is remarkable for proportion of cream, averaging 35 per cent., and giving a value of dairy products in-

comparable to any other breed in our experience. The native, or common cow of Ontario, not Canada properly, because Quebec in particular stands distinct in her class of dairy cows, takes a high place in value of annual produce for ordinary dairy purposes, and along with the Short-Horn grade, is peculiarly the dairy cow for the country.

Seven days' test of Jersey cow "Jolie," 5126,

Statement of account of milk, cream and butter given by the Jersey cow, "JOLIE," of St. L., 5126, A. J. C. C., owned by W. Reburn, St. Anne, Island of Montreal, beginning on the morning of the 2nd May, 1883, and ending on the evening of the 8th May, 1883.

Date of milking.	Weight of milk.		Weight of cream.		Amount of butter.		
	lbs.	oz.	lbs.	oz.	lbs.	oz.	
May 2nd, Morning.....	18	12	3	8½	Churned together 7th inst.	8	8½
" " Afternoon.....	16	0	3	5			
" " Night.....	8	0	1	12			
" 3rd, Morning.....	17	0	3	11½	Churned together 7th inst.	8	8½
" " Afternoon.....	18	0	3	2½			
" " Night.....	6	12	1	12½			
" 4th, Morning.....	17	13	3	4½	Churned together 11th inst.	7	5
" " Afternoon.....	18	4	3	6½			
" " Night.....	4	12	1	0			
" 5th, Morning.....	18	4	3	8	Churned together 11th inst.	7	5
" " Afternoon.....	18	4	3	4			
" " Night.....	6	4	1	6			
" 6th, Morning.....	18	4	3	4	Churned together 11th inst.	7	5
" " Afternoon.....	17	8	3	1½			
" " Night.....	8	12	1	8½			
" 7th, Morning.....	17	4	3	11½	Churned together 11th inst.	7	5
" " Afternoon.....	18	12	3	8½			
" " Night.....	1	8	0	7			
" 8th, Morning.....	20	4	4	0	Churned together 11th inst.	7	5
" " Afternoon.....	18	4	3	9½			
" " Night.....	9	8	1	13			
Totals in seven days.....	298	0	58	0½	Total	15	13½
	lbs.	oz.	lbs.	oz.	butter	lbs.	oz.

NOTE.—It will be seen by the last three days of test that "JOLIE" averaged 2 lbs. 7 oz. of Butter per day, equal to 17 lbs. 1 oz. in seven days.

Measurement taken of "JOLIE'S" udder seven hours after milking:

Breadth..... 13 1-2 inches.
 Length..... 20 "
 Circumference..... 54 "

Since I received the above, I hear that Mr Reburn has sold Jolie for \$1,500!!!
 A. R. J. F.

LIME.

By SIR J. B. LAWES, BAR, LL. D., F. R. S.

[The following is taken from the columns of the North British Agriculturist].

THE report of the directors of the Scottish Chamber of Agriculture contains some very interesting tables respecting the exhaustion of lime

The directors have brought together in one page the opinions, and experience of the great body of the farmers of Scotland; and, according to the evidence thus supplied, the shortest period of time during which a full application of lime, is said to last, is seven years, while thirty years and over is stated to be the longest period.

When we consider that the influence of lime, upon a soil which is naturally deficient in this substance, is due to several distinct causes; and further, that the after treatment of the land which has received the lime differs much in different cases, we have no difficulty in understanding that there must

be considerable variations in the periods of time during which the beneficial effects of lime will be apparent.

Two of the crops which are grown at Rothamsted in our ordinary rotation—roots and clover—contain large quantities of lime in their ash, and when potash is not abundant in the soil they possess the property of utilising this lime in its place.

The ash of leguminous plants growing in an ordinary pasture which had been well supplied with potash, contained 32 per cent, of potash and 22 per cent, of lime; but on pasture where potash was not supplied, the ash contained 32 per cent. of lime and 14 per cent. of potash. Lime, therefore, economises the use of potash.

The first application of lime to moor land, or to pastures which are deficient in lime, is often followed by a growth of white clover so abundant as to have led some to the conclusion that the plant was spontaneously generated in the soil! It may be observed, however, that it is only plants with creeping roots which can so rapidly cover the ground; a similar instance in the case of arable land may frequently be observed in the equally rapid covering of the soil by couch grass; this being a graminaceous plant can find in all soils an abundant supply of its own proper food—silica; but lime in many soils is by no means abundant, and, if the supply is insufficient, a liberal dressing is essential, not merely for the purpose of furnishing the lime which the plant takes up, but also to enable the roots to be in constant contact with that substance.

I may observe that although the amount of lime dissolved, and removed in drainage waters, is considerable, still, the necessity of repeating the application after a few years appears to be rather due to a descent of the lime to a lower level in the soil, where it is less accessible to the roots of the plants.

Lime also acts as the medium by which nitrification takes place; and the almost entire absence of nitrates in the water passing through the peat soils in Scotland—which abound in nitrogen—must be mainly due to the absence of lime.

A reference to the returns in the table shows that the effect of lime is most durable upon pastures that are grazed! that its effects are very good upon virgin soil; that it lasts longer upon good, than upon bad land, and upon clays and heavy loams, than upon light land.

The amount of soil nitrogen which is nitrified each year must depend somewhat upon the amount that the soil contains; but where each application of lime is attended with less benefit than the preceding one, we may feel tolerably sure that the resources of the soil have been too largely drawn upon, and that the export of fertility has been too great.

Lime therefore acts in a double capacity; it furnishes an important ingredient in the food of roots and leguminous plants; and in addition, it furnishes the key by which the stores of organic nitrogen in the soil are unlocked, and rendered available as the food of plants. It is in this latter capacity that its functions are more liable to be abused.

As lime does not furnish any of the more costly ingredients which plants require to form their structure and seed, it is quite evident that these must be derived from the soil: this being the case, if the views of those who hold that agriculture should be carried on without any reduction of the fertility of the soil are correct, it is evident that an application of lime should be accompanied by an application of all those ingredients which are carried away in the crops, or by feeding with stock.

My own opinion is that soils are generally competent to yield a certain portion of their fertility without injury, and that practical experience of the particular district will be the best guide for deciding the amount of fertility that may be thus removed.

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BEWARE of all imitations, and of all other oil colors, for they are liable to become rancid and spoil the butter.

If you cannot get the "Improved" write us to know where and how to get it without extra expense.

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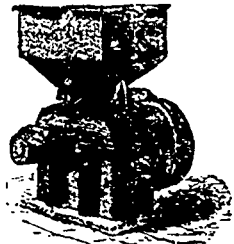
GREGORY'S SEED CATALOGUE

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