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THE ILLUSTRATED

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Table of Contents.

FORESTRY.

SECOND PART

RESTORATION OF THE FORESTS.

CHAPTER I

GENERAL CONSIDERATIONS.

After having shown, in the preceding chapters, that it is the duty of the state and of all our citizens to watch over the preservation of the forests, I proceed in my endeavour to prove that their restoration is a no less important work. If a large part of the public domain is still covered with forests which are as yet almost intact, another part, hardly less extensive, presents to the gazer nothing more than a few clumps of trees half-destroyed by one cause or another; strips of wood gnawed by the flames; whole townships of land unfit for cultivation almost entirely cleared by the axe, and which, in no long time, will become absolutely of no value to the public.

The establishments in the neighbourhood of these places are threatened with a scarcity of lumber and firewood; and the scarcity is not very distant. In a few years, they will find themselves in the same position as the entirely cleared parts of the Dominion. In fact, it is acknowledged that a wood half cleared and left to its own devices is devoted to destruction. On the slopes of the mountains, the rains carry off the soil from the clearings, and leave nothing but the bare rock. The earth is washed away, and gradually borne off, leaving the roots of the nearest trees naked, and their subsequent destruction is not long delayed. In places ravaged by the flames, the trunks of the half-burnt trees soon rot; water collects in the cavities formed by the roots of those which the wind has thrown to the ground; frost raises the surface, and thus loosens the roots of the young trees; if the ill-used wood is near settled townships, the stock break in, devouring all the tender shoots of the young struggling plants, and stamping to death with their clumsy hoofs the naked roots of the older trees, till at last, by a concurrence of all these causes, the maltreated forest entirely disappears.

Now, all this may be avoided, the evil may, perhaps, be cured, and we are about to see in what way each of us can do his part in the patriotic work.

CHAPTER II

DUTY OF GOVERNMENTS AS REGARDS THE RESTORATION OF THE FORESTS.

Governments can assist greatly in restoring the forests to their pristine condition. The action they are called upon to undertake is not a direct action, as in the case of the preservation of uninjured woods, seeing that those which require restoration have generally passed out their control.

Nevertheless, they can assist the work greatly. I will relate an isolated fact which will serve to show how our legislators can attain the proposed end. A Horticultural Society of the Province of Quebec, with very little encouragement from government, left, in fact, almost to its own resources, offered certain prizes for the re-planting of woodlands. A farmer, a competitor for these prizes, carried off the first, after showing that he had replanted in maple 62 arpents, whence the wood had almost entirely disappeared nearly 25 years previously. Well! I want to see government do what has been done by a simple horticultural society with very few funds at its disposal.

In the province of Quebec there are eighty agricultural and five horticultural societies, aided by the government. Besides these, there are thirty nine agricultural clubs organised, and in full operation in the different parishes in the country. Thus, we have one hundred and twenty four associations of husbandmen spread over the whole extent of the province. Societies of the same class, in greater or lesser numbers, exist in all parts of the confederation. Let the governments of the different divisions devote, every year, a certain sum to be distributed amongst these associations, which sum shall be given as prizes to encourage the restoration of the woodlands, and the fruits of this timely liberality will soon be apparent.

For, if a purely local agricultural society has succeeded in inducing farmers to compete for similar prizes in a country were woodlands are still plentiful, how much more likely should we be to succeed, acting, as we should be doing, over the whole country, and with governments taking the initiative, in those places where there remain nothing but a few half-denuded spots, and where firewood and lumber are both on the point of absolutely disappearing.

This, if I do not deceive myself, is an excellent way of inducing farmers to take precautions against a scarcity of wood, and, in that belief, I submit it in full confidence to the attention of our legislators.

CHAPTER III

DUTIES OF AGRICULTURAL CLUBS AND SOCIETIES AS REGARDS THE RESTORATION OF THE FORESTS.

In the foregoing chapter, I quoted the example of a horticultural society (that of the county of Islet, in the province

of Quebec), as one worthy of being followed by the different governments of the Dominion.

I would propose the same thing to all the agricultural clubs and societies, of what ever sort, which exist in the con federation. Even if the governments themselves do not take the initiative, the societies ought, for the pure sake of promoting the interests of agriculture, to undertake with heartfelt earnestness the work of the restoration of the forests.

Local societies, the agricultural societies of the province of Quebec, for example, might offer prizes for work of this description done in their respective neighbourhoods; and, then, those who had won first prizes would, doubtless, compete for the prizes offered by the county societies, and thus, a noble emulation would be excited among the farmers, not of each locality only, but also of each county.

The societies would appoint a committee of judges in each county, the members of which committee, would be charged with the duty of visiting the forest-lands which had been improved or planted by the competitors, and after inspection, they would make their report to the societies.

All those interested in these competitions would become, *ipso facto*, members of the forestry associations. They would receive advice from them, and follow out their regulations. Thus the societies would grow considerably in numbers and influence, an influence which would manifest itself in the course of a few years by magnificent results. But before we get so far, it is necessary that the active assistance of the farmer be secured, and how to win this shall be the subject of my next chapter.

CHAPTER IV

DUTIES OF FARMERS AS REGARDS THE RESTORATION OF THE FORESTS.

The traveller, in passing through the longer-settled parishes of our province, sees, scattered here and there, on the hill-tops, on the slopes of the mountains, in the valleys, and in the low-lying marshes, clumps of trees varying in species with the quality of the soil. Here, are found sugar maples, there, poplars; soft maples, larch, fir, tamarack, cedars: all, more or less, useful woods. Observing all these thickets, which add amazingly to the beauty of the country, the traveller conceives that the inhabitants of the district possess all the timber necessary for their wants. A false conclusion! let him wait awhile, and examine these patches of woodland attentively. What does he find? cattle gnawing the branches, and stamping the roots to death. The trees, flourishing enough to a careless eye, are drooping, weakly, half-dead for want of moisture, and on the point of perishing for lack of nourishment. In a few years, they will have entirely disappeared, and the site which they now occupy will be naked and barren.

How many of these lovely groves have I seen, young as I still am, where, when children, I and my playfellows used to wander, listening to the music of the birds, and watching the sportive habits of the nimble squirrels. The groves are gone, though barely twenty five years have elapsed since we took our pastime therein. The cattle, as I said above, begin the destruction; the axe of the poor man suffering from the cold of a rough winter's day, carries on the work by felling the already half dead trees, and the rest, rotten, and with difficulty retaining their hold on the soil, are up-rooted by the fierce blast, and a weary desert occupies the once green and smiling spot.

Where the wood is still thick, though the grove may be small, the remedy is easy: enclose it with a fence. I expect to be told that this is impossible, or that the work would be costly, if done on a large scale. To which I reply that, the larger the wood, the better the enclosure would pay, considering the great value it would gain by the growth of the protected timber. The cattle would no longer browse on the shoots, the trees would shed their seed on the ground, the young plants would spring up and take the place of their predecessors, which, when arrived at maturity, or menaced with death from decay, would be carried off to the mill or to the wood-pile. To accomplish this is one of the easiest duties of the farmer.

But there is more than this to do. Those who have well-wooded property do not keep it for the mere pleasure of looking at it. Each year, the owner takes what he requires for his own use. If he does this carelessly and hap-hazard fashion, in a few years his store will have been expended, while, on the contrary, if he knows how to treat it properly, it will last for ever.

Let us see how he should proceed to ensure this durability. First, as before, all cattle should be excluded; then, no immature trees should be felled,—from ten to thirty young trees will be ready to take place of each of those taken away. Indeed, the ground is covered with the seeds of the felled trees, and it is by this that the forest are re-formed. A thick brush-wood is soon established by the young plants, if neither the hoofs nor the teeth of cattle are allowed to injure them. But here, there is one danger: they should not be left too thick; they would injure each other, keep off the beneficent rays of the sun, and never become fine trees. Judicious thinning, therefore, should be practised every three or four years.

In spite of all precautions, certain spots will suffer, some from fire, some from sudden rushes of water after heavy rains which carry off the top-soil, and so on. The vacancies due to these different causes must not be neglected. It is through breaches of this sort that the enemy, sterility, finds an entrance. How shall we oppose his attacks? Fill the naked spots by re-planting.

Of re-planting I will speak farther on. At present, I must content myself with saying that to re-plant a bare spot in the middle of a wood it is only needful to take from the space around it the young trees, which, being set immediately after being dug up, will infallibly take root at once.

By treating it in this fashion, every farmer can preserve his reserve of bush for an indefinite period; not only for his own life time, but for the generations that shall come after him, if, be it understood, they continue to observe the same precautions.

And it is not only the farmers who are concerned in what I have said about the re-planting of the bare spots being one of the important points connected with the restoration of the forests. Those lumbermen who hold timber limits on long leases ought, for their own sakes, to carry out the re-planting of the clearings as often as may be necessary. The governments of the different provinces ought even to compel them to do it, and the foresters should be obliged, by a regulation passed to that effect, to re-plant all clearings which they shall find have been made on the crown-lands.

People will, doubtless, exclaim against all this as impracticable, too costly, etc., but they will be wrong. Let us look for our edification at what the different European governments have done. They would have thought themselves remarkably fortunate if they had nothing but the filling up of bare spots to trouble them. Their enormous outlay was caused by the necessity of re-planting whole districts menaced with absolute depopulation, as well as with entire denudation of wood. Let us take care less we find ourselves in a like peril; the steps to avoid which should be taken before it becomes too great.

Another operation which will be found advisable in the restoration of the woodlands is the pruning of the young trees, to insure their regular growth, and of the old trees, to

insure them a prolonged existence and to repair any accidents of which they may have been the victims. Of this operation I shall give a special description when I speak of the establishment of new forests, a subject which will furnish matter for the third part of my work.

THIRD PART

PLANTING NEW FORESTS.

CHAPTER I.

GENERAL CONSIDERATIONS.

It will perhaps surprise my readers to see that I have remitted to the third division of my book the most important by far of its contents. The reason which induced me to treat first of the preservation and then of the restoration of our forests is this: We have still, fortunately, a large part of our public domain remaining in woodlands full of fine timber. Our first duty is to preserve these forests intact, and, where they have been damaged, to restore them to their primitive condition. Once assured of the possibility of keeping our rich woods safe, no one will deny that it is our duty to seek to restore them were such necessity exists.

When we talk of re-planting, many a one will shrug his shoulders. Those who seem to think it possible that our forests may be ruined, and that, as has already happened in Europe, we may suffer from a scarcity of wood, are treated as pessimists.

But in spite of this, there exists very evident proof that the fears of these pretended pessimists are well founded. This proof is, the complete denudation of wood of certain districts of the country—so complete is it, that the firewood used there has to be carried from places more than twenty leagues, and timber for building from places thirty, and even fifty leagues, off.

If it is thus in regions full formerly of the finest timber still more must we dread to see the rest of our forests disappear by degrees. For the truth is, these forests are no better treated that those that have already vanished, and have not only to supply the local demand, but the demand of the cleared districts as well.

In order that the equilibrium may be established and our woods utilised but not destroyed, we must not only preserve and restore them, but we must create new ones, that is to say, we must re-plant.

Here, I may say, that almost all that I have stated with regard to the preservation of forests applies equally to their creation, such as the system of prizes for the encouragement of planting, and the like.

Re-planting is a work repugnant to certain minds. They see very little to encourage them to plant, because, as they say, they will never enjoy the fruits of their labour. They are wrong! I, who am comparatively young, have seen parts of the forest falling under the axe, and replaced by the golden sheaves of the husbandman; and now I see the spot clothed again with wood, and that very wood once more in process of felling. I remember well, in my sweet memories of childhood, a trip to the sugar bush. It was in a grove of ancient maples that the little fête took place; I was in my seventh year. The following season, those very maples were warming our house, and the owner of the land had carried off a crop grown among the stumps. Pass by the spot in April now, and you will hear the song of the sugar-maker, still engaged in his work, in the same place—but the trees are not the same, they are new ones shot up where the old ones stood—and all this in twenty seven years!

And yet, the maple is not one of the quickest growing trees. The poplar, the willow, the negundo, the larch, all grow more rapidly, and I know of soft maples that, only eight years from sowing, measure eight inches in diameter at a foot from the ground.

Thus, unless he is very old, the planter is sure to enjoy the fruits of his labour. But there is more than this to be considered; suppose it to be impossible for him to reap the crop of his own planting, there are other reasons which should induce us to re-plant our hills and our barren plains.

CHAPTER II.

THE PLACES IN WHICH TO PLANT.

I will class under six heads the lands on which re-planting is necessary.

The first comprises the clearings we meet with in the forests. Of these I have spoken in the second part of this work. These clearings, whether caused by partial fires, by the axe, by floods, or by storms, are the open doors through which the destroyers of the forests enter. The soil of the bare spots, parched by the sun, no longer offers the protecting shade necessary to the growth of the tender plants, and it follows, that the seeds which fall from the trees sprout only to wither immediately. The trees, still more exposed to the attacks of the wind, are, in addition, ravaged by mice and other rodents, which find a hospitable abode in the grass which springs in the clearings. From the two causes united, they perish rapidly, from the violent attacks of the one, or from the imperceptible operations of the other; and, as no new plant is ready to take the place of the old one, the void enlarges itself, and the evil goes on increasing. And for these reasons the clearings should be re-planted.

The second description of lands under this head is the slopes of the hills and mountains. And this is a vital point. The timber-trees grown on these slopes retain the moisture of the soil. At their disappearance, the water formed by the melted snow of spring, by the summer thunder-storms, by the continous rains of autumn, raise the soil, no longer kept in its place by the roots of the trees, and carry it down to the valleys below, leaving the rock naked and despoiled of all its vegetation. Moreover the water which, while the wood remained, filtered gently through the soil, descending, so to speak, drop by drop to the lowlands, being no longer kept in check by the soil, rushes down in torrents; hollowing out deep ravines in the sides of the mountains, and covering the valleys with its destructive inundations. Such is the history of the quasi-periodical floods of France, of Spain, and of other countries where the forests have perished.

Enough has been said to show the necessity of re-planting the mountain-sides. Our sons and grandsons will thank us for our care, and for having guarded them from the disasters which recur almost every year in those places where the slopes of the hills and mountains have been denuded of their natural covering. The soils unfit for cultivation come under the third head of lands to be re-planted. Rural economy lays down the rule that every part of a farm should yield its share of profit to the general stock. Now, certain soils, for divers reasons, are unfit for agriculture properly so called. To grow wood on them is the only way to make them productive. Almost all these lands are fit for planting, and will produce, if not wood of the first class, at least such as will serve for firing.

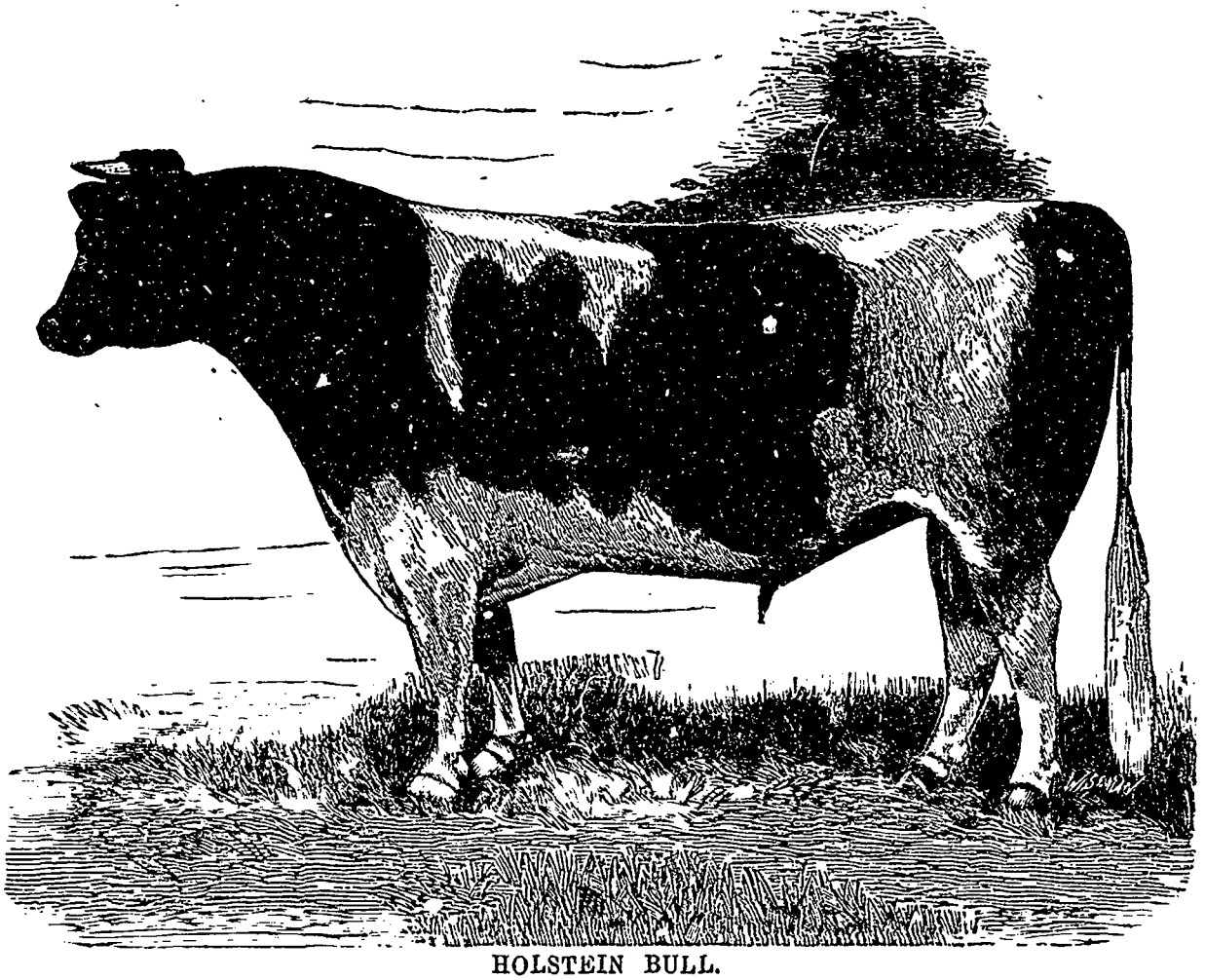
Really sterile lands may, with a little care, be converted into shrubberies (*bocages*). Where stone prevails so much as to make ordinary farming impossible, trees can always be planted, except where the bare rock crops out. Lastly, savannahs, bogs, where no possibility of drainage exists, may

(1) Here follows a long extract from a poem by Louis Veuillot, which, not being a poet, I must decline translating.—Trans.

be planted . the methods to be followed in these places I will describe farther on.

In the fourth category I place that part of each farm which forms the reserve of wood for the proprietor's use. Wherever wood has disappeared, each farmer should plant a few acres of trees. For the site of this plantation, he should choose that part of his farm which is least susceptible of cultivation. It is seldom that some inferior spot cannot be found on a farm. But even where the land is all of first-rate quality, it is still advisable to plant a piece of it to put an end to the scarcity of wood. Do not say that this is impracticable, the thing is done both on a large and on a small scale by our neighbours in the United States, and the results are most satisfactory.

The North West especially, which is rapidly filling up, thanks to the rush of immigrants which is approaching from all parts, will be covered with a vast network of roads which will require for themselves alone a greater supply of wood than all the rest of the Dominion put together. Now, the North West has not much wood. It is to the other provinces, already in difficulties for their own consumption, that the North West must look for supplies of the necessary material. It is time, then, before scarcity and ruin arrive, to set before our capitalists the example of certain companies in the United States. There, especially on the Pacific slope, the Americans have planted millions of trees to furnish sleepers and other requisite materials. Our companies should do the same, and do it at once. I am acquainted with cer-



HOLSTEIN BULL.

Under the fifth head, come the lands which are intended to furnish the rail-road timber—telegraph-posts, fences, ties, &c. Do not be surprised that I make a special class of lands to be planted for the use of rail-road companies, for they are, without doubt, the main cause of the ruin of our forests. It is by the million of feet that we must reckon the quantity of wood felled each year to supply only the ties and sleepers that support the rails. The sleepers last but a short time, and need, therefore, frequent renewals.

The marvellous development of our network of railroads, forewarns us of a time not distant, when we shall see the Dominion furrowed over its entire surface with iron roads.

tain parts our woodlands, in the neighbourhood of our earlier lines, which cannot even now furnish wood of the size proper for these requirements. And how will it be in twenty-five, in fifty, in a hundred years from this time? There will be scarcity, ruin, not only for the companies but for the whole Dominion.

In a sixth category of lands for planting must be placed the prairies of the North West. Every one knows that in Manitoba and in the great North West, there are large districts without any timber. A few miles of woodland along the rivers are the sole wood-resource of the colonist; but the quantity is very small compared with the woodlands of the

other provinces of the Dominion. For three principal reasons, it is absolutely our duty and our interest to sow and plant trees in these regions:

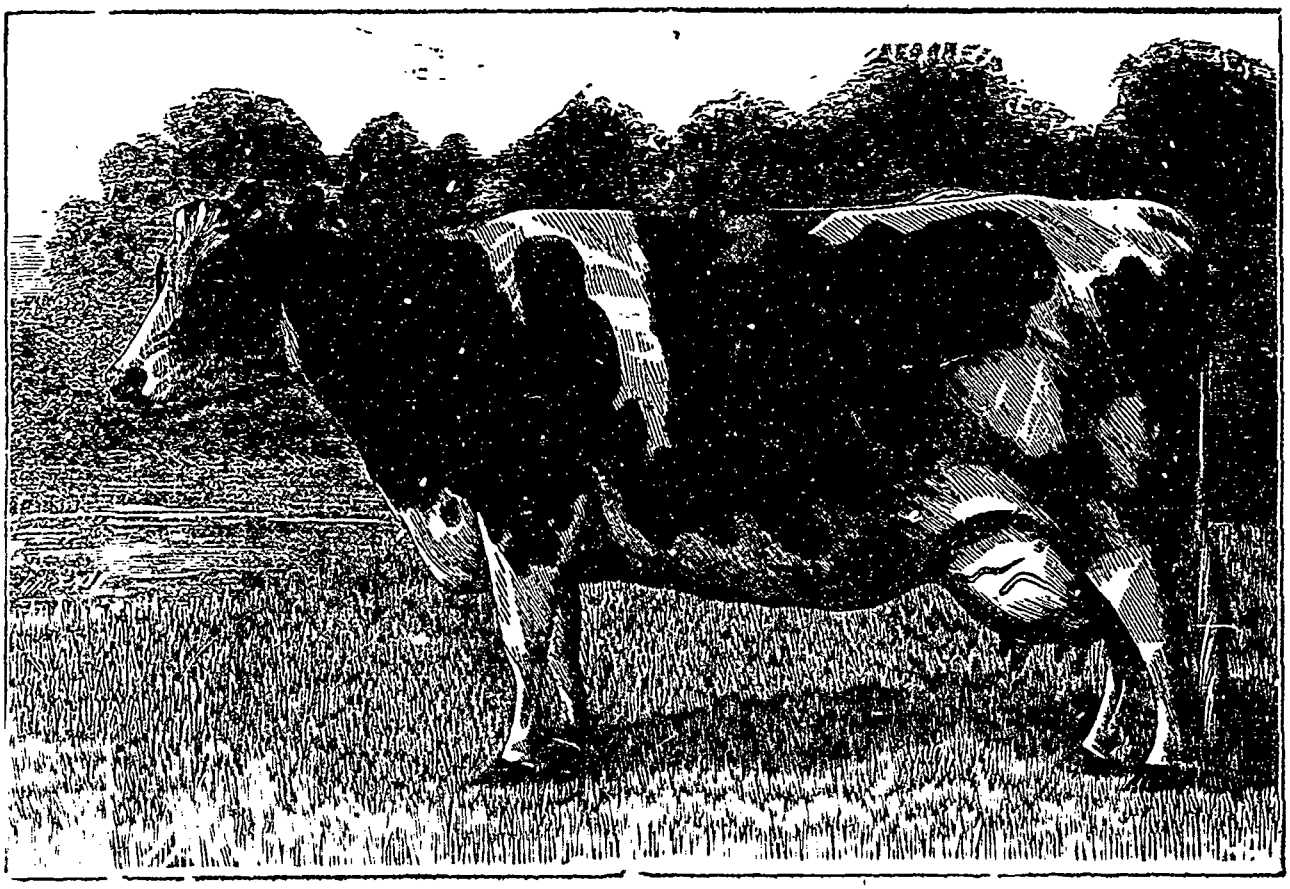
First, because wood is wanted for the firing and buildings of the population If wood is already scarce in the North West, what will it be when the present population has increased a hundred fold? It may be said with truth that, if things go on as at present, in twenty years from to-day there will not be enough wood found there to make a match-box. Their population is increasing in an inconceivable ratio, and the demand for firewood and timber increases proportionally. In this lies the danger, and a pressing one it is, of not being able to preserve the equilibrium which should exist between the expenditure of wood, on the one side, and capacity of production of the Canadian forests, on the other. It is, therefore, a matter of the highest importance that the planting of the proper districts of the North West should be set about at once and on a large scale.

The second reason why planting trees should be practised is furnished by the counsels of science. Meteorologists, whose occupation it is to determine the origin of tempests, and to give an account of their causes and effects, have shown that wood-denuded countries are exposed to terrible tornadoes at certain seasons, followed by hot, drying winds most injurious to vegetation. As regards the tornadoes, these are due to the freedom with which the wind sweeps over vast tracts of land where, for hundreds of miles, not a single obstacle is presented to its course. It is for this reason, that a wind, of no very great initial pace, finds means to develop into a terrific storm, if it finds nothing to impede its progress and its swiftness. On the other hand, the absence of trees causes the soil, which is always exposed to the ardent rays of the sun, to lose the moisture which the violent storms of which I have just spoken have communicated to it; and it necessarily follows that the land is exposed to the extremes of drought and wet, than which there are no two things more injurious to vegetation.

The third and last reason is suggested by the fact, that treeless regions are much more exposed than others to the periodic invasions of certain destructive insects, such as grasshoppers, of which the inhabitants of Manitoba have often had to complain. If to this be added the demands of *hygiene*—that the atmosphere should always contain a certain amount of moisture, and that trees should abound, here and there, in all countries, to serve as filters to purify the air from the quantity of putrid emanations it contains—my readers will be convinced that it is absolutely necessary to the well-being of a country abounding in prairies, that a judicious system of tree-planting in fit localities should be immediately put in practice.

From the French.

J. C. Chapais.



HOLSTEIN COW.

OUR ENGRAVINGS.

Holstein Bull. Holstein Cow. Fruit-drying apparatus.

DE OMNIBUS REBUS.

Hops.—Those who took my advice, and did not rush wildly into planting, will be glad of it. The price of hops has already fallen from $1.10 to 25 cents! If there is, as

prospects promise, a fair crop this year, they will probably go down to the usual average of 15 cents to 20 cents a pound. There is no royal road to riches in farming: steady, does it. A regular system of cropping; an equal distribution of stock year by year; so many couple of chickens; so many pounds of wool; a moderate-sized plot of tobacco; a few vines, a small orchard; these things kept going with care and regularity, will place the farmer in easy circumstances much sooner than a rush at sudden wealth by means of any particular crop, the price of which may be, for the time, abnormally high. We are not, generally speaking, sufficiently advanced here to embark, with any hopes of a successful voyage, in the cultivation of a plant which requires such special knowledge as the hop.

SHEEP AS DUNG CARRIERS.—"A plough-land must have sheep to dung their land for bearing corn. for if they have no sheep to help to fat the ground, they shall have but bare corn and thin." So spoke Bishop Latimer in a sermon preached nearly 350 years ago! He was the son of a tenant-farmer of those days, and knew thoroughly what he was talking about; and still, after all this lapse of time, the Englishman finds his "saw of might." I hear of only one man in this province who is really going in for sheep-farming: he, however seems to be well pleased with the profits he has hitherto made. Well, I still stick to my old story. Sheep, clay-burning, and rape, would change the face of the country in four years!

SOWING WHEAT:—A. R., in the "Country Gentleman," does not approve of Major Hallett's plan of growing wheat, which we published in the Journal for August. A. R. complains that to follow out Hallett's system cost him more than the crop return. Here, we see, for the hundredth time, the effect of taking only part of a system. Major Hallett uses a steerage drill, and a horse-hoe fitting the drill, and consequently gets through his cultivation very cheaply. A. R. was not likely to find hand-hoeing at American prices pay. Now, he takes off the coulters of his drill, thus converting it into a broad-cast implement, and buries his seed, "at a uniform depth of 4 inches," with a disc pulveriser, finishing the operation with a Scotch harrow, which, he says, leaves the surface of the soil, "not figuratively, but in fact, like a garden." Just what I should try to avoid: a good round clod is far better for autumn wheat than a pulverised surface. I would on no account bury the second crop, or any part of it, of clover for autumn-wheat.

The rotting of the vegetable matter must inevitably leave hollow places in the mould, and the roots of the wheat would as inevitably lose their hold in the spring when they found themselves therein. Our clover-leys, if intended for autumn-wheat, should be ploughed once only, with a skim on the plough beam, well harrowed, drilled, and the seed covered with a single or double stroke of the harrows. Here, however, autumn-wheat is not likely to find itself on clover-ley, as the pasture is too valuable to be sacrificed.

HARROWING GRAIN IN SPRING.—A gentleman says, in the same paper, that he has doubled his wheat crop by harrowing in the spring! A rather loose statement, as, unfortunately many of these are, but deducting half, it is still, as Voltaire says, "admirable." He has the same report to make of his oats and barley, which were harrowed after the grain was several inches high, but one piece he could only find time to roll. "The grain is not yet threshed," he continues, "but I am sure from the weight of the loads there is at least 33 0/0 more grain where the harrow passed, though the unharrowed piece was much the richer. The heads were longer, the straw stiffer, and the grain plumper."

This breaking of the spring-crust on all soils, light and heavy, is what I have been trying to persuade people to do for the last 25 years—not very successfully I admit. When farmers have once tried it, however, they do not seem inclined to give it up. The few blades destroyed in the operation are of no consequence.

HOPS.—Hop-picking has begun, and in most localities considerable damage from lice (and consequent mould) is reported In Canada, the general tenor of advices, however, is that the Canadian crop, on the whole, will be up to a fair average, both in quantity and quality. Some parties who have been through the principal hop districts, believe that the yield will exceed the average. The increase of acreage in the United States and Canada will go far to make up any deficiency in average yield, so that an average crop may be expected. England reports the crop in very much the same condition as here. Germany makes only favorable reports. The question of tare on bales of hops is prominent just now. Brewers propose to deduct seven pounds per bale. At a meeting of growers last week in Utica, resolutions were adopted opposed to the allowance of any tare, but the meeting adjourned to meet the brewers in Albany this week, when the question will probably be satisfactorily settled. It was also decided to ask some one in every neighbourhood to report the number of acres, boxes, and bales, last year and this, to B. D. Gilbert, Utica, N. Y. The statistics thus gathered are to be published for the benefit of growers. It was stated that the Pacific coast will harvest this year 30,000 bales more than will be used on that coast.

STANSTEAD, P. Q.—C. E. W. writes, August 29th, "the weather here the past summer has been cooler than the average. The hay crop is better than for several years. Wheat, oats, barley and rye are above average crops, and of very fine quality. Potatoes are not yielding as well as last year, but are extra in quality, with very few small ones. Butter is low; from 13 cts. for ordinary to 18 cts. for choice. Eggs, 17 cts. Stock of all kinds is high and scarce. Every mare that is available is breeding. The cross of the common mare and thoroughbred Percheron horse is very popular. Breeding for speed is a thing of the past in this vicinity. The frequent showers of the past month have started the second crop, and fall feed and everything are as green as in June."

I am delighted to hear of the improved ideas on breeding as noted above. When I visited Stanstead in 1880, I remarked how light and weedy too many of the horses were. Long, sprawling animals, with no middle-piece, and nothing but their heads and tails and a general showy appearance to to recommend them. I also remarked in the Journal (August 1880) that "I found the Stanstead men sensible of the defects of their horses, and only too anxious to get rid of the sort." It may be taken as an axiom in breeding that *weeds* never pay. Plenty of what I call *peacocky* park hacks may be bought for a mere song, but a good stamp, with power and gentlemanlike manners, will always fetch his $400 even in Montreal.

GAPES IN CHICKENS.—Stripped feathers and horse-hair loops may be all very well, but I believe in tobacco-smoke. Shut the chickens up, one at a time, in a little cardboard box, pierced all round with holes, and blow in tobacco-smoke as long as the little things can stand it. At my first trial, I cured ten out eleven patients, and I generalise therefrom.

ORCHARD-GRASS.—Somebody, who does not give his name,

wants to know how much seed of orchard-grass is required per acre. What a question? It might as well be asked how many shot it would take to kill a wild-duck. It all depends upon circumstances—in the duck-case, on the size of the shot and the part where it strikes, in the grass-case, on the condition and quality of the land. On rough, half cultivated soils four bushels of good seed will not be found too much; on well-managed, well-manured farms, two and a half or three bushels will do. Bush harrow it in with the grain in spring, and roll afterwards. If clover is to be sown with it, seven pounds of red or five pounds of alsike will be sufficient. I wish people would sow more orchard grass and less timothy.

BRITISH CROP PROSPECTS.—The Mark Lane Express, London, August 29th., contains crop-returns from 385 correspondents, representing every county in England, and seven counties in Wales. Reduced to percentages, their numerical significance is as follows:

1883.	*Wheat.*	*Barley.*	*Oats.*	*Beans.*	*Peas*
Over average...	9.1	34.5	34.0	41.6	22.5
Average.....	24.7	39.4	43.4	38.5	43.5
Under average..	66.2	26.1	22.6	19.9	28.0

In glancing at the remarks of our correspondents, we are struck with the frequent occurrence of, "blighted or mildewed." "Blighted" means defective from some cause or other, such as imperfect fructification or development of grain, or destruction by insects. Barley is in many cases said to have been much laid and knocked about by storms, and in others, to be wanting sun to ripen it properly. We fear the quality will be coarse, as a rule. The remarks on oats, beans and peas are chiefly favourable.

Similar reports from 477 correspondents, representing all parts of Great Britain, appear in the London *Farmer* of the same date, and show in percentages the following result:

	Wheat.	*Barley.*	*Oats.*
Above average	11.7	38 2	37.3
Average.....	25.0	42.1	35.5
Below average.....	63.3	19.7	27.2

The upshot of these returns is: that whereas the normal average wheat yield of England is twenty-eight imperial bushels per acre the yield this year will be 26.6 bushels; in other words, there will be a deficiency in the English crop of one and a half bushels, nearly, per acre. Knowing the English farmer as I do, and hearing of several who have forty bushels an acre, I am inclined to think that wheat will be quite an average. (1)

JERSEYS.—Is the Jersey furor all over already? At Mr. Ross' sale in Indiana de Brocq's *Glory*, for which $1,000 had been refused, fetched $90! Silvia's *Gilderay* sold for $40, Mr. Ross having paid $125 for her: *Longview Signal*, a handy and convenient name for a bull, for which an offer of $400 had been rejected with scorn, went for $190; *Angel Chief*, cost $200 in Philadelphia, and fetched $65; Le Brocq's *Prince* (come, that's reasonable,) brought in $70, $200 having been refused. Lastly, Cheneva, for which cow Mr C. Easthope of Ohio is said to have been willing to pay $1500, sold for less than one-half, $700!

NITROGEN.—Sir John Lawes and Dr. Gilbert have published a pamphlet of 60 pages containing an account of the examination of some of the experimental plots at Rothamsted, and on the bearing of the results on the question of the sources of the nitrogen of our crops. The essay on the question was read at the meeting of the American Association for advancement of Science in Montreal, last year. The experiments have been going on for more than forty years, and an enormous number of facts have been brought out bearing on the important question. whence do our cultivated plants obtain their supplies of nitrogen? The conclusion arrived at long ago by the two patient observers, Lawes and Gilbert, seems to be still unaltered. the soil rather than the atmosphere is the source of the nitrogen in plants; and a careful weighing of the argument on the side of those who hold that plants assimilate the free nitrogen of the air, is said to afford no conclusive evidence in their favour.

THE DAIRY has discovered that "cows will eat ripe tomatoes greedily!" No doubt about it, I have seen a cow take a bar of soap like a pill, and every one is familiar with Mark Twain's comparison of the conceited tenor's placid self-satisfaction to a calf's contentment in chewing a dish-cloth. But, for all that I don't think the discovery is of much value.

HEADS AND HANDS.—The question whether a farmer cultivating more than 150 acres of arable land should work with his proper hands, or devote himself entirely to the supervision of his men, is receiving a good deal of attention at the present time in the States as well as in England. It seems that, in the latter country, whereas the farmers of the southern counties have been terribly injured by the miserable weather of the past nine years, their brethren of the north, especially in the counties of Westmoreland and Cumberland, have escaped almost scot-free.

Their comparative prosperity has been attributed to the custom prevailing in the said district of the farmer and his entire family working with the hired men. To my mind, the argument is rather in need of support, for there are several reasons why the meat and dairy farms of the North should be more profitable to their occupants than the purely arable farms of the South. Our own family tenants have not suffered a great deal, as they are all cheese-makers, and a moderate return of rent has satisfied them—they employ no labour, but do all the work themselves, except in hay-time. But the Rural New Yorker argues the question philosophically, and comes to the conclusion that no farmer who employs two teams and four men has any business to meddle with manual labour.

The farmer must make a difference between his own work and that of his hired man, or he will sooner or later fail in body and in business. His man has but one subject to engross his attention, the work upon which he is engaged; but with the farmer there are many weighty questions to be considered. There are the arrangement and timing of his work. There is the subject of implements and machinery, of farm improvements, of rotation of crops, and of varieties, all important questions. Then there is the commercial aspect of his business, which he can certainly not afford to overlook. If he deals with these subjects wisely, he does well, without putting his own hand to the plough. He is a poor business-man whose head is not worth more than his hands.

There are doubtless farmers to whom moderate manual labor is a true pleasure. It is not work as a privilege, but work as a duty, that we are denouncing. The farmer whose mind is so large and whose farm is so small that the care of it is no burden, and who takes delight in moving his fertile soil and his golden grain with his own hands, is of all men the most enviable. But we all agree that such farmers are too few. We find many more who come to the shady

(1) More recent news confirms me in my opinion. The crop is decidedly an average, and the weather for getting it in is superb. Poor fellows, the farmers have a turn at last, and I am glad of it. There will not be more than 130,000,000 bushels of foreign wheat wanted to supply the consumption.

side of life with the back bent with toil, and the brow furrowed with care. It is for this class that these words are meant.

Holstein cattle.—Great attention was paid at the Exhibition last year to the small herd of cattle sent by Mr. Pierce of Stanstead. I find in my notes (see Journal for Nov. 1882) that I speak of them as "useful farmer's cattle with signs of great milk giving propensities, and if well finished at the end of their dairy career, likely to give satisfaction to the butcher." It seems that we are to have a furor excited in connection with this class of stock similar to the one that has apparently quieted down a little about the Jerseys. The Holsteins, Frisians, or Dutch cattle, for they are known by all these names, are large, with excellent forms, sleek skins, and pleasing colours. The engraving we give of the bull de Watergeus, by the bye, shows rather a hollow back, but the cow is as straight as a shorthorn. My own fancy is for the fine Yorkshire cow of the London dairies crossed with a pure bred shorthorn bull, *where the soil is good enough to carry such large cattle*, but as a combination of dairy- and beef- cattle, I should place the Holsteins next.

Forestry.—I beg to call the attention of the readers of the Journal of Agriculture to an article on the destruction of American forests, by Mr W. Little. The following extract from an editorial in the English magazine, *Forestry*, in which Mr. Little's essay appears, will give some idea of the estimation in which that gentleman is held abroad :

"Probably no name in the country, said an American journal, so long ago as June, 1882, 'is more familiar to those who are at all conversant with or interested in the subject of forestry than is that of William Little, of Montreal, who has made the timber resources of this country almost a life study. For years his fluent pen has been sending forth constant warning against the wanton and unnecessary destruction of the timber resources of the country. As a timber statistician he probably stands to-day without a peer."

All that Dr. Hoskins says in the Vermont Watchman is marked by good sense and sound judgment. In the present period of cattle-craziness the following paragraph strikes my fancy amazingly :

"As a general principle it may be affirmed that good yields of butter can be produced from any breed, and that frequently a common cow will yield as much and as good butter as one with a boasted pedigree."

A. R. J. F.

Preservation and Dessication of Fruit.

Some time ago, I spoke in this journal on the subject of the *evaporation* of fruit, or, if you prefer it, on a method of preserving fruit by employing heat to dry it.

A small pamphlet, the matter of which is extracted from "*Le Journal de la société centrale d'horticulture*," France, gives me another opportunity of saying a few words on the subject, and at the same time of presenting my readers with engravings of some of the machinery used in the fruit-drying process.

And, first, a few words from the pamphlet treating of the ripening of fruit and of its preservation in a perfectly natural condition :

"From the very moment when the fruit begins to form on the tree, it has to pass through a series of transformations which consist, first, when it is in green state, of decomposing carbonic acid and setting free oxygen, just as the leaves do. When the season of ripening approaches, the colour begins to change, the extent depending upon the sort of fruit, and varying in depth according to its situation as regards the sun. A slow combustion (Is this what Liebig calls *eremacausis* ? Trans.) takes place in the cells, which drives off the acids to make room for the sugar, and it is at this moment that, after taking certain now well-known precautions, the fruit intended for preserving must be gathered. Then, after having carefully wiped the fruit, it should be placed in a chamber where it will be safe from the three great promoters of vegetation : heat, light, and moisture. Too much moisture rots the fruit ; too much draught wrinkles it ; too much heat hastens its ripening ; frost breaks the liquid cells, and injures the appearance and flavour ; but this is an old story. It is enough to describe what is the object of this note, namely the method of preservation pursued now-a-days on a large scale in the United States."

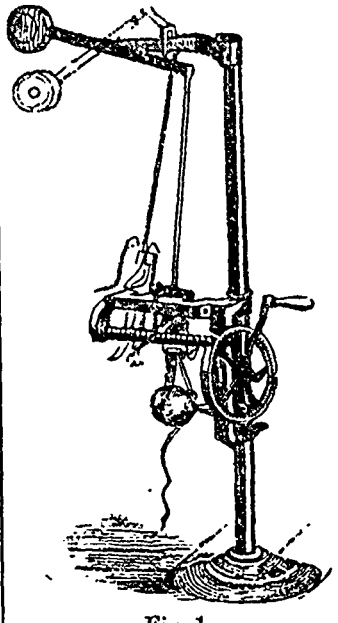


Fig. 1.

"There, as elsewhere, the first attempts were made in an ordinary oven ; then, after trying other means, a system of rapid evaporation was pursued, by which a current of hot air was passed through layers of fruit, taking with it in its passage the watery particles, and leaving the flavour and perfume peculiar to each sort."

In this place, the author of the pamphlet mentions Appert's method, which consists in preserving fruit, etc., *in vacuo*, and describes its inconveniences: the immense boxes necessary, the tinning, which latter, often carelessly done, causes poisoning, and the cost of the whole, which makes the price very high ; and he continues :

"When quick work is desired in wholesale operations, what is called in the United States *evaporation*, but with us *desiccation*, is the best plant to follow. By this, the fruit preserves its original colour, taste, and odour ; it forms a sort of natural envelope or artificial bark over the fruit, by which the saccharine principles are confined, just as nature itself treats dates and raisins, which are sun-dried in their primitive skins. To prepare evaporated fruit, it should be steeped in water for some hours before cooking, which may be carried out in the same way as with fresh fruit. Vegetables may be treated on a large scale in the same way. But the advantage of

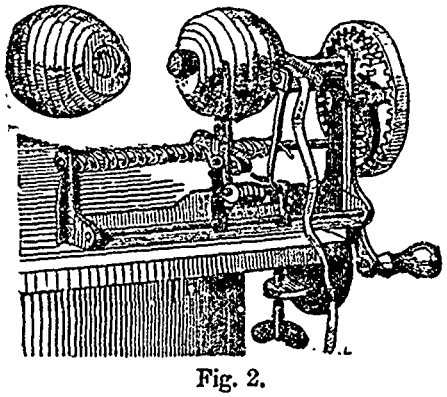


Fig. 2.

the process is that fruit of the second or third quality may be employed; it can be practised any where, and at all seasons, in Northern climates, and it works extremely fast, while drying in the sun can only be done slowly and in Southern countries."

After presenting a few considerations on the small space occupied by fruit and vegetables dried for exportation, and on the immense quantity of preserves making annually over the whole world in different ways, the author proceeds to describe the *evaporators:*

"Let us see, first, what the American evaporators are; we will then describe the different machines made for the pur-

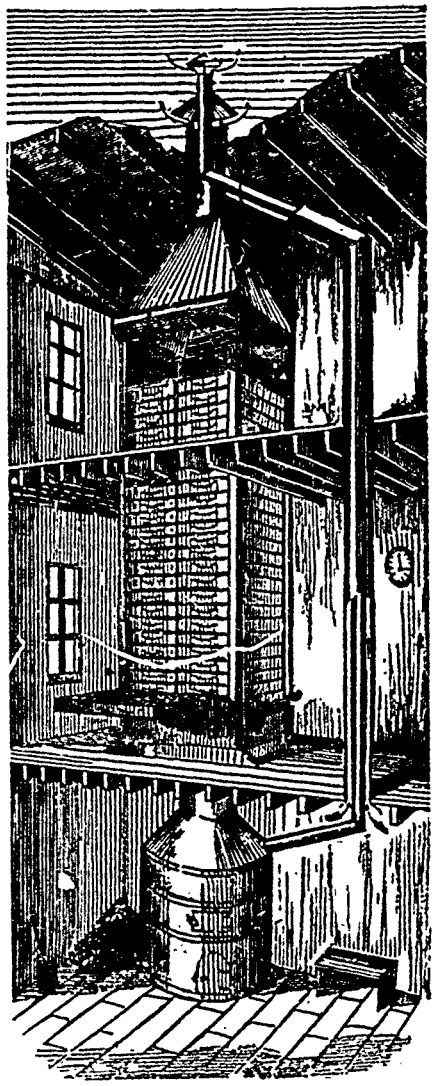


Fig. 3.

pose of peeling, coring, and slicing the apples. The engravings 1 and 2 show the apparatuses most in use. With these, eight or nine bushels can be prepared per hour, and the peels, cores, etc., are sold for converting into cider or jelly. In this way nothing is lost, and the waste products need not pay the cost of a heavy freightage. The next step is to place the apples on the evaporators.

"Among these, one of the oldest and most generally used, is Alden's, which came into notice in 1869; it is preferred in most large establishments. Then comes Williams', which consists principally of a square box, 33 to 40 feet high, by 4½ to 6½ feet wide. Inside this is a partition separating two columns in which circulate trays (*claies*) of galvanised iron wire, distinct from one another, but united to a roller round which passes an endless chain. Through openings at the sides, trays filled with fruit are placed in the lower part of the box, one under the other, directly above the hot air apparatus; the trays are raised successively, and return down the other column, whence, when done, they are withdrawn more or less quickly in proportion to the heat of the fire and the amount of evaporation desired.

Engraving 3 represents another evaporator on a large scale and its use is too self-evident to need description.

"Besides these large fixed apparatuses" continues the author, "intended for the more important farms, and which are sometimes carried on by companies, as we do in France with wine-presses and harvesters, portable evaporators are made of galvanised iron, through the middle of which passes the stone-pipe, the heat of which is utilised both for desiccation and for the ex raction of the watery vapour through a double pipe which may be observed in the engraving. These

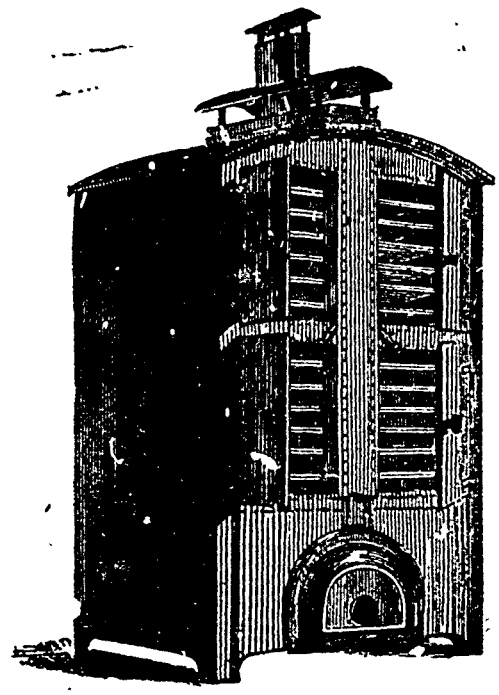


Fig. 4.

dryers, or evaporators, are portable, and can be stored anywhere when not in use. They answer for drying all sorts of fruit and vegetables." (see fig. 4).

The author adds that, in the United States, the evaporator has its place in every farm just as the fanning mill and the mowing machine. To which I add, that it ought to be so here in that region of our province where flourish those fine orchards which give such abundant supplies of delicious fruit. We have no great quantity of winter apples. The celebrated Fameuse, so plentiful a bearer, and so fine in quality, has the grave defect of hardly keeping good after January, and our summer apples, so numerous in variety, cannot be largely planted, as they cannot be exported, and their season, even in our own market, is very short.

Thus, the evaporation of fruit, it seems to me, is an industry that ought to be encouraged, and it will furnish us with the means of sending, under a new but most acceptable shape, the products of our orchards to the markets of foreign

parts. The idea deserves serious attention, and it is to be hoped that some of our manufacturers will hazard some small amount of capital to start this industry into life. It is a new enterprise in our province, but one full of promise, as regards profits, to our farmers.

From the French. J. C. Chapais.

CORRESPONDENCE.

Cowansville, Que.

Dear Sir,—Your exceedingly valuable letter, for which I am very grateful, is most carefully studied, and I now continue my subject for your kind advice.

The plan of my hundred acres is *sixty acres* good meadow, off which I drew hundred and sixty loads (double team) of hay, which I calculate at three quarters of ton per load, thus making *hundred and twenty tons*. (It was a bountiful harvest, and we saved it well—whilst on this subject I will make a digression—when in your opinion is the most advantageous period to cut clovers and grasses? I have been led to believe when the clover "flowers," or at any rate during the week it flowers, and grasses when the heads are fully formed, and the straw of the stem just turned yellow below the flower. Is it the best to cut hay thus early?) Add to sixty acres meadow, twenty five of pasture, and five for roads, house, garden, barns, stables, yard &c., and ten in crops, as per plan on the other side:

No	ACREAGE	LAST YEARS CROP.	MANURED WITH.	THIS SEASON CROP	MANURED WITH FOR	CONTEMPLATED NEXT SEASON CROP.
1	2	Buckwheat (on the last cleared piece)	30 loads good manure	Barley	(and seeded down)	Meadow hay.
2	1	Potatoes (on fairly rich land)	No manure	Oats	and seeded down)	Clovers.
3	1	Turnips (on fairly rich land)	No manure	Oats	and seeded down)	Meadow hay.
4	1	Mangolds (on same land)	25 bushels ashes	Wheat	(and seeded down)	Meadow hay
5	1	Greensward (on high sandy loam)	15 loads good manure	Oats	15 load hog manure)	Corn.
6	1	Greensward (on average loam)	Old cow yard	Oats and peas	5 do do with 200 lbs superph	½ Mangolds. ½ Turnips.
7	1	Stable (average loam rather low)	15 loads hog manure	Corn	(15 loads old manure)	Potatoes.
8	1	Corn (same land as above)	15 loads good manure	Potatoes	15 loads old manure)	Wheat and seed down.
9	4	Barley (on sandy loam gentle slope)	10 loads good manure	Fodder corn	(15 loads old manure)	Barley and seed down.
10	1	do	15 do do	Mangolds and carrots		
	10		80 loads farm yard. 15 loads hog manure. 25 bushels ashes			

My pastures are on the banks of the river, and the water in spring and fall flows over some good portion of them.

As soon as the crops are off the three acres meadow marked on the plan * I contemplate spreading on each acre ten loads of well rotted manure. My covered manure shed receives the cows' and calves' manure (I bed with old straw) which I have evenly spread about once a week, when I draw in and scatter over evenly the manure from my three horses. Two hogs in the summer, and four during winter, occupy a sty which leads into one end of it, and thus have the run of this manure shed. I keep four pigs in pens by themselves to make me good manure for my corn and roots. Now I wish to follow out your advice in growing green crops, but all my pasture is distant from the barns and yard; but around and behind the barns I could conveniently convert three acres into "permanent soiling-crop ground," taking care to manure it as you suggest with, say, ten loads of old farm-yard manure yearly per acre, in addition to a hundred pounds of nitrate of soda and two hundred pounds of plaster per acre. Would such a rich dressing be requisite yearly? or how often? If I commence this fall with one acre of rye, and sow from three to four bushels per acre during September, giving ten loads of manure, at what stage should I cut it in the spring, and with what crop should I follow it to bring it ready to sow winter rye again next fall?

Clover this year I shall cut from my no 2 new meadow, as on plan, after early in spring spreading on, say, a hundred pounds superphosphate and hundred pounds plaster, mixed, and *again* the same quantity after *first* cutting, preparatory to sowing wheat with grass seeds as you suggest. (You say ten pounds of seed, five pounds timothy, three red clover, two alsike—or *ten pounds each*? In England they sow up to forty-five pounds per acre, but round here any random quantity. I send a sample of grass seeds which is supposed to consist of twelve pounds timothy, five pounds red clover, and three pounds alsike, of which I have about eighty pounds;) next year treat the two half acres, nos 9 and 10, the same manner.

Or for soiling crops, would you approve of my sowing this autumn—one acre (four bushels) of—

Italian Rye Grass (*Lolium Italicum*) with ten loads of good farm-yard manure, and apply hundred pounds nitrate of soda after every cutting—I believe this could remain down two years, and give four or five cuttings each year!! Then, as early as possible in spring, put in on another piece three bushels of tares with one half bushel of oats; put on twenty loads of manure early in spring and leave stale furrow for seed—might a crop of turnips follow this, and how late could they be sown? put in one half acre in another field, to follow this, of Western soiling corn, and by then, fall feed would be ready.

Would you advise my trying a crop of lucerne? I have a deep, dry, light soil suitable for it. I purpose putting in about twenty four pounds per acre as soon as possible in spring. They say it will remain seven or eight years; and can be cut from four to six times a year!!!

Your correction in my rotation I will adopt. My plan at present is to have my cows brought up from the pasture to the cow-yard at six p. m, to be milked, after which they receive a ration of fodder corn, and remain in the yard until six a. m., the next morning, when they again go to pasture.

In addition to my soiling-crops do you advise a grain ration of, say, two quarts crushed barley, Indian corn, oats and peas, either, or a mixture of all? or would one or the other, either green crops or grain, be sufficient?

Could I then put my cows in the stable every evening during summer, putting the grain and green food in their boxes every night before milking, and thus do away with the necessity of a cow-yard?

Young cattle would have to rely upon green food being carried to their pasture during summer, and receive one quart of ground corn.each,during winter! I observe you do not mention carrots or roots, and from my experience this year I fancy they are a very expensive crop to raise, although we are having a very promising crop.

I keep rock-salt at all times within reach of my cows, horses and young stock: is there any danger of their partaking too freely? I think not. I presume a n° 2 grain crusher, as supplied by Wm Evans, Montreal, costing $42.00, would suit me. Are oats crushed more nutritious and acceptable to horses?

This brings me to another great point.

Do you recommend cutting all hay and straw for horses and cattle the year round—say ⅔ hay, ⅓ straw, cut into one inch chaff, damped, mixed with meal, and fed just when heated a little. Is it more beneficial to all classes of cattle,—or is it good for fattening only, or for growing beasts?

About twenty-eight pounds hay or mixed chaff is an ample daily ration, I am led to believe, but I have never as yet weighed my feed given either winter or summer.

I infer from your remarks that when the *cows* are off the pastures the grain ration might stop—would it push the young cattle on to continue to them a little throughout winter?

Thanking you sincerely for your kind promise of attention to my letters, I am yours truly, H. T.

P. S.—I am writing to Montreal requesting my name to be taken as a subscriber to *The Illustrated Journal of Agriculture;* which I am sure I shall find useful.

Of what fertilizing value are wood ashes? if of any, on what crops do they pay the best, and in what quantity should they be applied?

Are nitrate of ammonia, and nitrate of soda the same?

Should they be mixed with the plaster, and spread at time of sowing, *with* the manure for green crops, or put on when the crop appears above ground, and after each cutting?

I trust I do not exhaust your patience, but I wish to thoroughly master these details.

REPLY.

Clover should be mown when the majority of heads have come into bloom; and the rule holds good for all other grasses. If you allow timothy &c. to stand till the stem below the head turns yellow, you will find that the starch has become converted into woody fibre. In this province, thousands of tons, which were fit to cut in the last week of June, were still standing on the 7th of August. The damage was something enormous.

I don't like the idea of "permanent soiling-crop ground." It will, like a hop-garden, gradually absorb more than its fair share of manure. Shift from place to place every year; it will pay better in the long run, and the successive crops of different sorts will be more likely to utilise *all* the constituents of the manure than soiling crops constantly repeated.

Italian rye-grass I have grown a good deal of in the South of England, but I doubt its succeeding in this country. I don't think it would stand the winter. Try it first on a small scale.

Lucerne is a most valuable crop here, but, from experience, I doubt its standing more than four years Your soil is the very one for it, always provided that it is not kept damp by trees. Sow twenty pounds, broadcast, and, the second autumn, when the roots are well down, harrow freely. Top-dress with rough manure the first and every subsequent autumn; v. Journal vol. 1, pp. 21, 47. If the land is good, it may be cut, in fair seasons, by June 1st.

A grain ration for milch-cows is, in this country where the pastures give out so soon, almost indispensable. Try pease, corn, and linseed, mixed; one of the last to five of the two first together.

Stables are too close for cows in summer. Why not have a cheap shed, with food-boxes, in the pasture?

There is not the slightest fear of cattle licking up too much rock-salt; especially as, on your plan, they can take it at will.

Carrots are splendid food for all kinds of stock, but the thinning out costs a small fortune. A hoe three inches wide is a handy tool for this work.

Crushed oats are better than whole oats as they are more certain to be digested.

The benefit to be derived from chaffing hay and straw (your proportions are quite correct) is that the animals are not so likely to waste it, and it saves them work, i. e. expenditure of food. But where labour is so high and food and the products of the cattle, meat and dairy-stuffs, are so low in price as they are here, I should not like to recommend cutting all the hay and straw into chaff.

I should not stop the grain-ration as long as the cows were giving milk. There is great danger in checking young cattle when they are brought into the yards in the autumn.

Wood ashes are good for grass-land, turnips, potatoes, and generally for all crops. Besides the potash, they contain a notable proportion of phosphoric acid, in which the ashes from the *beech* are peculiarly rich. The *climate* is different here, but the *great facts* of agriculture are the same as in England. In the answer to your first letter, *nitrate of ammonia* was a slip of the pen. *Nitrate of soda* was meant. The sulphate of ammonia and the nitrate of soda should be mixed with the ashes and plaster, sown broadcast after the dung is ploughed down, and harrowed in with one stroke.

I have answered your questions as concisely as possible, my dear Sir, but if I have not been explanatory enough, pray say so. You evidently inquire for information's sake, and I shall always be extremely happy to aid you in any way. Very truly yours,

ARTHUR R. JENNER FUST.

TO THE EDITOR ILLUSTRATED JOURNAL OF AGRICULTURE.

In your issue of this month is an article on "winemaking," on which I should like to put a question or two for further elucidation.

The seventh paragraph opens by recommending, for fermenting purposes, "the covering of a tub or barrel with "grooved and tongued boards fitted so tight, with a coating "of plaster &c., as to exclude air &c."—Why should not a tight cask be used at once and save this difficult operation?

Further on it says. "A hole,eight or ten inches in diameter is "to be made in the cover for the admission of the "must," and "hermetically sealed when the must is all put in; and then "it goes on to say, that if fermentation be sluggish, a small "quantity of the "must," heated to about 150° F. will "quicken it"—Pray how is the sluggish action of the "must" in a hermetically sealed vessel to be discovered? Is the plaster-covered top to be broken through to ascertain? Or does the bubbling of the gas through the tube, recom-

mended to be inserted in the top and conducted to a vessel containing water, give the indication?

Twelfth paragraph says: Wine improves by age *up to a certain point*. Does this mean that it arrives at a ne plus ultra of perfection after a given time, and remains at that standard thereafter—or are we to understand the author as conveying impression that it deteriorates after a given time.

Information on the above points in your next, will oblige a subscriber.

Montreal, 12th September, 1883.

M. Chapais, the author of the article on wine-making, insists most positively that the vat cannot be too hermetically sealed. Mr Ferguson, of Pointe Claire, on the other hand, uses an ordinary cask with a tight bung in which the bent tube is inserted. My own ideas on fermentation in general, derived from long study in my own brewery, I will give in a future number of the Journal. The Italian wines, I learn, *from what I saw myself in that country, and the Cavaliere* Gianelli, Consul for the King of Italy, confirms me in my recollections, are all made in open vats, in which they remain about fifteen days before racking. The bubbling of the gas in the water vessel should indicate the amount of activity in the fermentation, but I imagine the real test would be the continuance or cessation of the attenuation, i. e. the loss of gravity.

Wine improves by age up to a *certain* point and then after remaining at that point for an *uncertain* time, degenerates, loses flavour, the colour vanishes, and the wine becomes flat and effete. For instance the port wines of the vintages of A. D. 1808, 1811, were in splendid order in 1830; 1808 remained so till the last bottle was drunk in 1838, but in 1835 what remained of the vintage of 1811 was *gone to water:* colour, flavour, and life had all vanished. The vintage of 1820. was not drinkable in 1840—I remember well tasting it in that year, it was a very fruity wine. In 1853, I drank a great deal of it at a house in Cambridgeshire, and it was superb: at a sale at Reading that year it fetched a guinea a bottle! The vintages, again, of 1834 and 1837 differed marvellously from each other in keeping quality—both were good.but any judge could have told, from the taste, that one would keep and the other would not. Canadian wines require an immense amount of study in their manufacture before embarking capital in vineyards. I confess, judging from the few samples I have tasted, I should expect them to turn sour before ripening—*body* seems wanting.

A. R. J. F.

Lambhood to Wetherhood.

Hampshire Downs.

To the Gazette:

Your correspondent "Ottawa" struck the key-note when he asked the question, "Which is the best mutton sheep, always ready for the knife from early lambhood to adult wetherhood?"

Premising that they are to have good rational keep and to be run in flocks of say 200, he wants a rough-and tumble, out-of-door, take-care-of-himself sheep. Friend Bowman, in your issue of July 26th, speaks highly of his favorites, the Southdowns, and without wishing to detract one particle from the justly-merited good qualities of that royal breed, I wish to ask (and to my own satisfaction answer) the question. Is there not a breed that combines all of the good points of the Southdowns, such as early maturity, quality of mutton, capability of taking care of itself, prepotency, etc., etc., together with a good paying fleece of wool, a point in which the Southdown is lamentably deficient?

Some five or six years ago the Hampshire Downs were introduced into this part of our State by gentleman who had been tenant farmers in England. They were so partial to them that I was led to acquaint myself with the breed, and, in my opinion, it is the very one that we Americans at this particular time are looking for, viz., one that will give us heavy mutton of the *best* quality, together with a fleece of wool that will, under ordinary circumstances, pay for the year's keep of the animal that grows it, with oftentimes a balance to the credit side. Having become convinced that this was the breed I was looking for, I made some purchases. Each year I liked them better, and last year added to my flock by two importations from England.

I must differ with Mr. Bowman, when he says the hardiest of all English breeds of sheep are the Southdowns. The Hampshire lamb when he is born is the strongest, hardiest, toughest specimen of infantile sheephood that it has ever been my good fortune to see, and so he continues through *life, asking odds of no one, but growing from the hour of* birth to his maturity.

I affirm that a Hampshire lamb will outweigh a Southdown from the hour of its birth to the time it meets the butcher's knife. Mr. Bowman compares the Southdown to the Shorthorn. Without wishing or intending any disparagement, I would compare the Southdown to one of my favorite breeds of cattle, *i. e.*, the Devon, and the Hampshire to the Short-horn.

As to quality, it is a noted fact that at Islington market the butchers always leave the heads of their Hampshire lambs and mutton on the carcass, so that the connoisseurs among their customers may be certain of getting their favorite breed. For weight I refer you to the tables published in your issue of January 4th of the sheep exhibited at the Smithfield Fat Stock Show. The Downs all herd well, but I doubt if there is any breed which, in England, it is customary to run in as large flocks as the Hampshire. Certainly in flocks of 200 they would do equally as well as the Southdown. As to their wool, it is finer, longer in staple and much heavier, and another point, at the same time it is compact and dense, without any of the drawbacks of the long wools.

My yearling Hampshire rams averaged me thirteen pounds, and my two-year-old ewes eight pounds; one owe yielding eleven and a quarter pounds, all of which was free from dirt, tags, clipping, etc., and this wool is of a quality now most in demand and bringing the highest price in market. So that my advice to "Ottawa" would be, get Hampshire Down rams, cross them on your common ewes, save your ewe lambs, and thus raise a flock of sheep that will give you all the good qualities of the Southdown, with more weight and a handsome clip of wool.

WM. L. BRADBURY.

The publishers of the *Farm, Field and Fireside*, Chicago, are meeting with great success in securing subscribers to their publication. In addition to furnishing an excellent paper at the low price of 50 cents for six months, they propose to distribute $40,000 in presents to their readers. See their announcement in advertising columns.

The Ranches.—Dr Mr Eachran has just returned from the North West, with the bronzed and healthy look of a true Highlander. He has just set going the *Walrond ranche:* capital $500,000! Five thousand head of cattle are already on the spot, and it is intended to raise the number, gradually, to fifteen thousand. Sir John Walrond, of Collumpton, Devon, is the principal stockholder. Articles from Dr Mr Eachran's pen will appear in the Journal regularly throughout the winter, whereat the present writer rejoices.

Horticultural Exhibition.

It is not too much to say, that the outdoor grapes and the apples at the show this year were astonishingly fine. Not ripe, most of them, but that was the fault of the season not of the growers. Mr Graham's, of Ottawa, collection of grapes (o d) was really wonderful, and Mr Pattison, of Clarenceville, was not far behind him. I got one good point out of the assembly of grape-growers, viz, that the *Champion* grape is emphatically the most *trustworthy* of all the kinds cultivated in the province, the earliest, the most prolific, and decidedly the hardiest. The flavour is, of course, to a certain extent, objectionable. This is the verdict of such men as Messrs. Graham, Pattison, Wm Evans, Fiske, and Charles Gibb The pseudonym "Beaconsfield," was, happily, absent, but I regret to see it appear in the *Minerve* of the 18th September I should really have thought that, after the public exposure of the fraud in this Journal, and the remonstrances which I have so often made privately to the principal vendor of the vine, shame, if no other motive, would have caused the withdrawal of this utterly false epithet.

The flowers were neither abundant nor striking. Many of the usual exhibitors were not represented. I observed a marvellously well-grown Begonia rubra, very well trained—the flowers placed with almost mathematical accuracy. The usual Geraniums and a few good bouquets. Of course, the season has been dreadful all through.

Melons very poor, not many vegetables. I saw a few *artichokes*, from Mr Jesse Joseph's garden—the first I have met with in Canada. I hope to eat them for dinner on Saturday—*tous à l'huile*. A. R. J. F.

Montreal Horticultural Report.

This report for 1881-82 is just issued, and is full of most valuable information. It embraces Mr. Charles Gibb's report upon Russian Apples, heretofore noticed at length in these columns, and another report by the same critic on the Seeds and Shrubs of Northern Europe and Asia. Mr. Gibb was accompanied on his Russian tour by Professor Budd of the Iowa Agricultural College, and the professor's report is also given, covering the same ground, with much of interest in addition. Professor Budd also gives a paper upon, Not Well Known Trees and Shrubs, that is very useful. Heinrich Goeggringer of Riga, Russia, contributes a paper upon the Fine Fruits of that country, while A. G. Tuttle of Baraboo, Wisconsin, gives his experience with Russian apples. Taking all these in connection with the paper of Aaron Webster, of East Roxbury, Vt., on Russian Apples, in the previous report of this society, the pomological student will find about all that is now known on that subject, collected in an accessible form. These papers give a much more favorable idea of the probable usefulness of Russian fruits in the colder parts of America than has heretofore been held. The inferior quality of many of the Russian apples imported by our department of agriculture in 1870, and the fact that nearly all of them were early varieties, has tended to prejudice growers against that class of fruit. But, as we several times before have remarked, it is not likely that, out of over two hundred sorts of American apples taken at random and exported, say, to New Zealand, more than half a dozen would prove valuable there. Yet that half-dozen might be very valuable indeed. Besides the early kinds (and of these some ten or more are very useful for the cold North), there are undoubtedly some long keepers among the Russians, that are valuable both for home use and for market. Among these we have fruited "Longfield's Apple," very similar to Fameuse in size and appearance, very productive, keeping well until March or April. Another is Borsdorf (No 402 of the department list), which is larger than Longfield, and a much longer keeper, being really a spring rather than a winter apple. We put it with Ben Davis as a keeper, while it is considerably better in quality, with a much hardier tree. Another Russian that is a long keeper is Little Seedling. Notwithstanding its name this apple is not very small, while the tree is very productive, and the fruit keeps until apples come again. The quality is pretty good. These kinds show that there are long-keeping Russians that are already here, while the remarks of Messrs. Gibb and Budd have revealed still better apples of this class in the Antonovka, and the varieties of Anis, and perhaps, in the Arabska and some others. When we get to growing these hardy apples in America, there will unquestionably spring up a class of seedlings from them, perhaps crossed with our own apples, that will be likely to have among them sorts more valuable in the far North than either.

But the researches of Messrs. Gibb and Budd were not limited to apples alone. The pears, plums and cherries of Russia are likely to be quite as valuable in our colder sections as the apples, and to become also the parents of new sorts still better suited to our wants. We shall await the propagation and dissemination of these, therefore, with the warmest interest.

Besides the articles above mentioned, this report contains a valuable paper on the Principles of Successful Orcharding in the Province of Quebec, by R. W. Shepherd, Jr., an experienced orchardist, whose teachings are as valuable for northern Vermont as for Canada. The report concludes with the reports of five auxiliary county societies, all of which are of a practical nature and worthy of study. There is no price attached to these reports, but we do not doubt that fifty cents forwarded to Henry S. Evans, secretary of the society, Montreal, would secure a copy. We are especially pleased to note that the Montreal society never had so large a number of contributory members or was so successful in every way as at this time. We wish that the fruit-growers of Vermont could be persuaded of the advantages of such an organisation for themselves. *Dr Hoskins, in Vermont Watchman.*

Hints on Tobacco Culture.

Eds. Country Gentleman—At a recent meeting of the Chemung Valley Tobacco Club held in Elmira, a member asked when he should cease cultivating the tobacco. The query elicited a discussion on the subject which brought out some suggestive points. Mr. Chamberlain said he would not stop the work until the buds of the plants had formed above the top leaves. He would not allow the cultivator to run very near the plants, and each time he passed over the piece, he would narrow off the cultivator teeth a little to prevent mutilation of the lateral rootlets. He had cultivated his tobacco nine times and was not through yet.

Geo. W. Hoffman stated that he has the notion that tobacco, like corn, should not be cultivated when advanced to the stage of blossoming. He had yet to be convinced that nature can be improved upon by mutilating the roots of growing plants, unless it is desired to hasten maturity. Mr. Chamberlain thought there is no danger when breaking the roots previous to the time the buds show themselves, provided care is exercised in the work. He said he is confident that frequent and deep cultivation is one of the secrets of success in producing a good yield and quality of tobacco. It was generally conceded that cultivation could hardly be too thorough for the good of the crop, especially in soil liable to "bake," and in dry weather.

A brief discussion on the subject of "topping" tobacco resulted in general agreement that early topping or when the buds first made their appearance, is of considerable importance. High topping was recommended for the hybrid varie-

ties, as it prevents too large growth of the lower leaves. Mr. W. W. Albro said. "I have to-day visited a crop of tobacco which was topped two weeks ago. The plants were topped very high—or what would generally be considered too high for seed leaf tobacco—but now the top leaves are nearly as large as any on the plants." John Strauss had topped some hybrid tobacco about ten days before, very high, as he thought at the time, but upon looking at the plants that day he decided that he had topped too low, as all the growth appeared to go into the top leaves. G. A. Goff, Jr., thought, in regard to high and low topping, that very much depends upon the stage of growth which the plants have reached at the time. He is convinced that it is a mistake to allow any tobacco plant, not intended for seed, to produce blossoms, and in his own practice he said he makes it a rule to allow no blossoms to appear. He argued that all growth which a plant is allowed to make above the point were the top is to be broken off is waste of strength to the plant. President John D Miller said there is no question that all unnecessary growth which the plant makes before the topping is performed, is a waste of plant force. "Early topping," he said, confines the entire strength and growth of the plant to the leaves which make up the crop."

It was thought by several members that it is a common mistake to allow tobacco to stand too long after topping before cutting. It being somewhat difficult to tell when the crop is in the best condition to harvest, inexperienced growers are liable to the mistake of allowing the plants to remain in the field until the leaves become so ripe that the quality of the cured product is impaired. A fine, silky leaf is generally preferred, and this quality is best secured by allowing but from two to three weeks to elapse between topping and cutting the crop

Several of those present at the meeting reported having experimented this season with wheat plowed down early in June for green manure for tobacco, and thus far results have been wholly satisfactory, giving a good color and growth to the plants. Wheat is considered preferable to rye as a green manure crop, because it is of a warmer nature and decomposes quicker. A case was reported of rye turned down in spring, which had remained in the ground through the greater part of the summer without the straw becoming rotten, and causing, as was thought positive damage to the crop. Commercial fertilizers were generally considered unsatisfactory, and one member reported having bought some dried blood which, on being washed out in water, was found to be composed to a considerable degree of tan-bark. Another fertilizer on being washed out proved to be made up in part of common sand. However, the latter was found to give good results when used on cabbages. G. A. G. JR.

Elmira, N. Y.

Care of Sitting Hens.

EDS. COUNTRY GENTLEMAN—Although rather late in the season to be of practical use for this year, I venture a few hints which some of your readers may find of benefit at some future time. We often read of disappointment by persons who purchase eggs for setting, sometimes to be carried far by express or other transportation, or nearer, where no fault in hatching can be laid to injury in transit. There are several reasons why eggs fail to hatch, such as failing to be properly impregnated, want of care in gathering, and keeping after being gathered, proper attention to hen and eggs during incubation, &c. If one keeps more than one breed he should keep them entirely separate. Strong vigorous cocks should be kept in not less proportion than one to ten hens. The nests should be shallow so that the hen in going on and off need not disturb the eggs, which should be gathered often.

When the eggs are gathered they should be carefully handled, placed in a suitable dish where they may lie without being piled one on the other, and can be carefully turned daily. They should be kept in a room of even, low temperature, never in a cold or damp cellar. Better keep them out of any cellar, judging from my experience. The eggs ought not to be kept on hand over a week, at most two, before being put under the hen. If eggs of different breeds are put under the same hen it is well to mark them with ink to distinguish the sorts. The number of eggs to put under a hen depends upon the size of the hen, season and weather. In cold weather nine eggs are sufficient for any of the medium breeds, and eleven for the larger. In mild or warm weather the same hens will manage eleven to fifteen. In cold weather the nests should be in a building which can be kept comfortable, and the hen should have food, water, and dust bath, so that she may not be off from the eggs long enough for them to get chilled.

It is well, unless the hen can run out to get her feathers moist, to sprinkle the eggs with lukewarm water after the hen has been sitting a week or ten days, and every time an opportunity occurs thereafter. If an egg gets broken, every trace of it should be removed, even to washing the eggs besmeared, which should be done when the hen is off the nest.

Whenever the hen can be set in the nest where she has laid, it is best to do so. If a new nest is to be made, it is better to take a box six to ten inches deep, and fill it about two thirds full of fresh earth, over which put a layer of fine hay, shaping the nest naturally: put in a few nest eggs, and put the hen on them at night, confining her there till she becomes accustomed to her new quarters, when she may be given her liberty. If inclined to be contented, put the eggs under her at night, and watch her and the nest for results.

To keep hens clear of parasites while sitting, it is well to sprinkle a little flour of sulphur through their feathers and in the nest. It is better to set several hens at the same time, and when they hatch unite the broods, if only a part of the eggs hatch, and the hen can care for more than her own, which will depend upon weather and size of hen.

W. H. WHITE.

Worcester County, Mass.

About Choosing Breeds.

EDS. COUNTRY GENTLEMAN—There are some breeds that unite both beauty and utility, others are merely ornamental, while still others have little to recommend them beyond the cardinal virtue of usefulness. Most well-kept fowls have a certain amount of comeliness, plumpness, and regularity of plumage. The pure-bred fowls have markings that belong to their breed alone, which greatly serve to establish their purity. When two distinct varieties are crossed, discrepancy creeps in. A judicious cross, sometimes makes a nice bird, but more often the beauty of both sides is entirely lost. An over-sized fowl is not handsome or useful. There are many who breed largely for market purposes, either flesh or eggs. For early chickens, something that unites size with quick maturity should be selected. This useful bird is generally obtained from a crossing of two good breeds, which makes a *fowl also good for egg production.*

A mistake is often made in the introduction of too much Asiatic blood, which element possesses too much bone, is long in coming to maturity, and, has at last, a poor quality of flesh. The Plymouth Rocks are highly esteemed for this purpose, but are at best only indifferent layers. Broilers, to be profi-

table, must be hatched early in the season, consequently some rugged, hardy variety must be chosen. This may be obtained from crosses, and the hardy, persistent Brahmas are always called into use, from the fact that they are always at hand as sitters at the particular time of year, give no trouble, and have size and hardiness. These virtues are at the expense of quality. There is perhaps no better flesh than that of the Game-fowl. This breed matures early, is extremely hardy when young, and will soon grow to fair size. They will be ready for market fully three weeks before any other, when hatched at the same time. But they are pugnacious, great scratchers, and impatient of any restraint. The farmer and villager dislike them, for they give much trouble, while the regular poultry-man likes them both as layers and sitters.

It is not for me, however, to say which variety shall have precedence. For early birds, the English Dorkings are much to be esteemed.(1)They have size, mature early, are good layers, and the chicks are easily reared. They are not widely known. The breed is excellent for crossing on varieties of similar size. It is a mistake to mix the blood of large and small breeds. The Dorkings are large fowls, but the hen lays an egg of medium size. The smaller Leghorn oftentimes excels in size of egg, but the Dorking fowl will weigh twice as much. The Hamburgs are excellent for eggs, but indifferent table birds. The American taste prefers size and yellow skin. With the consumption of fresh eggs and poultry on the increase at remunerative prices, the query will often arise which breed is best for all purposes. The only way to become satisfied as to which breed is the best, is thorough trial.

C. B. *Duchess County, N. Y.*

(1) There is no fowl-flesh like the flesh of the Dorking If you don t believe me, ask "Tom Irving." A. R. J. F.

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This Offer Good Till Thanksgiving Day Only.

The proprietors of the **FARM, FIELD AND FIRESIDE**, being desirous of having their already well-known and popular Agricultural and Family paper more widely circulated and introduced into houses where it is not already known, have determined to throw off all profit this year, and in addition use a portion of their capital for the sole purpose of increasing their circulation to **100,000** copies. Its circulation is now **65,000**. Only **35,000** more needed before the distribution takes place. After deciding to more extensively advertise than ever before, the following plan has been adopted by us:

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Read These Testimonials.

CHICAGO, Aug. 31, 1883.
We have furnished the paper for the FARM FIELD AND FIRESIDE for several months, and have always found its Proprietors honorable in their dealings, and prompt in their payments.
CHICAGO PAPER CO.

CHICAGO, Aug. 31, 1883.
The Proprietors of the FARM, FIELD AND FIRESIDE have paid me several thousand dollars for press-work on their paper. I have always found them prompt in all transactions.
A. G. NEWELL.

August 15, 1883.
I am highly pleased with your paper. The information concerning Poultry management alone is worth five times the price of your paper, saying nothing about the valuable Farm information and interesting stories, etc.
W. R. SIMPSON,
SLIPUP, Morgan Co., Ala.

BRAIDWOOD, Ill., Aug. 11, 1883.
I am very much pleased with your paper. Every number seems to me to become more attractive and profitable. I have shown it to several of my friends, who were at once delighted with it.
Mrs. J. F. EHLE.

WAUSEON, O., Aug. 11, 1883.
I received a copy of the FARM, FIELD AND FIRESIDE some days ago and must say that I was well pleased with it. I find it *a first-class journal for the farmers*, of whom I am one. With such an agricultural journal every farmer can receive much benefit.
M. H. HAYES.

MEXICO, Juniata Co., Pa., July 24, 1883.
I here with send you the names of fifteen subscribers to the FARM, FIELD AND FIRESIDE, which I secured in less than as many minutes.
B. L. SHUMAN.

SOUTH UNION, Ky., July 13, 1883.
It is certainly the best paper I ever saw, neat, plain, instructive and beautifully illustrated.
E. L. HOTE.

ILDERTON, ONT., Aug. 3, 1883.
I have lately been a subscriber to your tasty and profitable paper, and must say I am more than pleased with it. I gave my subscription, in the first place, more to have a chance for one of the many presents than for anything contained in the paper; but I find the paper is worth three or four times the money beside all presents.
S. W. PAISLEY.

PORTSMOUTH, VA., July 9, 1883.
I received the papers all right and am delighted. My friends and subscribers say they are surprised at its size and beauty. Every person that has seen the paper acknowledges it to be the best paper printed, and say it is *worth $2 per year.*
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